

**Appendix B: Senate Bill 1204 Requirements and Performance
Criteria Evaluation for Heavy-Duty Projects**

(Health & Safety Code Section 39719.2(c) and (d))

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Overview

Senate Bill (SB) 1204 (Lara, Chapter 452, Statutes of 2014) created the California Clean Truck, Bus, and Off-road Vehicle and Equipment Technology Program, funded by Low Carbon Transportation Investments, to support the development, demonstration, precommercial pilot, and early commercial deployment of zero- and near zero-emission (ZE) technologies with priority given to projects that benefit disadvantaged communities. This appendix describes the ten requirements of SB 1204 and how the California Air Resources Board (CARB) is addressing each of these requirements, followed by an evaluation of how each applicable heavy-duty or off-road project proposed in the Proposed Fiscal Year (FY) 2024-25 Funding Plan (Proposed Funding Plan) satisfies the proposed performance criteria. Providing direct benefits to priority communities requires careful consideration of CARB's equity goals and incorporating lessons learned from implementing our suite of clean transportation and air quality improvement investments. While the requirements of SB 1204 are discussed in detail here, staff also considered additional relevant legislation that guides investments to priority populations, such as Assembly Bill (AB) 1550 (Gomez, Chapter 369, Statutes of 2016), SB 535 (De León, Chapter 830, Statutes of 2011), and SB 350 (De León, Chapter 547, Statutes of 2015) in developing the Annual Funding Plan for Clean Transportation Incentives (Funding Plan).

CARB's proposed heavy-duty vehicle and off-road equipment projects were evaluated based on criteria that address emission reductions, technology viability and advancement, and market acceptance. Details of this evaluation are provided later in this appendix. SB 1204 and AB 8 (Perea, Chapter 401, Statutes of 2013) provide important policy drivers behind CARB's process of evaluating heavy-duty and off-road projects for funding consideration. Projects funded by the Air Quality Improvement Program (AQIP) must be evaluated based on the benefit-cost of criteria pollutant reductions and five additional preference criteria consistent with the requirements of AB 8, as detailed in Appendix A - Emission Reductions: Quantification Methodology. Heavy-duty and off-road projects received funding from the State's General Fund, the Greenhouse Gas Reduction Fund (GGRF), and AQIP, although this year's appropriation included only AQIP funding. Projects that receive funds from CARB's Low Carbon Transportation appropriation must satisfy the requirements of SB 1204, discussed in this appendix. (See Table 3 in Chapter 2 of the Proposed Funding Plan for a full list of heavy-duty or off-road projects proposed for funding in FY 2024-25 and each project's funding source). To ensure compliance with the requirements from both bills, CARB evaluates all proposed heavy-duty and off-road projects consistent with the benefit-cost and additional preference criteria requirements of AB 8 and the requirements of SB 1204, regardless of the project funding source. Appendix A - Emission Reductions: Quantification Methodology details the complete AB 8 and greenhouse gas (GHG) emission analysis.

Addressing Senate Bill 1204 Requirements

SB 1204 establishes specific program planning and project eligibility requirements and directs CARB to use the Funding Plan process to develop the guidance necessary to implement the program (Health and Safety Code section 39719.2(c)). The Proposed Funding Plan coordinates AQIP and Low Carbon Transportation investments in the heavy-duty sector, while implementing the specific statutory requirements that apply to each program.

SB 1204 establishes ten goals for California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program in Health and Safety Code section 39719.2(d) that should be addressed in CARB's guidance. The following describes how CARB will address each of these requirements, either by continuing procedures and processes that have been in place for previous AQIP or Low Carbon Transportation funding cycles or through new requirements proposed in this Funding Plan, followed by CARB's overarching vision for heavy-duty vehicle and equipment investments.

Senate Bill 1204 Requirement 1: Outline performance criteria and metrics for deployment incentives. The goal shall be to design a simple and predictable structure that provides incentives for truck, bus, and off-road vehicle and equipment technologies that provide significant greenhouse gas reduction and air quality benefits.

