

Strategies for Mitigating Air Pollution: Introduction

Stephen Perkins

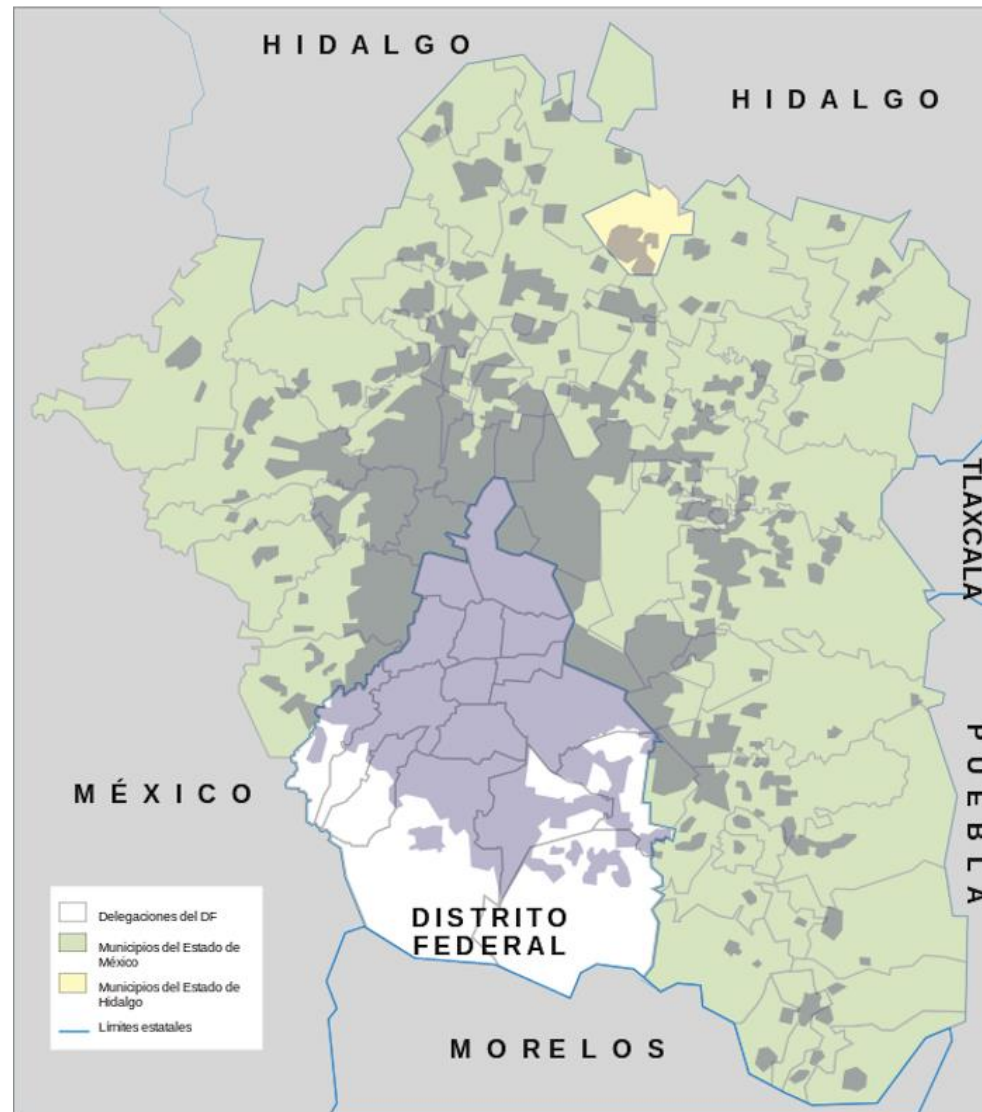
Head of Research and Policy, International Transport Forum

