

# **Transport Issues and the Environment in Latin America**

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# Presentation Sequence

- Some Program Contrasts--Bogotá, México, Santiago and São Paulo
- Wider Urban Contrasts--8 World Cities
- The Tricky Case of Congestion Pricing
- The Challenges--Are We Meeting Them?

# Program Contrasts: Bogotá, México, Santiago, São Paulo

- Initiatives are similar in different cities.

-BUT-

- Variations in detail often mean widely different levels of achievement
- There is much to be learned from comparative studies

# Transit Administration and Regulation



Contrasting experiences with bus regulation:

	México	Santiago	São Paulo	Bogotá
70s and before	Private Operators, some regulation	Public operation, some regulated private operators	CMTC, Municipal Bus Company operated main lines, and subcontrat other services	Private Operators subject to control from the Ministry of Transportation
80s	Governments takes over all routes, Ruta-100 is created	Total privatization and liberalization	Increase in the proportion of lines operated by CMTC. Initial BRT corridors and trolleybuses were built.	In 1987, regulation of urban buses is transferred to municipalities
90s	Ruta-100 goes bankrupt, explosive growth of informal transit	Strong move towards government's regulation of private operators, route bidding process	Privatization of Municipal Public Bus Company. SPTRans, an agency in charge of transit planning and management, is created	Municipality allowed three fare levels according to level of service to encourage fleet renewal. Restrictions to the import of new buses were lifted.
2000s	Government trying to control informal transit	Route associations becoming formal firms, international operators moving in, integration with subway	Working toward fare integration. New BRT lines being built.	Transmilenio is launched. Fare integration with other private operators.

# Colectivos: Mexico

- Tolerated since the 1950s--recognized in the 1960s
- Licensed to service metro stations from 1969
- Needed because of failure of public transport
- Advocated by the profession and the international banks during the 70s--high service level, wide coverage. Each vehicle averages 700 passengers, 150 km./day
- Loose operating specifications and weak oversight
- GENUINE DILEMMA

# Travel Demand Management



## A comparison of traffic ban programs:

	<b>México City</b>	<b>Santiago</b>	<b>Bogotá</b>	<b>São Paulo</b>
Name of the program	Hoy no Circula	Restricción Vehicular	Pico y Placa	Rodizio
Hours of operation	5:00 – 22:00	7:00 – 19:00	7:00 – 9:00 17:00 – 19:00	7:00 – 10:00 17:00 – 20:00
Vehicles that are subject	Only vehicles built before 1993	Only vehicles built before 1992	All vehicles	All vehicles
% of these vehicles banned each day	20%	20%	40%	20%
Comments	<ul style="list-style-type: none"> <li>•Relative high cost of new vehicles From 1989</li> <li>•has incentivated the purchase of old cars</li> <li>• Fixed schedule</li> </ul>	<ul style="list-style-type: none"> <li>• From late 80s</li> <li>• Low tariffs and a rotatory schedule (changes once a month) have reduced the incentives to buy secondary cars</li> </ul>	<ul style="list-style-type: none"> <li>• From 1998.</li> <li>• Fixed schedule (changed once a year)</li> </ul>	<ul style="list-style-type: none"> <li>• From 1996.</li> <li>• Only within central area</li> <li>• Fixed schedule</li> </ul>

# **Hoy No Circula: Mexico Mixed Opinion: a Dialog**

- Objectives both environmental and congestion oriented.
- México goes from net exporter of used cars to net importer.
- '95 Estimate that 22% drivers get second vehicle
- But contributes to solving environment and congestion problem

# Metros: Scale, Performance



	<b>Mexico City</b>	<b>Santiago</b>	<b>Sao Paulo</b>
Number of lines	11	5	4
Total extension (km)	202	60	58
Passengers per year (million)	1,430	200	520
Passengers per km of alignment (million)	7.1	4.9	10.1
Average fare per passenger (US cents)	16.1	38.0	33.6
Mode Share (over motorized trips)	12% (1999)	7% (2001)	8% (1997)

# Urban Transportation Modeling



	<b>México City</b>	<b>Santiago</b>	<b>Bogotá</b>	<b>São Paulo</b>
Models being used	EMME/2	ESTRAUS (developed in Chile), EMME2	EMME/2, Transcad, Tranus	MVA's START
Who maintains the data?	Secretary of the Environment, DF	SECTRA, Ministry of Public Works	Secretary of Transportation of Bogota, Transmilenio.	Secretary for Metropolitan Transportation
O/D surveys	Last one in 1994, which has some errors	Last one in 2002		Last one in 1997
Comments	<ul style="list-style-type: none"> <li>• Not enough resources to maintain the model</li> <li>• Not very useful at present state</li> </ul>	ESTRAUS is integrated with land-use model (MUSSA) and emissions model (MODEM)		START was adapted to SP for the formulation of a transportation plan for 2020 (PITU 2020)

# Focus on the Two-Wheeler Dilemma

City	Belo Horizonte	Chennai	Dakar	Kuala Lumpur	Mexico City	Mumbai	Shanghai	Wuhan
Region	Latin America	South Asia	Africa	South East Asia	Latin America	South Asia	Asia	Asia
GDP per capita (US\$)	\$6,000	\$800	\$1,500	\$8,000	\$7,500	\$1,200	\$4,200 (2000)	\$2,000
Population millions	4.2	7	2.5	4	18-23	18	13-17	4-8.5
Average annual growth rate	1.5%	2.4%	3.2%	2%	2%	3%	0.42%	1%
Density (population/ hectare)	4-63	59-288	35	10-58	50-120	120-460	14-460	10-160
Age distribution	26%<15 4%>65	26%<15 8%>60	43%<15 5%>55	27%<15 4%>65	30%<15 5%>65	26%<15 6%>60	12%<15 12%<65	16%<15 12%>65
Trip rate (trips/day)	1.43 (1995)	1.24 (1993)	2.3 (1998)	2.4 (1997)	1.2-1.4 (1994)	1.26	1.95 (1996)	2.25 (1998)
Personal vehicles/1,000 pop.	225 4-wheelers 22 2-wheelers	40 4-wheelers 171 2-wheelers	42	300 4-wheelers 170 2-wheelers	110 8 2-wheelers	27 4-wheelers 25 2-wheelers	4-20 4-wheelers 35 2-wheelers	14 4-wheelers 31 2-wheelers
Rail transit	1 line metro	1 line metro 3 suburban rail	1 suburban rail	3 lines LRT 2 sub rail	11 line metro	2 suburban rail Services 3 lines	3 metro lines	none
Fare (US\$)	\$0.30	\$0.10		\$0.20-0.60	\$0.20		\$0.12-0.50	
Non-motorized transport	5-7% (1995)	44%	44%	NA	NA (possibly 15%)	NA 26% in 1981	72% (1995)	61%
Public transport	69% (1995)	47%	45%	20% (of motorized)	70% (of motorized)	88% (of motorized)	17% (1995)	22%

Image by MIT OpenCourseWare. Source: World Business Council for Sustainable Development (WBCSD), Overview of Main Traits of Developing Countries.

