

# **Railway Connections and High Speed Transport: the Social and Environmental Impact**

**Enrico RISPOLI, Italy**

**Key words:** Land distribution, land management, urban renewal, infrastructure, technology, railway.

## **SUMMARY**

The carrying out of new works or the modification of the existing ones have always as consequences alterations on the habitat. Sometimes these kind of alterations bring the necessity to adopt some remedies aimed to mitigate the consequences of the works on the “environment system” in order to avoid the lowering of the level of wellbeing or the lost of its quality.

Usually, in relation to the defined sphere of impact of the work, the valuation of environmental changes is limited at local level.

In case of carrying out of big works which interested wide areas of the land, it is necessary that the survey is able to give valuations on the intensity and consequences of both permanent and usual changes (physical, ecological and aesthetic of the environment) but also on the important social, economical and political consequences at regional and national level.

In fact, the carrying out of these big works brings to the modification of the migration flows, the modification of the transport costs, of the costs and commercial values of the areas in numerous cities, etc.

The main goal of this paper concerns the analysis and the valuation of the social and economical impact resulting from the carrying out of the high speed transport by rail for the Italian territory, with particular reference to:

- the comparison among 5 European cities - Milano, Madrid, Lione, Bruxelles and Monaco – as the reference background and comparison for all Italian cities which will be reached by high speed transport by rail;
- the different carrying out proceedings adopted in the respective countries focusing on the different kind of approach;
- the relapses (advantages or disadvantages) on the migration flows of the population, on the tourism, on the real estate market, on the labour market and on the sector of services for the persons.

The impact on the land resulting from an infrastructure as the railway is big and interests a lot of variables. The results of the high speed transport are measured in terms of greater competitiveness of the companies, of impulse to the specialization of the technologies and to wealth mobility.

The coming of the new high speed transport within the urban context represents, in fact, the occasion for the renewal and the realization also of the most important undergrounds, as it is

happening for example in Monaco di Baviera or at national level in Roma, Torino, Milano and Verona. Moreover, the project of high speed transport has brought big proceedings of strengthening and of reorganization of all big railway road junctions touched by the new infrastructure with big effects in the economy and finance, in the work and radical transformations of the urban structure of the cities. The airport system at national level feels the effects of all this.

# **Railway Connections and High Speed Transports: the Social and Environmental Impact**

**Enrico RISPOLI, Italy**

Nowadays, people, resources, goods, and news are travelling around the whole planet at a speed that we couldn't have imagined before. This process is strictly related to the economical globalisation and the increased mobility of tourists. In order to fulfil the client's requirements, there is a constant need of adjourned technologies and instruments matching the new scientific knowledge.

Economic processes, industrial interests, and labourers' movements are now having a global diffusion, while state boundaries are fading away.

As a consequence of the fast changes and the economic value of these relationships, towns and regions are obviously trying to acquire their own status and to be the leaders of these transformations (avoiding to be cut off from the advantages so offered).

Nevertheless, only few towns could be considered crossroads where all these communication lines can intersect and constitute a prominent field for significant benefits.

To be included in this sort of network requires some specific and favourable terms.

In order to draw prominent attention, the first thing to be considered is the geographical position of specific areas connected to economic and social flows. Moreover, supporting the integration processes among different people and having suitable infrastructures for mutual communication and hospitality is mandatory.

For this purposes, from 10 years ago a European Project has started. Its final goals are to improve and speed communications and transport ways. Such a system is called TEN-T (Trans-European Transport Network).

The project involves the whole Europe, through the construction of a European-spread network of High Speed Transports by Rail (at the estimated cost, non-priority projects for communal interest included, of more than 600 milliards of Euro).

The HS railway system allows a lot of citizens to reach their destinations (both at middle and long distance) on time and with the maximum comfort.

