Public Transport in Latin America: a view from the World Bank

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Presentation contents

- Relevance of urban transport interventions
- Main urban transport problems in LAC cities
- LAC strategy to improve urban transport. Examples from our portfolio
- Main Lessons
- Looking forward: how to scale up Bank support?
Relevance of urban transport interventions

Main urban transport problems in LAC cities

LAC strategy to improve urban transport. Examples from our portfolio

Main Lessons

Looking forward: how to scale up Bank support?
High levels of urbanization in LAC

Ever-growing share of countries GDP generated in cities

Cities concentrate big pockets of poverty

Positive link between economic growth and urbanization, between transport efficiency and labour market efficiency.

Potential gains from urbanization are sensitive to local conditions. Local public services affect business costs in cities, and thus the potential gains from agglomeration. Transport is one of these crucial public services.
Long travel times, up to three hours per day in big cities.

Low quality transport generates social exclusion, poor accessibility to job opportunities, to schools, to hospitals, etc.

Urban transport represents a high % of households expenditures (higher than all other utilities combined, up to 25% in São Paulo)… except for the poorest who end up not traveling at all or walking / bicycling.

In Bogota, the poor walk on average 5.0 km!
Relevance at the micro level. Impact on poverty.

Buenos Aires: % of household expenditures on urban transport per quintile before and after the crisis.

Santiago: 40% of the poor walk (compared to less than 10% for the upper quintile).

Same numbers in São Paulo.
Relevance at the micro level. Impact on Accidents.

Fatalities per 10,000 cars

- Leon
- Lima
- Montevideo
- Bogota
- Guadalajara
- Santiago
- Ciudad de Mexico
- Sao Paulo
- Rio de Janeiro
- Porto Alegre
- Caracas
- Buenos Aires
- San Jose
- Belo Horizonte
- Curitiba
Relevance at the micro level. Impact on Air Pollution

- Bogota: conventional vs. Transmilenio corridor

Source: Behrentz and Rojas, 2006
Relevance of urban transport interventions

Main urban transport problems in LAC cities

LAC strategy to improve urban transport. Examples from our portfolio

Main Lessons

Looking forward: how to scale up Bank support?
A simple diagram illustrates the “vicious circle” of urban transportation in developing countries …

The vicious circle of urban transportation

- Increased fares and low-quality bus service
- Poverty and social exclusion (pricing out)
- Cars & motorcycles more attractive: growing motorization
- Congestion and delays
- More congestion and delays
- Public transportation slower and less attractive
- Rise of informal transportation
- Transport operators financial crisis. Possible need for subsidies leading to additional fiscal burden
- Urban expansion with reduced density
- Increased pollution, accidents and overall congestion. Lower gains of agglomeration, negative impact on GDP growth

Less demand, decreasing revenue, higher cost per pass.

Incorporating financial crisis and additional fiscal burden.
... and allows for the identification of several major, interrelated sector issues

RAPID URBANIZATION, MOTORIZATION, GROWING CONGESTION, POLLUTION AND NOISE

WEAK INSTITUTIONAL CAPACITY

LACK OF COORDINATION BETWEEN LEVELS OF GOVERNMENT IN METROPOLITAN REGIONS

THE ORGANIZATION OF BUS TRANSPORT

EXPLOSIVE GROWTH OF INFORMAL SECTOR (VANS)

LOW-INCOME USER: ACCESSIBILITY, AFFORDABILITY, AVAILABILITY, ACCEPTABILITY

URBAN TRANSPORT FINANCING

TARGETED VS. GENERAL SUBSIDIES

Inefficiencies within the urban public transport system generate negative social and environmental impacts, and weaken cities as growth engines
Motorization: a major trend in developing countries. Automobile and motorcycle growth is high and induced in part by poor public transport.

<table>
<thead>
<tr>
<th>Country</th>
<th>Cars and motorcycles per 1000 inhabs.</th>
<th>Motorcycles as % of total motorized vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>202</td>
<td>22%</td>
</tr>
<tr>
<td>Colombia</td>
<td>65</td>
<td>39%</td>
</tr>
<tr>
<td>Chile</td>
<td>168</td>
<td>2%</td>
</tr>
<tr>
<td>Ecuador</td>
<td>66</td>
<td>9%</td>
</tr>
<tr>
<td>Mexico</td>
<td>227</td>
<td>3%</td>
</tr>
<tr>
<td>USA</td>
<td>797</td>
<td>3%</td>
</tr>
<tr>
<td>China</td>
<td>54</td>
<td>83%</td>
</tr>
<tr>
<td>India</td>
<td>18</td>
<td>71%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>262</td>
<td>95%</td>
</tr>
</tbody>
</table>
Rapid urbanization and motorization result in growing congestion, pollution and noise

