

Cumplimiento y Verificación (Compliance and Enforcement)

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Mexico DF

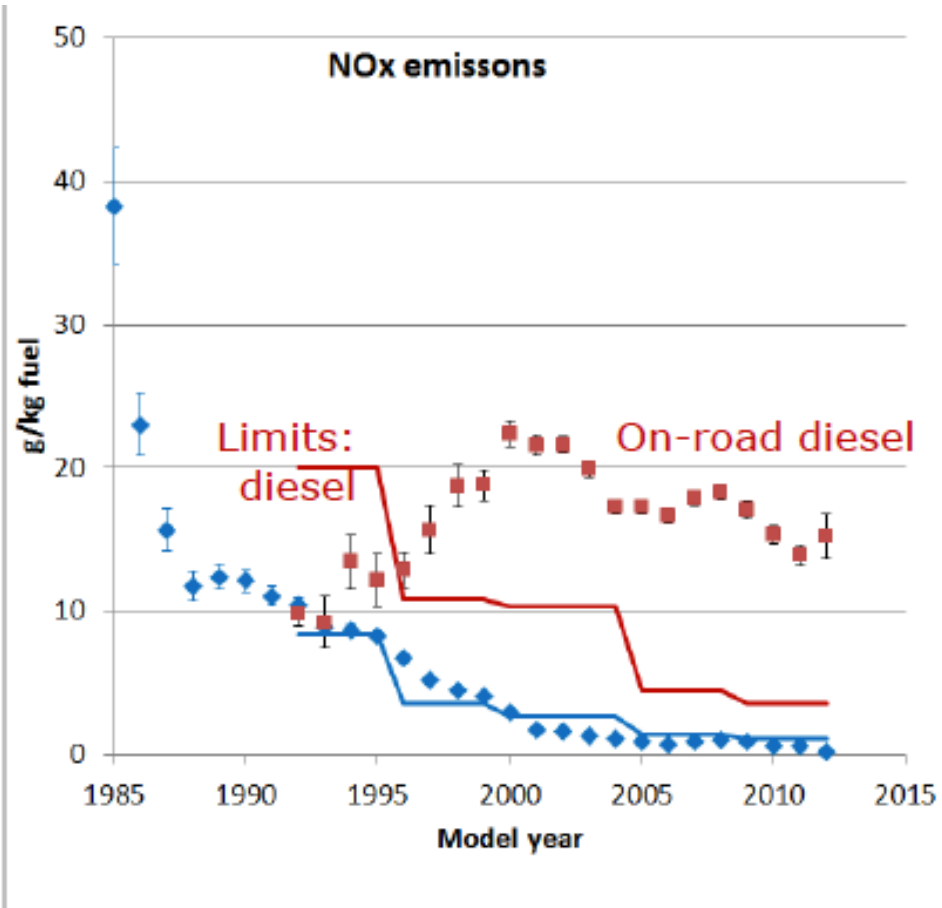


Que son los programas de cumplimiento y verificación?

- Este programa asegura que las normas para vehículos nuevos y en uso sean efectivamente implementadas
- Garantiza que los beneficios de los estándares mas estrictos se trasladen a vehículos en uso durante su vida útil

