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AIR RESOURCES BOARD

DEER

Reducing the Impact of Diesels on Air Quality and Public Health

Tom Cackette

Chief Deputy Executive Officer

Air Resources Board

August 20, 2000

Diesel Exhaust is Unhealthy

- NOx
  - Precursor to Ozone - a lung irritant
  - Precursor to PM2.5 - lung disease, mortality
- Diesel PM = toxic air contaminant (TAC)
  - Identified as TAC in August 1998
  - Contains over 40 substances identified as TACs
  - Carcinogenic in humans & animals
  - Non-cancer damage to lungs

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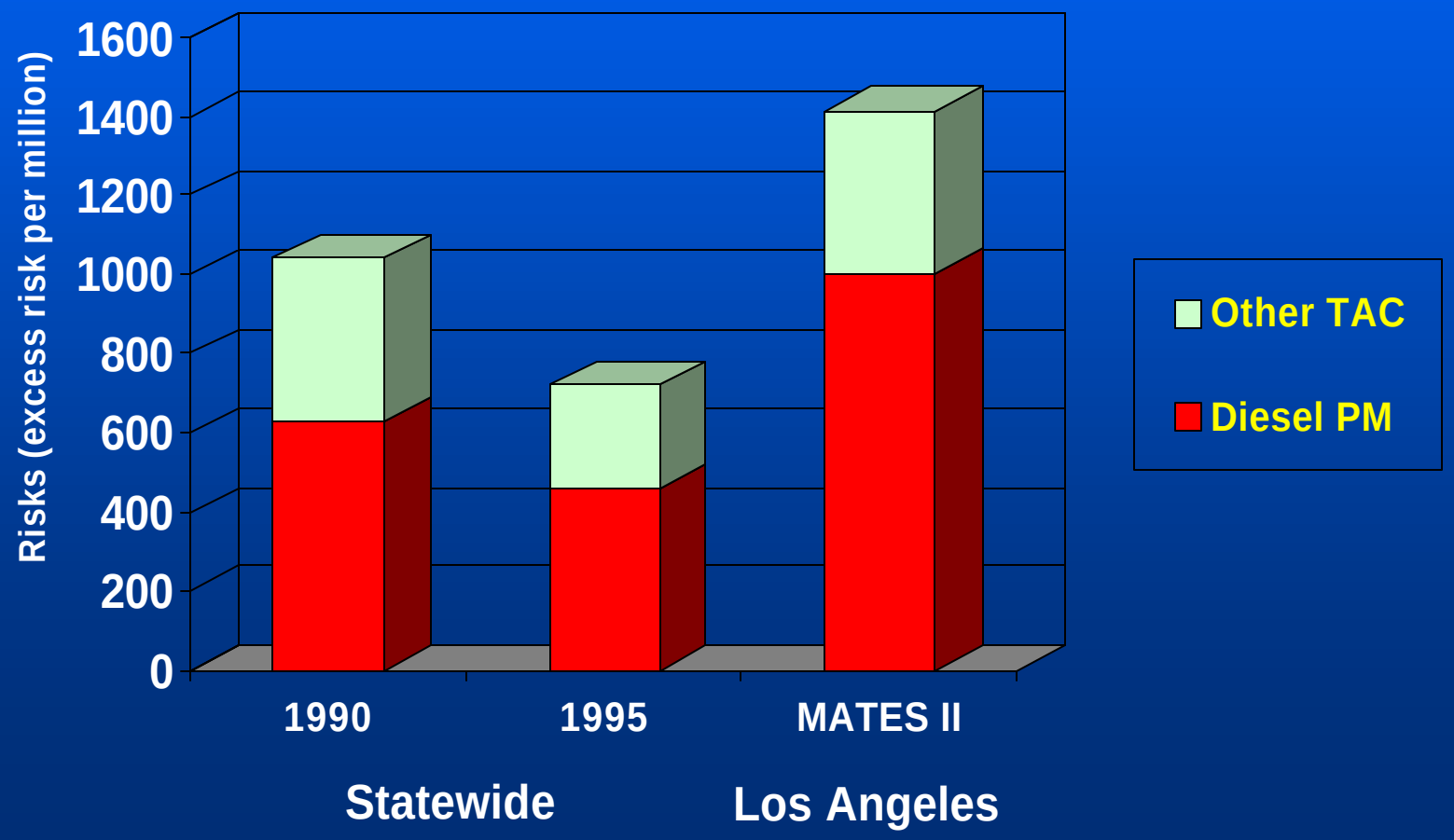
Diesel's PM Cancer Risk is High



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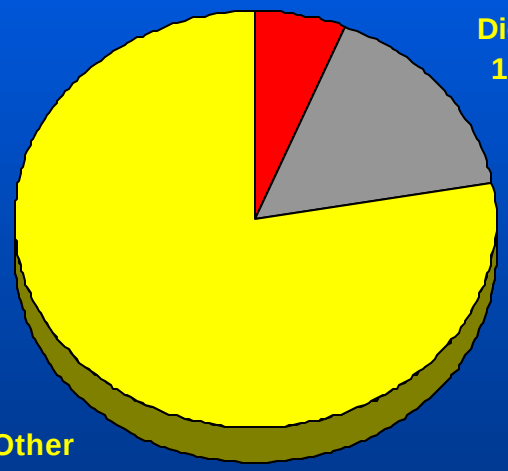
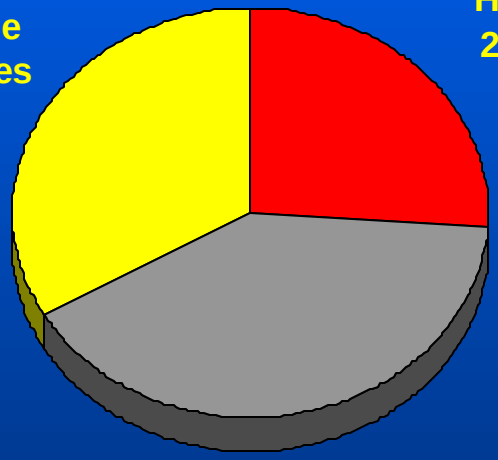
Reducing Diesel Emissions is a Priority

