Traffic Safety and Traffic Management
Strategic Approaches

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Buenos Aires, February 22-26, 2010
Metropolitan Urban Transport Systems
Traffic Safety & Traffic Management

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What do we have today?

Inadequate Public Transport

Traffic Laws in All Its Variations!
Public Transport Efficiency

- Traffic Flow / Vehicular Speed
- Bus Stops / Shelters
- Loading and Unloading
- Traffic Stream – In/Out
Child Restraint Laws
Seat Belt Laws
Motorcycle Helmet laws
Global Traffic Safety Is Seriously Dangerous
1.27 Million Fatalities Globally in 2004
Estimated to Reach 2.4 million by 2030

• Global traffic accident fatalities were 555,000 in 2007, with the largest share of 97,657 reported in China, followed by India with 101,000, the United States with 38,000, and Russia with 34,000.

• In the five years, 2003-2007, road traffic accidents in China accounted for 481,221 deaths and around 2.56 million people injured: the highest rate in the world.
### Leading causes of death, 2004 and 2030 compared

#### TOTAL 2004

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<thead>
<tr>
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<th>LEADING CAUSE</th>
<th>%</th>
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<tbody>
<tr>
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<td>Ischaemic heart disease</td>
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<td>3</td>
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<tr>
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<tr>
<td>19</td>
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#### TOTAL 2030

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<td>Trachea, bronchus, lung cancers</td>
<td>Mouth and oropharynx cancers</td>
<td>Road traffic injuries</td>
<td>Violence</td>
</tr>
</tbody>
</table>

Fatality Rates in High Income Countries

Year

Rate per 100,000 population

Australia
Canada
France
Japan
Sweden
United States of America
What Kind of Traffic today?

Road Traffic in All Variations!

Unsafe At Best
Where is this?: Bucharest, Romania!!
Crossing the Street in Delhi, India
Mumbai Commuter Trains: 2008
Prakash, did you super charge your taxi?

Need to clean this damn air filter.
Mumbai: Public Transport Fighting its way through!
Mumbai, 2006
Unrestricted Use of Road Space: Equal Rights!
Bangkok, Thailand
China: Traffic Flows Smoothly Sometimes
Battle to Cross the Streets: Shanghai
Pedestrians and Cyclists Crossing *Against* red Light
Battling to Cross on a PZC: Beijing
Well Organized Cycle Parking: Beijing
Newspaper Shop, Obstructing Walking: Beijing
Expressway Accident Kills 17 people
Beijing-Shijiazhuang Expressway
Statues of Traffic Police
Hopefully to Reduce Speeding!!
Traffic Safety in India
INDIA

Population: 1,169,015,509
Income group: Low
Gross national income per capita: $950

<table>
<thead>
<tr>
<th>REGISTERED VEHICLES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>72,718,000</strong> total (2004)</td>
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</tr>
<tr>
<td>Trucks and Lorries</td>
<td>3%</td>
</tr>
<tr>
<td>Light motor vehicles</td>
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</tr>
<tr>
<td>(goods and passengers)</td>
<td></td>
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<tr>
<td>Buses</td>
<td>1%</td>
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<tr>
<td>Two wheelers</td>
<td>71%</td>
</tr>
<tr>
<td>Cars, jeeps and taxis</td>
<td>13%</td>
</tr>
<tr>
<td>Tractors and trailers</td>
<td>6%</td>
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<tr>
<td>Other</td>
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</table>

Data cleared by the Ministry of Health and Family Welfare.
<table>
<thead>
<tr>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reported road traffic fatalities (2006)</strong></td>
</tr>
<tr>
<td>105 725&lt;sup&gt;d&lt;/sup&gt; (84% males, 16% females)</td>
</tr>
<tr>
<td><strong>Reported non-fatal road traffic injuries (2006)</strong></td>
</tr>
<tr>
<td>452 922&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Costing study available</strong></td>
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<td>Yes (deaths and injuries)</td>
</tr>
</tbody>
</table>

<sup>d</sup> Police data, defined as died within 30 days of the crash.
<sup>e</sup> Police data.

