

Transantiago: redesigning public transport in Santiago, Chile

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Transantiago signals a radical change in public transport, by redesigning the complete network and investing substantially in rolling stock, infrastructure and technologies



Santiago de Chile

The capital of Chile is located at the heart of the country in a valley surrounded by mountain ranges. It covers a surface area of 1,400 km² and has close to 6 million inhabitants, about 40% of the national population.

The city public transport service is varied, consisting of a modern and growing underground network (4 lines 80km long), a fleet of city buses, taxis, and shared taxis, with pre-set routes shared by various people.

However, Santiago suffers many of the problems of large South American cities: although people tend to live in the suburbs, the financial, educational and entertainment activities happen in the city centre. Population increases, territorial expansion, transport development, and

industrialisation have combined to generate unprecedented growth in the city and a clear demarcation between the new suburbs and the old 19th century part of the city.

Public bus services are poorly rated by inhabitants despite a fleet of over 8,000 buses on offer, covering a wide geographic area (it is possible to cross the entire city without changing buses, and only 18% of journeys require a change in bus), being widely accessible (98% of inhabitants live less than 8 blocks from a bus stop), and offering a frequent service (mean waiting time is less than 4 minutes). The flat rate fare is low, costing the equivalent of USD 65 cents.

Economic growth has led to many inhabitants purchasing automobiles for private use; in Santiago there are some

970,000 cars. This has created a pollution problem, traffic congestion, and increased energy consumption – a vicious circle that is difficult to break.

This trend is very evident in a comparison of transport use in 1991 and 2001 (see right).

How did it come to this?

In the early 1990s a free market system was created, with routes put out to tender; this resulted in improvements in terms of frequency and coverage. However, it has led to uncontrolled growth in the bus fleet, which in turn has caused increased roadway congestion, pollution, and lengthier travel times.

In 2000, the transport system was operated by over 3,000 microbusinesses (with an average of 2 buses each), consisting of bus owners organised into 120

BUS SYSTEM CONCEPTS

associations. Over 7,000 buses are in circulation, covering 323 transport routes.

These companies, which were informal and inefficient, have been acting as 'recruiters'. Bus owners contract bus drivers, maintain their buses, and collect the daily revenues from fare sales.

No economies of scale can be achieved operating in this way.

Employment laws are frequently broken; moreover, some of the most common complaints relate to bus drivers being employed on a casual basis, with no social security, and being expected to work excessively long hours. A significant proportion of drivers' wages are directly linked to the fare revenue, and so there is fierce competition and even road races to 'capture' passengers. This situation is similar to the 'guerra del centavo' which took place in Bogotá, Colombia, prior to implementation of its Transmilenio system.

Although the legislation in force requires automatic fare-collection equipment or a person to perform this function, it is in reality the bus driver who collect fares. Drivers consequently frequently fall victim to assaults (occasionally fatal), which create a widespread fear of crime amongst passengers.

This is the background to the overhaul of the public transport system in Santiago de Chile. Originally called **PTUS** (Santiago Urban Transport Plan), this programme is now known as **Transantiago**.

The Transantiago project

The programme sets out the design and implementation of a fully-fledged **transport system**, with the metro as the backbone. This is supplemented by a quality bus service operated by formal companies, with segregated transport corridors and inter-change stations, a smart fare-collection system allowing fare integration (operated by a different company from the transport providers), and a user information centre.

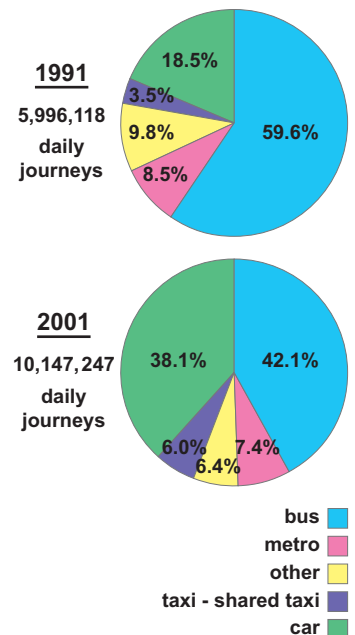
Since operators are required to be constituted as limited companies with a specified minimum share capital, most of the traditional operators have had to adapt their company status. The new system includes two companies with Colombian capital who also operate in the Bogotá Transmilenio system.