Diferencias entre laboratorio y uso real

■ Mediciones con Remote Sensing y con PEMS



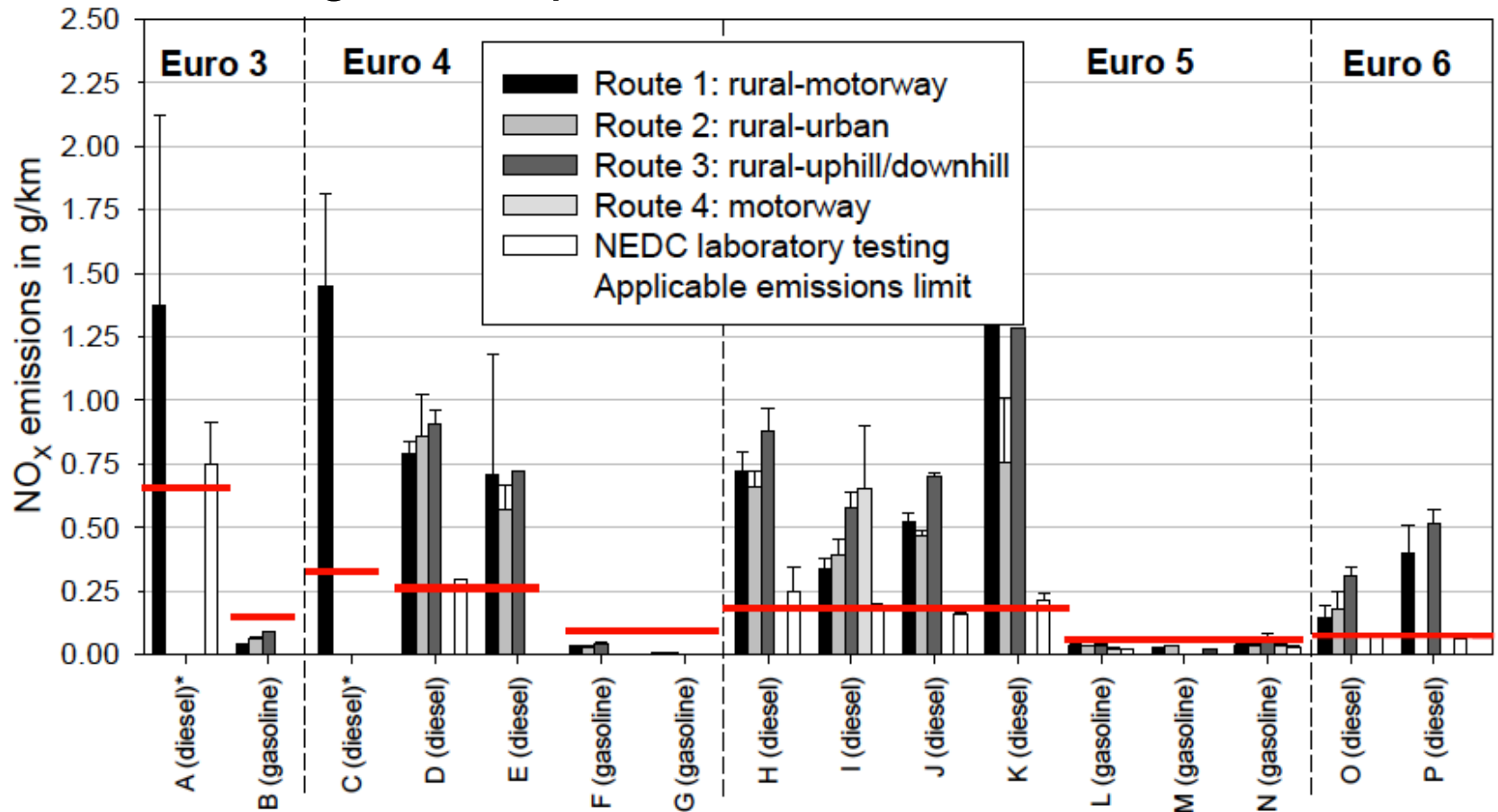
Limits more lenient for diesel than for gasoline cars
 ⇔ compliance for type approval on lab cycle

- On-road:
- Gasoline cars follow limits
 - Diesel cars even higher now than 20 years ago, no correlation with limits.