DEATHS BY ROAD USER CATEGORY
Deaths by User Category

Unspecified (11%)

Passenger cars and taxis (15%)

Riders motorized 2- or 3-wheelers (27%)

Other (29%)

Pedestrians (13%)

Cyclists (4%)

Source: “Road Accidents in India 2006.” Ministry of Shipping, Road Transport and Highways
TRENDS IN ROAD TRAFFIC DEATHS

Source: National Crime Records Bureau
Traffic Safety in China
CHINA

Population: 1,336,317,116
Income group: Middle
Gross national income per capita: $2,360

REGISTERED VEHICLES

145,228,994 total (2006)
Registered vehicle types: data not available

Data cleared by the Ministry of Health.
<table>
<thead>
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</tr>
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<tbody>
<tr>
<td><strong>Reported road traffic fatalities (2006)</strong></td>
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<tr>
<td>89 455&lt;sup&gt;e&lt;/sup&gt; (76% males, 24% females)</td>
</tr>
<tr>
<td><strong>Reported non-fatal road traffic injuries (2006)</strong></td>
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<tr>
<td>431 139&lt;sup&gt;f&lt;/sup&gt;</td>
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<tr>
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<td>Yes (deaths and injuries)</td>
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<sup>e</sup> Police data, defined as died within 7 days of the crash.

<sup>f</sup> Police data.
China: Population and Vehicles

- **Population (million)**
  - 1100 to 1400

- **No. of Motor Vehicles (million)**
  - 10 to 170

*Year* 1991 to 2007
To Cater to the Growth of MVs

- China has invested 90 Billion $ in building highways throughout the country, both urban and rural, during 1998-2008.
- In 2009, had a network of expressways totaling 65,650 Km, expected to reach 85,000 Km by 2015.
- In 2009, the Network of highways was 3.9 million Km.
Investment in Highways
China: 1998-2008

Billion USD

Year


0 10 20 30 40 50 60 70 80 90 100

All Highways Investment
Development of Highways
China: 1996-2008

Total Highways

Year

1,000 KM

0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000


Total Highways

Bar Graph showing the total number of highways from 1996 to 2008 in China.
Development of Highways
China: 1996-2008
China: Traffic Management & Safety

- China promulgated the first ever National Road Safety Law (NRSL) in 2004, with detailed regulations in 2005, with safety as a pre-eminent goal.
- NRSL enables integrated traffic management with powers vested in municipal government but penalties for various offences increased and standardized at the national level.
- Almost all the Chinese cities with >2 million people have modernized their traffic control systems, have ATCs, installed red light cameras and CCTV traffic surveillance with centralized traffic management centers.
China: 2007

- Accidents: 327,209
- Fatalities: 81,649
- Injured persons: 380,442
- Direct Economic Loss: 1.19 billion RMB (170 million$)
Causes of Accidents, 2007

- Driver Error 89%
  - Improper Driving 84%
  - Fatigue 1%
  - Alcohol 2.7%

- Overloading 1.2%

- Vehicle Condition 5%

- Highway and Road System 0.01%
In 2008, every seven minutes, 1 person was killed in road traffic accidents in China.
## Causes of Death in China
### 1990-2020

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<td>11</td>
<td>9</td>
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### 3 Road traffic accidents

交通事故

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</tbody>
</table>
China: Vehicles and Accidents

- **Year**
  - 1991
  - 1993
  - 1995
  - 1997
  - 1999
  - 2001
  - 2003
  - 2005
  - 2007

- **Accidents (1,000)**
  - 1991: 200
  - 1993: 220
  - 1995: 240
  - 1997: 260
  - 1999: 280
  - 2001: 320
  - 2003: 340
  - 2005: 360
  - 2007: 380

- **No. of Motor Vehicles (million)**
  - 1991: 80
  - 1993: 100
  - 1995: 120
  - 1997: 140
  - 1999: 160
  - 2001: 180
  - 2003: 200
  - 2005: 220
  - 2007: 240

- **Legend**
  - Red: Accidents 事故数
  - Blue: No. of Motor Vehicles (million) 机动车保有量（百万辆）
Traffic Accidents: High Cost

• China's traffic accidents’ economic cost (direct and indirect) more than 12.5 billion USD. These costs decreased China’s by about 1.7% in 2007.

