

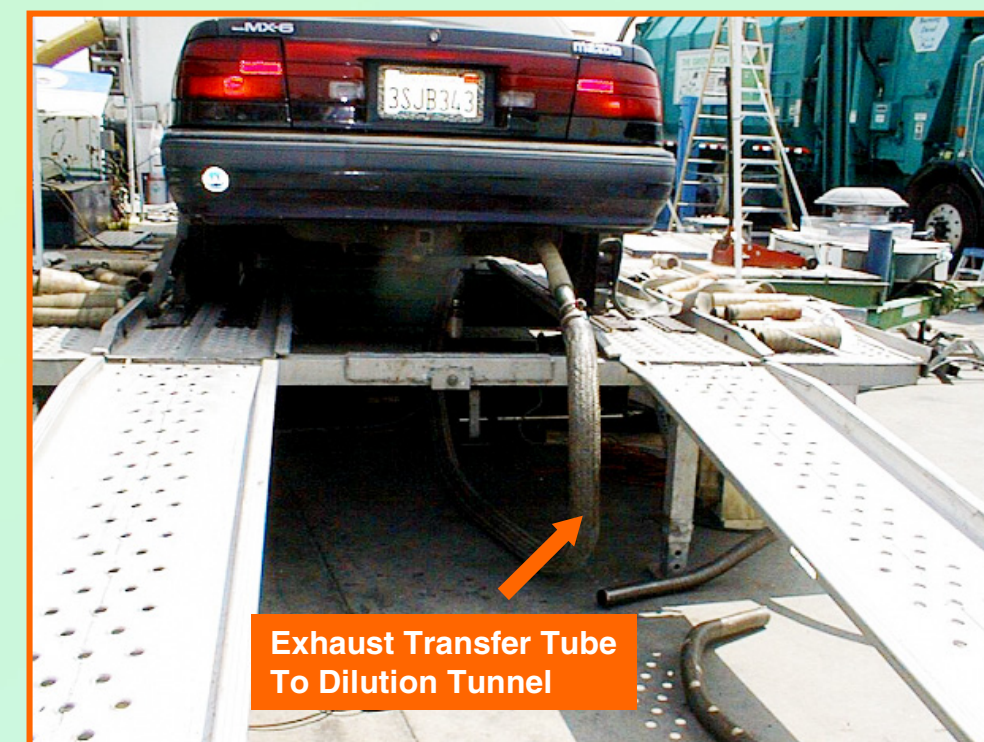
# ORD's TRANSPORTABLE DYNAMOMETER SYSTEM

*Moving Science  
into Action*

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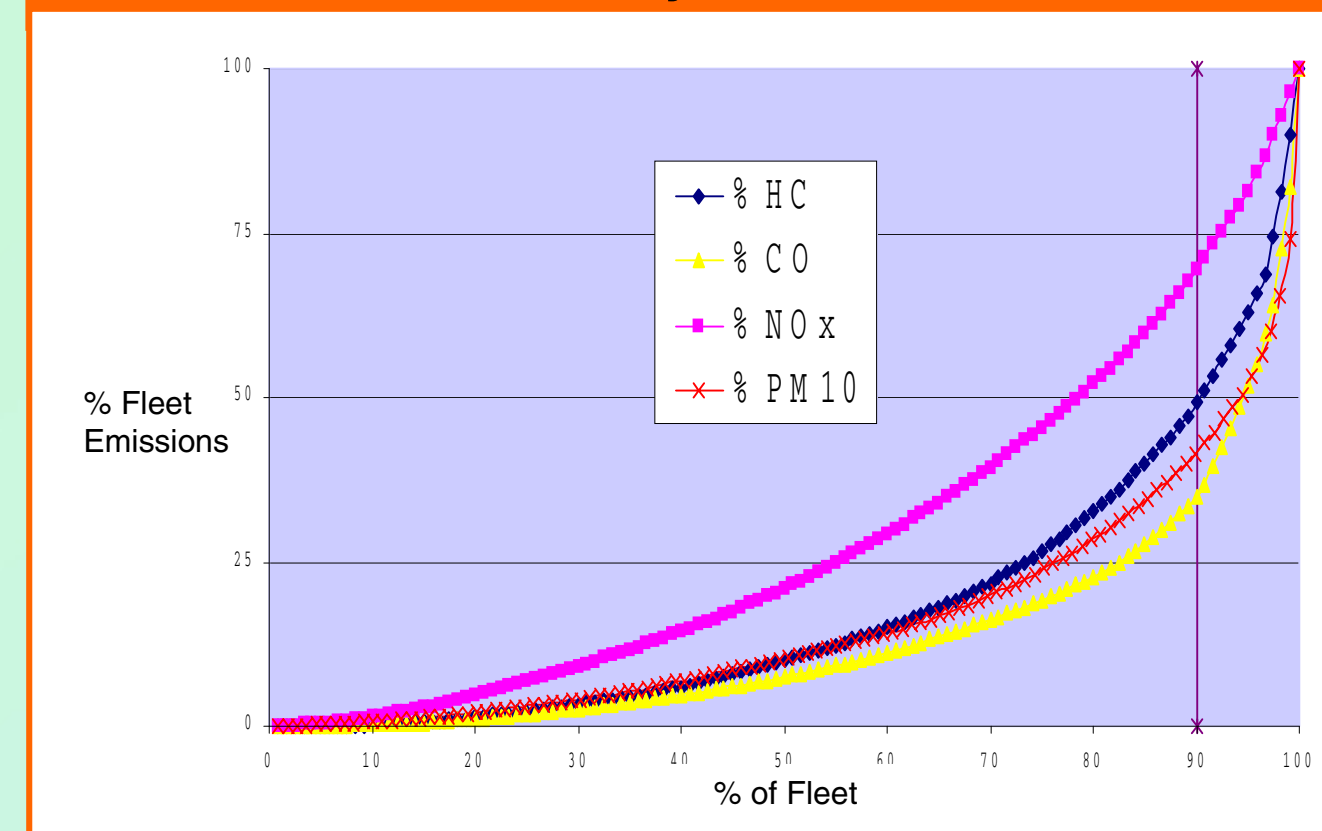
## The Transportable Dynamometer System Measures Emissions from Real-World Cars in Field Studies:

