
Controlling Mobile Emissions The Case of Egypt

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Introduction

Egypt's approach to improve air quality through reducing mobile emissions includes:

- **Improving fuel specifications**
- **Using natural gas, as a cleaner fuel**
- **Enforcing emissions standards**

Improving Fuel Specifications

- **Use of Unleaded gasoline:**
About 85% of gasoline consumption
- **Reduce Sulfur Content In Diesel fuel:**
Sulfur content is reduced from about 1.2 % (max) to an average of 0.4 %– 0.6%.

Using Natural Gas (CNG) in Transportation

■ **Light Duty Vehicles:**

Gas distribution system: 74 fueling stations

Technical Support: 38 service centers

Economic Incentives: Reduced price

NGV Fleet: 50,000 LDV

Taxi (77.5%) – Microbus (6.4%) – Private (20.3%) – Others (11.8%)

■ **Transit Buses:**

Dedicated CNG engines: 50 buses (CAIP-USAID)

Technical Support: 2 garages including fueling stations

Economic Aspects: Special service fees

Emission Standards for New Vehicles

- **A protocol was agreed upon by the involved entities:**
Effective 1-1-2002, the new vehicles should meet the European Emission Standards “Euro-2”, as the minimum requirements .
- **The standards were not adopted due to incompatible fuel specifications**

Enforcing Emission Standards for In-Use Vehicles

Background:

A Previous pilot program for vehicle emissions was conducted in 1995 for a sample of 1300 vehicles tested before and after minor tune-up. The indicated achievements of tune-up are:

- ◆ 35% reduction in hydrocarbons**
- ◆ 62% reduction in carbon monoxide**
- ◆ 10% gain in fuel efficiency**

Pre – VET Activities

CAIP – VET Activities:

- **Economic, technical and institutional feasibility studies for VET options**
- **Awareness and baseline data collection:**
ORT (LDV) – MORT (Motorcycles) – MTP (Microbuses)
- **I/M program for transit buses (IMTB)**

VET Options

- **Test and Repair:**
Vehicle testing takes place within facilities operated by the repair industry
- **Test-Only:**
Employs a more limited number of high capacity testing centers in which no repairs are performed
- **Hybrid Systems:**
Employs Test-only and repair facilities capable of performing certified testing are referred to as hybrids

Baseline Data - ORT

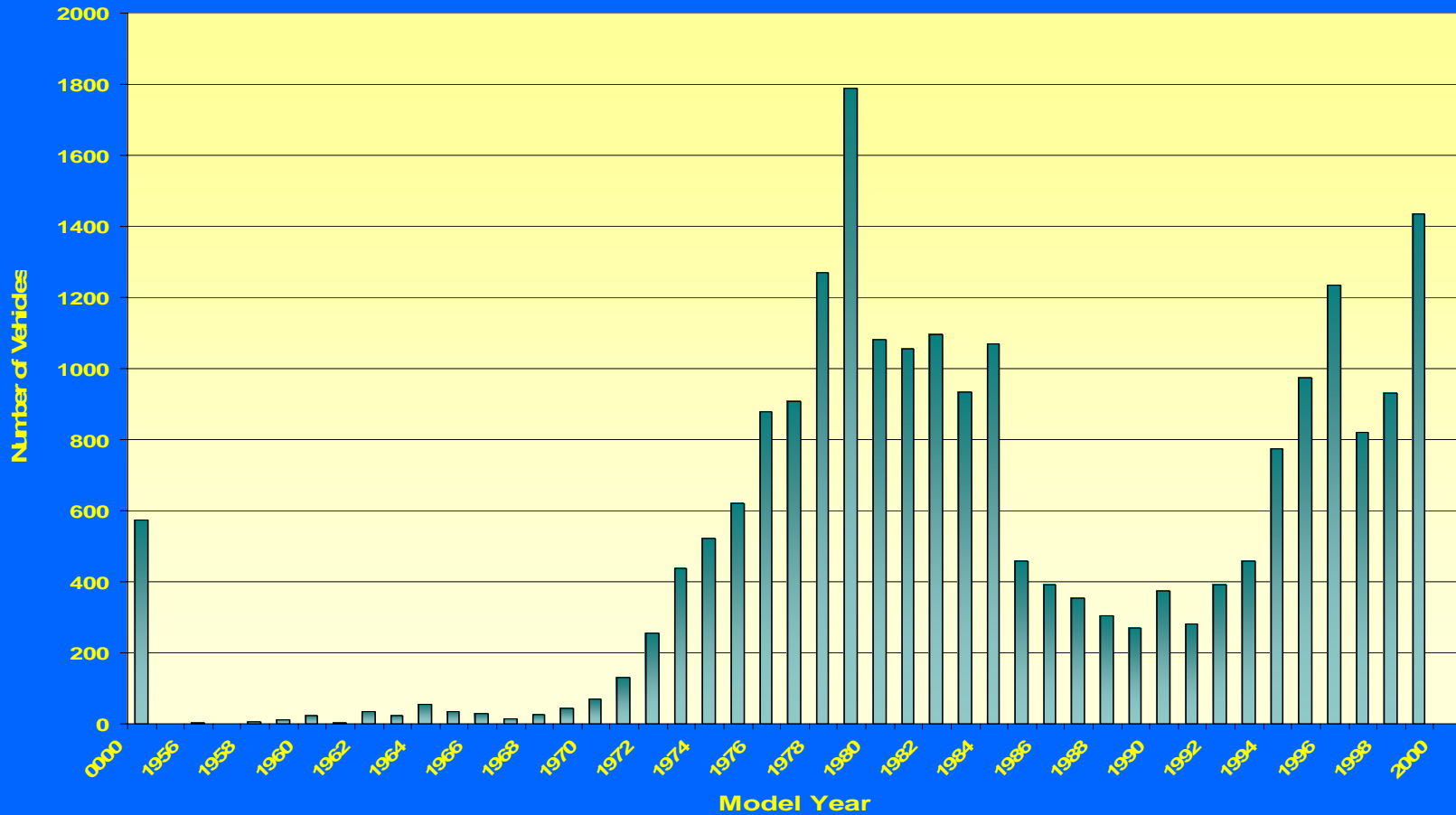
- **EEAA/CAIP provided 30 exhaust gas analyzers**
- **Awareness for drivers and emissions data collection**
- **57000 vehicles were tested**

