Measures for Reducing Emissions from On-Road Heavy-Duty Vehicles

2022 AQMP Mobile Source Working Group

June 3, 2021
Outline

• 2022 Air Quality Management Plan
• CARB Adopted Regulatory Measures
• 2020 Mobile Source Strategy Concepts
• Overview of Proposed Measures
• Infrastructure Planning and Development
• Governor’s Zero Emissions Vehicles & Infrastructure package
California’s Air Quality and Climate Goals

- **2023**: South Coast & SJV Ozone
- **2024/25**: South Coast & SJV PM2.5 (AB 617 Communities)
- **2030**: GHG 40 percent below 1990
- **2031**: South Coast & SJV Ozone
- **2037**: South Coast & SJV Ozone
- **2045**: Carbon Neutrality
- **2050**: GHG 80 percent below 1990

Focus of today’s working group meeting
2022 AQMP

- Address attainment of the 2015 8-hour ozone standard (70 ppb) for South Coast Air Basin and Coachella Valley without reliance on black box measures in 2037

**Timeline**

- **Draft control measures**
  - June/August 2021

- **Late Fall 2021**
  - Release Draft AQMP

- **July 2022**
  - CARB Board Hearing

- **June/August 2021**
  - Carrying Capacity

- **South Coast AQMD Board Hearing**
  - June 2022

- **70 ppb Ozone SIP due to EPA**
  - August 3, 2022

**Mobile Source Workgroups**

- **December 2020 – June/August 2021**
2037 Attainment Working Draft

- Stationary and Area
- Cars/Light-Duty Trucks/SUVs/Motorcycles
- Medium-Duty & Heavy-Duty Gas Trucks
- Heavy-Duty Diesel Vehicles
- Aircraft
- Locomotives
- Ocean Going Vessels
- Commercial Harbor Craft
- Recreational Boats
- Off-Road Equipment and Vehicles
- Carrying Capacity

Baseline

Carrying Capacity 2037

More than 70% Reduction

SCAB NOx Emissions (tpd)

Baseline

Carrying Capacity 55-85 tpd

Off-Road Equipment and Vehicles

Ocean Going Vessels

Locomotives

Aircraft

Heavy-Duty Diesel Vehicles

Stationary and Area

Carrying Capacity 55-85 tpd
CARB Adopted Regulatory Measures from 2018-2020

HD Vehicle Inspection Program (HDVIP)/Periodic Smoke Inspection Program (PSIP)

Innovative Clean Transit (ICT)

Advanced Clean Trucks

HD Engine Warranty

Zero Emission (ZE) Airport Shuttle Bus

HD Omnibus
NOx Emission Reductions for Heavy-Duty Vehicles in South Coast from Adopted Measures

- **Baseline**
- **HD Omni. + ACT**
- **2020 MSS Target**

**ACT/Heavy-Duty Omnibus**
- 14.2 tpd

**2020 MSS Target**
- 37.7 tpd

*HD Omni.: Heavy Duty Omnibus
ACT: Advanced Clean Trucks
MSS: Mobile Source Strategy*
2020 Mobile Source Strategy

- Builds on 2016 Mobile Source Strategy
- Conceptual scenario approach
- Identifies technology mixes needed to meet toxics, air quality and climate targets
- Reflects Governor’s recent ZEV EO
- Informs policy development
Executive Order N-79-20

100% ZEV sales by 2035

- Full transition to ZEV short-haul/drayage trucks by 2035
- Full transition to ZEV buses & heavy-duty long-haul trucks by 2045*
- Full transition to ZE off-road equipment by 2035* *where feasible

CARB
Heavy-duty vehicles (above 14,000 lbs. GVWR) are 32% of mobile source NOx in South Coast and 16% of statewide mobile source GHG emissions.

