

# **Transantiago: On the Development of Public Transit in Large Cities**

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# What is Transantiago?

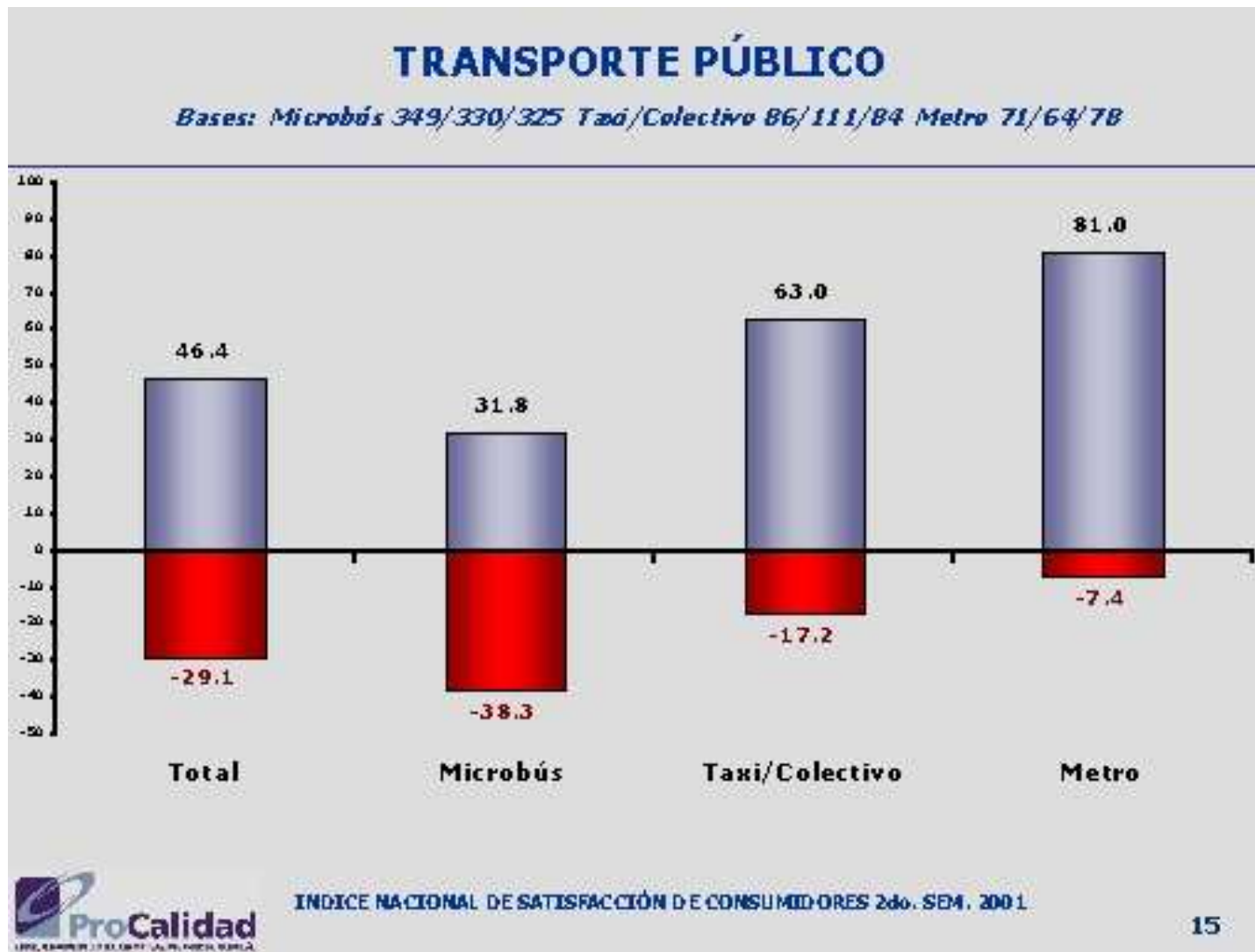
- **A major transit modernization effort as no other worldwide city has suffered.**
  - **New firms**
  - **New buses**
  - **Bus control system**
  - **Integration among services (fares, services, etc)**
  - **New services**
  - **New fare**
  - **Touchless payment card**
- **For many: “The worst public policy ever implemented in Chile”**