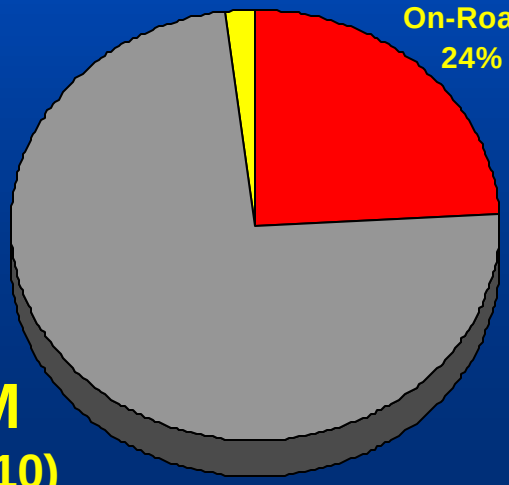
ROG (SCAB-2010)



NOx (SCAB-2010)



Diesel PM (Statewide-2010)



Source for ROG and NOx: 1994 SIP

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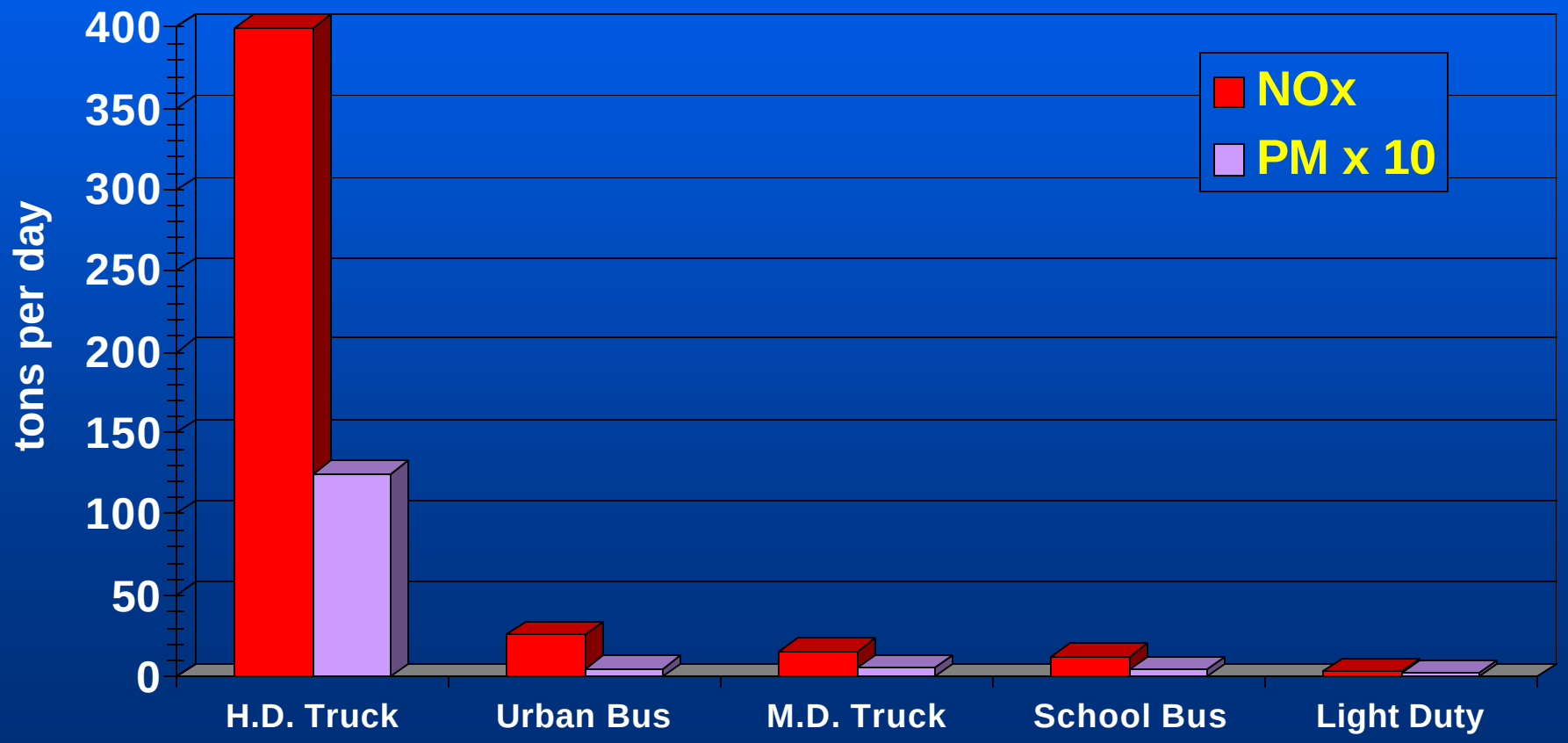
Heavy Diesel Trucks Dominate On-Road Heavy-Duty Diesel Emissions



