

I/M Design Concepts

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I/M Summit Kickoff Meeting

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I/M Design Concepts

- **Contract Designs**
- **Vehicle Testing Designs**
- **Motorist Equity Designs**
- **Motorist Convenience Designs**
- **Vehicle Registration Designs**
- **Next Steps**

Contract Designs

- Who does the testing?
- Who pays for the testing?
- When is testing available?
- How long is the next I/M contract?
- Local economic benefits

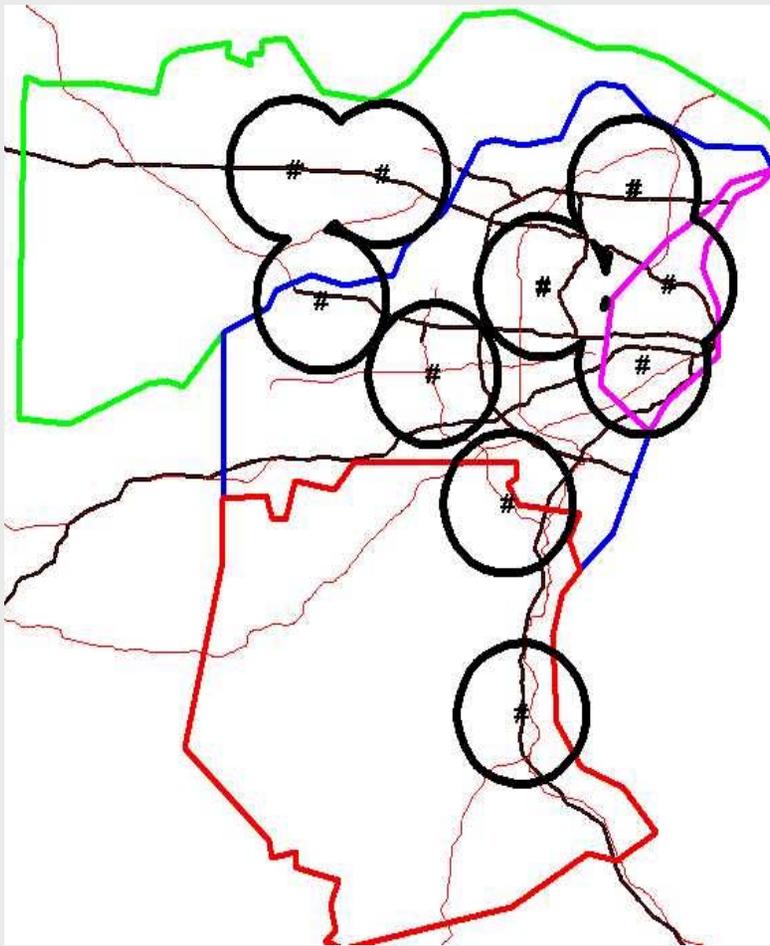
Who does the testing?

■ Centralized (Test-Only)

- Pro: Public already knows the concept
- Pro: Quick, quality assured testing
- Pro: Motorist observes test, keeps the vehicle
- Pro: Lower state oversight costs
- Pro: If vehicle fails, it can't be repaired by tester
- Con: If vehicle fails, it can't be repaired by tester
- Con: Fewer locations to choose from
- Con: Separate from safety test

Contract Designs

Current Centralized Stations



- 80% of population was within 5 miles of a test station in 2000
- Test stations are open 66 hours per week
- Wait times have averaged under 6 minutes in 2004-2005

Contract Designs

Who does the testing?

■ Decentralized (Test-and-repair)

- Pro: Public likes one stop idea
- Pro: More locations to choose from
- Pro: Combined with safety test
- Pro: If vehicle fails, it can be repaired by tester
- Con: If vehicle fails, it can be repaired by tester
- Con: Repair industry must choose to participate and incur costs to purchase and maintain testing equipment
- Con: May require state licensing of I/M testers

Contract Designs

Who does the testing?

■ Test-and-repair (Decentralized)

- Con: Motorists don't observe test or keep the vehicle
- Con: Higher state oversight costs than centralized

Contract Designs

Who does the testing?

