Updated Informative Digest

Heavy-Duty Inspection and Maintenance Regulation

Sections Affected:

Amendments to California Code of Regulations (CCR), title 13, section 2193. Adoption of CCR, title 13, section(s) 2195, 2195.1, 2196, 2196.1, 2196.2, 2196.3, 2196.4, 2196.5, 2196.6, 2196.7, 2196.8, 2197, 2197.1, 2197.2, 2197.3, 2198, 2198.1, 2198.2, 2199, and 2199.1.

Documents Incorporated by Reference (Cal. Code Regs., tit. 1, § 20, subd. (c)(3)):

The following documents are incorporated in the regulation by reference as specified by the following section:

- "California Standards for Heavy-Duty Remote On-Board Diagnostic Devices," adopted August 22, 2022, incorporated by reference in 13 CCR section 2195.1.
- Society of Automotive Engineers (SAE) J1667 Recommended Practice "Snap Acceleration Smoke Test Procedure for Heavy-Duty Powered Vehicles," as issued February 1996 ("1996-02"), incorporated by reference in 13 CCR section 2195.1.
- Title 49 Code of Federal Regulations (CFR) Part 565, October 1, 2021, incorporated by reference in 13 CCR section 2195.1
- Title 49 CFR Part 566, October 1, 2021, incorporated by reference in 13 CCR section 2195.1
- Title 49 CFR Part 571, October 1, 2021, incorporated by reference in 13 CCR section 2195.1

The "California Standards for Heavy-Duty Remote On-board Diagnostic Devices," is being adopted by this regulation and thus the adoption date will be the date that the regulation is approved by the California Air Resources Board (CARB or Board).

The following documents are incorporated by reference in the "California Standards for Heavy-Duty Remote On-Board Diagnostic Devices":

- Section 86.010-18, title 40, CFR, "On-board Diagnostics for engines used in applications greater than 14,000 pounds GVWR", 2009.
- International Organization for Standardization (ISO) 11898-1 "Road vehicles – Controller area network (CAN) – Part 1: Data link layer and physical signaling," 2015.
- ISO 11898-2 "Road vehicles – Controller area network (CAN) – Part 2: High-speed medium access unit," 2016.

- ISO 15031-4 "Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 4: External test equipment," 2014.
- SAE J1699-2 "Test Cases for OBD-II Scan Tools and I/M Test Equipment," 2017.
- SAE J1962 "Diagnostic Connector," July 2016.
- SAE J1978 "OBD II Scan Tool – Equivalent to ISO/DIS 15031-4," April 2002.
- SAE J1979 "E/E Diagnostic Test Modes," February 2017.
- SAE J1979-DA "Digital Annex of E/E Diagnostic Test Modes," May 2019.
- ISO 15765-4 "Road Vehicles-Diagnostics Communication over Controller Area Network (DoCAN) - Part 4: Requirements for emission-related systems," April 2021.
- SAE J1939 Recommended Practice for a Serial Control and Communications Heavy Duty Vehicle Network – Top Level Document," August 2018.
- SAE J1939-DA "Digital Annex of Serial Control and Communication Heavy Duty Vehicle Network Data," March 2020.
- SAE J1939-3 "On Board Diagnostics Implementation Guide," 2015.
- SAE J1939-13 "Off-Board Diagnostic Connector," October 2016.
- SAE J1939-21 "Data Link Layer," October 2018.
- SAE J1939-73 "Application Layer – Diagnostics," June 2019.
- SAE J1939-81 "Network Management," March 2017.
- SAE J3005-1 "Permanently or Semi-Permanently Installed Diagnostic Communication Devices," February 2019.
- SAE J3005-2 "Permanently or Semi-Permanently Installed Diagnostic Communication Devices, Security Guidelines," March 2020.
- SAE J1979-2 "E/E Diagnostic Test Modes: OBDonUDS," April 2021.