Source: EMFAC2000, Year 2010, Statewide

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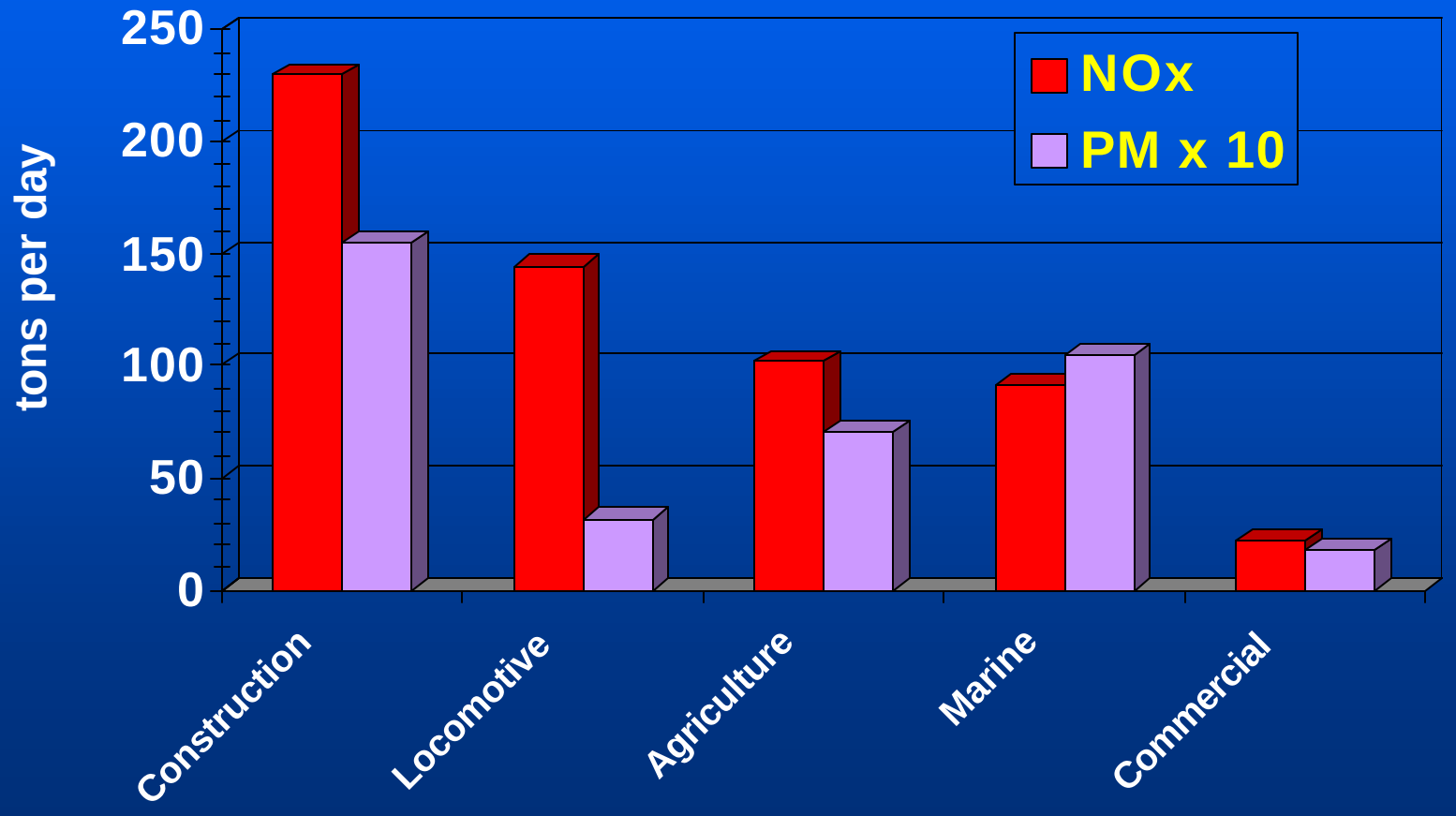
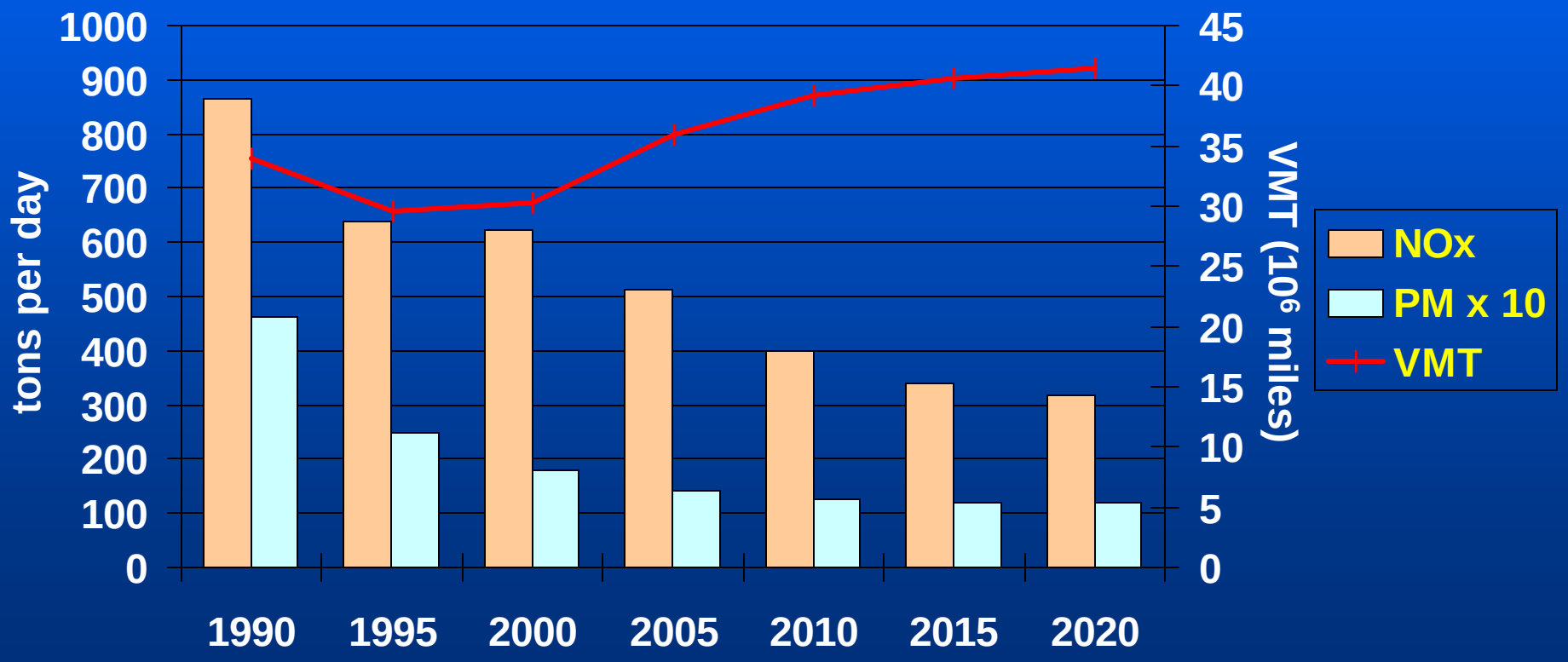
Off-Road Diesel's Contribution is Distributed



