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## Resumen

Cuando se escribe sobre Historia del Transporte, la utilización de un concepto que hasta hace poco no aparecía en los diccionarios entraña riesgos evidentes. No obstante, el objetivo de este artículo es resaltar que las decisiones adoptadas o la imposibilidad de ponerlas en práctica en el pasado influyen sobre la facilidad o la dificultad para convertir el concepto en realidad en el presente.

El caso de estudio es la relación entre la expansión urbana y el incremento de la capacidad de transporte en la ribera meridional del Tajo, frente a Lisboa, a partir de 1850. Desde esa época, barcos de vapor han comunicado Cacilhas y Lisboa, pero el proyecto de introducción del ferrocarril en este distrito nunca se acometió. De este modo, el crecimiento urbano estuvo ligado a las conexiones de autobús y, desde los años sesenta, al uso de automóviles particulares. Las estaciones intermodales imaginadas a finales del s. XIX no pudieron hacerse realidad hasta después de 1999; ese año, por fin, se instaló el tren en el puente, pero ya no pudo tener el papel modelador de la ciudad que se le había asignado en un principio.

**Palabras clave:** Intermodal; suburbanización; sistema de transporte público.

## Abstract

Using a concept that has only recently entered the dictionaries while writing transport history has its manifest risks. Nevertheless the aims of this article is to emphasize that the decisions taken or the impossibility of implementing them at various stages in the past, have an influence on the facility or the difficulty in turning the concept into reality in the present.

The case study is the relation between urban expansion and the growth of the transport capacity since 1850 in the south bank of the Tagus, in face of Lisbon. Since that time steamboats linked Cacilhas to Lisbon but the planned railroads were never installed in this district. Thus urban growth was related to bus connections and, since the sixties to the use of private motorcars. Intermodal stations imagined at the end of the nineteenth century could only be a reality after 1999. The train was that year finally installed in the bridge but it could no long shape the urban form.

**Key words:** Intermodal; sub urbanization; public transport system.

## **Encounters and disencounters in the transport system on the South Bank of the Tagus Estuary. On the difficulties of establishing intermodal transport in a region**

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“(…) The creation of the North-South Railway Crossing in the Lisbon Region between Chelas [Lisbon] and Coina [South Bank], and the linking thereof with the Lisbon urban transport system, is not merely a phenomenon of the simple expansion of the existing railway network. In addition to the unequivocal gains that the new railway crossing over the Tagus represents as a form of bringing about profound change in the access possibilities between the river banks, the new link is an expression of new urban transport concepts that positively favour the collective over the individual and an attempt at integrating into one network the various modes of transport of the operators in the Lisbon Metropolitan Area Roxo, 1999)”.

Using a concept that has only recently entered the dictionaries while writing history has its manifest risks. Nevertheless, the decisions taken or the impossibility of implementing them at various stages in the past, have an influence on the facility or the difficulty in turning the concept into a reality in the present.

This is the hypothesis that I have set out to illustrate herein. I shall use a local scale, looking to identify the restrictions on the development of transport in the west of the Tagus South Bank from the mid-19<sup>th</sup> century onwards. I will endeavour to bring them into relation with the urban growth in the area and with the current constraints to the full integration of the city of Almada into the Lisbon Metropolitan Area. The integration of the transport systems that could have been in the reach of the South Bank from the 19<sup>th</sup> century onwards would seem to have gone inexorably out of its reach in the 20<sup>th</sup> century.

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Growth of peripheral areas on the basis of the social accessibility of the existing transport networks, the prices and the travel times are, after all, the determining factors for changes, establishing the thresholds of change and of the suburbanisation process. Suburbanisation as a process involving more rapid demographic growth in the peripheral areas than in the city centre, associated with the daily commuting of the residents to work in the centre, first emerged in the most developed cities of Europe and the United States in the first half of the 19<sup>th</sup> century (Jackson, Kenneth, 1985). The first omnibuses, horse-drawn tramways, funicular lifts, steamboats and railway lines are generally given as the beginnings of a process which the tram and the bus took to new levels.

In Europe between the two world wars, the structuring role of the railway in the growth of the built-up areas provided for star-shaped growth. The massification of private automobile use, which became more established in post-World War II Europe, gave the cities extensive and new forms of peripheries in which the difference between city and country was diminished. The metropolis was changed in this more recent process, which also saw the emergence of new peripheral forms of centrality<sup>1</sup>.

However, in recent decades, faced with the progressive congestion of the roads due to the growth of individual transport, one has witnessed a revitalization of the metropolitan rail transport networks. The integration of a wide range of modes of transport has revolutionized the ease with which people can travel in the urban space, making collective transportation attractive once again.