Diferencias entre laboratorio y uso real

Mediciones con Remote Sensing y con PEMS

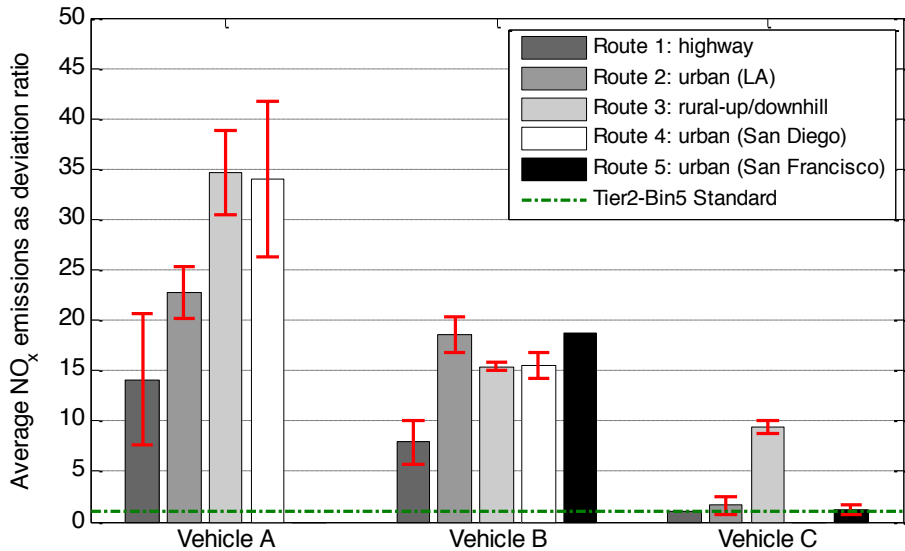
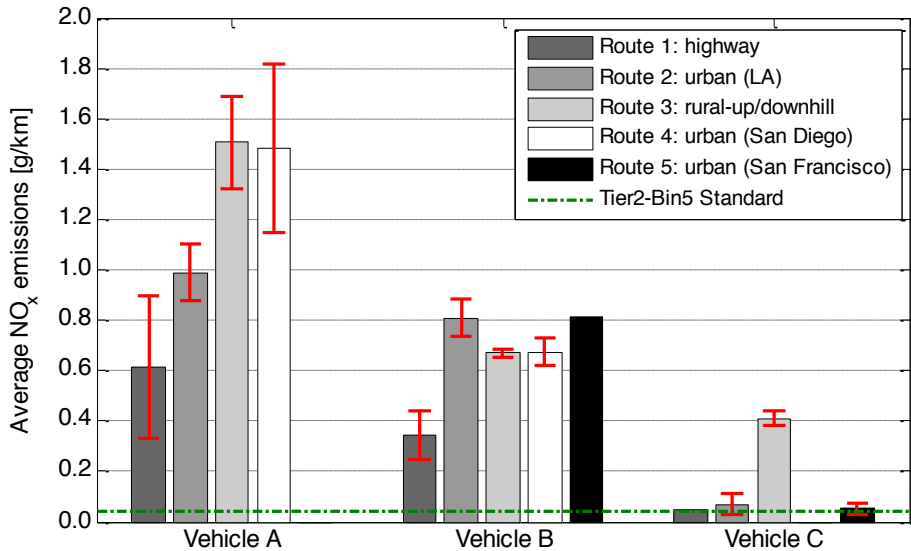
PEMS testing in Europe