Source: OFF-ROAD, Year 2010, Statewide

Diesel Truck Usage Will Increase -- Emissions Will Decrease



Source: EMFAC2000, Statewide On-Road HDD

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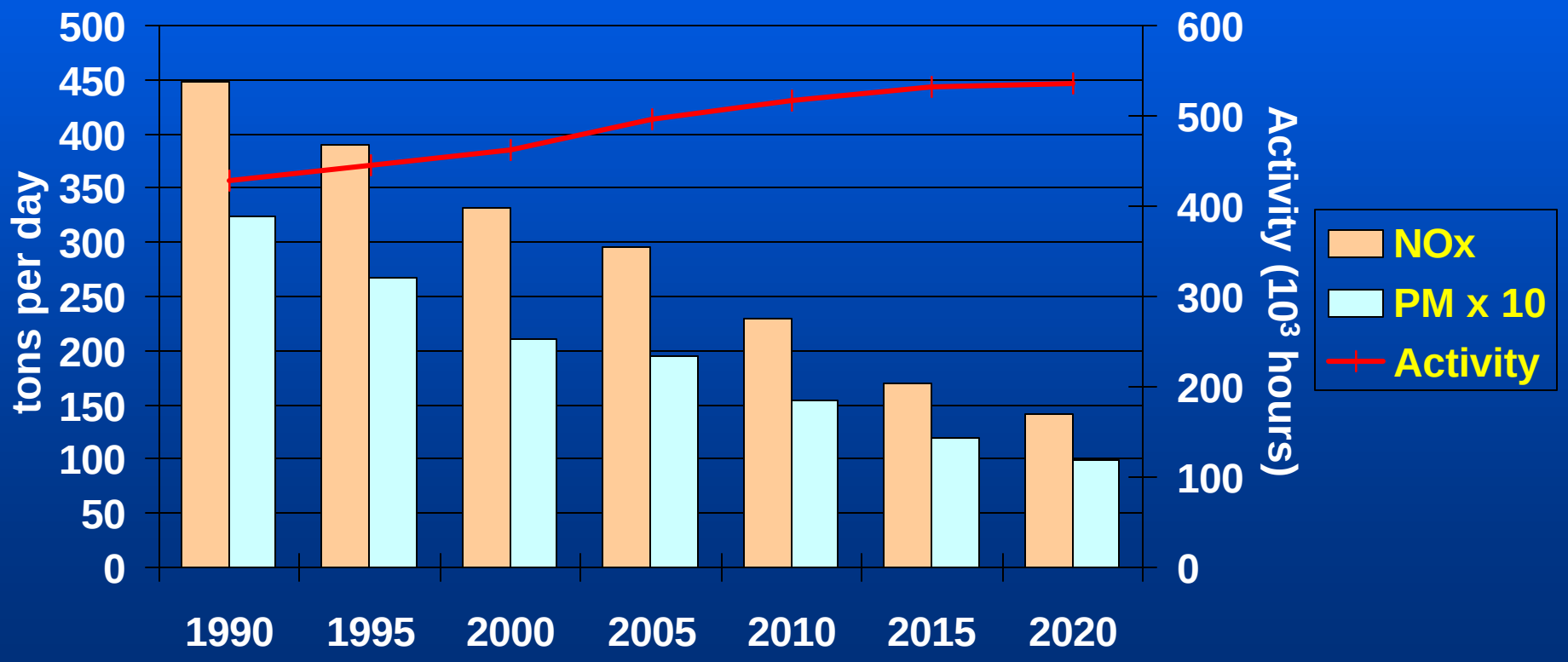
Construction Equipment Activity Will Increase -- Emissions Will Decrease



Source: OFF-ROAD, Statewide Construction Equipment

Existing Control Measures Will Produce These Decreases

- New Engine Emission Standards
  - On-Road Truck
  - Off-Road Diesel
- Transit Bus Fleet Rule
- Carl Moyer Program ($$ incentives)
- Smoke Enforcement Programs

Future Control Measures: Still Needed

- Reduce Toxics Risk
- Assure Ozone Attainment
- Reduce Secondary $PM_{2.5}$ Formation

Diesel PM Control Plan

- Draft plan issued July 15, hearing late Sept.
- Adopt New Aftertreatment-Based Standards
  - 2007 NOx, PM for New On-road Trucks
  - Tier 3 PM Standard for New Off-Road Equipment
  - Tier 4 NOx, PM for New Off-Road Equipment (2009?)
  - Ultra-low sulfur diesel on and off-road
- Retrofit Existing Diesels with PM Controls
- I&M and In-Use Compliance Testing
- On-Board Diagnostics for Heavy Diesel Trucks