■ Hybrid (Both)

- Pro: Gives motorists a choice for type of testing they prefer
- Con: Dilutes the test volume, and therefore the revenue, for testing providers
- Con: Contract difficulties resulting from unknown test volume of centralized test market
- Con: State oversight costs are greater than centralized

Contract Designs

Who pays for the testing?

- **Motorist pays tester**
 - Current fee of \$24 (\$1/month/registration)
 - What should the fee be?
 - Tester remits state's portion of fee
- **State pays tester**
 - Source of funds?
 - State remits tester's portion of fee

Contract Designs

When is testing available?

■ Hours of test station operation

- 40 hours: Normal business hours, 1 shift per day, not as convenient to the public
- 66 hours: Expanded business hours, 2 shifts per day, more convenient to the public, significantly increases public costs
- Range of possibilities

■ Days of the week

- Weekdays/Weekends/Holidays

Contract Designs

How long is the next I/M contract?

■ End of current I/M program:

- 1-hour ozone maintenance plan (10 year duration) in effect May 2003
- 8-hour ozone SIP, due June 2007, must address federal I/M requirement
- Current I/M contract ends September 2007

■ Transition to next I/M program:

- Federal 8-hour ozone requirement: SIP controls in effect by April 2009
- 1-hour maintenance plan includes I/M control strategy until current I/M program is replaced or May 2013
- What happens from September 2007 to April 2009?

Contract Designs

How long is the next I/M contract?

- Transition to 8-hour maintenance area:
 - 8-hour ozone maintenance plan required for redesignation
 - What happens after attainment/redesignation?
- Contracting Options
 - Specified duration?
 - Renewed annually/biennially?
 - Provisions for transition to maintenance plan control strategy?

Contract Designs

Local Economic Benefits

- I/M creates local employment opportunities
- State MBE/WBE contracting requirements
- Current I/M program partners/mentors
 - Design/Construction firms
 - Public Information firm
 - Remote sensing data processing firm
 - Recognized/Qualified Repair Technicians

Contract Designs

Vehicle Testing Designs

- Vehicle Model Years
- Emissions Test Methods
- Cost Limit Waivers
- Emissions Test Frequency
- Fraud Prevention
- I/M Program Evaluation
- I/M Program Incentives

Vehicle Model Years

■ Which Model Years to Test

- Currently testing 2-25 year old vehicles (rolling window concept)
- Majority of excess emissions are from older vehicles, but majority of miles traveled are in newer vehicles
- Vehicle emissions control warranties expire after 2 years/24,000 miles (Federal) or 3 years/36,000 miles (Manufacturer)

Vehicle Testing Designs

Vehicle Model Years

■ Which Model Years to Exempt

- Exempting more model years adjusts the equity of the program in favor of one group and may decrease program effectiveness
- Exempting newer model year vehicles may shift financial burden of repairs on second, third vehicle owner, often after warranties have expired