## **1. The Situation in the West of the South Bank of the Tagus from the Mid-19<sup>th</sup> century to the 1920s**

### **1.1. Roads and steamboats**

Facing Lisbon, and separated from the centre of the city by the river only, in 1864, the Municipality of Almada was a predominantly rural one, consisting of only two parishes. The parish of Caparica had 6,311 inhabitants and that of Almada itself, which contained many rural pockets, counted 4,026 souls. The two parishes consisted of settlements separated by roads and narrow paths. The parish of Almada extended to the limits of Sobreda and, in addition to the town of Almada itself, included a number of localities, of which Cacilhas was the most important. In the census of 1801, the town had 4,203 souls, but there are reasons to believe that this figure is too high. In 1911, the town had 3,767 inhabitants and Cacilhas had 1,648. Piedade did not have a much larger population than Caramujo, but the most important factories in the municipality were concentrated there.

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<sup>1</sup> My approach diverges from that of Giuseppe Dematteis, who, in an article entitled «Suburbanización y Periurbanización. Ciudades anglosajonas e ciudades latinas», makes reference to two urban periphery models: the Anglo-Saxon and the Latin models. In my opinion, this approach is historically incorrect as it identifies phenomena with totally diverse social contents. In Monclús, Javier, (1998), *La ciudad dispersa*, Barcelona.

In the parish of Almada, the state of the road network connecting the localities was very deficient. However, the ports were the loading and unloading points for the agricultural and industrial production, for which the river was the main attraction. The settlements of Mutela, Caramujo, Margueira, Cacilhas and Ginjal had a direct relationship with the river. The river bathed directly the hillock of Margueira that stretched without interruption to Cacilhas.

The estuary inlet that had extended from the Mourelos valley to Cova da Piedade since the Middle Ages had begun to dry up a long time before. However, the maps up until the 19<sup>th</sup> century clearly show two arms of water. The first one flowed into the Tagus at Outeiro and gradually disappeared. As is natural, given the proximity of a large city in need of foodstuffs, cereal-milling facilities grew up along these arms of water. Here the relationship with the river and the Tagus estuary was a two-fold one.

On the one hand, watermills were established along the inlets on the South Bank, using tidal energy. On the other hand, the cereals were brought to the mills downriver from the Ribatejo region, or by the sea and river route when the grain was sent from the Alentejo via the River Sado.

The road network converged at the port of Cacilhas. In the Setúbal, Sesimbra or Seixal direction, the road leading out of Cacilhas had to pass through the urban fabric, in between the walls of farms and estates to Mutela and Piedade. From Piedade valley the road climbed up the clay hills to Corroios. Until the opening of the new road, it was necessary to climb a steep hill, Pedreira, to reach Almada. Crossing through the town, the road passed through farming estates to Pragal, Monte da Caparica and, from there, to the other parts of the parish of Caparica. The requests for repair work on the roads and avenues were a constant feature in the press throughout the 19<sup>th</sup> century. According to the journalist Eduardo Tavares, the roads were “a patchwork quilt that will never be fully mended”( *O Almadense*, 1856, no. 9). Because of their ports, the localities of Trafaria and Porto Brandão had closer links with Belém in Lisbon than Almada.

Also in connection with the supply of the large city, one should also highlight the importance of wine growing. Activities related with wine provided the backdrop for the presence of taverns in the quays and ports of the municipality. Muleteers, carters, boatmen and sailors mingled with the people who came from the city in search of cheap wine. There were fights, disorder and scandals, particularly on religious feast days. The feasts of St. John, Our Lady of Piedade and of the patron saint of Cacilhas were the most important. In the late 19<sup>th</sup> century, the steamboats transported up to 4,000 Lisboaans to Cacilhas on such occasions ( *O Puritano* , 1890, no. 62, no. 385, 1893).

If the boats could bring the working classes from Lisbon to the suburbs in search of disreputable leisure and devotion, at the end of the 19<sup>th</sup> century the steamboats were not in a position to transform them into commuters. The 50 réis for the trip sitting in the prow and the 30 réis for a seat in the stern in the 1890s would have meant that daily transport would have taken up one or two tenths of the daily wages of many workers. The same prices were applied to the crossings

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in the traditional *faluas* and other boats. The first commuters, therefore, belonged to the middle classes of Cacilhas and Almada. One example was the students, which were a diminutive group at the time.

This first early stage of commuter transport was a result of the existence of the steamboat. In 1839, the trip to Cacilhas in the boats of *Empresa de Vapores Tejo* cost 40 réis. That was considerably cheaper than the omnibus to Belém, which cost 120 réis (*Diário do Governo*, 1839). The existence of the steamboats was considered to be of fundamental importance for the eastern side of the municipality to maintain its role of summer resort for the middle classes (*O Almadense*, 1856). In 1856, the municipality was authorised to pay a subsidy of up to 600,000 réis to guarantee the maintenance of the steamboat traffic.

The local press waged a constant war against the river transport companies. In 1892, a group of prominent citizens submitted a petition demanding the re-establishment of the steamboat service to Trafaria. A short time later, there emerged a proposal from a development company aimed at furthering transportation in the area and the construction of housing for holidaymakers in Costa da Caparica (*O Puritano*, 1884, no. 446).

