

Avilés: industry, urban space and transport. From the Sociedad del Tranvía del Litoral Asturiano (1893-1933) to the Compañía del Tranvía Eléctrico (1916-1959)

I. INTRODUCTION

This paper illustrates the process of technological substitution in urban transport in the second industrial town of Asturias, Avilés. Unlike what happened in Oviedo or Gijón, where urban growth itself fuelled the demand for mobility, in Avilés the industrial activity and the real estate interests of the Real Compañía Asturiana and the “Indiano” capital were the promoters of the tramway. In those three cases, the transition from animal to mechanical traction went through similar cycles: the *fin-de-siècle* boom (1895-1900), linked to the repatriation of the mentioned capital, facilitated the transition to steam traction; the WWI business boom of 1914-1918 witnessed the electrification of the tramway; the Spanish years of autarchy (1940-1950) did so with the introduction of the trolleybus, and during those of “developmentalism” (1960-1974), the bus was established.

The research organises as follows. The first section offers a synthesis of the process of technological transition in urban transport systems in Spain and Asturias. The second one represents an approach to the economic and industrial history of Avilés since 1850, to clarify its connection with the origins of the Compañía del Tranvía Eléctrico (CTEA). The third section details the genesis of the Sociedad del Tranvía a Vapor del Litoral Asturiano (1893), and the last one focuses on the business history of the CTEA (1916).

II. ASTURIAS: INDUSTRIALISATION AND DEMAND FOR MOBILITY. FROM ANIMAL TO MECHANICAL TRACTION

Since the mid-18th Century, pre-industrial transport systems could not satisfy the demand for mobility generated by the processes of industrialisation, urbanisation, and population growth. The modernisation of urban transport went through three stages. Between 1843 and 1895, the first one was dominated by animal traction (omnibuses and rippers). It had different temporal ranges depending on the size of the cities, the surface of the urban plan and its topography, and the income levels, among other factors. From the end of the 19th Century until 1930, the second one witnessed the coexistence of three technologies: blood, steam and electricity. In other words, the introduction of mechanical traction did not mean the disappearance of animal traction, which coexisted with the other two as long as it had a market niche in which its range of services was competitive. Between 1930 and 1950, the third stage coincided with the replacement of the tramway by the trolleybus and the gradual irruption of the bus.

1. FROM ANIMAL TRACTION TO THE STEAM TRAMWAY

Animal traction showed several restrictions related to speed, dragging capacity and the slope and pavement of

the roads, to which its difficult adaptation to the expansion of line lengths must be added. The solution would be the omnibus on rails. Although it optimised animal traction, it implied the use of rails or rails on rungs that, mounted on the pavement, hindered the circulation of other vehicles. The only available alternative was steam. In addition to the investment in infrastructure and rolling equipment, this technology required facilities for fuel supply, as well as water tanks for the boilers, stations, workshops and depots. The higher financial and capital tie-up requirements resulted in a business model that was cut off from the traditional family business.

Tramway regulation in Spain on animal traction — laws of 1859 and 1864— differentiated between the main railway network and tramways or railroads installed on roads and streets. The development of the urban tramway in Spain since 1870 occurred late in comparison to the rest of Europe. Furthermore, it was not able to represent an organised network. Its presence was delayed in Asturias until the *fin-de-siècle* decade. In 1890, Gijón inaugurated a line that would remain active until 1963. Between 1895 and 1922 a mule tramway ran in Oviedo, replaced in 1922 by the electric tramway, operative until 1955. In Avilés, steam and electric tramways date from 1893 and 1916, respectively.

2. FROM STEAM TO ELECTRICITY: TRAMWAYS AND TROLLEYBUSES

Electricity had apparent advantages over steam in terms of costs, speed, regularity, comfort and gas emissions. Its appearance was linked to the availability of electric generation and electromechanical industries. Once the experimental phase of the new technology (1880-1920) was over, its generalisation in the urban environment took place. In Spain, the initial impulse for the electrification of urban transport came from the Act of August 14th 1895. The first stage of its installation (1890-1900) was slow due to the limitations in the generation and supply of electricity, mainly from thermal origin. In a second phase (1900-1910), its progress ran parallel to the diffusion of hydroelectricity and some improvements in long-distance distribution. The Great War (1914-1918) and the difficulties in importing equipment slowed down the extension of the network until 1925. By 1936, the electrification process could be considered completed.

The presence of the trolleybus in Spain was almost simultaneous to that of the electric tramway, but its

diffusion accumulated a considerable delay compared to neighbouring countries. In 1936 no line had yet been installed. In the autarchy period, the shortage of liquid fuels and the deficiencies in the electrical supply system favoured its emergence as an alternative to the tramway. The October 5th 1940 Act regulated the possibility that concessionary tramway companies could operate trolleybus lines. This was the starting point of the trolleybus network expansion.