# The bus system before Transantiago

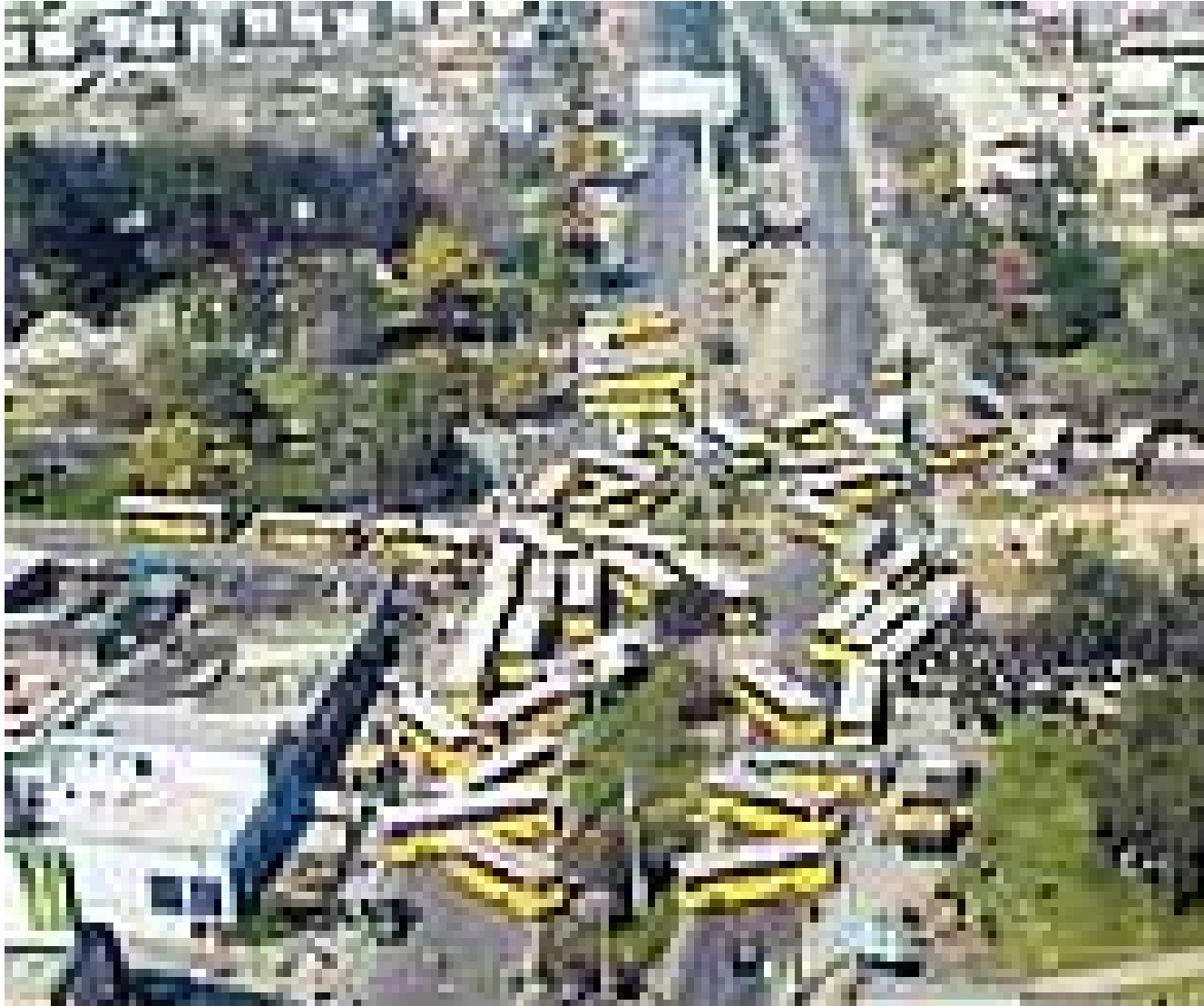
- **Did not work as a network**
- **Excessive on-street competition**
  - Drivers paid per passenger
  - Average size of a firm: two buses.
- **High operational costs**
  - High fares for the quality of service offered
- **Severe externalities: accidents, pollution, congestion**
- **Drivers frequently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



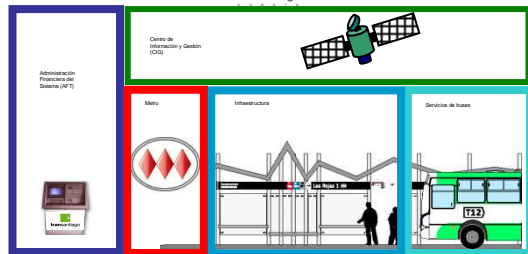
- Keep (and increase) its modal split.
- Improve quality of service.
- Offer a economically, socially and environmentally sustainable system.



# **Transantiago an integrated system**

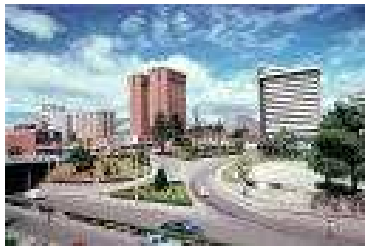


# How would these goals be achieved?



- Bus services respond to a trunk and feeder system using 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.