As Low Carbon Transportation and AQIP evolve, there is a clear need to evaluate the effectiveness of program investments. Staff will continue to work with interested parties, with a focus on small businesses and priority populations, to identify appropriate metrics of success for each project funded under AQIP and the California Clean Truck, Bus, Clean Off-Road Vehicle and Equipment Technology Program (i.e., the heavy-duty vehicle and off-road investments covered in the Proposed Funding Plan).

CARB investments have helped to bring many zero-emission options to the market for sectors such as heavy-duty trucks and buses, as well as many off-road options including construction, freight handling, marine, and locomotives. To continue advancing clean technologies in other sectors needed to meet long-term air quality and climate goals, this funding should spur increasingly low-emission and low-carbon technologies as they are introduced and achieve market acceptance, with a focus on zero-emission everywhere feasible. CARB will continue to work with communities to assess how technology advancement can be more inclusive of the most impacted communities and other priority populations and best address their needs.

California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program funding will complement regulatory efforts to expedite widespread deployment of zero-emission transit and school buses, freight and line-haul trucks, and off-road equipment, which are responsible for the bulk of emissions from the heavy-duty sector. Investments in Clean Truck and Bus Vouchers (HVIP), Clean Off-Road Equipment Voucher Incentive Project

(CORE), Heavy-Duty Demonstration and Pilot Projects, Innovative Small e-Fleets Pilot Project (ISEF), and the Zero-Emission Truck Loan Pilot Project play a critical role in transitioning the freight and passenger transportation sector to zero-emission, with an intentional focus on providing benefits to small businesses and disadvantaged communities, including increased access to funding for those that it the most.

Proposed Performance Criteria for Evaluating Heavy-Duty Projects: The following performance criteria for evaluating heavy-duty projects funded through AQIP, the California Clean Truck, Bus, and Off-Road Equipment Program, or both. These criteria are consistent with previous funding plans. These performance criteria are also intended to fulfill SB 1204 requirements:

- Potential for statewide and local emission reductions and health benefits.
 - Near-term reductions in both GHG and criteria emissions.
 - Long-term reductions in GHG and criteria emissions.
 - Emission reductions in non-attainment areas.
 - Emission reductions in and benefiting disadvantaged communities.
- Potential for technology viability.
 - Cost parity compared to conventional technology.
 - Reliability and durability in chosen application.
 - Ability to transfer technology to other vehicle or equipment types.
 - Fueling infrastructure support.
 - Ability to integrate renewable fuels.
- Broad market acceptance.
 - Ability to leverage additional public and private funding.
 - Collaboration between multiple entities, including State and local communities.
 - Ability to address market barriers.

Senate Bill 1204 Requirement 2: Ensure that program investments are coordinated with funding programs developed pursuant to the California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007 (Health and Safety Code Sections 44270 through 44274).

The California Clean Truck, Bus, and Off-Road Equipment Program complements and enhances the existing CARB/California Energy Commission (CEC) coordination in the AQIP planning process by directing additional funding for the development, demonstration, pre-commercial pilot, and early commercial deployment of the cleanest truck, bus, and off-road equipment technologies.

In developing the Funding Plan, CARB and CEC staff meet routinely during the development of each agency's funding/investment plans for these respective programs to ensure that investments are coordinated.

CARB and CEC continue to closely coordinate on program implementation after the Funding Plan is approved to ensure that investments in vehicles and infrastructure are complementary. For example, CARB and CEC are closely coordinating to ensure that heavy-duty vehicle purchase incentives offered by CARB are complemented by infrastructure funding opportunities through CEC. CEC implements a first of its kind infrastructure incentive program, Energy Infrastructure Incentives for Zero-Emission (EnergIIZE) Commercial Vehicles. EnergIIZE provides incentives for zero-emission vehicle infrastructure for medium-heavy duty battery electric and hydrogen fuel cell vehicles in California.

Senate Bill 1204 Requirement 3: Promote projects that assist the State in reaching its climate goals beyond 2020, consistent with Health and Safety Code Sections 38550 and 38551.

