# California's Diesel Retrofit Program

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FACA Mobile Source Sub-Committee
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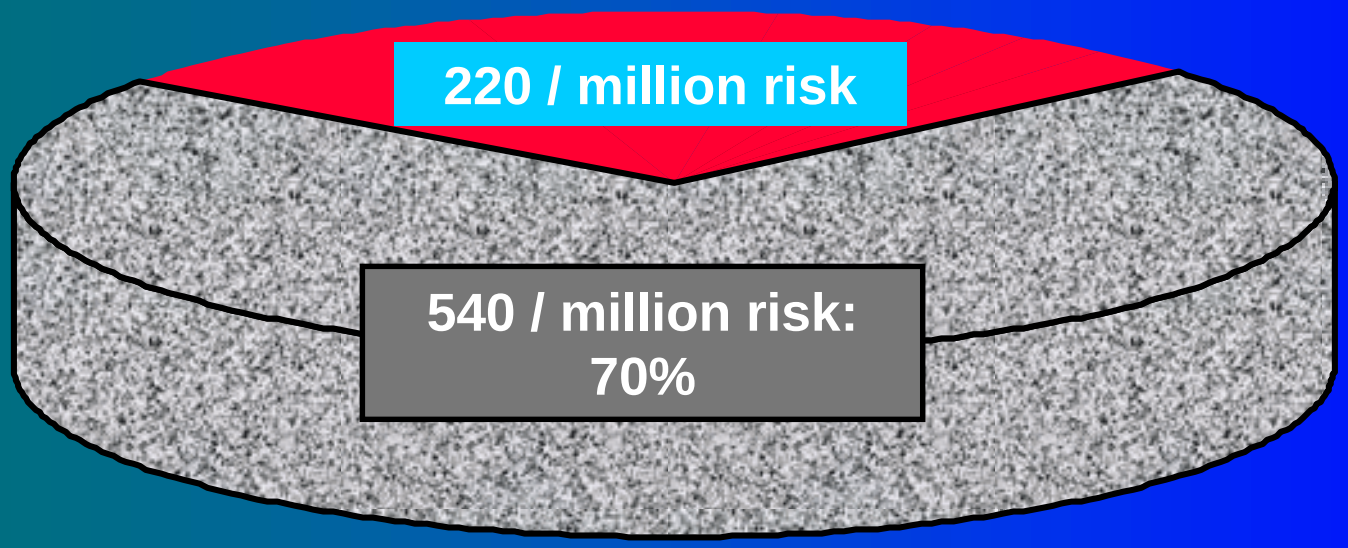
California Environmental Protection Agency
Air Resources Board

