Air Resources Board Regulatory Update
Cal/ACT Spring Conference
Napa, CA
March 23, 2006

Speaker: Kathleen Mead

Presentation Outline

- Background
- Fleet Rule For Transit Agencies
  - Urban Bus Requirements
  - Transit Fleet Vehicle Requirements
- Idling Restrictions
  - Commercial Vehicles
  - School Buses
Health Impacts of Diesels in California

- Annual health impacts - 2001
  - 2,900 premature deaths
  - 3,600 hospital admissions
  - 240,000 asthma attacks/respiratory symptoms
  - 600,000 lost days of work
- By comparison - 2001
  - 3,700 deaths from car accidents
  - 2,000 homicides

Why Reduce In-use Diesel Emissions?

- New Engine Standards Offer Long Term Reductions
- Diesel Engines are Long Lived
- In-use Emission Rules Provide Near-Term Reductions
- Control Technology is Available
Scope

Fleet Rule for Transit Agencies

URBAN BUS:
• Urban Bus Engine
• Fuel Path Selection
• ULS Fuel Requirement
• Fleet NOx Average
• % PM Reduction from 2002 Diesel UB Baseline

TRANSIT FLEET VEHICLE:
• Heavy-Duty Truck Engine
• Fleet NOx Average
• % PM Reduction from 2005 Diesel TFV Baseline

Fleet Rule For Transit Agencies

◆ Adopted February 2000
◆ Applies to Public Transit Agencies
◆ Regulates “Urban Buses”
◆ New Engine Emission Standards for Urban Buses
◆ In-Use Fleet Requirements
Urban Bus

- Passenger Carrying
  - Fixed route
- Powered by a Heavy Heavy-Duty Diesel Engine, or of a Type Normally Powered by a Heavy Heavy-duty Engine
  - 35 feet or longer or >33,000 gvwr
- Not a "Commuter Service Bus" as Defined By the Rule

Exhaust Emission Standards for NOx
(grams per brake horsepower-hour)

<table>
<thead>
<tr>
<th>Model Year</th>
<th>Urban Bus</th>
<th>HD Engine</th>
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</thead>
<tbody>
<tr>
<td>1988</td>
<td>6.0</td>
<td>6.0</td>
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<tr>
<td>1990</td>
<td>6.0</td>
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<tr>
<td>1998</td>
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<tr>
<td>Oct-02</td>
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<tr>
<td>2004</td>
<td>0.5 (diesel), 2.2 (Alt.)</td>
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<tr>
<td>2007</td>
<td>0.2 —— 1.2</td>
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<tr>
<td>2010</td>
<td>0.2</td>
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</table>
Exhaust Emission Standards for PM
(grams per brake horsepower-hour)

<table>
<thead>
<tr>
<th>Model Year</th>
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<td>1988</td>
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<td>1991</td>
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<td>1993</td>
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In-Use Urban Bus Requirements

- Fuel Path Selection (Diesel vs Alternative Fuel)
  - Alternative Fuel Purchasing Requirement
  - PM Compliance Schedules
- Low Sulfur (<15 ppm) Diesel Fuel
  - as of July 1, 2002
- 4.8 g/bhp-hr NOx Fleet Average
  - as of October 1, 2002
- PM Reductions 2003 through 2008
  - Goal is 85% Reduction from Baseline
2005 Changes

- In 2007, Aligned the NOx Engine Exhaust Emission Standard with the CA HD Standard
  - Diesel Path Fleets with 30 or more
    - Retrofit existing fleet 1:1 for each new 2007-2009 MY purchase where the engine is certified above 0.2 g NOx/bhp-hr
    - Level 3 DECS with 40%, if available or at least 25%, NOx Exhaust Emission Control
  - All Transit Agencies within the SCAQMD Must Follow the Alternative Path Requirements

New Requirements
Covers Transit Fleet Vehicles

- Adopted February 24, 2005
- Covers “Transit Fleet Vehicles”
Transit Fleet Vehicles (TFV)

