Objective and Content

- Provide a brief, somewhat anecdotal, “survey” of developing country urban mobility reality

1. Trends and Forces
2. Developing World?
3. Developing Country Challenges and Opportunities: 5 Key Areas
   - Motorization, motorized 2-wheelers, public transportation, land management, institutions
“Developing” World Urban Transportation: Trends in Perspective

By 2030

\[\sim2 \text{ billion new residents} \times \sim3,000 \text{ vkm/person/year} = \sim6 \text{ trillion additional vehicle kms/yr} = \sim600 \text{ billion additional liters of gasoline/yr}\]

or \sim1.9 \text{ billion tonnes of GHG yearly}

Some Relevant Forces

- Income growth…
- Accessibility is a “superior good”
- Urban decentralization (i.e., suburbanization)
- Increasing labor force participation
- Declining household size
In other words…

\[
\begin{align*}
\text{Urbanization} \\
\text{(Urban population growth)} \quad & \quad + \quad \text{Decentralization} \\
\text{(Urban outgrowth, “sprawl”) \quad & \quad +} \\
\text{Income Growth} \quad & \quad = \quad \text{More people making more trips over greater distances}
\end{align*}
\]

What do we mean by “developing” world?

- Can (should) we generalize?
- What is different?
- What is the same?
- Sources of variation?
Range of “Developing World” Cities

Source: Various, see WBCSD, Table A-1.

Household Car Ownership

Source: Hyodo et al., 2005.
Chilean Cities:
Vehicle Ownership & Mode Shares

Non-motorized transport “cultures”?

Pucher & Dijkstra, 2003; Santiago derived from SECTRA, 2002.
Gender

- Again, significant variation by culture...
- Generally, women have less access to private vehicles (all else equal)
- Women’s travel habits – more often than men’s related to household maintenance – not conducive to convenient public transport itineraries.
  - Further suffer possible dangers on public transport.
- In developing countries, female trip generation rate tends to be higher than males in most cities
  - Exceptions in places like Cairo and Kuala Lumpur
  - Likely religious and cultural influence (e.g. Hyodo et al, 2005).
A few accurate generalizations

Poverty
• By definition, developing world is poorer
  – Accessibility poor
  – Time poor
  – Safety poor
  – Energy poor
• Distribution of income: tends to be worse
  – Gini coefficients
• Interacting effects: poor on periphery, isolated, poor transport, long trips

Accurate generalizations

Dynamism
• E.g., land market changes in China and Vietnam
• Political and institutional decentralization
• Rates of population growth
• Demographic
  – Women in work force participation

Densities
Can we “buy (and/or learn) away” some of the effects?

- Kuznets curve
- But, will this come in time?
- E.g.: traffic accident rates in India will not start declining until 2042…(Kopitz and Cropper, 2003)
- Paths of development will depend, in part, on time, speed, sequence of technological adaptation
- Impacts and implications will vary across contexts

Developing country challenges and opportunities: Five key areas

- **Motorization** – does a foreseeable ceiling exist?
- **Motorized two-wheelers** – friend or foe?
- **Public transportation** – what future?
- **Land development** – any possibility for management for mobility?
- **Institutions** – capable of responding?
Motorization

In theory, a saturation point exists... **ALL** of developing world is well-below saturation
The “vicious cycle…”

**Motorization (cars/capita) Income Elasticity**

Motorization: Influencing Factors

- Income distribution
- Local industry and trade policy
  - Brazil, Malaysia, China
  - Trade liberalization and used vehicles
    - Peru, Senegal
  - Local tax policies: Shanghai until recently
- Other policies, with potentially perverse effects
  - “Hoy no circula”
- Will any country take a Singaporean approach to long-term management of S-curve?

Motorization and Motorized Two-Wheelers

The “ladder of mobility”? Where does the 2-wheeler culture come from?
Motorization and 2-wheelers

Chennai, 1993

Rites, 1995.
2-wheeler

- The “worst of both worlds”? (Barter, 2004)?
  - Traffic saturation and undercutting public transport
- High levels of air and noise pollution
- Dangerous driving habits
- Difficult traffic management conditions
- Likely the “most challenging” transport problem that Asia will face in the next decade (Gwilliam, 2003)

Public Transportation

Developing cities mobility backbone
Public Transportation

- Ubiquitous service
- Entrepreneurial spirit
- Large potential demand…
- Severe financial conditions
- Inadequate capacity
- Little network integration
- Slow speeds
- Deteriorating capital

Public Transportation: Obstacles

- Poverty
  - Allport and Thomson (1990): with 1 dollar fare, Metros in LDCs “break even” (operationally)
- “Guerra del centavo”
- Potentially “counter-productive” competition
Public Transportation: Competition

- *Car rapides* (Dakar)
- *Matutus* (Nairobi)
- Two-wheelers (Chennai)
- *Colectivos* (Mexico City)
- Auto industry… (KL, Brazil, Mexico, etc.)