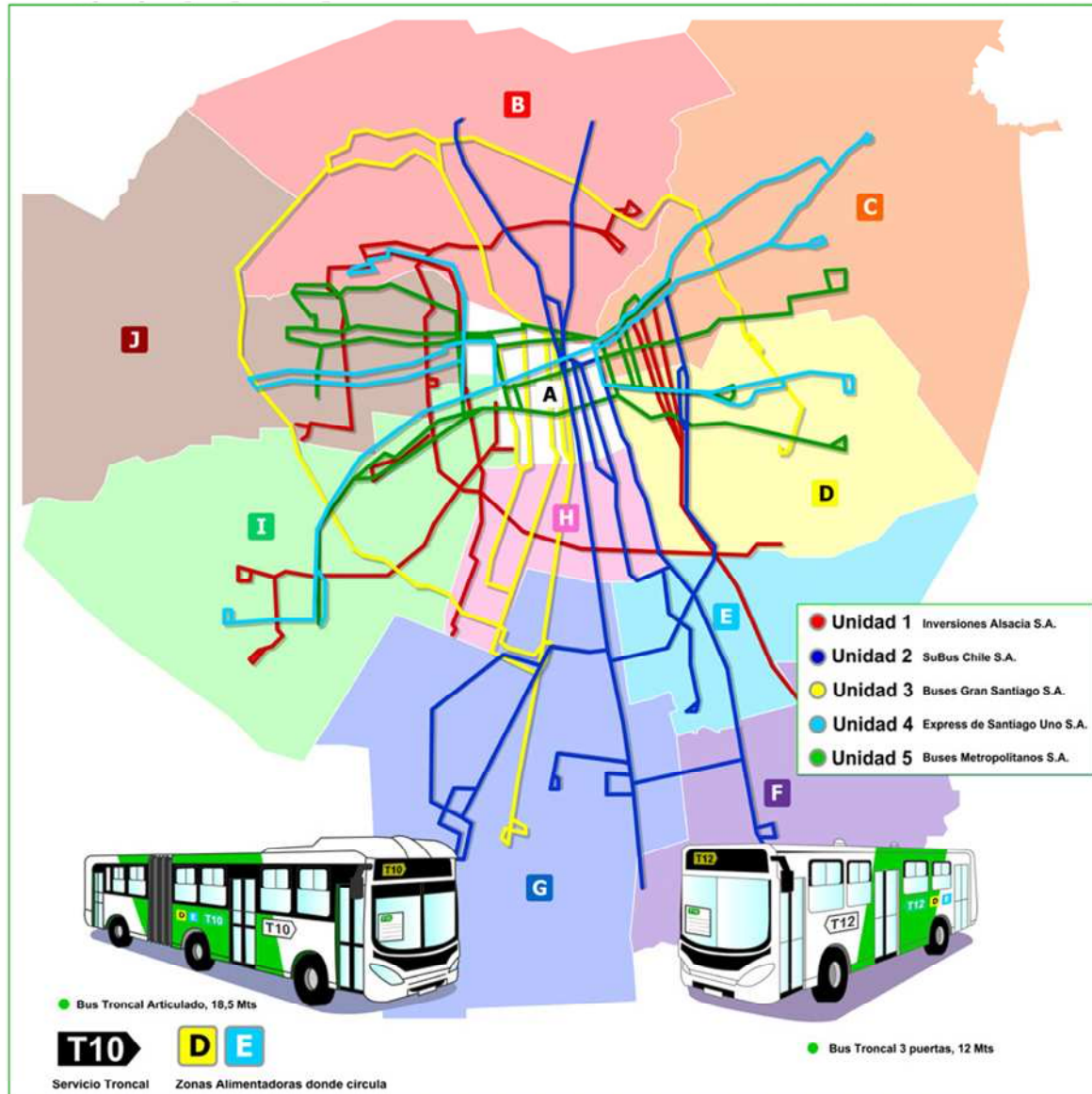
# How would these goals be achieved?



- **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

# Trunk services



The trunk network is grouped into 5 firms.

Trunk buses are colored white and green.

Metro is a sixth trunk operator

- **Unidad 1** Inversiones Alsacia S.A.
- **Unidad 2** SuBus Chile S.A.
- **Unidad 3** Buses Gran Santiago S.A.
- **Unidad 4** Express de Santiago Uno S.A.
- **Unidad 5** Buses Metropolitanos S.A.