III. FROM THE TROLLEYBUS TO THE BUS

Since 1920, the generalisation of serial production in the automotive industry, with the resultant economies of scale, altered the transportation scenario. The Decree of July 21th 1933, dictated by the Ministry of Public Works, anticipated that no new concessions would be granted for tramways installed on public roads or highways, adding that “the public interest is already perfectly served with buses”, and that “it could also be served with trolleybuses, since for both the installation of rails is dispensed with”. Although the trolleybus represented significant progress compared to the tramway, in the long term and in comparison with the bus, it will be blamed for similar limitations: the high cost of installation and maintenance of the infrastructure and vehicles, and vulnerability to failures in the energy supply.

Among the causes that favoured the replacement of the trolleybus by the bus can be mentioned: *a*) the difficulties in renewing the fleet, since Enasa had been replacing trolleybus production with industrial diesel vehicles since 1960; *b*) the agreements with the United States (1953) and the Stabilisation Plan (1959), which meant the end of the oil embargo and the possibility of importing equipment; *c*) the initial advantages of the bus itself, as it did not require infrastructure, its service did not limit the circulation of private vehicles, and it showed higher versatility and flexibility; *d*) the pressure exerted by other industries interested in popularizing the new means of transport: oil, automotive and tire multinationals, among others. All these factors anticipated the end of the trolleybus. The Decree-Law of June 16th 1954 announced the transition in urban transport systems. In its preamble, it warned that “practice has shown that the need to lift the fixed tramway installations persists”, a problem that would not be solved by replacing tramways with trolleybuses due to the “high cost of the installations of the latter and of the electric fluid”, and to the fact that “neither the traffic nor the conditions of

the roads or streets were adapted to the use of this means of transport". Given that the industrial manufacture of buses had not reached optimum levels at that time, the substitution process was slow. The decisive milestone in the acceleration of the process was the Act of July 21th 1973, which authorised the transformation of trolleybus concessions into buses.

IV. AVILÉS, ECONOMIC GROWTH AND URBAN DEVELOPMENT

The industrialisation of Avilés was largely subsidiary to the port activity related to the movement of minerals (coal and zinc) operated by the Real Compañía Asturiana de Minas de Carbón (RCA) since 1833. The RCA initially aimed at exploiting the coal mines of Arnao, Santa María del Mar and Ferroñes. In 1853, given the poor quality of the coals and their high exploitation and transportation costs, the company reoriented its core business to zinc metallurgy. The government's industrial policy to attract international investors was based on the generous concession of facilities (tax and tariff exemptions, privileged access to raw materials and industrial land). In this sense, the case of the RCA will be paradigmatic. By Royal Order of November 14th 1833, all pieces of land linked to its mining concessions between Avilés and Soto del Barco were transferred to the Company. In 1855, the town council of Castrillón sold El Espartal for 12,000 *reales*, establishing that the seller renounced "any claim if, contrary to his statements, the land sold turned out to be worth more".

Both for the direct and the induced jobs generated, the RCA, in addition to being an essential engine of the council's economy, will become the shaper of an urban landscape. This environment will end up reflecting its business location strategies. The links between mining, industry and urban space did not take long to materialise: a) from 1833 onwards, coal exports demanded infrastructures (animal-drawn vehicles, wharves) and auxiliary facilities (warehouses and housing); b) from 1870 onwards, the second stage of urban development was dominated by the reclamation and draining of marshes and sandbanks in order to increase the supply of industrial and residential land; c) finally there is an overlap between the third stage and the *fin-de-siècle* economic boom, fed by the repatriation of "Indiano" capital and responsible for the diversification of the industrial network of Avilés.

Communications reinforced the industrial take-off: in addition to the railroad laid by the RCAM to connect

Arnao and San Juan de Nieva (1893), during the period 1890-1894 the Compañía del Norte created new branches between Villabona/Avilés/San Juan de Nieva and Villabona/Soto del Rey/Ciaño, definitively connecting Avilés with the basins of the Nalón and Caudal-Aller rivers. By the same time, the port of Avilés was enlarged with a breakwater, and that of San Juan de Nieva with a new dock. Temporarily, Avilés would become a coal port comparable to Gijón. The cabotage of minerals became a pole of attraction for companies and auxiliary port services, with the consequent impact on employment, housing and transport. The response to urban expansion came from the Plan de Ensanche (1895-1898). The urbanisation process was completed with public services (lighting, sewage and telephone lines).

The war business cycle (1914-1918) sponsored by the Great War, would open new opportunities for the local economy thanks both to the external demand for coal and the speculative freight prices. After the war, the broad public works program of the Directorate supported the consumption of domestic coal and the promotion of shipbuilding. This indirect intervention made it possible to partially counteract the post-war depression and to sustain economic growth until the end of the twenties. Paradoxically, the contractionary phase that began in 1929, and would continue during the decade of the autarchy (1940-1950), represented an exceptionality for Asturias and Avilés, affecting three main activities: fishing, mining and metallurgy. One of the objectives of the autarchy that of guaranteeing food self-sufficiency, contributed to the strengthening of the local fishing and shipbuilding sectors. Secondly, the commercial blockade and the impossibility of importing oil made Asturian coal a strategic energy reserve for the Spanish economy. In the same way, INI's aspiration to keep national sufficiency on steel production encouraged a wide program of interventions: Siderúrgica Asturiana (1942), Empresa Nacional de Aluminio (1943) and Cristalería Española (CESA), occupied all the industrial land between Avilés and San Juan de Nieva. The creation of an integrated steel plant (Ensidesa) would mean an economic revulsive without precedent. Between 1950 and 1960 the population of Avilés increased from 21,270 to 48,503 inhabitants, radically altering the previous urban model in two ways. On the one hand, between 1951 and 1965, 9,000 public housing units were built and, on the other hand, the new factory multiplied the daily commuting between the municipalities of Castrillón, Corvera, Illas and Avilés.

