Transantiago: On the Development of Public Transit in Large Cities

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What is Transantiago?

• A major transit modernization effort as no other worldwide city has suffered.
  – New firms
  – New buses
  – Bus control system
  – Integration among services (fares, services, etc)
  – New services
  – New fare
  – Touchless payment card

• For many: “The worst public policy ever implemented in Chile”
The bus system before Transantiago

• Did not work as a network
• Excessive on-street competition
  – Drivers paid per passenger
  – Average size of a firm: two buses.
• High operational costs
  – High fares for the quality of service offered
• Severe externalities: accidents, pollution, congestion
• Drivers frequently assaulted
• Student discrimination
• Poor night services

People in Santiago rated bus service very badly
Buses: worst service in Santiago
And even more ...
Goals of Transantiago
Goals of Transantiago

Transantiago’s first goal was to modernize the transit system in Santiago:

- Keep (and increase) its modal split.
- Improve quality of service.
- Offer a economically, socially and environmentally sustainable system.
Transantiago an integrated system
How would these goals be achieved?

- Bus services respond to a trunk and feeder system sing Metro as a main trunk operator.
- Only corporate operators are allowed. Bus services are grouped into 15 units.
- Better work conditions for drivers.
- No passenger discrimination.
- Integration among services: routes, fares, infrastructure.
- Distance travelled and necessary fleet are reduced considerably.
- Intensive use of Metro.
- Gradual inclusion of new buses: some articulated, smoother drive, disabled friendly, etc.
How would these goals be achieved?

• Considers a smart and contactless payment card
  – Allowing fare integration and eliminating cash from buses

• Reaches the environmental goals (new buses, fewer kilometers traveled, filters, Diesel 50 ppm)

• Considers a user information system and a centralized headway control system

• Considers segregated bus corridors and modern bus stops

• Cost savings would allow keeping the fares stable.
Traveling in Transantiago
The trunk network is grouped into 5 firms.

Trunk buses are colored white and green.

Metro is a sixth trunk operator
Transition
Transition designed between systems

• Within a year, components were to be incorporated gradually
  – Operators
  – Buses
  – Infrastructure
  – Smart card
  – Card charging network
  – Headway control system

• Finally, integrated fares and new services; simultaneously in the whole city.
Implementation of Transantiago (January 10th, 2007)
Incomplete system

- Infrastructure was not built.
  - Almost no exclusive bus lanes
  - No bus stops with pre-paid zones
- Information was very poorly provided
- Firms were not ready to start
- GPS-based control system was not ready
- Card validating devices were not trusted
- A nervous authority guaranteed the income, fixed the fare and extended trip lengths
Incomplete system

- Not enough buses, and additionally operators lacked all incentives to operate…
- Operating buses bunched consistently, losing reliability
- Metro collapsed
- Lack of services in some areas
- A financial deficit started to grow
Dramatic evidence
Recommendations by an expert panel (January 2008)
Panel

– Juan Enrique Coeymans (P. Universidad Católica de Chile)
– Pablo Allard (P. Universidad Católica de Chile)
– Leonardo Basso (Universidad de Chile)
– Ana Luisa Covarrubias (Libertad y Desarrollo)
– Joaquín de Cea (P. Universidad Católica de Chile)
– Louis de Grange (Universidad Diego Portales)
– Juan Enrique Doñas (consultant)
– José Enrique Fernández (P. Universidad Católica de Chile)
– Rodrigo Fernández (Universidad de los Andes)
– Gloria Hutt (Steer Davies Gleave)
– Marcela Munizaga (Universidad de Chile)
– Juan Carlos Muñoz (P. Universidad Católica de Chile)
Recommendations: General

- Road congestion pricing.
- Subsidies justified on grounds of efficiency (carefully designed to avoid creating perverse incentives).
- Eliminate surface parking in congested areas & periods.
- Ensure marginal social productivity in transit infrastructure investment.
- Provide dedicated bus infrastructure.
- Eliminate other distortions in the transportation system (specific fuel taxes and vehicle registration).
- Implement a mechanism for trading pollution permits.
Recommendations: Regulation & Competition I

- Flexible contracts for operators ensuring adequate coverage, wait times and vehicle occupancy rates.
- The authority defines a set of reference routes and minimum service levels and the operator proposes definitive routes, frequencies and types of vehicle.
- Maximum headways and overlaps between bus and metro services.
- Authority ensures service levels throughout the city.
- Payment based on demand and service quality.
- Offer users a degree of choice in order to improve coverage and guarantee service in any eventuality.
Recommendations: Regulation & Competition II

- Define indicators for conducting regular measurement of service quality that affect operators revenues.
- Allow operators to offer a range of services and vehicle types in response to different operating conditions (express, regular or other service patterns).
- Allow operators to introduce incentives for drivers as long as they apply to the service as a whole rather than individual drivers or vehicles.
- Develop a plan involving all operators to minimize fare evasion (use technology and authorize fines).
- Eliminate barriers to entry resulting from ownership of bus terminals.
Recommendations: Financing