- Private automobile main source of emissions.
- Trucks and buses very noisy
- Congestion exists in major cities, and is responsible for substantial negative externalities

Limited road space is taken by private auto with very limited priority for public transit, increasing door-to-door travel times. **NEED TO GIVE PRIORITY TO PUBLIC TRANSPORT**
Weak institutional capacity

- Few transport, traffic engineers
- Few transport planners
- Too many lawyers vis-a-vis number of engineers/planners
- Traffic lights: often lack proper timing and coordination (generate instead of lowering congestion)
- Low capacity to enforce laws
- Low capacity to educate drivers and pedestrians

Virtuous cycle of Traffic Management: E.E.E.
Lack of coordination between levels of Government in metropolitan regions

- No formal metropolitan regions defined
- No formal metropolitan coordination bodies
- Need to use federal/national power to create these bodies to avoid duplication of efforts and wastage at the metropolitan region level

*Municipal buses, inter-city buses and rail/metro are not integrated neither physically nor tariff wise*
The organization of bus transport has weak regulatory framework

- Mostly permissions, not concessions, assigned many times for life and passed from generation to generation
- Competition in the market with little or no barriers to entry
- Multiple routes; trend to oversupply and overlapping
- Bus vs. informal vans:

  Duplication of routes, high tariffs, bus congestion, lack of hub-and-spoke services, no tariff integration
The organization of bus transport: Mexico, Central America, Colombia, Chile, Perú…
The organization of bus transport: leads to competition in the market

- Competition in the market known as the “penny war” in several countries
- Wrong incentives:
  - Inflated fare
  - Oversupply
  - Low quality, except in terms of frequency
  - High travel times
  - High accident rates
- But: fair coverage and low waiting times (passengers like these attributes. i.e. high frequency and not walking)
The organization of bus transport: weak regulation

- Regulation favors the regulated party over the user and perpetuates negative incentives

\[
\text{Fare} = \sum \text{fixed and variable costs} / \text{Passengers per bus}
\]

- Way to calculate fare promotes oversupply and assigns commercial risk to the passenger—the party least able to control this risk
The organization of bus transport: example from Bogota

- High frequency demands larger-than-needed fleets and higher-than-efficient fares

- Small vehicles (“vans”) enter the market because of ability to offer high frequency and navigate faster congested streets

### Real Increase in Fares, Before and After Transmilenio

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New Bus</td>
<td>7.0%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Old Bus</td>
<td>52.9%</td>
<td>28.4%</td>
</tr>
<tr>
<td>New Small Bus</td>
<td>46.0%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Old Small Bus</td>
<td>129.4%</td>
<td>28.4%</td>
</tr>
<tr>
<td>Microbus</td>
<td>22.3%</td>
<td>-19.7%</td>
</tr>
<tr>
<td>Transmilenio</td>
<td>N.A.</td>
<td>13.3%</td>
</tr>
</tbody>
</table>
The explosive growth of informal sector (vans) complicates urban transport even further

- Why are they multiplying? Lower price (tariffs reductions, financial aids), unemployment
- Can they be turned into an ally rather than being seen as the enemy?
- How can they be controlled? Barriers to entry
- Can they be part of a competition for the market arrangement and integrate with mass transit?

They add to congestion if they don’t work as feeders, are more often than not illegal, are unsafe, stop where they want, don’t pay taxes, but people like them because they are door-to-door transport.
Low-income users request accessibility, affordability, availability, and service acceptability

- Huge concentration of poor/low-income users in the periphery of metropolitan areas or in pockets close to downtown
- They spend over 20% of their net income in home-to-work trips
- They often have money for one leg but cannot afford returning home
- Access to closest public transport hard and unsafe
- Availability is low
- Leave very early to get to work return very late home: family problems

As a result, access to employment, health and education facilities is becoming more and more difficult for the poor

Buenos Aires after the crisis
- Poorest households switch out of public transport towards walking and cycling (12% first quintile)
- Budget share absorbed by public transport rises substantially among lowest quintiles

Sao Paulo
- Number of walking trips almost 40% of daily trips, long distances
- Non recipients of subsidies paying almost 20-25% of their gross incomes for UT
- Users of trains mainly between 2 and 4 Minimum Salaries
Public urban transport financing is a major issue; in LAC, the private sector has a relevant role

