



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

Speaker: Kathleen Mead

## Presentation Outline

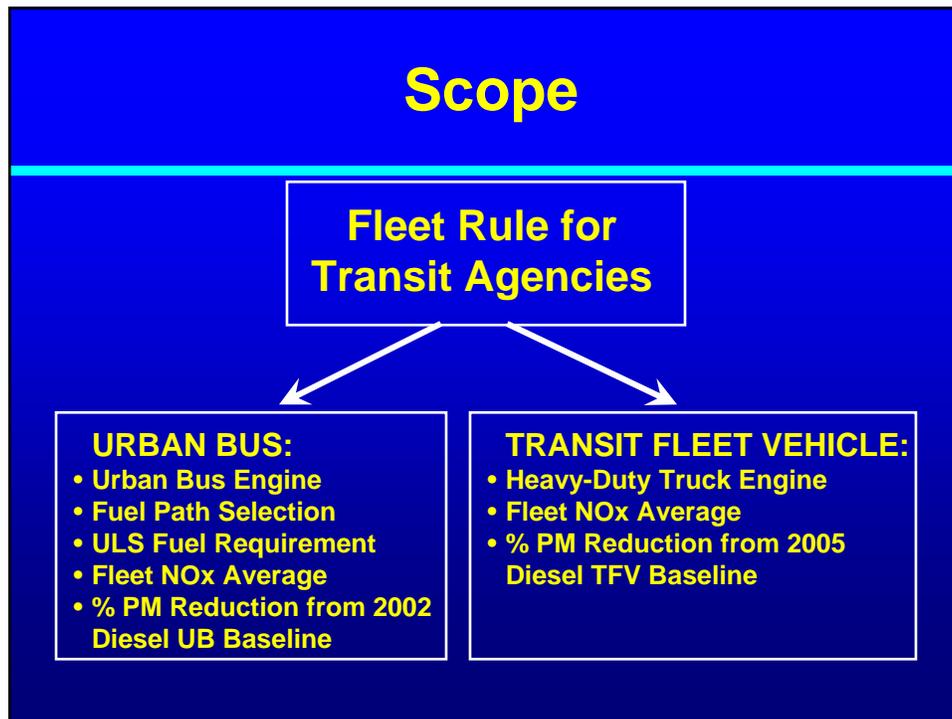
- ◆ **Background**
- ◆ **Fleet Rule For Transit Agencies**
  - ◆ Urban Bus Requirements
  - ◆ Transit Fleet Vehicle Requirements
- ◆ **Idling Restrictions**
  - ◆ Commercial Vehicles
  - ◆ School Buses

## 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



- ## 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)

<u>Model Year</u>	<u>Urban Bus</u>	<u>HD Engine</u>
1988	6.0	6.0
1990	6.0	6.0
1991	5.0	5.0
1996	4.0	5.0
1998	4.0	4.0
Oct-02	2.2	2.2
2004	0.5 (diesel), 2.2 (Alt.)	2.2
2007	0.2 → 1.2	1.2
2010	0.2	0.2

## Exhaust Emission Standards for PM

(grams per brake horsepower-hour)

<u>Model Year</u>	<u>Urban Bus</u>	<u>HD Engine</u>
1988	0.6	0.6
1991	0.1	0.25
1993	0.1	0.25
1994	0.07	0.1
1996	0.05	0.1
Oct-02	0.01	0.1
2007	0.01	0.01

## 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 NO<sub>x</sub> 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 NO<sub>x</sub>

(grams per brake horsepower-hour)

<u>Model Year</u>	<u>Urban Bus</u>	<u>HD Engine</u>
1988	6.0	6.0
1990	6.0	6.0
1991	5.0	5.0
1996	4.0	5.0
1998	4.0	4.0
Oct-02	2.2	2.2
2004	0.5 (diesel), 2.2 (Alt.)	2.2
2007	1.2	1.2
2010	0.2	0.2

## Exhaust Emission Standards for PM

(grams per brake horsepower-hour)

<u>Model Year</u>	<u>Urban Bus</u>	<u>HD Engine</u>
1988	0.6	0.6
1991	0.1	0.25
1993	0.1	0.25
1994	0.07	0.1
1996	0.05	0.1
Oct-02	0.01	0.1
2007	0.01	0.01

## 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

Fleet Type	Compliance Date		
	10/01/02	12/31/07	12/31/10
Urban Bus	4.8*		
Transit Fleet Vehicles		3.2**	2.4***

\* 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
- ◆ Example: 1 (1995 MY), 4 (2000 MY), 5 (2003MY)
  - ◆ 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)									
Pre-88	88-90	91-97	98-02	2003-2006	Pre-2004 Alt Fuel	2004+ MY Alt Fuel	Total	NOx Total	NOx Avg.
		1					1	5	<b>3.2</b>
			4				4	16	
				5			5	11	
		1	4	5			10	32	

## UB and TFV Percentage Diesel PM Reduction

Fleet Type	Baseline	% Reduction From Baseline				
	Year	2004	2005	2007	2009	2010
Urban Bus						
Alternative Diesel	2002	20	40	60	85*	
TFV	2005			40		80*

\*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

2) Listed By Corresponding Model Years (Fill in columns A-H ONLY)							1.0	
74-87	88-90	91-93	94-06	Retrofit Level 2 (DPF) 94-06	Retrofit Level 3 (DPF) 94-06	0.01g Engine	Total TFVs	Total PM
			5				5	0.5
					5		5	0.075
							10	0.575

## Diesel Emission Control Strategies

- ◆ "Verification" Procedure Adopted in 2003
- ◆ PM Reduction
  - ◆ Level 1 -  $\geq$  25% (DOC)
  - ◆ Level 2 -  $\geq$  50% (Fuel)
  - ◆ Level 3 -  $\geq$  85% (DPF)
- ◆ NO<sub>x</sub> Reduction, optional
  - ◆  $\geq$  15%
  - ◆ 5 % increments

## Current Level 3 Verifications

<http://www.arb.ca.gov/diesel/verdev/currentlyverifiedtech.htm>

Product Name	PM Reduction	NO <sub>x</sub> Reduction
Cleaire Flash and Catch CRT	85%	25%
Cleaire Flash and Catch DPX	85%	25%
Cleaire Horizon	85%	
Cleaire Longview	85%	25%
CleanAIR Systems PERMIT™	85%	
Donaldson	85%	
International DPX	85%	
Johnson Matthey CRT	85%	
Johnson Matthey CCRT	85%	
Johnson Matthey EGRT	85%	40%
Lubrizol ECS Purifilter	85%	
Lubrizol ECS Unikat Combifilter	85%	

## Reporting Requirements

- ◆ January 31<sup>st</sup> 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

AIR RESOURCES BOARD   
California Environmental Protection Agency

## 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



30

## 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

31

## 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

32

## 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:**  
<http://www.arb.ca.gov/regact/sbidling/fro.pdf>

## 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](http://www.arb.ca.gov/msprog/bus/bus.htm)

### Kathleen Mead

Manager, Retrofit Implementation Section

Phone: (916) 324-9550

E-mail: [kmead@arb.ca.gov](mailto:kmead@arb.ca.gov)

### Douglas Grandt

Phone: (916) 327-2938

E-mail: [dgrandt@arb.ca.gov](mailto:dgrandt@arb.ca.gov)