# 70% of Air Toxic Risk From Diesels

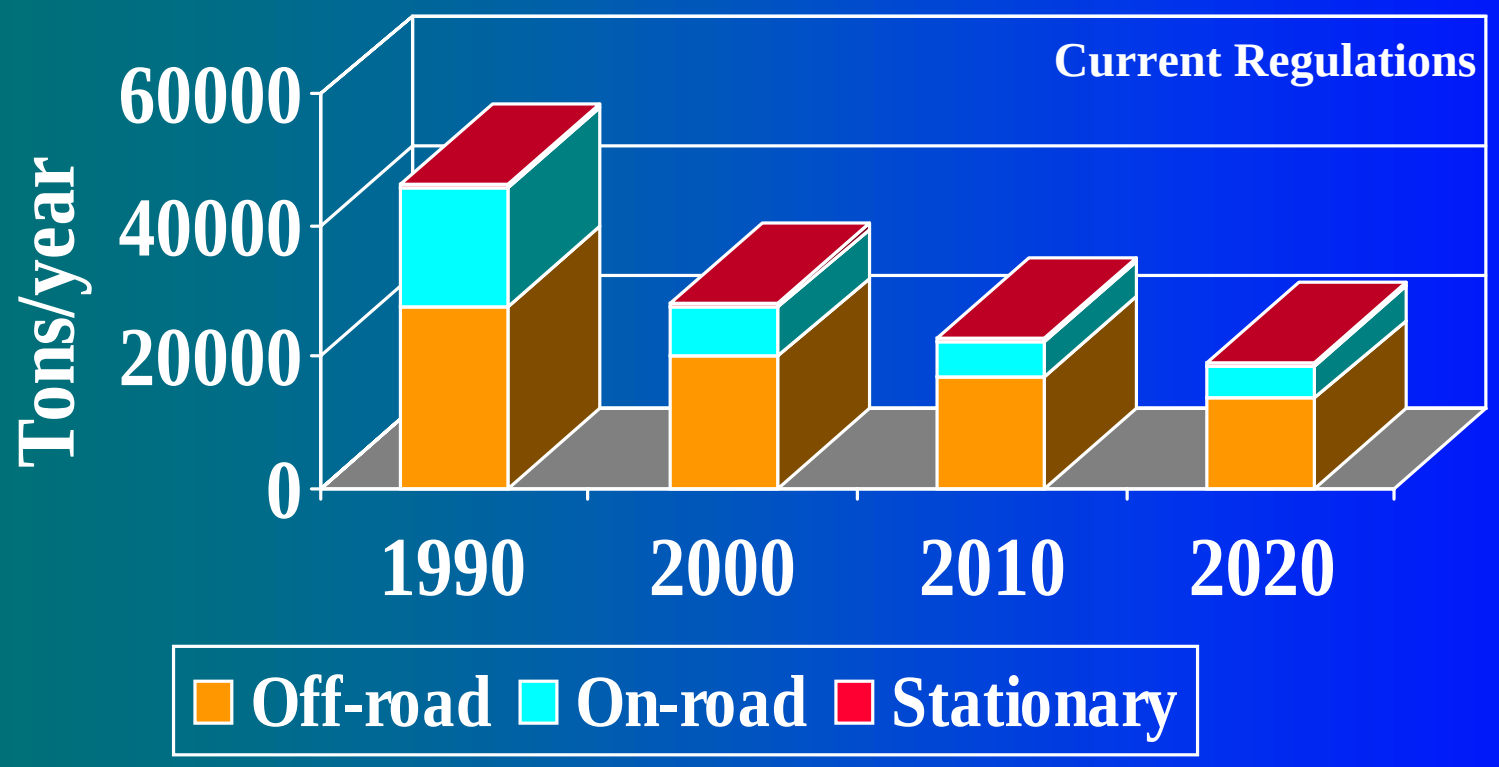



**Diesel PM (70%)**

**Other Air Toxics (30%)**

1,3 Butadiene (10%)
Benzene(8%)
Carbon Tetrachloride (4%)
Formaldehyde (3%)
Hexavalent Chromium (2%)
All Others (3%)