Diferencias entre laboratorio y uso real

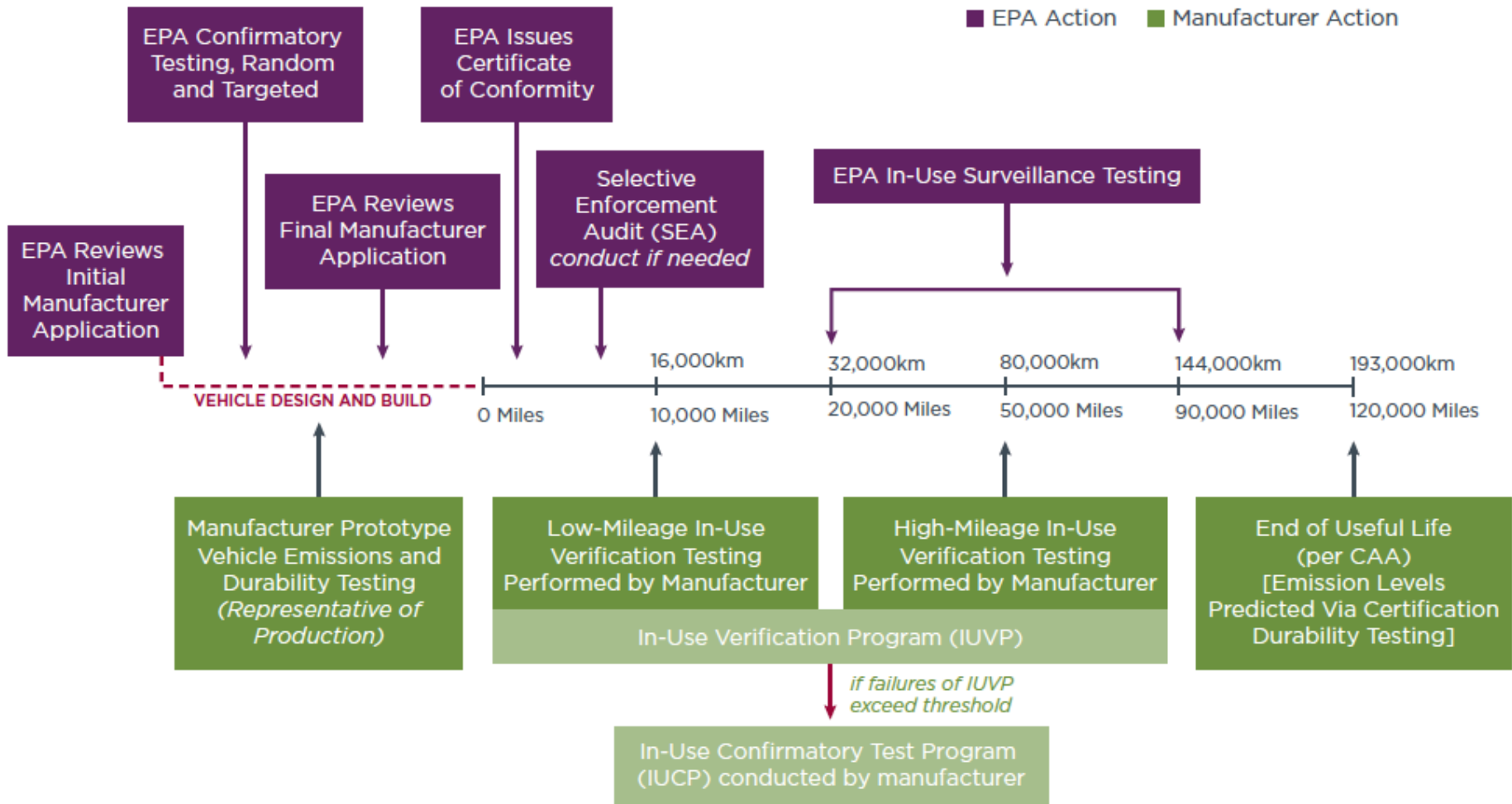
■ Mediciones con Remote Sensing y con PEMS

PEMS testing in the US



- 1) Preproduction certification [**Fabricante**],
- 2) Confirmatory testing [**EPA**],
- 3) Selective Enforcement Audit (SEA) [**EPA**],
- 4) In-use surveillance [**EPA**],
- 5) Verification performed by the manufacturer under the EPA's In-Use Verification Program (IUVP),
- 6) Recall in case of noncompliance, and
- 7) Warranties and defect reporting.

USEPA vehicle compliance program for light-duty vehicles (LDVs)



- Preproduction testing is conducted by manufacturers to **support their applications for certificates of conformity**
- A manufacturer can establish its own testing facility, or
- Contract the services of independent laboratories.
- Test results, adjusted with deterioration factors, must be recorded in the certification applications to demonstrate compliance. Manufacturers must perform certification testing for all “test groups” that they choose to certify
- The EPA issued more than 3,600 conformity certificates to vehicle and engine manufacturers annually in both 2007 and 2008

- Confirmatory tests are targeted and random tests performed **by EPA to validate the emission and fuel economy results reported for certification.**
- In recent years, EPA selected about 15 percent of all test groups for confirmatory testing;
- two-thirds of the selected test groups (10 percent of all test groups) are randomly selected, and
- the remaining one-third (5 percent of all test groups) are targeted test groups.