- Where do the funds for investment, maintenance come from when revenues are not sufficient to cover costs?
- Should we favor an urban transport fund?
- What are other financing mechanisms?
- How to establish financing priorities?
- Designing adequate and reliable urban transport financing mechanisms is a priority in all LAC countries

Private Sector Financing

- Traditional in the bus industry
- Revenue perception, guarantees
- Concession or Public-Private partnership (PPP) laws
- How to foster Private Sector Participation?
- PPP are possible and desirable with the proper risk mitigation and an enabling environment for the PS as well as a good regulatory agency
Targeted vs. general subsidies

- Targeted (vale-transporte) vs. blanket
- The impacts of flat fares in large cities
- What are the advantages and disadvantages of alternative subsidies to the poor?
- How can subsidy fraud be controlled?
- Is the Bank willing to finance initial subsidies out of loan proceeds?

Targeted subsidies are theoretically better and they might be enhanced and better controlled by the smart card. But they must be offered to both formal and informal employees.
• Relevance of urban transport interventions
• Main urban transport problems in LAC cities
• LAC strategy to improve urban transport. Examples from our portfolio
• Main Lessons
• Looking forward: how to scale up Bank support?
The Bank approach to break the vicious circle is based on several pillars, derived from the sector policy and the Region particular problems.

- A need to coordinate transport policy and planning
- Growing trend towards decentralization, as well as lending to sub-national entities
- Coordination of transport planning with land use and air quality policies, at a regional level

A seminal document has established the Bank sector policy in 2002.
The Bank approach … (continued)

FINANCING MECHANISMS TO ENSURE LONG-TERM FINANCIAL SUSTAINABILITY

- Careful design of regulatory mechanisms, as Transmilenio
- Fare adjustment as a critical issue

PROGRESSIVE PRIVATE SECTOR PARTICIPATION IN OPERATIONS AND INVESTMENT

- BOT schemes in rail projects
- Public-private partnership in BRTs
The Bank approach to break the vicious circle is based on several pillars, derived from the sector policy and the Region particular problems:

- **Competition for the Market**
- Reorganizing network layout with formal services over trunk and feeders corridors
- High capacity modes on trunk corridors: BRT, rail transit, LRT
- Intramodal and intermodal service integration
- Fare integration

- Design networks targeting the poor accessibility
- Fare levels affordable by low income users
- Emphasis on non motorized transport (pedestrians, bicycles)
- Gender issues
- Attention to disadvantaged groups

A seminal document has established the Bank sector policy in 2002.
The current project portfolio is characterized by the improvement of public transport service and its orientation to the poor, addressing the other basic pillars with varied emphasis.

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>REGIONAL TRANSPORT COORDINATION</th>
<th>STRATEGY INTEGRATED WITH LAND USE, AIR QUALITY</th>
<th>EMPHASIS IN FINANCIAL SUSTAINABILITY</th>
<th>PRIVATE SECTOR PARTICIPATION</th>
<th>MAIN FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lima Transport</td>
<td>partial</td>
<td>low</td>
<td>high</td>
<td>high</td>
<td>BRT (busway and feeders), non motorized transport</td>
</tr>
<tr>
<td>Colombia Integrated Mass Transit Systems</td>
<td>yes</td>
<td>partial</td>
<td>high</td>
<td>high</td>
<td>BRTs in Bogotá and medium size cities</td>
</tr>
<tr>
<td>Sao Paulo Metro Line 4</td>
<td>yes</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Turnkey and concession of a metro line</td>
</tr>
<tr>
<td>CBTU (Brazil) decentralization Program</td>
<td>yes</td>
<td>yes</td>
<td>low</td>
<td>low</td>
<td>Suburban rail rehabilitation, decentralization</td>
</tr>
<tr>
<td>Buenos Aires Public Transportation</td>
<td>yes</td>
<td>yes</td>
<td>low</td>
<td>yes</td>
<td>Metro and suburban trains rehabilitation, planning</td>
</tr>
<tr>
<td>Santiago urban transport</td>
<td>partial</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Integrated transport system (metro, buses, railroads)</td>
</tr>
<tr>
<td>Upgrading and Greening the Rio de Janeiro Urban Rail</td>
<td>yes</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Suburban rail concession, urban redevelopment</td>
</tr>
</tbody>
</table>

All projects are aimed at the development of efficient public transport systems, oriented towards the poor.
In a simplified typology, the Bank operations can be categorized under three types of projects:

<table>
<thead>
<tr>
<th>Typology</th>
<th>Main Characteristics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>MULTI – CITY</td>
<td>Several cities in one country&lt;br&gt;Strengthen national authority and local authorities&lt;br&gt;Mix urban development and urban transportation&lt;br&gt;I.e.: missing links, paving, sidewalks, lightening</td>
<td>Venezuela First Urban Transport Project&lt;br&gt;Brazil First and Third Transport Project&lt;br&gt;Mexico Medium Cities Urban Transport Project&lt;br&gt;Colombia Integrated Transit Systems&lt;br&gt;Mexico UTTP</td>
</tr>
<tr>
<td>MULTIPLE TRANSPORT</td>
<td></td>
<td>METRO LINE 4 SAO PAULO&lt;br&gt;DECENTRALIZATION SUBRB.&lt;br&gt;Railways CBTU - Brasil&lt;br&gt;Metro y ferrocarriles suburbanos - Buenos Aires&lt;br&gt;Upgrading and Greening the Rio de Janeiro Urban Rail</td>
</tr>
<tr>
<td>COMPONENTS</td>
<td></td>
<td>CHILE’S TRANSANTIAGO</td>
</tr>
<tr>
<td>MASS TRANSIT CORRIDORS</td>
<td>Focusing on one or several corridors&lt;br&gt;BRT or rail mass transit&lt;br&gt;Integration with other modes&lt;br&gt;Urban improvement in the proximity&lt;br&gt;Private sector participation&lt;br&gt;Non motorized transport such as bikeways</td>
<td></td>
</tr>
<tr>
<td>SINGLE CITY INTEGRATED TRANSPORT SYSTEM</td>
<td>Integrated urban transport system (operational and fare integration)&lt;br&gt;Linked with air quality and urban development policies&lt;br&gt;Establishment of a regional transport coordination&lt;br&gt;Private sector participation</td>
<td></td>
</tr>
</tbody>
</table>
The support of Buenos Aires metro modernization is an example of system rehabilitation ...
… as is Sao Paulo trains modernization project
... as is Sao Paulo trains modernization project

Sao Paulo Line 4: Faria Lima – Paulista stations opening day (May 25th 2010)
Curitiba: the precursor

Segregated busways and transit-oriented development
Transmilenio established a new paradigm in the region

- Segregated Busways
- Dedicated bus stations
- Smart Cards
- Facilities for persons with disabilities
Transmilenio: Competition for the Market through concessions and barriers to entry that limit competition in the market from old buses

Infrastructure (State)
- Exclusive lanes
- Stations
- Accessways
- Parking Lots & Maintenance Shops

Operation (Private Sector)
- Operation companies
- Buses
- Operation Employees

Collection System (Private Sector)
- Equipment
- Card Based
- Fiduciary Management

Planning, Operation and Control:
TRANSMILENIO S.A,
Alcaldía Mayor de Bogotá

TRANSMILENIO
Bogotá, Colombia
Lima project follows the same principles
Rio de Janeiro: a long-term partnership

- Rio de Janeiro Metropolitan Transport Decentralization Project (P006547) 1992
- Rio de Janeiro State Reform and Privatization Loan (P039197) 1997
- Rio de Janeiro Mass Transit Loan (P043421) 1998
- Rio de Janeiro Mass Transit II Loan (P111996) 2009
- Upgrading and Greening the Rio de Janeiro Urban Rail System (P125630) 2012
- Rio de Janeiro Mass Transit Additional Financing (P106427) 2008
Rio de Janeiro: a long-term partnership

Ridership from 150,000 in 1998 to 550,000 in 2012

Subsidy: US$ 121 million in 1997 to US$ 0.00 (zero) currently
PDO:
a) improve the level-of-service provided to the suburban rail transport users in RJMR in a safe and cost-efficient manner; b) to place the suburban rail transport system, in particular the D. Pedro-Deodoro rail corridor, on a lower carbon growth path; and c) to improve the transport management and policy framework in the RJMR.
Relevance of urban transport interventions

Main urban transport problems in LAC cities

LAC strategy to improve urban transport. Examples from our portfolio

Main Lessons

Looking forward: how to scale up Bank support?
Main lessons

- Priority to public transport because of its benefits, particularly to the poor
  - Priority in funding
  - Priority in physical space

- Institutional capacity and coordination
  - Project champion and leadership
  - Metropolitan coordination
  - E.E.E

- Not Bus vs. Rail: it is public transport!
  - Promote competition for the market
  - Hierarchical networks that are integrated: fare-wise and physically
- Relevance of urban transport interventions
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- Main Lessons
  - Looking forward: how to scale up Bank support?
Looking forward: how to scale up Bank support