The competition desired in 1895 became a reality with the introduction of small boats making the crossing to Praça do Comércio. A man called Price, a butcher in the municipality, was the first to bring petrol-driven boats to Cacilhas. He was followed by a company founded by a former skipper of the Lisbon steamboat company with the support of a group of inhabitants. In 1902, in addition to *Parceria dos Vapores Lisbonenses*, a Frederico Burnay company founded in 1860 providing a ferry service between Cais do Sodré and Cacilhas every 40 minutes, there was also the *Cooperativa de Navegação Fluvial Progresso da Caparica* (*Anuário Comercial de Portugal*). The price for the crossing in the prow was 40 réis, the stern costing 60 réis. On Sundays, there was one single price of 50 réis. Hersent, an entrepreneur in the port of Lisbon, became interested in the business, but it was not long before the complaints as to the prices and the insufficient number of lines returned. In 1916, the price for the steamboat crossing was reduced to 20 réis in second class, with a return ticket costing 30 réis.

Despite the competition, the operators reached an agreement (*A Pátria*, 1922, n.9). In 1922, the purchase, by the town council, of a steamboat with the objective of providing cheap crossings, including one in the morning and one at night, was included in the election programme of the Democrat Alfredo Simões Pimenta. In 1929, the crossing in a small boat cost one *coroa* (50 centavos). The service was cheap, but of poor quality. As for the students, who had meanwhile reached sufficient numbers to found a student's union, they succeeded in achieving a reduction of 50% on the price of a return ticket from *Parceria dos Vapores Lisbonenses* (*O Almadense*, 1929, no. 66).

In 1890, the population census in the municipality identified that 38.7% of those who had a profession worked in the agricultural sector. A total of 2,849 family members, without a profession, and 91 housekeepers were dependent on these 2,555 persons, which make up 40.5% of the population. In that year, 64.4% of the

inhabitants of Almada were born in the municipality, but the difference between the parish of Almada (São Tiago) and that of Caparica (Nossa Senhora do Monte) was manifest. Only 45.8% of the inhabitants of São Tiago were born in the municipality.

The growth in the urban areas in the late 19<sup>th</sup> century was partly a result of the industries that began to spring up – particularly in Caramujo (cork and milling), Margueira (cork), Cacilhas (shipbuilding) and Ginjal (textiles and shipbuilding). However, the average growth rates in the population of the parish of Almada were already higher than those in the city of Lisbon.

Expansion involving commuter travel to Lisbon was restricted by the problem of overland transport. Although the price for the river crossings had decreased substantially by the beginning of the 1920s, the residential areas in Almada could not extend beyond reasonable walking distances from Cacilhas.

## 1.2. The Lost Opportunity of the Railways

Development along different lines could only have been brought about by the construction of a railway line. On 22 April 1874, a licence was granted for the operation of a narrow gauge railway line connecting Cacilhas and Sesimbra. Authorisation for changing the line to broad gauge was given on 29 December of the same year. To this line was added a branch line in the direction of Pinhal Novo on the Southern Line. The network supported by the engineer Raimundo Valadas emerged in conjunction with the project that the engineer Jaime Larcher had carried out in 1860 with the aim of constructing docks on the Tagus South Bank between Cacilhas and Mutela (Fino, Gaspar Correia, 1888).

The solution of constructing a railway line connecting Cacilhas and the Southern Line was vigorously opposed by the engineer Miguel Carlos Correia Pais, who was interested in defending the traffic on the South and South-East lines. He argued against the solution of the construction of a branch line between Barreiro and Cacilhas, proposing the construction of a rail bridge across the Tagus in the direction of Grilos.

In 1889, T. Seyrig and E. Bartissol made the proposal of building a bridge over the Tagus between Estrela (Lisbon) and Almada. The local press received the proposal favourably (*O Puritano*, 1890, no. 116). The project included a railway bridge across the river with a connection between Rossio station and Barreiro and with stations at Almada, Piedade, Alfeite and Seixal. The railway line was presented as an indispensable connection between the North and South of the country and was also valued as a leisure line (T. Seyrig and E. Bartissol, 1889). Also in the context of the expansion that preceded the crisis of 1891, a project for a bridge connecting the Beato area of Lisbon and Montijo was presented. However, these railway bridge construction projects submitted by the private sector were not included in official plans (*A Ponte Salazar*, 1966).

In 1897, the construction of the railway line connecting Cacilhas to Barreiro was linked to the transfer of the Navy Arsenal from Lisbon to the Tagus South

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Bank. This extension of the South and South-East railway line was included in the report of the commission set up to study the railway network plan for the Tagus South Bank in 1898, it was considered a priority in the law of 14 July 1899 (*Relatório da Comissão Encarregada de Estudar o Plano da Rede Ferroviária ao Sul do Tejo*). A Decree of 27 November 1902 classified it. The study on the projects took a long time, due to the need to carry out survey work and the complexity of the projects. The layout of the project was approved on 3<sup>rd</sup> January 1910 (Conde de Paçô Vieira, 1905).

