

**EXPERTS WORKSHOP ON ASSESING THE
ANCILLIARY BENEFITS AND COSTS OF
GREENHOUSE GAS
MITIGATION STRATEGIES**



27 - 29 March 2000
Washington, DC

*Co- sponsored by: IPCC, RFF, WRI, OECD, US DOE, US
EPA, Climate Institute, W Alton Jones, Rockefeller Family,
World Bank, Statistics Norway, US NREL*

**NATIONAL INSTITUTE OF ECOLOGY
GENERAL DIRECTION OF ENVIRONMENTAL
REGULATION**

CLIMATE CHANGE DIRECTION

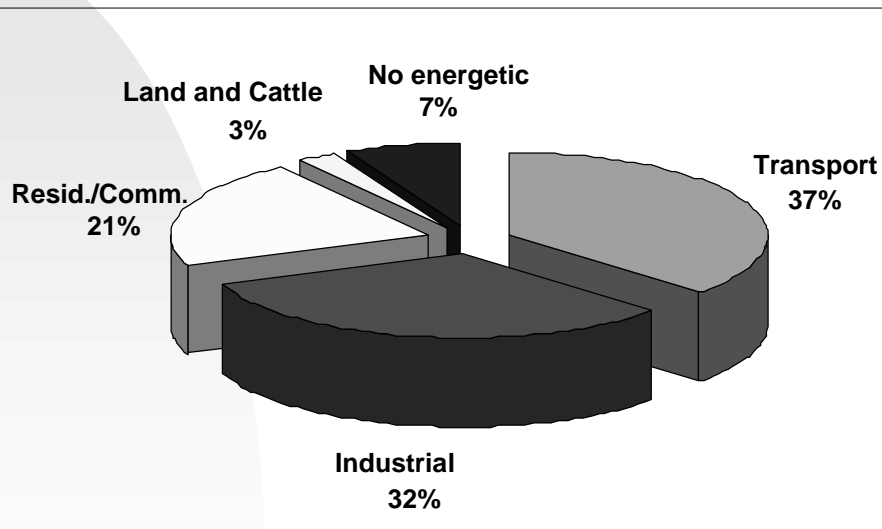
**MINISTRY OF ENVIRONMENT, NATIONAL
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<http://www.ine.gob.mx>

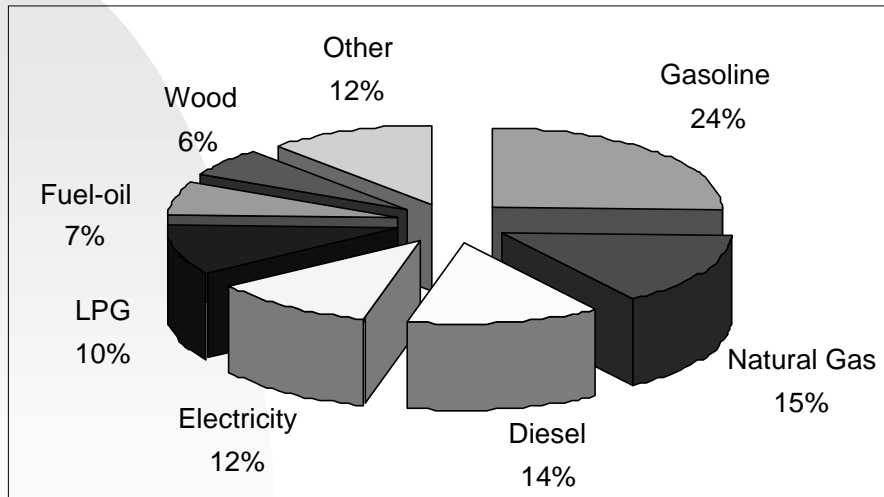
GHG Emissions in Mexico

- In Mexico, greenhouse gas emissions are produced mainly by fuel consumed to generate energy
- CO₂ accounts for 96.42 % of total greenhouse gas emissions, methane for 0.79 %, and other gases for 2.79 %
- The transport sector accounts for 32 % of emissions, electric generation for 23 %, and industry for 22 %