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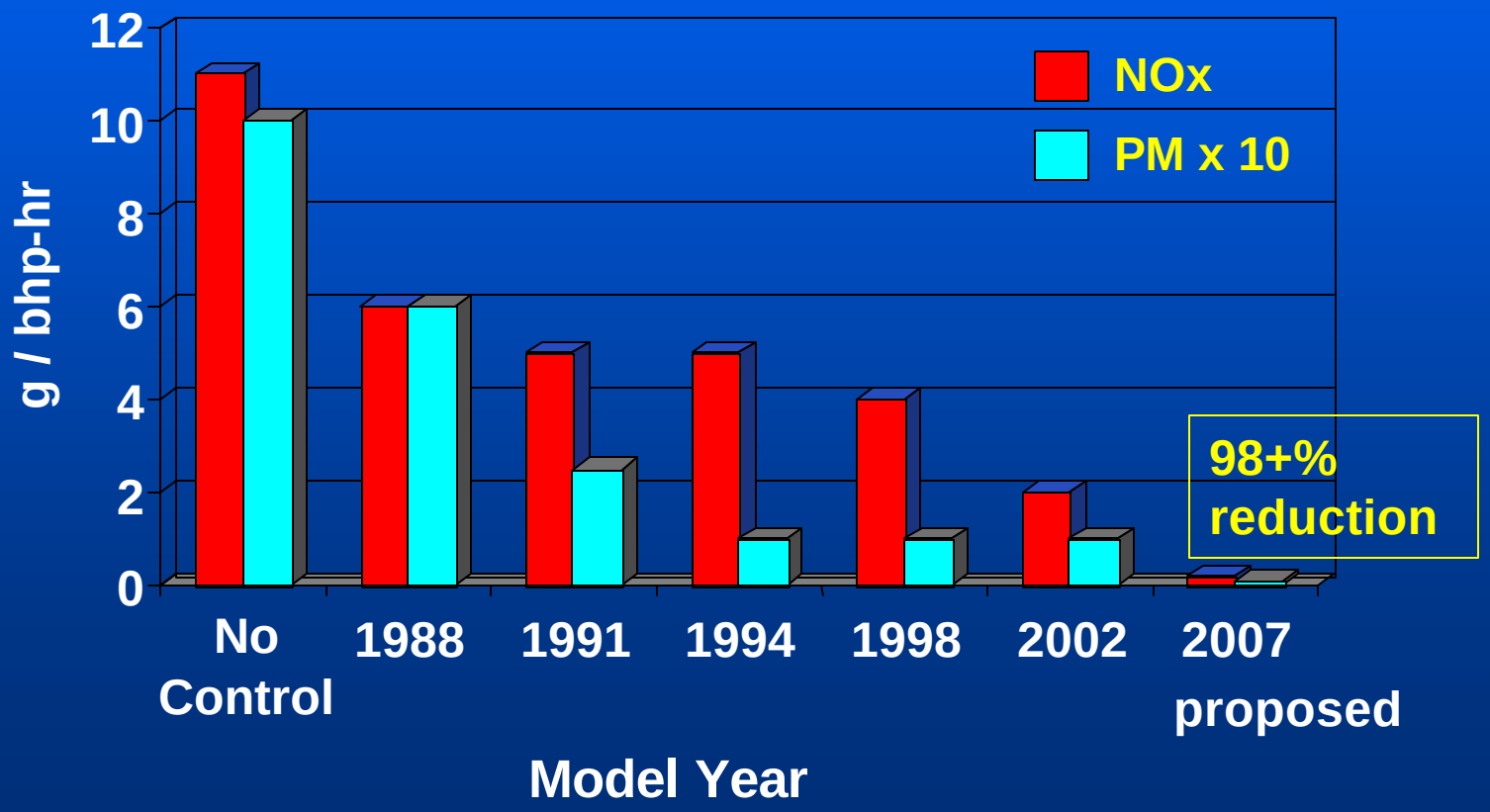
New Diesel Truck Emission Standards Are Proposed



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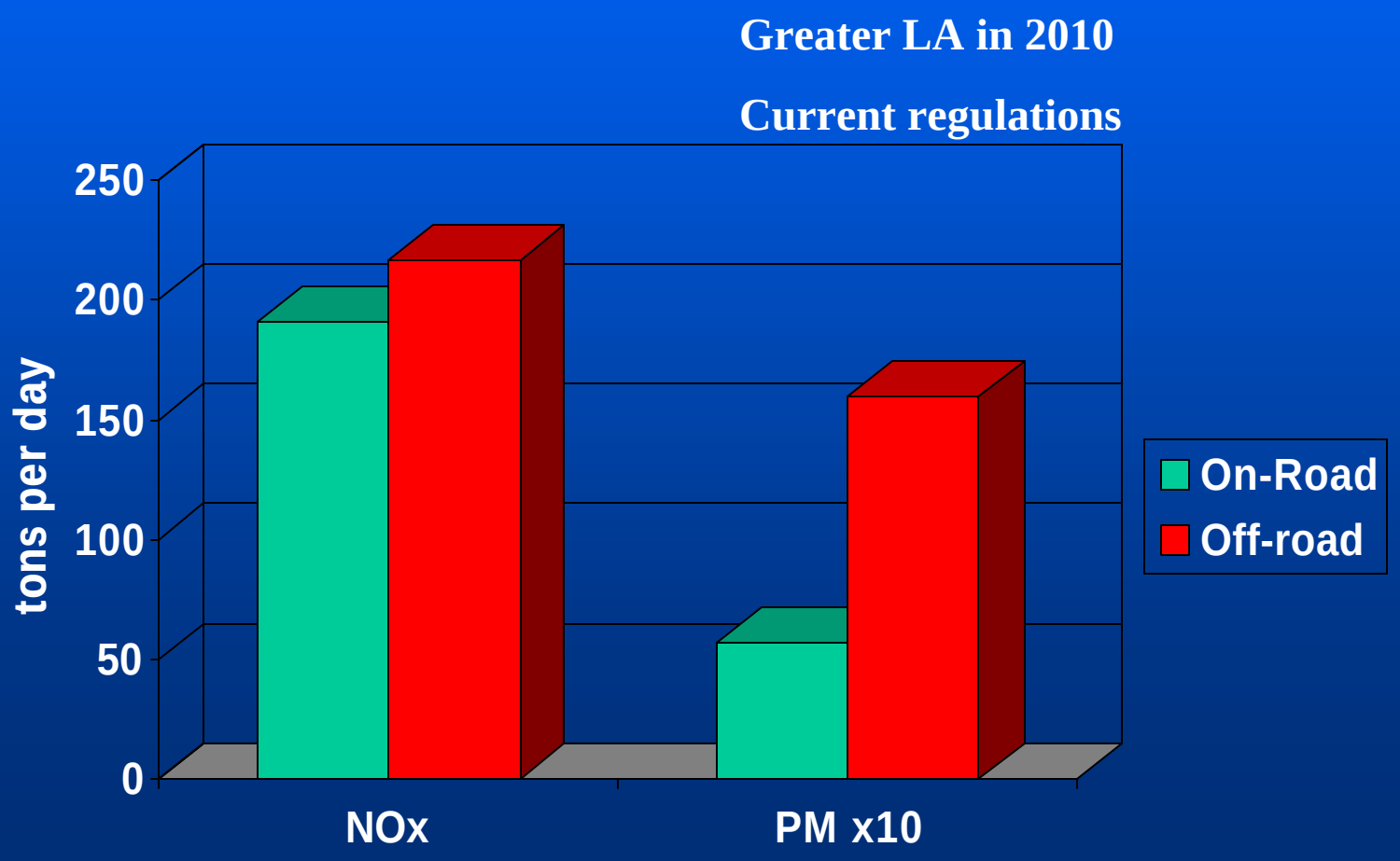
Off-Road Diesels are as Important as Trucks and Buses