ORT Results

- **63% overall compliance rate with emission limits “Executive Regulations of Law 4/94**
- **26% Failure rate for CO emissions only**
- **21% Failure rate for HC emissions only**

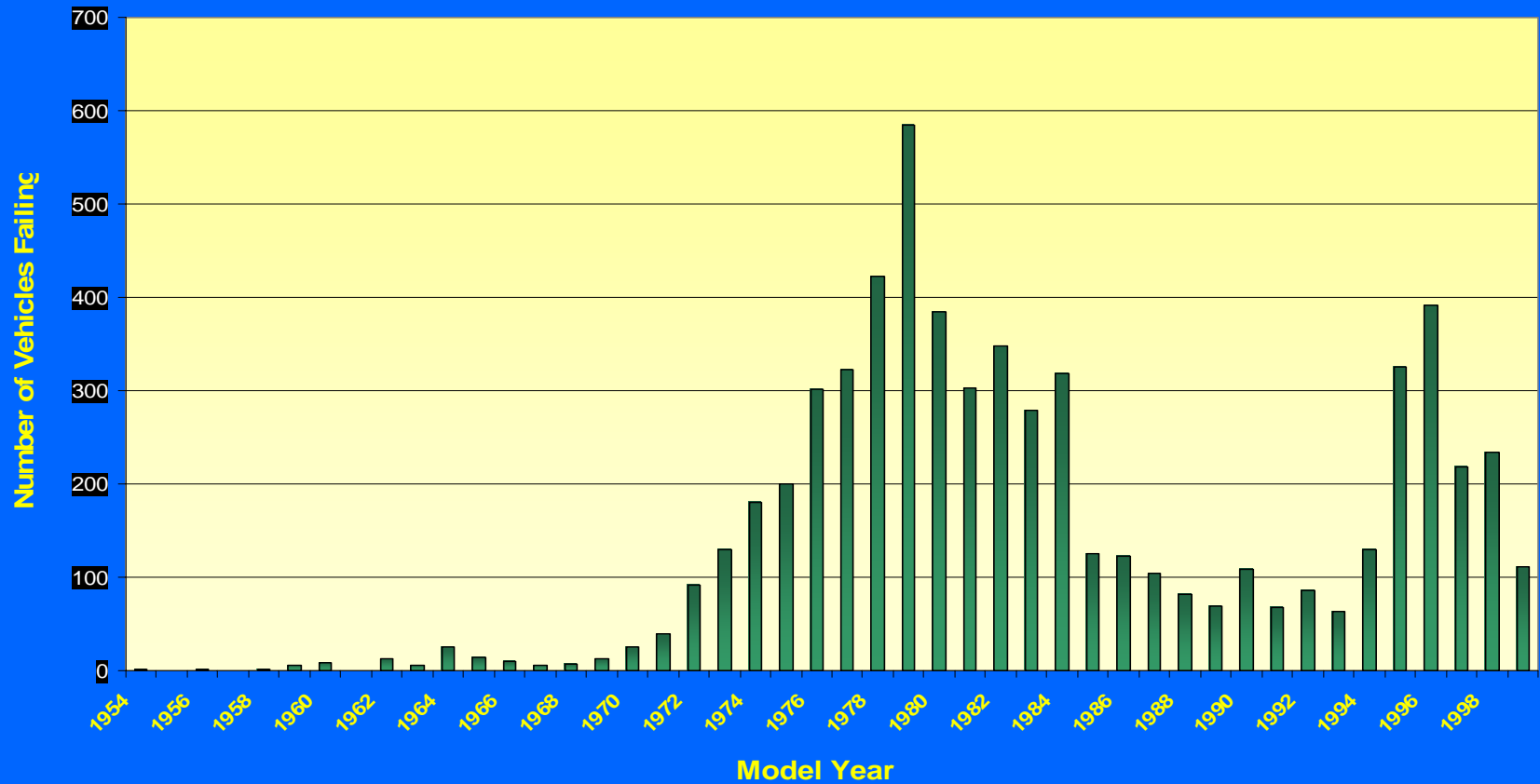
ORT Results

Overall Number of Tested Vehicles



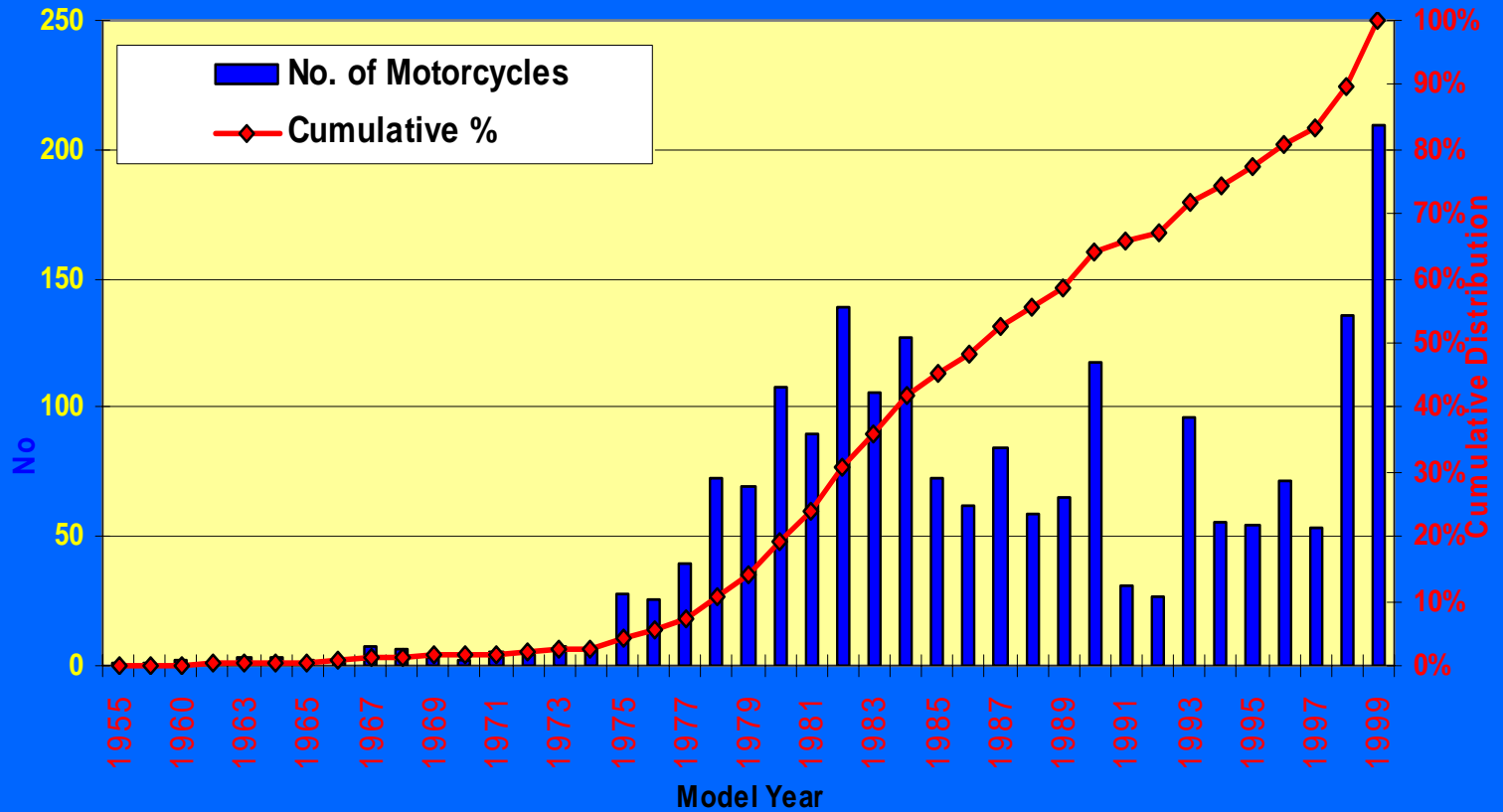
ORT Results

Vehicles Failing Emissions Test (Either HC or CO) by Model Year



