

Diesel Emissions I&M

The experience of Mexico & other developing countries

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United States and Europe

Strategy

Promote introduction of new clean vehicles

PM & NOx reduced over 30:1 in only 14 years !!

EPA..... "Our interest in in-use PM measurement is much more focused on compliance testing for the manufacturers than it is on I/M."

South Asia & Latin America

- Vehicles last longer
- Cannot wait for new technology to trickle down.
- Emissions must be improved from current vehicle fleet
- Importance of Inspection and Control of Emissions from In-use Vehicles



Mexico City

- ≈ 6000 Heavy Duty diesel vehicles operate in the City
- ≈ 200,000 long distance trucks and buses enter the city
- Growing concern on Diesel Particulate emissions
- Free Acceleration smoke check has been used for over 14 years **BUT** is ineffective
Has allowed visual enforcement

Visual Smoke Controls

- Mexico City,
Delhi – Jaipur – Agra
Visual smoke rule
- Bangkok, Manila,
New Zealand
Mobile Phone and SMS reporting
- Hong Kong
Trained Police Spotters



Free Accel. Test is not effective

SAE J1667 vs ECE R24 standards

- Test Results depend on the Tester
- Even with additional Controls to limit Tampering has Poor Reproducibility in I&M Environment
 - RPM, Oil Temp
 - Master Reference Tables
- Short Dyno Test more cost efficient
- Not effective on recent technology vehicles

ECE Joint Commission Services Study (1998)



What is a Good Test Procedure?

- Should not cause clean vehicles to be repaired
- Must not allow dirty vehicles to pass
- Must be easy to perform
- Must be cost-effective
 - The advantages of the program to the public must be seen to be **MUCH** greater than its social cost.
- Must promote permanent repair
- Must be resistant to tampering and cheating

Cost of a False Pass is a good indicator of Program effectiveness

I&C is not



But I&C is not this either.....



Santiago, Chile

Dynamometer test used for urban diesel buses for over 10 years



Engine	BHP	Dyno
80 – 120		45
121 – 165		60
166 & over		80

Must address the Institutional Issues first



Verificenter - Mexico

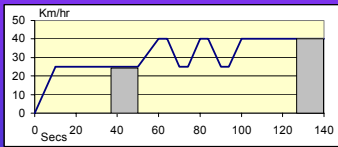
Over 2,000,000 vehicles up to 5 tons GVW are dynamometer tested every 6 months



Bangkok – DIESEL program

World Bank and US-Asia Environmental Partnership funded

- Developing one short dynamometer test to be used for all fuels and vehicles
- Proposed for adoption in Mexico + possibly Australia



Lessons Learnt from Mexico

- Emissions program **must be seen by Public** to be
 - effective,
 - totally objective,
 - transparent and
 - control gross polluters
- Focus on dirtiest vehicles
- Enforced, supervised and audited
- False Passes damage public acceptance
- Centralized Test-only inspection
- Use Good Robust Test Procedure
 - Dynamometer testing used to stop cheating / tampering

Conclusions

Phased, Selectively Applied Program

- For vehicles that most contribute to pollution
- Critical Metropolitan Areas

Promoted from the highest level

- Address Institutional Issues First

Involve the Public

- Mobile Phone and SMS reporting

No Static Tests

- Static tests promote false passes
- Little permanent emissions improvement
- Easy to cheat

Thank you

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