- Cars recruited "on the spot" using incentives
- Tests conducted with cars "as is"
- Comprehensive analyses performed on exhaust emissions yield emission rates for numerous pollutants
  - HC, CO, NO<sub>x</sub>, and CO<sub>2</sub>
  - PM<sub>2.5</sub> (elements, EC/OC, ions)
  - SVOCs
  - Speciated HCs, aldehydes & ketones, oxygenates
  - Mobile source air toxics

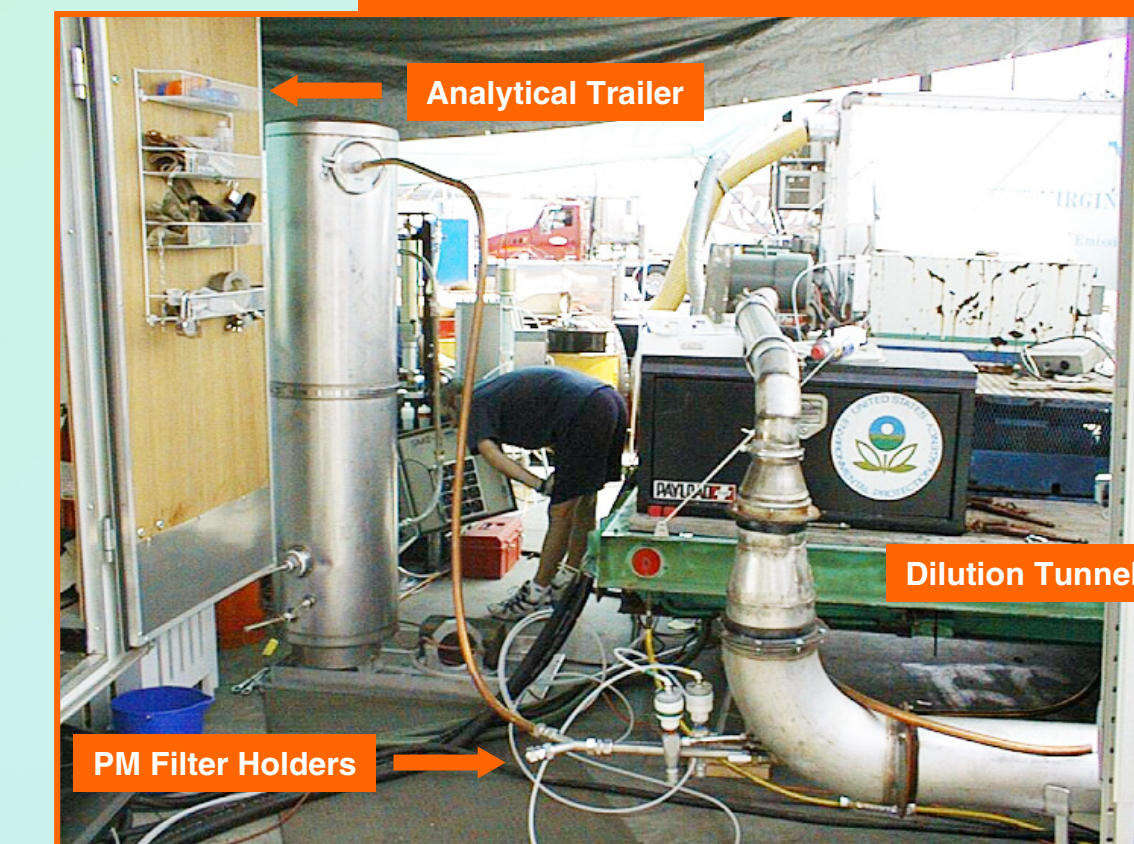


## Cumulative Exhaust Emissions

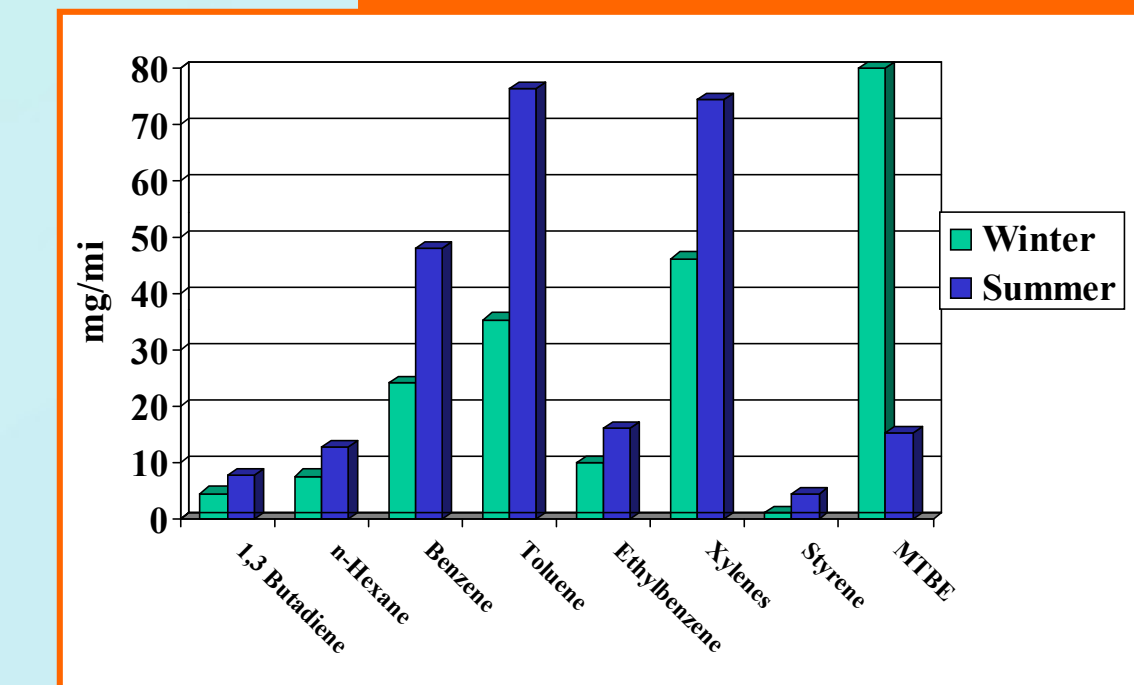
Ten Percent of the Cars Emit Most of the Pollution In Cary, NC