# 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 10<sup>th</sup>, 2007)



**tran\*#%@**

# 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

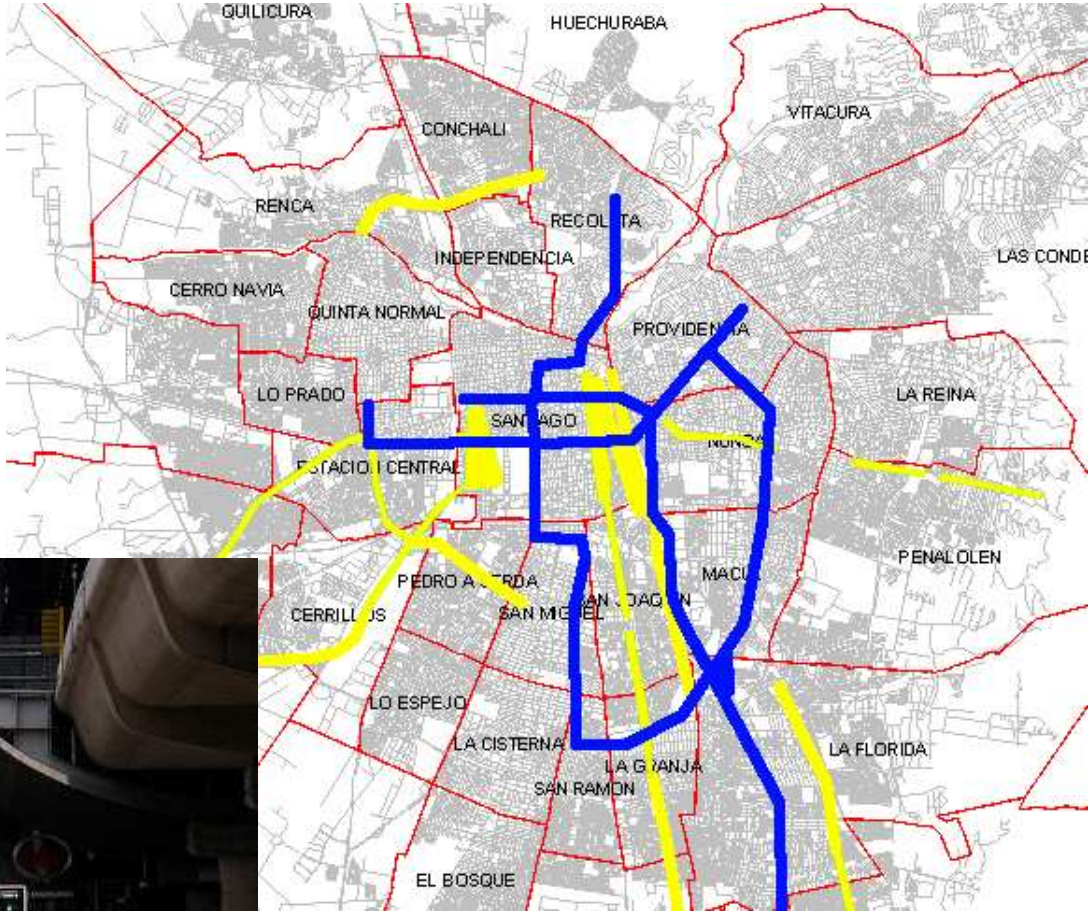
- Provide a significant proportion of express services: either skipping selected stops or joining two very distant points through the fastest route (using urban freeways).
- Provide scheduled services during very low demand periods, eventually using low occupancy vehicles.
- Provide high quality transfers (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

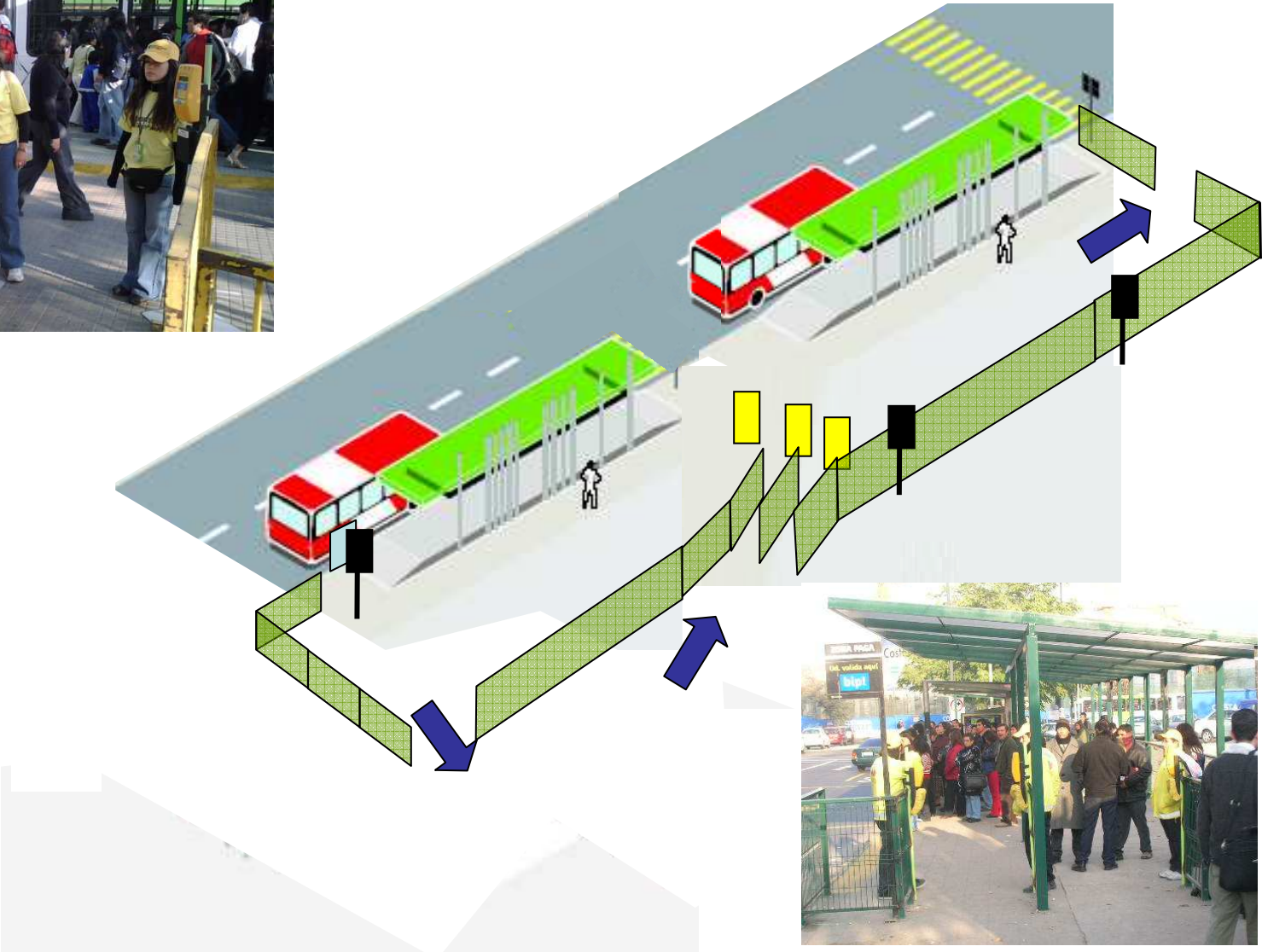
Metro network 100 kms  
Transantiago bus corridors 92.1 kms.



