OVERVIEW OF I/M IN THE UNITED STATES

Merrylin Zaw-Mon
United States Environmental Protection Agency

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Overview

- Law requires I/M programs for areas not meeting National Ambient Air Quality Standards
- Older cars did not have rigorous requirements for deterioration once on the road
- 33 States have I/M programs
- EPA originally recommended centralized I/M 240 test as “gold standard”
  - States complained about “one size fits all” policy; we now have various types of I/M programs

Inspection/Maintenance

Many Considerations

- Effectiveness
  - Enforcement
  - Test types
  - Network design
  - Frequency
  - Quality of repairs
- Cost
  - Economies of scale
  - Sophistication
  - Capital
  - Operations
- Economic Impact
  - Ability to pay for repairs
  - Waivers
  - Scrappage
  - Alternatives
- Roles & Responsibilities
  - Audits
  - Oversight
  - Training
  - Repairs
  - Testing

Several Test Types in Use

- On Board Diagnostics (OBD)
  - Kiosk OBD
  - Remote OBD
  - OBD and remote sensing are most "consumer friendly" approaches
- Transient Loaded
  - IM240
  - VMass
- Steady State Loaded
  - ASM
- Remote Sensing
- Unloaded (idle)

On Board Diagnostics

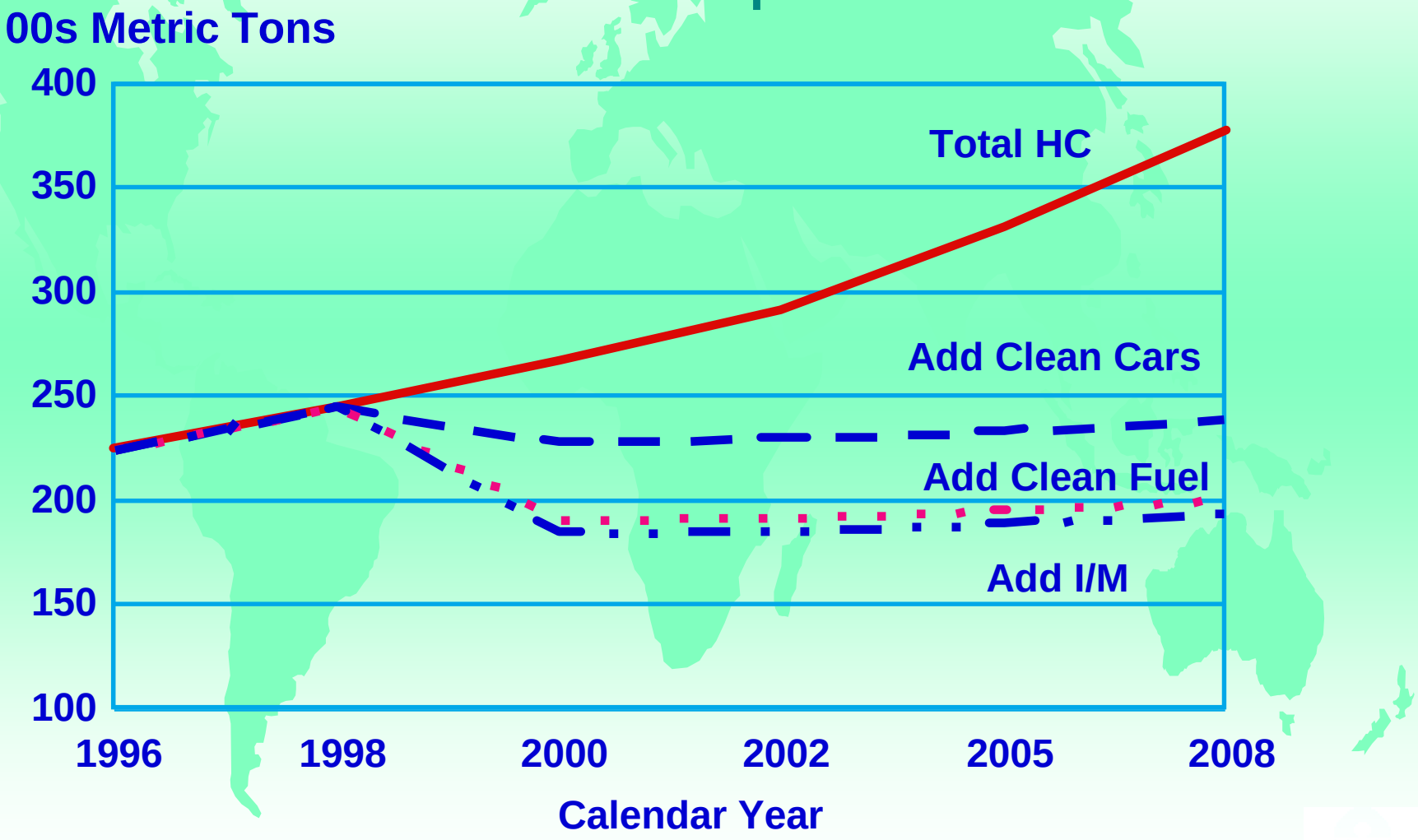
- Features
  - Computer on car illuminates dashboard light when system failure could result in excess emissions
  - Required on U.S. cars since 1996
- Approaches
  - Remote OBD – device installed on car continuously monitors and transmits status
    - Problems found immediately (instead of once a year or two)
    - Cheapest way to test cars
  - Traditional – motorist reports to a test station periodically
    - Most expensive approach

