

# **Status Update**

## **Public Transit Bus Fleet Rule**

San Diego  
March 21, 2002



## **Outline**

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-  Background
-  Outreach to Transit Agencies
-  NOx Fleet Average Update
-  Alternative NOx Strategy Update
-  Implementation Update
-  Transit Agencies Voluntary Activities
-  Outstanding Issues
-  Recommendations



# ***Background***



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- 10 Select Fuel Path by January 31, 2001
- 10 New Engine Standards
  - ❖ 2002: 0.1 g/bhp-hr PM
  - ❖ 2004-2006: 0.5 g/bhp-hr NOx
  - ❖ 2007 and beyond: 0.2 g/bhp-hr NOx
- 10 Alternative NOx Strategy Exemption
- 10 4.8 g/bhp-hr NOx Fleet Average  
Effective October 1, 2002



## ***Background***

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- Annual Reports Due Each January 31
- Low Sulfur Fuel (15 ppm or less)  
Starting July 1, 2002
- PM Retrofits Starting January 1, 2003
- Zero-Emission Bus Demo Starting  
2003
- Zero-Emission Bus Purchases in 2008



## ***September 2001 Update***

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- 4.8 g/bhp-hr NO<sub>x</sub> Fleet Average
  - ❖ 14 transit agencies supplied incorrect or insufficient information
- Alternative NO<sub>x</sub> Strategy
  - ❖ 15 applications
  - ❖ 1 complete plan; 3 incomplete plans
  - ❖ No NO<sub>x</sub> demonstrations



## ***Resolution 01-31 (September 2001)***

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-  Assist Transit Agencies to Comply with NOx Fleet Average
-  Assist Transit Agencies with Alternative NOx Strategy Applications
  - ❖ Submit complete plan by 12/31/01
  - ❖ Commit resources for NOx demo by 12/31/01
  - ❖ Implement demo by 12/31/02



## ***Outreach to Transit Agencies***



## ***Outreach to Transit Agencies***

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-  Multiple Meetings & Teleconferences
-  Presentation at California Transit Association Conference
-  Issuance of Two Advisories
-  Engine Manufacturers Association Meeting
-  Communication through Letters, Phone Calls, and E-mails



## ***NOx Fleet Average Update***



## ***NOx Fleet Average Update***

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-  Fleet Average Effective October 1, 2002
-  Compliance through Retirement, Repowering, or New Purchases of Buses
-  Four Transit Agencies Projected to be in Non-Compliance in October 1, 2002



## ***NOx Fleet Average Update***

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Transit Agency	Fleet Path	Fleet Size	Date
Arcata/MAD River Transit System	Diesel	4	11/02
Fairfield/Suisun Transit	Diesel	41	12/02
San Luis Obispo Regional Transit	Diesel	18	12/03
South County Area Transit	Diesel	4	12/03



# *Alternative NOx Strategy Update*



## *Alternative NOx Strategy Update*

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- # No Complying Engines Available  
2004-2006
- # Exemption Requirements
  - ❖ Apply by 6/30/01
  - ❖ Achieve greater NOx emission benefits
  - ❖ Demonstrate advanced NOx aftertreatment technology at 70-90% reduction
- # Board Allowed Until 12/31/01 to  
Complete Plan & Commit Resources



## ***Approved Strategy Plans***

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<b>Transit Agency</b>	<b>Fuel Path</b>	<b>Air District</b>
AC Transit District	D	Bay Area
Eastern Contra Costa Transit	D	Bay Area
Golden Gate Transit	D	Bay Area
Santa Clara VTA	D	Bay Area
El Dorado County Transit	D	El Dorado County
Merced County Transit	D	San Joaquin Valley
Visalia City Coach	D	San Joaquin Valley

## ***Withdrawn or Incomplete Applications***

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<b>Transit Agency</b>	<b>Fuel Path</b>	<b>Air District</b>
Central Contra Costa Transit	D	Bay Area
Livermore/Amador Valley Transit	D	Bay Area
San Francisco MUNI	D	Bay Area
Monterey-Salinas Transit	D	Monterey Bay
San Joaquin Regional Transit	D	San Joaquin
Long Beach Transit	D	South Coast
Montebello Bus Lines	D	South Coast
City of Norwalk	D	South Coast

## ***Aftertreatment Demonstration Status***

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- One Joint Demonstration with All Seven Transit Agencies
- San Mateo County Transit & Central Contra Costa Transit Authority will also Participate
- Potential to Achieve 70% Reduction
- Torrance Transit will Perform Separate Demonstration (Not Required)