• This economic cost of traffic accidents is higher than the national budget for public health services and for rural compulsory education.
China: Causes of Accidents, 2007

![Bar chart showing the percentage of different causes of accidents in 2007. The most significant cause is "Drivers." Other causes include "Mechanical Failure," "NMV Rider Offence," "Pedestrians," "Road Condition," and "Others." The chart indicates that the majority of accidents are related to drivers.]
China: Causes of Accidents, 2007

Driver Error

中国：2007 年事故成因(操作不当)
China National Road Safety Law
Due Process and Data Bases

- Beijing Traffic Police issued 710,000 traffic violation notifications in 2008.

- 170,000 notifications were returned as undeliverable because drivers had failed to update their address information.

- Drivers are still responsible for paying the fines even if they do not receive the posted notifications.

- What about the legal due process?
Fatalities Caused by

<table>
<thead>
<tr>
<th>Drivers 司机</th>
<th>Percentage 比例</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unlicensed Drivers 无驾照</strong></td>
<td>23.38%</td>
</tr>
<tr>
<td>Licensed MV Drivers 机动车司机</td>
<td>76.39%</td>
</tr>
<tr>
<td><strong>Army &amp; Police 军队和武警司机</strong></td>
<td>0.23%</td>
</tr>
<tr>
<td>Category</td>
<td>2004</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Pedestrians 行人</td>
<td>25.00%</td>
</tr>
<tr>
<td>NMV Driver 非机动车司机</td>
<td>16.10%</td>
</tr>
<tr>
<td>Bus Passengers 客车乘客</td>
<td>21.00%</td>
</tr>
<tr>
<td>Motorcycle Passengers 摩托车乘客</td>
<td>3.60%</td>
</tr>
<tr>
<td>Vulnerable Road Users 道路弱势群体</td>
<td>65.70%</td>
</tr>
<tr>
<td>Motorcycle Drivers 摩托车司机</td>
<td>21.30%</td>
</tr>
</tbody>
</table>
Site Investigation/Accidents – 2007

Hit & Run

- Untouched Sites: 81.79%
- Hit & Run: 4.70%
- Site Tampered: 9.95%
- Car Abandoned: 0.93%
- Others: 2.63%

原始, 81.79%
驾车逃逸, 4.70%
变动, 9.95%
弃车逃逸, 0.93%
其它, 2.63%
Fatalities / Driver Qualification – 2007

- Licensed MV Drivers 机动车司机, 76.39%
- Unlicensed Drivers 无驾照, 23.38%
- Army & Police 军队和武警司机, 0.23%
China: Driving Without License

Number of persons driving vehicles, without driver’s license and apprehended by the traffic police, has increased steadily from 11 million in 2000 to 24 million in 2008. It is estimated that another 15 million persons, also drive without a drivers license but not caught by the police. This is very high at 39 million illegal drivers!!
Traffic Safety in Canada
CANADA

Population: 32 876 047
Income group: High
Gross national income per capita: $39 420

<table>
<thead>
<tr>
<th>REGISTERED VEHICLES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20 065 000 total (2006)</td>
<td></td>
</tr>
<tr>
<td>Motorcars</td>
<td>52%</td>
</tr>
<tr>
<td>Motorized 2- and 3-wheelers</td>
<td>3%</td>
</tr>
<tr>
<td>Minibuses, vans, etc. (seating &lt;20)</td>
<td>43%</td>
</tr>
<tr>
<td>Trucks</td>
<td>3%</td>
</tr>
<tr>
<td>Buses</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Data cleared by the Public Health Agency of Canada.
<table>
<thead>
<tr>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reported road traffic fatalities (2006)</td>
</tr>
<tr>
<td>2 889(^h) (68% males, 32% females)</td>
</tr>
<tr>
<td>Reported non-fatal road traffic injuries (2006)</td>
</tr>
<tr>
<td>199 337(^i)</td>
</tr>
<tr>
<td>Costing study available</td>
</tr>
<tr>
<td>Yes (deaths and injuries)</td>
</tr>
</tbody>
</table>

