

# TRANSPORT INFRASTRUCTURE AND TERRITORY. THE STRUCTURAL EFFECTS OF THE HIGH-SPEED TRAIN IN SPAIN

**Carmen Bellet, Pilar Alonso y Antònia Casellas**

Departamento de Geografía y Sociología  
Universitat de Lleida

## SUMMARY

In recent years, the expansion of the high-speed rail network in Spain has generated a growing interest in urban and territorial development policies and in how they are analysed by academia. The present article adds to these studies by: first exploring the opportunities for socioeconomic and territorial development that the high speed train (HST) offers to medium-sized cities; second, analysing the effects that the introduction of this type of infrastructure and the arrival of the HST have on the territory; and finally, highlighting the main policies that local agents implement in order to maximize the benefits associated with the presence of the train. The ultimate objective of the article is to identify policy issues that may help public policymakers to maximize the opportunities that the HST creates for their respective territories. The article summarizes the knowledge acquired during a decade spent examining the socioeconomic and urban impacts of the HST on medium-sized Spanish cities.

## I. THE RESTRUCTURING CAPACITY OF THE HIGH-SPEED TRAIN

The HST creates numerous expectations for socio-economic development in the territories that it serves, many of which are not fulfilled. There is a tendency to forget that the train is only a means of transportation. It is able to revolutionize the accessibility of a given city to other urban centres and territorial systems, but it can only have repercussions on activities that are sensitive to the new relational possibilities that are presented (Plassard, 1991; Mannone, 1995).

### 1. The train only moves what is already on the move

Although it is possible to identify the opportunities created by the presence of an HST station, which may, as in the case of Ciudad Real (Garmendia, Ureña, Ribalaygua, Leal

and Coronado, 2008), help to attract new residents and investment, numerous studies have shown that the mere presence of the train is not enough to promote significant economic and territorial improvements. In fact, what the train provides a medium-sized city with is a comparative advantage with respect to other urban areas with similar socioeconomic, geographic and demographic features that do not have this infrastructure (Gutierrez, 2001). The emphasis should therefore be on the structural capability that the HST provides. In this sense, although unable to foster the economic and social wellbeing of a territory by its presence alone, the train does have the potential to contribute towards the development of local social and economic systems (Plassard, 1997; Fariña, Lamíguez y Pozueta, 2000).

## **2. A means of transport for the post-Fordist period**

The HST is a new means of transport that, to a great extent, complements the new spatial and economic relationships generated in the post-Fordist period. The train plays an important role within the dynamics of the spatial differentiation and socio-productive transformation of territories in quite an intense way: generating a major duality between spaces that have HST connections and those that do not. Its presence creates new dynamics among discontinuous socioeconomic spaces and generates polarities around the node-stations. In this sense, the HST tends to reinforce the hierarchy of cities and their territories. Nevertheless, the capacity of the train to concentrate activities and population is also determined by the presence (or absence) of other means of transport, such as industrial ports, road networks, airport hubs and intermodal centres (Troin, 1995). Furthermore, this hierarchy is not uniform (Klein, 2001).

## **3. The importance of the territorial context**

The influence of a new item of infrastructure cannot be considered in isolation from the context into which it is introduced. The characteristics and dynamics of the place and the actions and policies implemented by the agents of the territory in question have a crucial influence. As Hoyle and Smith (1992) point out, infrastructure allows, but does not cause, socioeconomic development and spatial change. The HST creates new opportunities and promotes existing dynamics, but it does not induce new developments out of nothing (Bellet, 2000). Within this context, within any analysis of the effects of infrastructure, it is necessary to consider the characteristics and spatial organization of the space in question both before and after the introduction of the new service. It is also necessary to examine the development strategies of various agents during the decision making process and on its implementation (Albrechts and Coppens, 2003).

## **4. A multi-scalar analysis of HST outcomes**

In order to understand HST outcomes, it is necessary to make a multi-scalar analysis at the railway station, neighbourhood, local-metropolitan area, and regional and national scales. Important policy considerations exist at each of these spatial scales, though there are two transversal issues that affect all scales: the socio-functional organization of the territory in question and its mobility dynamics.