## ***Implementation Update***



## ***Annual Reports***

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Reported on Time	49
Reported Late By 03/01/02	14
Reported Late By 03/15/02	2
Outstanding Reports	5
Total	70



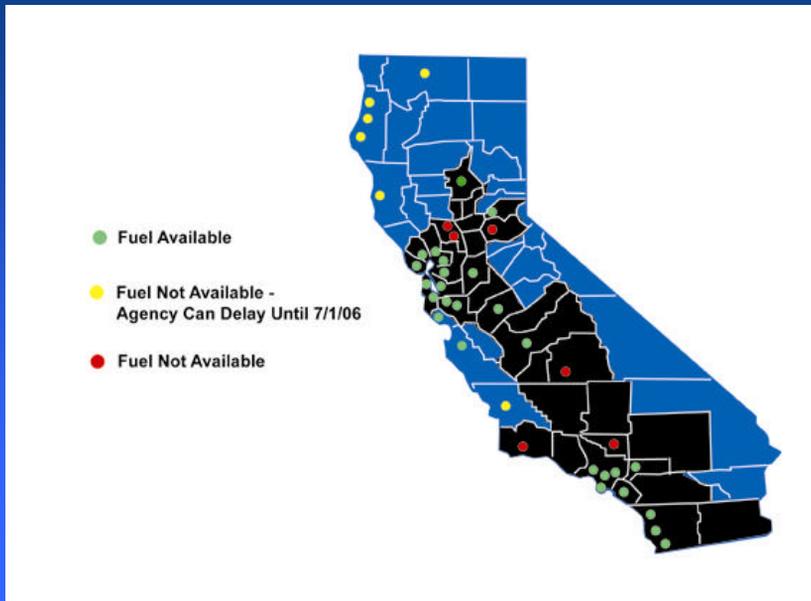
## ***Past Due Annual Reports***

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Transit Agency	Path	Air District
City of Commerce	D	South Coast
City of Norwalk	D	South Coast
Fairfield/Suisun Transit	D	Bay Area
City of LA – Dept of Transportation	A	South Coast
Yolobus	A	Yolo-Solano



## Ultra Low Sulfur Diesel Fuel Availability



## Ultra Low Sulfur Diesel Fuel Availability

- 📄 Fuel Contracts (45 Responded)
  - ❖ 14 have contracts in place
  - ❖ 31 do not have contracts yet or purchase on open market
- 📄 Price Difference
  - ❖ 67% are paying \$.02 - \$.07 more
  - ❖ 23% are paying \$.08 - \$.15 more



## ***Transit Agency Voluntary Activities***



## ***Transit Agency Voluntary Activities***

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- Aggressively Repowering Buses with Two-Stroke Engines
- Using Low Sulfur (<15 ppm) Fuel Earlier than 7/1/02 Deadline
- Installing Particulate Filters Earlier than Required
- Testing Engines with Lower NO<sub>x</sub> and PM than Current Certified Engines



## *Outstanding Issues*



## *Outstanding Issues*

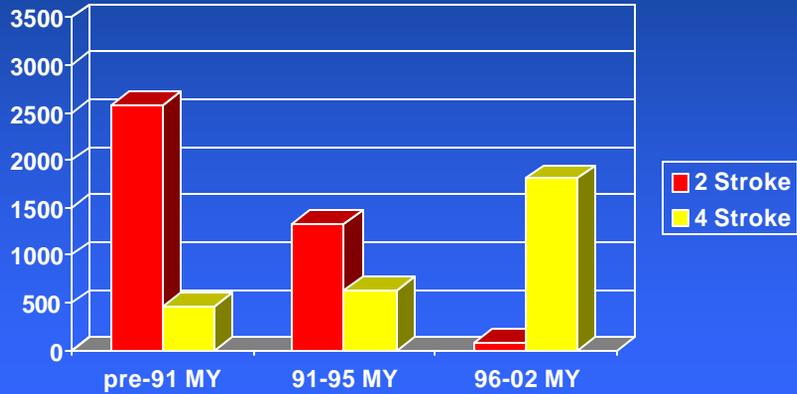
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- ❏ Unavailability of 85% PM Reduction Strategies for Older Engines
- ❏ In-Use Performance of Retrofits
- ❏ Development of Hybrid-Electric Bus Test Procedures