- The SEA aims to identify cases where **prototype vehicles supplied by manufacturers are not representative of production**
- the EPA can require manufacturers to test vehicles pulled straight off the assembly line, at the manufacturer's expense, without prior notice.
- This regulatory tool is rarely deployed
- One recent case: GM Tavera India

In-Use Verification Program (IUVP) and In-Use Confirmatory Program (IUCP)

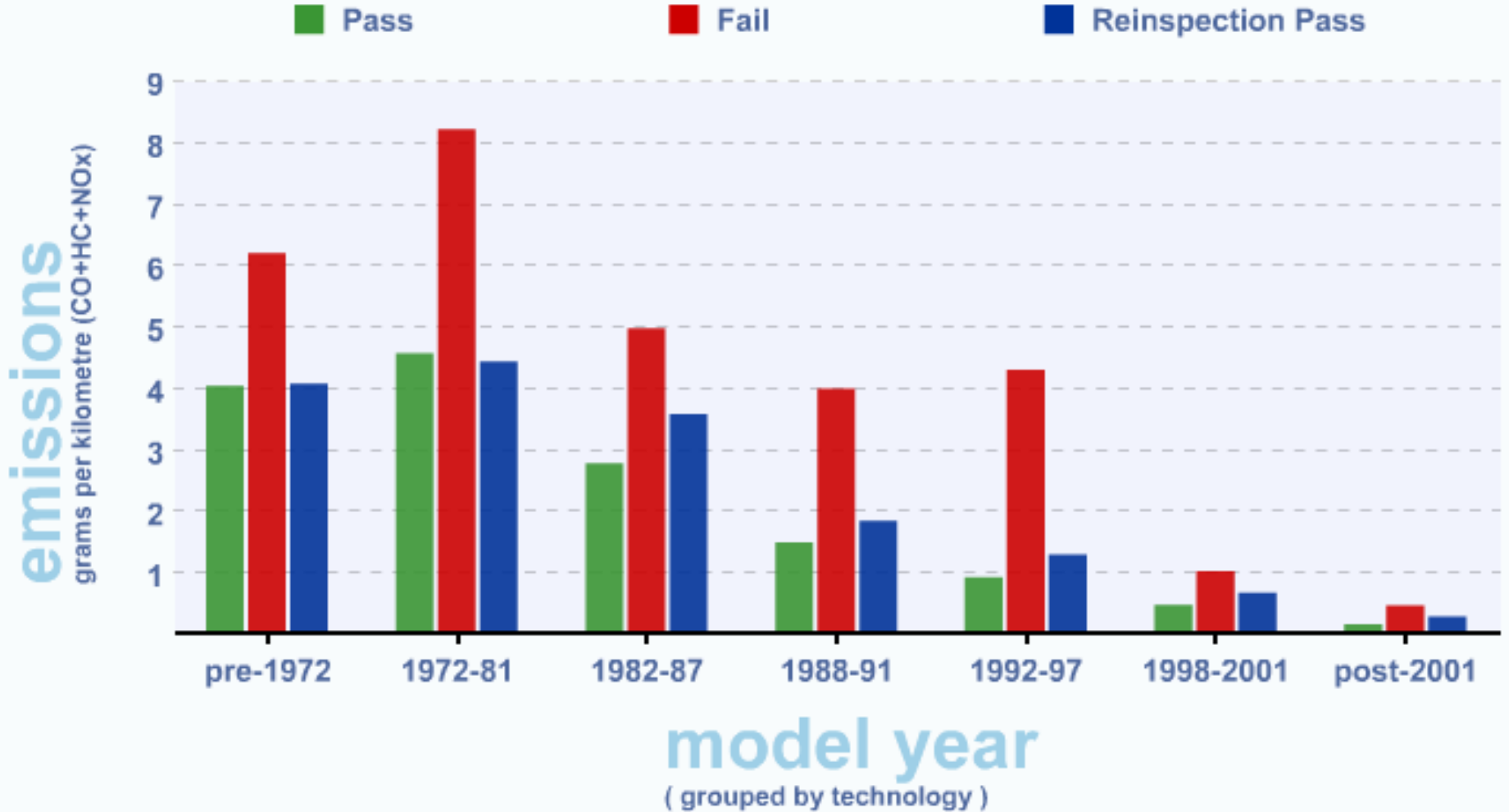
- The IUVP is manufacturer-conducted testing of both low-mileage (10,000 miles, or 16,000km) and high-mileage (50,000 miles, or 80,000km) in-use vehicles.
- Manufacturers are responsible for testing one to five vehicles per test group.
- About 2,000 industrywide tests were performed in 2007.
- If 50% of vehicles in a test group fail and the average emission levels are greater than 1.3 times the standard limits, the manufacturer must automatically conduct an IUCP test.
- In the IUCP, test vehicles are selected and tested in a more rigorous manner).
- Failure of IUCP tests can lead to recall.