Vehicle Testing Designs

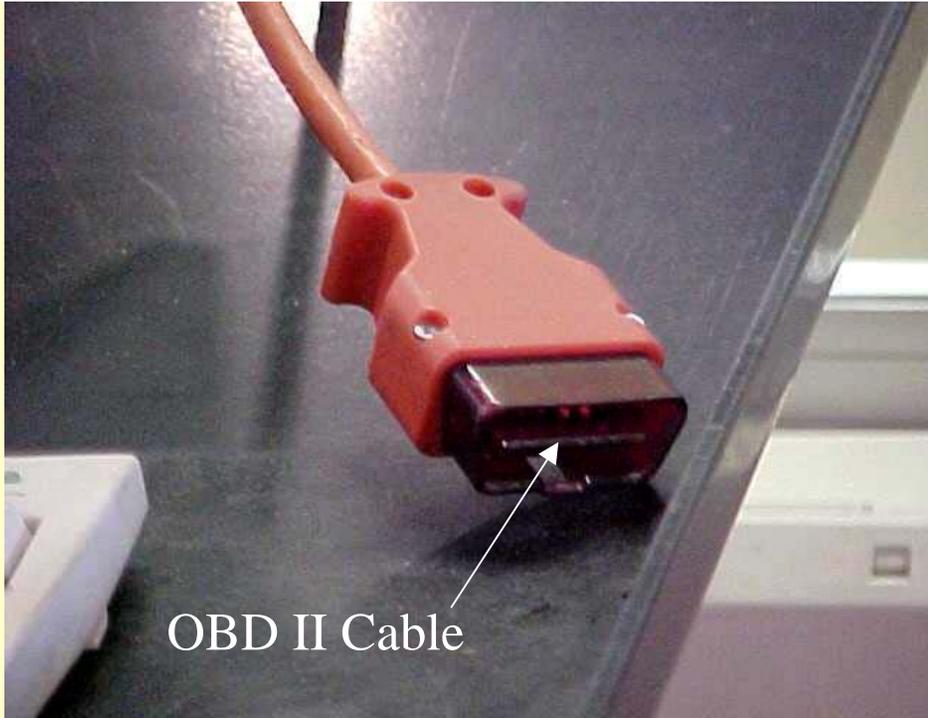
Emissions Test Methods

■ On-Board Diagnostics II Test

- Federally required for 1996 and newer vehicles (currently 66% of St. Louis area fleet)
- Tailpipe and evaporative VOC benefits
- Measures vehicle components, not emissions
- Emphasis on pollution prevention
- Centralized or decentralized test method