- Passenger Carrying Vehicles and Non-Revenue Vehicles
- Vehicles Greater than 8,500 GVWR
- Powered by Heavy-Duty Engine
- Diesel and Alternative-Fuels
- Owned/Operated by a Transit Agency
- Under Contract to a Transit Agency
- Not an Urban Bus

Commuter Service Bus

- Powered by a heavy heavy-duty diesel engine or a type normally powered by a heavy heavy-duty diesel engine
- Operates on a fixed route schedule, primarily during peak commute hours
- No more than 10 stops per day excluding "Park-N-Ride" lots
- Defined as a transit fleet vehicle, not an Urban Bus
TFV Requirements

- In-Use Fleet Requirement Only
  - Emission Reductions Through Retrofit or Fleet Modernization

- Not Required
  - Path Selection or Purchasing Requirements
  - Ultra Low Sulfur Diesel
  - Stricter Urban Bus Engine Emission Standard

Exhaust Emission Standards for NOx
(grams per brake horsepower-hour)

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<tr>
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<td>0.01</td>
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### TFV Requirements
In-Use Fleet Emission Reduction

- Maximum Allowable NOx Fleet Average
- Percentage Reduction in PM Emissions
- Two-Phase Implementation
  - December 31, 2007
  - December 31, 2010
## UB and TFV NOx Fleet Average Requirement

<table>
<thead>
<tr>
<th>Fleet Type</th>
<th>Compliance Date</th>
<th>10/01/02</th>
<th>12/31/07</th>
<th>12/31/10</th>
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<tbody>
<tr>
<td>Urban Bus</td>
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<tr>
<td>Transit Fleet Vehicles</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

* in g/bhp-hr
* or retire 1997 or older TFV
** or retire 2001 or older TFV

### TFV NOx Average Calculation

- Sum of the NOx engine certification standard (g/bhp-hr) of each transit fleet vehicle engine
  - include diesel and alternative fueled vehicles, not gasoline.
  - Divide by the total numbers of vehicles in the TFV fleet
  - calculation: $(1 \times 5g) + (4 \times 4g) + (5 \times 2.2g) / 10 = 3.2$
### TFV NOx Calculation Form

2) Listed By Corresponding Model Years (Fill in columns A-F ONLY)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
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<td>4</td>
<td></td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>3</td>
<td>3.2</td>
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</tbody>
</table>

### UB and TFV Percentage Diesel PM Reduction

<table>
<thead>
<tr>
<th>Fleet Type</th>
<th>Baseline</th>
<th>% Reduction From Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year</td>
<td>2004</td>
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<tr>
<td>Urban Bus</td>
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<td>Alternative</td>
<td>2002</td>
<td>20</td>
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<td>Diesel</td>
<td>2002</td>
<td>40</td>
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<tr>
<td>TFV</td>
<td>2005</td>
<td>40</td>
</tr>
</tbody>
</table>

*In the final year of compliance and beyond the transit agency can meet a fleet average of 0.01 g/bhp-hr (same as if all your vehicles are retrofitted with a Level 3 DECS or of a MY 2007 or newer).
TFV PM Calculation

- **Establish Fleet 2005 Baseline**
  - Diesel TFV Fleet as of January 1, 2005
  - Sum of the PM engine certification standard (g/bhp-hr) of each diesel transit fleet vehicle
    - Example: 10 diesel TFV (MY 1994-2006)
      Certified @ 0.1 g/bhp-hr. Baseline = 1.0 g/bhp-hr

- **Required Reduction from 2005 Baseline**
  - On 12/31/2007 40% reduction from Baseline
  - Example: 1.0 g/bhp-hr Baseline requires total fleet PM must not exceed 0.6 g/bhp-hr on 12/31/2007