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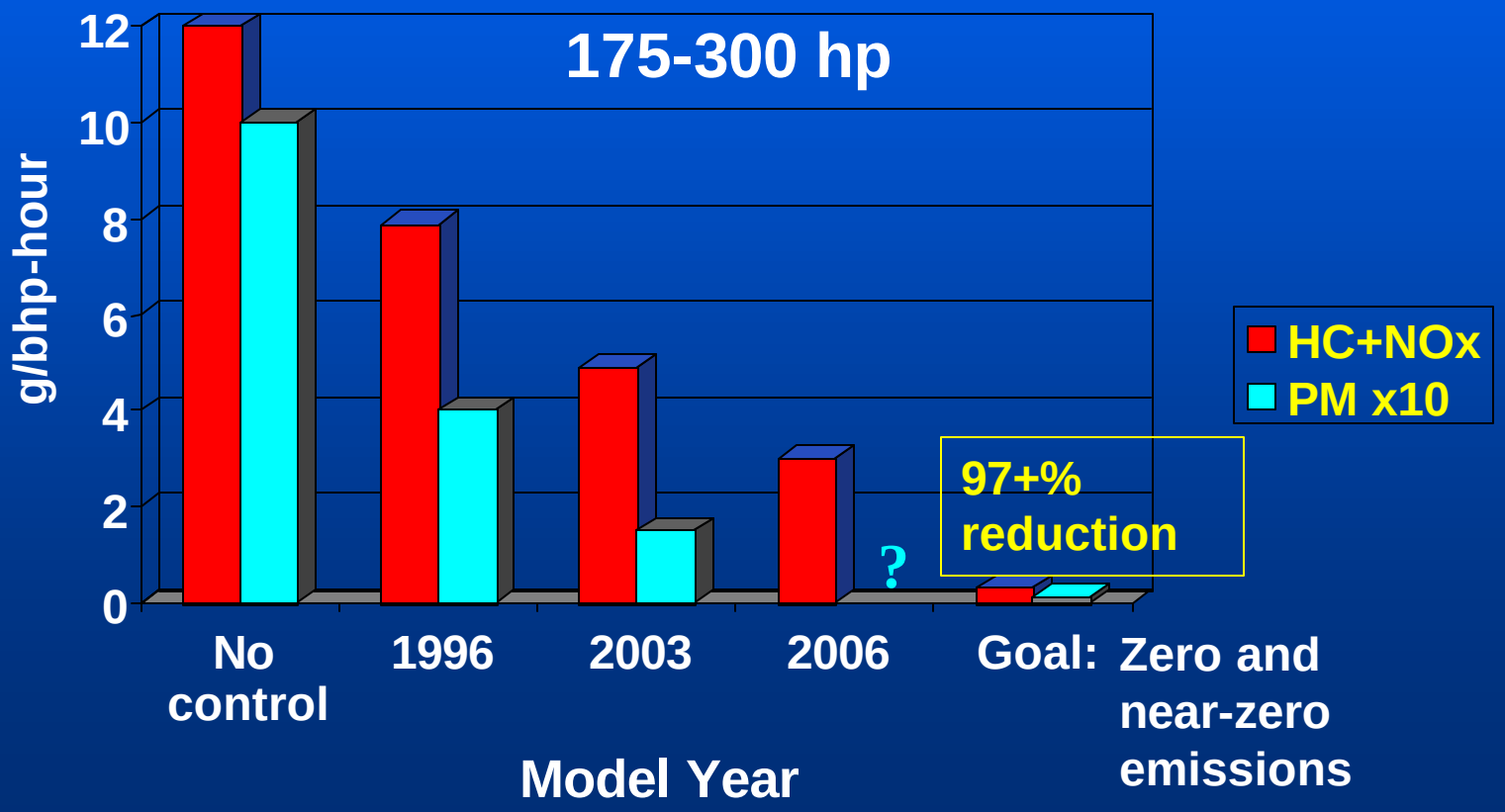
New Off-Road Diesel Emission Standards Need to Be Developed