## Guayaquil, Ecuador

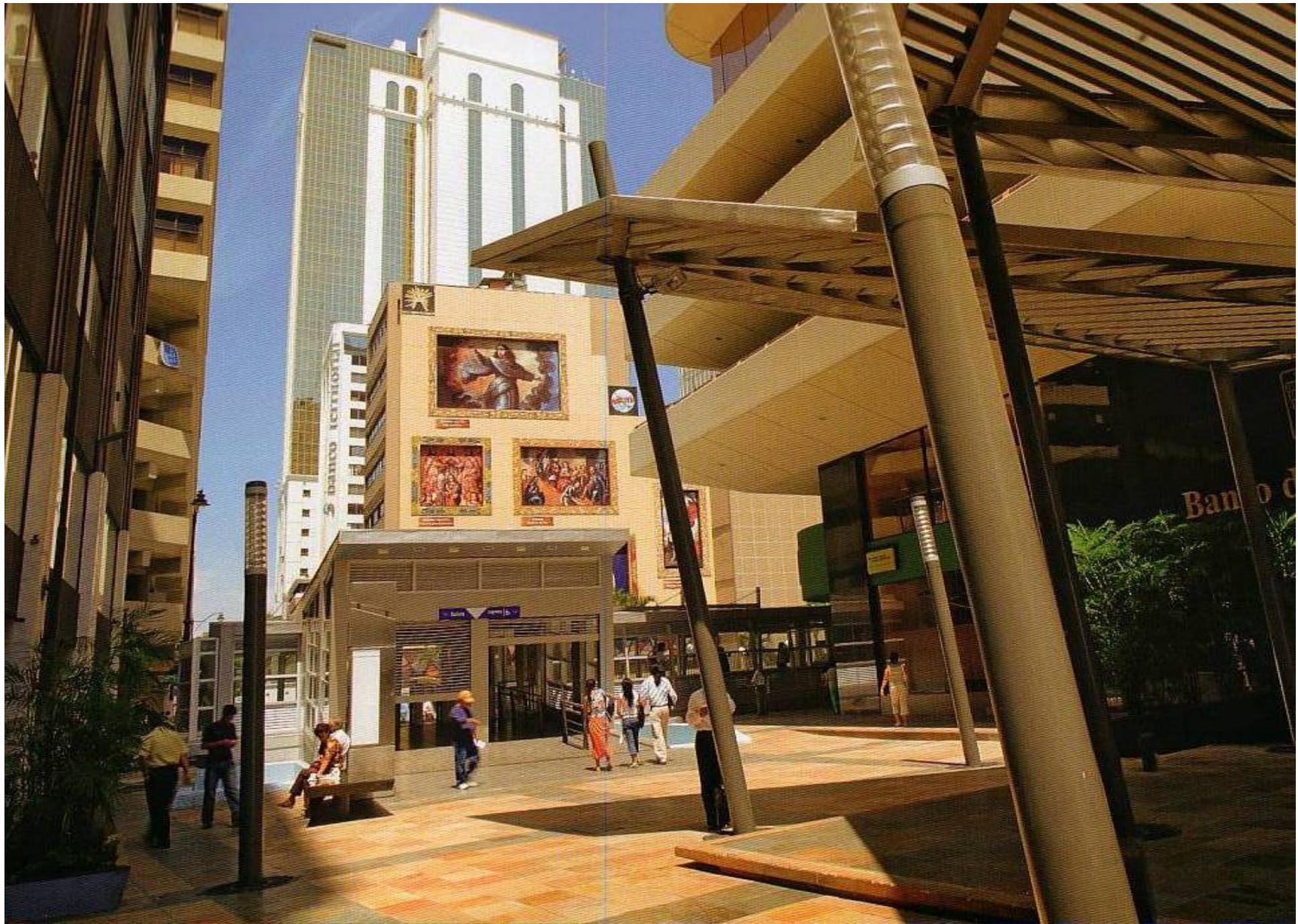


Carlos González B.; César Arias 2006

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# TranSantiago: the Problems

Many agencies--national gov. dominance, no executive role

Inadequate system completion and buses, many transfers

Only on-board ticket reading

Few dedicated lanes

Station stop door positions not indicated

## **CONGESTION PRICING - DEFINITION**

A charge on vehicle use levied at points of congestion for the purpose of reducing the number of vehicles below congestion level ..... and collecting revenue.

# Types of Congestion Pricing

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- Area Licensing Zone (ALZ) around Central Business District (as in London, formerly Singapore).
- Large Perimeter Scheme (as in cities of Norway).
- Area Coverage Scheme (as in Singapore).
- Street or Highway Lane Based Scheme (as in Houston).

# Road Pricing -- A Broader and Different Concept

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Possible by such means as:

- Gas Taxes
- Purchase Taxes on Vehicles
- Licensing, Highway Use or Other Periodical Charges
- Parking Taxes



Not Congestion Pricing because they are not based on location and time of road use.

# Institutional Links for Congestion Pricing

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- Trip makers who will pay the tariff
- Trip makers who will take other options
- Trip makers who are disadvantaged by the initiative
- Trip makers unaffected by the initiative
- City center retailers and employers
- Transit concessionaries
- Public transit agencies
- Plans for the use of revenue
- Responsible elected public officials

# Public Acceptability:

## What to Call Congestion Pricing?

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- Congestion Pricing
- Value Pricing
- Rationing
- Externalities Charges
- “Fairness” Management
- Road Pricing

# Congestion Pricing Survey

## Mexico City, January 2004

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### Congestion Pricing – objectives

- Method to manage demand, and allocate road space efficiently between different modes by charging a fee.
- Improves utilization of present road capacity to reduce need for large investments (such as Segundo Piso)
- Implies that people pay a fee to reflect the “true costs” of car use in congested urban areas. These include: time delays due to congestion, pollution, fuel costs, road accidents, road maintenance and operation costs
- Increases efficiency of public transport (buses)
- Raises revenues and can reduce fiscal deficit