## Sampling Real-World Car Emissions In the Field



## Air Toxic Results from 250 Cars Tested in Cary, NC



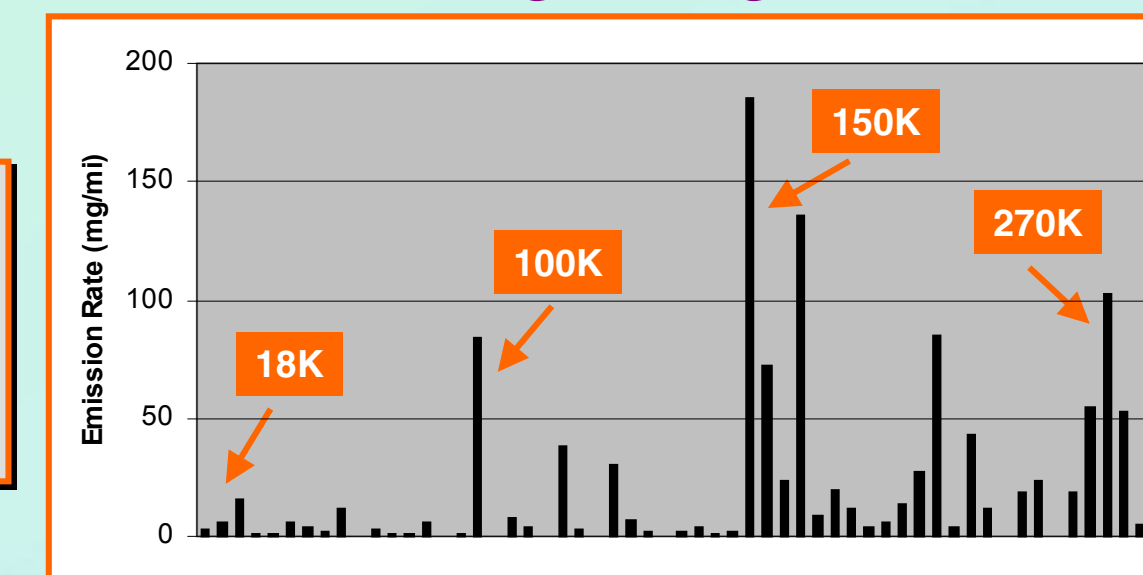
## Real-World Emission Studies Enable the Development of:

- Updated mobile source emission models
- Tuned receptor models
- Improved emission inventories for air toxic and other pollutants
- Relevant exposure models
- More focused regulatory decision-making

## Real-World Studies Provide Data Needed to Develop Accurate Emission Inventories and Conduct Meaningful Exposure Assessments

- Emissions from gross emitters are characterized and quantified
  - PM<sub>2.5</sub>, HC, CO, NO<sub>x</sub>, and CO<sub>2</sub>
  - Gross emitters (an elusive source) contribute significantly to mobile source pollution
- Pollutants from gross emitters often have unique characteristics
- Emission profiles specific to given regions are updated for use in receptor models
- Emission rate distributions for sampled fleets are used to update emission models

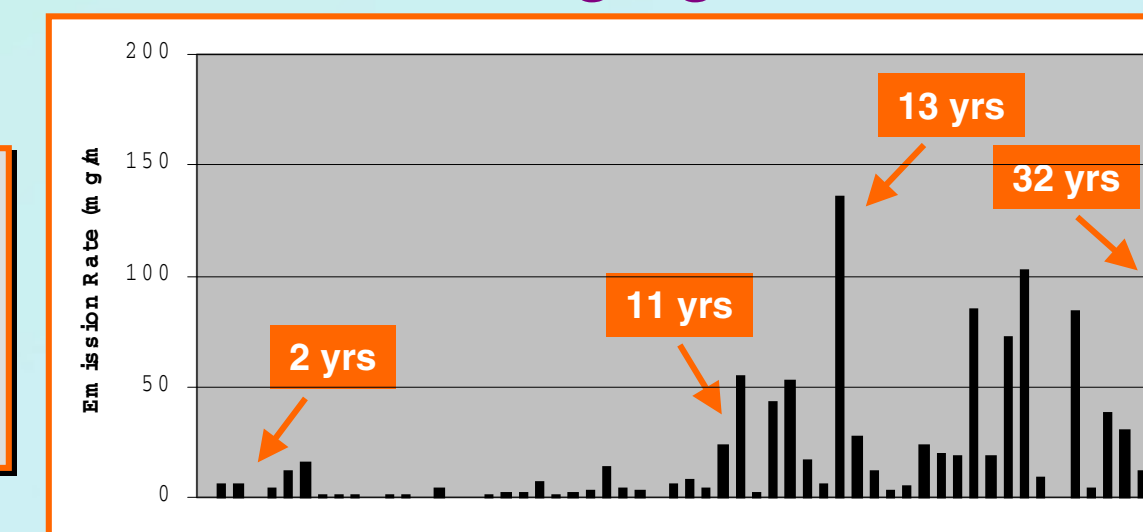
## Ascending Mileage



PM Emission Rates From 60 Cars Tested in Riverside, CA

**Mileage Effect**  
Note: The 16 vehicles < 98K mi had emission rates < 20 mg/mi.

## Ascending Age



PM Emission Rates From 60 Cars Tested in Riverside, CA

**Age Effect**  
Note: The 31 vehicles < 11 yr. had emission rates < 20 mg/mi.



GAK