Heavy-Duty Vehicle Inspection and Maintenance (HD I/M) Workgroup Meeting:

Senate Bill 210 Pilot Program Activities and On-Board Diagnostics (OBD) Specifications

November 16, 2020
Today’s Agenda

• SB 210 Pilot
  • Purpose
  • HD I/M review
  • Senate Bill (SB) 210 HD I/M pilot program
    • SB 210 pilot program requirements and stakeholder engagement
    • Pilot program
    • Additional HD I/M support studies
  • Q&A

• Technical specifications for HD on-board diagnostics (OBD) data collection and submission systems and tools
  • Q&A
HD I/M Review
HD I/M Review

• SB 210 (Leyva; Statutes of 2019) directs CARB to develop and implement a new, comprehensive HD I/M program, in coordination with partner State agencies
  • Target excess NOx and PM emissions from in-use vehicles
  • Require all vehicles operating in California to comply
  • Allow OBD system checks to identify malfunctioning emissions-related components in applicable engines

• Program objectives:
  • Maintain low emissions throughout a vehicle’s life
  • Ensure emissions control systems are functioning properly
  • Minimize inspection downtime for vehicle owners
  • Ensure quick and adequate repair of malfunctioning parts
HD I/M Review - continued

- Heavy-duty vehicles remain one of the largest emissions contributors in the state
- HD I/M is a key measure in California’s State Implementation Plan (SIP) statewide strategy
- In San Joaquin Valley region, HD I/M is one of the largest proposed near-term reduction measures
  - SJV SIP Commitment: 6.8 TPD NOx reduction in 2024
- In South Coast region, action needed beyond current programs by 2031
  - Further NOx reductions on order of 80% needed
SB 210 Pilot Program Requirements and Stakeholder Engagement Efforts
SB 210 Pilot Program Requirements

• Consult with partner state agencies and stakeholders in public process to demonstrate technologies that show potential for bringing vehicles into the HD I/M program – Health and Safety Code (H&SC) §44156(a)
  • Report findings on CARB website before Board adoption
• Adopt and implement the HD I/M program no later than two years after completion of the pilot program – H&SC §44152(a)
• Beyond pilot effort itself, CARB plans to further test components of HD I/M system prior to the roll out of each implementation phase
Stakeholder Engagement

• January 29, 2020: CARB workshop discussed SB 210 pilot concepts and solicited ideas from stakeholders
• February 19, 2020: CARB HD I/M workgroup meeting to continue discussion of pilot
• Individual meetings with interested parties throughout 2020
• Continued coordination with participants on pilot testing efforts
• Today November 16, 2020: Update on Pilot Efforts
Coordination with State Agency Partners

• Bureau of Automotive Repair (BAR): expert consultant on I/M implementation, OBD data collection tools, testing device requirements, and certification process

• Department of Motor Vehicles (DMV): California vehicle registration hold process for non-compliant vehicles; learning and improving on SB1 process; future outreach/education strategies

• California Highway Patrol (CHP): enforcement strategies coordination

• California Department of Transportation (Caltrans): assistance with equipment siting and permitting: Remote sensing devices (RSD), CARB’s Portable Emissions AcQuisition System (PEAQS), Automated license plate recognition (ALPR) cameras

• California Department of Food and Agriculture (CDFA): assistance with equipment siting; future outreach/education strategies
SB 210 Pilot

• SB210 pilot designed to test how the future HD I/M program components can best operate together to ensure an efficient and effective rollout during program implementation

• OBD Efforts
  • Piloting of OBD data collection tools and submission options
  • Piloting of OBD data processing

• Vehicle Monitoring Infrastructure Efforts
  • Piloting of remote sensing emission detection equipment
  • Piloting of ALPR cameras for non-compliance identification
  • Piloting of vehicle/emissions data processing

• Program Enforcement Efforts
  • Piloting enhancements to enforcement design processes
Details on Pilot Effort
OBD Data Collection and Device Testing Efforts