TFV PM Calculation Form

<table>
<thead>
<tr>
<th>Year</th>
<th>Retrofit Level 2 (DPF) 94-06</th>
<th>Retrofit Level 3 (DPF) 94-06</th>
<th>0.01g Engine</th>
<th>Total TFVs</th>
<th>Total PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>74-87</td>
<td>5</td>
<td>5</td>
<td>0.5</td>
<td>5</td>
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<tr>
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<tr>
<td>91-93</td>
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<td>10</td>
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<tr>
<td>94-06</td>
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<tr>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Listed By Corresponding Model Years (Fill in columns A-H ONLY)
Diesel Emission Control Strategies

- “Verification” Procedure Adopted in 2003
- PM Reduction
  - Level 1 - > 25% (DOC)
  - Level 2 - > 50% (Fuel)
  - Level 3 - > 85% (DPF)
- NOx Reduction, optional
  - > 15%
  - 5 % increments

Current Level 3 Verifications

[http://www.arb.ca.gov/diesel/verdev/currentlyverifiedtech.htm](http://www.arb.ca.gov/diesel/verdev/currentlyverifiedtech.htm)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>PM Reduction</th>
<th>NOx Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaire Flash and Catch CRT</td>
<td>85%</td>
<td>25%</td>
</tr>
<tr>
<td>Cleaire Flash and Catch DPX</td>
<td>85%</td>
<td>25%</td>
</tr>
<tr>
<td>Cleaire Horizon</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>Cleaire Longview</td>
<td>85%</td>
<td>25%</td>
</tr>
<tr>
<td>CleanAIR Systems PERMIT™</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>Donaldson</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>International DPX</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>Johnson Matthey CRT</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>Johnson Matthey CCRT</td>
<td>85%</td>
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<tr>
<td>Johnson Matthey EGRT</td>
<td>85%</td>
<td>40%</td>
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<tr>
<td>Lubrizol ECS Purifilter</td>
<td>85%</td>
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</tr>
<tr>
<td>Lubrizol ECS Unikat Combifilter</td>
<td>85%</td>
<td></td>
</tr>
</tbody>
</table>
Reporting Requirements

- **January 31st of each year thru 2016**
  - Contain number, manufacturer, make, and model of engines and fuel type used

- **January 31, 2006 Report**
  - TFV PM Baseline as of January 1, 2005
  - TFV NOx Fleet Average as of 1/1/2006
  - TAs proposed actions to achieve the 12/31/2007 NOx requirements

- **Late Penalty of $100 per day**

Questions?
Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

Adopted
July 22, 2004

Effective
February 1, 2005

Applicability

- All commercial on-road diesel-fueled vehicles operating in California with > 10,000 pounds GVWR
- Applies to CA based and non-CA based vehicles operating in CA
Requirements

- Targets non-essential idling
- Limits the primary engine idle time to five (5) minutes at any location
- Manually shut-off engine
- Buses
  - Allowed 10 minutes prior to passenger boarding
  - No limit when passengers onboard

Exceptions

- Idling to prevent a safety or health emergency (e.g. special needs kids)
- Operate equipment such as wheelchair lift
- Queuing in the normal course of conducting business
- Adverse weather conditions or mechanical difficulties
- and several others
School Bus Idling at Schools

- Applicable to:
  - Buses and Heavy-duty Vehicles
  - All Fuel Types
  - At or Within 100 Feet of K-12 School
    - includes school bus stops and school activity destinations
- Immediately turn off engine and restart 30 seconds or less before departing
- More Information:

Idling Contacts

- For enforcement or compliance questions:
  - Renae Hankins (916) 322-8275
  - Jason Francis (916) 324-9683
- For regulatory development questions:
  - John Gruszecki (916) 327-5601
  - Michael Miguel (916) 445-4236
- Website:
  - http://www.arb.ca.gov/toxics/idling/idling.htm
Questions?

Contact Information

Fleet Rule For Transit Agencies
www.arb.ca.gov/msprog/bus/bus.htm

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Phone: (916) 324-9550
E-mail: kmead@arb.ca.gov

Douglas Grandt
Phone: (916) 327-2938
E-mail: dgrandt@arb.ca.gov