# Diesel PM Emissions

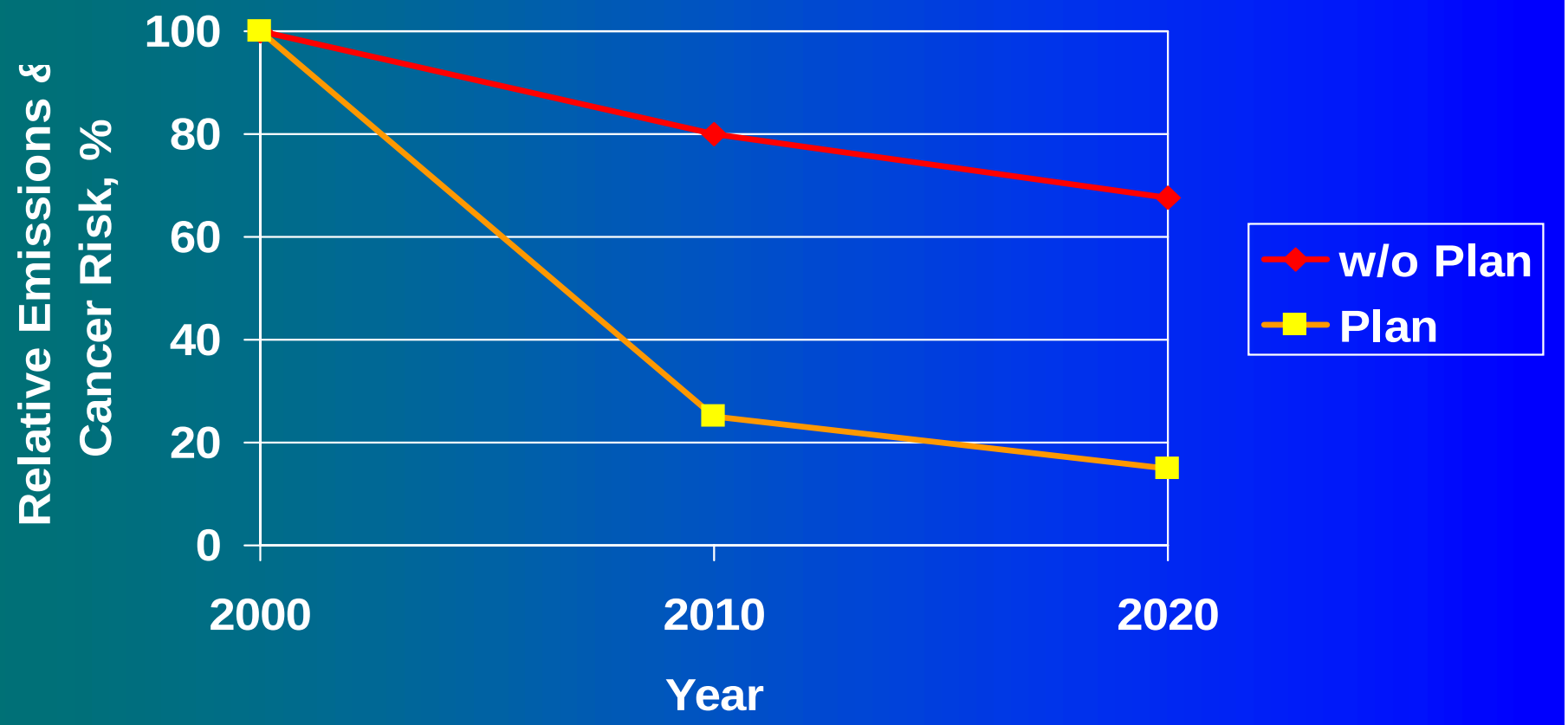



Statewide

# Diesel Risk Reduction Plan

- Adopted September, 2000
- Goal:
  - Reduce risk of exposure to diesel PM to near zero
  - Apply PM controls to all diesel engines
  - Integrate with NOx reduction efforts (SIP)