- Pilot and evaluate HD vehicle OBD collection and monitoring methods
  - Test and demonstrate OBD submission tools to ensure effective incorporation into the HD I/M program
  - Validate internal database processing functions for the incoming OBD data
Testing Potential OBD Data Collection and Submission Tools

• Validating OBD data collection methods
  • Telematics equipment
  • Plug in dongle devices
  • Kiosk submission
  • OBD scan tools

• Testing Efforts
  • Working with CA fleets to test and demonstrate potential OBD submission options
  • Collaborating with certified PSIP testers to use OBD collection devices in the field
  • Equipment vendors developing and testing prototype devices
  • Consulting with telematics providers
  • Surveying fleets on preferred submission options
  • Coordinating with other state agencies in development and testing efforts

• Contract with ERG supporting some of these testing efforts
Areas to be Further Explored

• Ensure the feasibility and effectiveness of the different data acquisition platforms to collect and submit HD I/M required OBD data
• Better characterize fleet testing preferences of these different platforms
• Further constrain potential vehicle downtime necessary to complete testing through these various platforms
• Evaluate potential costs and lead time required to bring devices to the marketplace
• Identify best testing approaches to maximize program effectiveness
Internal OBD Data Processing Efforts

• Verify internal systems adequately incorporate data submissions from the multiple platforms
• Verify data submission processes and data validity
• Establish automated processes to collect, store, and assess data submissions for program compliance
• Ensure robust security protocols and privacy protection for incoming data submissions
Next Steps

• Continue testing and fleet outreach efforts through Spring 2021
• Continue collaboration with device vendors, manufacturers, and OBD experts to further refine testing device requirements based on testing results
  • OBD specifications discussion later in this workgroup meeting
• Continue analysis to refine database design
HD Enforcement using Roadside Monitoring Systems

Pilot Goals:
• Evaluate how best to establish a RSD and complimentary ALPR network to identify potential high-emitters/non-compliant vehicles and to better understand vehicle operations in the State
• Evaluate how best to establish a data-driven enforcement process

Pilot Components:
• Pilot long-term unattended PEAQS deployments
• Evaluation of different RSD technologies
• Pilot stand-alone ALPR cameras
• Pilot a data-driven enforcement process
HD Enforcement using Roadside Monitoring Systems: Long-Term, Unattended PEAQS Deployments

Pilot of permanent PEAQS deployment for unattended and continuous operations.

- Collect emissions and ALPR data to design a streamlined enforcement process
- Evaluate system durability under harsh environment conditions
- Establish secure data transmission pipeline
- Assess system deployment, operation and maintenance requirements, and costs
HD Enforcement using Roadside Monitoring Systems: Long-Term, Unattended PEAQS Deployments

Current Progress

• Currently testing two unattended PEAQS systems at CDFA Border Inspection Stations

• Emissions and license plate data remotely transferred to CARB continuously via secure connection

• Collecting emissions data from tens of thousands of vehicles each month

• Testing methods to detect TRU presence and DOT numbers

• Pilot efforts to continue through Spring of 2021

Two-week field test (Nov 2 – Nov. 13) to compare available RSD robustness of measuring critical emissions (PM, NOx, CO2) and optimal RSD set-up conditions. Concurrent OBD and opacity data collected to determine correlation between RSD and control tests.