With a view to avoiding competition in the same area by a number of different companies, the city was divided into **Business Units** which were then put out to tender. Only the winning tenderer has the right to operate in a particular zone.

The bus route layout was thoroughly overhauled on the basis of a design inspired by the results of a survey (implemented in 2001) on origins and destinations. The new transport grid

In 1991 60% of the 6 million daily journeys were by bus. By 2001 this figure had fallen to 42%; however, private car use rose from 18.5% to reach 38% over the same period. Furthermore, the total number of daily journeys swelled to over 10 million, further aggravating the situation

**MODAL SHARE
1991-2001**



TRUNK ROUTES: OPERATORS, LICENSING PERIODS AND INVESTMENTS

Assigned operator	License period	Business unit	Investment (million USD)
Inversiones Alsacia S.A.	3 to 16 years	Trunk 1	30.2
Su Bus Chile S.A.	10 to 16 years	Trunk 2	80.3
Buses Gran Santiago S.A.	3 to 16 years	Trunk 3	28.0
Express de Santiago Uno S.A.	10 to 16 years	Trunk 4	88.0
Buses Metropolitana S.A.	3 to 16 years	Trunk 5	28.0
Total			254.5

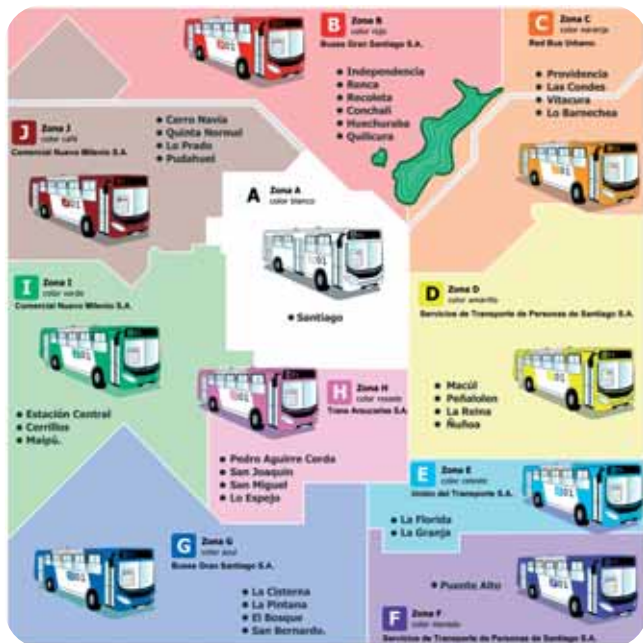
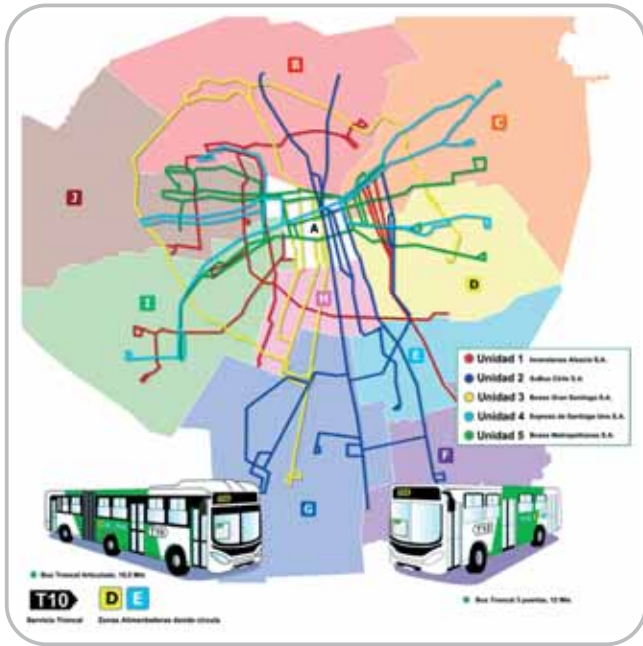
License periods vary according to fleet renewal