# PM Emissions and Risk Reduced: 75+% w/ Plan



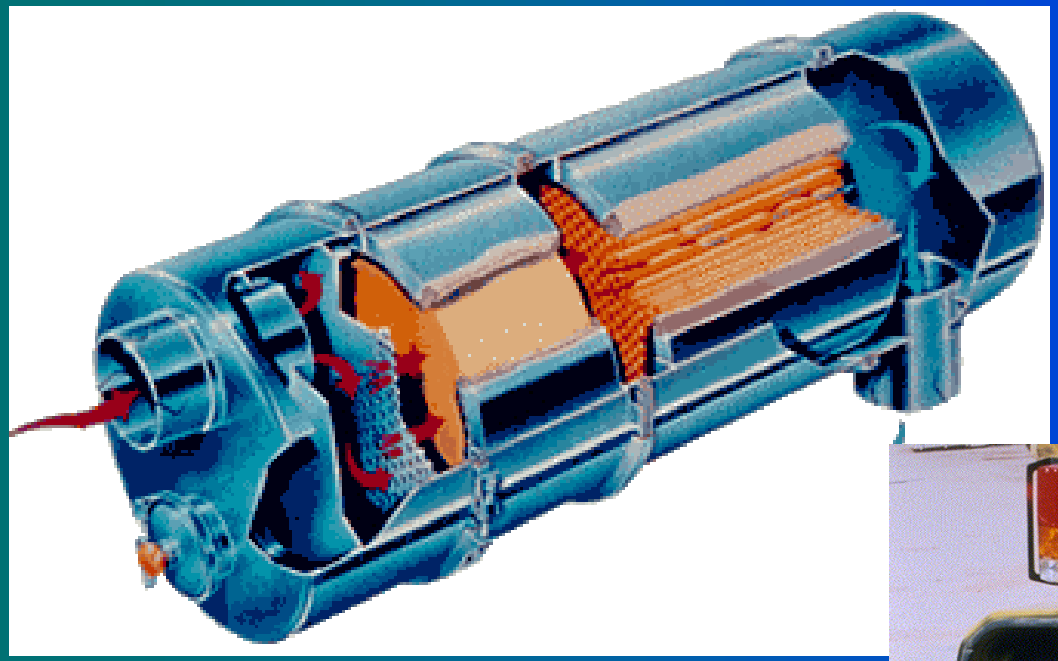
# Elements of the Diesel Plan

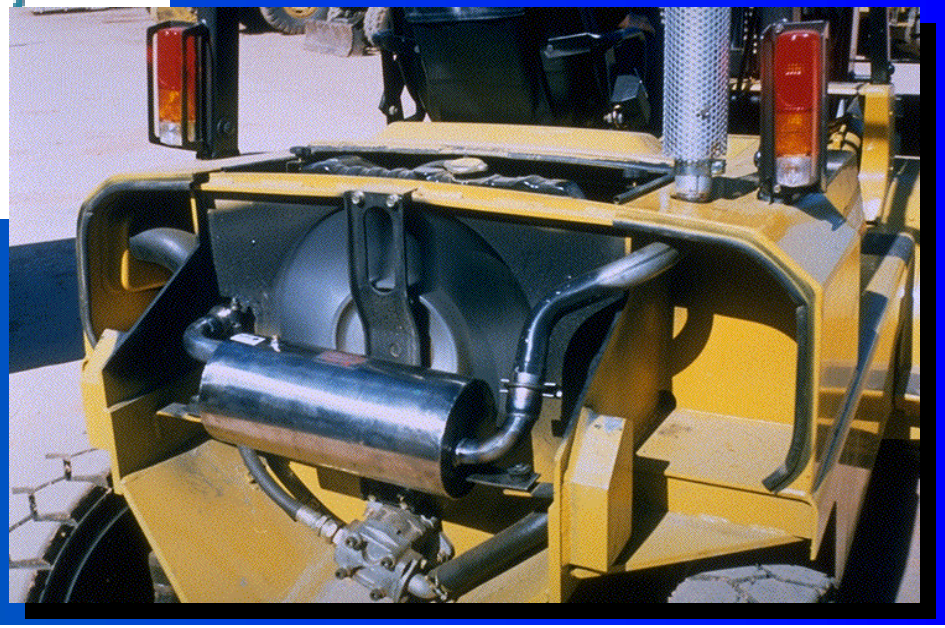
- Reduce emissions from new engines
  - ✓ Trucks
  - Off-road
- ✓ Provide ultra-low sulfur fuel (<15ppm)
  - ✓ Available in CA now
- Ensure in-use emission performance
- Require retrofit of existing engines w/ filters

# Diesel PM In-Use Retrofit Program

- Achieves 80% of Plan's reductions (2010)
- Retrofit every Diesel in California w/ filters
  - Feasibility
  - Exposure
- Approaches
  - Regulation
  - Incentive funds
  - Voluntary action
- Effectiveness
  - Minimum 85% PM reduction/vehicle
  - Get NOx reduction when feasible

# Diesel Particulate Filter Technology





# Implementation
## Filter Retrofits

- Regulation
  - Urban transit buses
    - 4500 filter retrofits starting 2003
    - New engines - filters required 2002
  - Trash trucks
    - Regulation under development
- Permit conditions
  - e.g. major construction projects

# **Implementation** (cont.)

- Incentive funding
  - School buses
    - $12.5 million
    - ~2000 filter retrofits, beginning 2001
  - Moyer program
    - $100 million FY01/02
    - Incremental cost of new, repower, retrofit paid
    - NOx focus
    - PM filters where feasible

