Proposal

Public Transit Bus Fleet Rule and Emission Standards for New Urban Buses

California Air Resources Board Public Hearing
February 24, 2000
Today’s Presentation

• Review of January staff proposal

• Four Outstanding Issues
  ◆ Discussion
  ◆ Recommendations

• Conclusions
Review of Staff Proposal

• Two paths: Diesel and Alternative-fuel
  - Equal NOx reductions
  - Alt-fuel path yields more PM reductions

• Each path: (requirements vary)
  - More stringent new bus emission standards
  - PM retrofits and ultra-low sulfur fuel
Diesel Path

- Forego buying cleaner buses until 2004
- More stringent standards introduce advanced technology earlier
  - NOx catalysts + traps beginning in 2004
  - Zero emission buses
    - Demonstration in 2003
    - Purchase in 2008
Alternative-Fuel Path

• Purchase cleaner, alt-fuel buses now and in future
• More stringent new bus standards deferred until 2007
• Zero emission buses
   Purchase requirement: 2010
   No demonstration required
Both Paths

- Retrofit existing diesel buses with particulate traps
  - Phased-in 2003-2009
- Use 15 ppm sulfur diesel fuel
Issues for Today’s Discussion

1. PM retrofit requirements
2. 2004 diesel standards
3. Diesel hybrid buses
4. Local authority to choose the alternative-fuel path
Issue 1: PM Retrofits

Options:

- Staff proposal:
  - Retrofits phased-in 2003-2009

- Environmental proposal:
  - Accelerate retrofit requirements on diesel path
Environmental proposal (diesel path)

- Tier 1 (pre-91 models): No change
- Tier 2 (MY 91-95): Accelerate by 1 year
  - 50% by 2003; 100% by 2004
  - Limit exemption for retirement to one year
- Tier 3 (MY 96-03): Accelerate by 2 years
  - 20% by 2005; 75% by 2006; 100% by 2007
  - Eliminate exemption for retirement
Fleet Average In-Use PM Emissions
Staff Proposal vs. Accelerated PM Retrofit Proposal

PM Emissions (g/mile)

Issue 1: PM Retrofits

Staff Recommendation:

Accelerate retrofit requirements on the diesel path

- Technologically feasible
  - Traps and low sulfur diesel fuel available
- Reduces PM gap between paths
- No apparent opposition
**Issue 2: 2004 Diesel Standards**

**Options:**

- **Staff proposal:**
  - 75% cleaner new bus NOx standard in 2004 (0.5)
  - 80% cleaner new bus PM standard in 2004 (0.01)

- **EMA proposal:**
  - NOx fleet average in lieu of 2004 diesel standards

- **Revised EMA proposal:**
  - EO-approved alternative for fleets to demonstrate NOx emission reduction equivalence
  - Accelerate 80% cleaner new bus PM standard to 10/02
Issue 2: NOx Comparison

![Graph showing NOx comparison over years](image)

- **g/bhp-hr**
- **x-axis:** Years from 2004 to 2015
- **y-axis:** g/bhp-hr

- **Lines:**
  - **Blue line:** Staff
  - **Red line:** EMA
  - **Red squares:** EMA rev
Issue 2: PM Comparison

![Graph showing PM comparison over years with different emission levels for Staff, EMA, and EMA rev.]
Issue 2: Summary

- Original EMA proposal
  - Less NOx benefit, more PM benefit
  - Technology pull-ahead due to 2004-06 emission standards may not be realized

- Revised EMA proposal
  - Same NOx, more PM benefit vs staff proposal
  - Guarantees reductions that may not be realized due to pre-buying, or no complying engines
  - Potentially lower cost
  - Includes demonstration of after-treatment in CA
Issue 2: 2004 Diesel Standards

Staff Recommendation:
Adopt revised EMA proposal

- Equivalent or better NOx emission reductions
- Greater PM emission reductions
- Demonstration program for diesel buses with after-treatment
Issue 3: Diesel Hybrid Buses

Options:

• Staff proposal
  - Diesel hybrids can’t exceed 15% of purchases by agencies on alternative-fuel path

• Industry proposal
  - Diesel hybrids qualify as alternative-fuel buses if meet standards
Issue 3: Diesel Hybrid Buses

- New data available - 2 hybrid buses
  - In-use PM (g/mi) for trap-equipped diesel hybrid similar to NG bus
  - NOx higher than NG

- In-use compliance test needed to demonstrate equivalency
Issue 3: Diesel Hybrid Buses

Staff recommendation:

**Staff proposal**

- Diesel hybrids don’t count as alt-fuel buses
- Staff developing in-use compliance procedure
  - Return with updated recommendation in 2001
  - Could qualify buses for incentive funds
Issue 4: Local Authority

Options:

• Staff proposal
  ◆ Does not explicitly address local authority

• SCAQMD/SJVUAPCD proposal
  ◆ Require alt-fuel-only path if districts so choose
Issue 4: Local Authority

- Authority to regulate bus fleets exists
  - ARB legal office opinion
  - ARB regulatory action unnecessary, but
  - May facilitate local district adoption of alt-fuel only requirement

- Provides little or no NOx benefit
  - Reduces toxic exposure from diesel PM

- Sets precedent
  - Alt-fuel bias
Staff Recommendation:

Staff proposal

- Maintains dual path flexibility
  - Key principle upon which consensus achieved
- Districts free to act to limit bus fleets to alt-fuel purchases
Other Issues

- In-use compliance program
- In-use/certification test cycle
- Staff agrees and will investigate
Conclusions

Staff Recommendations: Summary

• Accelerate PM retrofit schedule

• Adopt revised EMA proposal allowing alternative compliance with 2004 standards

• Adopt original staff proposal, including
  ✦ Maintaining dual path flexibility
  ✦ Diesel hybrids don’t count as alt-fuel