2020 Mobile Source Strategy

Public Webinar
May 6, 2021
Zoom Language Selection

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Zoom Webinar Details

• Telephone Call-in: (888) 273-3658
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    • #2 to “Raise Hand”
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Today’s Webinar

• Background & Purpose
• Scenarios & Concepts
• Near-term Strategies & Benefits in Priority Communities
• The Need to Reduce Vehicle Miles Travelled
• Pathways Forward
• Online META Tool Demonstration
Background & Purpose
California’s Air Quality and Climate Goals

- **2023:** South Coast & SJV Ozone
- **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
- **2024/25:** AB 617 Communities South Coast & SJV PM2.5
Importance of Mobile Source Emissions

**Statewide NOx Emissions**
- Areawide 3%
- Stationary 17%
- Off-Road Mobile 35%
- Light Duty Vehicles 13%
- Heavy Duty Vehicles 26%

**Statewide GHG Emissions**
- Light Duty Vehicles 28%
- Other Sectors (industrial, electricity generation, etc.) 59%
- Medium Duty Vehicles 2%
- Heavy Duty Vehicles 7%
- Off-Road Mobile 4%
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
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
2020 MSS Informs Development of Other CARB Efforts

- Air Quality Targets
- GHG Reduction Goals
- Community Risk Reduction

2020 Mobile Source Strategy

- 2022 State SIP Strategy
- 2022 Scoping Plan
- AB 617 CERPs
Evolution of a Concept

1. Concept
2. Measure
3. Regulation / Program
4. Reduced Emissions
5. Air Quality Improvement

5-10 years
2020 MSS Scenarios & Concepts
What is an MSS Scenario?

• Top-down approach
• Mix of vehicle technologies that would provide the level of emissions reductions needed to meet our goals
• May go beyond levels of clean technologies from current regulatory proposals
On-Road Heavy-Duty Vehicle Scenario

Statewide Heavy Duty Vehicle Population (Thousands)

- **Clean Combustion & Low NOx Certified Trucks**
- **Zero-Emissions Trucks**
- **Internal Combustion Engines 2010 Technology and older**

- **HD Omnibus & Fed. 0.02 g**
  - 2020: 20%
  - 2031: 20%

- **HD ZEV**
  - 2020: 24%
  - 2031: 27%

- **Internal Combustion Engines 2010 Technology and older**
  - 2020: 77%
  - 2031: 22%

- **2031**
  - 2037
  - 2045
Technology Mixes in a Nutshell

**Passenger Vehicles:** 100% ZEV and PHEV sales in 2035, along with ~25% reduction in statewide VMT per capita by 2035 relative to 2005.

**Heavy Duty Vehicles:** 100% CA fleet purchases being ZEV starting in 2035 combined with cleaner combustion (Omnibus, HD I/M, EPA CTI) in near term.

**Smaller Off-Road (e.g., forklifts, TRU, SORE):** Full transition to zero-emission by 2035 for most off-road sectors with smaller engines.

**Heavier Off-Road (e.g., marine, construction, locomotive):** Zero-emission wherever feasible, and cleaner combustion engines along with low-carbon fuels in hard-to-electrify sectors.
# Potential Statewide Benefits

## 2020 Mobile Source Strategy

<table>
<thead>
<tr>
<th>Diesel PM Emissions</th>
<th>NO\textsubscript{x} Emissions</th>
<th>GHG Emissions*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2031</td>
<td>2031</td>
<td>2045</td>
</tr>
</tbody>
</table>

- **66%** below 2017
- **75%** below 2017
- **82%** below 2017
- **76%** below 2020

*well-to-wheel, excluding aviation*

- **85 percent** of passenger cars ZEV & PHEV in 2045
- **77 percent** of heavy-duty fleet ZEVs in 2045

April 2021 Revised Draft

CARB
Important to Prioritize Benefits in Low-Income and Disadvantaged Communities

- Disadvantaged communities and people of color are disproportionately affected by both mobile and stationary source pollution
- MSS concepts can reduce emissions in these communities
- Seeks rapid transition to zero-emission technology in and near communities
- Supports AB 617 strategies & provides opportunities to accelerate benefits in priority communities
Near-term Strategies & Benefits in Priority Communities
On-Road Measures Helping Near-Road Communities

Provides significant benefits for all communities near major roadways

Passenger Cars

- Aggressive transition to zero-emission technology and cleaner combustion for gasoline and diesel engines in 2026 through Advanced Clean Cars II
- Reduce Vehicle Miles Travelled (VMT)