Systems tested:
- Hagar Environmental Atmospheric Technology (HEAT)’s Emission Detection and Reporting (EDAR) system
- OPUS AccuScan
- CARB Developed Portable Emissions AcQuisition System (PEAQS)
- All systems utilize ALPR to pair vehicles to emissions

NEXT STEPS

• Evaluate results from RSDs for robustness in measuring PM, NOx, & CO2
• Determine strengths and weakness of each system
• Evaluate each RSD for suitability in varied settings (e.g. traffic speeds, existing support infrastructure, etc.)
• Ensuring compatibility between RSD screening assessments and potential follow up emissions testing mechanisms
• Expected completion early next year dependent on data returned from HEAT and OPUS
HD Enforcement using Roadside Monitoring Systems: Stand-Alone ALPR Cameras

This is a potential means of supplementing an ALPR equipped RSD network to identify vehicles operating without a compliance certificate

- CARB has contracted UC Irvine for this portion
- Data collection for SB 210 pilot through spring 2021
- Total of 3 locations along CA border
  - 1 system installed on CA/NV border near Mt. Pass
  - 2 additional systems to be installed on CA/AZ and CA/MX borders.
HD Enforcement using Roadside Monitoring Systems: Stand-Alone ALPR Cameras

Goals

• Assess feasibility and effectiveness of establishing a near border monitoring infrastructure to ensure compliance of out of state vehicle traffic

• Assess systems durability for long-term permanent installations

• Improve understanding of out-of-state truck travel characteristics in California
Enhancing the Design of HD Enforcement Processes

Enforcement process development will include:

• Evaluation of methods to identify non-compliance using RSD, ALPR, vehicle registration data, vehicle test data, and other CARB internal data sources
• Design of data-driven, targeted enforcement processes
• Evaluation of the effectiveness of enforcement and behavior change as a result of new processes in partnership with Energy & Environmental Lab/University of Chicago Urban Labs
Additional HD I/M Support Studies Outside of the SB210 Pilot
Initial HD I/M Feasibility Assessment

- University of California at Riverside, Center for Environmental Research and Technology – Contract #15R0D22
  - January 2019 final report: [https://ww2.arb.ca.gov/sites/default/files/classic//research/apr/past/15rd022.pdf](https://ww2.arb.ca.gov/sites/default/files/classic//research/apr/past/15rd022.pdf)

- Study purpose: Evaluate options for a more comprehensive HD I/M program

- Conclusions:
  - Repairs are needed to keep emissions at low levels
    - 12 out of 47 vehicles (26%) came in for repair with MIL on
    - 50-75% NOx reductions achieved via repairs
  - Recommended primary test methods
    - OBD data scans for OBD-equipped engines as a quick and convenient test method
    - Couple with RSD/PEAQS roadside monitoring for program validation
HD I/M Repair Impacts

• Evaluate potential impacts to fleet business operations as a result of a HD I/M program

• Work with HD repair shops and fleets to evaluate potential changes to vehicle repair process due to HD I/M
  • Assess vehicle downtime as a result of HD I/M related repairs

• Estimate costs associated with HD I/M related repairs
  • Working with several repair facilities/other sources to identify most common emission-related fault codes and necessary repairs to extinguish MIL-on
  • Link specific repairs to repair costs

• Expected completion date: Spring 2021
Evaluating Need for HDV Repair Assistance

• Determining if repair assistance program is needed in a fully implemented HD I/M program
• Qualified small fleet owners paid for part of emissions-related repair bill with remainder of costs covered though funding grant
  • In 2018 $1 million grant to San Joaquin Air Pollution Control District to administer pilot
  • Cooperating HD Repair facilities in Stockton, Fresno, and Bakersfield
  • $850,000 expended on 156 repairs.
  • Data from repair strategies and cost currently being analyzed.
• Report from SJV APCD expected later this year
Next Steps: HD I/M Development

- December 2020 HD I/M workgroup meeting to discuss detailed regulatory concepts
- Additional HD I/M workgroup meetings and workshops in 2021
- SB 210 Pilot Program report to be posted on CARB website in summer 2021
- Board hearing: December 8-9, 2021
- Implementation: phase in starting in 2023
For More HD I/M Program Information

- Visit CARB’s website at:  https://ww2.arb.ca.gov/our-work/programs/heavy-duty-inspection-and-maintenance-program

- Subscribe to receive HD I/M email updates at:  https://public.govdelivery.com/accounts/CARB/subscriber/new?topic_id=hdim

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