- Define optimal fares and subsidies simultaneously.
- Carefully avoid perverse incentives when subsidizing.
- Consider different fare structures: distance-based, dependent on time of day, weekly or monthly passes.
- Student subsidies should be dealt separately.
- Infrastructure construction and maintenance should be financed separately.
- New Metro projects must show social benefits when compared with segregated bus corridors.
- Designate transit (metro and bus) as an essential service that cannot be interrupted for labour conflicts.
Recommendations: Operations and Infrastructure

- Provide transit with high average speeds (> 20 kms/hr).
- Improve accessibility to stops and stations, access to buses (wait, board).
- Enforce the banning of non-transit traffic from exclusive bus lanes (or streets) using fixed and mobile cameras.
- Educate motorists on the importance of cooperating.
- Control service regularity
- Continuously adjust, update and modify service networks. Avoid transfers as possible.
Recommendations: Operations and Infrastructure

• Provide a significant proportion of express services: either skipping selected stops or joining two very distant points through the fastest route (using urban freeways).

• Provide scheduled services during very low demand periods, eventually using low occupancy vehicles.

• Provide high quality transfers (fast, comfortable, safe and well informed).

• Implement a broad user information program.

• Conduct statistical analyses, compare and contrast data trends, carry out data matching and detect key elements to determine problems to be addressed.

• The use of bus terminals should be more flexible.
Improvements since February 10, 2007
Infraestructure

- Metro network: 100 kms
- Transantiago bus corridors: 92.1 kms.
Infraestucture

148 operating provisional prepaid bus stops
Headway regularity has improved.

More buses running the system.

Services: 222

Km driven: 39 MM Km/mes

Buses: 5.613

Buses Totales Circulando (con GPS), Días Laborales desde 03/07/07 al 31/12/07

- 5.816
- 4.400
- 4.600
- 4.800
- 5.000
- 5.200
- 5.400
- 5.600
- 5.800

Operation:

- 5.613
- 6.094
+ 47%
+ 8%
## Operation

<table>
<thead>
<tr>
<th></th>
<th>February 2007</th>
<th>February 2009</th>
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<tbody>
<tr>
<td><strong>Services:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Trunk</td>
<td>89</td>
<td>141</td>
</tr>
<tr>
<td>Feeder</td>
<td>133</td>
<td>185</td>
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<tr>
<td><strong>Total</strong></td>
<td>222</td>
<td>326</td>
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<tr>
<td><strong>Super express services</strong></td>
<td>0</td>
<td>14</td>
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<tr>
<td>Roofed bus stops</td>
<td>3,013</td>
<td>7,556</td>
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<tr>
<td>Pre paid bus stops</td>
<td>0</td>
<td>155</td>
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<tr>
<td>Operating buses</td>
<td>4,000</td>
<td>5,850</td>
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## Operation

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<thead>
<tr>
<th></th>
<th>February 2007</th>
<th>February 2009</th>
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<tbody>
<tr>
<td>Average waiting per trip (adding all trip legs)</td>
<td>11.9 minutes</td>
<td>5.6 minutes</td>
</tr>
<tr>
<td>Average trip time</td>
<td>57.3 minutes</td>
<td>43.5 minutes</td>
</tr>
<tr>
<td>Passengers waiting more than 10 mins</td>
<td>17.4%</td>
<td>6.8%</td>
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<tr>
<td>Passengers waiting more than 20 mins</td>
<td>4.4%</td>
<td>0.7%</td>
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Same place, same day, same hour, two years later

Escuela Militar, Las Condes 08:30 am

10/02/07

Escuela Militar, Las Condes 08:30 am

10/02/09

Source: El Mercurio
Same place, same day, same hour, two years later

5 de abril con Pajaritos, Maipú
06:20 am

10/02/07

Source: El Mercurio
Monthly trip legs

Junio 08 - abril 09 vs Junio 07 - abril 08

Junio 07 - abril 08
Average monthly deficit of MM US$ 40 for the whole system (i.e. Buses, Metro, Metro infrastructure, etc.)
Transantiago approval rates
Satisfaction level with Metro’s Quality of Service

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Dic</th>
<th>Ago</th>
<th>2008</th>
<th>2009</th>
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<tbody>
<tr>
<td>% Satisfacción (% 6 y 7)</td>
<td>83</td>
<td>81</td>
<td>85</td>
<td>87</td>
<td>89</td>
<td>81</td>
<td>37</td>
<td>52</td>
<td>57</td>
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<tr>
<td>% Insatisfacción (% 1 a 4)</td>
<td>-4</td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>-1</td>
<td>-3</td>
<td>-27</td>
<td>-16</td>
<td>-11</td>
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<td>ISN</td>
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FrontDesk

METRO
DE SANTIAGO
Perception of Metro’s Image

89    | 92    | 93    | 89    | 53    | 67    | 86
87    | 91    | 92    | 87    | 33    | 57    | 83

% Satisfacción (% 6 y 7) | % In satisfacción (% 1 a 4) | ISN
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