Trucks and Buses

- Aggressive transition of California truck fleets to zero-emission in 2023 through Advanced Clean Trucks and Fleets regulations
- Cleaner combustion trucks in 2024 through HD Omnibus and heavy-duty smog check program starting in 2023
First Phase of Heavy Duty Inspection & Maintenance

• Real-time emissions monitoring equipment with ALPR cameras to identify high emitting vehicles
• High emitters would be required to demonstrate compliance via testing mechanisms

Early Deployments
(to date)
• 1 mobile and 2 unattended systems
• PM focus

SJV & SCAB Deployment
(before 2023)
• 2 mobile and 11 - 12 unattended systems
• PM focus

First Phase HD I/M: SJV & SCAB
(2023)
• 2 mobile and 11 - 12 unattended systems
• PM and NOx focus

CARB
Advanced Clean Fleets Regulation

• Phase-in zero-emission trucks and buses 2023 to 2045*
  o State and local government fleets
  o High priority private fleets and federal agencies
  o 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

CARB
Off-Road Measures Helping Near-Port Communities

- **Ocean-Going Vessels**
  - Reduce emissions during at berth

- **Commercial Harbor Craft**
  - Accelerated turnover to cleanest combustion
  - Zero-emission requirements
  - Renewable fuel

- **Cargo Handling Equipment & Drayage Trucks**
  - Transition to zero-emission technology through Advanced Clean Fleet and Cargo Handling Equipment Regulations
Commercial Harbor Craft

- **Rule Concepts:**
  - Turn over to cleanest engines and retrofit with DPF, starting in 2023
  - Zero-emission capabilities for new excursion vessels
  - In-use short run ferries become zero-emission by 2028 (9% of ferries)
  - 100% renewable diesel beginning in 2023
Cargo Handling Equipment

• Potential Regulatory Concepts
  o Phase-out of dirtiest engines (pre-Tier 4) by 2031
  o Begin transition to full electric operation around 2024

Implementation: TBD

New Measure
Off-Road Measures Helping Communities Near Industrial Facilities & Warehouses

- Small Off-Road Engines, Forklifts & Transport Refrigeration Units
  - Zero-emission requirements

- Locomotives
  - Accelerated turnover to cleanest combustion
  - Idling and remanufacturing limit

- Construction, Industrial & Mining
  - Cleaner off-road engine standards
  - Replace dirtiest vehicles with cleanest available technology
In-Use Locomotives Regulation

- Rule Concepts:
  - Spending account: fee structure based on engine Tiers & activities (MW-hr)
  - Limit the useful life of locomotives and number of times they can be remanufactured

![Image of a locomotive]

South Coast Locomotive NOx Emissions

Implementation: 2023

New Measure
Construction, Industrial & Mining

- Potential Concepts:
  o Retiring and replacing dirtiest equipment (Tier 0/1/2) by 2033
  o Tier 5 implementation starting in 2028
### Potential Near-term NOx Reductions

(tons per day)

<table>
<thead>
<tr>
<th>Measures</th>
<th>Adoption</th>
<th>Implementation</th>
<th>South Coast 2023</th>
<th>San Joaquin Valley 2024</th>
<th>South Coast 2031</th>
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<td>Advanced Clean Cars II</td>
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<td>2026</td>
<td>0</td>
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<td>ACT and HD Omnibus</td>
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<td>2024</td>
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<td>2024</td>
<td>3.5</td>
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<tr>
<td>Zero-Emission Drayage and Advanced Clean Fleet*</td>
<td>2021</td>
<td>2023</td>
<td>0</td>
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<td>Ocean Going Vessels At Berth</td>
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<td>2024</td>
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<td>Small Off-Road Engines</td>
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<td>Transport Refrigeration Unit</td>
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<td>In-Use Locomotive*</td>
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<td>2024</td>
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<td>7</td>
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<td>Commercial Harbor Craft*</td>
<td>2021</td>
<td>2023</td>
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<td>2.9</td>
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<td>Zero-Emission Forklift</td>
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<td>0</td>
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<tr>
<td>Cargo Handling Equipment*</td>
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<td>Construction &amp; Mining*</td>
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<td><strong>11.4</strong></td>
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</table>

* New measures – not part of 2016 State SIP Strategy
Questions?