The studies to construct a new port on the South Bank of the Tagus experienced some development. In the plans published in 1904 by Adolfo Loureiro, the railway reached Cacilhas landfill (Loureiro, Adolfo 1904). The railway line directly served the quays and the dock. The Mutela stream continued to exist as a navigable canal closed by a lock at the Margueira quay end. Both in the plans of Costa Serrão and António dos Santos Viegas, the passenger station was directly facing the quays and separated from the goods quays, where there was one quay specifically designed for the loading and unloading of coal.

As Fernando de Sousa put it in the *Gazeta dos Caminhos de Ferro*: “This comprehensive and intelligently conceived project includes a large high-speed terminal station, with the indented landfills forming jetties with several separate landing stations for arrivals and departures and for passengers and transport by pack animals. It is separated from the low-speed station by a canal, making full use of the landfill” (1910,nº530).

“The steamboats dock on and sail off directly at the prow without losing time in manoeuvres and they find convenient shelter even before the construction of the low-speed jetty.”

“Five platforms, separated by tracks, guarantee the distinction of the services, even in the hypothetically most intense and complicated situations, and are connected by underground accesses. A local, low-speed service was included from the beginning. The station building, placed parallel to the railway lines, is modest in proportions, as it serves for the local passenger traffic in Cacilhas only. The rest of the station is a huge conjunction of lines, platforms and general roofing in units that can be carried out one after the other”.

Fernando de Sousa went on to write in the *Gazeta dos Caminhos de Ferro*, “some three years from now, the work on the Cacilhas line and station will be carried out. In 1912, or 1913 at the latest, the terminal for the high-speed services on the Southern Line can be transferred to this station”.

The construction work began with the connection between Barreiro and Seixal, where the station that operated until the 1960s still exists today. Today one can also still see the foundations for the Rio Judeu Bridge, which was never completed. The establishment of the Portuguese Republic, followed by the First World War, interrupted a process that could have led to a much more harmonious situation in the development of urban transport and urbanization on the South Bank of the Tagus than that which in reality took place.

## 2. Cars and Busses – The New Reality

### 2.1. Disillusions

By 1920, the Municipality of Almada had 20,291 inhabitants, of which 11,478 resided in the parish of Almada. The average growth rate was more moderate than in the preceding decade, though it remained at all times higher than that for the city of Lisbon. The rural parish of Caparica had also grown, but at a more moderate rate. By 1930, there were two distinct urban parishes. Cova de Piedade had grown to 5,071 inhabitants and Almada had 8,529 inhabitants. The population of the two parishes together grew to 13,600, but for the first time the population growth in Lisbon was greater.

Towards the end of the 1920s, the newspapers were already publishing news items such as, “The steamboats transport on a daily basis thousands of people from one bank to the other, which the busses from various origins and various destinations pick up and drop off there [Cacilhas]” (*O Almadense*, 1928, no. 45).

Alfredo Brito had proposed the introduction of automobiles for passenger and goods transportation in 1899, with the issue being referred to in the local newspaper, the *Puritano* (1899, no.1009). From 1905 onwards, bus transport became a reality in the Municipality of Almada, but the growth and regularity of the bus lines was difficult in the early stages. By roughly 1928, the ancestors of the main bus transport company that existed in the area had already been incorporated. *Zagalo e Febrero (A Piedense)* began operating in June 1928 (*O Almadense*, no. 39). One of the companies operating in Cacilhas at the time was already making six daily journeys to Setúbal. In 1931, *A Transportadora Setubalense* was running 8 lines on a daily basis.

The square in Cacilhas, in which all the transportation modes converged, soon became too small to house them. Earthwork carried out in 1932 altered its surface area to meet the new needs. The same cannot be said of the roads and streets of the municipality, which had developed very little since the beginning of automobile circulation<sup>2</sup>.

It is difficult to assess the circulation of motorcars at the end of the 1920s. The taxis and automobiles for hire charged very high prices for passenger transport<sup>3</sup>. According to official figures as at 31<sup>st</sup> December 1936, there were some 100 motorcars, 26 bus and 16 motorcycles offering services in the municipality (*Relatório da Direcção Geral dos Serviços de Viação referente ao ano de 1936*).

Pictures of the period show the presence of automobiles, even if it is true that they were far from becoming widespread in Portugal. Even the middle classes did not have the means necessary for owning a private vehicle. Furthermore, given the proximity to Lisbon, those with larger incomes in the municipality did not have their permanent residence in Almada.

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<sup>2</sup> See map in Américo Costa, (1929), *Dicionário Coreográfico*, Lisbon, Vol. I, page 731.

<sup>3</sup> The Cacilhas-Costa da Caparica trip cost was in 1928, 35 escudos in a car for hire. *O Almadense*, (1928) no. 56, 4th August.