\(^h\) Police data, defined as died within 30 days of the crash.
\(^i\) Police data.
DEATHS BY ROAD USER CATEGORY

Drivers 4-wheelers (54%)

Passengers 4-wheelers (22%)

Riders motorized 2- or 3-wheelers (7%)

Cyclists (3%)

Pedestrians (13%)

Other (1%)

Source: Police-reported records of traffic collisions that occurred on public roads during 2006
TRENDS IN ROAD TRAFFIC DEATHS

Deaths per 100,000 population

Year

Source: Country questionnaire
Canada’s Progress: 1975-2005
过去30年的进步

Road Fatalities
Motor Vehicles Registered

Vehicles Registered
1975: 11.3 million
2005: 19.4 million

Fatalities
1975: 6,061
2005: 2,923

Motor Vehicles Registered, Index (1975=100)
Road Fatalities, Index (1975=100)
Canadian Experience: 1975-2005

• Motor Vehicles increased from 11 to 19 million (91%).
• Fatalities decreased from 6,000 to 2,900 (52%).
• 46% of fatalities are young drivers: 16-24 years age.
• Impaired driving (Alcohol) causes 33% of fatalities.
• Speeding is a major cause of fatalities.
Canada-Driver Penalties: Point System

• 0-3 points: nil; 4 points: 175$
• 5 points: 230$; 6 points: 300$
• 7 points: 415$; 8 points: 520$
• 9 points: 640$; 10 points: 905$
• 20 points: 3,760$
• 30 points: 8,160$
• 40 points: 14,560$
• 50 points or more: 24,000$!
Canada-Point Penalties & Fines!

Examples

• Fail to yield to pedestrians: 2 points and 144$ fine.

• Speed in school zone: 3 points and 230$ fine.

• Fail to stop for school bus: 3 points and 144$ fine.

• Disobey stop sign: 3 points and 144$ fine.
Canada
Linking Insurance to Safety

• Third party liability insurance is required for all MVs.
• Insurance premiums are based on type and weight of vehicles, private or public transport, driving record.
• Premiums vary depending upon who drives the MVs.
• Safe drivers (3 years with < 10 points) get discounts: 30% to 50%.
Canada: Safe Driver Discounts

- Safe driver discounts based on primary driver’s record.
- If you drive to work, premiums are 100% higher.
- Bigger MVs pay higher premiums proportional to weight, length and power.
- Commercial vehicles pay higher premiums.
Graduated Licensing: Canada

- New drivers get probationary license.
- Eligible at age 16 years.
- Duration: 12 months if no driving offences; 24 months otherwise.
- Supervisor: Licensed driver, >25 years.
- Passengers: Supervisor + 1 Adult only.
- Curfew: 12-5 A.M.
Canada: Driver Licensing & Renewal

- **Written test:** Motor Vehicle Laws, Insurance Laws and Rules of the Road.
- **Road test:** Ability to drive safely.
- License Valid for 5 Years.
- Renewable without road test if less than 10 penalty points, after paying fines.
- Road test may be required if >10 points.
Canada Driving Offences: Criminal Code

- Motor manslaughter
- Criminal negligence
- Dangerous driving
- Failure to remain at scene of a collision
- Impaired Driving
- Driving while disqualified or prohibited
- Failing to stop for Police
Traffic Safety in USA & UK
United States of America

Population: 305 826 246
Income group: High
Gross national income per capita: $46 040