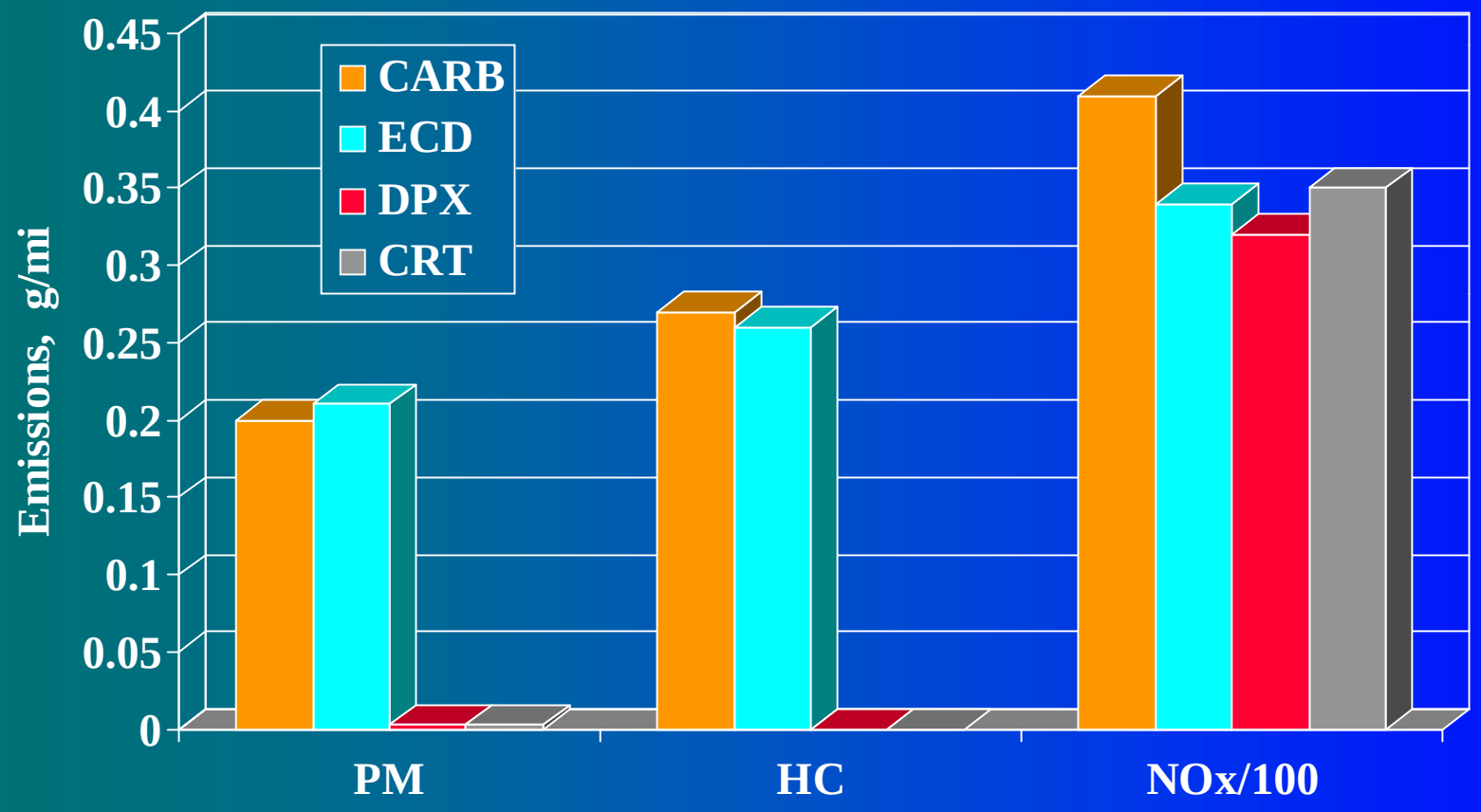
# **Implementation** (cont.)

- Voluntary
  - City of Los Angeles
    - 1300 vehicles
  - Caltrans (state DoT)
    - Clean new purchases (e.g. LPG)
    - Retrofit filters (~600)
  - Need recognition for others
    - Labeling
    - Publicity

# Demonstration Programs Support Implementation

- BP ECD - (# vehicles with filters)
  - Ralph's grocery trucks (10)
  - BP tanker trucks (10)
  - LA County MTA (4)
  - Hertz equipment rental (10)
  - LA City Sanitation (10)
  - People movers/local amusement park (10)
  - School busses San Diego (10)
- School Busses LA (39)
- Construction equipment (19)

# Ralph's Grocery Fleet Demo
## Low Sulfur Fuel & PM Filters




City Suburban Heavy Vehicle Route

CARB = ~ 150 ppm S

ECD = <15 ppm S

# Technical Support & Outreach

- International Advisory Committee
- Certification of retrofit devices
- Testing and evaluation
- Application assessment
- Partnership with local agencies
- Coordination with U.S. EPA's program

# EPA's Help Needed

- Adopt filter-based PM standards for new off-road engines
  - Tier 3 off-road engines - ~2006
  - Tier 4 standards similar to trucks (NOx too!)
- Ultra-low sulfur fuel for off-road
  - 5000 ppm sulfur standard now
  - <15 ppm needed
- Implement retrofit program
  - Encourage 85%+ PM control devices

# Benefits

**Plan will reduce:**

- PM emissions
- Cancer risk
- Respiratory impact

**Other benefits include:**

- Improved visibility
- Reduced soiling

# For More Information

- Diesel Risk Reduction Website
  - www.arb.ca.gov/toxics/diesel/diesel.htm
  - Sign up to receive notices
- Talk to a real person ((626-575-6973), or ____@arb.ca.gov
  - Annette Hebert - Manager, In-use Diesel Control Branch
  - G. Scott Rowland - Manager, Assessment Section
  - Nancy Steele, PhD - Manager, Implementation Section