Mexico City, 18-19 January 2017

Mexico City, State of Mexico + neighboring States

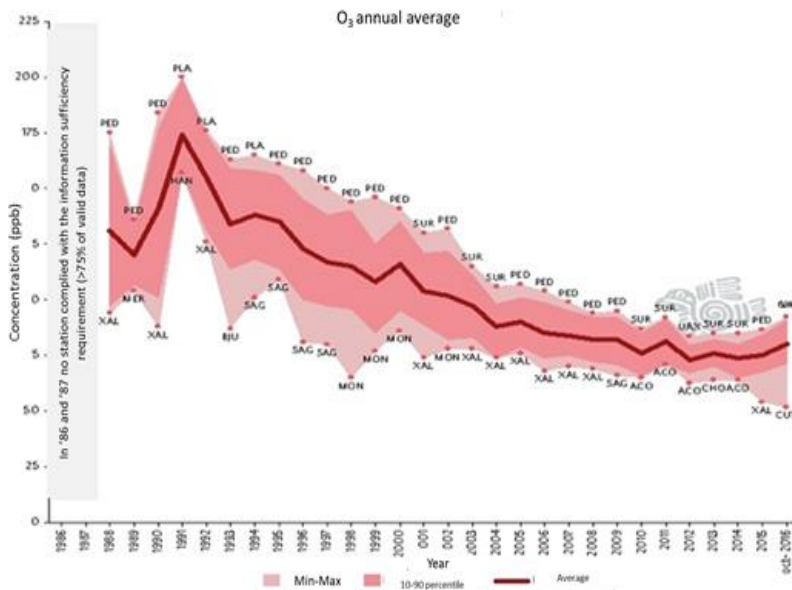


The ZMVM



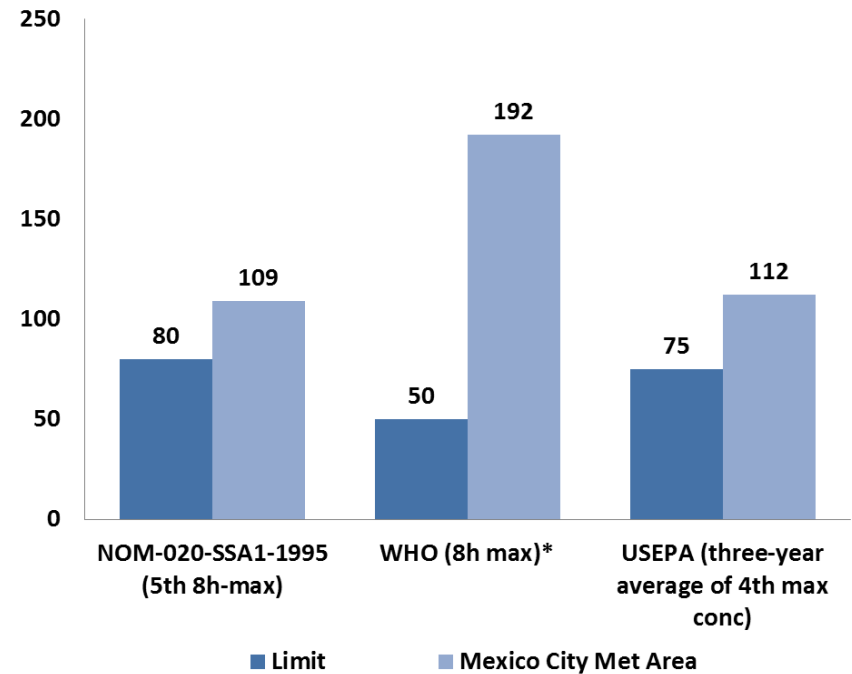
Average Ozone Concentrations

Figure 1. Trends in ozone concentrations, annual average (1986-2016)



Source: SEDEMA¹

Figure 2. Ozone concentrations vs. Mexican, WHO, and US air quality limits
Ozone (ppb)