# Infraestructura



148 operating provisional prepaid bus stops

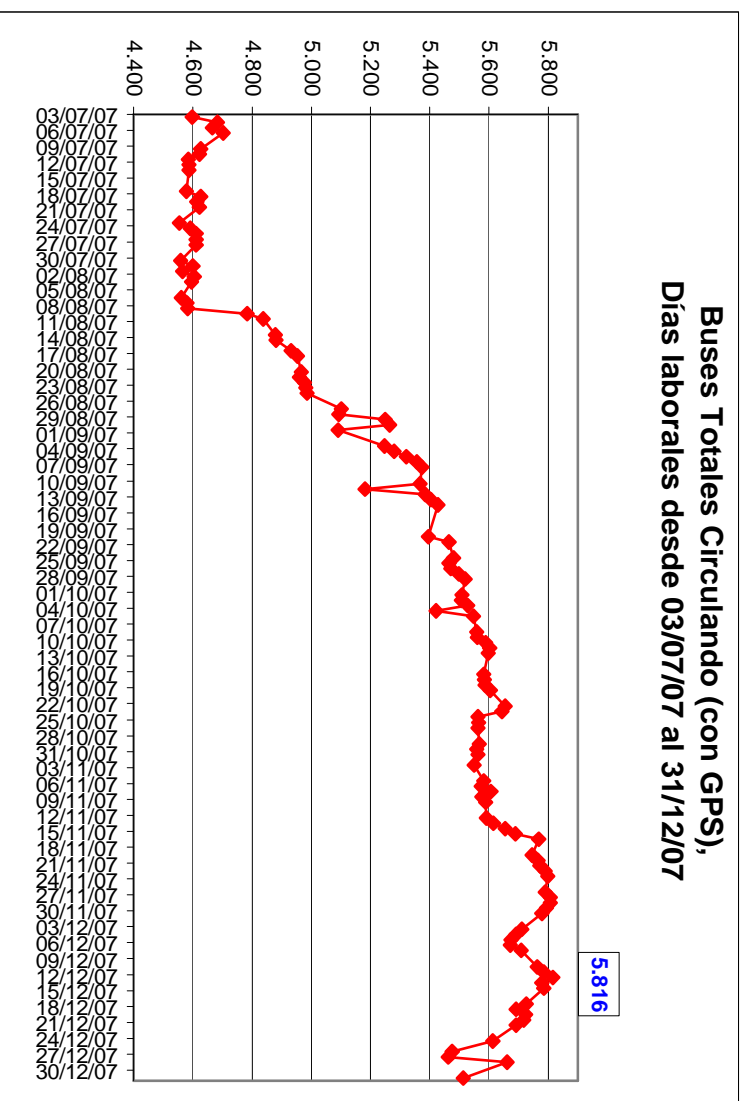


## Operation


Services:	222	326	+47%
Buses:	5.613	6.094	+ 8%
Km driven:	39 MM Km/mes	50 MM Km/mes	

Headway regularity has improved


More buses running the system



## Operation

	February 2007	February 2009
<b>Services:</b>		
<b>Trunk</b>	89	141
<b>Feeder</b>	133	185
<b>Total</b>	222	326
<b>Super express services</b>	0	14
<b>Roofed bus stops</b>	3,013	7,556
<b>Pre paid bus stops</b>	0	155
<b>Operating buses</b>	4,000	5,850