Background and Effect of the Proposed Regulatory Action:

This proposed regulatory action would substantially reduce emissions of dangerous pollutants from existing heavy-duty (HD) vehicles by implementing an inspection and maintenance program as directed by the Legislature. Once fully in force, the program would help protect Californians by ensuring these vehicles are properly maintained, and thereby cut air pollution.

HD vehicles, i.e., those with gross vehicle weight rating (GVWR) greater than 14,000 pounds, continue to be major contributors to statewide mobile source air pollution, even though this sector only makes up about 3 percent of the total on-road vehicles operating in California. In 2020, HD vehicles emitted approximately 52 percent of the statewide on-road mobile source oxides of nitrogen (NOx) emissions and about 54 percent of the statewide on-road mobile source particulate matter (PM) 2.5 emissions.[1]

HD vehicles' NOx and PM emissions harm human health and the environment. In 1998, CARB listed diesel PM as one of the identified carcinogenic toxic air contaminants due to its

[1] PM 2.5 is particulate matter with a diameter of less than 2.5 micrometers.

contribution to increased mortality, cancer risk, and serious illness. NOx is a precursor of ozone formation and several other air toxics including PM. Exposure to PM and ozone can lead to serious adverse health effects such as asthma, cardiopulmonary and respiratory diseases, and premature deaths.

Despite continuing efforts by CARB and air districts which have substantially reduced air pollution, most densely populated areas in California, such as South Coast and San Joaquin Valley air basins, are still not in attainment with the federal ozone and PM 2.5 standards and CARB is focused on rapidly cutting remaining air pollution. About 70 percent of Californians live in areas that exceed the federal ozone and PM 2.5 standards. To achieve federal air quality standards and improve public health in these regions as well as across the State, it is critical to substantially further reduce NOx and PM emissions from on-road HD vehicles beyond what CARB's current programs are already doing. As many major populated regions and economically disadvantaged communities are near heavy trucking traffic areas, by reducing in-use HD truck emissions, the Proposed Regulation would help achieve equitable clean air quality for all Californians. The Proposed Regulation would especially benefit Californians exposed to freight-related pollution from HD vehicles.

To limit excess emissions from in-use HD vehicles, CARB currently implements two in-use vehicle inspection programs, the HD Vehicle Inspection Program (HDVIP) and the Periodic Smoke Inspection Program (PSIP). This program would generally replace these programs with a more comprehensive and effective structure.

In the early 1990s, CARB adopted the HDVIP, which allows CARB staff to inspect HD trucks and buses operating in California for excessive smoke, tampering, and engine certification label compliance. CARB inspections are typically performed at border crossings, California Highway Patrol (CHP) Commercial Vehicle Enforcement Facilities (commonly known as "weigh stations"), fleet facilities, and randomly selected roadside locations. Vehicle owners found in violation are subject to monetary penalty and required to provide proof of correction to clear violations. In addition to HDVIP, CARB adopted the PSIP to control HD vehicle smoke emissions. Under the PSIP regulation, fleet owners of two or more HD diesel vehicles are required to perform annual smoke opacity tests following the SAE J1667 testing procedure, keep the smoke test records for potential auditing purposes, and repair vehicles that exceed the allowed smoke opacity limits. CARB staff randomly audits fleets, reviews maintenance and inspection records, and tests a representative sample of vehicles at the roadside to enforce the PSIP regulation. Upon initial implementation in the early 1990s, the smoke opacity limits for both HDVIP and PSIP were established at 40 percent for 1991 and newer model year (MY) HD diesel engines and 55 percent for pre-1991 MY HD diesel engines. Recent Board adopted amendments in 2018 to the HDVIP and PSIP established a more stringent set of smoke opacity limits, such as 5 percent for any HD vehicle powered by a 2007 or subsequent MY diesel engine and 5 percent for any HD vehicle required to be equipped or retrofitted with a Level 3 Verified Diesel Emissions Control Strategy, regardless of its diesel engine MY.