Vehicle Testing Designs



OBD II Cable

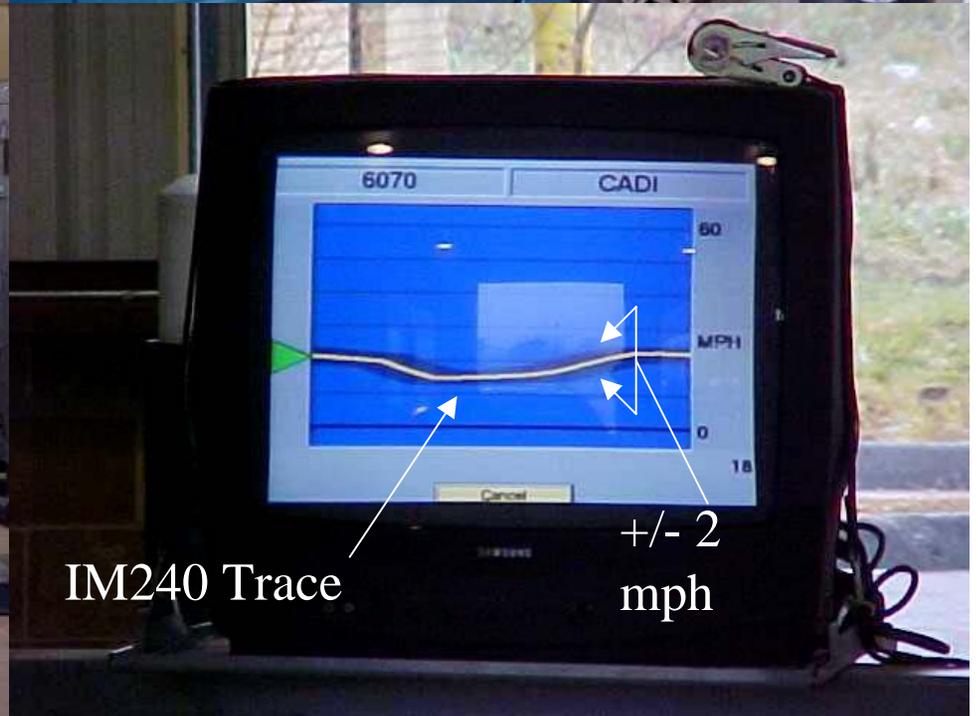
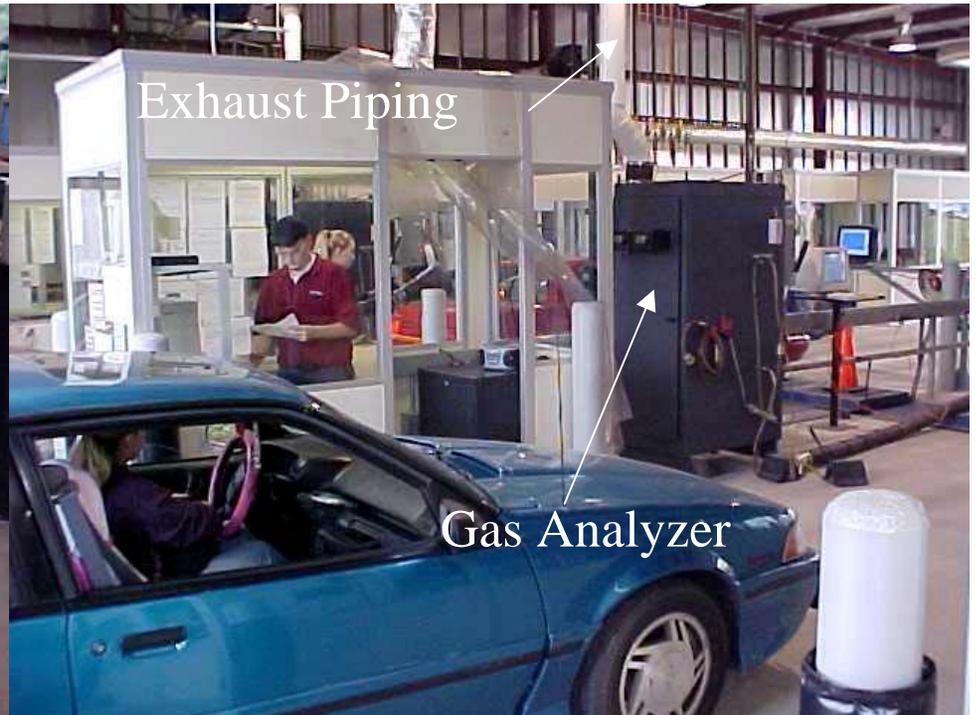
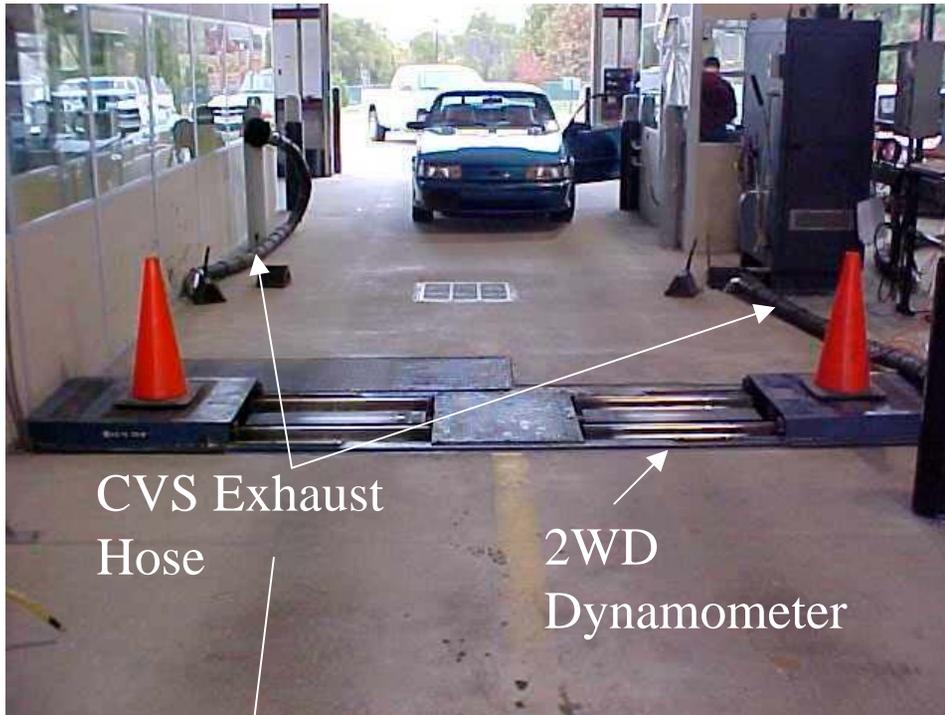