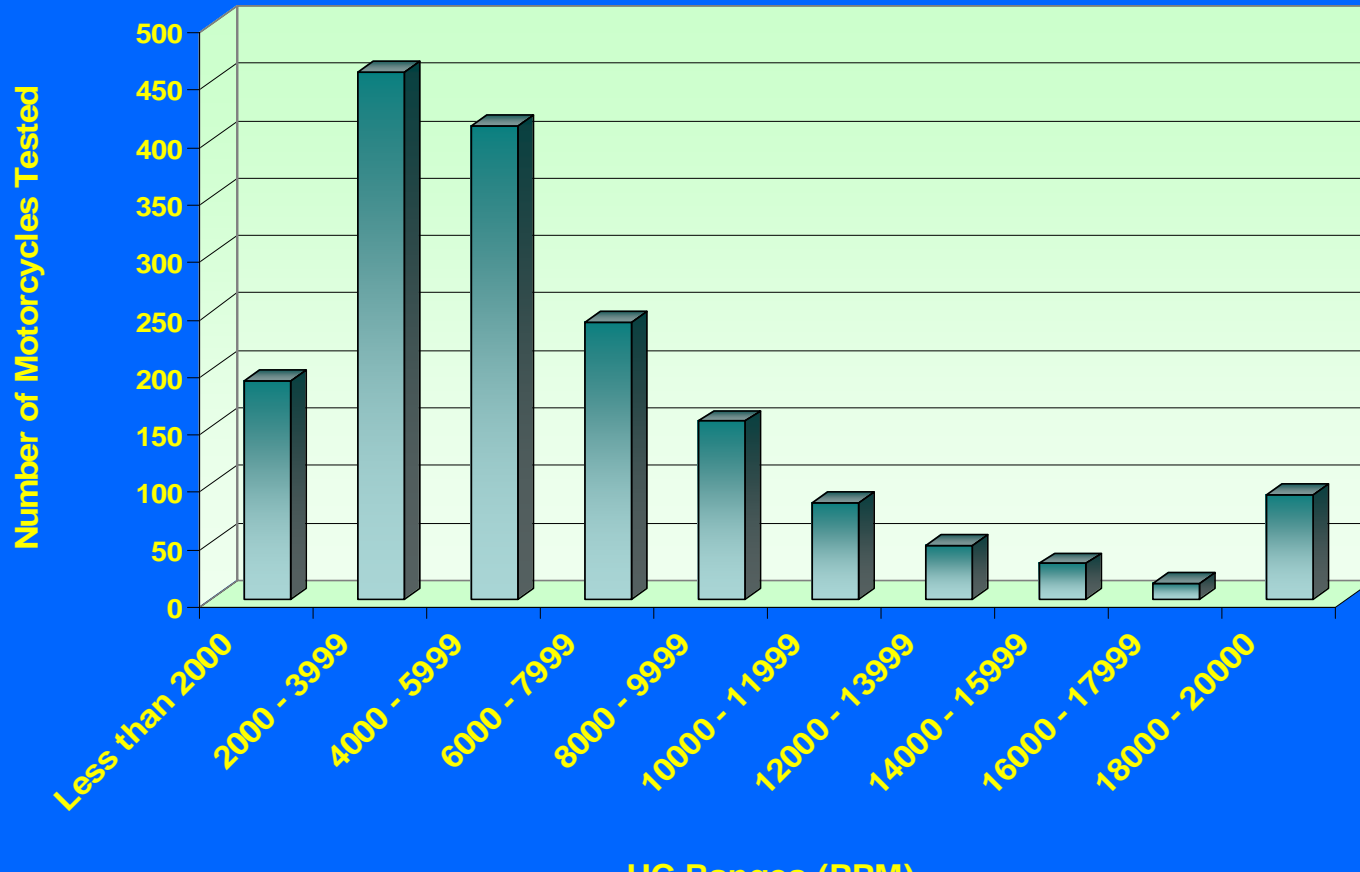
MORT Results

Motorcycles Tested by Model Year



MORT Results

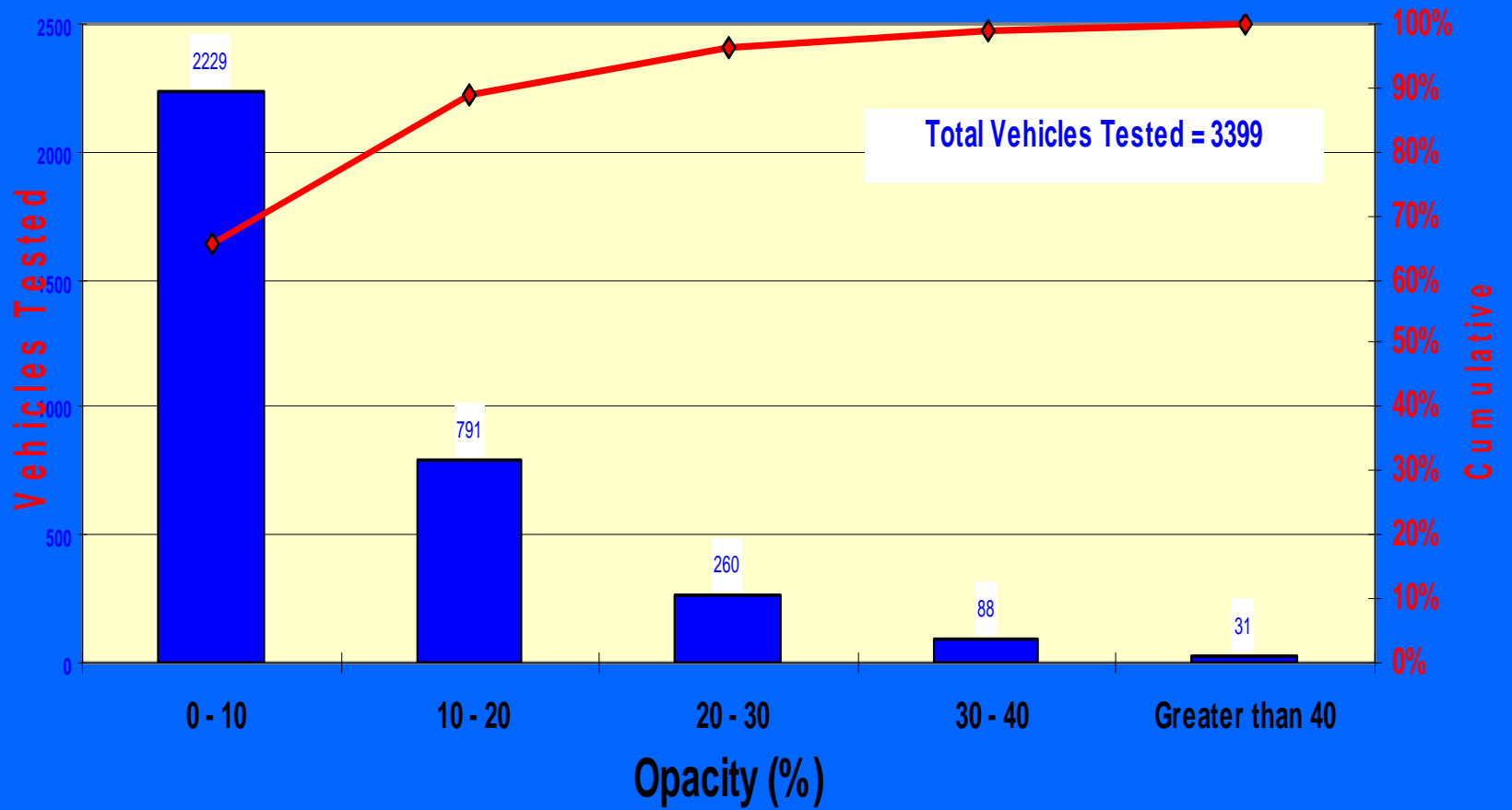
Number of Motorcycles Tested According to HC (PPM)



