California’s Efforts to Reduce Emissions from Heavy Duty Vehicles

CALSTART

May 21, 2015
Santa Ana /OC International Airport
Santa Ana, CA

Eloy Florez, Air Pollution Specialist
On-Road Heavy Duty Diesel Section
Presentation Outline

- History of ARB
- Overview of ARB Regulations
  - Public Fleet Rule
  - Truck and Bus Rule
  - Off-Road Rule
- Contacts
- Conclusion
First recognized smog episodes in LA in summer of 1943

Visibility: 3 blocks

Symptoms: burning eyes, respiratory discomfort, nausea, vomiting

Initial blame was put on stationary sources

Vehicles were a big part of the problem
Local Impacts of Poor Air Quality

Smoggy Sequoia: The national park has the worst the system. Scientists are starting to see its impact environment. Four of the worst affected parks are in.

By TRACIE CONE / THE ASSOCIATED PRESS

Sequoia National Park was established in 1890 as the second U.S. national park, after Yellowstone National Park. The park spans 404,051 acres. Encompassing a vertical relief of nearly 13,000 feet (3,962 m), the park is south of and contiguous with Kings Canyon National Park and is home to the sequoia tree and the giant

L.A. air pollution may increase risk of stroke
February 15, 2012 | By Dean Kuipers

L.A.'s smog problem might not be as visible as it was in the bad old days of the 1970s and '80s, but city residents might be at an increased risk of stroke even at levels of pollution that meet EPA standards. Oh yeah, and memory loss.

A new study published Monday in the Archives of Internal Medicine found that Boston residents experienced more strokes when exposed to “moderate” amounts of particulate air pollution, as opposed to “good” amounts of pollution, according to EPA standards. The types of pollution monitored included those specifically linked with car traffic.

Reviewing the medical records of about 1,700 stroke victims at Boston’s Beth Israel Deaconess Medical
American Lung Associations "State of the Air" Report

#1: Bakersfield-Delano, CA
#1: Merced, CA
#3: Fresno-Madera, CA
#4: Los Angeles-Long Beach-Riverside, CA
#4: Hanford-Corcoran, CA
#6: Modesto, CA
#7: Visalia-Porterville, CA
#8: Pittsburgh-New Castle, PA
#9: El Centro, CA
#10: Cincinnati-Middletown-Wilmington

Cities with most contaminated air

State of the Air Report 2013
Heavy-Duty Truck Emissions

Overall and by Truck Type
Statewide Diesel Emission Sources

2014 Statewide NOx Emissions

- Heavy Duty Vehicles: 33%
- Light Duty Vehicles: 13%
- Marine: 13%
- Off-Road Equipment: 14%
- Trains: 6%
- Aircraft: 2%
- Stationary: 15%
- Areawide: 4%

2014 Statewide Diesel PM2.5 Emissions

- Heavy Duty Vehicles: 26%
- Off-Road Equipment: 34%
- Marine: 25%
- Stationary: 4%
- Areawide: 0%
- Aircraft: 1%
- Trains: 9%
Types of Trucks

- Class 2b–8 Vehicles
- These vehicles are responsible for a variety of essential functions from transporting freight to support for a wide range of vocations.
Classifications

Class 7/8 Tractors
- Over the Road
  - Younger Trucks; High Annual VMT
  - Mostly higher average speed, highway driving
- Short Haul/Regional
  - Between cities; Drayage; Day Cabs
  - Includes second use trucks; trucks with smaller engines

Class 3-8 Vocational Work Trucks
- Urban
  - Cargo, freight, delivery collection
  - Lower VMT; Lower Average speed; Lots of stop start
- Rural/Intracity
  - Cargo, freight, delivery collection
  - Higher VMT; Higher Avg speed; Combined urban/highway
- Work site support
  - Utility trucks, construction, etc.
  - Lots of idle time; Lots of PTO use

Class 2B/3
- Pickups/Vans
  - Commercial use; Automotive OEMs & volumes
Emission Regulations
In–Use Diesel Engine Regulations
Diesel Risk Reduction Program

• Urban buses - 2000
• School bus and delivery vehicle idling - 2003
• Solid waste collection vehicles - 2003
• Transport refrigeration units - 2004
• Stationary compression ignition engines - 2004
• Commercial truck idling - 2004
• Portable engines - 2004
• Locomotive and harbor craft fuel – 2004
• Port/rail cargo handling equipment – 2005