The recent Board amendments to the HDVIP and PSIP improved the ability to identify some emissions related issues, such as malfunctioning diesel particulate filters. However, these programs still rely on the smoke opacity test for emissions related diagnosis and thus can

only identify and ensure repairs on a subset of HD vehicle emissions control-related issues, leaving NOx related emissions issues unchecked. Considering the substantial proportion of statewide NOx emissions attributed to HD vehicles, it is critical to develop improved testing methods to ensure the diagnosis of all emissions related issues that may result from HD vehicles.

Recognizing that a revamped and robust HD vehicle inspection and maintenance program could provide significant and critically needed NOx and PM reductions, Senator Connie Leyva introduced Senate Bill (SB) 210 (Leyva; Chapter 5.5, Statutes of 2019). SB 210 directed CARB, in consultation with its partner State agencies, to develop a new, comprehensive heavy-duty inspection and maintenance (HD I/M) program applicable to non-gasoline HD vehicles operating in California with a GVWR above 14,000 pounds. Governor Newsom signed SB 210 into law on September 20, 2019.

Summary of Proposal

The Proposed Regulation would implement a more robust and enforceable, yet streamlined, inspection and maintenance test procedure for non-gasoline combustion HD vehicles with GVWR greater than 14,000 pounds operating in California. It would help curb on-road HD NOx and PM emissions by ensuring HD vehicles' emission control systems are well maintained and functioning as designed throughout their vehicle life. The Proposed Regulation would consist of the following elements:

1. Vehicle Applicability

All non-gasoline combustion vehicles above 14,000 pounds GVWR that operate in California would be subject to the Proposed Regulation to ensure that emissions control systems on these vehicles are operating as designed and get repaired in a timely manner when they malfunction. This would include out-of-state and out-of-country registered vehicles when operating within the State of California. Such vehicles account for up to 50 percent of the vehicles that operate in California and emit about 27 percent of total NOx emissions, and 36 percent of total PM 2.5 emissions from all HD vehicles operating in California each day. The Proposed Regulation would not apply to:

- Zero-emission HD vehicles,
- Authorized emergency vehicles,
- Military tactical vehicles,
- New vehicles certified to the most stringent optional NOx certification standard for the first four years of the Proposed Regulation,
- Non-California registered motor homes used for recreational purposes,
- Vehicles operating under a CARB-issued experimental permit,
- Historical plated vehicles, or
- Vehicles operating under an Emergency Declaration.

2. Reporting Requirements

Under the Proposed Regulation, owners of HD vehicles operating in California (including out-of-state vehicles) would be required to report owner and vehicle information to CARB

and ensure their fleet information is current. Owners would first need to establish an account in CARB's HD I/M database system and then report the required vehicle information for vehicles within their fleet. To reduce redundancies in state database systems, CARB staff would coordinate with California Department of Motor Vehicles (DMV) to obtain vehicle information for applicable vehicles that are registered with the DMV and/or International Registration Plan databases. Only owners that have vehicles not registered in one of these two databases or with critical data gaps in these databases (e.g., vehicle identification number (VIN), license plate, etc.) would need to report such vehicle information.

3. Vehicle Compliance Testing Requirements

HD vehicle owners would demonstrate their emissions control systems are properly functioning through required vehicle compliance tests. For on-board diagnostic (OBD)-equipped vehicles, vehicle owners would submit OBD data, while for non-OBD vehicles, vehicle owners would submit the results of a smoke opacity test and visual emissions control inspection.

a. OBD Testing for HD OBD-Equipped Vehicles

For OBD-equipped vehicles, staff is proposing that vehicle owners comply though OBD data submission. The OBD-based vehicle compliance test would rely on the submission of the OBD data parameters specified by CARB's HD OBD regulation (Section 1971.1, Title 13, CCR). These OBD data parameters have been standardized through regulation and verified through CARB's certification process to monitor and detect for emissions related issues. This required OBD data would include information such as emissions related fault codes, monitor test results, and live stream data parameters necessary to determine whether a vehicle has an emissions related issue present during the inspection. It would also include additional parameters to help assess whether the test was performed properly and whether any fraudulent activity may have occurred during the inspection test.