<table>
<thead>
<tr>
<th>REGISTERED VEHICLES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>251 422 509 total (2006)</strong></td>
<td></td>
</tr>
<tr>
<td>Motorcars</td>
<td>54%</td>
</tr>
<tr>
<td>Motorized 2- and 3-wheelers</td>
<td>3%</td>
</tr>
<tr>
<td>Minibuses, vans, etc. (seating &lt;20)</td>
<td>39%</td>
</tr>
<tr>
<td>Trucks</td>
<td>4%</td>
</tr>
<tr>
<td>Buses</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Data cleared by the Department of Health and Human Services and the Department of Transport's National Highway Traffic Safety Administration.
<table>
<thead>
<tr>
<th><strong>DATA</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reported road traffic fatalities (2006)</strong></td>
</tr>
<tr>
<td>42,642(^f) (70% males, 30% females)</td>
</tr>
<tr>
<td><strong>Reported non-fatal road traffic injuries (2006)</strong></td>
</tr>
<tr>
<td>3,305,237(^g)</td>
</tr>
<tr>
<td><strong>Costing study available</strong></td>
</tr>
<tr>
<td>Yes (deaths and injuries)</td>
</tr>
</tbody>
</table>

\(^f\) US DOT/NHTSA Fatality Analysis Reporting System, defined as died within 30 days of the crash.
\(^g\) Health data.
DEATHS BY ROAD USER CATEGORY

- Drivers 4-wheelers (51%)
- Passengers 4-wheelers (21%)
- Riders motorized 2- or 3-wheelers (11%)
- Cyclists (2%)
- Pedestrians (11%)
- Other (4%)

Source: 2006, US DOT/NHTSA Fatality Analysis Reporting System
TRENDS IN ROAD TRAFFIC DEATHS

Source: US DOT/NHTSA Fatality Analysis Reporting System
UNITED KINGDOM

Population: 60 768 946
Income group: High
Gross national income per capita: $42 740

<table>
<thead>
<tr>
<th>REGISTERED VEHICLES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>34 327 520</strong> total (2006)</td>
<td></td>
</tr>
<tr>
<td>Motorcars</td>
<td>84%</td>
</tr>
<tr>
<td>Motorized 2- and 3-wheelers</td>
<td>4%</td>
</tr>
<tr>
<td>Minibuses, vans, etc. (seating &lt;20)</td>
<td>9%</td>
</tr>
<tr>
<td>Trucks</td>
<td>1%</td>
</tr>
<tr>
<td>Buses</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
</tr>
</tbody>
</table>

Data cleared by the Department for Transport.
<table>
<thead>
<tr>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reported road traffic fatalities (2006)</strong></td>
</tr>
<tr>
<td>3 298 f (76% males, 24% females)</td>
</tr>
<tr>
<td><strong>Reported non-fatal road traffic injuries (2006)</strong></td>
</tr>
<tr>
<td>264 288 g</td>
</tr>
<tr>
<td><strong>Costing study available</strong></td>
</tr>
<tr>
<td><em>Yes</em> (deaths and injuries)</td>
</tr>
</tbody>
</table>

f Police data, defined as died within 30 days of the crash.

g Police data.
DEATHS BY ROAD USER CATEGORY

- Drivers 4-wheelers (36%)
- Passengers 4-wheelers (19%)
- Riders motorized 2- or 3-wheelers (19%)
- Cyclists (4%)
- Pedestrians (21%)
- Other (1%)

Source: “Road Casualties Great Britain: 2006 Annual Report”
“Road Traffic Collision Statistics (Northern Ireland) Annual Report 2006”

TRENDS IN ROAD TRAFFIC DEATHS
Traffic Safety: Chile, Brazil & Argentina
CHILE

Population: 16 634 760
Income group: Middle
Gross national income per capita: $8 350