• Transit fleet vehicles - 2005
• Public agencies and utility on-road fleets - 2005
• Ship auxiliary engine fuels - 2005
• Off-road (construction and mining) vehicles - 2007
• Drayage (port) trucks - 2007
• Commercial harbor craft - 2008
• Statewide trucks and buses – December 2008
• Agricultural veh. off-road engines – proposed 2010
Fleet Rule for Public Agencies and Utilities
Scope and Applicability

- Vehicles owned, leased, or operated by a state agency, municipality or private utility
- Diesel vehicles over 14,000 GVWR
- Medium heavy-duty and heavy heavy-duty engines
- 1960 to 2006 model-year engines*

*Board adopted revisions to Public Fleet Rule to include 2007 and newer engines that do not meet the 0.01g/bhp-hr engine emission standard.
## Implementation Schedule for Public and Utility Fleets

<table>
<thead>
<tr>
<th>Group</th>
<th>Engine Model-Years</th>
<th>Percentage of Group to Use Best Available Control Technology</th>
<th>Compliance Deadline, As of December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1960-1987</td>
<td>20, 60, 100</td>
<td>2007, 2009, 2011</td>
</tr>
<tr>
<td>3</td>
<td>2003-2006 (Includes dual-fuel and bi-fuel engines)</td>
<td>50, 100</td>
<td>2009, 2010</td>
</tr>
<tr>
<td>4</td>
<td>2007 and newer certified above the 0.01g/bhp-hr std.</td>
<td>100</td>
<td>2012</td>
</tr>
</tbody>
</table>
Fleet Rule for Public Agencies and Utilities

Best Available Control Technology (BACT)

- Engine certified to 0.01 g/bhp-hr PM standard (most 2007 MY engines); or
- Engine certified to 0.10 g/bhp-hr PM and retrofit with highest level verified diesel emission control strategy (DECS); or
- Alternative-fuel, gasoline, or heavy-duty pilot ignition engine certified to lowest optional PM standard; or
- Highest level verified diesel emission control strategy
Fleet Rule for Public Agencies and Utilities

- Apply BACT to each engine in engine model year group
- Follow specific implementation schedule based on engine model-year
- Keep records for and label each vehicle
- Once in compliance, fleet must remain in compliance
Truck and Bus Regulation
Truck and Bus Regulation

Applicability

• Privately and federally owned, on-road vehicles;
  ◦ Diesel or alternative diesel fuel
  ◦ GVWR greater than 14,000 lbs.
  ◦ Operate in California

• Public and private school buses

• Privately owned two-engine street sweepers
Requirements vary by GVWR

- **Lighter Vehicles** (14,001 – 26,000 GVWR)
  - 2010+ model year engines 2015-2023
  - No PM retrofit filters

- **Heavier Vehicles** (> 26,000 GVWR)
  - PM Filters 2012–2014, then
  - 2010 Engines 2020-2023
# Truck and Bus Regulation

## Engine Model Year Schedule for Lighter Vehicles

<table>
<thead>
<tr>
<th>Engine Year</th>
<th>2010 MY Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995 and older</td>
<td>January 1, 2015</td>
</tr>
<tr>
<td>1996</td>
<td>January 1, 2016</td>
</tr>
<tr>
<td>1997</td>
<td>January 1, 2017</td>
</tr>
<tr>
<td>1998</td>
<td>January 1, 2018</td>
</tr>
<tr>
<td>1999</td>
<td>January 1, 2019</td>
</tr>
<tr>
<td>2003 and older</td>
<td>January 1, 2020</td>
</tr>
<tr>
<td>2004-2006</td>
<td>January 1, 2021</td>
</tr>
<tr>
<td>2007-2009</td>
<td>January 1, 2023</td>
</tr>
</tbody>
</table>

- **14,001 – 26,000 lbs GVWR**
  - No reporting required
  - Limited flexibility options
## Truck and Bus Regulation

### Engine Model Year Schedule for Heavier Vehicles

More than 26,000 lbs GVWR

<table>
<thead>
<tr>
<th>Engine Year</th>
<th>PM Filter</th>
<th>2010 MY Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-1994</td>
<td>Not required</td>
<td>January 1, 2015</td>
</tr>
<tr>
<td>2000-2004</td>
<td>January 1, 2013</td>
<td>January 1, 2021</td>
</tr>
<tr>
<td>2005 or newer</td>
<td>January 1, 2014</td>
<td>January 1, 2022</td>
</tr>
<tr>
<td>2007-2009</td>
<td>Already equipped</td>
<td>January 1, 2023</td>
</tr>
</tbody>
</table>

No reporting required
Flexibility in the Regulation

Small Fleet Option
- Delay’s PM filter requirements for fleets of 1–3 vehicles

PM Filter Phase-In Option
- Allows fleet to phase-in filter requirements

Extended use of Truck
- PM filter by 2014 delays 2010 EMY upgrade

Low-Use Exemption
- Exempts low use vehicles from cleanup

Reporting required for all flexibility option
Flexibility in the Regulation (cont.)