## Operation

 February 2007	February 2009	
<b>Average waiting per trip (adding all trip legs)</b>	<b>11.9 minutes</b>	<b>5.6 minutes</b>
<b>Average trip time</b>	<b>57.3 minutes</b>	<b>43.5 minutes</b>
<b>Passengers waiting more than 10 mins</b>	<b>17.4%</b>	<b>6.8%</b>
<b>Passengers waiting more than 20 mins</b>	<b>4.4%</b>	<b>0.7%</b>

**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



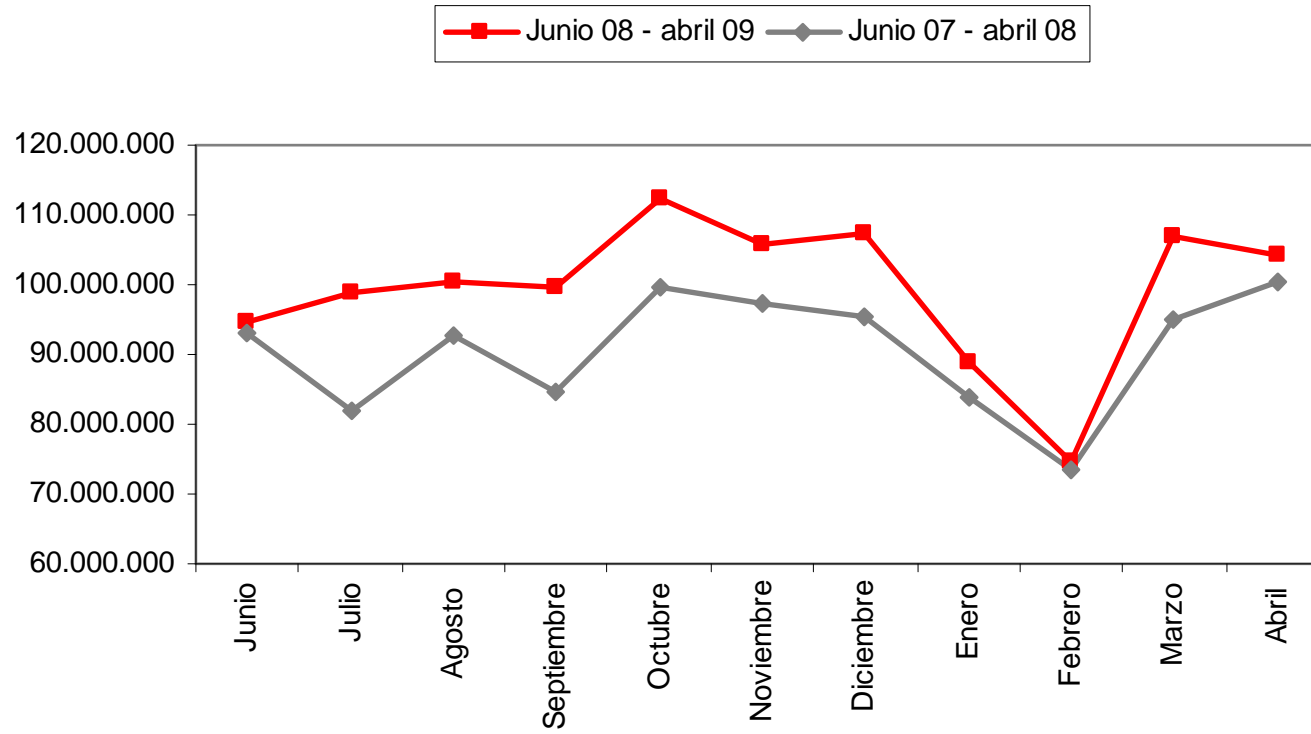
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Source: El Mercurio