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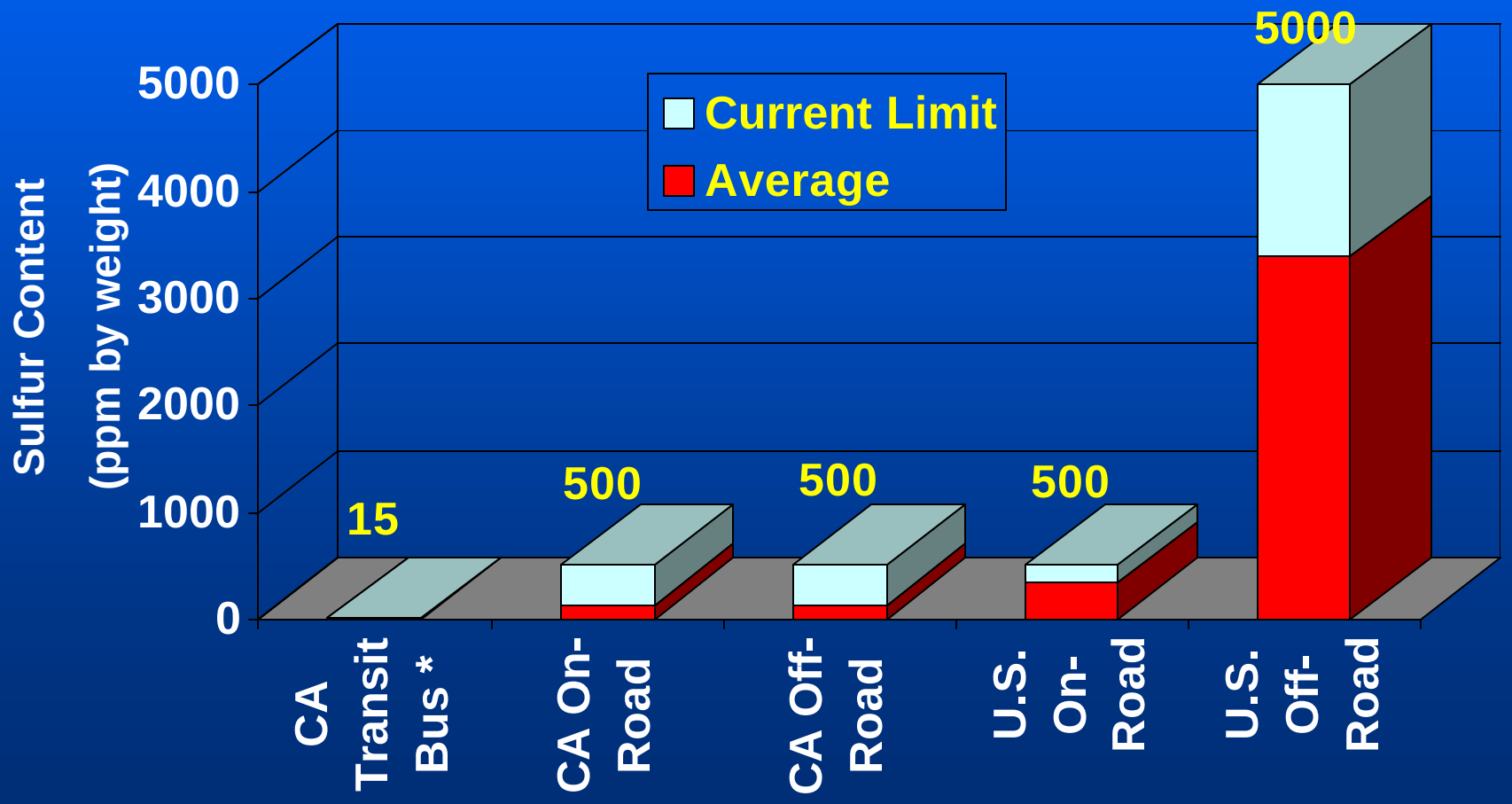
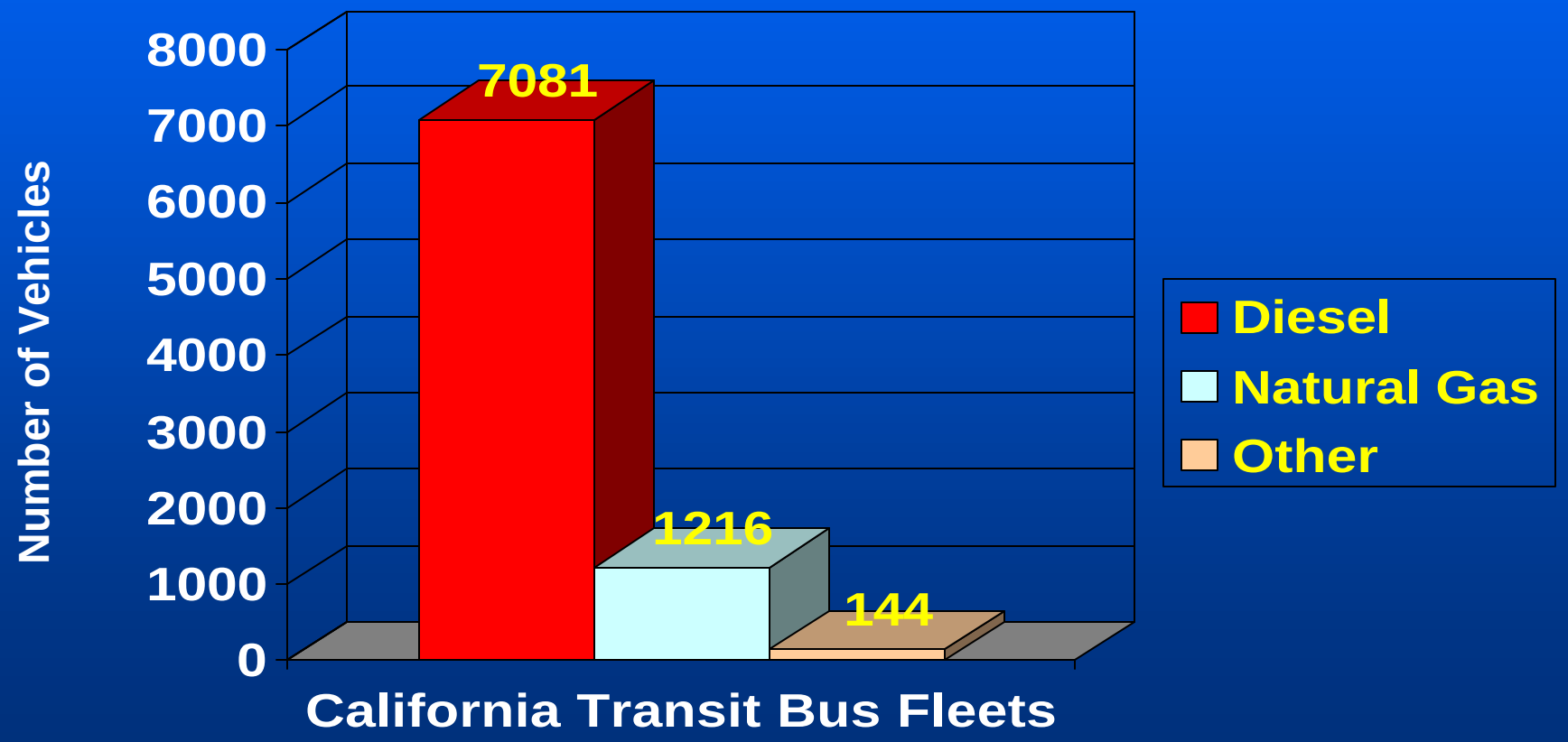
Lower Sulfur Limits Are Needed and Feasible