Owners of HD OBD-equipped vehicles would have multiple options for the required compliance testing, allowing vehicle owners to select a test method that best meets their vehicle operation and business needs. OBD test results could be submitted through a continuously connected remote OBD device, generically referred to as a telematics submission. Telematics allow for an automated test inspection and submission without human interaction or vehicle downtime. Telematics technology has been utilized by HD fleets for logistic managements or preventive maintenance notification through fleets' subscription to telematics companies for many years. The proposed continuously connected remote OBD testing submission approach could be incorporated into the current telematics services offered to fleets. Alternatively, OBD test results could be submitted through a non-continuously connected remote OBD device, referred to as a plug-in test device. Such testing could be performed anywhere and submitted remotely to the HD I/M database system. Although not an automated inspection as with the telematics submission, tests performed via a plug-in test device would take less than five minutes to complete.

b. Smoke Opacity and Visual Inspection for HD Non-OBD Vehicles

For HD vehicles that are not equipped with OBD systems, staff is proposing a smoke opacity test following the SAE J1667 testing procedure, along with a visual inspection of a vehicle's emissions control systems as the required compliance test. The SAE J1667 smoke opacity testing currently is required as part of CARB's HDVIP/PSIP regulations. Smoke opacity testing is limited to monitoring PM emissions control systems and not as comprehensive as OBD testing, staff is also proposing a visual inspection of emissions control systems as part of the vehicle compliance testing procedure for non-OBD vehicles. The proposed visual inspection would require an inspector to verify all emissions control components are in the manufacturer-approved configuration.

Compliance testing for non-OBD vehicles would be required to be performed by a HD I/M-approved tester. The proposed testing would take about 30 minutes per vehicle: 15 minutes for the smoke opacity test and another 15 minutes for the visual inspection. Because the SAE J1667 smoke opacity test is specific to diesel vehicles, non-OBD alternative fuel vehicles subject to the Proposed Regulation would not be required to perform the smoke opacity test. Such vehicles would be subject solely to the visual inspection requirements during their vehicle inspection, thus, the proposed testing would take about 15 minutes per inspection.

4. Periodic Testing Requirements

For periodic testing requirement, staff is proposing semiannual (once every six months) compliance testing for affected HD non-OBD vehicles. Affected HD OBD-equipped vehicles would be subject to semiannual compliance testing for the first three years, then quarterly testing starting in the fourth year of the periodic testing implementation. Non-commercial California-registered motor homes and all agricultural vehicles would be subject to annual testing. Owners would be required to have a passing compliance test submitted for their vehicle by each periodic testing deadline. For California-registered vehicles, the periodic compliance deadlines would align with a vehicle's DMV registration date and the date six months (for semiannual testing) or three months (for quarterly testing) from a vehicle's DMV registration date. The compliance deadline for motorhomes and agricultural vehicles subject to an annual testing requirement would be the vehicle's DMV registration date. Compliance deadlines for out-of-state vehicles would be based on the last number of a vehicle's VIN, with each number representing a different month of the year. Spreading out testing deadlines throughout the year would help ensure the effective implementation of the Proposed Regulation by avoiding the risk of surges in program activity at select times of the year.

5. HD I/M Tester Requirements

The Proposed Regulation would require any individual performing vehicle compliance testing to complete a CARB-approved training course and obtain a testing credential. Such training would include instruction on how to properly perform the required vehicle compliance tests and the regulatory requirements of the Proposed Regulation. These training requirements would establish minimum competency and knowledge required of a tester, encourage consistent testing procedures, and thereby ultimately mitigate improper testing habits.

6. Referee Testing Network

Analogous to the responsibilities performed by referees in the Bureau of Automotive Repair's (BAR) light-duty smog check program, staff is proposing to establish a referee testing network to provide independent evaluations of HD vehicles and services for vehicles with inspection incompatibilities or compliance issues. The referees would provide a critical testing backstop for vehicles that struggle to comply with the testing requirements or submit testing that suggests potential fraud.

