A decorative graphic consisting of a thin yellow circle. A thick black left square bracket is positioned on the left side of the circle, and a thick yellow right square bracket is on the right side. A horizontal bar with a light olive green gradient is centered across the circle, containing the title text.

# Transitioning Vehicle Inspection and Maintenance Programs

May 29, 2008

# [ Transitioning I/M Workgroup ]

- Workgroup formed in response to state concerns about changes in fleet composition
- Charter
  - Develop a joint strategy and background information for states and EPA to use in transitioning I/M programs from tailpipe-testing systems to OBD-testing systems. Address overarching issues with existing OBD programs that may impact transitioning.

# [ FACA Workgroup Members ]

Organization	Name	Organization	Name
EPA, Co-lead	Gene Tierney	New Jersey	Rob Schell
Oregon, Co-Lead	Ted Kotsakis	Envirotest	Chris Stock
California	James Goldstene	SysTech	Lothar Geilen
Massachusetts	Nancy Seidman	Gordon-Darby	Richard Joy
North Carolina	Brock Nicholson	AIAM	John Cabaniss
Missouri	Haskins Hobson	Alliance	Greg Dana
New York	Jim Clyne	ERG	Sandeep Kishan
Maryland	Dave Filbert	Washington	Dennis McLerran
Texas	Bob Wierzowiecki		

# [ Background on I/M ]

- Required by the Clean Air Act (1977/1990)
  - Basic I/M in moderate areas (idle test)
  - Enhanced I/M in severe and worse areas
    - Dynamometer test - NOx benefits
- 33 states conduct test programs
  - Most do tailpipe tests on pre-1996 vehicles
  - And OBD checks on 1996 and newer
  - Few dropping due to lack of alternatives
- Issues arising as fleet turns over

# [ Onboard Diagnostic Systems ]

- Tier 1 light-duty vehicle regulations were phased in between 1994-1996
- OBD systems turn on a dashboard light if emissions exceed standards
- OBD checks substitute for tailpipe and evaporative system emission testing in I/M programs on 1996 and newer vehicles

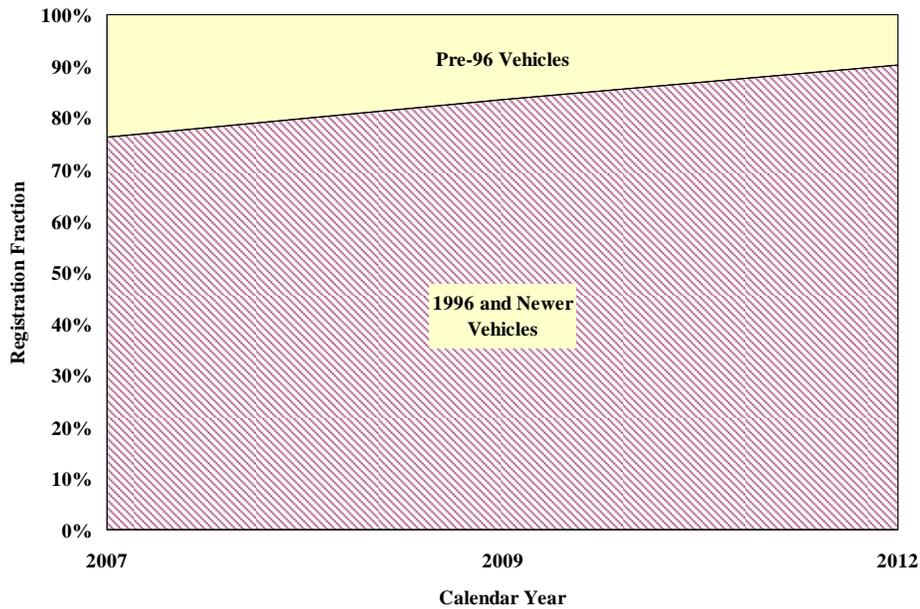
# [ Overview of Report ]