* Beginning July 1, 2002

Natural Gas Remains an Option



Source: 9/1999 Transit Fleet Inventory

Retrofit Programs Reduce Emissions "Now"

- **Goal: Retrofit All In-Use Diesels in CA**
  - School bus retrofits begin 2001
  - Transit bus retrofits begin January 2003
  - Retrofit control plan - all others
  - Guided by International Advisory Committee
- **Demonstration programs - USA**
  - 1000s of trucks in Europe
  - 100s in USA
  - More where needed

Incentives Help to Lower Emissions "Now"

- **Objective: Pay Incremental Cost of Low Emission Technologies**
- **Carl Moyer Program** (NOx; NOx + PM)
  - **$44 M to date; $50 M for FY00/01**
  - **Reductions first year: 4 t/day NOx; 100#/day PM**
- **School Bus Replacement & Retrofit Program** (PM, NOx)
  - **$50 M**
  - **Purchase of new low-emitting buses**
  - **PM retrofit for existing buses**
- **Sacramento/San Joaquin Special Allocations** (NOx)
  - **Meet SIP obligations**
  - **$75 M**

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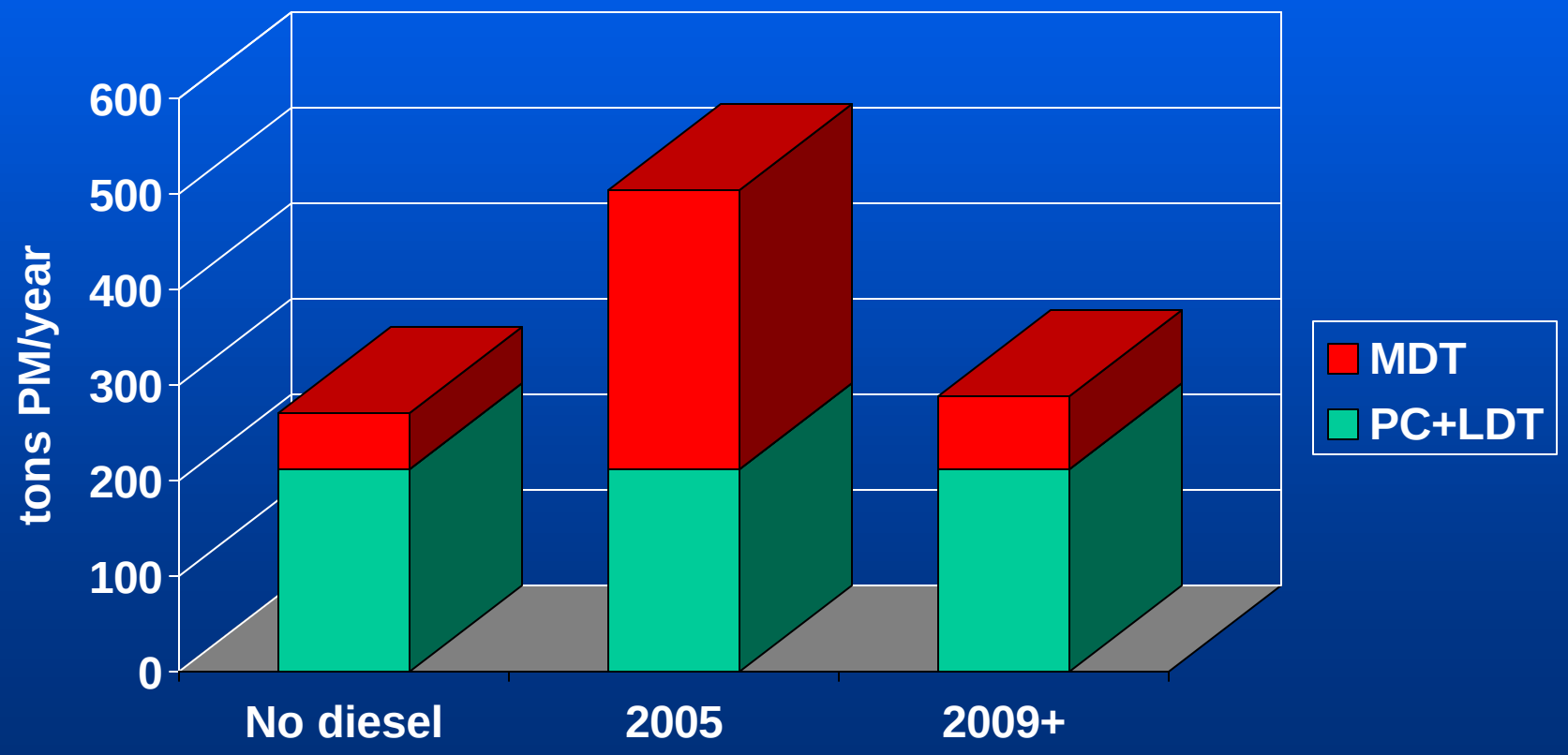
Dieselizing SUV & PU Trucks* Would Increase PM Emissions



* MDVs under 8,500 lbs GVW only

Conclusions

- Diesel exhaust harms public health
- Diesel emissions are declining
- Additional control measures needed to remove health threat
  - After-treatment based standards for on- and off-road
  - Low sulfur diesel fuel on- and off-road
  - Better in-use compliance
  - Retrofit of existing diesels with PM filters
  - Encourage alternative fuels and technologies