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The local press continued to back the construction of the South and Southeast railway line. In 1929, *O Almadense* considered it foolish not to lay the line (*O Almadense*, 1928, no. 41). The problem was no longer one of summer holiday-makers but one of the ability of the area to become a smoke-free and comfortable residential suburb for those who worked in Lisbon.

Various proposals for high-speed trams to the Atlantic Coast, or to Sesimbra and Setúbal were discussed. The Tejo, Oceano, Sado Company (Viscount of Assentiz) achieved official approval for such lines but foundered on the problem of financing on the part of the town councils involved

The railway emerged periodically as an option in association with the construction of a bridge. In 1913, for instance, there was a Portuguese bridge-building proposal: a new bridge over the Tagus designed by the engineer Alfonso Peña caught the interest of the regional press, but despite the promotion meetings with local support and a parliamentary debate, it failed to gain approval (A Pátria, 1922). In 1926, the idea of a suspension bridge was launched by Cortez-Bruhns.

The periodical press envisaged a futuristic Lisbon in 1906, in which the underground network connected the two riverbanks by means of a tunnel (Barata, 2002). The South Bank came to be regarded as an industrial suburb. In 1919, the idea of building a tunnel was taken up by Henry Burnay. The tunnel was to connect Cacilhas and Santa Apolónia Station (A Ponte de Salazar).

Yet another tunnel project was received with enthusiasm by the *Almadense* newspaper in 1929. That year, an application was received for a concession for a railway line connecting Beato (Lisbon) and Montijo (South Bank) via a rail bridge over the Tagus. The ministry approved a report on the project, but it had little to do with the transport in the area.

In the 1930s and 40s, the municipality of Almada and its two easternmost parishes grew more rapidly than the city of Lisbon. The growth was a cause of concern for the parish of Cova da Piedade, where rockeries, in their smallness and density, offered the advantages of living near to the places of work or of embarkation. The transfer of the Navy Arsenal to Quinta do Alfeite on the South Bank in 1939 made it necessary to provide for the transfer and housing of the workers.

Thus, the transfer to Almada of a part of the migratory flow of workers normally expected in Lisbon was planned. The instruments used in the Almada urbanisation plan followed the example of Lisbon, though on a more modest level. As far as passenger transportation is concerned, better conditions for the circulation of bus transport were created. The opening of the waterfront road between Cacilhas and Cova da Piedade allowed for bus transport in the direction of Corroios, but it also cut Margueira off from the sea, putting an end to its cork factories and leading to an initial de-industrialisation trend<sup>4</sup>. The new avenues laid out in Almada created better conditions for bus transport. With a total of 43,768 inhabitants, the municipality's population reached almost half of that envisaged in

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<sup>4</sup> Covita, José Luís Gonçalves, (1995), *História da Camionagem no Concelho de Almada*, CMA, Almada, p.29. Also projects by Agro Ferreira, 1933, *A Avenida Sul do Tejo: Cacilhas Trafaria*, p. 31.

the deconcentration project, and it was growing at a rate four times faster than Lisbon.

Nevertheless, nothing became of the hopes for the construction of a railway line. The definitive transformations of Quinta do Alfeite into a military base brought employment to the area, thus leading to new expansion that was not only working class in nature. Commerce and services played an increasingly important role in the area. However, the Navy Base in Quinta do Alfeite also rendered the rail connection to Barreiro along the lines previously envisaged totally impossible.

In the 1950s, with a lack of State solutions in sight, the built-up area spread without guidance and at the will of the real estate speculators. New streets sprung up in the direction of Laranjeiro, Feijó and Corroios. The farming area between the parishes of Almada and Cova da Piedade and the Margueira mount and Cacilhas began to fill up with clandestine shanty houses.

The bus transport companies consolidated more and, after overcoming the difficulties brought about by the 2<sup>nd</sup> World War, made every effort to accompany the urban expansion. In 1950 3,551,569 passengers made the crossing between Cacilhas and Terreiro do Paço every year. And practically all of them got to Cacilhas by bus. Some of them used the steamboats of the *Parceria dos Vapores Lisbonenses*. Others used the so-called small boats that were the descendants of the petrol driven boats and obliged the passengers to perform balancing acts on the wooden planks they pushed over to the Cais das Colunas on the Lisbon side. The *Lisbonenses* steamboats also made crossings between Cais do Sodré and Cacilhas, transporting 2,840,365 persons in 1950. In Porto Brandão a further 267,365 passengers were carried, and in Trafaria 804,901.

The steamboat also transported automobiles. Up until 1966, as the municipality of Almada did not have its own urgency hospital service, ambulances had to be carried across the river on the boats. Fog often severed the links between Lisbon and its suburb. On such occasions it was best not to fall seriously ill because all ambulances had to use the bridge upriver at Vila Franca de Xira. The passengers waited for the boats in the cold and rain. The reality had distanced itself inexorably from the futuristic outlooks of modernity that the idyllic projects of the late 19<sup>th</sup> century and early 20<sup>th</sup> century had announced.