In all Funding Plans since FY 2014-15, heavy-duty projects focused on vehicles and industry sectors that, when transitioned to zero-emission, will significantly reduce emissions. All of these Funding Plans (with the exception of this year and FY 2020-21 which did not have a GGRF appropriation) included significant Low Carbon Transportation funding allocations for demonstrations, pilot commercial deployments, and ongoing deployments of commercially available vehicles that will achieve both near-term and long-term GHG emission reductions.

By continuing to develop promising advanced technologies for use in industry sectors that: (1) are significant GHG emitters; and (2) hold promise for technology expansion and transfer to other sectors, these investments will help the State reach its long-term climate goals and meet the clean transportation needs of priority populations. Some of the key performance criteria listed above are "potential for long-term GHG reductions" and "ability to transfer technology to other vehicle or equipment types." These criteria help to promote projects that will contribute to meeting climate goals.

Senate Bill 1204 Requirement 4: Promote investments in medium- and heavy-duty trucking, including, but not limited to, vocational trucks, short-haul and long-haul trucks, buses, and off-road vehicles and equipment, including, but not limited to, port equipment, agricultural equipment, marine equipment, and rail equipment.

Since the launch of AQIP with the first annual Funding Plan in 2009, CARB has funded the types of projects identified by SB 1204, and staff proposes to continue these investments as available funding allows. As shown in Table 3 in Chapter 2 of the Proposed Funding Plan, there is a total of \$34.9 million allocated from the Air Quality Improvement Fund for ISEF, CORE, and the Zero-Emission Truck Loan Pilot Project. This fiscal year, no additional funding has been allocated for HVIP or demonstration and pilot projects.

Senate Bill 1204 Requirement 5: Implement purchase incentives for eligible technologies to increase use of the cleanest vehicles in disadvantaged communities.

In prior years, approximately 30% of CARB's Low Carbon Transportation funding was cumulatively spent in disadvantaged communities. After the implementation of AB 1550 in 2016, this share has increased. To date, 59% of CARB's Low Carbon Transportation funding has gone to projects benefiting disadvantaged communities and low-income communities, including low-income residents. These heavy-duty vehicle investments, coupled with strong, ongoing outreach and education initiatives and metrics to measure and track direct community benefits, will promote increased access and use of the cleanest vehicles in these communities.

Over past funding cycles, CARB has provided AQIP, Low Carbon Transportation, and other funding for purchase incentives for clean technologies, reducing emissions from the heavy-duty sector and providing benefits to disadvantaged communities. HVIP has supported the purchase of approximately 8,200 zero-emission trucks and buses, 2,500 hybrid trucks, 2,500 combustion engines, and 300 trucks with electric power take off systems by California fleets through July 2024. To date, over 58% of awarded HVIP funding has been spent in low-income and disadvantaged communities.

CORE has issued about 2,500 vouchers since its inception, totaling about \$250 million. Approximately 74% of CORE funded equipment has been or will be deployed in low-income, disadvantaged communities, and small businesses. A total of 47 manufacturers currently have eligible equipment models, including terminal tractors, forklifts, transport refrigerator units, mobile power units, and railcar movers. Altogether, there are currently 297 different eligible equipment model configurations.

Senate Bill 1204 Requirement 6: Allow for remanufactured and retrofitted vehicles to qualify for purchase incentives if those vehicles meet warranty and emissions requirements, as determined by the State board.

Eligibility for zero-emission conversions of original equipment manufacturer vehicles was added to HVIP in FY 2015-16, and staff propose these to continue in FY 2024-25, with adjustments to increase incentives for conversions of existing diesel trucks. CORE also provides incentives for conversions of specific equipment types. CARB works with the conversion manufacturer and other related entities to ensure that end-user fleets will be supported after the sale with warranty provisions and a service and maintenance plan when considering eligibility for conversions.

Senate Bill 1204 Requirement 7: Establish a competitive process for the allocation of money for projects funded pursuant to this section.

