

Red Metropolitana
de Movilidad



Technological
transformation

Modernization process of the Metropolitan Public Transport System

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The Directorio de Transporte Público Metropolitano (DTPM) is the Public Transport Authority (PTA) of Santiago and responsible of regulating the Metropolitan Public Transport System of the city. It oversees the design of the main elements of the public transport: route design, bus frequency, administration of concession contracts for the operation of the routes and all the technological systems required for the system operation. These services include Fleet Management, Passenger Information, Ticketing System, Operational Programming and Data Governance. DTPM is currently preparing a series of international procurement processes for the renewal and modernization of a large part of the technological systems.

Background information on Santiago's public transport System

Santiago is the capital of Chile, a city that is a Latin American reference in regulation and fare integration in public transport systems. The current population of the city is almost 7 million inhabitants, with an urban area of 867 km². Since 2017, DTPM is leading the shift towards zero emission vehicles in public transport, with a fleet that will reach roughly 2,000 electric buses during 2023 and becoming a world leader in promoting electromobility and reduction of emissions towards the environment. The multi-modal public transport system has a Metro network that interconnects a large part of the city with an extension of 140 kilometres and 7 different lines, one of the largest

networks in the region. In addition, the System is fare, technological and operational integrated between the different modes: buses, Metro and train.

A model that grows and advances: various measures are being promoted to improve both the quality of the System and sustainability of it. In the recent months, the city has started an operation and fleet renewal process that introduced more than 1,600 new high-standard buses and new bus operators. In addition, in the following years, more than 30 kilometres of metro lines will be inaugurated, allowing a city that is more interconnected with the citizenry.

The main characteristics that drive our System are the following:

Descripción	Cantidad
Number of routes	379
Number of bus stops	12.000
Number of passenger trips per working	3.000.000
Number of buses	7.000
Number of bus service operators	7
Number of service units	12
Number of depots	71
Prepaid zones	215
Number of operator workstations supplied by Fleet Management	1 cada 200 buses
Number of Bus Monitoring Center	17
Metro: number of lines	7
Metro: number of stations	136
Metro: network extension	140 km
Train: number of lines	2
Train: number of stations	10
Train: network extension	20 km

In addition, the Metro and Train maps are shown, along with the routes of the buses that are deployed in the city.

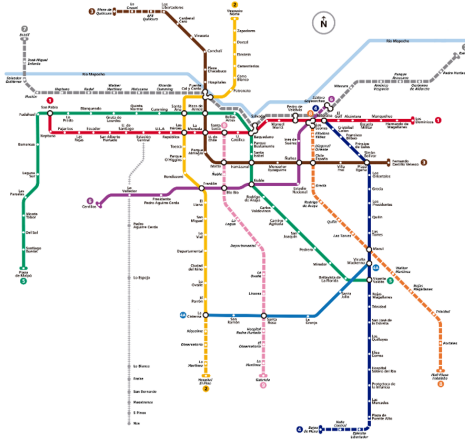
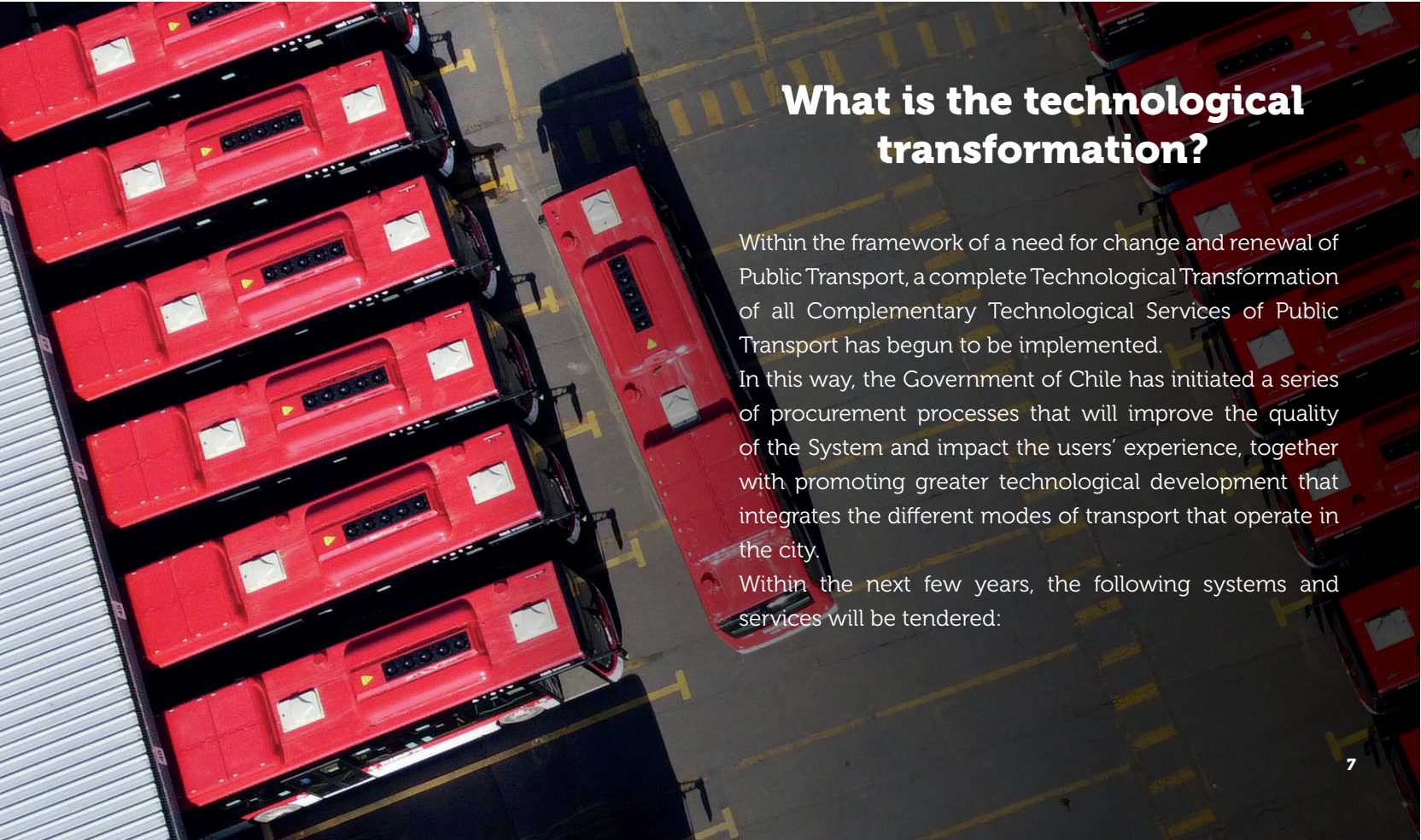