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Use “Raise Hand” feature, or type in “Q&A” box

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https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy
The Need to Reduce Vehicle Miles Travelled (VMT)
Beyond ZEVs: The Need to Reduce VMT

Complete communities lead to better public health outcomes

Conversion of natural and working lands for development impedes California’s ability to store carbon

Lack of affordable housing and transportation options reinforces racial and economic injustices and lengthens commutes

Even under EO N-79-20, 30 percent of cars will still burn gasoline in 2045

Getting cars off the road reduces congestion
Purpose of the MSS VMT Section

- The MSS identifies concepts CARB could take under its authority to reduce VMT
- Represents a waypoint in a broader interagency and stakeholder process that lies ahead
  - The 2022 Climate Change Scoping Plan Update will identify a broader set of actions across State government, including specific actions CARB can take
  - Next steps will be outlined in more detail later in this presentation
“New highways were frequently constructed through predominately Black, Latino, Asian, and low-income neighborhoods to meet the needs of primarily white suburban commuters, and through tribal lands” while other “racist policies and decisions also influenced the siting of other types of transportation infrastructure, such as commuter railways, and the delivery of transit services.”

*California Transportation Commission, Equity Statement*
Partnerships

• Successfully reducing VMT needs partnership across all levels of government using multiple policy levers
• On-going and upcoming collaborations
  • Climate Action Plan for Transportation Investments (CAPTI)
  • CARB-CTC-HCD Joint Meetings
  • State-MPO Working Group
  • State’s Housing and Transp. Coordination Working Group
  • Transportation Research Roundup Group
Strategy Area 1: Increase Transportation Choices and Improve Access

• Identify community needs, fund transportation choices to meet those needs, and reduce barriers to transit

Strategy Area 2: Authorize and Implement Equitable Pricing of Transportation

• Collaborate with other agencies in developing an equitable pricing strategy
Strategy Area 3: Align State Funding Programs to Reduce VMT and GHGs

• Develop tools that help advance transportation project selection and planning to better align with climate and equity goals

Strategy Area 4: Shape the Deployment of New Mobility in Ways That Reduce VMT

• Continue and expand regulations to help support an expanding ZEV market and an efficient transportation system
Strategy Area 5: Better Align Land Use with the Scoping Plan’s Goals

- Update SB 375 to incentivize SCS implementation, and update guidance to better connect state climate, transportation, and conservation goals with regional planning.

Strategy Area 6: Accelerate Infill Housing Production

- Study and explore infill housing barriers and potential state solutions, increase outreach, and develop tools to improve alignment of housing, transportation and climate goals.
Strategy Area 7: Support Local and Regional Partners to Implement VMT Reduction Measures

• Work with state and regional agencies to support the development of a statewide VMT mitigation bank

Strategy Area 8: Elevate Science to Inform Sustainable Community & Transportation Policies

• Develop a Sustainable Transportation and Communities Research Roadmap to support CARB and other agencies’ efforts related to transportation, housing, and land use
Pathways Forward
Achieving Air Quality and Climate Goals Requires Multiple Tools

- Enhanced Enforcement
- End User Requirements
- Outreach & Education
- Facility Requirements
- Manufacturer Requirements
- Incentive Programs
- Infrastructure Development
CARB Continues to Push Forward

• CARB continues to look for new control strategies in all mobile sectors

• New regulatory concepts have been identified

• Work will continue to develop concepts with ongoing public and stakeholder feedback
## Next Steps on the 2020 MSS

<table>
<thead>
<tr>
<th>Step</th>
<th>Date</th>
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<tbody>
<tr>
<td>Incorporate Public Feedback</td>
<td>May 2021</td>
</tr>
<tr>
<td>Review Period</td>
<td>June – August 2021</td>
</tr>
<tr>
<td>Release &amp; Board Consideration of Final 2020 Mobile Source Strategy</td>
<td>September 2021</td>
</tr>
</tbody>
</table>
Contact us!

- Comments on the Revised Draft 2020 MSS: MSS@arb.ca.gov
- General information: Ariel Fideldy, Ariel.Fideldy@arb.ca.gov
- Scenarios & Concepts
  - On-Road LDV: Kathy Jaw, Kathy.Jaw@arb.ca.gov
  - VMT Reduction: Lezlie Kimura, Lezlie.Kimura@arb.ca.gov
  - On-Road MD/HD: Sara Forestieri, Sara.Forestieri@arb.ca.gov
  - Off-Road: Liang Liu, Liang.Liu@arb.ca.gov

https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy
Demonstration:

Mobile Emissions Toolkit for Analysis (META)

https://arb.ca.gov/emfac/meta/
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