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# Metro sul do tejo: Service design and user feedback

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ABSTRACT

*Metro Sul do Tejo* (MST) is a public Light rail system operating in Almada, Portugal. The line opened in 2008 with the aim of improving mobility in the city, reducing pollution, noise and traffic congestion, and reducing the use of private transport. The concession contract provided for the payment of compensations (to be paid by the State) if the estimated number of users was not achieved.

After eight years in operation, the service is not economically viable without further support from the State, construction of second and third phases is suspended and the number of service users represents only 45 per cent of the initial estimate.

The main purpose of this paper is to contribute to a better understanding of the causes behind such a low usage rate by analysing the results of a survey carried out among users of the MST. As we will see, the service does not fulfil quality expectations, nor does it satisfy important requirements such as safety and comfort, which are currently a cause for complaints and may prove decisive in increasing service usage and helping modal shift.



## 1. Introduction

Almada is a Portuguese city situated on the south bank of the River Tagus, facing Lisbon, the capital. Many migrants from other Portuguese regions settled in Almada during the 80's and 90's to work in the cork and boat construction's industries. Meantime the industries ceased labouring, but the number of residents did not stop increasing and reached a total of 174,030 inhabitants (INE, 2011).

In 2010, 22.7 per cent of this population worked and studied outside the municipality (20 per cent workers – 35,003 people, 2.7 per cent students – 4717 people), and used the local transport network or private transportation to commute daily to their job/school (INE, 2011).

57.8 per cent of Almada's inhabitants use their private transportation (auto or motorbike) in daily journeys (47.3 per cent working people, 10.5 students); against 42.2 per cent of residents that use bus, train or boat.

The public transportation network consists of bus lines (*TST*, and *Barraqueiro*), ferry lines (*Transtejo* and *Soflusa*), and train (*Fertagus*), but like in other European cities its usage has declined in the last years, in contrast with private transportation usage.

In Almada, the bus service (*TST*) is very efficient, but runs sparsely outside the city centre, with low frequency and reduction of service outside rush hours and weekdays. Buses do not operate on dedicated lanes, and are therefore not efficient in days of severe traffic.

The ferry (*Transtejo*) links the two river margins, and provides a fast journey to commuters that live and work near to the river (Cacilhas or Lisbon downtown), but for most people it does not replace other transport (bus, underground or tram in Lisbon).

In 1999, a new train service (*Fertagus*) started to operate on the bridge between Almada and Lisbon. With interfaces in Almada, in other locations inside the Lisbon Metropolitan Area – LMA, and connecting to the Portuguese train network; the principal purpose of *Fertagus* was to reduce time of travel for people commuting to Lisbon, and also reduce the number of private transportation on the bridge (and consequently the carbon dioxide emissions).

Previous to this project, in 1996, the southern municipalities of LMA joined together to discuss a solution for the traffic congestion and designed a light rail project with modal connections into Lisbon, that would serve the residents of Almada, Barreiro, Seixal, and Moita (a total of 477,092 residents in 2011) (INE, 2011).

The project was subject to a procurement process and the first three lines were concluded in September 2008, connecting the municipalities of Almada (civil parishes of Almada, Cacilhas,