<table>
<thead>
<tr>
<th>REGISTERED VEHICLES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 824 570</strong> total (2007)</td>
<td></td>
</tr>
<tr>
<td>Motorcars</td>
<td>61%</td>
</tr>
<tr>
<td>Motorized 2- and 3-wheelers</td>
<td>2%</td>
</tr>
<tr>
<td>Minibuses, vans, etc. (seating &lt;20)</td>
<td>28%</td>
</tr>
<tr>
<td>Trucks</td>
<td>5%</td>
</tr>
<tr>
<td>Buses</td>
<td>2%</td>
</tr>
<tr>
<td>Non-motorized vehicles</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Data cleared by the Ministry of Health.
<table>
<thead>
<tr>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reported road traffic fatalities</strong> (2006)</td>
</tr>
<tr>
<td>2 280(^e) (79% males, 21% females)</td>
</tr>
<tr>
<td><strong>Reported non-fatal road traffic injuries</strong> (2007)</td>
</tr>
<tr>
<td>50 010(^f)</td>
</tr>
<tr>
<td><strong>Costing study available</strong></td>
</tr>
<tr>
<td>Yes (deaths and injuries)</td>
</tr>
</tbody>
</table>

\(^e\) Health data, defined as died within 1 year and 1 day of the crash.
\(^f\) Police data.
DEATHS BY ROAD USER CATEGORY

- Pedestrians (40%)
- Other (27%)
- Cyclists (6%)
- Riders motorized 2- or 3-wheelers (3%)
- Passengers 4-wheelers (13%)
- Drivers 4-wheelers (12%)

Source: 2006, National Institute of Statistics/Ministry of Health/Civil Registry
TRENDS IN ROAD TRAFFIC DEATHS

Deaths per 100,000 population

Year

Source: National Institute of Statistics/Ministry of Health/Civil Registry
**BRAZIL**

Population: 191,790,929  
Income group: Middle  
Gross national income per capita: $5,910

<table>
<thead>
<tr>
<th><strong>REGISTERED VEHICLES</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>49,644,025 total (2007)</strong></td>
<td>61%</td>
</tr>
<tr>
<td>Motorcars</td>
<td>22%</td>
</tr>
<tr>
<td>Motorized 2- and 3-wheelers</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Minibuses, vans, etc. (seating &lt;20)</td>
<td>10%</td>
</tr>
<tr>
<td>Trucks</td>
<td>4%</td>
</tr>
<tr>
<td>Buses</td>
<td>1%</td>
</tr>
<tr>
<td>Non-motorized vehicles</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

Data cleared by the Ministry of Health.
### Traffic Fatalities by User Category

<table>
<thead>
<tr>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reported road traffic fatalities (2006)</td>
</tr>
<tr>
<td><strong>35 155</strong>(^c) (82% males, 18% females)</td>
</tr>
<tr>
<td>Reported non-fatal road traffic injuries (2006)</td>
</tr>
<tr>
<td><strong>407 685</strong>(^d)</td>
</tr>
<tr>
<td>Costing study available</td>
</tr>
<tr>
<td>Yes (deaths and injuries)</td>
</tr>
</tbody>
</table>

\(^c\) Health data (Mortality Information System), defined as died anytime after the crash.

\(^d\) State Traffic Departments, National Traffic Department, Ministry of Cities data.
DEATHS BY ROAD USER CATEGORY

Drivers 4-wheelers (5%)
Passengers 4-wheelers (5%)
Riders motorized 2- or 3-wheelers (20%)
Cyclists (5%)
Pedestrians (28%)
Other (37%)

Source: 2006, Ministry of Health Mortality Information System
TRENDS IN ROAD TRAFFIC DEATHS

Source: Ministry of Health Mortality Information System
ARGENTINA

Population: 39 531 115
Income group: Middle
Gross national income per capita: $6 050

<table>
<thead>
<tr>
<th>REGISTERED VEHICLES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12 399 887</strong> total (2007)</td>
</tr>
<tr>
<td>Registered vehicle types: data not available</td>
</tr>
</tbody>
</table>

Data cleared by the Ministry of Health.
<table>
<thead>
<tr>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reported road traffic fatalities</strong> (2006)</td>
</tr>
<tr>
<td>4063(^d) (75% males, 25% females)</td>
</tr>
<tr>
<td><strong>Reported non-fatal road traffic injuries</strong> (2007)</td>
</tr>
<tr>
<td>174,339(^e)</td>
</tr>
<tr>
<td><strong>Costing study available</strong></td>
</tr>
<tr>
<td>Yes (deaths and injuries)</td>
</tr>
</tbody>
</table>

\(^d\) Health data, defined as died at the scene of the crash. National Registry of Transit Records (RENAT) reported 4175 deaths in 2007.