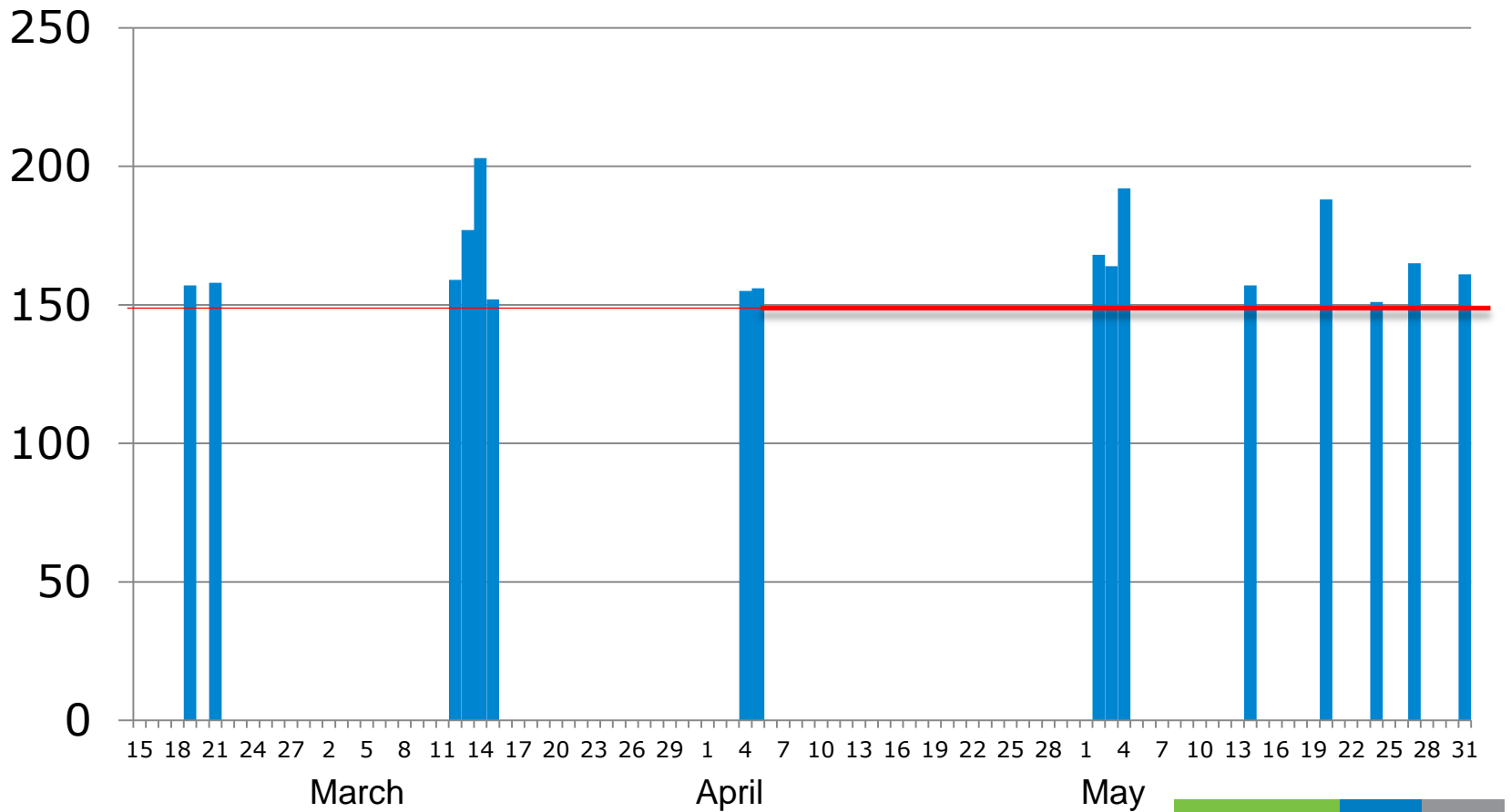


WHO recommendation = 100 $\mu\text{g}/\text{m}^3$