Data Link Connector

Emissions Test Methods

■ IM240 Tailpipe Test

- State-of-the-art tailpipe test for pre-1996 vehicles
- No evaporative VOC benefits
- Measures vehicle emissions, not components
- Emphasis on pollution reduction
- Centralized test method



Emissions Test Methods

- Acceleration Simulation Mode
 - Decentralized dynamometer test
 - Less accurate than IM240
- Two- or Single-Speed Idle Tailpipe Test
 - Centralized or decentralized test
 - Out-of-date test method

Emissions Test Methods

- Gas Cap Pressure Check
 - Centralized or decentralized test
 - Reduces evaporative VOC emissions
- Visual Inspection of Components
 - Centralized or decentralized test
 - Identifies vehicle emissions tampering

Emissions Test Methods

■ Remote Sensing Tests

- Best suited for centralized tailpipe testing programs
- Identify clean-running vehicles for exemption
 - More equitable than model year exemptions
 - Small air quality benefit decrease
 - Differing results from OBD II and Remote Sensing tests
- Identify dirty-running vehicles for testing
 - Involves a confirmatory test to prevent unnecessary repairs
 - What if vehicle passes confirmatory test?

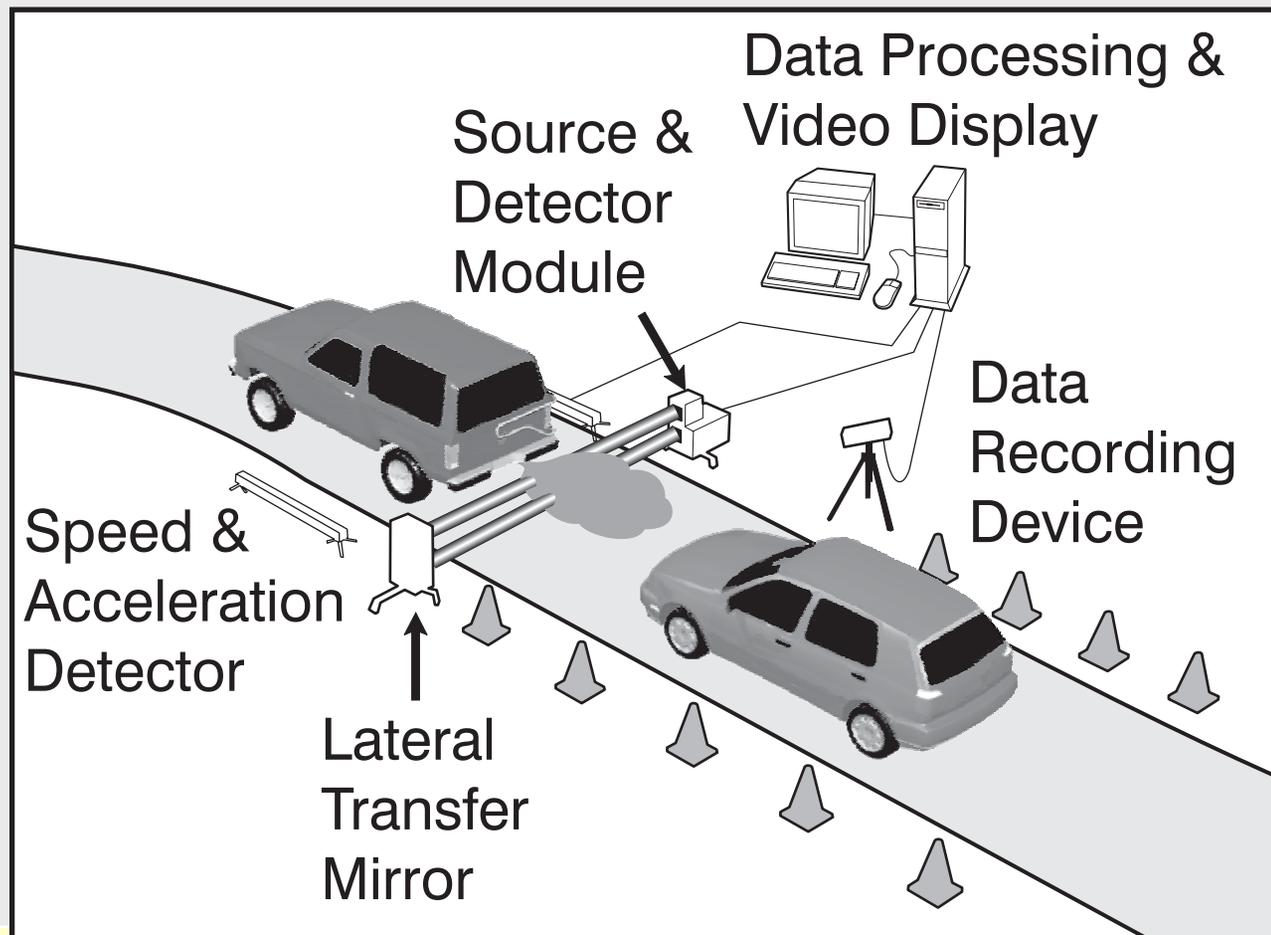
Vehicle Testing Designs

Emissions Test Methods

■ Remote Sensing Tests

- Fleet analysis capabilities
- Registration fraud enforcement tool
- Current remote sensing test examples