\(^e\) Health data.
DEATHS BY ROAD USER CATEGORY

- Unspecified (23%)
- Occupants 3- and 4-wheelers (42%)
- Pedestrians (19%)
- Riders motorized 2-wheelers (10%)

Source: Ministry of Health Argentina, 2006
TRENDS IN ROAD TRAFFIC DEATHS

Source: The Health Statistics and Information Office, the Department of Policies, Regulation, and Institutes at the National Ministry of Health, Argentina
Traffic-related Deaths/Million Vehicles 2006

- Switzerland: 92
- Spain: 148
- Holland: 147
- USA: 198
- Argentina: 1,080
Fatalities per Million Vehicles

- India: 1500
- Chile: 800
- Brazil: 600
- China: 500
- Argentina: 400
- United States: 200
- Canada: 100
- United Kingdom: 50
Fatalities per Million Persons

- Chile: 50 fatalities
- Argentina: 9 fatalities
- Canada: 4 fatalities
- Brazil: 2 fatalities
- United Kingdom: 1 fatality
- India: 0 fatalities
- United States: 0 fatalities
- China: 0 fatalities
Safety

Accessibility

Mobility
ACCESSIBILITY PLANNING

PROVISION OF ROADS AND INFRASTRUCTURE

All People
All Age Groups
All Income Groups

All Modes
MV
NMT

Transport Services
Comfort & Convenience
Cost
MOBILITY PLANNING

Transport at Low Cost Disposable Incomes

Housing Location
Job Location
Market Location

All Modes
MVs
NMT

Social Infrastructure
Health
Education

Vulnerable Road Users
Children & Women
Elderly
TRAFFIC MANAGEMENT

Management to Achieve Strategic Objectives

Overall Efficiency

Accessibility  Safety  Mobility
Mobility and Safety

• Safe Mobility
• Reduce Accidents:
  - Reduce Loss Life and Injuries
  - Reduce Economic Loss
What is urgently Required?

• Changing the traffic culture to obey the traffic laws.
• More rigorous enforcement combined with substantially higher penalties.
• Curbing unlicensed drivers with severe penalties, even jail terms.
• Impounding and confiscating vehicles driven by unlicensed and hit and run drivers.
HUMAN TOLERANCE TO PHYSICAL FORCE

Source: Adapted from reference 13.
Traffic Management

Management to Achieve Strategic Objectives

Overall Efficiency

Accessibility  Safety  Mobility
People Focused Traffic Management System

Traffic Management System

Moving Goods
Priorities:
- Mode Separation
- Truck Routes
- NMT Delivery Systems

Assuring Safety
Priorities:
- Mode Separation
- Traffic Management
- “Safe Traffic” Culture

Moving People
Priorities:
- NMT Priority
- Public Transport
- Mode Separation
Traffic Safety Components

- Public Health and Traffic Safety
- Traffic Management & Traffic Safety
- Engineering Design and Traffic Safety
- Vehicles: Age/Maintenance/Quality
- Enforcement & Education
- Human Behavior & Attitudes to safety
- Fatalities/Injuries and Value of Life
Traffic Management System

- Institutional Framework
- Traffic Controls: Modernization
- Traffic Engineering and Design
- Enforcement and Penalties
- Education of Road Users
- Citizen Participation
- Knowledge Management and Training
Institutional Framework

- Well integrated institutional systems are essential to successful traffic management and assuring safety.
- In most cities, traffic police are responsible for traffic management and other local government organs for infrastructure.
- Divided jurisdictions often lead to the “blame game” and achieve the minimum.
Traffic Control Systems

- Modernization requires:
- Area Traffic Control Systems (ATC)
- Intersections Traffic Controls
- Red Light Cameras
- CCTV Monitoring
- Control systems to include all modes (Pedestrians & Cyclists)