- Promote a more proactive engagement in projects that give priority to urban public transport under a broadened agenda
  - Moving from corridor projects to integrated urban transportation systems
  - Strengthening cross sectoral links (air quality, urban development, social inclusion, road safety, vulnerable users)

- Better response to existing and emerging demands
  - Large agglomerations, strengthening institutional organization at the metropolitan level
  - Mid size cities, anticipating the problems and inducing better urban development patterns

- Address associated lending challenges
  - Lending to sub-nationals
  - Dealing with subsidies (design and financing) when externalities justify them
<table>
<thead>
<tr>
<th>Investments in Metrorail Projects</th>
<th>World Bank (US$ millions)</th>
<th>TOTAL (US$ millions)</th>
<th>Completed/To be Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Paulo - CBTU</td>
<td>126</td>
<td>281</td>
<td>1998</td>
</tr>
<tr>
<td>Rio - CBTU</td>
<td>128</td>
<td>272</td>
<td>2000</td>
</tr>
<tr>
<td>Belo Horiz. - CBTU</td>
<td>99</td>
<td>199</td>
<td>2003</td>
</tr>
<tr>
<td>Recife - CBTU</td>
<td>102</td>
<td>204</td>
<td>2003</td>
</tr>
<tr>
<td>S. Paulo (CPTM)Estado</td>
<td>45</td>
<td>95</td>
<td>2004</td>
</tr>
<tr>
<td>Salvador CBTU/Est/Pre.</td>
<td>150</td>
<td>350</td>
<td>2010</td>
</tr>
<tr>
<td>Rio Mass Transit/Estado +AF</td>
<td>230</td>
<td>375</td>
<td>2009</td>
</tr>
<tr>
<td>Fortaleza Linha Oeste CBTU/Estado</td>
<td>35</td>
<td>35</td>
<td>2010</td>
</tr>
<tr>
<td>S. Paulo Metro Line 4/Est.+AF</td>
<td>304</td>
<td>1580</td>
<td>2010</td>
</tr>
<tr>
<td>Buenos Aires (PTUBA)</td>
<td>200</td>
<td>400</td>
<td>2006</td>
</tr>
<tr>
<td>São Paulo Trains &amp; Signaling</td>
<td>542</td>
<td>1550</td>
<td>2011</td>
</tr>
<tr>
<td>Rio Mass Transit 2</td>
<td>400</td>
<td>550</td>
<td>2012</td>
</tr>
<tr>
<td>S. Paulo Metro Line 4/ Fase2</td>
<td>225</td>
<td>640</td>
<td>2012</td>
</tr>
<tr>
<td>São Paulo Metro Line 5</td>
<td>650</td>
<td>2450</td>
<td>2014</td>
</tr>
<tr>
<td>Buenos Aires (PTUBA 2)</td>
<td>100</td>
<td>138</td>
<td>2011</td>
</tr>
<tr>
<td>Investments in BRTs and other UT PROJECTS</td>
<td>World Bank (In $US millions)</td>
<td>TOTAL (in $US millions)</td>
<td>Completed/To be Completed</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------------------------</td>
<td>-------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Bogotá (Transmilénio)</td>
<td>20</td>
<td></td>
<td>2002</td>
</tr>
<tr>
<td><strong>Venezuela Urban Transport Project</strong></td>
<td>75</td>
<td>150</td>
<td>2004</td>
</tr>
<tr>
<td><strong>Mexico-Ciudades Medianas</strong></td>
<td>75</td>
<td>150</td>
<td>2004</td>
</tr>
<tr>
<td>Santiago-Chile (Transantiago)</td>
<td>30</td>
<td>30</td>
<td>2007</td>
</tr>
<tr>
<td><strong>Colombia Integ. Mass Transit Systems (Bogotá, Perera, Medellin, Bucamaranga Cartagena)</strong></td>
<td>250 (600)</td>
<td>500</td>
<td>2009</td>
</tr>
<tr>
<td><strong>Transantiago-TAL</strong></td>
<td>4.5</td>
<td>6</td>
<td>2009</td>
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<tr>
<td><strong>Lima Urban Transport</strong></td>
<td>45</td>
<td>90</td>
<td>2010</td>
</tr>
<tr>
<td><strong>Mexico Urban Transport Transformation</strong></td>
<td>150</td>
<td>350</td>
<td>2012</td>
</tr>
<tr>
<td><strong>Brasília</strong></td>
<td>26</td>
<td>26</td>
<td>2010</td>
</tr>
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