- **Concepts**
  - Aggressive ZEV penetration, and accelerated replacement of older vehicles
  - Cleaner combustion
  - Continued energy efficiency improvements
  - In-use performance measures
  - Renewable fuels where electrification is not feasible
2020 Mobile Source Strategy
On-Road Heavy Duty Vehicles

HD Omnibus & Fed. 0.02 g
HD ZEV (w/Accelerated Turnover)

2020 Mobile Source Strategy
On-Road Heavy Duty Vehicles

HD Omnibus & Fed. 0.02 g
HD ZEV (w/Accelerated Turnover)
Evolution of a Concept

1. Concept
2. Measure
3. Regulation / Program
4. Reduced Emissions
5. Air Quality Improvement
Proposed Heavy-Duty Vehicle Measures

- Federal Cleaner Trucks Initiative
- Heavy-Duty Inspection and Maintenance
- Advanced Clean Fleets and Zero Emission Drayage
Federal Cleaner Trucks Initiative

- The Environmental Protection Agency (EPA) is pursuing a Cleaner Trucks Initiative (CTI) regulation to update NOx emissions standards for heavy-duty trucks
- In 2020, EPA released an Advanced Notice of Proposed Rulemaking
- Proposed rulemaking expected in 2021

Implementation: 2027
Anticipated NOx Emission Reductions for Heavy-Duty Vehicles in South Coast from CTI

**ACT**: Advanced Clean Truck  
**HD Omni.**: Heavy Duty Omnibus  
**CTI**: Federal Cleaner Trucks Initiative

*Preliminary estimate assuming 90% cleaner in-use*
Heavy-Duty Inspection & Maintenance Overview

- Senate Bill 210 (Leyva; Statutes of 2019) directs CARB to develop and implement a new, comprehensive HD I/M program
  - Maintain low emissions throughout a vehicle’s life
- Applies to all (non-gasoline) heavy-duty vehicles operating in California
- Major program elements
  - Require periodic vehicle inspections
  - Complementary roadside high-emitter vehicle screening
- First hearing December 2021

Implementation: 2023
HD I/M Roadside High-Emitter Vehicle Screening

• Real-time emissions monitoring equipment with ALPR cameras to identify high emitting vehicles

• High emitters would be required to demonstrate compliance via testing mechanisms discussed previously

Implementation: 2023
HD I/M Implementation: Proposed Program Phase-In

• First Phase – Begins **January 1, 2023**
  o High emitter vehicle screening

• Second Phase – Begins **July 1, 2023**
  o Enforcement of compliance certificate requirements starts
  o DMV registration holds for California registered vehicles start

• Third Phase – Begins **January 1, 2024**
  o Periodic testing starts
Anticipated NOx Emission Reductions for Heavy-Duty Vehicles in South Coast from HD I/M

- ACT: Advanced Clean Truck
- HD Omni.: Heavy Duty Omnibus
- CTI: Federal Cleaner Trucks Initiative
- HD I/M: heavy-duty inspection and maintenance

* Preliminary estimate assuming 90% cleaner in-use
** Draft estimates based on current rulemaking analysis. Subject to change.
Advanced Clean Fleets Regulation

• Phase-in zero emission trucks and buses 2023 to 2045*
  • State and local government fleets
  • High priority private fleets and federal agencies
  • Drayage trucks serving ports and railyards
• Contribute to meeting zero-emission fleet goals where feasible
• Prioritize benefits in disadvantaged communities
• First hearing December 2021

*Applies to on-road vehicles with a gross vehicle weight rating >8,500 lbs. and off-road yard tractors
Zero Emission Drayage Truck

- Trucks must register with CARB if they conduct drayage activities at the seaports and railyards
- Beginning in 2023, any truck added to the CARB Drayage Truck Registry must be zero-emissions
- Legacy drayage trucks removed from registry at the end of their useful life
- All drayage trucks would be required to be zero-emission by 2035
NOx Emission Reductions for Heavy-Duty Vehicles in South Coast from ACF & ZE Drayage

- ACT: Advanced Clean Truck
- HD Omni.: Heavy Duty Omnibus
- CTI: Federal Cleaner Trucks Initiative
- HD I/M: heavy-duty inspection and maintenance
- ACF: Advanced Clean Fleets