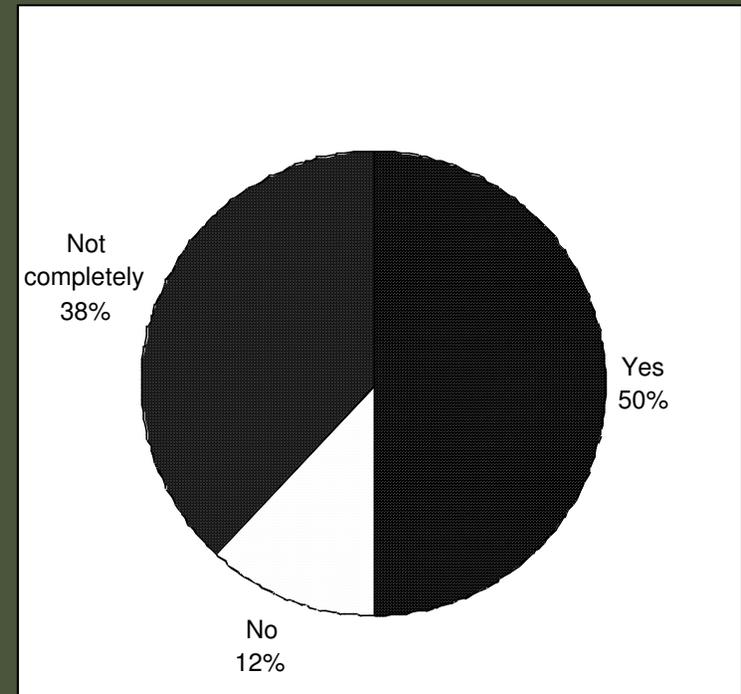
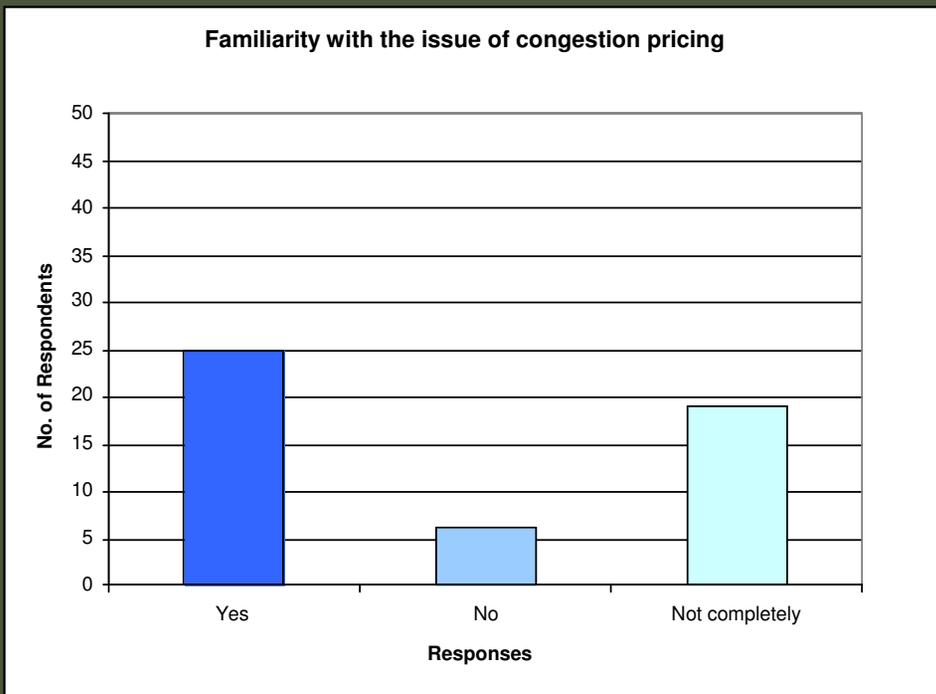
This was the Introduction at the start of the survey sheet for those not familiar with Congestion Pricing.

# Survey Questions and Responses

Total Mexican Respondents = 50

1) Are you familiar with the concept of congestion pricing?

Yes: 19      No: 25      Not Completely: 6



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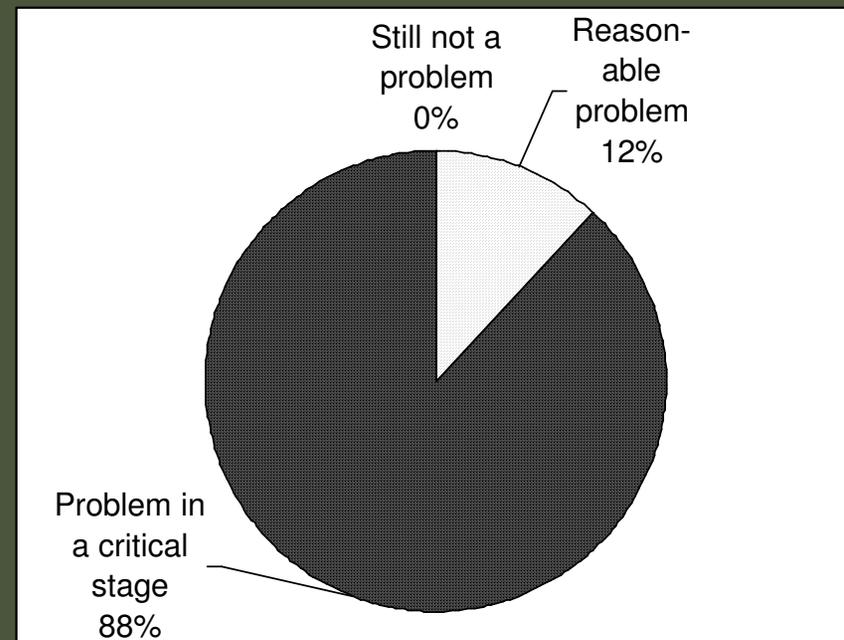
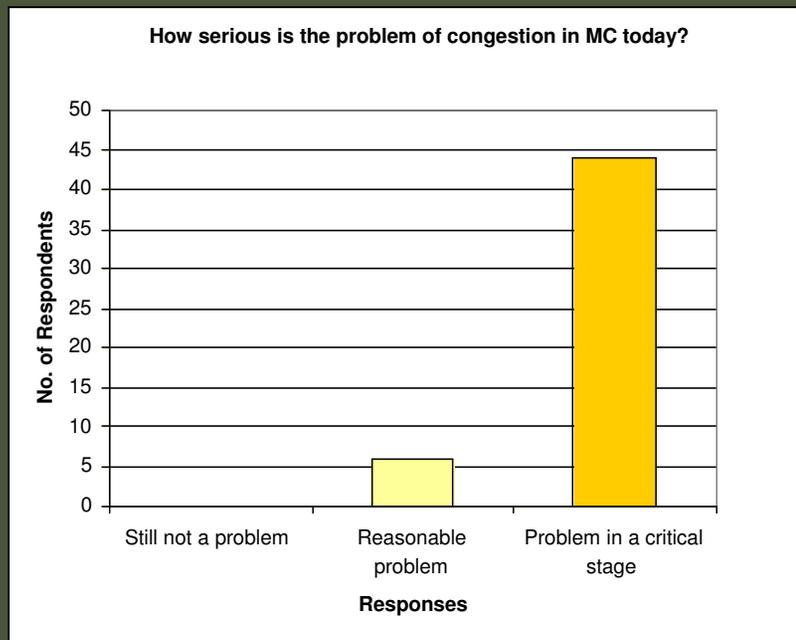
# Survey Questions and Responses

1) How serious do you consider the problem of traffic congestion in Mexico City today?