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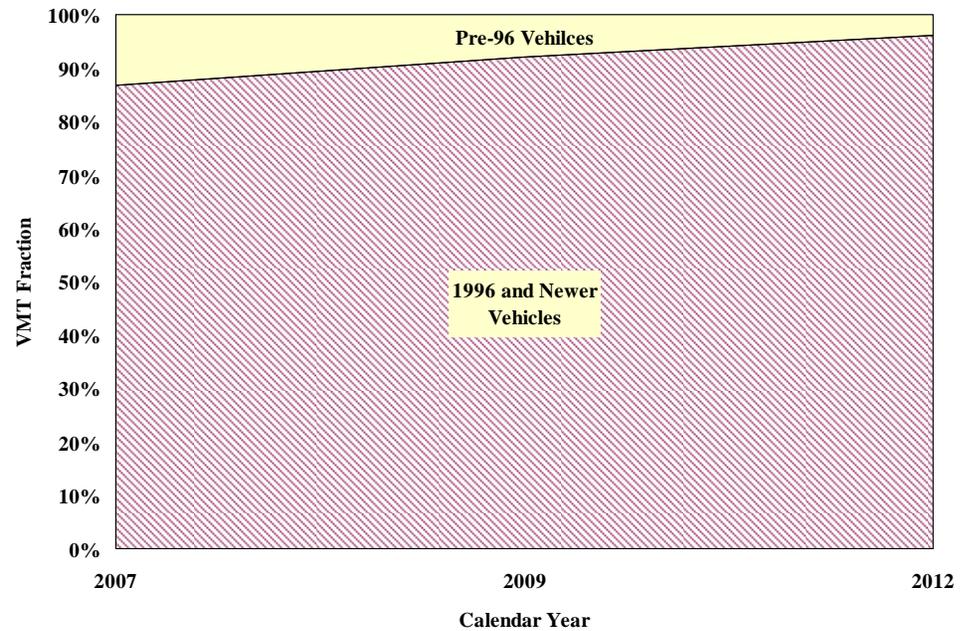
- Review of data related to vehicle trends
- Analysis of options for innovative approaches to I/M
- Assessment of costs, benefits and pitfalls