7. Parts Unavailability Compliance Time Extension Provisions

CARB staff is proposing a compliance time extension provision for fleets whose fleet owner cannot obtain the parts needed to repair a vehicle in time. In case of such a lack of parts availability, a compliance extension could be granted to the vehicle owner to allow the vehicle to operate up through the vehicle's next periodic testing deadline. Upon seeking approval of such a request from the Executive Officer, the vehicle owner would be required to provide documentation that provides evidence that they made a good faith effort to bring the vehicle into compliance, what parts are not available to make the required repairs and why, and when such parts are expected to become available.

8. HD I/M Vehicle Compliance

The Proposed Regulation would require HD vehicle owners to have demonstrated compliance with the HD I/M program for their applicable vehicles when operating in California. Under the provisions of the Proposed Regulation, the Executive Officer would deem a vehicle compliant after the vehicle owner has completed the following:

- Reporting vehicle and fleet information,
- Passing the required vehicle compliance tests,
- Resolving any outstanding enforcement actions on the vehicle for which the compliance certificate is being issued, and
- Paying the program's annual compliance fee of $30 per vehicle through CARB's HD I/M database system.

Similar to BAR's Smog Check program, compliance with the Proposed Regulation would be tied to California DMV registration. Thus, owners of California-registered HD vehicles would be unable to renew their DMV vehicle registrations unless they demonstrate that an applicable vehicle is fully compliant with the HD I/M program by a vehicle's DMV registration renewal date. Out-of-state vehicle owners would be required to meet the same testing requirements as in-state vehicle owners and obtain HD I/M vehicle compliance to operate legally in California.

9. HD I/M Roadside Inspections

The proposed HD I/M enforcement tools described below are intended to help maintain a more level playing field among all vehicles operating within the State and to enhance program compliance by increasing the overall enforcement presence available to support the Proposed Regulation.

a. Roadside Monitoring

Roadside Emissions Monitoring Devices (REMD), which may include remote sensing devices CARB's Portable Emissions AcQuisition System (PEAQS), and automatic license plate recognition (ALPR) cameras would assist with enforcement efforts for the Proposed Regulation. These systems would detect potentially high-emitting vehicles or those lacking a valid compliance certificate operating in California. CARB's PEAQS units are already deployed in California to assist with mobile regulatory enforcement efforts. Staff projects to increase the number of systems in statewide operation over the coming years. These systems help support regulatory enforcement efforts by enhancing the ability to screen vehicles for potential compliance issues. When a vehicle is flagged for potential high emissions, the vehicle would have to submit to CARB a vehicle compliance test to ensure the emissions control systems are functioning as required. Furthermore, vehicles identified passing through the monitoring systems and cross-referenced within the HD I/M database system as not having a valid compliance certificate may be subject to citations and penalties for non-compliant operation.

b. Field Inspections

Under the Proposed Regulation, CARB staff would perform field inspections on HD vehicles operating in California, similar to the current field inspections performed in HDVIP. Inspectors may issue citations to vehicle owners to take corrective action on vehicles found to be in non-compliance. Additionally, SB 210 specifically codifies CHP's authority to perform HD I/M field inspections to check for HD I/M compliance, malfunction indicator light issues, and visible smoke during their normal day-to-day safety inspections at weigh stations and other roadside locations throughout the State. CHP's participation would enhance the Proposed Regulation's enforcement presence in the field.

10. Freight Contractor Requirements

To assist with the implementation and enforcement of the Proposed Regulation, CARB staff is proposing that freight contractors, applicable freight facilities, and brokers verify fleet and vehicle HD I/M compliance as part of their business processes. These proposed requirements, which also include recordkeeping provisions, are consistent with those in existing CARB regulations. By incorporating all levels of the supply chain into HD I/M compliance verification, CARB staff intends to maintain a level playing field for vehicles and fleets conducting business in California. By encouraging the hiring of only HD I/M compliant vehicles, CARB's goal is to reduce the monetary advantage to "bad actor" fleet and vehicle owners that try to circumvent the requirements of the Proposed Regulation.

