Transportation Pricing as an Air Quality Management Tool:
Case Studies of Recent Practice

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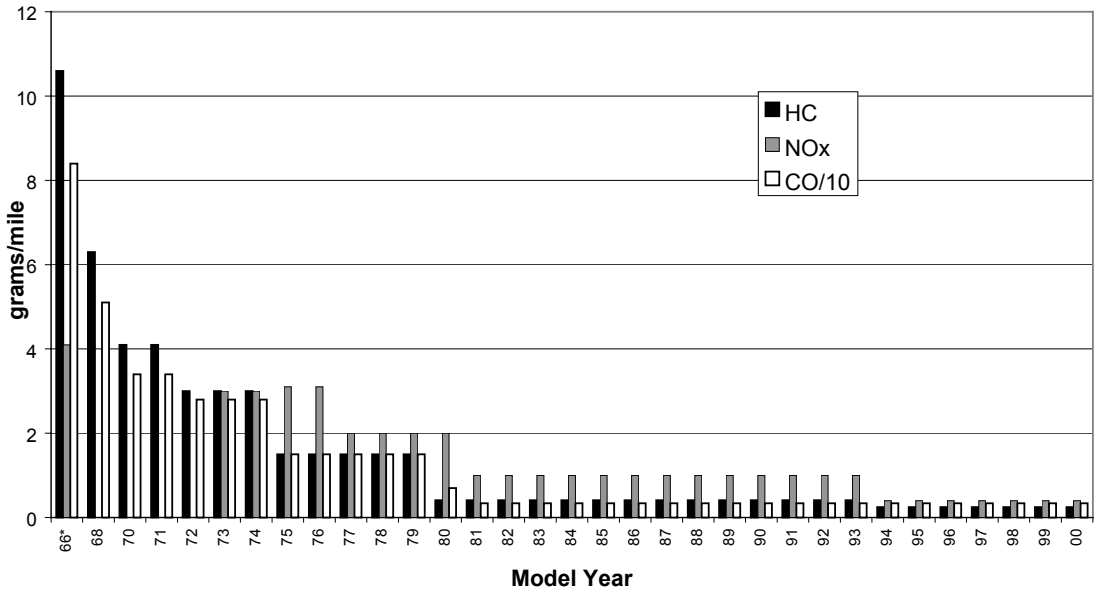
Today's focus

- Pricing strategies that *specifically* target air pollutant emissions
- Not covering pricing strategies that generally target travel behavior, such as congestion or parking pricing – unless there is a pollutant-specific component

Problems

- Some vehicles pollute more than others
- Vehicle emission levels depend upon:
  - Age. Older vehicles pollute more.

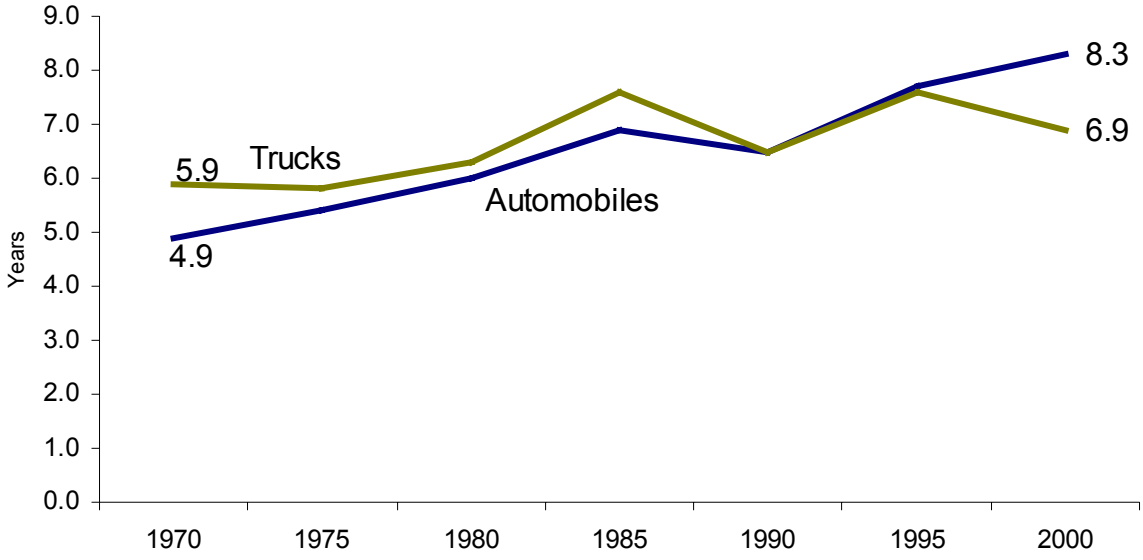
Figure 1: Federal Tailpipe Standards for New Light Duty Vehicles



  - Maintenance
  - Fuel type
  - Technology

- Reducing emissions through new technology standards depends upon fleet turnover. But, vehicles are getting older

Figure 2: Median age of vehicles in the U.S



- Driving behavior impacts emissions
  - Overall amount of driving
  - Speed
  - Idling
  - Acceleration

Pricing strategies targeting vehicles (fleet turnover)

- Financial incentives to scrap old vehicles
- Subsidies for cleaner vehicles
- Tax incentives for cleaner vehicles
- Differential registration fees

Strategies targeting vehicle use

- Tolls or VMT fees based on emissions
- Fuel taxes based on emissions
- Parking pricing based on emissions
- Charging for idling
- *These strategies may also impact vehicle purchase decisions*

What's really being done?

- United States
  - Voluntary Accelerated Vehicle Retirement
  - Tax incentives and financial subsidies for clean fuel vehicle purchase and conversions
  - Free parking for electric vehicles
- Other countries
  - VAVR
  - More direct pricing based on emissions

Why limited application in the US?

- Political difficulty with pricing
- Existing pricing (e.g. gas tax, registration fees) established for other objectives
  The original objective of a fee/tax may work against emission reduction goals
  For example, Oregon raised the registration fee for hybrid and electric vehicles to be twice as high as gasoline vehicles to help make up for the reduced gas taxes paid by those vehicle owners.
  New fee structure (2004) equalizes them again.
- Air quality agencies don't have authority to implement pricing

Accelerated Vehicle Retirement

- Also known as vehicle scrapping, vehicle buy back, Cash-for-Clunkers, Junker clunker
- Offer $ to get vehicles off the road early
- Vehicle eligibility criteria helps ensure emission reductions
- Has been used for light duty vehicles, heavy duty trucks, lawn mowers

  Over 16 programs for light duty vehicles have existed at one time in the U.S. At least three states (CA, IL, TX) have state regulations allowing and regulating such programs.

San Francisco Bay Area VAVR

- Largest publicly-funded program in U.S.
- Funded with $4 vehicle registration fee surcharge
- 15,700 vehicles scrapped since 1996
- $500 for 1981 and older cars & trucks
- Cost effectiveness: ~$6,400/ton ROG

Gateway Cities

- First VAVR program targeting heavy duty vehicles
- Financial incentives (~$25k) to replace pre-1984 heavy duty trucks with a 1994 or newer model
- 85% of mileage must be in air basin
- Cost effectiveness: ~$7,200/ton NO_x
- 86 trucks replaced to date
- Goal: 3,000 trucks (~ half)

Beyond the U.S.

- Switzerland: Heavy good vehicle fees based on emissions (3 categories)
- Sweden: Marine vessel fees based on fuel and NO_x level
- Great Britain: Ultra-low sulfur diesel taxed at a lower rate
- Singapore: discount on vehicle fees and road use taxes for natural gas, electric and hybrid vehicles