CARB has awarded AQIP funding through competitive solicitations since 2009. This process has served as the basis for allocating most Low Carbon Transportation funding since the FY 2014-15 funding cycle, and staff proposes using a similar process moving forward.

Senate Bill 1204 Requirement 8: Leverage, to the maximum extent feasible, federal, or private funding.

Currently, most grant solicitations require a minimum level of match funding, and projects that offer more match funding have the potential to be scored higher than projects with less match funding. Proponents are encouraged to seek additional funding from federal (there are new federal funding sources, described in more detail in the Funding Plan, which include the Inflation Reduction Act and the Infrastructure Investments and Jobs Act), as well as state, and local public sources, as well as private sources. Staff develops solicitation scoring criteria to encourage leveraging federal and private funding and works with other funding providers to maximize the funding available. Vehicle purchase incentives such as HVIP and CORE also encourage private investment, as the voucher only covers a portion of the total cost of the vehicle. HVIP, for example, leverages over \$3 of additional public and private investments for every \$1 invested by the state. This also aligns with CARB's goals of ensuring the investments we are making, especially in priority communities, are sustainable beyond what CARB funding can provide.

Senate Bill 1204 Requirement 9: Ensure that the results of emissions reductions or benefits can be measured or quantified.

All grant solicitations require that the project proponent report various metrics associated with vehicle operation and fuel consumption. Emissions from vehicles certified to a cleaner standard will be compared to a diesel baseline to determine emission reductions. Fuel consumption and carbon intensity will be used to quantify GHG emission benefits from hybrids, battery electric, and fuel cell electric vehicles, and vehicles using renewable fuels, compared to their conventional counterparts. All program-level GHG emission reduction benefits will be quantified by comparing to conventional technologies on a well-to-wheel basis. In addition, telematic devices will be used, when possible, to monitor in-use data and provide information on usage in disadvantaged communities and other designated areas. Metrics to assess emissions reduction benefits, particularly direct benefits in priority populations, will allow for more equitable outcomes and tracking progress of heavy-duty investments over time.

Senate Bill 1204 Requirement 10: Ensure that activities undertaken pursuant to this section complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Meeting California’s climate and air quality goals requires a mix of policy approaches, including mandates, incentives, consumer education, and infrastructure investments. The technologies funded in California Clean Truck, Bus, and Off-Road Vehicle and Equipment Program provide GHG reductions and criteria pollutant and toxic air contaminant reductions, consistent with the existing AQIP program. These technologies operating in and near disadvantaged communities will reduce oxides of nitrogen and diesel particulate matter, contribute to criteria pollutant emission reductions, and reduce GHG emissions in the heavy-duty sector. Adopting heavy-duty technologies in communities complements and supports other air quality improvement programs and measures. CARB contracted with a team of researchers at the University of California who specialize in technological innovation systems theory, behavioral research, and environmental policy. The researchers reviewed California’s portfolio policy approach related to transportation and assess its effectiveness. The contract aimed to better define GHG emission benefits of individual CARB incentive programs. While the contract was primarily focused on assessing greenhouse gas reductions, the findings also improved understanding of how the complementary programs interact to support criteria pollutant and toxic air contaminant reductions. The contract was implemented for two years and was completed at the end of 2023. An analysis of the findings was included in the final report.

Overarching Vision for Heavy-Duty Vehicle Investments

SB 1204 directs that the annual framework and plan required under Health and Safety Code Section 39719.2(f):

Articulate an overarching vision for technology development, demonstration, pre-commercial pilot, and early commercial deployments, with a focus on moving technologies through the commercialization process.

The recommended heavy-duty vehicle and off-road equipment projects support SB 1204's overarching vision for technology development, demonstration, precommercial pilot, and early commercial deployments, focusing on moving technologies through the commercialization process and addressing air quality needs of priority communities. This evolutionary role of incentives - is illustrated in Figure B-1 and described below.

Figure B-1: Recommended Approach for Heavy-Duty Vehicle and Off-Road Equipment

In the *demonstration phase*, manufacturers are placing pre-commercial vehicles and equipment in service under real-world operating conditions. In this phase, per-vehicle incentives are high because manufacturing is not standardized and focuses on smaller vehicle batches. For FY 2024-25, there is no appropriation for Demonstration and Pilot projects.

