Introduction

- Overview of Testing Technologies
- Possible Strategies
- Implementation Issues
- Estimated Costs
- Estimated Benefits
Overview of Technologies

- I/M 240
- Two-Speed Idle
- On Board Diagnostic (OBD)
- Remote Sensing
- Gas cap pressure check
4 minute tailpipe test measuring Hydrocarbon (HC), Carbon Monoxide (CO) and Nitrogen Oxides (NO\textsubscript{x}) on a grams per mile basis

Conducted on a dynamometer to simulate driving conditions

Vehicle emissions compared against established cutpoints for vehicle type and model year

Because of capital costs, tests must be conducted at centralized facilities
Two-Speed Idle Test

- Measures HC and CO tailpipe emissions on a concentration rather than mass basis
- Test run at engine idle and 2500 rpm, not conducted under load
  - no dynamometer required
- Vehicle emissions compared against established cutpoints
- Not as effective or accurate as I/M 240
- Centralized or Decentralized facilities
OBD

- Utilizes information from a vehicle’s on board diagnostic system (OBD) to determine pass/fail.
- OBD monitors various vehicle systems that may affect emissions, and based on a predictive algorithm determines if there is an emission problem.
- Test utilizes scan tool to assess OBD system and determine pass/fail:
  - MIL command on
  - Monitors not set
- Higher failure rate compared to other tests:
  - Estimated at 7.3% vs. 3.3% for current Denver Metro Area (DMA) test for model years 1996 and newer.
- Concerns with correlation between failure and repairable emissions.
- Centralized or Decentralized Facilities.
Remote Sensing Technology

- Developed at University of Denver
- Uses infra-red based emissions measurement technology
  - Concentration of CO, HC and NO\(_x\) determined based on absorption of certain wavelengths
  - Snapshot in time
- Video camera collects license plate information corresponding to each emission measurement
Remote Sensing Technology

- 0-3% Road Grade
- Source / Detector
- Lateral Transfer Mirror
- R.S. Van
- Camera
- Speed
- Acceleration Rate
- Deceleration Rate
- Laser Speed Bars
Gas Cap Check

- Pressurized check of gas cap to determine if there is excessive leakage of gas vapors
Expand current DMA program to NFR
- Biennial I/M 240 test for model years 1982 and newer
  - 4 year new vehicle exemption
- Annual Two-Speed Idle test for 1981 and older, heavy duty gas vehicles and fleet vehicles
- Gas cap check
- Remote sensing clean screen to exempt vehicles subject to I/M 240
- Remote sensing high emitter pilot program
Possible Strategies

- Reinstinate NFR Basic Program
  - Biennial Two-Speed Idle test for model year 1982 and newer vehicles
  - Annual Two-Speed Idle test for model year 1981 and older vehicle
  - Clean Screen 1982 and newer vehicles
  - 4 year new vehicle exemption
Possible Strategies

OBD Program
- Biennial OBD test for 1996 and newer vehicles
- Other strategy for 1995 and older vehicles?
- 4 year new vehicle exemption
Possible Strategies

- Mandatory Remote Sensing High Emitter Program
  - Technical and administrative challenges currently being considered through implementation of a pilot-scale project in DMA

- Voluntary Remote Sensing Based High Emitter Program
  - “Repair Your Air” Model
  - “Valley Can” Model
Implementation Issues

- Legislative Authority
- Regulatory Development
- Contracting
- Infrastructure Build Out
- Implementation by 2010 or before depending on program
Expand DMA Program

- Existing regulation expanded to NFR
  - Minimum 120 days for AQCC process
  - Longer if stakeholder process
- Contracting
  - Modify existing contract or new contracting process
- Extensive infrastructure build out
Implementation Issues

 Pest Reinstitute NFR Basic Program
   - Re-promulgate prior regulation
   - No contract for decentralized facilities
     • Centralized data system required
   - Less infrastructure than IM 240 but issue regarding equipment availability
Implementation Issues

OBD

- Significant regulatory development work
- New contract if centralized
  - At minimum new contract for centralized data
- Development of equipment specifications
- Less infrastructure than IM/240
Implementation Issues

- Mandatory Remote Sensing High Emitter
  - Extend applicability of existing regulation
  - Modify existing contract
  - Some infrastructure for follow-up compliance testing
Implementation Issues

Voluntary Remote Sensing High Emitter
- No regulation
- Question regarding funding
- Use existing infrastructure
- Only viable option for 2008
Program Costs

- Expand current DMA Program: $4.4 million per year
- Reinstitute NFR Basic Program: $4.4 million per year
- OBD Program: 3.2 million per year
- OBD/Two Speed Idle Program: $4.2 million per year
- Mandatory Remote Sensing High Emitter Program: unknown/depends on scope
- Voluntary Remote Sensing High Emitter Program: unknown/depends on scope
## Emission Reduction Benefits

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Cost and Benefit
Assumptions/Caveats

- Emission benefits based on EPA Mobile6.2 emission modeling for NFR in 2010
- Costs based on:
  - DMA level registration fees
  - $25 test fee for I/M 240 and Two Speed Idle tests
  - $15 test fee for OBD testing (national average)
  - $2.81 gallon gasoline and estimates on fuel savings
  - Average cost of repair
The costs and benefits presented for the various options likely provide a directional approximation of actual costs and benefits, but should not be considered exact.

Given the uncertainties and assumptions built into the cost and benefit calculations, the numbers presented should not be considered determinative in assessing the merits of the various strategies.
Other Possible Considerations

- Programmatic consistency
- Duration of program
  - Reasonable expectations of testing operators
- Equity throughout non-attainment area
- New ozone standard
Questions?