**Preliminary estimate assuming 90% cleaner in-use**

**Draft estimates based on current rulemaking analysis. Subject to change.**

83% Reduction
Interagency Coordination on Infrastructure

- Zero-emission technology for both on- and off-road sectors requires streamlined infrastructure build-out
- Results from the 2020 MSS are incorporated into the CEC’s technical analysis for AB 2127 report
- Staff will continue working with CEC, CPUC, and GO-Biz to layout the infrastructure buildout needed to support the number of ZEVs anticipated to be deployed in future years
Governor’s Proposed Budget for FY 21/22 devotes $3.2 billion over the next three years to fast-forward on the state’s zero-emission vehicle goals

Incentives will play a pivotal role in supporting the State’s air quality and climate goals
**Zero-Emission Vehicle & Infrastructure Package**

$1.8 Billion for FY 2021-22

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<th>Category</th>
<th>Amount</th>
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<td>Drayage Trucks &amp; Infrastructure</td>
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<tr>
<td>Transit &amp; School Buses</td>
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<td>CVRP</td>
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<td>ZEV Manufacturing Grants</td>
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<td>ZEV Market Development Strategy</td>
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Next Steps

- Incorporate CARB’s heavy duty measures into 2022 State SIP Strategy as well as 2022 South Coast AQMP
- Continue working closely with U.S. EPA on Cleaner Truck Initiatives
- Evaluate additional opportunities for emissions reductions through regulatory and incentives programs
- Continue the interagency coordination on infrastructure planning and development
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Overview and Update on Warehouse Indirect Source Rule

RULES 2305 AND 316
WAREHOUSE ACTION AND INVESTMENTS TO REDUCE EMISSIONS (WAIRe) PROGRAM
Background

Rules 2305 and 316 were approved by South Coast AQMD Board on May 7, 2021
- Rule 2305 includes requirements for warehouse owners/operators. Rule 316 includes administrative fees.
- Rule covers about 3,000 warehouses

Rules implement control measure MOB-03 from 2016 AQMP
- Control measure development included one-year process evaluating potential voluntary and regulatory approaches, followed by three years of rule making
- Control measure did not include quantifiable emission reduction commitment

[Bar chart showing NOx emissions from 2019 to 2031 with different scenarios for emissions reduction]

All Stationary Sources = 43 tpd in 2023

Rule 2305 Warehouse Inventory

Baseline (2016 AQMP)  Baseline (with CARB’s ACT, Low NOx, HD I&M)  PR 2305
OVERVIEW OF RULE 2305

Requirements

- **Warehouse Actions and Investments to Reduce Emissions (WAIRE) Menu**
- **Mitigation Fee**
- **Custom WAIRE Plan**
- **Limited transferring/banking with early or over-compliance**

**Reporting**

- **Warehouse Operations Notification**
- **Initial Site Information Report**
- **Annual WAIRE Report**

**Applicability**
- Owners and operators of warehouses >100,000 sf
- Owners are only subject to reporting, but they can voluntarily earn points

**Phase-In**
- Starting Jan. 1 2022, warehouses introduced into program over 3 years
- Largest are first
- Once in, stringency increases over 3 years

Funds projects in communities near warehouses that paid the mit. fee
## WAIRE Menu Actions & Investments

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<th>WAIRE Menu Actions &amp; Investments</th>
<th>Commercial Availability</th>
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<td>TRU Plug EVSE Acquisition</td>
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<td>H₂ Station Usage</td>
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</tbody>
</table>

**Zero Emissions**

>1,200 NZE trucks funded by South Coast AQMD since 2017

>200 warehouses already have solar

WAIRE Menu includes many options

https://globaldrivetozero.org/tools/zero-emission-technology-inventory/
Spending Approach for WAIRE Mitigation Program

WAIRE Mitigation Program would be funded by mitigation fees paid by warehouse operators