Source: SEDEMA¹⁰



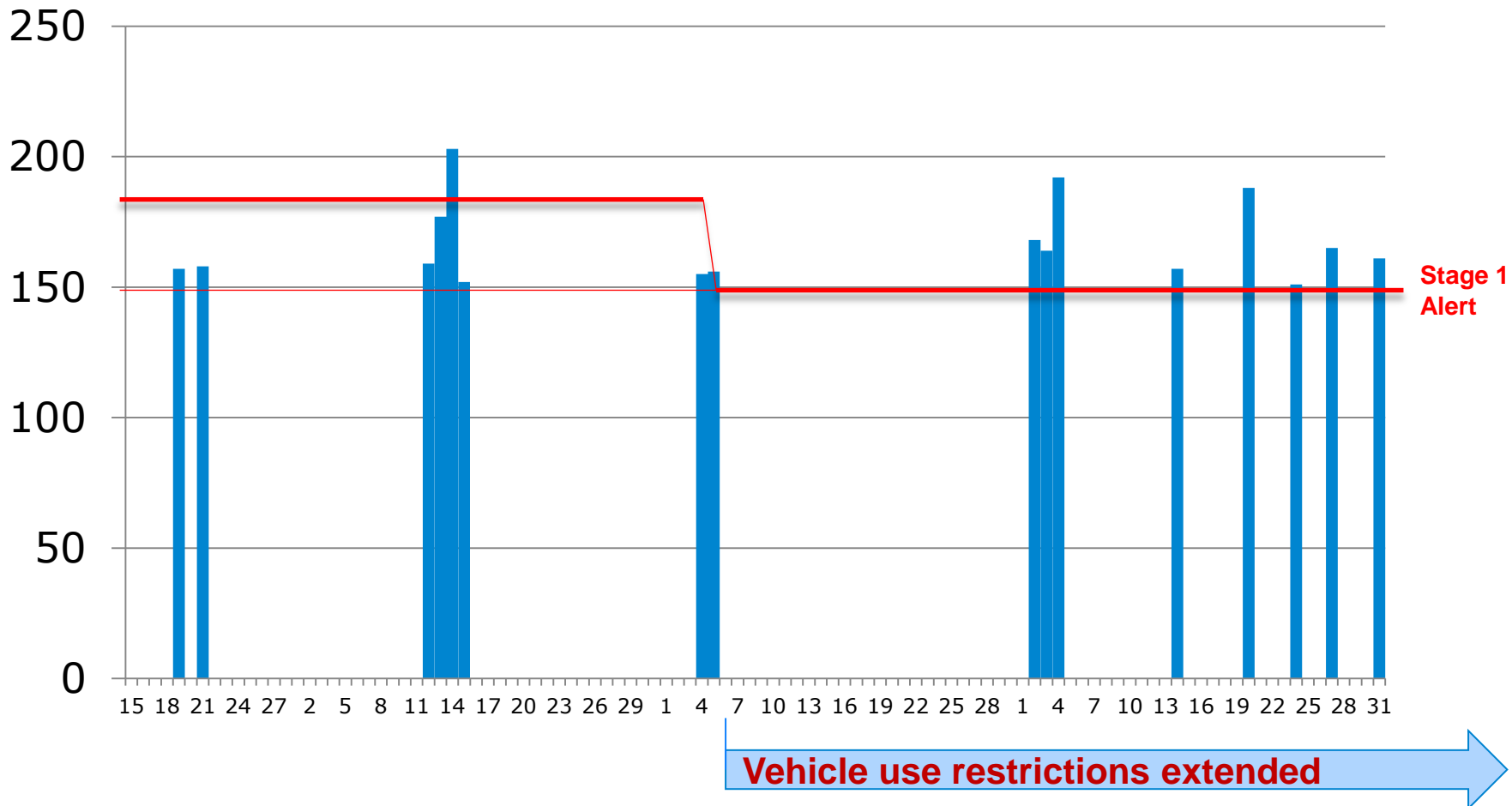
Pollution Alerts 15 February to 31 May 2016