Equipment alone is not enough
Engineering

- Road Space: Design, Operation and Maintenance
- Road Hierarchy and Use of Road Space
- Neighbourhood Roads and Traffic Calming
- Public Transport: Buses/Shelters/Furniture
- Dedicated Traffic Lanes, Signs and Markings
- Traffic Control Systems: Efficiency and Safety
- Design of Intersections
Engineering/ Design

- Roads: Design, Operation and Maintenance
- Neighborhood Roads and Traffic Calming
- Public Transport: Buses/Shelters/Furniture
- Lane Separation, Signs and Markings
- Design of Intersections
Enforcement of Traffic Laws

- Legal System: The Laws and Enforcement
- Education of Road Users
- Enforcement Process and Citizen Understanding
- Training for the Traffic Police
Enforcement of Traffic Laws

- Legal System: Need enabling Laws, Policies and Enforcement
- Education of Road Users
- Enforcement Process and Citizen Understanding
- Training for the Traffic Police
Education

- Education of Experts & Officials: Training
- Education of Road Users: Building Bridges Between Experts and Citizens: Participatory Process
- Legal Framework: Traffic Laws and Regulations for Enforcement and penalties
- Education of Traffic Police
- Knowledge Management
Education of Road Users

- Rules of the Road: Laws / Regulations
- Drinking and Driving
- Hit and Run
- Driving Without License
- Respecting the Rights of Other Road Users
- Liability for Causing Accidents
Civil Society & Citizen Participation

- Why Citizen Input?
- Citizens as Owners
- Citizens as Road Users
- Participatory System
  - Planning, Design and Evaluation
- Rapid Participatory Framework
  - Structured Questionnaires
  - Tiers of Respondent Groups
  - Focus Group Discussions
Mobility and Safety

- Safety without mobility has no value.
- Mobility without safety is dangerous and costly.
- Enhanced mobility must come with safety.
- The strategic goals ought to emphasize safe mobility by all modes: walking, cycling, railways, buses, metro and private motor vehicles.
Mobility and Safety

- Safe Mobility
- Reduce Accidents:
  - Reduce Fatalities/Loss Life
  - Reduce Injuries
  - Reduce Economic Loss
Chindia: Road Safety, 2005

• During 2001-2005, one million people were killed in traffic accidents in Chindia. Chindia has the highest traffic fatality rates in the world, about 192,000 fatalities in 2006.

• 93% of the fatalities in China and 78% of the fatalities in India were caused by driver error in 2004. Fatalities caused by road condition were 3% in China and 11% in India.

• Drinking and driving is a serious problem in India but not in China; hit and run fatalities are serious problems in Chindia. Driving without license is also a serious concern in both countries.
Enforcement of Laws

- Red Light Cameras
- Video Surveillance
- Speed Detection / Radar
- Manual Spot Check
Education of Traffic Police

- Modern Traffic Management Methods
- Traffic Safety Law / Regulations
- Insurance and Liability
- Dispute Resolution
- Dealing with Accidents
- Respecting the Rights of Road Users
Knowledge Management

New Knowledge and Keeping Up-To-Date

Technology

Management Knowledge

Training
Planning Paradox!

- Efficient traffic flow, especially during the peak hours;
- Traffic safety during all hours;
- Shifting people from private motor vehicles (cars, vans and motorcycles) to public transport; and
- Assuring safe walking and cycling by providing proper sidewalks and bikeways.
Paradigm Shift

• Cultivating “Safe Traffic Culture”;
• Moving away from private motor vehicles to public transport;
• Encouraging walking and cycling by providing proper NMT infrastructure; and
• Introducing a variety of “Taming the Motor Vehicle” measures:
  – Congestion Pricing; Parking Fee Structure Changes; Entry Fess and others.
Urban Transport Planning Practice

Current Practice

Motor Vehicles First
Other Modes

Recommended Practice

Feet First
Pedal Next
Motor Vehicles
Thank you very much
Muchas gracias.
Preguntas y comentarios?