11. OBD Testing Device Requirements and Certification

Under the Proposed Regulation, staff is proposing technical specifications that OBD devices used for vehicle compliance testing must meet. CARB staff is also establishing a certification process for vendors to demonstrate that their devices comply with the technical specifications. The proposed technical specifications would standardize key functionality requirements, including:

1) The diagnostic connector that must be used for the device to connect to the vehicle;
2) The communication protocols required between the device and the vehicle;
3) The OBD data that must be collected from the vehicle and submitted to CARB's HD I/M database; and
4) The format and transmission method of that data.

Standardizing these functionalities and establishing a formal certification process would provide vendors and developers a pathway for offering devices that meet the demands of the market while also ensuring that the devices can connect and communicate effectively with vehicles' OBD systems. Such requirements would also enable an automated compliance test submission process and time-efficient analysis of the compliance test results within the HD I/M database, thus streamlining compliance determinations for vehicle owners.

12. Phase-in Approach

The Proposed Regulation would begin in 2023 with requirements implemented in three phases as follows:

a. Phase 1 starting on January 1, 2023: The initial phase of the Proposed Regulation would rely on CARB's network of REMD to monitor vehicles operating within the State and screen for HD vehicles potentially operating with excess emissions. Owners of vehicles that are flagged by CARB as high-emitting vehicles with a potential emissions control issue would be required to complete a vehicle compliance test and submit the results to CARB. Vehicle owners would also be required to complete the reporting of their vehicle and fleet information to obtain a compliance certificate for each vehicle.
b. Phase 2 starting in July 2023: Phase 2 of the Proposed Regulation would begin the implementation of the freight contractor, broker, and applicable freight facility compliance verification requirements. Furthermore, the reporting requirements and annual compliance fee payment requirements would become effective for HD vehicle owners.
c. Phase 3 starting in January 2024: During this phase, periodic testing requirements would begin. All owners of vehicles operating in the State would need to perform the applicable periodic testing, resolve any outstanding CARB-issued program citations, and pay the required annual compliance fee to meet the compliance requirements of the HD I/M program. CARB's network of REMDs would continue to identify potential high emitting vehicles that may require further testing. This network would continue to be expanded as the program is implemented to provide greater coverage of the HD vehicles operating in the California.

13. Amending and Sunsetting Current HDVIP and PSIP Regulations

To avoid unnecessary duplication between regulations, staff is proposing to sunset the HDVIP regulation upon the effective date of the Proposed Regulation. The HD I/M roadside inspections as part of the Proposed Regulation would replace the HDVIP regulation. The Proposed Regulation would establish updated opacity test standards for off-road motive engines equipped in on-road vehicles. Thus, to ensure consistency, staff is proposing to amend the PSIP to align the smoke opacity standards with those in the Proposed Regulation.

Furthermore, upon the implementation of the new periodic testing requirements in the Proposed Regulation, staff is proposing to sunset the PSIP regulation. This would eliminate any overlapping and duplicative periodic testing requirements.

Objectives and Benefits of the Proposed Regulatory Action:

Objective

The overall goal of the Proposed Regulation is to reduce NOx and PM emissions from HD vehicles with a GVWR greater than 14,000 pounds. The Proposed Regulation is critical for helping California to meet the State Implementation Plan's commitment of achieving federal ambient air quality attainment in the San Joaquin Valley and South Coast air basins by 2024 and 2031, respectively. As described above, the Proposed Regulation would institute a revamped HD I/M program to more effectively identify and repair malfunctioning emissions control systems on HD vehicles operating in California. As a result, the Proposed Regulation would help ensure HD vehicles are properly functioning and low-emitting throughout their operating lives. As many major populated regions and economically disadvantaged communities are near heavy trucking traffic areas, the Proposed Regulation would help provide more equitable clean air for all Californians.