FEEDER ROUTES: OPERATORS, LICENSING PERIODS AND INVESTMENTS

Assigned operator	License period	Business unit	Investment (million USD)
Redbus Urbano S.A.	5 years	Feeder 1	13.5
Serv.de Transp.de Personas S.A.	5 years	Feeder 2	8.6
Unión del Transporte S.A.	5 years	Feeder 3	17.4
Serv.de Transp.de Personas S.A.	5 years	Feeder 4	11.0
Buses Gran Santiago S.A.	5 years	Feeder 5	12.6
Comercial Nuevo Milenio S.A.	5 years	Feeder 6	12.4
Comercial Nuevo Milenio S.A.	5 years	Feeder 7	5.5
Buses Gran Santiago S.A.	5 years	Feeder 8	8.4
Trans Araucarias S.A.	5 years	Feeder 9	5.3
not awarded	5 years	Feeder 10	3.0
Total			97.7

All feeder services are in the hands of national companies

BUS SYSTEM CONCEPTS



Top: Trunk services are operated by high standard articulated buses: low floor, access ramps for mobility-impaired users and meeting Euro III emissions standards.

Above: Feeder services. To prevent the different companies from competing on the road, the city was split up into zones called Business Units, and tendered out. In this way, only the tender-winning company can operate in each of the separate zones.

Below: Major investment in infrastructure is taking place, mainly for segregated routes and intermodal transfer stations.

Infrastructure construction works		
Item	Quantity	Investment (Million USD)
Stations	112	94.4
Bus stops	5100	32.8
Segregated routes	32km	47.9
Roadway connections		33.9

incorporated the concepts of **trunk routes** and **feeder routes**.

For the buses, size requirements have been drawn up (articulated 18.5m buses for trunk routes, and 12m and 8m buses for feeder routes), compliance with emission standards (Euro III) and access for mobility impaired users (ramps and low floors).

The **trunk-feeder system** also requires a significant investment in infrastructure (see below left).

The **Transantiago Financial Administrator (TFA)** will be in charge of establishing and maintaining a contactless smart card fare-collection system, requiring exact payment in cash of a network of over 1,100 card sales and top-up points, and general administration in terms of sales and fare collection. It also acts as a clearing house for the distribution of revenues to the other companies for services rendered. The contactless smart card payment system will also enable fare integration, i.e. savings for users changing between transport modes.

GPS, passenger counting systems, loudspeakers, alarm buttons, real-time communication systems, and user information panels will also be fitted in the new buses.

The TFA will make payments and manage a **Technical Reserve Fund**, created to ensure the continuity of the system while the fare system is being adapted. If demand for transport falls, fares will be increased but while this is being implemented, the fund will be used to pay operators until the system is fully readjusted.

Another of the TFA functions will be fleet operating and management information: optimising operational management of the bus fleet so as to ensure that supply meets demand.

The TFA tender was awarded to a consortium of banks (BancoEstado, Banco de Chile, BCI, SantanderSantiago and Falabella) and a systems technology integration company (Sonda) in July 2005 for a 12-year period. It is estimated that the TFA will invest close to USD 70 million in

the system and that it will handle cash flows of around USD 700 million annually.

Another important player is the **Transantiago User Information Service (TUIS)**, which will publicise and promote the system to Santiago's inhabitants. It will also transmit relevant information to transport service operators. Following an un-awarded tender in 2005, the TUIS was redefined and the tender was finally awarded in May 2006.

Implementation

Making such radical changes to a city public transport system is no easy task. Political ups and downs are likely to affect any kind of project that directly impacts on quality of life and the day-to-day routines of a city's inhabitants. In this respect, Transantiago is no different.