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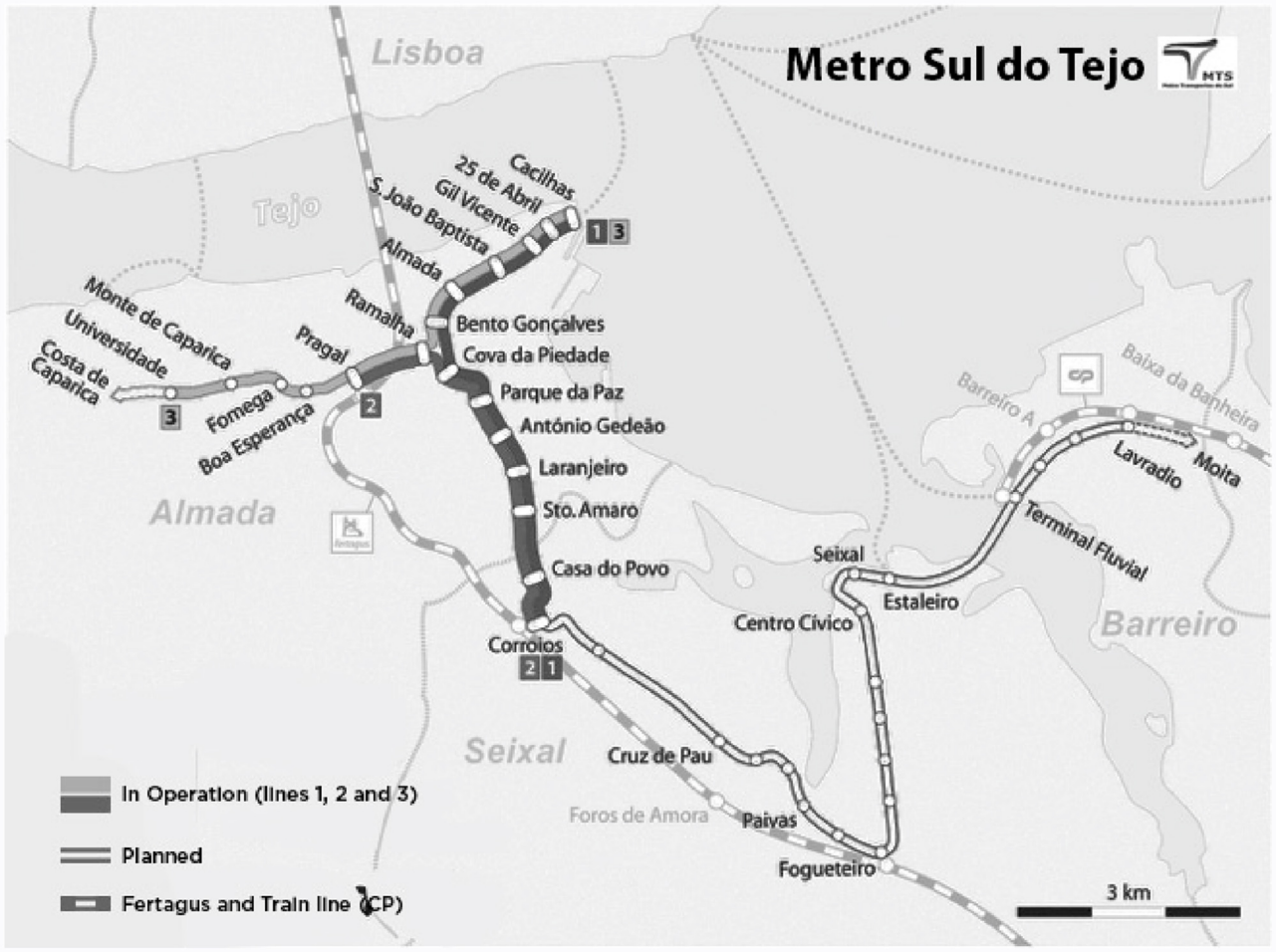


**Fig. 1.** Metro Sul do Tejo Project.

Source: pt.wikipedia.org

Caparica, Cova da Piedade, Feijó, Laranjeiro and Pragal) to Seixal (civil parish of Corroios) (*see* Fig. 1).

Initial estimates as to passenger flows pointed to 16,139,445 passengers x km transported (PKT), the first year of the concession – 2008, a number that was expected to increase gradually to 88,681,649 passengers x km in 2011 (MUNICÍPIO DE ALMADA/ CÂMARA MUNICIPAL DE ALMADA, 1996). The contract signed between the State and the winning consortium established that compensations were to be paid by the State if estimates were not achieved.

In 2008 real traffic was actually of 1,889,278 passengers/km and in 2011 only 32,261,410 passengers x km (PKT) used the service (approximately 36 per cent of initial estimates); the Portuguese State paid compensations of around 7.5 million Euros per year and ordered an audit to the company. The court of auditors concluded that MST had no economic viability (Tribunal DE CONTAS, 2011) without State support, and second and third construction phases were suspended (Lopes, 2011).

This paper reports the findings from a survey and series of focus group that were held during research, its aim is to gain insight into the perceptions of users regarding service design, in order to investigate the extent to which any possible design problems may affect the use of the service and explain its low rate of usage.

The work will focus on the quality requirements of a public transport that make it attractive for its users and encourage modal shift: if it does not provide a positive experience, or if interface points are difficult to use, users may feel uncomfortable or unsafe and restrain service usage.

The paper is organised as follows. Section 2 reports reasons of choice and success of light rail in different European cities. Case Study is presented in Section 4, with Discussion of the empirical study's findings in section 5. Section 6 concludes the document.

## 2. Literature review: light rail reasons of success

Urban design is today inherently linked to integrated public transportation systems (Sarmiento, 2016), that include "adaptive services, modern infrastructure, traffic management tools, awareness campaigns, well coordinated mobility schemes, and advanced ITS solutions" (Tyrinopoulos and Antoniu, 2013,p. 36), and contribute to a better quality of life in cities, reducing the use of private transportation, creating a healthier and safer environment.

In the last decades, modern public transport solutions privileged the construction of light rail systems in detriment of bus lines. Benefits of light rail when compared with bus, have been largely discussed by researchers (Van Der Bijl and Van Oort, 2014; Mackett and Sutcliffe, 2003; Lee and Senior, 2013; Olesen, 2014), and studies report that users most willingly pay for a "quick and frequent rail service, than for other urban modes" (Akiva and Morikawa, 200211, p. 110; Milena and Katrin, 2012), light rail systems are considered superior to bus: more modern, friendlier, and more accessible.