IMTB Program Objectives

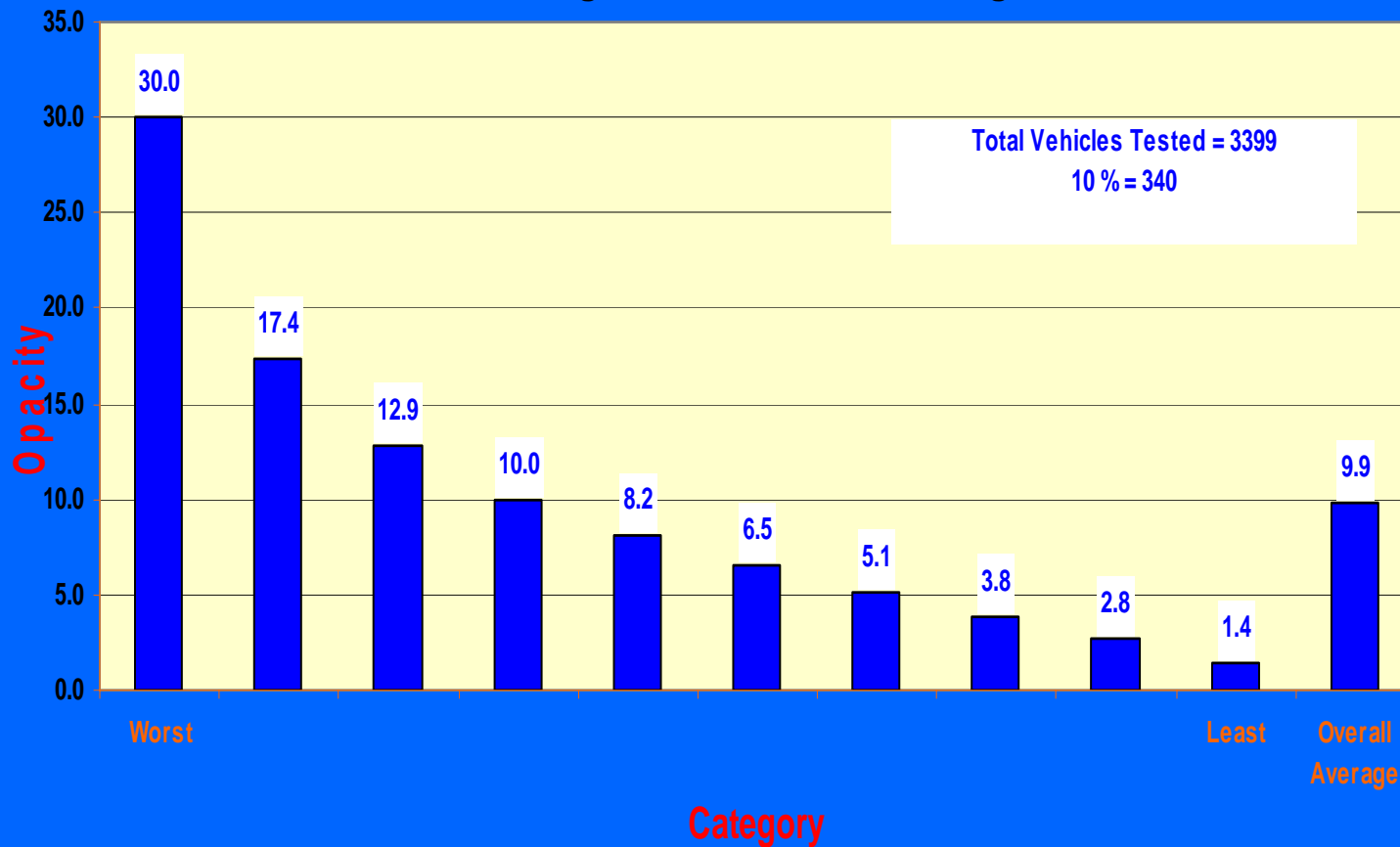
- **Reducing exhaust emissions by enhancing testing and tune-up capacities for diesel engines (transit buses).**
- **Data collection on smoke emissions to establish future Emissions Standards.**