Some of the hurdles to be overcome at the outset included:

- Traditional operators refused to sell buses that were taken out of circulation. New operators thus unable to buy locally-used buses, were obliged to bring forward their purchase of new buses, or had to use articulated buses in areas not suited to this bus type.
- Bus deliveries from Brazil were delayed due to a problem with permits to travel through Argentine territory to Chile.
- The bus quota for imports from Brazil at a zero tariff rate had been used up. It is estimated that an additional USD 17,000 was thus paid for each bus.
- Transantiago is a body in which several ministries are involved, namely Public Works, Transport and Telecommunications, Finance, and Housing, as well as the National Environmental Commission (CONAMA), Santiago City Council, the Transport Sub-secretariat, the Inter-ministerial Secretariat for Transport Planning (SECTRA) and the Public Works Licensing Office. Reaching agreement between these bodies is no easy task, and an alteration of the legal form of Transantiago is currently being explored, with the Madrid Transport Consortium being

taken as a reference model.

- The means of implementing the new system had to be decided, with the options being a 'big bang' introduction (total changeover on a specific date) or a gradual introduction allowing problems to be resolved as they arose. It was finally decided to introduce the new system gradually.
- Another problem was encountered with the single smart-card payment system, which initially was the only method of payment permitted on board buses. To facilitate the transition, it was however necessary to fit the buses with no-change cash fare machines.

A series of delays led to a certain disillusionment among users. Finally, however, Transantiago got up and running on 22 October, 2005, for a period designated as a transition phase. This was based on the use of the same routes (now operated by licensed operators), without the infrastructure of terminals, stops and segregated corridors, with the same payment methods, with bus operators collecting the fares directly, and without modal or fare integration.

As with any change, there was a certain degree of chaos. In the first days of the new system, users were misinformed, and some areas experienced serious service availability and/or frequency problems. These problems were rapidly corrected, however.

Some 10 months after introduction of the new system, Transantiago is focusing on the following issues:

- Expropriation of dwellings in order to be able to create sufficiently wide bus corridors;
- Infrastructural construction works;
- Indemnities and alternative employment for staff exiting the system (bus drivers, administrative staff, etc.);
- IT systems set up (fare collection and fleet management);
- Creation of a Transantiago users' rights body.

Although it seems that, with time, Transantiago will be a reality, there is evident discontent among those most affected by the changes, ie. users and operators.

From the users' perspective, a number of issues have come to the fore¹:

- Although a radical modification was proposed in the transport system, it seems that little has changed.
- Articulated buses operate less frequently than standard buses.
- Articulated buses are limited to a maximum speed of 60km/h.
- Articulated buses will not start unless the doors are closed.
- Articulated buses have too few seats.
- The new buses are perceived as less comfortable and slower than expected.
- Around 85% of passengers do not need, at present, to change buses, and the remainder only change once. With Transantiago, 52% of passengers will not change at all, 41% will have to change once, and 7% will have to change twice. So, the question remains as to how the user will perceive changes and journey times.

Transport operators are affected by operational losses, which may well continue until the new system is fully operational:

- Since the system was introduced, operators have made an accumulated loss of USD 63 million and have seen a reduction of 88% in their net worth.
- There is an oversupply of buses in relation to current demand.
- Fare evasion by passengers is over 30%.
- Non-Transantiago operators are using licensed routes and offering illegal transport services.
- Revenues are lower than expected.

The perceptions of the new operators, who have invested heavily in buses, set-up of companies, staff recruitment and training, are as follows:

- They feel disillusioned with regard to the lack of controls over illegal operators.
- They are using more costly articulated buses for routes that could be more effectively served using standard buses.
- They are also affected by fare evasion.

Full implementation of the system is scheduled for 10 February 2007, when the route layout will be fully implemented, the trunk and feeder routes will come into operation, and the financial management and user information systems (TFA and TUIS, respectively) will be fully operational.

It is anticipated that by then the user—or rather, the customer—will be better informed and educated. This will be a determining factor in the success of Transantiago.

Successful implementation of the new system, based on modern, efficient, comfortable and high-quality public transport, should, in theory, act as a disincentive to the use of private vehicles, reduce traffic congestion, environmental pollution, and fear of crime on public transport. In any case, this is the vision of the future, as both Santiago and its inhabitants deserve.

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