Still not a problem 0

Reasonable problem 6

Problem in a critical stage 44

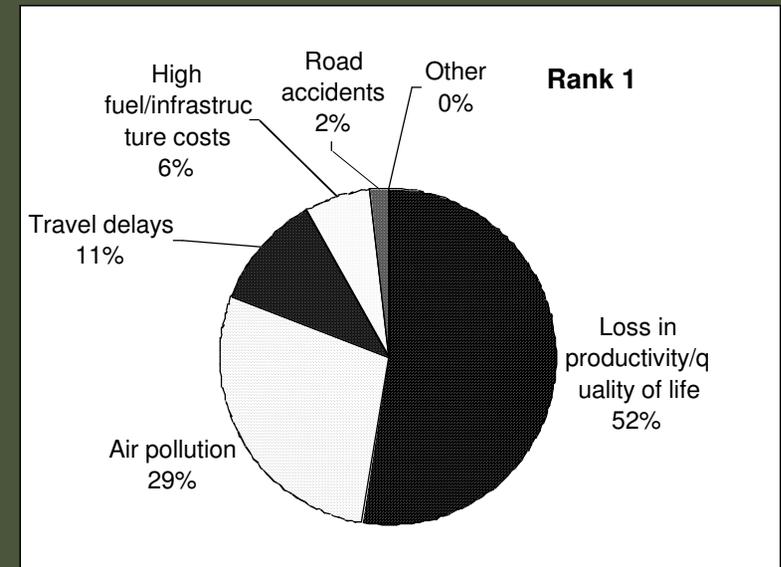
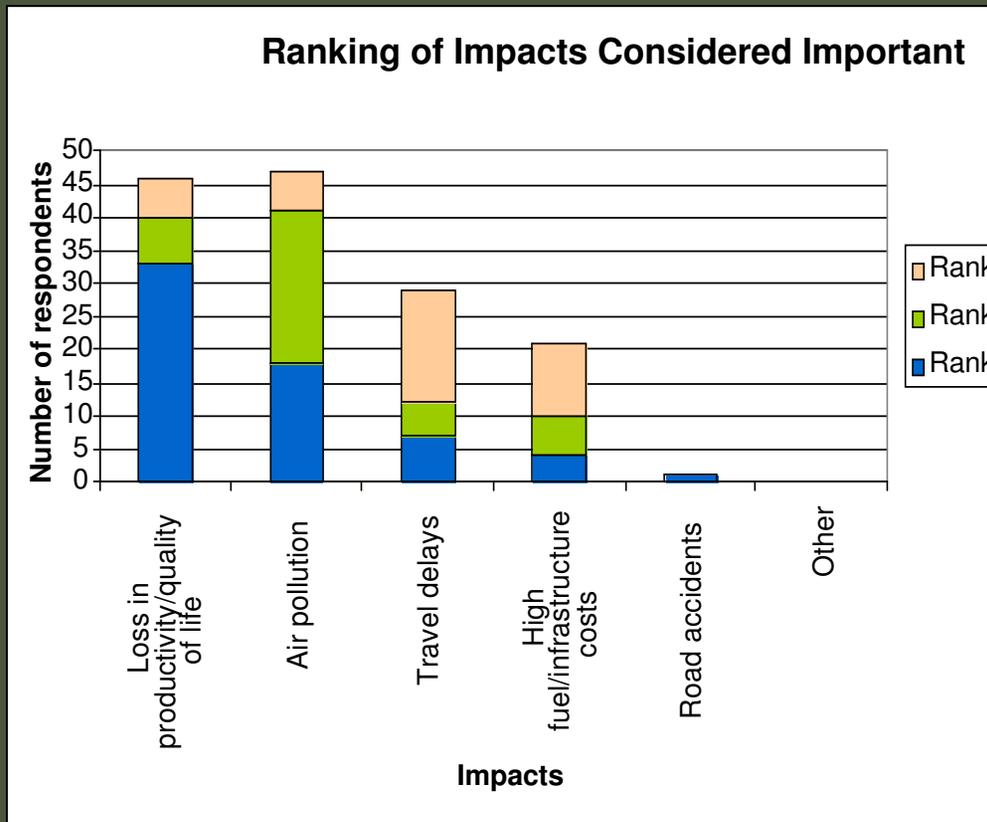


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# Survey Questions and Responses

3) What do you think is the worst impact of traffic congestion in Mexico City? Please rank top 3 options.

Loss in productivity/quality of life \_\_\_\_\_ Travel delays \_\_\_\_\_  
 Road accidents \_\_\_\_\_ Air pollution \_\_\_\_\_  
 High fuel/infrastructure costs \_\_\_\_\_ Other \_\_\_\_\_