Funding is also provided for *pilot projects* to help the technology evolve in the early commercialization phase by deploying a larger volume of vehicles and equipment. Pilot projects can include pre-commercial and commercial pilots depending on the technology advancement stage. *Pre-commercial pilots* are focused on first-time demonstrations of advanced technologies in new applications. On the other hand, *commercial pilots* involve deployments of vehicles and equipment that have been demonstrated, are certified by CARB, come with a warranty, and are purchased or leased by the end user. Vehicles in commercial pilots are ready to be sold commercially, but in such small numbers that they could not compete without incentive support.

In addition, many projects would only advance to commercialization with the appropriate fueling infrastructure. For this reason, CARB coordinates with the CEC, including the development of joint solicitations, to provide funding for fueling infrastructure that directly supports funded vehicles and equipment.

Table B-1: Pilot Project Categories

Milestone	Demonstration or Pre-commercial Pilot	Early Commercial Deployment or Commercial Pilot
CARB Certification/Approval	Experimental permit	Vehicle/engine certification or Zero Emission approval letter
Vehicle Ownership	Retained by manufacturer	Purchase or lease transaction
Manufacturer Warranty	No	Yes

In the *commercialization phase*, incentives are provided to address barriers to affordability and access and encourage consumer adoption of advanced technologies. The commercialization phase can be broadly separated into lower-volume and higher-volume production phases. In the lower-volume commercialization phase, per vehicle incentives are high. As sales grow and economies of scale are achieved, incentive funding levels and vehicle eligibility requirements can be adjusted to reduce per vehicle funding to ensure maximum incentive efficiency. In this higher-volume commercialization phase, while per vehicle incentives are decreasing, total sales and total incentive funding commitments increase as a result. As a technology moves from lower-volume commercialization to a fuller more mature higher-volume, the incentive funding goals shift from a focus on technology development to a more specific focus on moving the technology from early adopters to mainstream consumers, disadvantaged communities, and the secondary market.

As technology moves from commercialization into the transition phase, incentives can be adjusted to focus on moving the technology into new consumer demographic segments, including small fleets, and building upon earlier benefits in priority communities.

Project-Specific Senate Bill 1204 Performance Criteria Evaluation

The following sections include an evaluation of each proposed heavy-duty on-road and off-road equipment project in terms of how they satisfy the proposed performance criteria detailed earlier in this appendix.

Clean Off-Road Equipment Voucher Incentive Project

Following is an assessment of the proposed Clean Off-Road Equipment Voucher Incentive Project (CORE) in terms of how it meets the proposed SB 1204 evaluation and performance criteria.

Potential for Statewide and Local Emission Reductions and Health Benefits: CORE is expected to achieve near-term greenhouse gas reductions along with co-benefit reductions in toxic and criteria pollutant emissions. CORE is designed to encourage and accelerate the deployment of new ZE heavy-duty off-road equipment in California, ultimately leading to

long-term reductions in criteria and greenhouse gas emissions and aiding California in attaining federal ozone and particulate matter standards within non-attainment areas.

Potential for Technology Viability: CORE is intended to accelerate the deployment of advanced technology in the off-road sector by providing a streamlined way for fleets to access funding that helps offset the incremental cost of such technology. Providing incentive funding towards purchasing ZE equipment accelerates the penetration of these technologies into the off-road market. Increased production volumes will lead to cost reductions in components and assembly, energy storage systems, and fueling infrastructure.

Broad Market Acceptance: The proposed project is being structured to encourage leveraging local, State, federal, and private funding. Fleets would be allowed to apply to multiple funding sources; however, the maximum allowable voucher plus all other public incentives may not exceed the cost of the equipment. The collaboration between public agencies and their commitment to investing resources toward improving local air quality motivates advanced technology providers to invest in developing the cleanest possible technologies. Incentive funding and public and private partnerships encourage the deployment of advanced technology, reduces production costs, and increases commercial viability within the heavy-duty off-road equipment market. Greater availability of ZE off-road equipment that successfully performs the same functions as their conventional counterparts will send a strong signal to those considering adopting similar ZE technologies.

