

Inspection and Maintenance + RSD

Regional Air Quality Council
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High-Emitter History

- There has been on-going analysis and broad based stakeholder support for a high-emitter program in the Denver metro area starting in 1994
- High-emitters were first studied by the RAQC in the 1994 Total Clean Cars Program, a portion of vehicles were recruited using RSD
- High-emitting smoking vehicles were identified as a problem that needed to be addressed in the 1999 Blueprint for Clean Air
- The Options to Reform the Current Inspection/Maintenance Program report to the Governor in 2000 recommended implementation of an RSD based HE program
- The Strategies to Identify, Repair and Retire Smoking and High-Emitting Vehicles in the Denver Metropolitan Area in December 2002 recommended implementation of an RSD based HE Program

Current I&M Program

- Focus of program is carbon monoxide
- 2005 Enhanced I&M statistics
 - 5% of all IM240 tests are failures (~800,000 tests)
 - 1.2% failed for HC (approximately 10,000 vehicles)
 - This includes all vehicles through lanes (MY 1975 – 2006)
- Clean screen is designed to reduce up to 50% of clean vehicles from emissions testing lanes
- Total modeled program reductions are approximately 7 TPD VOC, 120 TPD CO, 2 -3 TPD NO_x

Current High-Emitter Activities

- AQCC I&M Evaluation
- HB1302
- ESP High-Emitter Study
- RYAC II

AQCC

- AQCC has been charged with investigating options to replace or reform the current Inspection & Maintenance Program
- AQCC Process
 - Analyzing many options related to I&M and High-Emitter:
 - RSD High-Emitter, RSD Clean Screen, model year exemptions, tightening lane cutpoints, OBD, evaporative system testing and a decentralized program
- Proposal by August 2006 with a hearing scheduled for November 2006

HB1302

- Expanded Clean Screen plus a high-emitter component
- Continues lane testing and Clean Screen
- Implement a 3 remote sensing identification high-emitter program with confirmatory testing
- Those vehicles not identified through RSD as clean or a high-emitter require emissions testing
- Scale back stations when annual number of vehicles clean screened is higher than the number of lane tests
- Increases model year exemptions from 4 to 8 model years
 - These vehicles require 1 clean remote sensing reading to qualify for clean screen
 - All other model years require 2 remote sensing readings to qualify for clean screen
- ESP pays consumer \$25 for false failure identification
- Annual registration fee not to exceed \$9 per vehicle
- Passed Transportation and Energy Committee and Appropriations

ESP RSD Analysis

- Critical assistance to CDPHE/RAQC for analysis of RSD options
- There are still unknowns regarding RSD that must be analyzed
 - Maximum fleet coverage and fleet identification demographics
 - Reducing the false failure rate
- ESP's Analytical Goals
 1. Determine how to provide maximum coverage
 2. Determine what vehicles will be identified by RSD
 3. SIP Credit
- Possible interim report by August 2006 on items 1 and 2

RYACII

- Started June 2005
- 750 notifications delivered
- 132 participants (~18% participation rate)
 - 62 failures
 - 46 passes
 - Remainder is pending and rejected vehicles
- 43% false failure rate
 - Reduced from 60% under RYACI
 - 28 vehicles had emissions related repairs performed
 - 7 of these passed the confirmatory testing
- \$300 direct repair cost
- 6.5 gr/mile HC reduction and 33 gr/mile CO reduction (n = 40)

RYACII

- The false failure rate is being reduced
- Pre-inspection repairs have been confirmed which increases the false failure rate
- Repair costs are similar to RYACI
- Observing increased emissions reductions

High-Emitter Analysis Goals

- Motorist costs (both direct and indirect) should be analyzed and reduced
- Increase convenience for owners of clean vehicles
- High-emitting vehicles should be identified and repaired
- Any reforms should approximate the current program's emissions benefits

Issues

- Technology
- Coverage
- False failure rate
- Confirmatory testing
- Enforcement
- Emissions reductions needed
- Program structure options
- Program financing