At the railway station and neighbourhood scales, it is especially relevant to consider the physical features of the station and the services that it supplies. Other relevant aspects include passenger flows, the level of connectivity within the local transport network, and the land use in the area surrounding the station. At the local-metropolitan scale, relevant issues include the layout of the railway system and the location of the station within its territory. Numerous case studies show how the role of local agents is fundamental in the decision making processes at this scale (Fröidh, 2008). The case of Segovia, whose civil society succeeded in changing national plans in order to secure a railway station within the city limits, illustrates the capacity of local agents to lobby and influence final decisions concerning layout and location (Casellas, Bellet, Alonso, 2008). At the regional and national scales, relevant issues include the new relational possibilities that are generated through the functions performed by these stations and their relative locations within national and international high speed networks, their level of inter-modality with other means of transport, and the way in which they transform and socio-functionally reorganise their respective territories.

## **5. The timing of HST outcomes**

The physical and socioeconomic outcomes of the HST have a specific timing that it is important to take into consideration if we are to appropriately evaluate the impact of the train. It often takes decades between the layout plans and the execution of the infrastructure, including the construction of a local railway station. As a matter of fact, the first noticeable changes in the territory are normally physical. This change in its morphology is a result of the presence of railway lines which, due to their very nature, generate important changes in the urban patterns of the spaces that they serve. After this physical transformation, the next relevant results of a new service are its influence upon mobility patterns within the area it serves. Another immediate outcome is related to the modified image of the city in question. Local leaders tend to engage in place marketing, which is often seen as a necessary requirement. This approach helps to give the place “greater visibility” and tries to capitalize on the momentum gained from the acquisition of the new infrastructure (Ganau, 2001). Thirdly, the new mobility dynamics and increased visibility will eventually influence the characteristics of the socioeconomic activity of the immediate area. Even so, socioeconomic influences tend to be seen in the long run. Studies of the French HST, which has a longer history than its Spanish counterpart, show that a 20-year period is required to fully evaluate the socioeconomic impact of the HST. The final transformation will imply physical changes resulting from the previous dynamics.

## **II. FACTORS THAT INFLUENCE THE DEVELOPMENT CAPABILITY OF THE HIGH-SPEED TRAIN IN SPAIN**

The arrival of the high-speed train generates new opportunities deriving from the improved accessibility which need to be fully exploited. In order to take the fullest possible advantage of these opportunities, it is necessary to consider several different factors and characteristics,

which include: the nature of the implementation-insertion of this infrastructure in the area in question; more specific details of the service, such as schedules and prices; the existing socioeconomic composition of the territory; and the policies applied by local agents.

## **1. Implementation-insertion of the infrastructure**

The specific layout of the rail network (radial, lineal, grid) and its nodes (stations) is crucial. The dynamics of the corridor, the degree of connectivity with the wider rail network, and the multimodal network (road system, airports, etc.), and the degree of accessibility at the urban scale, are all aspects that influence the development capability of the HST (López Pita, 1996; Gutiérrez, 2001; Menéndez, Coronado, Guirao, Rodríguez, Ribalaygua y Rivas 2002).

Historically speaking, the Spanish railway network has always had a radial structure and been centred on Madrid. The Spanish Strategic Plan for Transport Infrastructure 2005-2020, with a total budget of € 248,892 million, aims to overcome the drawbacks of this radial pattern by establishing a new grid network that should foster a series of new territorial relations. This will include connections to all the provincial capitals and also improvements in inter-modality between different passenger systems. Nevertheless, this new approach is still subject to an important set of limitations. First, it still fails to fully escape the present radial system and continues to have Madrid as its centre. It is also a system that has been designed at the national scale and needs to be adapted to meet the needs of other scales, and in particular the regional and metropolitan/urban scales.