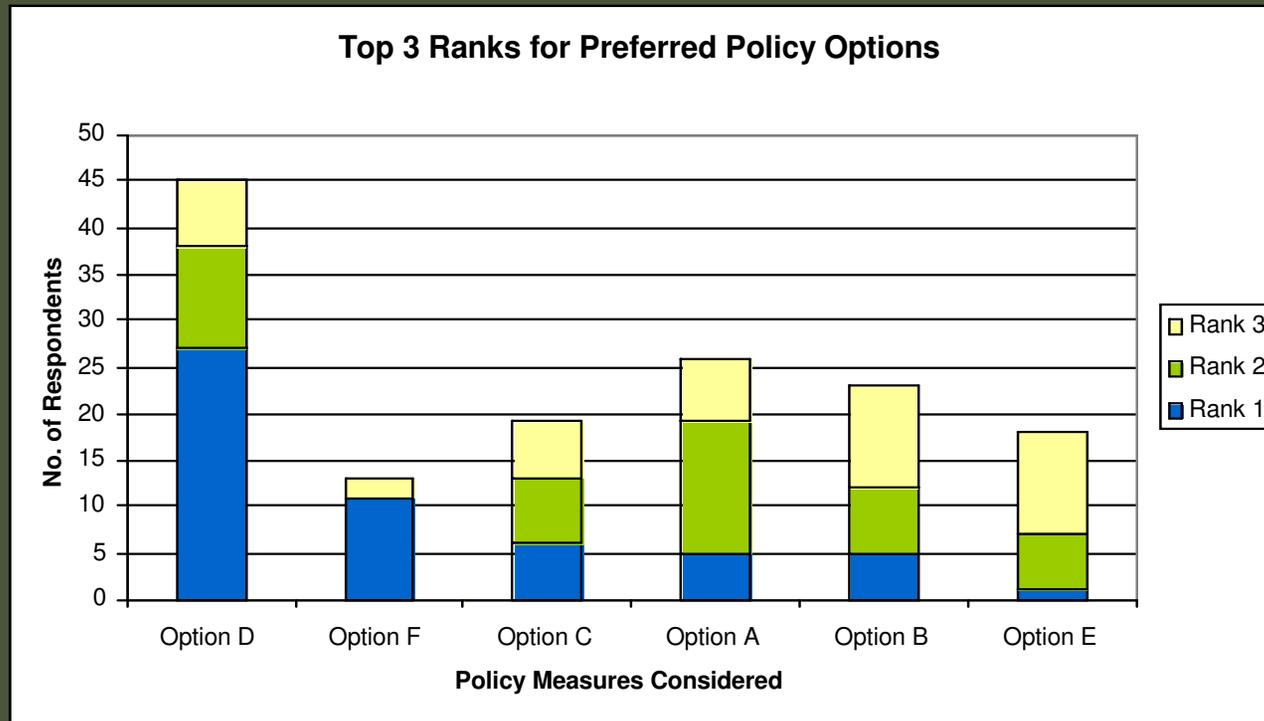
Travel delays



Loss in productivity/quality of life  
(can be added up)

# Survey Questions and Responses

## Best Way to Deal With Traffic Congestion in Mexico City



### OPTIONS KEY

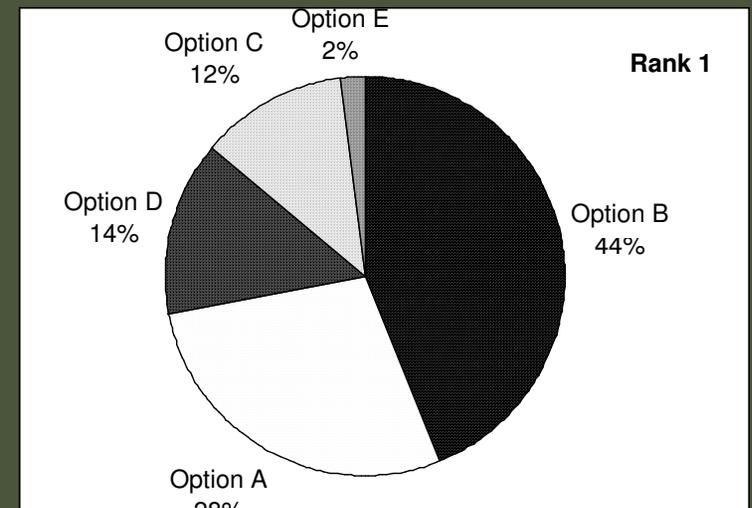
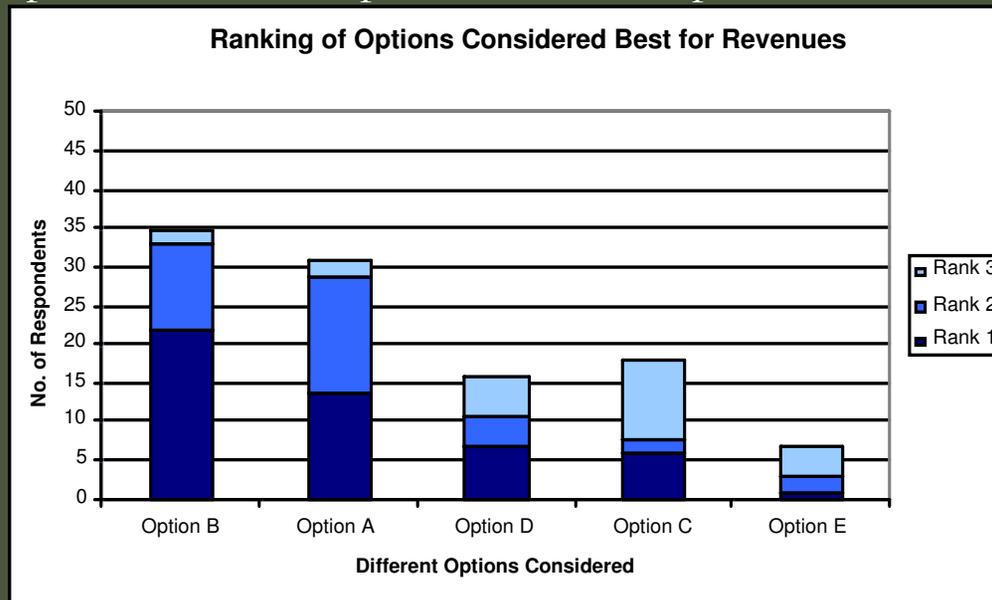
- A** - Reform parking policies, and introduce higher parking charges in congested area
- B** - Introduce congestion pricing, applicable either during peak hours or on certain congested city roads
- C** - Use traffic bans such as Hoy No Circula or Pico y Placa
- D** - Improve public transport, use physical restraints such as bus-only lanes and pedestrian zones
- E** - Expand infrastructure and increase road capacity
- F** - Any combination of the above policies (you may suggest combinations)

# Survey Questions and Responses

## 5) Best Option for Raising Revenue:

Which of the following do you think will be best for raising revenues? Please rank top 3.

Option A \_\_\_\_\_ Option B \_\_\_\_\_ Option C \_\_\_\_\_ Option D \_\_\_\_\_ Option E \_\_\_\_\_