End-use Energy Consumption by Sector



End-Use Energy Consumption by Type of Source



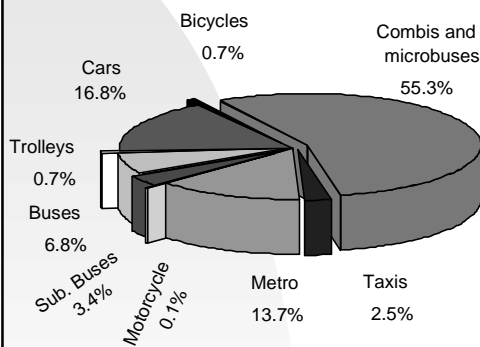
Largest City-Region in Mexico: The Mexico City Metropolitan Area

- The Mexico City Metropolitan Area (MCMA) is one of the largest urban areas in the world
- It has 18 million inhabitants, more than 3.5 million vehicles, and more than 30,000 industries
- It alone contributes with approximately
- 36 % of the national GDP

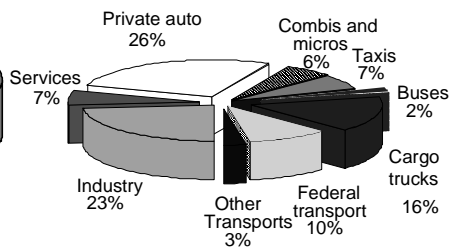
Atmospheric Pollution in Major Mexican City-Regions

- Mexico City
 - ◆ Highest levels are reached by ozone, exceeding the standard on almost 90 % of days
 - ◆ Episodes of more than 200 and 250 IMECA points are rarer (peaks have decreased)
 - ◆ PM10 is the second major pollutant, exceeding the standard on 30 to 50 % of days

Modal Distribution of Transport in MCMA



MCMA NOx Emissions Inventory by Source (1996)



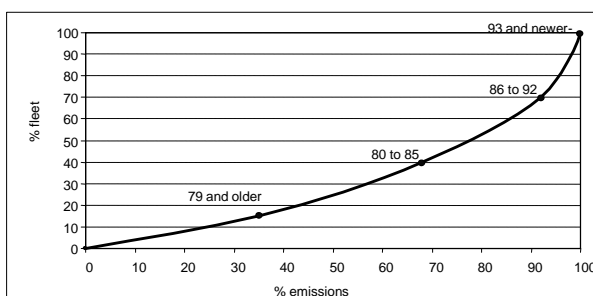
Vehicles and Use of Urban Space

- If the present tendencies continue, by the year 2010 there will be more than 5 million vehicles in MCMA, with an average speed of less than 10 km/h.
- If this happens, there will be a need for 6 to 10 thousand lineal km of roads
- But, according to recent studies from Germany and the UK, even if these roads are constructed, the traffic problem is solved only temporarily and, at the end of the day, more traffic is induced

Causes of Air Pollution in MCMA

- One of the main sources of air pollution in MCMA is transport, contributing with around 75 % of emissions
- It has been estimated that private cars, that satisfy only 21.4 % of the total demand of transport, contribute with around 35 % of transport-related emissions
- From the total vehicle fleet, most emissions come from aged vehicles

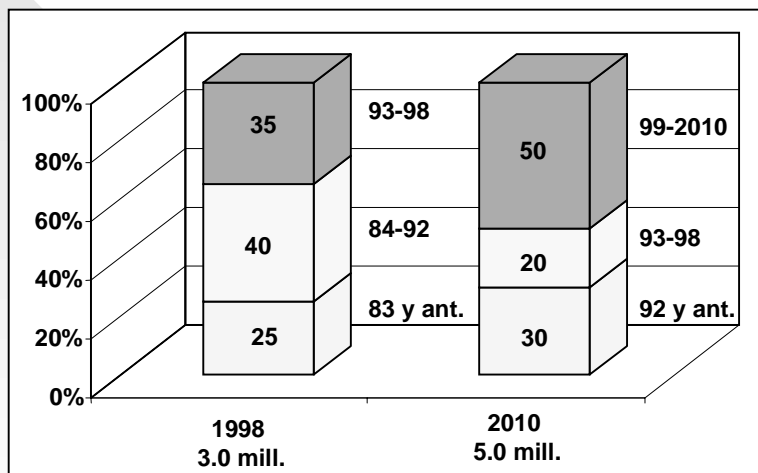
Relative Contribution to Emissions by Vehicle Year Model



Other Causes of Air Pollution in MCMA

- Other causes (different from transport) are the commercial/service activities, industry, and natural sources
- Factors to be considered include: available technologies (for production processes and pollution control), centralization, urban structure, consumption and quality of fuels
- In MCMA, air pollution is aggravated by geographical and climatic conditions