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The Power of “Informality”

**The Matutu minibus in Nairobi**

<table>
<thead>
<tr>
<th></th>
<th>Bus</th>
<th>Matutu</th>
<th>Matutu Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average wait time (min)</td>
<td>24</td>
<td>14</td>
<td>44%</td>
</tr>
<tr>
<td>Average trip time (min)</td>
<td>65</td>
<td>38</td>
<td>42%</td>
</tr>
<tr>
<td>Average travel time (min)</td>
<td>90</td>
<td>52</td>
<td>42%</td>
</tr>
<tr>
<td>Average fare ($/km)</td>
<td>0.03</td>
<td>0.02</td>
<td>28%</td>
</tr>
<tr>
<td>Average trip speed (km/hr)</td>
<td>13</td>
<td>18</td>
<td>42%</td>
</tr>
<tr>
<td>Average travel speed (km/hr)</td>
<td>9</td>
<td>13</td>
<td>41%</td>
</tr>
</tbody>
</table>

Source: Koster and Hop (2000).
Note: Overall average based on AM/PM Peak and Off Peak.
Rise of the Informal Sector: Mexico City

Mexico City’s Colectivos

Images removed due to copyright restrictions.
Public Transportation: Institutional Challenges

**Managing private industry in the public interest**
- Private operators: strong political leverage
- Fare: conspicuous component of cost of living
- Ambivalence about “informality”
- Inter-jurisdictional coordination
  - E.g., Mexico City
- Innovation in isolation
  - Metrobus, KL’s rail, TransMilenio

Public Transportation: A Range of Outcomes

- Mexico City Metro
  - US$400 mn/year of operating subsidies
- Kuala Lumpur
  - massive rail investment; bankrupts “companies”, little mode share effect
- BRT “Revolution”?
  - Curitiba, Transmilenio, MetroBus, Transantiago, etc.
Land Management

What hope for managing outcomes?

Urban Decentralization

<table>
<thead>
<tr>
<th>City</th>
<th>pop/sq km (1960)</th>
<th>pop/sq km (1990)</th>
<th>% chg. (1960-1990)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokyo</td>
<td>8,565</td>
<td>7,097</td>
<td>-17%</td>
</tr>
<tr>
<td>New York</td>
<td>2,878</td>
<td>2,086</td>
<td>-28%</td>
</tr>
<tr>
<td>Paris</td>
<td>6,860</td>
<td>4,614</td>
<td>-33%</td>
</tr>
<tr>
<td>London</td>
<td>6,539</td>
<td>4,232</td>
<td>-35%</td>
</tr>
<tr>
<td>Detroit</td>
<td>1,970</td>
<td>1,275</td>
<td>-35%</td>
</tr>
<tr>
<td>San Francisco-Oakland</td>
<td>1,640</td>
<td>1,602</td>
<td>-2%</td>
</tr>
<tr>
<td>Washington</td>
<td>2,046</td>
<td>1,373</td>
<td>-33%</td>
</tr>
<tr>
<td>Melbourne</td>
<td>2,028</td>
<td>1,491</td>
<td>-26%</td>
</tr>
<tr>
<td>Hamburg</td>
<td>6,827</td>
<td>3,982</td>
<td>-42%</td>
</tr>
<tr>
<td>Vienna</td>
<td>9,141</td>
<td>6,830</td>
<td>-25%</td>
</tr>
<tr>
<td>Brisbane</td>
<td>2,095</td>
<td>978</td>
<td>-53%</td>
</tr>
<tr>
<td>Copenhagen</td>
<td>4,952</td>
<td>3,467</td>
<td>-30%</td>
</tr>
<tr>
<td>Amsterdam</td>
<td>9,973</td>
<td>5,591</td>
<td>-44%</td>
</tr>
<tr>
<td>Zurich</td>
<td>5,998</td>
<td>4,708</td>
<td>-22%</td>
</tr>
<tr>
<td>Frankfurt</td>
<td>8,722</td>
<td>4,661</td>
<td>-47%</td>
</tr>
</tbody>
</table>

Will the developing world follow suit?