The autonomous regions of Catalonia, Andalusia and the Basque Country have voiced their interest in developing their regional interconnectivity. Their approach is to focus on achieving high-speed connectivity among their main urban centres. Fully developing these expectations may require a specifically regional railways policy in Spain. Regardless of the importance of the regional scale, there is currently a clear lack of technical, political and academic studies at the regional level. The majority of analyses undertaken so far have focused on the local scale. These studies have been carried out following requests from various local agents for an effort to help capitalize on the potential that new infrastructure could bring to their urban and regional areas.

## **2. Features of the transport system**

The territorial impact of the HST depends, to a great extent, on the characteristics of train schedules and ticket pricing. One of the first implications of the introduction of the HST is the possibility to establish a discontinuous metropolitanisation of economic activity. In this sense, many of Spain's medium-sized cities have the possibility of becoming integrated within the economic and social dynamics of larger urban centres. The cases of Toledo, Segovia, Ciudad Real and Guadalajara, with respect to Madrid, and Tarragona and Lleida, with respect to Barcelona, both illustrate this point. The HST helps to enlarge existing labour markets and integrate consumer and service markets. This metropolitanisation process has been more intensive in cities that had previously suffered from the consequences of poor transport infrastructure and accessibility (Garmendia, Ureña, Ribalaygua, Leal and Coronado,

2008). In fact, the poorer the previous connectivity of a city, the greater is the tendency for it to exhibit signs of this new metropolitanisation (Ureña, 2006).

The second important transformation associated with the characteristics of the HST service is the possibility to create new regional interrelations that derive from the new articulation of urban and economic dynamics generated within the region as a result of the implantation of this infrastructure. The pattern observed in Spain is similar to that seen in France. Even though the logic of the national HST network and the scheduling of services are more akin to the interests of large centres than to the needs of medium-sized cities, the latter eventually also generate their own series of new regional interactions. Nevertheless, medium-sized and small cities still have a legitimate argument in that, to date, HST networks and schedules have given priority to the main urban centres and, as a result, the number and characteristics of the stops in medium-sized destinations remain few and often of only secondary importance.

### **3. Socioeconomic characteristics and the territorial context**

The socioeconomic dynamics of the territory in which there is an HST station has a crucial influence upon the effects this item of infrastructure will have on the city and its surrounding region. The capability of this infrastructure to help develop the immediate territory rest on a complex group of socioeconomic factors that interact with the comparative advantages and shortcomings of the area in question. In this sense, an item of infrastructure can transform a territory and its potential but, and as many case studies show, it is the social and economic agents who have the real capacity to transform a territory and to use its advantages and overcome its shortcomings. It is they who must decide when to intervene and when not to, and who must initially define which policies to implement.

### **4. The policy approaches of local agents**

An analysis of case studies provides evidence that some HST stations in medium-sized Spanish cities have been the result of lobbying by local economic and social agents; examples of this are the cases of Cuenca, in the eastern corridor, and Segovia, in the northern corridor. These new intermediate stations affect regional and metropolitan rail flows. Furthermore, they tend to be located on the periphery of the urban fabric. This location generates expectations regarding future real estate developments in the area. On the other hand, stations built in city centres have shown their capacity to create new economic synergies based on existing economic structures, while also permitting urban restructuring.

From the lessons learned through our analysis of medium-sized cities in Spain during the last decade, we would argue that agents should:

- integrate the HST within their city/territory vision. The HST should be incorporated into urban and territorial development projects in a comprehensive way. Specific urban planning and economic development projects could take into account the new possibilities that this means of transport offers to them.
- learn from best practices. It is a good strategy to become more familiar with policies implemented in other cities and to study the constraints and advantages encountered

there. The objective is not to replicate other models but to adapt solutions to the specific characteristics of a given place while helping to formulate and implement successful policies.

- design specific strategies in order to capitalize on the opportunities generated by the improved accessibility.
- work within an active and dynamic governance structure in order to take the fullest advantage of the opportunities generated by the new item of infrastructure.