### OPTIONS KEY

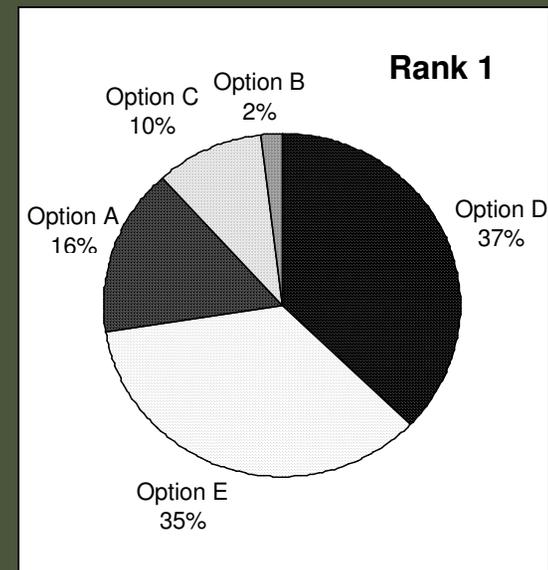
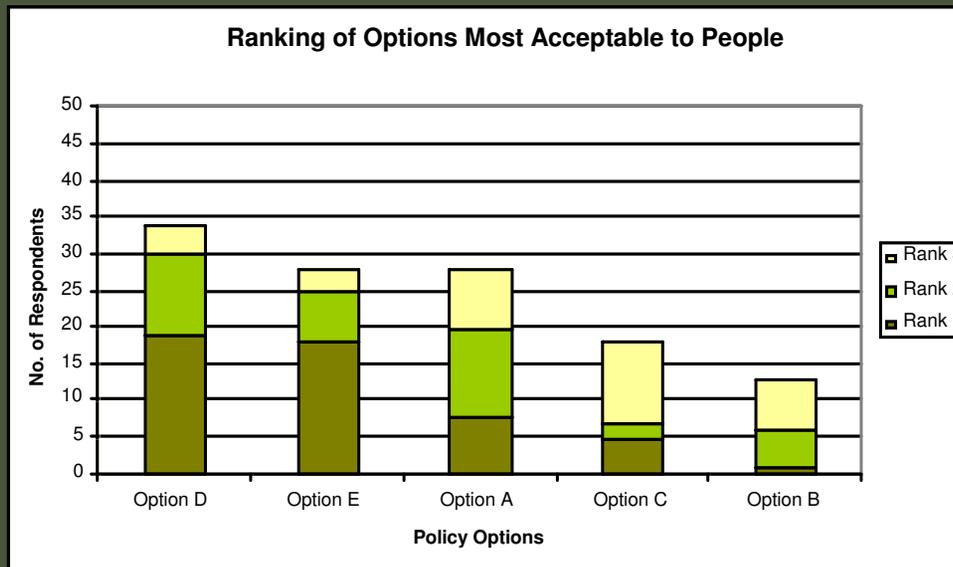
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# Survey Questions and Responses

## 6) Option Most Acceptable to Public

Which of the following do you think will be **most acceptable to people**? Please rank top 3.

Option A \_\_\_ Option B \_\_\_ Option C \_\_\_ Option D \_\_\_ Option E \_\_\_ Option F \_\_\_



### OPTIONS KEY

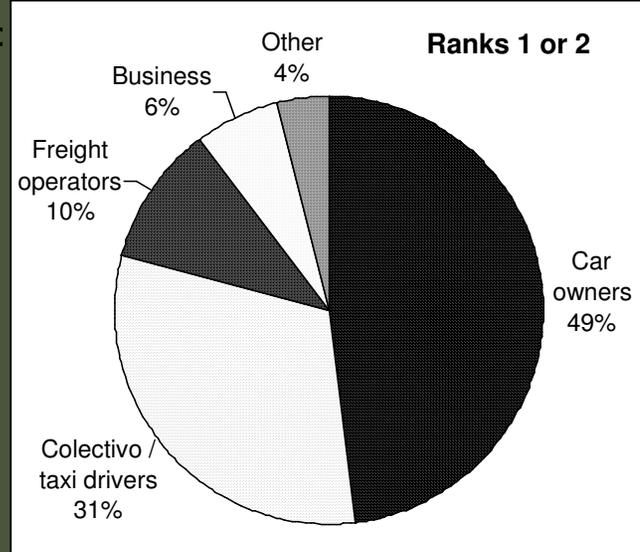
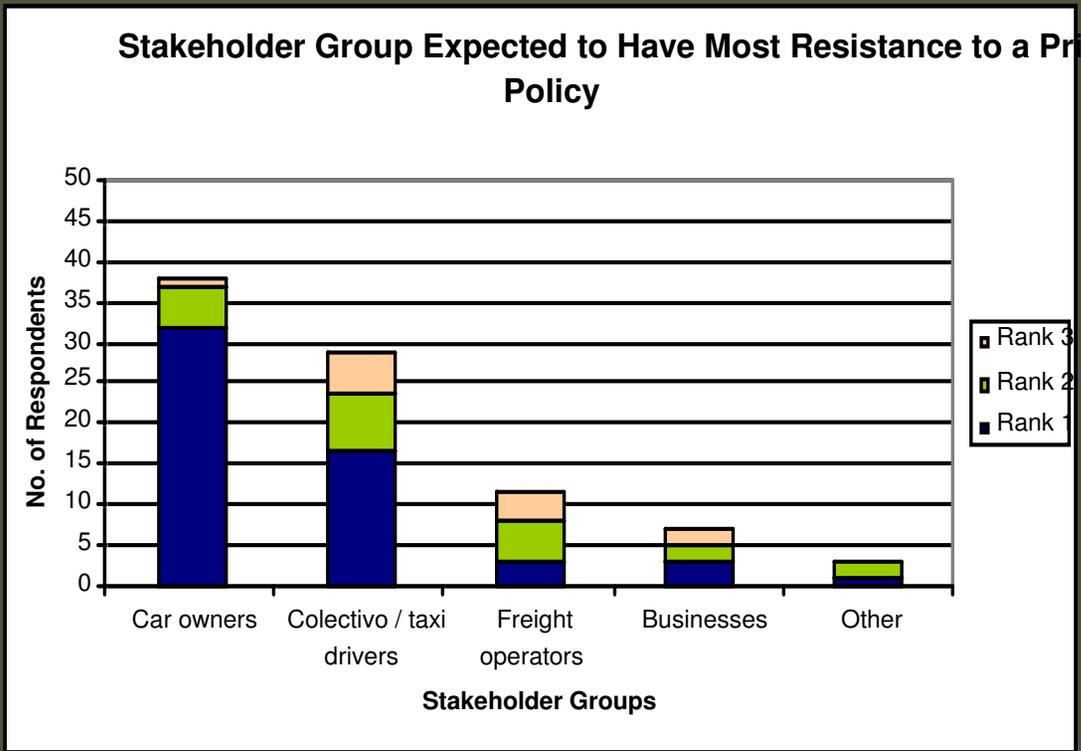
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# Survey Questions and Responses

## 7) Stakeholder Group With Most Resistance to Congestion Pricing:

Who do you think will have the most resistance to a “pricing policy” such as A and B above?