## 2.2. The Expansion of the Private Car

**B**etween 1950 and 1960 the Eastern built-up area on the Tagus South Bank, known as the “other bank”, grew at a dramatic rate, whereas growth in Lisbon practically stagnated. This area reached a population of 55,108 inhabitants, while the whole municipality rose to 70,968. Even the parish of Caparica began to grow at rates almost 10 times higher than those for Lisbon. The bus companies continued to converge at Cacilhas, bringing all Lisbon commuters to the quays, where they filled the steamboats and small boats, without even the slightest change in the conditions. In 1960, the number of passengers

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between Cacilhas and Praça do Comércio rose to 14,006,827; the boats to and from Cais do Sodré carried 153,646 commuters. The total number of passengers on the Belém – Porto Brandão crossing was 120,195, while 1,729,759 persons travelled on the Belém – Trafaria route. The transport was heavily season-influenced, with the summer season accounting for peak periods.

The private automobile began to emerge as a solution for all those whose pace of life was accelerating. There was still space to leave the car in Cacilhas and take the boat, but driving to Lisbon, to the beaches or to the South of Portugal rapidly became journeys giving rise to major congestion problems. In 1965, 1,491,037 vehicles were ferried across the Tagus (*Cinco Anos da Ponte Salazar*, 1971).

In 1965, a survey conducted by Maria Alfreida Cruz, revealed that private passenger cars already dominated in the total number of vehicles on the road in the municipality of Almada. The number of busses was relatively low, even in relation to the heavy-duty vehicles (Cruz, 1973). The author of the survey identified organised car-pooling amongst the car owners who had the same daily route and shared the costs. This phenomenon was to become associated with the area of residence being chosen not for its proximity to the place of work, but to its value in relation to the most important urban centres. Evidently the number of vehicles differs substantially from the number of passengers transported. Nevertheless, the relatively high wages paid in the area led to the expansion of the automobile.

Even though the municipality could consider itself one of those most opposed to Salazar's Novo Estado (New State), the rise in the standards of living and the new individual freedom that access to private cars provided, the car became a symbol everyone wanted to have. The expansion of the car meant that urbanisation could continue into more remote areas, in the direction of Pragal, Charneca and Corroios.

### 3. The Bridge over the Tagus

On 1 February 1933, Duarte Pacheco set up a commission to study the previous proposals for the construction of a bridge over the Tagus as part of a rail connection to the South and South-East network, for which the State had granted an operating licence to CP in 1927. An invitation to tender opened in 1934 was annulled on the grounds that no bid met the contract specifications.

Arguments in favour of a suspension bridge were put forward in 1938. The engineer Peña Boeuf returned to the matter of a Tagus bridge and proposed a suspension bridge between Almada and Santa Catarina.

In the improvement plan in the 1940s, the Lisbon road network was radio-concentric in layout and the connections to the motorway to the North and to the South of the country were different to those that were to be built. The bridge of the Tagus crossed the river from Poço do Bispo (Lisbon) to Montijo (South Bank), while the motorway to the North used the Avenida Augusto Aguiar axis and headed towards Torres Vedras.

A joint order issued by the Ministries of Public Works and Communications (under Frederico Ulrich and Manuel Gomes de Araújo) set up a commission to study the building of a bridge across the Tagus at Lisbon. The group of experts included specialists from the LNEC, the Lisbon Port Authority, the Junta Autónoma de Estradas, the Urbanisation Department and Almada Town Council. In 1954, Lisbon City Council and the Secretariat of National Defence were also represented. This decision led to the revision of the master plan, which was, in turn, to result in the plan of 1958 (Carlos Nunes Silva, 1998).

The Junta Autónoma de Estradas centralised the whole process as of 8 May 1958 when it created the “Tagus Bridge Office”. The invitation to tender published on 27 April 1959 and 3 March 1960 received 4 tenders. The contract was awarded to an American tender and it was signed on 25 February 1961. The bridge was to be opened to the public on 6 August 1966 (*A Ponte Salazar*, 1966).

The project for the bridge had always presented it as a road and rail bridge. However, the railway construction part was not carried out, and was left for a later phase. Together with the bridge, the motorway to the South was built as far as Fogueteiro, as was the Caparica dual carriageway.

With the completion of the bridge, the use of private vehicles extended to commuting trips to Lisbon and back. By 1971, 43% of the drivers using the bridge into Lisbon made the crossing 10 or more times per week. Their number was, however, limited. At the beginning, the traffic on the bridge fell short of the expectations on which the financial calculations were based. These expectations were only reached in 1970. Fifty percent of the southbound vehicles stayed on the South Bank and 88.5% of the northbound vehicles stayed in the city of Lisbon.

In 1971, the specialists in the Tagus Bridge Office predicted that the road bridge would reach saturation point in 1975 and that then the completion of the railway crossing on the would become an absolute necessity. Almada now had a population of 107,575 inhabitants. The urban expansion in this period had to do with a new industrial boom in which metal industries and shipbuilding played a prominent role. The densification of the space in the centre of the town took place with the substitution of the single-family homes by multi-home buildings. The expansion became totally chaotic. The collective transport means in what in 1973 was to become known as the City of Almada were already considered as urban transport in 1970.