Remote Sensing Tests



Vehicle Testing Designs

V500

18/25/04 11:41:02.98 1794

Date, Time, Record Number

Speed and Acceleration

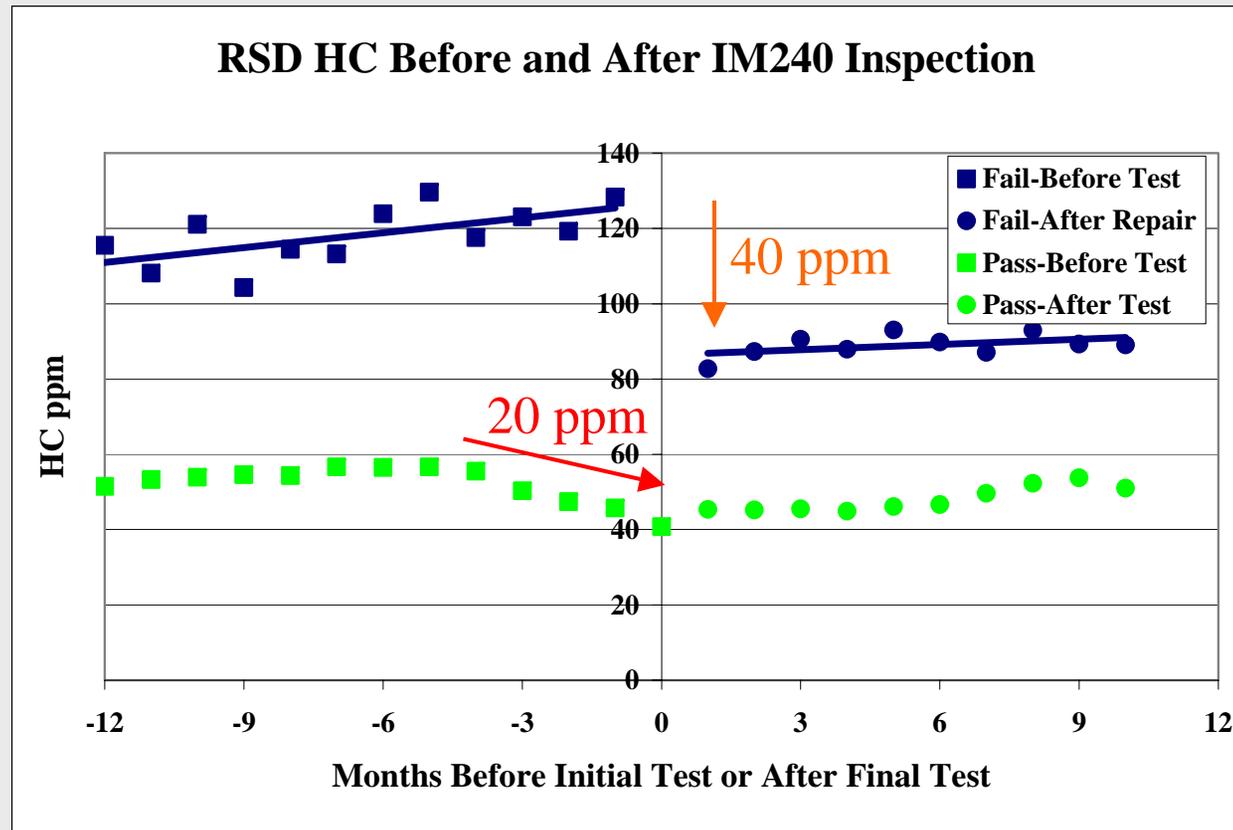
Emissions Measurements

SP:28.0 AC:1.51

HC CO CO2:14.71 NOX: 2456
212 0.36

L793 18/25/04 11:41:05.56 1795

Remote Sensing Tests



Vehicle Testing Designs

Cost Limit Waivers

- How do they work?
 - State chooses a minimum cost limit
 - Motorist tries to repair vehicle up to the cost limit (emissions may or may not decrease)
 - State allows partially-repaired vehicles to be registered
 - State's expectation: Motorist will complete repairs before next inspection
 - Reality: Repairs delayed until next inspection

Vehicle Testing Designs

Cost Limit Waivers

■ Effectiveness of Cost Limits

- Low limit = More vehicles waived = More pollution
- High limit = Fewer vehicles waived = More inequity
- Fixed limits vs. Cost of living-adjusted limits
- Trained repair technicians are limited by low cost limits
- Untrained repair technicians aim for low cost limits

■ Other waiver options

- Time extensions
- One waiver per vehicle
- Repairs by designated repair shops

Vehicle Testing Designs

Emissions Test Frequency

- Annual
- Biennial
- Transfer of ownership
 - In addition to regular test frequency?
 - In place of regular test frequency?
- Mileage-based
- Vehicle age-based

Vehicle Testing Designs

Fraud Prevention

■ False Pass Test Methods

- Sensor simulators (OBD II test)
- Clean scanning (OBD II test)
- Clean piping (Tailpipe test)

■ False Fail Test Methods

- Tester fails vehicle to generate income from unnecessary “repairs”

■ Ineffective Repairs

Vehicle Testing Designs

I/M Program Evaluation

- How does state validate program effectiveness to EPA, to public?
- Grams per mile (gpm) measurement of fleet
 - Can't be done with OBD II test