V-Mass

- Test Procedure
  - Uses IM240 test cycle
  - Can use any other transient cycle
- Measurement
  - Uses ASM-type equipment
  - Plus mass flow measurement device
  - Yields same measures as IM240
- Pros/Cons
  - Costs about the same as ASM
  - Good correlation with IM240

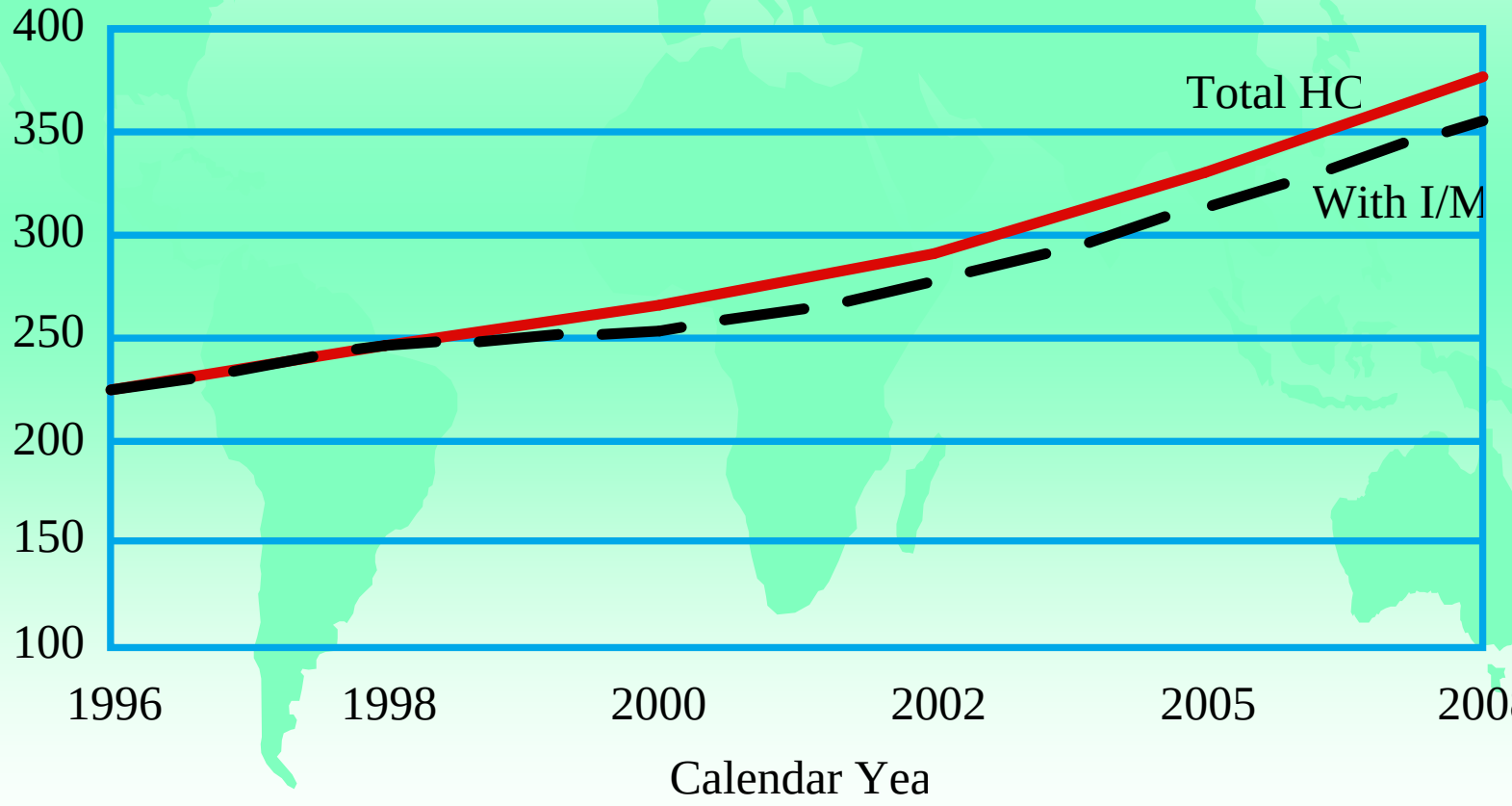
Emission Impacts

Cairo Example



Emission Impacts

I/M Only



General Principles

- Test type -- Periodic OBD
  - OBD fleet growing while non-OBD shrinking
  - OBD gets NOx reductions at fraction the cost of dyno-based tailpipe tests
  - OBD results target repairs -- less trial-and-error
  - Self-serve OBD could increase program acceptance
  - Equipment calibration, maintenance, training costs much less than tailpipe
- Network types -- Centralized
  - Most cost-effective due to low oversight
  - Most protective of drivers due to low conflict of interest
  - But often resisted because of multiple trips if car fails

General Principles

- What drives US program design considerations?
  - Predominate technology of local fleet (i.e., ratio of OBD to non-OBD fleet)
  - Severity of air pollution problem
  - Types of reductions needed (non-OBD NOx reductions cost the most)
  - Willingness of public to take personal action
  - Position of automotive service industry
  - Local government's resources for operation, enforcement, oversight
  - Overall cost effectiveness