Technology

- How durable and reliable are the RSD units?
- The RSD4000 is a laser based technology that identifies a split second in a vehicle's emissions
- Multiple readings on unique vehicles are critical
- Variability in vehicle and driver operation makes identification/emissions characterization difficult
- Unit siting is also critical
- The technology can be complimented with multiple tools to increase its reliability

Coverage

- How much of the fleet will RSD identify?
- How many RSD units are required to meet program needs?
- Good RSD sites, single upslope on-ramps, are becoming more limited as two lane on-ramps are built
 - Multiple lane testing will be part of ESP's HE Study
- What vehicles will be identified with RSD?
 - Do clean vehicles and high-emitters follow similar commute patterns?
 - Will there be an avoidance problem?
- What is done with vehicles that are not identified with RSD?

Coverage Assessment

- High-emitters require immediate test and repair
- Marginal-emitters test due at registration
- Clean Screen should be increased to exempt most vehicles possible
- Unsure what percentage of vehicles will not be identified with remote sensing
 - What is done with these vehicles?
 - some could be model year exempt

High-emitters (1%-5%)
Marginal-emitters (6%-10%)
Clean screen (10% - 80%)
?
Not Identified by RSD
?

False Failure Rate

- What level is acceptable?
 - The literature indicates 10% - 20%
- Pre-inspection repairs contribute to false failures
- Cold start identifications contribute to false failures
- However, siting, increased remote sensing readings, the addition of Vehicle Specific Power (VSP) and Indexing are additional tools that reduce false failures
 - Inclusion of these tools reduces the number of vehicles eligible for a program

Confirmatory Testing

- What type of confirmatory testing is required?
 - IM240, idle tests, RSD or no confirmatory testing
 - Should the program be centralized or decentralized?
- No confirmatory testing and RSD will limit the potential for SIP credit
 - A decentralized program could also limit SIP credit
- If confirmatory testing is required HC cutpoints in the lanes must be reduced or the false failure rate will be high

Emissions Reductions

- What emissions reductions are needed to meet SIP requirements?
- Must determine emissions reductions required to determine the percentage of the fleet that must be identified in a remote sensing based high-emitter program

Enforcement Options

- What type of enforcement options should be included?
 - Are out of area commuters included in the program?
- Program could utilize:
 - Immediate notifications
 - Fines
 - Registration denial

Program Options

- Option 1 – RSD Only High-Emitter
- Option 2 – Hybrid RSD Program

Option 1 - RSD Only High-Emitter Program

- RSD based high-emitter only identification and repair program
- No clean screen program
- Identify high-emitters and require off-cycle repairs if the vehicle fails confirmatory testing
- Some type of confirmatory testing is necessary
- If there is no confirmatory testing, how do repair shops repair high-emitters?
 - SIP credit for HE only with no confirmatory testing will be difficult
- Coverage could be problematic
 - What types of high-emitters are identified with RSD?
 - Vehicles not identified with RSD are not subject to emissions testing
 - Avoidance would become a problem

Option 2 – Hybrid RSD Program

- Add an RSD based high-emitter program to the current Clean Screen and lane based program
- Identify high-emitters and require confirmatory testing and off-cycle repairs if the vehicle fails confirmatory testing
- Required confirmatory testing should be IM240 test through current program
- Vehicles not identified as clean or high-emitters would still be on their normal emissions test cycle
 - Model year exemptions could further reduce the number of vehicles in this category

Options Analysis

- Both options:
 - Meet the goals of reducing indirect costs to motorists through time savings
 - Reduction of direct costs still needs analysis
 - Convenience to owners of clean vehicles is increased
 - High-emitters are identified and repaired
- Option 1
 - Difficult to design program to equate to emissions reductions in current program due to questions on coverage and vehicles not identified through remote sensing
- Option 2
 - Could be designed to provide emissions reductions equivalent to current program
 - Has a higher probability of receiving SIP credit

Program Finances

- How is program paid for?
- Current pay per test?
- Charge per registered vehicle?
- Some environmental justice issues, such as repair assistance and waivers, need to be resolved