Cumulative Frequency Vehicles and Average Opacity

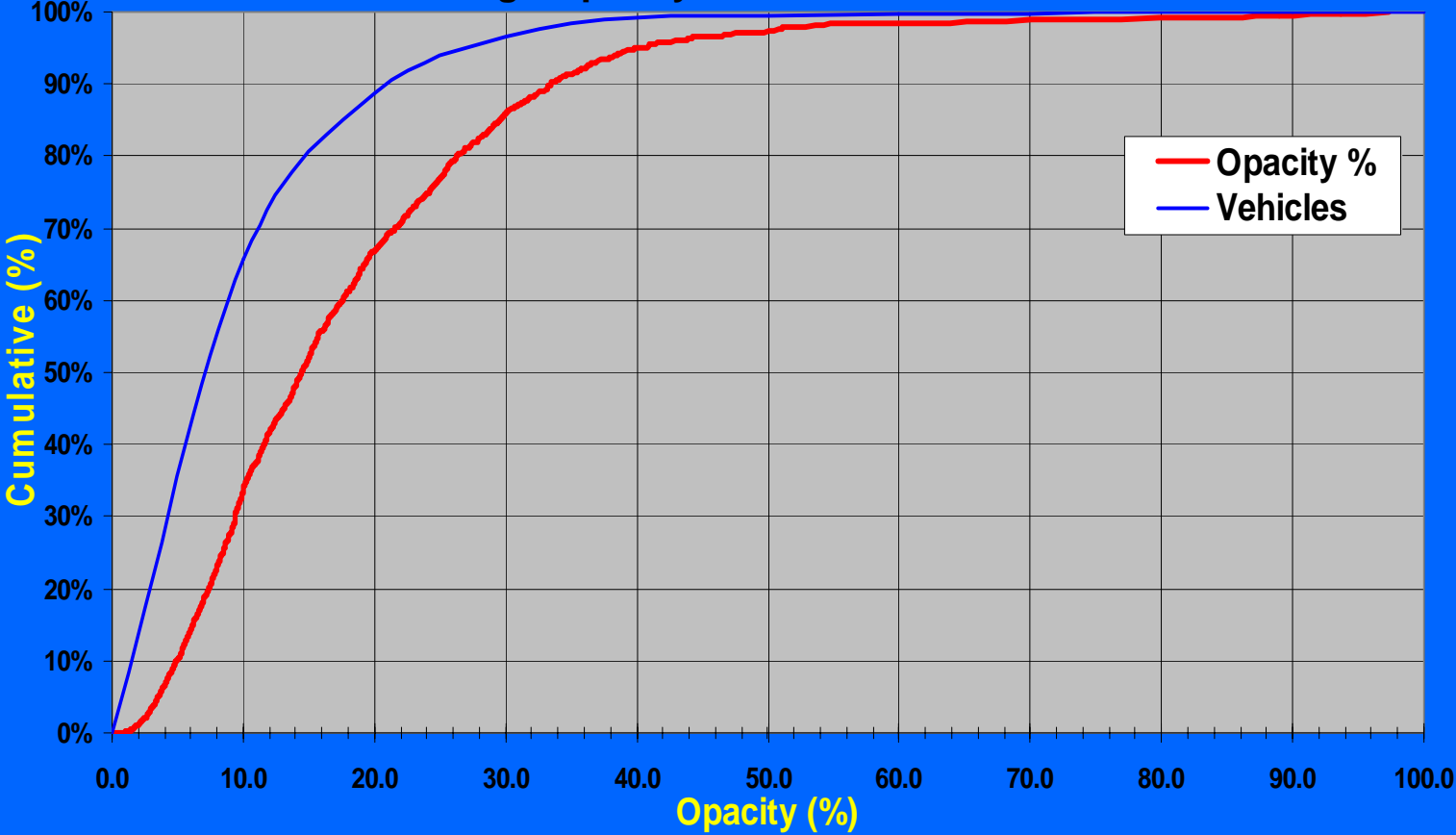