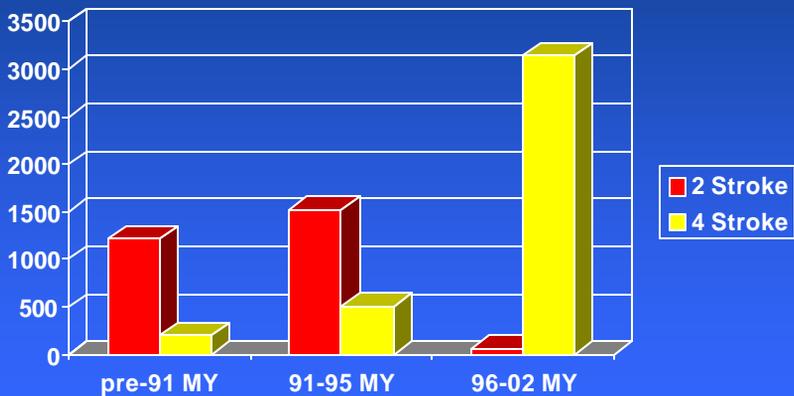
## Fleet Composition 2001

Two and Four Stroke Engines (2001)



## Fleet Composition 2002

Two and Four Stroke Engines (2002)



## ***PM Retrofit Requirements***

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- Requirement Effective 1/1/03
  - ❖ 100% of pre-91 MY diesel engines
  - ❖ Certain % of 91-95 MY diesel engines
- Applicable exemptions:
  - ❖ Pre-91 MY engines retrofitted with 0.1 g/bhp-hr PM ARB certified retrofit device
  - ❖ Alternative fuel path: 91-95 MY buses within two years of retirement
  - ❖ Diesel path: 91-95 MY buses within one year of retirement



## ***2002 Fleet Plans***

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	Pre-1991 MY		1991-1995 MY		Total
	2 stroke	4 stroke	2 stroke	4 stroke	
Retire	825	96	303	110	1334
Repower	0	0	83	91	174
Retrofits	430	16	674	350	1470
Exempt	537	5	13	3	558
<b>Totals</b>	<b>1792</b>	<b>117</b>	<b>1073</b>	<b>554</b>	<b>3536</b>



## ***PM Retrofit Update***

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- Two Devices Verified for Four-Stroke Engines (MY 94-02) at 85%
- No Retrofit Devices Verified for Engines Older than 1994 MY or Two-Stroke Engines
- No 85% Technology Expected for Pre-1994 Engines to Meet 1/1/03 Deadline



## ***In-Use Performance of Retrofits***

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- New York City Transit
  - ❖ 900 buses, few problems
- Long Beach Transit
  - ❖ 60 buses, 2 failures
- Philadelphia
  - ❖ 30 buses, no problems



## ***In-Use Performance of Retrofits***

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- Los Angeles MTA
  - ❖ 2 buses, no problem
- San Francisco MUNI
  - ❖ 2 buses, 1 problem
- Santa Clara VTA
  - ❖ 1 bus, 1 failure



## ***Hybrid-Electric Bus Developments***

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- Continue to Work with Hybrid Bus Manufacturers, Hybrid Drive Train Developers & Transit Bus Fleet Managers
- Heavy-Duty Hybrid-Electric Vehicle Test Procedures Planned for Board Consideration in September 2002



# Summary



# Summary

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- NOx Fleet Average
  - ❖ Nearly all project compliance
  - ❖ NOVs to be issued to 4 projected not to comply
- Alternative NOx Strategy Exemption
  - ❖ All plans submitted on time approved
  - ❖ Others chose not to purchase diesel engines 2004-2006
  - ❖ One joint demonstration planned



## *Summary*

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- Annual Report Due 1/31/02
  - ❖ 5 are past due
- Low Sulfur (<15 ppm) Diesel Fuel
  - ❖ Generally available
  - ❖ Staff will assist transit agencies
- Retrofit Field Experience
  - ❖ 1994 MY and newer - few problems
- Retrofits Not Verified For pre-94 MY



## *Recommendations*



## ***Recommendations***

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- Propose Revised Retrofit Implementation Schedule in September 2002
- Continue to Work with Transit Agencies
  - ❖ NOx Fleet Average
  - ❖ Advanced NOx Aftertreatment Demo
  - ❖ Low Sulfur Diesel Fuel
  - ❖ Retrofits



## ***Recommendations***

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- Assist Rural and Small Transit Agencies
- Propose Adoption of Hybrid Test Procedures in September 2002

