



Consideration of Pre-Inspection Activity on OBD-Based Inspections

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BAR Advisory Group Meeting

Overview

- What is pre-inspection activity?
- Can it be quantified?
- How does it relate to the benefits of the I/M program?

Pre-Inspection Activity

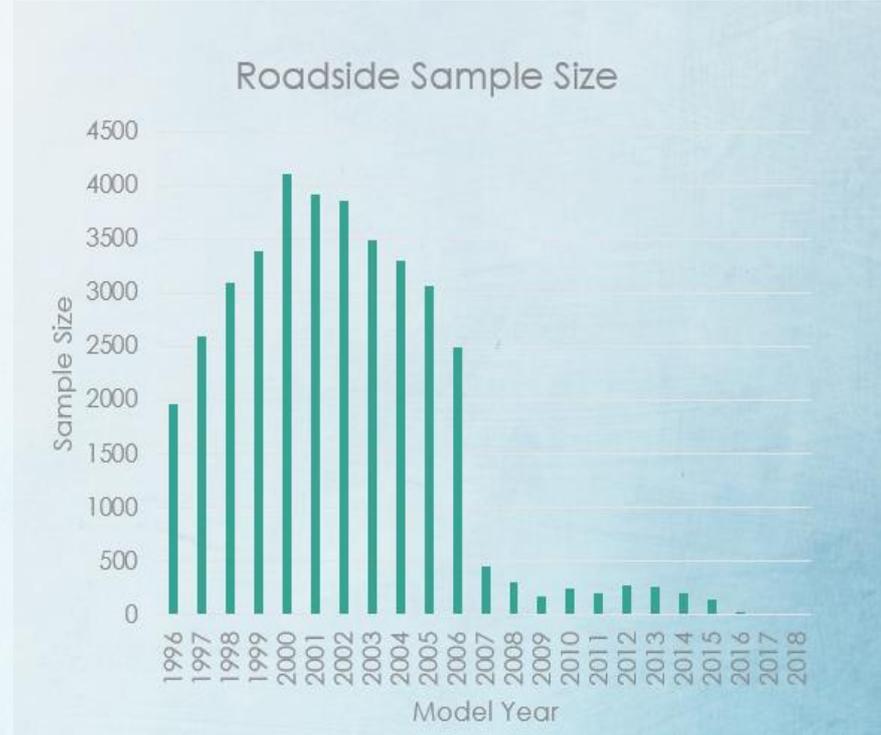
- For most, taking a MIL ON vehicle into an Inspection is (not efficient)
 - Exceptions: People new to the program, and people who need to have the failure documented (repair assistance, retirement)
- People know pass/fail status before going to inspection center
- Something needs to be done before inspection when MIL=on
 - Repair the vehicle
 - Clear codes and hope to get through inspection rules
 - Cheat!

Can Pre-Inspection Activity Be Quantified?

- Yes, it can at least be estimated through:
 - Random Roadside Testing
 - The OBD data itself

Roadside Testing

- Vehicles pulled over from roadside for voluntary inspection
- Smog Check procedures followed
 - ASM Test for 1976-1999's
 - OIS (OBD) for 1996+
- Sampling Plan Followed



Roadside Testing Data

- Smog Check query time aligned with Roadside records (minimize age/use bias)
- MIL is on much more frequently in Roadside testing
- Smog Check vehicles are more likely to be not ready
- Roadside MIL on rates fall dramatically when tested shortly before Smog Check
- Not-ready rates increase dramatically in same timeframe

Bottom Line Observations

- Real in-use MIL on rates are much higher than the rates recorded at Inspection (about 6X higher)
- Not-ready rates are higher at the time of Inspection compared to real in-use (about 2X higher)
- People generally wait until shortly before needing an inspection to deal with MIL on conditions

Estimate Using Only OBD Data

- OBD data itself can also yield an estimate of pre-inspection repair activity
- Assumptions:
 - Code clearing is not a very common event outside of I/M
 - Battery discharge/replacement
 - Repair work (including code clear) not influenced by SC/reg renewal
 - Therefore, most code clearing within 2 weeks of inspection can be attributed to pre-inspection repair activity.
 - Pre-inspection repair activity indicates that vehicle was in failing condition (i.e., MIL on)

The Specifics

- Use distance and warmups since code clear data (supported on 2005+ MYs) to estimate fraction of vehicles that passed, but experienced code clear within 2 weeks of inspection
 - < 420 miles (14 days at 30 miles per day)
 - or < 28 warmups (14 days at 2 warm ups per day)
- Assume/estimate the portion that had codes cleared due to pre-inspection activity
 - My first guess: 80%
 - Roadside/SC data: 75% (based on 2005-2011 MY average)
- Total in-use failure rate = I/M failure rate + rate passing with pre-inspection activity

The Results

- OBD data estimate for in-use fail rates trends with Roadside rate
- Biased about 45% higher
- Possible Reasons
 - 2 week mileage/warmup assumptions may need to be adjusted.
 - Roadside refusal rate is about 50% which might bias in-use rate lower.

Conclusions

- Most people deal with MIL on conditions before the vehicle is actually inspected
 - (and generally wait until they have to)
- Therefore, inspection failure statistics only reflect a small fraction of the real benefits of the program.
 - The total benefit should be based on the number of motorists that address vehicle problems because an inspection is required.
- States without a roadside testing program can create a reasonable estimate of pre-inspection activity with just OBD data.
- Strong I/M programs are still really important
 - In-use MIL on rates are too high
 - The most common in-use faults continue to relate to “major monitors”