Ozone Index



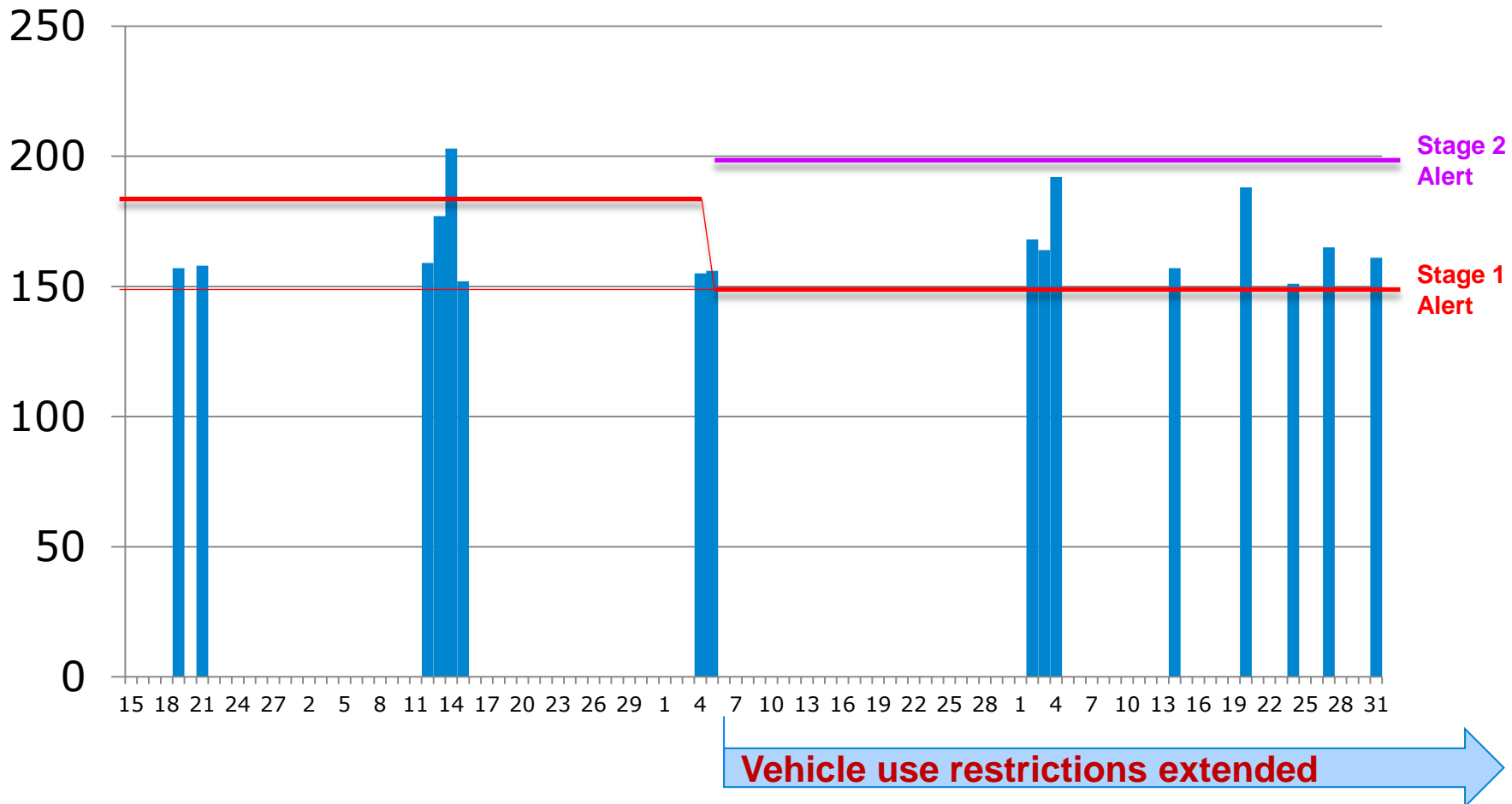
Pollution Alerts 15 February to 31 May 2016