# Changes in LDV Registrations and VMT

## LDV Registrations

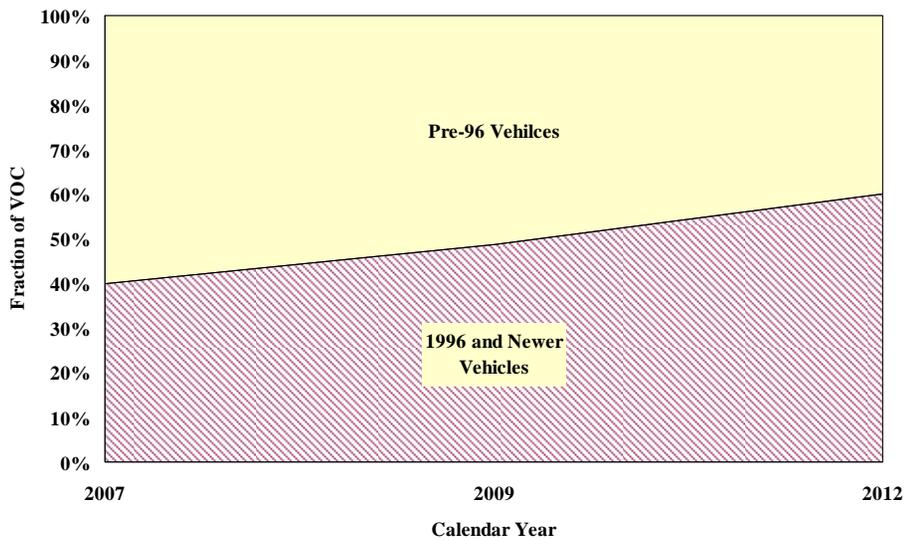


## VMT



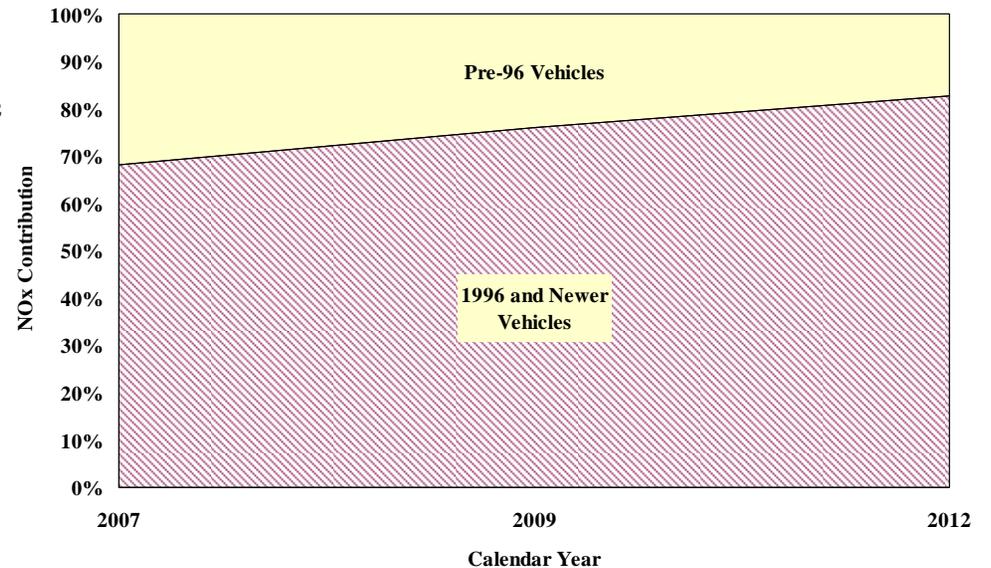
# Changes in Contributions of Pre- and Post-OBD Light-Duty Vehicles

Volatile Organic Compounds



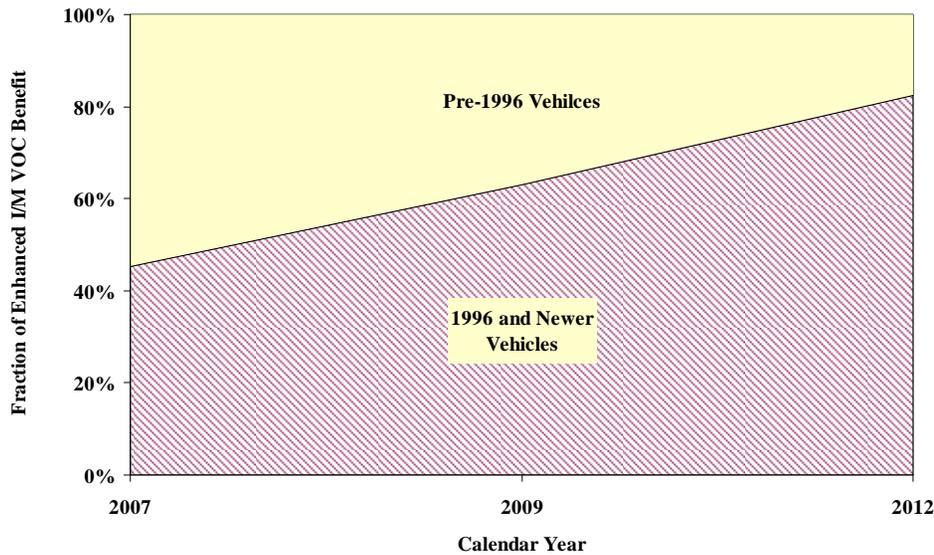
National default contributions based on emissions