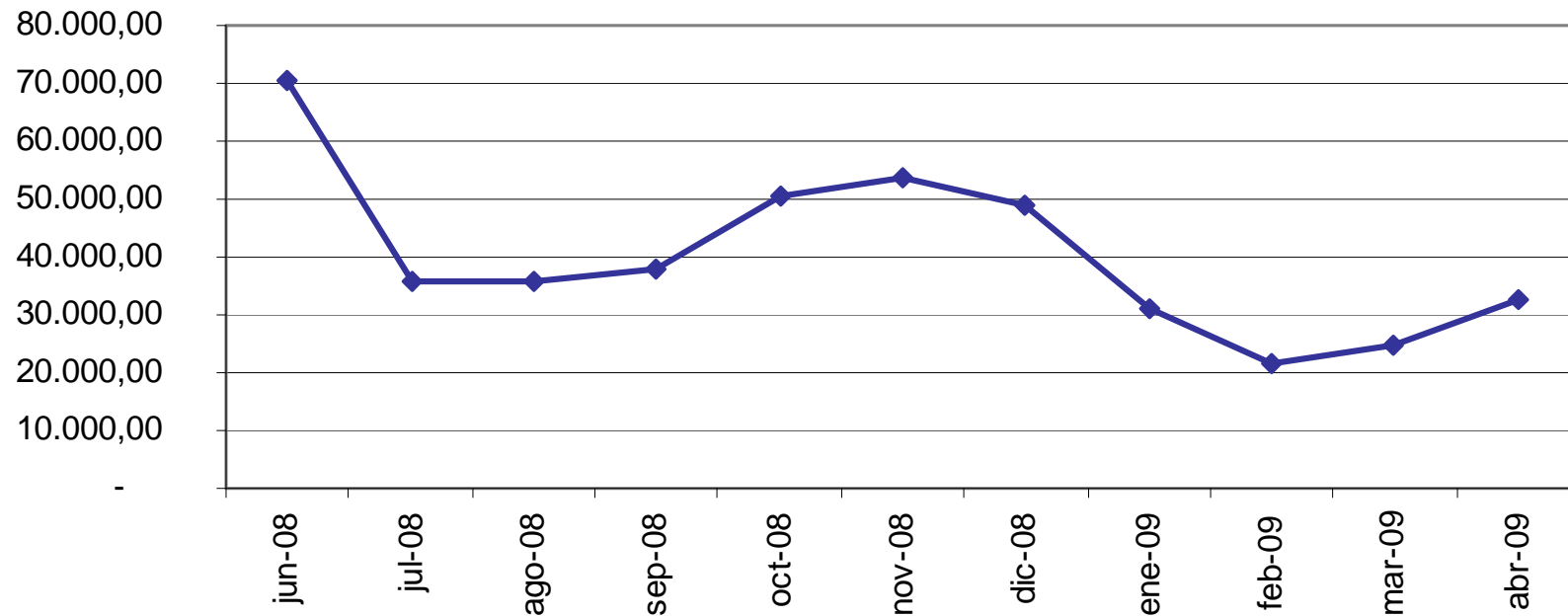
# Monthly trip legs





# Monthly deficit

Evolución deficit del sistema.