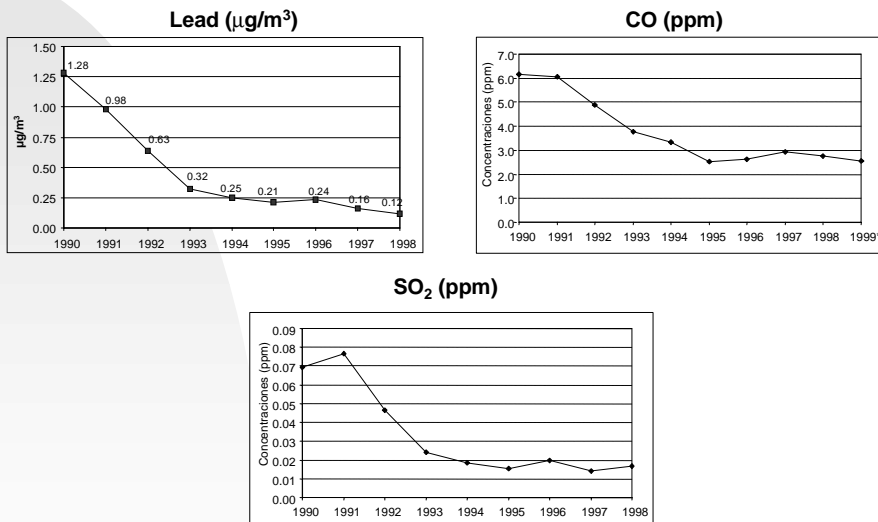
DISTRIBUCIÓN PORCENTUAL APROXIMADA DE AUTOMÓVILES POR AÑO-MODELO EN LA ZMVM



Comparison of Emission Standards for New Vehicles Between the U.S. and Mexico

	End-pipe emissions (g/km)		
	HC	CO	NOx
US Federal standards (80,000 km)			
1972	2.2	24.2	NR
1975	0.94	15.0	1.94
1978	0.94	15.0	1.25
1981	0.25	2.1	0.62
1994	0.16	2.1	0.25
Mexican standards for new vehicles			
1977	2.6	24.2	2.2
1988	2.0	22.2	2.3
1990	1.8	18.0	2.0
1991	0.7	7.0	1.4
1994	0.25	2.1	0.62
2000	0.16	2.1	0.25

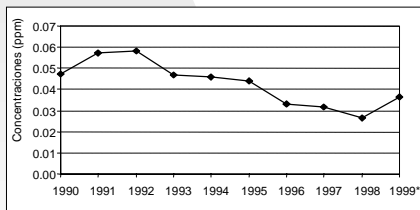
Annual Average Concentrations at a Downtown Monitoring Station (Merced)



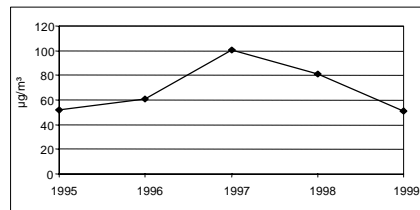
* Data for 1999: January to September

Annual Average Concentrations at a Downtown Monitoring Station (Merced)

Ozone (ppm)

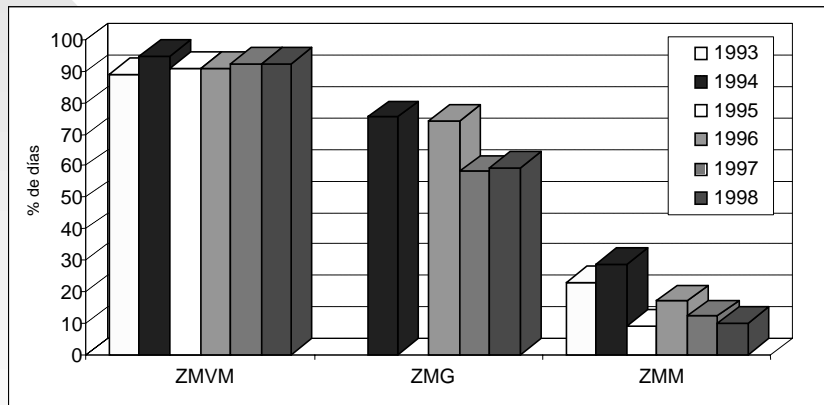


PM10 ($\mu\text{g}/\text{m}^3$)