 - Can be done with IM240 tailpipe test
 - Can be done with remote sensing

Vehicle Testing Designs

I/M Program Evaluation

	2000 Emission Rates	2003 Emission Rates	Reduction of Emission Rates	Percent Emission Reductions
Exhaust VOC	0.40 gpm	0.23 gpm	0.17 gpm	42.5%
Exhaust CO	4.66 gpm	2.64 gpm	2.02 gpm	43.3%
Exhaust NO_x	0.90 gpm	0.69 gpm	0.21 gpm	23.3%

Vehicle Testing Designs

I/M Program Incentives

- Exemptions for Hybrid Electric Vehicles
- Public recognition of employers for 100% employee compliance
- Public recognition of employers for employee vehicle repair assistance
- Other ideas?

Vehicle Testing Designs

Motorist Equity Designs

- Vehicle Ownership Changes
- Vehicle Fleets
- Exemptions/Extensions
- Repair Assistance
- Other Vehicle Pollution Sources

Vehicle Ownership Changes

- Inspection at sale? Who pays?
- Is selling a car with a waiver acceptable?
- Sales by private owners
- Sales by car dealers

Motorist Equity Designs

Vehicle Fleets

■ Federal, State, Local Agencies

- General Service Administration, United States Postal Service, MoDOT vehicles, Police cars, City maintenance vehicles, etc.
- Plates are not tied to state's registration database, vehicles are difficult to track
- Vehicles usually regularly maintained by fleet managers

Motorist Equity Designs

Vehicle Fleets

■ Private Fleets

- AmerenUE, SBC, MSD, Taxis, etc.
- Most have state-issued plates tied to state's registration database, vehicles easier to track
- Vehicles usually regularly maintained by fleet managers
- Special considerations:
 - Vouchers/Direct billing
 - Self Testing

Motorist Equity Designs

Exemptions/Extensions

- Age of Driver exemption
 - Is age a fair criteria?
- Income of Driver
 - Is income a fair criteria?
- Annual Mileage of Vehicle
 - Is mileage a fair criteria?
- Additional time to complete repairs
 - Is additional time a fair criteria?