Innovative Small e-Fleet

The following is an assessment of the proposed Innovative Small e-Fleet (ISEF) project in terms of how it meets the proposed SB 1204 evaluation and performance criteria.

Potential for Statewide and Local Emission Reductions and Health Benefits: The ISEF program funds vouchers for small fleets to access class 2b through class 8 zero-emission trucks and buses. ISEF helps transition the smallest of California truck fleets to cleaner technologies, which helps reduce trucking-related emissions in and around priority communities. Further, it accelerates the turnover to zero-emission vehicles by fleets that are not subject to fleet regulations, ultimately leading to long-term reductions in criteria and greenhouse gas emissions, and aiding California in attaining federal ozone and particulate matter standards within non-attainment areas.

Potential for Technology Viability:

Like the broader HVIP program, the ISEF pilot provides incentive funding towards the purchase of early commercial ZE trucks to early adopters, accelerating the penetration of these technologies into the medium and heavy-duty market and helping fleets adopt zero-emission vehicles in advance of regulatory requirements. Further spurred by regulations, increased production volumes will lead to cost reductions in vehicle components and assembly, energy storage systems, and fueling infrastructure. By offering increased funding to small fleets and for innovative strategies beyond a standard purchase, the program will

encourage repeatable test cases and increased uptake by various business types. This will lead to greater deployment for all sizes of zero-emission vehicles.

Broad Market Acceptance: The ISEF pilot was designed to help small fleets and independent owner/operators overcome challenges to zero-emission vehicle market entry. The pilot project was partly developed to better understand small fleets' specific needs and help inform policy for broader HVIP. ISEF encourages the exploration of innovative mechanisms to assist with the small fleet transition to zero-emission, such as flexible financing, all-inclusive leases, peer-to-peer truck sharing, truck-as-a-service individual owner planning assistance, as well as other support mechanisms. Funding these projects will encourage broader deployment of advanced technology to small businesses, reduce production costs, increase commercial viability within the truck and bus market, and promote technology and project sustainability, which are critical to meeting the long-term needs of priority communities.

Zero-Emissions Truck Loan Pilot Project

The following is an assessment of the Zero-Emissions Truck Loan Pilot Project in terms of how it meets the proposed SB 1204 evaluation and performance criteria.

Potential for Statewide and Local Emission Reductions and Health Benefits:

The program is a pilot project that is designed to provide increased financing opportunities for heavy-duty zero-emission vehicles through a loan-loss support mechanism. By supporting small fleets, the program will encourage increased uptake by fleets who may need a little extra assistance with funding a vehicle. This will lead to greater deployment of both new and used Class 2b through Class 8 zero-emission vehicles.

Potential for Technology Viability:

The program will increase small business fleets access to capital markets by lowering lender risk and assisting fleets in adopting zero-emission vehicles. This will accelerate the penetration of new technologies into the medium and heavy-duty market. Increased production volumes will lead to vehicle refinement and cost reductions in manufacturing and fueling infrastructure, which in turn supports greater development and deployment.

Broad Market Acceptance:

The ZE Truck Loan Pilot Project builds on the highly successful legacy Truck Loan Program and provides continuity and consistency for eligible fleets and lenders. The program is designed to help small fleets overcome barriers to zero-emission vehicle market entry and will allow staff to better understand the specific financial support needed when adopting zero-emission vehicles. The program is easy for an eligible fleet to use - an applicant contacts a participating lender and completes a loan application. The lender then approves the loan in accordance with its underwriting standards and enrolls the loan in the program. The streamlined process helps assist with broad adoption and encourages market acceptance. In addition, CARB has closely coordinated with the California Energy

Commission in the development of a zero-emission infrastructure loan support pilot program to support charging and hydrogen fueling needs in conjunction with the vehicle purchase.