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**1. Urban bus lines in Almada**

Year	km	Passengers carried (in thousands)
1970	99	21,458
1971	99	22,069
1972	159	22,431
1973	159	23,183
1974	159	23,213
1975	159	20,097
1976	158	15,934
1977	158	15,006

Source: *Estatísticas dos Transportes Terrestres*, INE**2. Traffic on the Bridges**

25th Abril Bridge			V. da Gama
Year	Nº vehicles in thousands	Daily average	
1967	3,557		
1968	4,214		
1969	-		
1970	6,133		
1971	7,288		
1972	8,887		
1973	10,665		
1974	11,588		
1975	12,962		
1976	14,286		
1977		42,096	
1978		45,104	
1979		49,454	
1980		53,620	
1981		57,441	
1982		63,838	
1983		62,132	
1984		60,366	
1985		65,182	
1986		71,238	
1987		-	
1988		43,754*	
1989		91,925	
1990		97,738	
1991		111,199	
1992		116,976	
1993		121,987	
1994		125,803	
2000		152,606	51,827

\*in one direction only

Source: *Anuário dos Transportes*, INE.

### 3. 25th April Bridge Types of vehicles

Year	Light	Heavy/Passengers	Heavy/Goods
1967	3,056,413	99,073	297,501
1968	3,607,697	100,620	367,329
1969	4,316,120	97,037	419,376
1970	5,365.683	101,867	473,636

Source: *Os Cinco anos da Ponte Salazar*

### 4. Automobile transport on ferries

Year	Total
1966	1,491,307
1967	189,574
1968	314,088
1969	322,918
1970	396,495
97110	420,010

Source: *Os cinco anos da Ponte Salazar*

In 1971 there was already a noticeable axis of strong urban expansion towards Fogueteiro, where the motorway providing access to the bridge ended. The more rapid growth of the population was soon to shift away from the Municipality of Almada in the direction of that of Seixal, thus helping to lessen the strong impact that de-industrialisation had in Seixal in the 1980s.

In 1991, the Municipality of Almada had 151,000 inhabitants; by 2001 it had reached 160,000. However, the population in the Eastern part of the urban area was already on the decline.

In 1991, approximately 135,000 persons, 44% of whom made the crossing in private vehicles and 56% in public transport, crossed the River Tagus. As far as journeys with Lisbon as the destination are concerned, only 10.4% were made by bus, 44.3% in private vehicles and 45.3% using river transport means. The bridge was to account for a total of around 74,00 daily journeys, corresponding to 55% of the overall total, as opposed to 45% for river transport (Gabinete do nó ferroviário de Lisboa). The percentages presented by the municipal bulletin in 1995 differ a little from these as they refer only to the morning rush hour traffic. Here, private vehicles represented 38%, and collective transport means accounted for 62%. Amongst the collective transport means, the ferries still held 82% of the traffic in the morning rush hour, with only 18% of the journeys into Lisbon being

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made on busses over the bridge. In 1995, a total of 69,000 people crossed the Tagus during the morning rush hour alone (*Almada*, Municipal Bulletin, no. 7 of April 1995)<sup>5</sup>. At the time, one only had to live 3 km away from Cacilhas to have travel times to upper central Lisbon of more than one and a half hours in a private vehicle and two hours using collective transportation.

Indeed, in terms of passenger numbers, river transport held its own better than was to be expected. Although it had gradually stagnated between 1970 and 1977, it experienced strong growth from 1977 to 1985. Significant drops in the river transport figures were not registered until after that year.

#### 4. The Train Crosses the Bridge

In 1987, The Gabinete do Nó Ferroviário de Lisboa (Lisbon Rail Junction Office) was created. It began work in 1988, with the aim of implementing the modernisation plan for the rail network. Amongst its strategic objectives was the installation of rail deck on the existing bridge (Objectivos Estratégicos). The connection between Chelas and Pinhal Novo Station was to use the old circle line, thus turning the line into a platform for connection between urban and suburban rail services. The deconcentration of the population towards the Tagus South Bank and the easing of the pressure on the existing transport means were expected results.

From the outset, the development of the railway line along the Southern motorway route was criticised. In a study published in issue no. 1 of the *Urbe* journal in 1990, Fernando Nunes da Silva criticised the fact that there was no clear development strategy for the Greater Lisbon area (*Urbe*, nº1). The Coordination Commission for Lisbon and the Tagus Valley had only recently been set up and the author considered the transportation plan for the Lisbon region out of touch with the reality and based on projects produced without any perspective for integration of the diverse entities involved in Greater Lisbon transport.

Nunes da Silva was of the opinion that the planned rail deck would only serve to increase the South Bank's dependence on Lisbon and argued in favour of strengthening the integration of Setúbal as a pole of deconcentration. He also pointed out that the planned railway line was far from the most densely populated areas on the South Bank and proposed a light rail system that was clearly urban in character instead of the planned railway line.