Ozone Index



Pollution Alerts 15 February to 31 May 2016

Ozone Index



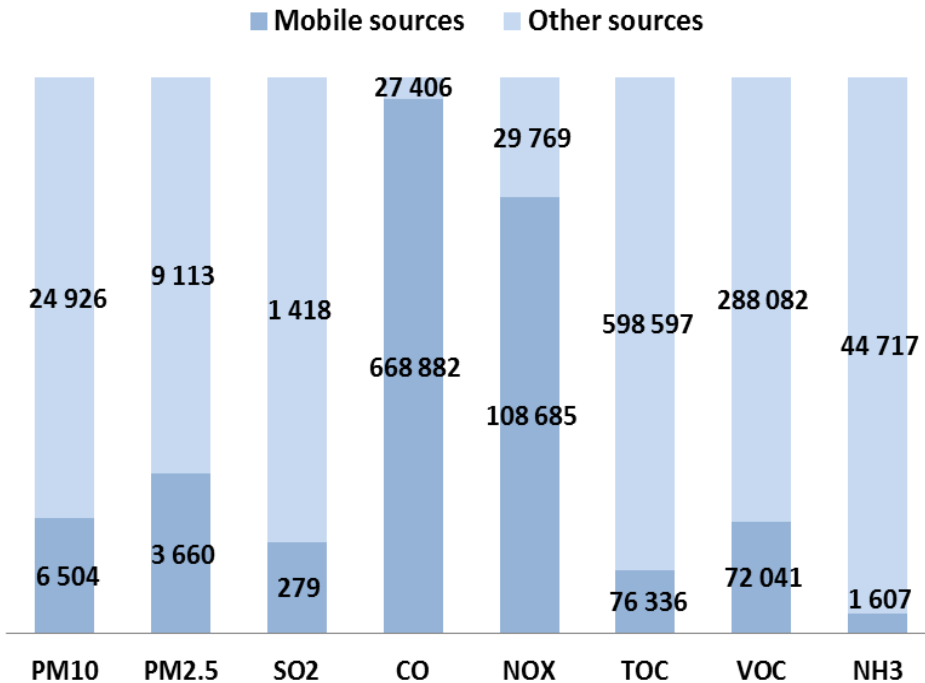
Regulatory context

Changes to air quality limits, inspections and restrictions on vehicle use

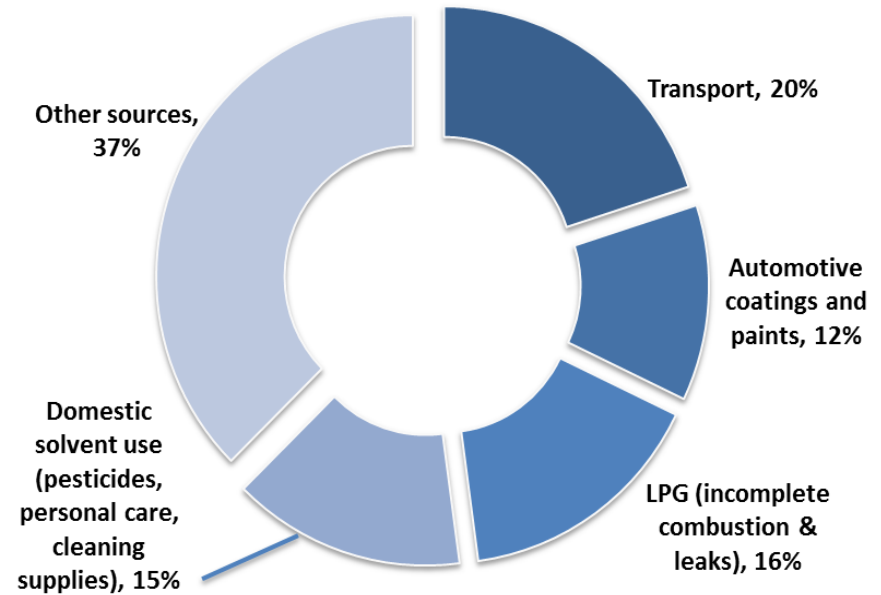
2014	8 year old vehicles and older restricted one day a week regardless of emissions test performance Court actions in protest
October 2014	Health exposure limits lowered Ozone concentration for alert thresholds lowered
Q3/4 2015	Supreme court rules against 8 year restriction Restrictions on use of older vehicles (types 1+2) suspended in response Affecting 1.3 million vehicles, 800 000 a day estimated on Mexico City roads
2016 / 2017	Inspection system renewed, restrictions to be reintroduced