Oxides of Nitrogen



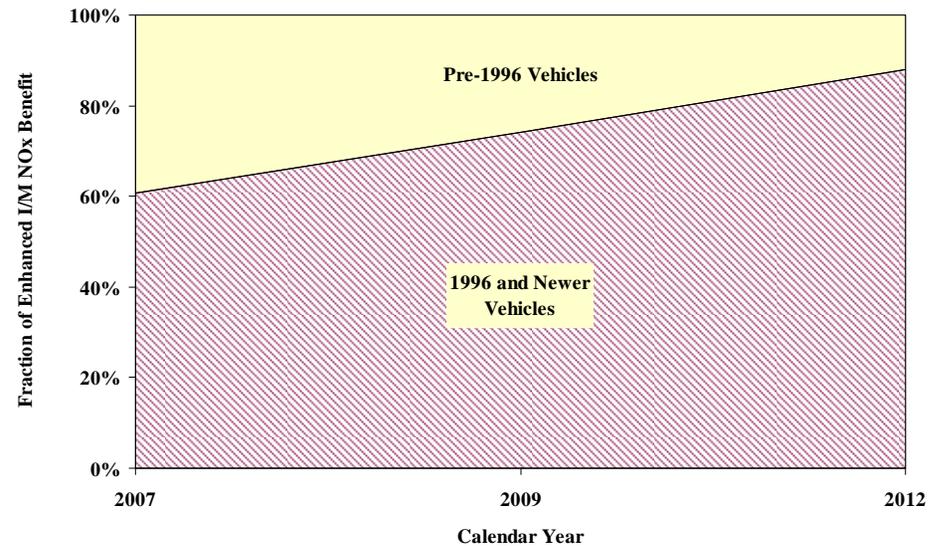
# Changes in Enhanced I/M Benefit From Pre- and Post-OBD Vehicles

Volatile Organic Compounds



National default contributions based on I/M Benefit

Oxides of Nitrogen



# [ Conclusions ]

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- Pre-OBD vehicles diminishing rapidly
  - Registration fraction
  - VMT fraction
- However, Pre-OBD vehicles contribute disproportionately to the inventory
  - I/M effects are driven by technology and standards
- Need to consider local fleet mix in future I/M program designs

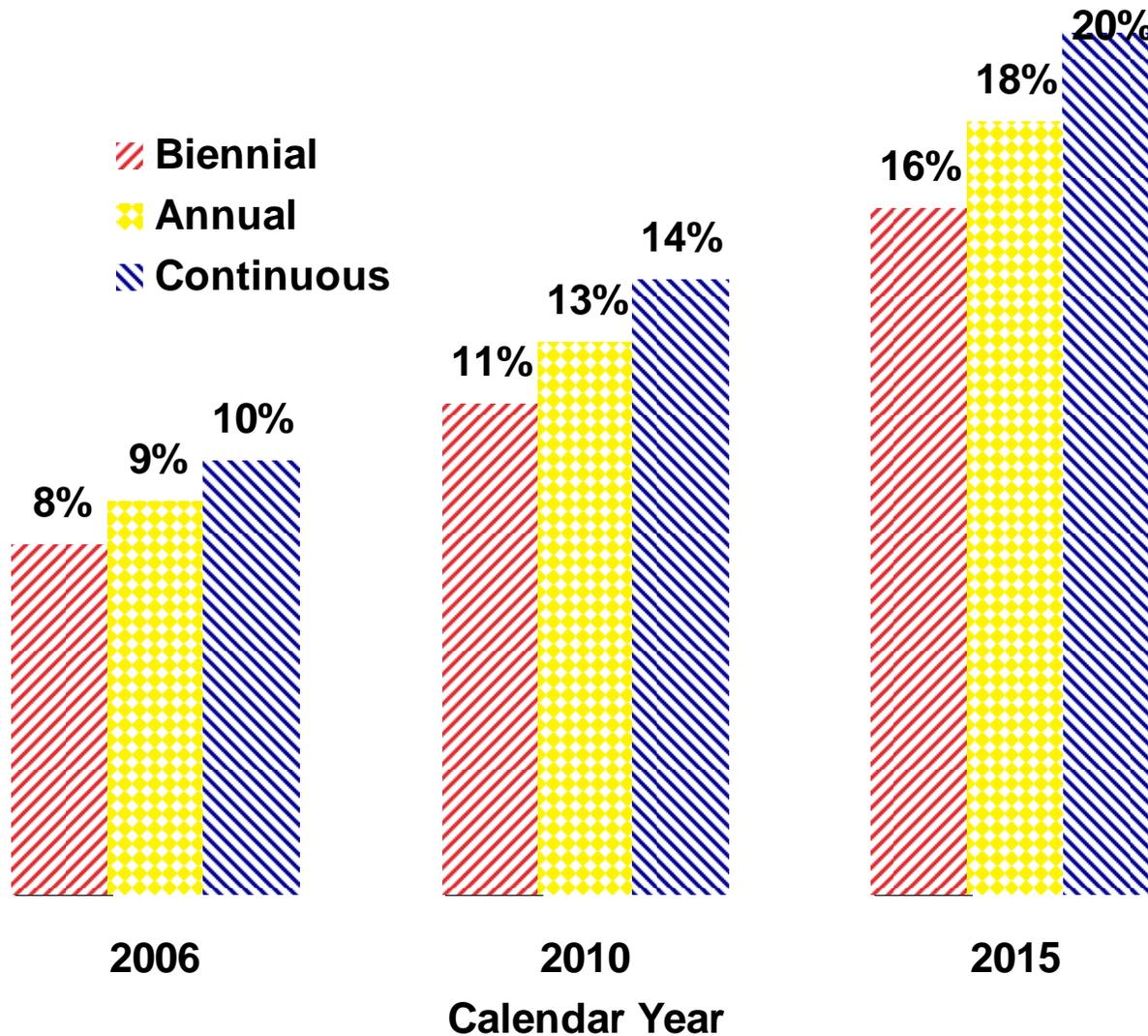
# [ Program Design Issues ]