Pollution Categories

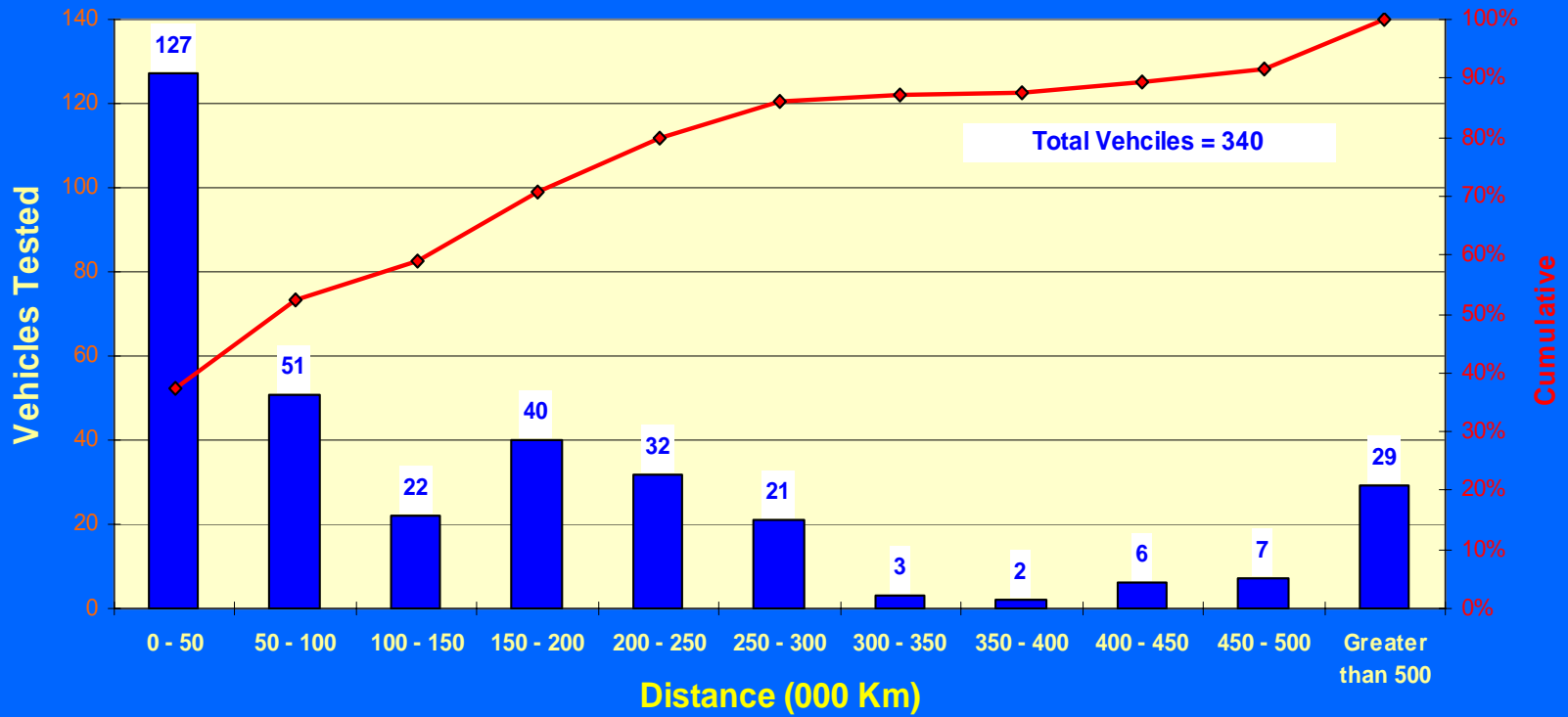
Worst Polluting 10% to Least Polluting 10%