V. AVILÉS, URBAN GROWTH AND DEMAND FOR TRANSPORT: FROM ANIMAL TRACTION TO THE STEAM TRAMWAY

The project of establishing a steam tramway between Avilés, Salinas and Arnao arose in 1880. It gave response to the existence of a regular demand for transport both for the daily commuting of RCA workers and the port companies, as well as for those journeys related to the leisure and spa tourism of Salinas. As in the case of Gijón and Oviedo, since these were cities with small populations, the expected profitability did not ensure a short-term return on the initial investment. Accordingly, the original business plan included the exploitation of urban land. In 1891, businessmen from Aviles forged in the overseas market, requested authorisation to operate a steam tramway. On April 12th 1893, with an initial social capital of 350,000 pesetas, the Sociedad del Tranvía de Vapor del Litoral Asturiano was registered. In addition to those mentioned above, its shareholders included the RCA and merchants, bankers and industrialists from Aviles, with real estate interests in the operational area of the tramway. Since 1921 its economic viability was threatened by the CTEA.

VI. COMPAÑÍA DEL TRANVÍA ELÉCTRICO DE AVILÉS (CTEA)

1. THE ELECTRIC TRAMWAY, 1916-1921: A HARD DEVELOPMENT

The Avilés-Salinas steam tramway did not connect directly either with the port area or the industrial zone. The situation opened by the Great War and the growth of coal exports created the ideal conditions for the project of establishing a transport service for the dockers and the workers of the auxiliary industries established there. The initiative counted on two expectations: those placed on the urban development of Salinas, and those on the resulting neighbourhoods from the expansion of Avilés. On November 17th 1916 the Compañía del Tranvía Eléctrico de Avilés was constituted before a notary.

The materialisation of the company would be involved in setbacks related to the war itself: rising prices of steel rail and difficulties to acquire rolling equipment from companies in belligerent countries. Once these problems were overcome, the installation of the line began, and was finally opened on February 20th 1921. Between 1922 and 1923, the CTEA completed its 14.8 km route.

2. CTEA: BUSINESS HISTORY

The Directorate years generated growth expectations, confirmed by three successive capital increases, reaching 2 million pesetas. However, the company's profitability was harmed by the debt level resulting from high installation costs and maintenance expenses. All this explains why the operating results were not enough to balance the accounts.

The thirties represented a double-edged sword for the company: on one side, the number of passengers reached a million for the first time; on the other side, the civil war broke this upward trend in revenue. The company was intervened by the government of the Republic and part of its electrical equipment was requisitioned and transferred to other industries to support the war effort. That was a new turning point in the Company's economic cycle, aggravated in the following years by political uncertainty, social unrest, unemployment and wage increases.

The service could recover step by step after the war. In 1939 it reached again a million passengers, a figure that would continually increase. The most challenging years of the autarchy (1940-1950) did not take their toll on the company. As mentioned, in the middle of the commercial blockade and facing the absence of oil imports, Asturias and Avilés benefited from the strategic character that the INI attributed to industries such as coal mining, steelmaking, shipbuilding, and so to the fishing sector. In 1944, when the bus was already making its presence felt, the CTEA reached a new peak in passengers, exceeding 2 million and reaching 3 million in 1955, its historical maximum.

Paradoxically, the period 1955-1960 would see the end of the electric tramway. From 1957 until its last service on December 31st 1959, it would coexist with the bus, which made its appearance with more competitive equipment and operating costs. In 1958 the CTEA began proceedings with the Dirección General de Ferrocarriles, Tranvías y Transportes por Carreteras to "request the transfer of our tramway concession to the bus".

VII. CONCLUDING REMARKS

In the case of both the steam and the electric tramway, its creation initially responded to the recruitment and displacement demand of workers employed in mines, factories and ports. In addition, the same RCA shareholders, under the protection of their privileged land concessions,

saw the tramway as a means to make them profitable. Subsequently, as Avilés advanced in its industrialisation and urban growth required expansion plans, the installation of tramway networks was perceived by its promoters as a business opportunity linked to the exploitation of urban land.

At the end of the fifties, the tramway ceased to be a business. Its end was not without contradictions. Since the sixties, urban travel prioritised the use of buses and

private cars, despite the initial advantages of both would gradually fade away: their higher energy costs became apparent, and the growing traffic congestion cancelled out their advantages in terms of time savings. Furthermore, all analysts agree in pointing out the lack of foresight of the July 21th 1973 Act, which promoted the use of the urban bus at the time when many European countries were initiating policies of energy-saving and promotion of electric transport.