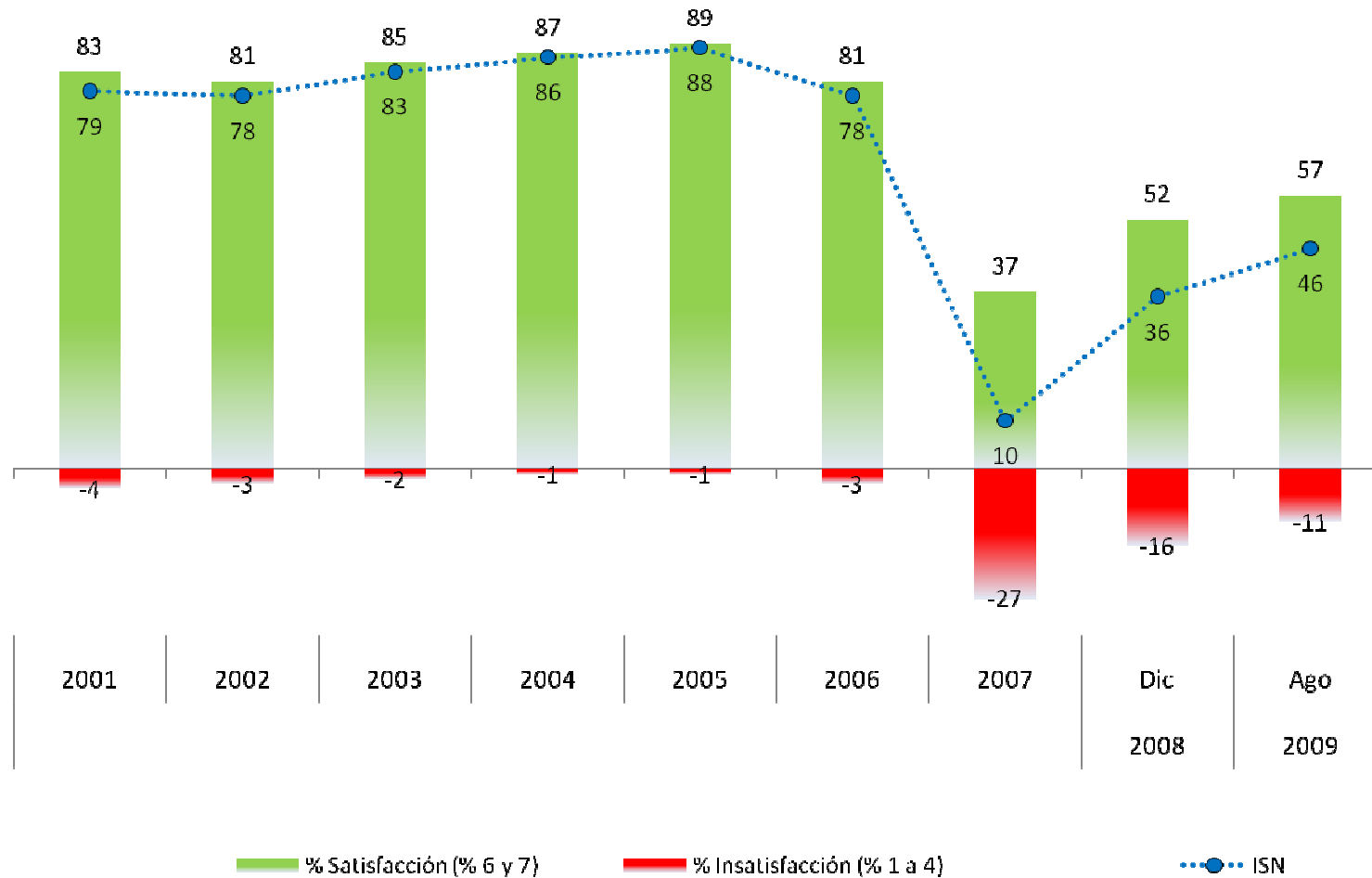


Average monthly deficit of MM US\$ 40 for the whole system (i.e. Buses, Metro, Metro infrastructure, etc.)

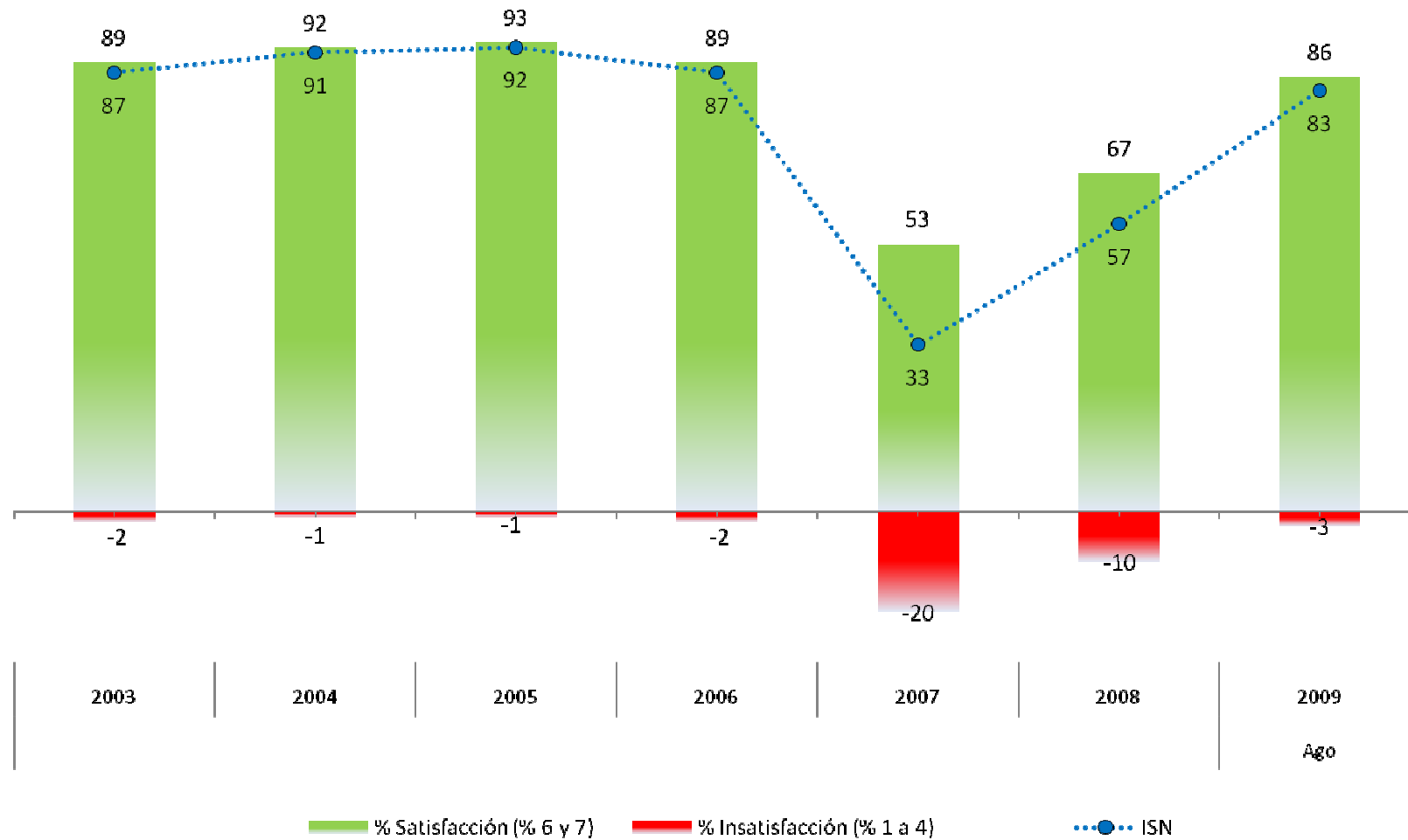
# Transantiago approval rates



# Satisfaction level with Metro's Quality of Service



# Perception of Metro's Image



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