Car owners \_\_\_\_\_ Colectivo / taxi drivers \_\_\_\_\_ Freight operators \_\_\_\_\_  
 Businesses \_\_\_\_\_ Other \_\_\_\_\_



**Note:** The respondents who chose the option “Other”, specified their choice as “Politicians”

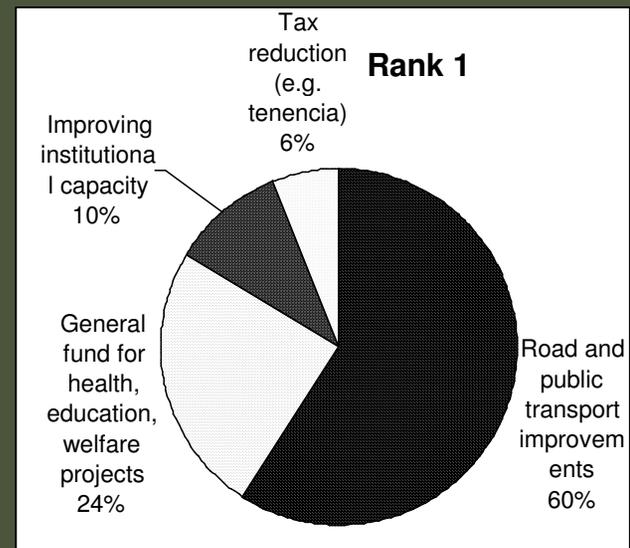
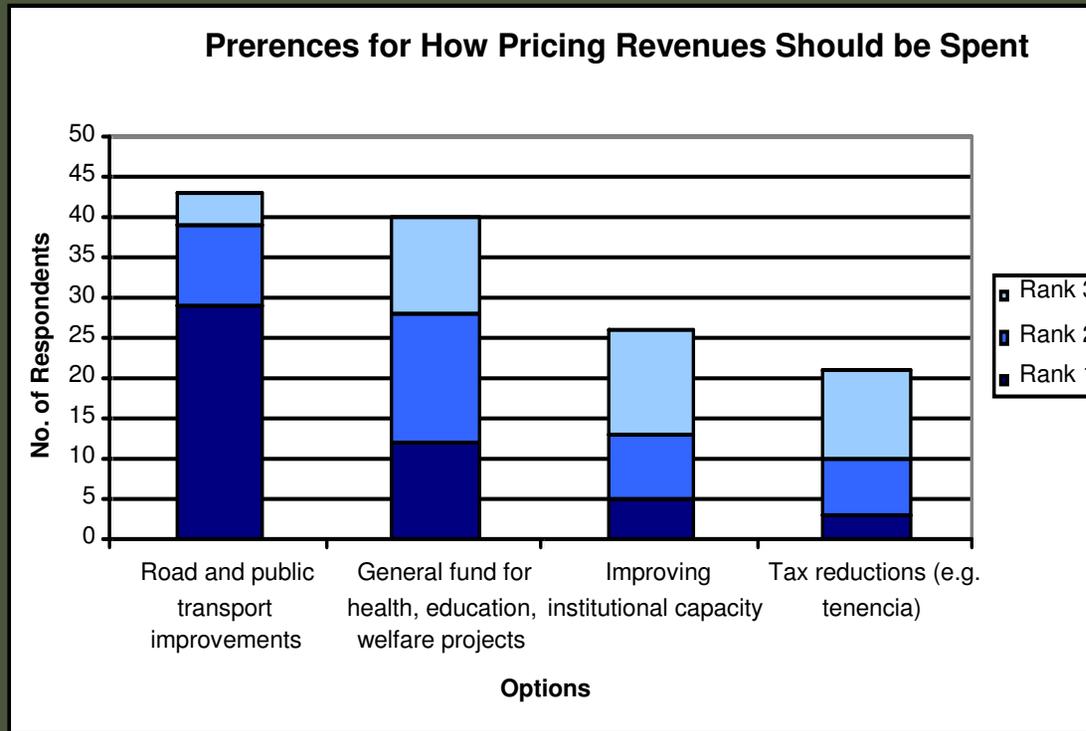
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# Survey Questions and Responses

## 8) Use of Pricing Revenues

How should the revenues from a pricing policy be spent? Please rank options from 1 - 4.

Road and public transport improvements \_\_\_\_\_ Tax reductions (e.g. tenencia) \_\_\_\_\_  
Improving institutional capacity \_\_\_\_\_ General fund for health, education, welfare projects \_\_\_\_\_



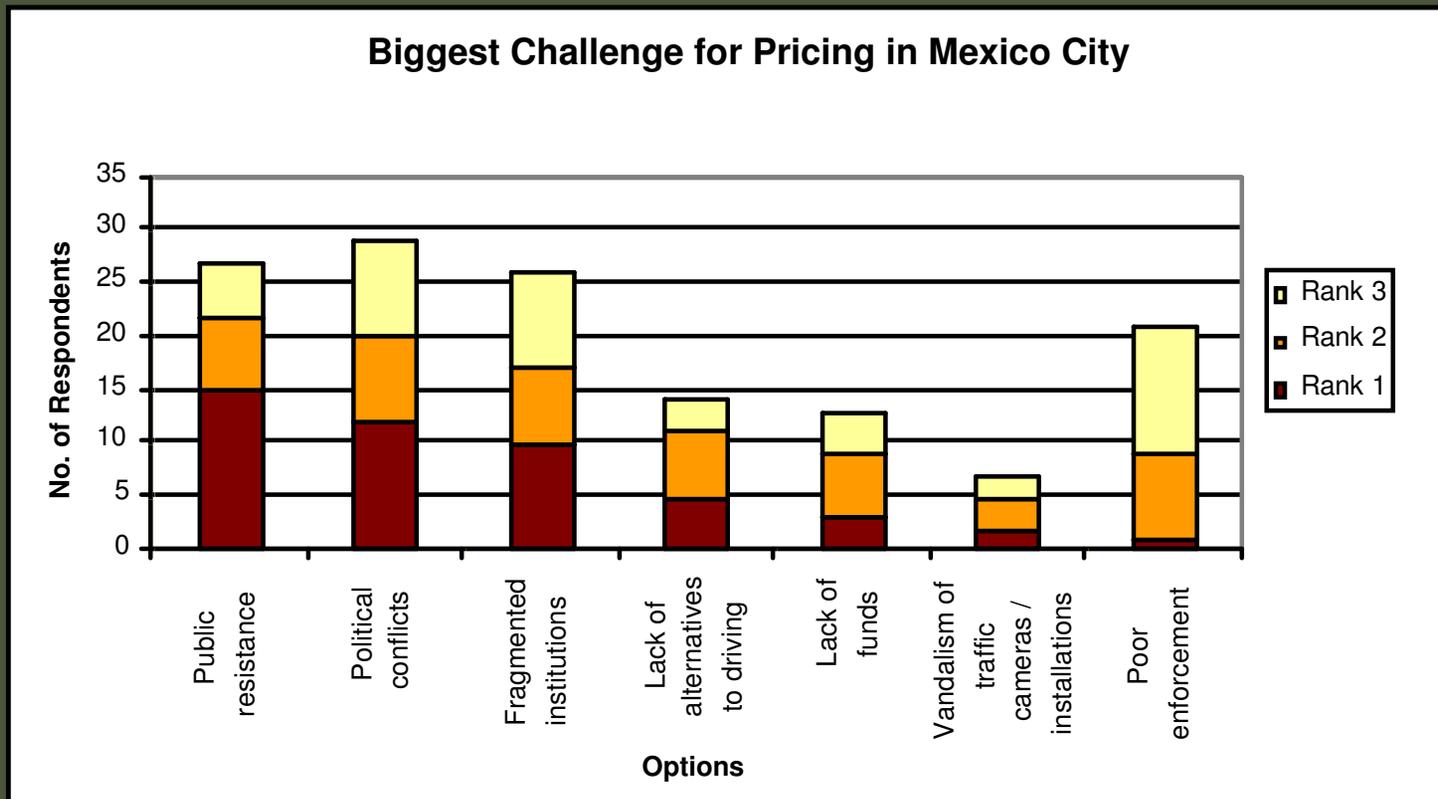
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# Survey Questions and Responses

## 10) Biggest Challenges

What do think is the **biggest challenge** in implementing congestion pricing for Mexico City? Please rank options from 1 to 7.