Sources of emissions in the ZMVM

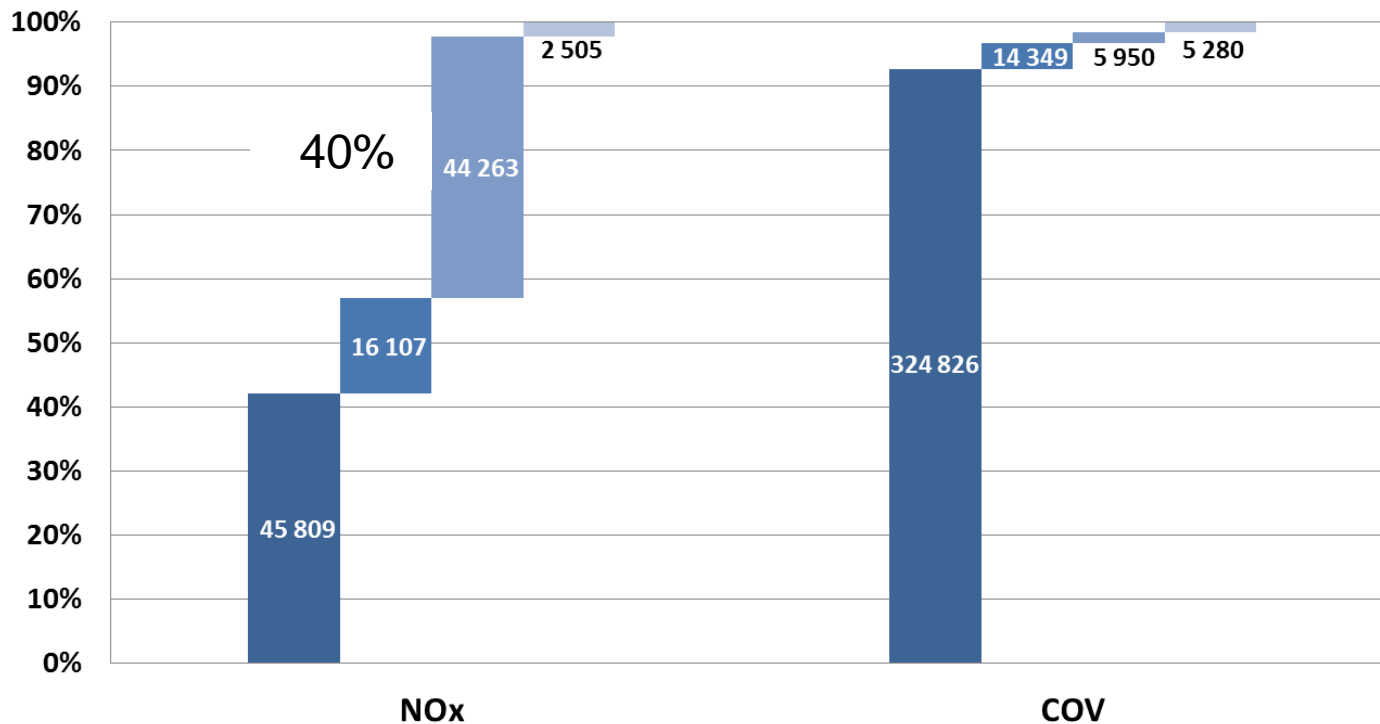
Total emissions (t/yr)



Contributions to VOC emissions



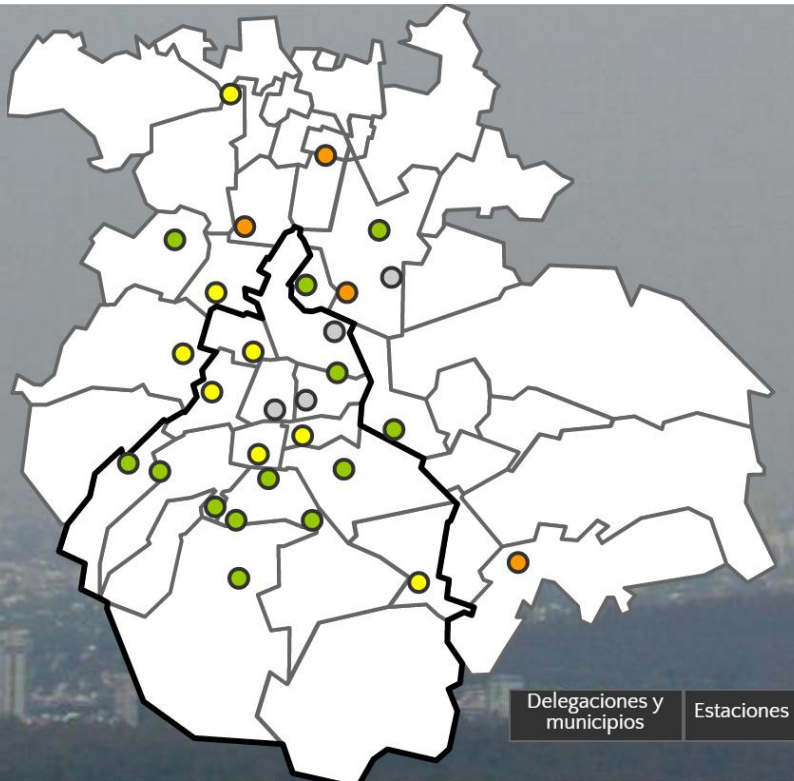
Ozone Precursors from Mobile Sources (t/yr)