- Leverage extensive South Coast AQMD experience with incentive programs

Key elements of proposed program

- Funding supports local projects around warehouses that paid the fee
  - Within SRAs and counties
  - Funds held in separate South Coast AQMD Special Revenue Fund
  - Funding for NZE/ZE trucks and ZE charging and fueling infrastructure
  - Require skilled and trained workforce for infrastructure
  - Public process during solicitations and prior to awarding funds to receive local community feedback

Commitment on WAIRE Program elements in Board Resolution
Warehouse ISR Costs & Public health Benefits

- Public health benefits exceed compliance costs by about 3:1
- Benefits from reducing regional pollution are ~20-25% greater per capita in EJ communities

Example Costs for a Warehouse Operator

- **PR 2305 Compliance Cost** (range: 0.5%-3%)
  - Utilities
  - Property and Sales Taxes
  - Building Costs (e.g., rent)
  - Labor

- Increasing 5+% per yr

PR 2305 could potentially increase cost of goods by about 0.05%

Expected Benefits Through 2031

- Premature Deaths Avoided: 150-300
- Asthma Attacks Avoided: 2,500 – 5,800
- Lost Work Days Avoided: 9,000 – 20,000
- Monetized Public Health Benefits: ~$1.2 – 2.7 billion
SIP Credit

Emission reductions must meet EPA criteria to be SIP creditable

- EPA criteria for emission reductions can be satisfied at rule adoption, *or during later analysis*
  - Example rules: SIP-approved *SJVAPCD ISR (Rule 9510)*
    - Not SIP-approved *South Coast AQMD Rule 2202*

Post-rule adoption SIP emissions inventory updates

- Updated vehicle sales data, economic activity projections, emission factors, etc.

Regular updates to CARB on-road inventory (EMFAC) capture all these changes and present a holistic analysis of anticipated future emissions

- State level data (e.g., vehicle registrations, fuel use, etc.) and annual reporting from Rule 2305 will inform future versions of EMFAC

Working with U.S. EPA to earn prospective SIP credit for WAIRE Mitigation Program

Rule 2305 will sunset when federal and state 70 ppb standards are achieved
Multiple Channels of Compliance Outreach Under Development

- Web Portal for Submitting WAIRE Reports
- Compliance Website w/FAQ’s, Guidance, etc.
- Online Training Courses
- Mailers, Bulk Emails, Social Media, Brochures, Etc.
- Public Presentations
- WAIRE Program Compliance Hotline & Email
- Individual Facility Consultations
- Utility Facilitation

WAIRE Program Online Portal (POP) [staged release 2021-2022]
www.aqmd.gov/waire (coming soon)
Recorded and available online, and in virtual courses w/Q&A
New Listserv for warehouse owners & operators: www.aqmd.gov/sign-up
Trade associations, COGs, etc.
(909) 396-3140 waire-program@aqmd.gov
Can be scheduled through hotline or email
Potential approaches under consideration
Upcoming Compliance Milestones

- **July 2021** – Phase 1 warehouse operators begin keeping records for total number of truck trips
  - Summary information will be reported by July 1, 2022 in Initial Site Information Report

- **September 1, 2021** – All warehouse owners must submit Warehouse Operations Notifications
  - Owner contact information and whether they are an operator
  - Warehouse information: address and building size
  - Tenant information: contact information and lease duration

- **January, 2022** – First Annual WAIRE Reports (AWR) can be filed documenting how early voluntary implementation of WAIRE Menu actions taken in 2021 since rule adoption have earned Points
  - AWR must be filed to bank Points for future compliance periods

- **January 1 to December 31, 2022** – First compliance period for Phase 1 warehouse operators
Next Steps

- Continue to develop and implement Compliance Outreach plan
- Submit Rule 2305 to CARB for submittal into the SIP
- Conduct outreach for development of Rule 2305 data access in FIND
- Questions? -> contact waire-program@aqmd.gov or (909) 396-3140