### **III. SUPPORTING POLICIES**

There are three main supporting policies that local agents implement with different levels of success (Ribalaygua, 2004; Paul, 2008). They include policies relating to aspects of urban planning, management, and image promotion.

- Urban planning measures: these are measures that in the best-case scenario are developed before the arrival of the train and whose goal is to integrate the new infrastructure into the urban fabric of the city. They include: regulations and incentives to reduce the possible barrier effects of the rail system; new zoning of land uses to allow the location of new economic activities and create positive synergies based on the potential offered by the HST; improvements in local and regional accessibility and in connections between different modes of transport, etc.
- Management measures: their goal is to manage the new flows and mobility patterns generated by the HST and to consolidate the central character that the new railway station and its surrounding area help to develop. These measures should include the implementation of mobility policies to foster the coherent coordination of internal and external passenger flows. This also implies re-zoning land, where necessary, and developing specific projects for areas surrounding the new station.
- Measures to create and promote a new image: old advertising strategies have been transformed into a more comprehensive approach during the last decade. Measures to create and promote a new image associated with the HST may include urban marketing, the promotion of different tourist segments, and the creation of new centralities which may include providing areas for advanced services, logistics, and new technologies, amongst others.

### **IV. THE SOCIOECONOMIC EFFECTS GENERATED BY THE TRAIN**

In general, the literature stresses the fact that the HST has the capacity to act as either an engine for local growth or to have only a limited effect or even drain away economic activity (Van den Berg, 1998). Nevertheless, any possible negative effects tend to be short-lived and to apply to small cities which become dependent on larger metropolises (Mannone, 1995). We can conclude that there are very few, if any cities, in which the HST will not produce a noticeable effect.

The effects and changes that the train introduces in urban areas and their surrounding regions tend to take place and become evident over time. As a consequence, there is a need for continuous analysis and to adapt actions and strategies to changing conditions. Our case

studies provide evidence that the HST has a tendency to generate dynamism by increasing mobility. This offers the local economic and social structure the opportunity to access new markets, services, and activities.

One type of economic activity that clearly registers the effects of the HST is the tourism sector and, most specifically, the part of it related to congress activities. The new infrastructure and visibility gained by the city help it to establish a niche in this economic sector. This has occurred in cities such as Ciudad Real, Córdoba, Sevilla, Lleida and Zaragoza (González, Aguilera, Borderías y Santos, 2005; Alonso y Bellet, 2008). Furthermore, the train facilitates the arrival of new visitors and promotes new forms of consumption in the territory. However, contrary to the expectations of local tourism industries, it has been seen that some cities, including Ciudad Real, Cordoba and Lleida, have not increased their number of overnight visitors. In some cases, as occurred in the first years after the arrival of the HST in Ciudad Real and Cordoba, overnight stays actually decreased (Bellet, 2000). With respect to the availability of hotels, the experience of Spain's medium-sized cities that have HST stations shows that in order to succeed, the hotel sector needs to adapt its facilities to meet the needs of a new type of client who is often more selective and requires more specialized services.

Another economic sector that has been affected by the HST is that of advanced services. These effects can take place in different directions: offering new advanced services to companies or to people that locate in the territory; extending and expanding the scope of local services provided by local residents; or the migration of local demands for goods and services to other urban areas. The immediate effect is that both companies and individual residents in close proximity to the station note improved accessibility to clients and services.

Finally, it is important to underline that there has been a long debate regarding the possibility of the HST helping to attract activities associated with the new economy. This is a complex debate, and so far it seems that the location of these activities is more related to the individual strategies of different companies and local public policy incentives than to the presence or absence of the HST itself. Whatever the case, two sectors that are related to the new economy and that seem to benefit from the HST are those of knowledge and culture. Cities such as Lleida have invested in their cultural offer which not only helps to attract visitors, but also has symbolic value, increasing local pride amongst residents. Universities are also positively influenced by the arrival of the HST, as this infrastructure not only allows them to attract students from a broader region, as daily commuting becomes a possibility, but also makes them more attractive to lecturers and researchers.