Figure 1: Map of the Santiago's Metro Network



Figure 2: Map of the bus, metro and train routes in operation in Santiago



What is the technological transformation?

Within the framework of a need for change and renewal of Public Transport, a complete Technological Transformation of all Complementary Technological Services of Public Transport has begun to be implemented.

In this way, the Government of Chile has initiated a series of procurement processes that will improve the quality of the System and impact the users' experience, together with promoting greater technological development that integrates the different modes of transport that operate in the city.

Within the next few years, the following systems and services will be tendered:

Fleet Management System: The aim is to have world-class tools for efficient fleet management, focused on improving the reliability of the service in the operation of buses and other surface modes. The system must allow to generate precise and in real time information for each vehicle, such as location, speed, occupancy level, possible disruptions in the journey. Advanced tools for the management of disruptions and incidents are among the main functionalities that DTPM is looking for as part of this procurement process, to support drivers in the deployment of the service in headway and timetable-based operations, enabling the assurance of connections, among others.



Passenger Information System: In accordance with the data that the Fleet Management service will provide, it is necessary to communicate in a simple, friendly and multi-channel way the information and performance of the different modes of transport. A key element of this service is the generation of accurate and real time information for decision-making, to be displayed in both: onboard the vehicles and at the bus stops. Information related to transfers and connections is also part of the scope of this service. Variable information will also be incorporated in whereabouts and through different digital channels.

Ticketing System: A large city like Santiago demands a modern and adaptable ticketing system that allows the citizens to pay for new forms of mobility, modern and flexible fare structures, and payment through different channels to lower access barriers to the System. As part of this process, the current smartcard technology will be renewed and new digital and open loop payment methods in the system will be enabled. Through a state of the art, scalable and adaptable back-office system and the massification of account-based ticketing solutions, DTPM expects to create user experiences that are customized to the citizens' needs.

Operational Programming: The correct design of the transport supply is essential for a good travel experience for the users of public transport. An advanced operational programming tool is required to generate optimizations in the planned transport supply and maximize the utilization level of the fleet. DTPM seeks to have tools that incorporate the challenges associated to the scheduling, charging and operation of electric fleets, increasing the life span of the bus batteries, maximizing the vehicle range and the efficiency in the use of energy during the charging process. It also seeks to generate different scenarios quickly and agilely, to respond to the needs of the city in a timely manner.

Data Governance: By having various systems and services that manage large volumes of data, it is imperative to have a system that allows them to be structured and generated from them useful information for decision-making, generating crossovers from different sources that allow drawing conclusions and analysis that would not be feasible analysing the information sources alone. Data storage is required in a Mobility Data Lake, which not only integrates information from public transport but also from other relevant sources for mobility in the city. It then seeks to generate a Data Warehouse that allows exploiting the data and exploiting the information for decision-making at different levels. Finally, it seeks to generate an Open Data Platform for citizens.





Contact

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