- Targets vehicle classes that are suspected of having emission-related problems, based on:
 - 1) manufacturer defect reports;
 - 2) **information from state inspection and maintenance programs;**
 - 3) manufacturer service bulletins;
 - 4) certification test results (the EPA is more likely to test vehicle models that have had problems in certification);
 - 5) newer technologies or engines;
 - 6) sales volume;
 - 7) In-Use Verification Program (IUVP) failures;
 - 8) random selection; or
 - 9) any other reason the EPA deems appropriate.
- In 2007, a total of 142 vehicles were tested, representing 47 test groups. Nine vehicles (representing five test groups) failed the in-use tests, but only one test group showed failure to an extent that warranted further investigation

- The main goal of an I/M program is to identify gross polluters—vehicles that emit well beyond standards—and to get those vehicles repaired
- In the US, I/M programs are implemented on a state by state basis, depending on local air-quality issues

- In the US, about 20% of malfunctioning vehicles emit about 80% of all in-use emissions.
- Extremely important to identify and fix emission control system malfunctions.
- However, I/M effectiveness depends on the program structure:
 - Done properly, this is the largest possible in-use emission reduction and at reasonable cost.
 - Done improperly, it has almost no benefits for a substantial customer inconvenience

I/M programs



Country / Region	Vehicle Type	Sub-type / manufacture date	Test Method	CO	HC	NO	NO _x	Other Pollutants	OBD (if available)	λ	λ test condition	Remarks
Australia	LDV	Between 1972 and 1973	Idle	✓					✓			
		Between 1974 and June 1976	Transient dyno test	✓	✓							
		On or after July 1976		✓	✓		✓					
China National	LDV		Idle / Fast Idle	✓	✓							
			ECE 15 Cycle (transient)	✓	✓		✓			✓	Electronic controlled vehicles	Required for all perfectual level or higher level cities by 2015. ¹
China, Beijing	LDV		BASM5024 (steady-state)	✓	✓	✓			✓	✓	Vehicles with electronic fuel injection system	
			BASM2540 (steady-state)	✓	✓	✓			✓	✓		Performed only if failed BASM5024
			Idle	✓	✓							Performed on carbureted cars only
China, Hong Kong	Gasoline vehicles	On or before 1974	Exempt									
		Between 1975 and 1991	Idle	✓								
		On or after 1992	Idle / Fast Idle	✓						✓		
Japan	LDV		Idle	✓	✓							
Singapore	LDV		Idle	✓								
USA, California	LDV		Idle / Fast Idle	✓			✓					Conducted in other areas with I/M programs, or on vehicles upon change of ownership
			ASM Test	✓			✓	HCHO, NMOG	✓ (1996 or newer models)			Conducted at areas with the most serious air quality problems
USA, Colorado	LDV	On or before 1981	Idle / Fast Idle	✓	✓							Test performed in the enhanced I/M program
		On or after 1982	IM240 (transient)	✓	✓		✓		✓ (1996 or newer models)			
Canada, Vancouver	LDV	On or before 1991	ASM (steady-state) and Idle	✓	✓		✓					
		On or after 1992	IM240 (transient)	✓	✓		✓		✓			
			Idle	✓	✓		✓		✓			Performed only if the vehicle cannot be placed on dyno
European Union	LDV	Not controlled by three-way catalytic converters	Idle	✓								
		Controlled by three-way catalytic converters	Idle / Fast Idle	✓					✓	✓		

Que es el OBD?