Benefits

Protection of Public Health and Safety. The Proposed Regulation is designed to ensure that HD vehicles operating in California are properly maintained and that those with broken emissions control systems get repaired in a timely manner. Hence, it would further reduce NOx and PM emissions from on-road vehicles. NOx and PM emissions contribute to increased asthma, cardiopulmonary and respiratory diseases, and mortality. The Proposed Regulation would reduce statewide NOx emissions by approximately 684,669 tons and PM emissions by approximately 6,219 tons relative to legal baseline for 2023-2050. The statewide NOx emission benefits from the Proposed Regulation are projected to be 31 tons per day (tpd) and PM emission benefits are projected to be 0.32 tpd for 2024. The San Joaquin Valley and South Coast NOx emission benefits are projected to be 8.7 and 8.5 tpd respectively and PM emission benefits are projected to be 0.089 and 0.083 tpd respectively for 2024. The anticipated emission reductions due to the Proposed Regulation would improve public health and reduce Californian's exposure to harmful pollutants. These emission reductions would in turn reduce the projected number of emergency room and doctor's office visits for asthma, hospitalizations for heart disease, as well as premature deaths that result from poor air quality.

Environmental and Health Benefits. The Proposed Regulation would reduce toxic PM 2.5 diesel exhaust and NOx, which would benefit California residents by reducing harmful emissions exposure that leads to adverse health impacts. The estimated statewide reductions in health outcomes resulting from the Proposed Regulation from 2023 to 2050 relative to the legal baseline are the following:

- Cardiopulmonary Mortality - 7,587
- Hospitalizations for Cardiovascular Illness - 1,159

- Hospitalizations for Respiratory Illness - 1,384
- Emergency Room Visits - 3,502

It is important to note that the estimates above represent only a portion of the full health benefits of the Proposed Regulation and do not include all the adverse health outcomes from PM 2.5 or from additional pollutants such as toxic air contaminants. An expansion of the emissions inputs and an assessment for other health outcomes, including, but not limited to, additional cardiovascular and respiratory illnesses, nonfatal/fatal cancers, nervous system diseases, and lost workdays would provide a more complete picture of the benefits, and CARB staff is considering adopting an expanded assessment for future rulemakings.
In addition, although it is difficult to quantitatively determine the emission benefits in the high-risk areas near major trucking and freight corridors, such as ports and rail yards, the Proposed Regulation is expected to provide the largest PM and NOx emission reductions in these regions, consequently, leading to larger health benefits in regions with the most HD truck traffic.

Economic Impacts. The Proposed Regulation would result in direct cost impacts on regulated entities, specifically owners of HD vehicles operating in California. The Proposed Regulation would require additional reporting, testing, and training, as well as a compliance fee associated with operating in California. Furthermore, the Proposed Regulation would also lead to additional vehicle repairs to bring vehicles into compliance, thus imposing additional costs on HD vehicle owners. The Proposed Regulation is projected to cost $4.09B over 2023-2050 period, with a maximum annual cost of $350M in 2024. The incremental costs are estimated to be $137M, $131M, and $149M for 2031, 2037, and 2050 respectively. The majority of costs stem from HD vehicle testing, repairs, and compliance fee costs. The cost effectiveness of the Proposed Regulation is about $60.65/pound PM and $1.80/pound NOx.

Benefits to Businesses. Typical businesses such as HD vehicle emission testing equipment manufacturers, vehicle emission testers, telematics providers, HD part manufacturers and suppliers, and HD repair shops would be expected to benefit from the Proposed Regulation. HD in-state vehicle fleets would also benefit from reduced smoke opacity testing costs due to the sunsetting of the PSIP regulation proposed as part of the Proposed Regulation. Finally, to the extent that the emission benefits from the Proposed Regulation benefit the health of truck drivers and employees who work in and around HD vehicles, such fleets and companies would benefit from their employees taking slightly fewer sick days.