Source: Demographia, 2001
Decentralization in Santiago

Land Patterns: Generalizations

- Developing world still *much* denser than industrialized
- Wuhan: 160 (persons/ha)
- Mumbai: 120 (persons/ha)
- Belo Horizonte: 63 (persons/ha)
- Santiago: 60-70(persons/ha)
- Shanghai at NY Metro Area density would be 16 x current size…
Land Development: Changes

- Massive Mega-Developments
  - Nave Mumbai (Mumbai)
  - Pudong (Shanghai)
  - Sante Fe (Mexico City)
  - Chacabuco (Santiago)
  - Kuala Lumpur City Centre Project
  - Etc.
  - Represent influence the “modernizing” forces (globalization, motorization, infrastructure expansion, etc.)
Land Development: Challenges

Poverty, informality, spatial segregation

- Mexico City
  - 49% of residents live in “irregular” settlements
- Navi Mumbai
  - 39% in “informal” settlements
- China
  - Land reform and government land conversion incentives…
- Forces: continuous in-migration, low purchasing power, segregation, etc.

Socio-Economic Spatial Segregation

Santiago Mexico City

Images removed due to copyright restrictions.
Urban Decentralization: The Rich & Poor

“Irregular” Settlements in Mexico City

Images removed due to copyright restrictions.

Upper Income “Sprawl” in Santiago de Chile

Images removed due to copyright restrictions.

Institutions

The ultimate challenge?
Institutions

- Dynamism of change
  - Decentralization, democratization
  - Income growth, motorization, etc.
- Outstrips
  - Data relevance
  - Institutional capability (jurisdictional, technical, etc.)

Mexico City Metro Area:
Number of Local Jurisdictions
Institutions

• Developing country context makes things worse
  – Conditions for bureaucracy, civil service
  – Information is scarcer, thus “more valuable”
  – Greater asymmetries between public and private sector

• Yet, interesting examples exist
  – In part, perhaps, due to institutional ambiguities

Institutions, Politics and Planning…

• The allure of “Ribbon cutting” (e.g., highways, Metros) transcends parties
  – Politics trumps planning (almost always?)
• Motorization and the vested interests
  – Not just motor vehicle manufacturers…
• Urban expansion, speculators, real estate developers and the invasion of ‘big box’
• Citizens Organizations can be co-opted
  – But increasing in technical and political sophistication
Politics, Planning and Ribbon-cutting:
Costanera Norte Highway in Santiago

Images removed due to copyright restrictions.

Politics, Planning and Ribbon-cutting:
“Los Segundos Pisos” in Mexico City

Images removed due to copyright restrictions.
Politics, Planning and Ribbons: “Los Segundos Pisos” en Mexico City

Images removed due to copyright restrictions.

Institutions, Politics and Planning: Theory vs. Reality…

Development of Project Alternatives

<table>
<thead>
<tr>
<th>Theory</th>
<th>Practice (&quot;the Genetics&quot; of a Project)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Concept and Scope well-defined</td>
<td>• Personal Relationships</td>
</tr>
<tr>
<td>• Clearly respond to a need</td>
<td>• Financial Sources</td>
</tr>
<tr>
<td>• Consider all reasonable options</td>
<td>• Public Opinion</td>
</tr>
<tr>
<td>• Provide a range of options, illustrating trade-offs</td>
<td>• Technical Analysis</td>
</tr>
<tr>
<td>• All alternatives should be competitive as possible</td>
<td>(Juan Tapia G., 2005)</td>
</tr>
<tr>
<td>• Process should be open, well-documented, etc.</td>
<td></td>
</tr>
<tr>
<td>• Include “do nothing”</td>
<td></td>
</tr>
</tbody>
</table>

Source: Meyer & Miller, 2001
Conclusions

• Urban developing world is mobility poor
• Still in early stages of motorization
  – Unclear where saturation might lie
• Two-wheelers are a mobility “equalizer” and possibly motorization “enhancer”
• Public transport faces street capacity constraints, low management power/capability, low purchasing power
  – Continued focus on high profile, costly “solutions”
  – Unclear whether BRT-as-panacea will be productive
• Urban physical growth may be largest long-term opportunity and challenge
• All of this (and more) poses massive challenge to under-capacitated institutions