Lack of funds \_\_\_\_\_ Public resistance \_\_\_\_\_ Fragmented institutions \_\_\_\_\_ Poor enforcement \_\_\_\_\_  
Lack of alternatives to driving \_\_\_\_\_ Vandalism of traffic cameras and other installations \_\_\_\_\_ Political conflicts \_\_\_\_\_



# **SUMMARY:**

## **The Challenges**

- Congestion
- Inadequate Public Transit Services
- Urban Structure Problems--Urban Form vs. travel needs
- Economic Development--Need to Favor Freight, Mobilize the Labor Force

# **SUMMARY: Solution Modes**

- Public Infrastructure Expansion  
(including by public-private concession agreements)
- Congestion Management/demand management/congestion pricing
- Managing Formal and Informal Public Transport--system integration
- Land Use Planning for Urban Transport Efficiency

# Challenge #1: Congestion

- WHAT FUTURE FOR CONGESTION? DEPENDS MORE ON SPEED OF MOTORIZATION THAN THE LEVEL OF MOTORIZATION
- AVERAGE URBAN SPEEDS ARE LOW
  - 9 KM/HR IN SEOUL AND SHANGHAI,
  - 10 KM/HR IN BANGKOK, MANILA AND MEXICO
  - 17 KM/HR IN KUALA LUMPUR AND SAO PAULO
- AVERAGE COMMUTE TIMES IN MANILA 120 MIN., JAKARTA 82 MIN., BOGOTA 90 MIN., RIO DE JANEIRO 106 MIN.
- **CHALLENGE:** ENABLE AUTOMOBILE USE IN ITS MOST SOCIALLY EFFECTIVE ROLE
  - A ROLE FOR CAR SHARING IN DEVELOPING CITIES?
  - USE OF NEW ELECTRONICS FOR TRAFFIC FACILITATION
  - LIMITATIONS ON USE OF CARS IN CONGESTION AREAS
  - CONGESTION PRICING?

# Challenge #2: Managing Public Transit and Formal Transit

ACCOUNTS FOR ABOUT 70% OF TRIPS IN MOST DEVELOPING CITIES

- WEAKENED BY POLITICAL AND FINANCIAL CONDITIONS, AND CONGESTION.
- UNAUTHORIZED TRANSIT HAS GROWN TO A LARGE PORTION OF THE MARKET IN MANY CITIES:

**50% in Dakar and Taipei, 40% in Caracas, 65% in Manila, 11% to 56% in Mexico in 10 years**

- **CHALLENGES:**

- CREATE MANAGERIAL STRENGTH AND SOURCES OF FINANCING FOR PUBLIC TRANSPORT
- DESIGN AND ENACT SYSTEM INTEGRATION FOR PUBLIC TRANSPORT
- ADOPT NEW MODES FOR MORE RAPID TRANSIT SERVICE

# Challenge #3: Land Use and Urban Transport

- EXPLOSIVE DECENTRALIZATION OF URBAN ACTIVITIES TOWARD METROPOLITAN PERIPHERIES PERMITS ADJUSTMENT TO MORE AFFLUENT LIFESTYLES AND NEW TECHNOLOGIES
- THE PROBLEMS: SOCIAL FRAGMENTATION, ABSORPTION OF ARABLE LAND, INCREASED CONGESTION, INCREASED TRIP LENGTH --POLLUTION, GLOBAL WARMING EMISSIONS, FUEL CONSUMPTION
- **CHALLENGES:**
  - REDUCE EXCESSIVE URBAN DENSITIES, ADJUST TO MODERN TECHNOLOGIES WITHOUT CAUSING EXCESSIVE DECENTRALIZATION
  - DEVELOPMENT PLANS AND STANDARDS THAT CREATE CLUSTERING OF DEMAND ADAPTIVE TO MORE EFFICIENT TRANSPORTATION

# Challenge #4: Focusing Mobility on Economic Development

- POSITION MOBILITY TO INCREASE EFFICIENCY OF THE URBAN ECONOMY - LOWERING PRODUCTION AND DISTRIBUTION COSTS, MOBILIZING LABOR, EXPANDING AVAILABLE LABOR MARKET FOR INDUSTRY, FACILITATING EDUCATION
- TRANSPORT INFRASTRUCTURE PROJECTS HAVE HIGH RATES OF RETURN: WORLD BANK SHOWS 18% TO 25% AVERAGES OVER THE LAST 25 YEARS.
- FUNDS ARE SHORT BUT HELP IS ARISING THROUGH PRIVATE CONCESSIONING AND ROAD SECTOR FUNDS. WORLD BANK LENT \$2.5 TRILLION TO TRANSPORT, 60% OF IT FOR ROADS. FUNDS FOR MAINTENANCE ARE MORE DIFFICULT THAN FOR NEW PROJECTS . . .
- . . . . BUT IT IS IMPORTANT TO DEAL WITH CONGESTED LINKS IN THE NETWORK WHILE EXPANDING THE NETWORK, AND NOT TO COUNT ON IT FOR SOLVING CONGESTION

# Challenge #5: Making Concessions Work for Roads and Transit

THE EXPERIENCE HAS BEEN BASICALLY POSITIVE BUT THERE IS A CONTINUING NEED TO:

- “FORMALIZE” PARTICIPATING CONSORTIA
- ENSURE COMPETITIVE BIDDING
- MANAGE ADEQUATE ASSIGNMENT OF RISK
- ASSURE INTEGRATION OF SERVICE, FARE AND TOLLS
- PROVIDE ADEQUATE ENFORCEMENT OF SERVICE CONDITIONS
- REDUCE INCUMBENTS' ADVANTAGES
- RETAIN PUBLIC CONTROL OF THE OVERALL NETWORK

THANKS FOR  
WATCHING.....AND  
LISTENING.....and now,  
COMMENTING!

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