Like typical businesses, small businesses in HD vehicle emission testing and vehicle repair sectors are expected to benefit from the Proposed Regulation due to the anticipated increase in vehicle testing and repair demands. Some HD vehicle part suppliers are small businesses and would see benefits due to increased demand for emission control parts. Furthermore, small businesses that work in and around HD vehicles would see benefits resulting from reduced exposure to PM and NOx emissions, which can lead to fewer sick days.

Promotion of Fairness. The Proposed Regulation would provide a more level playing field for HD fleets already investing in vehicle maintenance by helping ensure all fleets operating in California practice proper emission-related maintenance.

Description of Regulatory Action

On October 8, 2021, CARB released the Notice of Public Hearing (45-Day Notice) and Staff Report: Initial Statement of Reasons for Rulemaking (Staff Report), titled "Public Hearing to Consider the Proposed Heavy-Duty Inspection and Maintenance Regulation," for public review. The Staff Report contains a description of the rationale for the proposed amendments. On October 8, 2021, all references relied upon and identified in the Staff Report were made available to the public. CARB received written comments from 9 commenters during the 45-Day Notice comment period.

On December 9, 2021, CARB conducted a public hearing. CARB staff informed the Board of the proposed Heavy-Duty Inspection and Maintenance Regulation and the Board received written and oral comments from the public. At the conclusion of the hearing, the Board approved *Resolution 21-29*, which included direction to staff to modify its original proposal to implement a path to transition from two times per year to four times per year periodic testing for OBD-equipped vehicles three years after the effective date of the periodic vehicle emission testing requirements.

In accordance with Government Code section 11346.8, the Board directed the Executive Officer to adopt the proposed amendments after making any appropriate conforming modifications, as well as any additional supporting documents and information, available to the public for a period of at least 15 days. The Board further provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if warranted.

Subsequent to the hearing, CARB released a Notice of Public Availability of Modified Text and Availability of Additional Documents and Information (15-Day Notice) on May 11, 2022. Additional references relied upon and identified in the Final Statement of Reasons were made available to the public as part of the 15-Day Notice package. The text of the proposed regulatory and staff report modifications was posted on CARB's website at *https://ww2.arb.ca.gov/rulemaking/2021/hdim2021*, accessible to all stakeholders and interested parties.

Comparable Federal Regulations:

There are no federal programs comparable to this regulation. Federal regulations focus on new vehicle emissions standards, while leaving the development and implementation of in-use vehicle monitoring programs to state jurisdictions. As a result, many states have established I/M testing programs for both light-duty and HD vehicle populations. The Regulation is consistent with this regulatory structure.

An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code, § 11346.5, subd. (a)(3)(D)):

During the process of developing the proposed regulatory action, CARB conducted a search of any similar regulations on this topic and concluded this regulation are neither inconsistent nor incompatible with existing State regulations. This regulation supersedes the requirements of HDVIP and PSIP to avoid duplicative inspection elements, while at the same time, imposing more comprehensive vehicle testing requirements relative to the current programs. Upon the start of this regulation, the current HDVIP regulation will be superseded by the HD I/M roadside inspections. The current HDVIP allows CARB staff to perform roadside inspections on HD vehicles operating in California. This regulation will provide the ability to perform similar inspections, thus making the current HDVIP regulation redundant. Staff updated the smoke opacity limits within the PSIP regulation to align with this regulation to ensure consistency between the two programs. Thus, staff included the opacity standards for off-road engines in on-road vehicles within the PSIP regulation itself. This would ensure that vehicles are held to the same opacity standards if potentially flagged by REMD as they would be for the annual smoke inspection within PSIP. Once periodic testing in this regulation starts, the PSIP regulation will be superseded. The periodic inspection requirements will institute new periodic testing requirements for vehicles operating in California. Thus, to ensure there are no overlapping or duplicative requirements such as alternative periodic testing requirements, staff sunset the PSIP regulation.