Motorist Equity Designs

Repair Assistance

- Source of funds
- Source of assistance
 - Who administers?
- Qualification Criteria
- Spending Criteria
- Other forms of assistance
 - Investigative diagnosis
 - Guided or co-pay repairs

Motorist Equity Designs

Other Vehicle Pollution Sources

- Non-I/M solutions for:
 - Vehicles over 8,500 pounds
Gross Vehicle Weight Rating
 - Diesel-powered vehicles
 - Smoking vehicles
 - Idling vehicles
 - Off-road vehicles

Motorist Equity Designs

Motorist Convenience Designs

- Combined Safety/Emissions Testing
- Clean Screening
- Remote OBD testing – Vehicle self-reporting
- OBD Kiosks – Vehicle owner self-testing

Combined Safety/Emissions Testing

- Provide emissions tests at safety test stations?
- Provide safety tests at emissions test stations?
- Can functionally different tests coexist?
- Motorist wait times concerns

Motorist Convenience Designs

Clean Screening

■ Concept

- Clean-running vehicles get to skip an emissions test
- Should a test fee/reduced fee be charged?

■ Methods of identification

- New model year exemptions
- Remote Sensing (vehicle is seen on-road)
- Low Emitter Index (vehicle is not seen on-road)

■ Pros

■ Cons

Motorist Convenience Designs

Remote OBD testing

- Similar to Mobil SpeedPass or E-Z Pass Automatic Toll Collection
- Continuous vehicle self reporting
- One time cost to motorist
- What happens if vehicle fails?
- What happens if vehicle isn't repaired?
- Cost of data collection network

Motorist Convenience Designs

OBD Kiosks

- Similar to Automatic Teller Machine or Self check-out shopping lanes
- Vehicle owner conducts own test
- What happens if vehicle fails?
- Security of kiosk device
- Accuracy of kiosk data

Motorist Convenience Designs

Vehicle Registration Designs

- Vehicle Registration Options
- License Plate Tab Theft
- Registration Integrity
- Emissions Test Verification
- Value of Emissions Data

Vehicle Registration Options

- Mail
- Fee Office
 - Vehicle registration at emissions test stations?
 - Should emissions test stations provide all fee office functions?
- Internet
 - Provide internet access at emissions stations?

Vehicle Registration Designs

License Plate Tab Theft

- Stolen tabs are one of the most often reported crimes in St. Louis area
- Public cost of unregistered vehicles
 - Property tax rates
 - Vehicle insurance rates
 - Unsafe vehicles
 - Polluting vehicles
- Alternatives to license plate tabs?

Vehicle Registration Designs

Registration Integrity

- Falsified/fake emissions test certificates
- Falsified/fake insurance, property tax, safety inspection receipts
- Insider transactions
- Which state agency has responsibility?
- Need a consistent, committed enforcement mechanism to minimize success of fraudulent registration attempts

Vehicle Registration Designs

Emissions Test Verification

- Paper
- Electronic (delay)
- Electronic (live)

Vehicle Registration Designs

Value of Emissions Data

- Who “owns” the emissions data?
- Who wants the emissions data?
 - Used car sales consumer protection companies
 - EPA and vehicle manufacturers
 - Researchers/Consultants
- What can be done with emissions data?
 - Manufacturer compliance and recalls
 - National research/comparison

Vehicle Registration Designs

I/M Design Concepts Review

- Many designs are possible
 - Contract
 - Vehicle Testing
 - Motorist Equity
 - Motorist Convenience
 - Vehicle Registration
- Questions/Discussion

Next Steps

- Next Meeting Date
- Tracking I/M Summit Process
 - www.dnr.mo.gov/alpd/apcp/sipworkgrp/sipgrpmain.htm
- I/M Summit Final Product
- Facilitation Suggestions