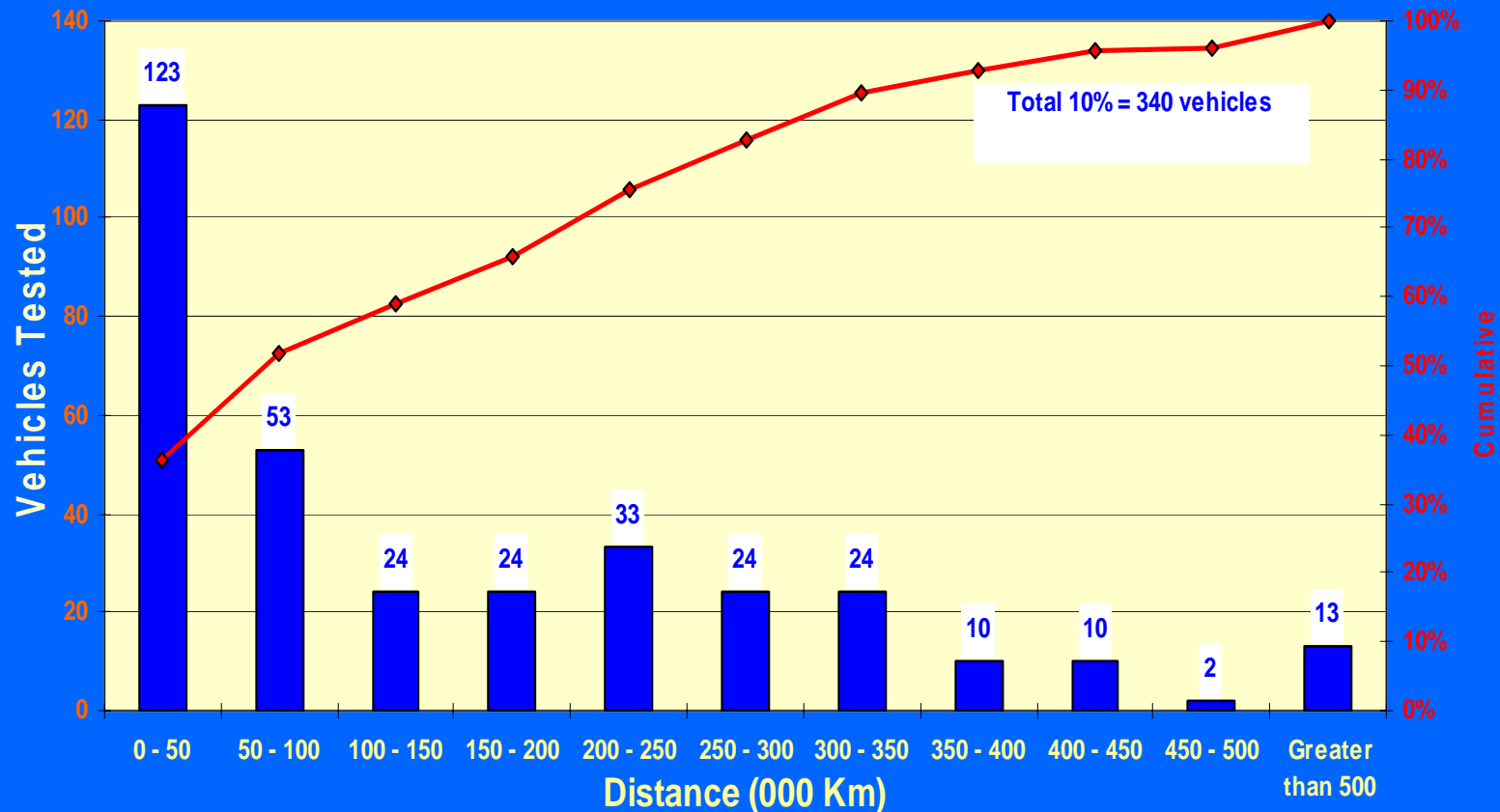
Cumulative Distribution Average Opacity and Vehicles Tested



Distance Covered by the Least 10% Polluting Vehicles



Distance Covered by Worst 10% Polluting Vehicle



Conclusions

- **Improve fuel specifications as follows:**
 - **Make unleaded gasoline available all over the country.**
 - **Reduce sulfur content to meet the European levels.**
- **Expand distribution network and fueling stations for natural gas.**
- **Develop more stringent emission standards for in-use vehicles, based on the actual failure rates.**
- **Overcome regulatory barriers to enforce international emission standards for new vehicles**