* Data for 1999: January to September

Percentage of Days when Air Quality Standards are Exceeded in Major Mexican City-Regions



There is not enough information for Guadalajara for the years 1993 and 1995

**CENTRO NACIONAL DE SALUD AMBIENTAL
CENSA**

**MEXICO CITY METROPOLITAN AREA HEALTH
STUDY**

Supported by IDRC CANADA

The Netherlands Trust Fund (World Bank)

Pan American Health Organization PAHO

Dr. Victor Borja

vborja@toluca.podernet.com.mx

OBJECTIVES



General

To characterize, with an ecosystem point of view, the health risks of atmospheric pollution in the Mexico City Metropolitan Area, the magnitude of the damage, the costs, the perception of the social groups about the problem, and the solution alternatives.

Based on the above policies of environmental management of the Government of the Mexico City will be sustained.

Specific Objectives

1. To evaluate the health risks due to atmospheric pollution in the MCMA, and estimate the levels of exposure in past, present and future scenarios.
2. To measure the economic costs and the quality of life associated to the main health problems caused for exposure to ozone and particles less than 10 ppm in the MCMA population.
3. To evaluate the social perception of the population of the MCMA about the atmospheric pollution, its effects on health and their willingness to participate in the solution of the problem

EXPECTED RESULTS

- Data base
- Information reports
- Better understanding of the past and present exposure levels of the population
- Better knowledge of the magnitude of the population health risk and related costs
- Better knowledge of the impact of the project "PROAIRE" about the population exposure levels
- Promotion and analyses of social perception of the problem, for proposals of public awareness and social participation in urban environmental management.

- Capacity building through multi-Institutional strategies
- New knowledge and technical inputs for the elaboration Air Quality Program for the MCMA (2001-2005).
- Publication of technical reports and scientific papers

METHODOLOGY

Module A

Risk Health Evaluation and estimation of associated costs

- I. Risk Identification
- II. Dose-Answer response
- III. Exposure Evaluation
- IV. Risk Characterization
- V. Associated Costs Evaluation

Module B

Social Cognition Evaluation

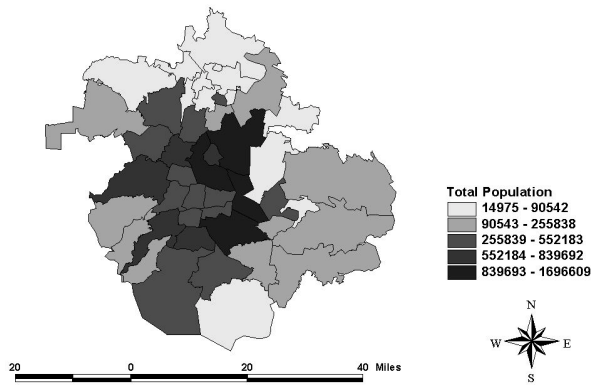
- I. Systematic Revision of the national and International literature, and elaboration of a data base about cognition and social participation in the environment and health themes
- II. Survey application to get basic information of the cognitive process. This survey will be developed in five regions of the MCMA during winter and summer
- III. Analyses of results
- IV. Formation of focused groups to get the qualitative information that allows get more detail of the perception and environmental cognition studies

Module C

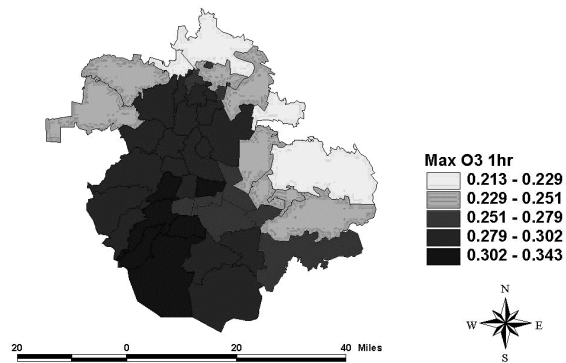
Community Ecosystem Participation

- I. Inter-Institutional Participation
- II. Training to the community
- III. Forums - Workshops about social participation on urban environmental management
- IV. Design and development of massive advertising campaign for public awareness
- V. Evaluation and publication of reports

Distribución poblacional para la ZMVM



Distribución de Máximos de Ozono en la ZMVM



Distribución de PM₁₀ en la ZMVM