Low-Use Agriculture
- Delays requirements until 2017 or later

Log Truck Phase-In
- Upgrade to 2010 engines 2014–2023

NOx Exempt Areas
- PM filter ONLY phase-in starting 2015

Low-Mileage Construction
- PM filter phase-in starting 2014

Three Day Pass
- Non-compliant, out-of-state trucks

Reporting required for all flexibility option
**Truck and Bus Regulation**

**Certificate of Compliance**

- Used to demonstrate compliance to hiring entity
  - Will not be asked for by ARB Enforcement
  - Can print a certificate that indicates you are complying with Engine Model Year Schedule, Flexibility Option.
In-Use Off-Road Diesel Vehicle Regulation
Off-Road Diesel Vehicle Regulation

Applicability

• Diesel and alternative diesel fueled vehicles (including biodiesel) that are:
  – Operated within California
  – Self-propelled (no generators, etc.)
  – 25 horsepower or greater
  – True off-road vehicles (check engine label)

• All oilfield & natural gas workover rigs

• All two-engine cranes and water well drilling rigs

• Certain other two-engine vehicles
Off-Road Diesel Vehicle Regulation

Requirements Vary by Fleet Size

• Determine fleet size by adding up all horsepower subject to the regulation
  – Must include all horsepower under common ownership or control

• Exclude:
  – Low use vehicles (used < 200 hrs/year)
  – Emergency use vehicles
  – Dedicated snow removal vehicles
  – Vehicles used > 50% for agricultural operations
Off-Road Diesel Vehicle Regulation

Requirements Vary by Fleet Size

<table>
<thead>
<tr>
<th>Fleet Size Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Fleet &lt;= 2,500 hp, or Municipality &lt;= 2,500 hp, or Municipality fleet in low population county, Captive attainment area fleet, or Non-profit training center, regardless of total hp</td>
</tr>
<tr>
<td>Medium</td>
<td>Fleet with 2,501 to 5,000 hp</td>
</tr>
<tr>
<td>Large</td>
<td>Fleet with more than 5,000 hp All state and federal government fleets</td>
</tr>
</tbody>
</table>
Off-Road Diesel Vehicle Regulation

Reporting Requirements

- Reporting is required for all vehicles subject to the regulation
- Report using the online Diesel Off-road On-line Reporting System (DOORS)
- Responsible Official Affirmation of Reporting (ROAR) – Was due starting March 1, 2013 for large fleets!

<table>
<thead>
<tr>
<th>Fleet Size</th>
<th>Annual Reporting (due by March 1st of year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>2012 - 2023</td>
</tr>
<tr>
<td>Medium</td>
<td>2016 - 2023</td>
</tr>
<tr>
<td>Small</td>
<td>2018 - 2028</td>
</tr>
</tbody>
</table>
Off-Road Diesel Vehicle Regulation Labeling Requirements

- All vehicles subject to the regulation must be labeled
  - ARB assigns Equipment Identification Number (EIN)
  - Fleets must label vehicles within 30 days of receiving EIN
  - EIN stays with vehicle for life, even after vehicle sold
  - Labels not issued by ARB
  - Starting January 1, 2013 label must be on both sides of vehicle
ARB Contacts

- Public Agency and Utility Rule
- Truck and Bus Rule
- Off-Road Rule
  866.6.DIESEL
  866.634.3735

- DOORS Reporting Help Line:
  877.59.DOORS
  877.593.6677

- Eloy Florez
  626.350.6525
  eflorez@arb.ca.gov

www.arb.ca.gov/truckstop
Conclusion

- ARB has implemented various regulations that can affect more than just one part of a fleet.
  - **Review your fleet's current status.**
    - Assess the number of vehicles in the fleet
    - Assess the different types of equipment in the fleet.
    - Review ARB regulations to see which rules and schedules may apply to respective pieces of equipment within your fleet.
    - Work with ARB to address questions or concerns.

- **Multitude of challenges remain**
  - Achieving ozone attainment
  - PM attainment
  - CA AB32 targets

- ARB continues to address challenges, balancing the needs of industry, the community, and the environment
Making Progress

September 15, 1955

September, 9, 2014