- Given that:
  - OBD vehicles do not need tailpipe or evap tests
  - OBD vehicles are cleaner and fewer fail
  - Pre-OBD vehicles are slowly going away
  
- How do we design a cost-effective I/M program that continues to get significant reductions from the fleet?

# [ Three Innovative Approaches ]

- Kiosk
  - Self-service, 24 hour testing, no staff
  - Motorist connects plug to OBD port and runs test
- Data logger
  - Small device that plugs into OBD Port
  - Captures status and indicates “ready”
  - Disconnect and upload data via internet or mail in
- Remote OBD
  - Small device that plugs into OBD Port
  - Continuously monitors and reports status using cellular, wi-fi or radio frequency communications
  - Visits to test station no longer needed

# Emission Benefits - VOC



# Lifetime Inspection and Convenience Costs of Periodic I/M vs. Remote OBD

Ten Year Costs

		Periodic OBD	Remote OBD	Savings
Test/Install	Low	\$12 billion	\$4 billion	\$8 billion
Cost	High	\$12 billion	\$5 billion	\$7 billion
Convenience	Low	\$9 billion	\$1 billion	\$8 billion
Cost	High	\$17 billion	\$2 billion	\$15 billion
Total Cost	Low	\$21 billion	\$5 billion	\$16 billion
	High	\$29 billion	\$7 billion	\$22 billion

- Assumes 100% of I/M vehicles switch to Remote OBD
- Costs analyzed over the life of a static fleet (10 years)
- Savings occur in both test costs and convenience costs
- Total of \$16-22 billion in savings over 10 years

# [ Extensive Review Process ]

- Several rounds of internal and external review
- Concerns included
  - Big brother watching
  - Application of innovative approaches in decentralized programs and those that include safety inspections
  - Limitations of cost analysis
  - What to do about pre-OBD vehicles?

# [ Conclusions ]

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- Innovative approaches reduce costs and improve convenience
  - Continuous I/M increases benefits
- Timing of dropping pre-OBD vehicles depends on local fleet mix and program design
  - Alternative approaches to covering pre-OBD vehicles may reduce costs and retain some benefit
    - Change of ownership
    - Remote sensing/dirty screen

# [ Next Steps ]

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- Incorporate Continuous I/M frequency into MOVES
- Universal Protocol for Remote OBD
  - Establish a universal protocol for data and communication; enable reciprocity among I/M programs
  - Tap into existing telematics systems (e.g., Onstar)
  - Hope to avoid having to re-equip a vehicle that moves from one state to another