- Sistema de diagnostico abordo (On-Board Diagnostics OBD)

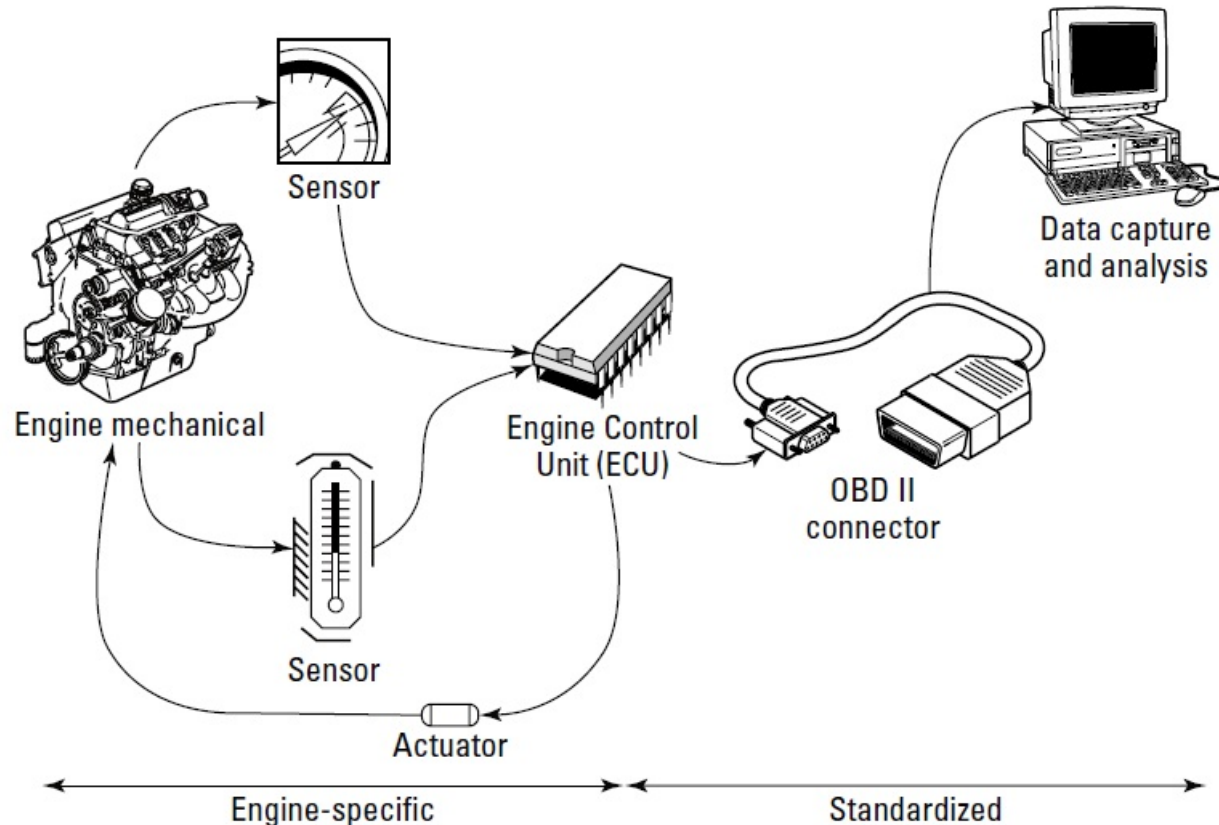


FIGURE 1: On-board diagnostics block diagram

OBD is a key element of I/M programs

- If the OBD system is properly designed, OBD II system checks are less expensive than I/M tests and more accurate. But only works on vehicles with OBD II systems.
- Mexico can take advantage of this as their vehicles require OBDII/EOBD

- Las diferencias entre emisiones medidas en el laboratorio y el uso real están documentadas
- Los programas de cumplimiento y verificación ayudan a mantener esa diferencia bajo control
- Programas de I/M ayudan a mantener el parque automotor bajo los estándares de diseño
- Sistemas OBD complementan el programa de I/M