Likewise, the decision of Minister Ferreira do Amaral to build a road bridge in the Eastern corridor between Sacavém and Alcochete instead of a road and rail bridge in the central corridor between Chelas and Barreiro met with almost universal criticism (*Nova Travessia do Tejo em Lisboa*, 1991). The opinion issued by the specialists appointed to study the matter was clearly in favour of the central corridor.

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<sup>5</sup> The bulletin quotes a survey conducted in partnership by the CESUR, Instituto Superior Técnico and the ITEP of the Federal Polytechnic of Lausanne.

Despite this disagreement, in April 1995, Ferreira do Amaral signed an agreement with the municipalities of Almada, Barreiro, Seixal and Moita for the construction of a surface light rail network that was to be completed by the year 2000. The South Bank Light Rail Network was not a priority for Amaral's successor, João Cravinho, nor for the latter's successors. The open invitation to tender was published, but was later contested. On 1 July 1999, a new agreement was signed with the government. Even though there was a reduction in the number of lines planned, work on the project still did not begin until 2000.

Meanwhile, the so longed-for rail connection over the first bridge was completed. The operating company, Fertagus, was incorporated in 1998 and operation of the line began in July 1999. The number of passengers in 2000 amounted to 11,485,123; 162,757,536 passenger/ km. The average journey was 14.7 km (Annual Report, 2000).

In terms of integration and intermodality, the reality far surpassed the expectations. The trains connect Fogueteiro and the integrated intermodal stations of Sete Rios and Entrecampos, thus providing direct access to the Lisbon underground network. The Transportes do Sul do Tejo and Fertagus busses have connections between the stations on the South Bank and diverse areas of Almada. Large car parks were built adjacent to the stations.

Construction work on the surface light rail network began in 2003, causing a certain amount of chaos in the road transport between Almada and Seixal. Paradoxically, a movement opposed to the construction of the light rail network emerged amongst those residents more used to using their cars. Some complained of the proximity of the new infrastructure to their homes, others objected to the loss of parking space for their vehicles – difficulties that reflect a lack of environmental education and information on the development of urban societies but also the resulting urbanistic maladjustments.

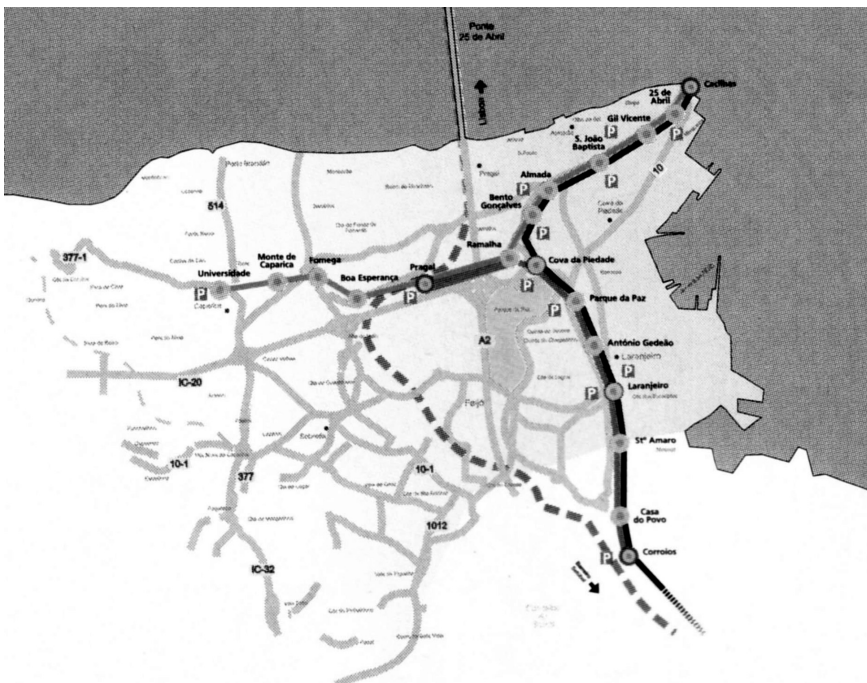


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## Conclusions

The road deck on the 25<sup>th</sup> April Bridge is as congested as ever. The train never was a structuring factor in the urbanisation, as it could have been with the plans of 1909. It has now been inserted into an urban fabric in whom the whole road network is orientated on the access junctions to the bridge or Cacilhas. Getting to the stations can be as troublesome as crossing the bridge, and even more expensive, given the need to pay for the ticket and the parking space.

Map I- the new light surface train



Source: Metro Sul do Tejo, 2003

Hence, the insufficient capacities for implementing the solutions studied in the early 20<sup>th</sup> century have had serious consequences in the 21<sup>st</sup> century. The ease or difficulty of integrating urban transport and the capacity to attract users depends to a large extent on whether the means of transport already available have an influence on the structuring of the urban development.

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