- Motorcycles
- Heavy duty vehicles (trailers, transit buses, freight trucks over 3.8 tons)
- Medium duty (microbuses, pickups and trucks below 3.8t)
- Light duty vehicles (cars, SUV, vans, taxis)



Air Quality Monitoring Information System AIRE



● BUENA ● REGULAR ● MALA ● MUY MALA ● EXTREMADAMENTE MALA ● MANTENIMIENTO

Ciudad de México, martes 17 de enero de 2017 12 horas 18 °C

Calidad del aire: ● MALA

Contaminante: PM₁₀

Índice: 122

Estación: VIF-Villa de las Flores

Recomendaciones aire:



Recomendación UV:



Hoy no circulan: 7 y 8

Próx. sábado: H1 Impar H2 Todos

Este mes verifican:



Key countermeasures

- ▶ Mandatory Vehicle Inspection Programme

Programa de Verificación Vehicular Obligatorio

- ▶ No-Driving Day Programme

Hoy No Circula

- ▶ Environmental Atmospheric Alert Programme

Programa de Contingencias Ambientales Atmosféricas



Emissions Inspection Windscreen Sticker



- Inspections twice a year
 - Colour coded for day of the week for restriction.
 - Rated Standards today
- | | |
|------|----------------|
| 00 | New cars |
| 0 | 2006 models on |
| 1 | 1994 models on |
| 2 | older models |
| Fail | - |

Hoy No Circula system

Regular restrictions on the use of vehicles

Sticker colour	Last digit on number plate	Restrictions on vehicle use for certified inspection categories 1 and 2 (00 and 0 types exempt)		
		Weekdays	Saturdays 05:00-22:00 1	2
Yellow	5 6	Monday	Odd plates 1 st and 3 rd Even plates 2 nd and 4 th	All vehicles every Saturday
Pink	7 8	Tuesday		
Red	3 4	Wednesday		
Green	1 2	Thursday		
Blue	9 0	Friday		
Uncertified vehicles				
Every day		05:00-11:00	Every Saturday 05:00-22:00	
Plus one day a week		05:00-22:00		

Air pollution alert countermeasures

Alert level	Activation points (Air Quality Index)		Vehicle use restrictions:
	Ozone	PM ₁₀	
Stage I	Over 150		Classes 1+2 restricted on alternate days by odd/even number plate. Classes 0+00 exempt. Freight prohibited 06:00-10:00.
			Classes 1+2 prohibited. Classes 0+00 exempt. Freight restricted on alternate days by number plate. Perishables allowed 22:00-05:00.
Stage II	Over 200		Classes 1+2 prohibited. Classes 0+00 exempt. Freight restricted on alternate days by number plate. Perishables allowed 22:00-05:00.
Plus restrictions on asphalting, LPG distribution, wood burning.			

Other measures

- ▶ Diesel Vehicle Self-Regulation Programme
 - Preventive maintenance – exemption from Alert restrictions
 - Truck replacement scheme Euro VI / EPA 2010
- ▶ Bus Retrofit with DPF – 2015 pilot
- ▶ Comprehensive Programme for Reducing Emissions
 - CAT replacement for cars > 15 years and cars failing inspection
- ▶ School Transport Programme
 - Substituting cars with buses
- ▶ PROAIRE programmes
 - Managing traffic, coordinating planning and public transport



Some relatively neglected factors

▶ Trucks and buses

- 40% of NO_x emissions, probably much more, priority
- Euro III, IV, V no NO_x reduction in real urban conditions
- Euro VI / EPA 2010 effective, national standard urgent

▶ Buses

- DPF retrofit increased NO_x ineffective for PM in Europe, in MX?

▶ Diesel car ban √ Motorcycles?

▶ Real world driving conditions

- Should determine emissions control technology & standards
- Aggressive driving, high speeds, congestion, excess emissions
- Speed limits increase flow and reduce stop-go in congestion, effective countermeasure

Workshop discussions

- ▶ Real world emissions, implications for counter-measures
- ▶ Effective I&M
- ▶ Technology
- ▶ Managing HDVs
- ▶ Managing car use and ownership
- ▶ **Comprehensive, integrated strategies**
- ▶ Communication
- ▶ Take-aways



Contact

Stephen Perkins
T +33 (0)1 45 24 94 96
E stephen.perkins@oecd.org

Postal address
2 rue Andre Pascal
75775 Paris Cedex 16