Such a transport network (its realisation is still going on) would allowed in the future:

- the possibility for a lot of citizens to reach their towns, reducing traffic-jams and simplifying the mutual access to different towns, both in Europe and outside of it;
- the chance to have high-quality infrastructure systems low cost;
- the best use of the resources still available;
- the economic sustainability (as far as it is possible);
- the "coverage" of the whole European territory, such as to make it easy to access to it, to connect all the islands and the suburban areas to the central regions and to link without problems big urban areas and different regions in the UE;
- without any frontier, the chance to a free movement of people and goods, in security and with the best social conditions.

In Annex A (with the attached geographical map), you will find the sections of the new infrastructures approved and financed by the UE.

The realisation of such big and innovative works, extended even outside the European boundaries, may involve important changes in the urban structure, in the environment, and, together with it in the whole habitat.

Normally, as there is not such an important impact, an eventual environmental change is evaluated by the local authorities.

When we are talking of Great Works, involving wide territories, it is necessary that the motivations of the project could include the valuation of the level and the consequences in any permanent and unavoidable modification of the landscape (physical, environmental, and esthetical). Moreover, it's important to consider the social impact (economic and political), both at the regional, and the local level.

Great Works modify migration fluxes, transportation costs, real-estate and building values in a lot of towns.

Whatever might be its extension, the realisation of a railway system always causes:

- environmental, landscape, etc. change;
- social and economical modification;
- improvements in the ecological system;
- increasing value of the real-estate in the area.

## **ENVIRONMENTAL, LANDSCAPE, ETC. CHANGE**

The change caused by an extended infrastructure such a railway on a specific area has big consequences and presents many different aspects. Among them:

- a change in the landscape: shapes and views are perceived in a different way, as new volumes are present, and there is often a need for a crafty camouflage;
- the division of the land in two parts: a real break in the continuity of the areas and a cause of difficult connections;
- a compromised hidro-geological balance within the territory (especially caused by the sub-crosses): the Work can represent a barrier and can make it difficult to let the underground waters flow. This can generate dangerous instabilities on the land-sides.

As for that, it is necessary to introduce rules that can reduce the impact of these Works on the Ecosystem, in order to avoid negative consequences over the general welfare or the decline of its quality.

## **SOCIO-ECONOMIC IMPACT**

Of course, the realisation of an HS Railway means also to built adequate and modern infrastructures.

The structures most in need of an updating are the stations.

Many stations, although modern, were built during the past two centuries. A lot of town where there is a HS Train Station needed to re-shape their organisation of the transit in order to match the demands of the clients for comfort and efficiency.

The stations, as a most relevant element in the town structure, were realised according to an idea of sub-urban use and with dimensions strictly related to the square, the streets, and the areas of their location (with markets, residential buildings, cultural sites, business centres, etc.). Frequently, the stations are true "symbols" of the town.

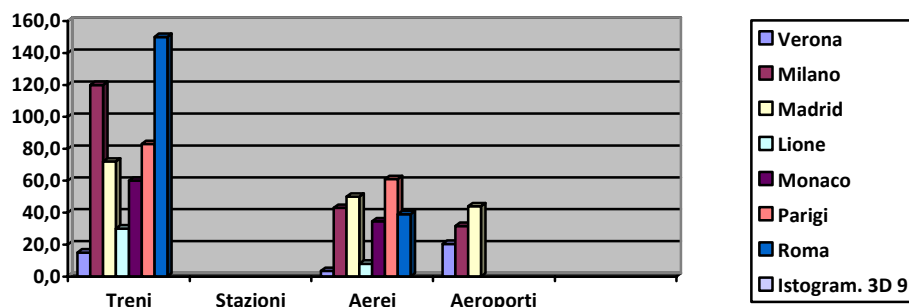
The mere existence of stations within a town means potential resources (passengers can assure daily an important economic movement).

In order to show that, let's consider the daily traffic of passengers in a station, together with their friends and with all their shopping cost for food (mineral water, sandwich, etc), logistic needs (hotels, fun, etc.) and other means of transport (taxi, subway, etc.).

The following table summarizes the data about the passengers (divided into those travelling by train, and those travelling by airplane) in some Italian and European towns:

Town	Number of passengers			
	TRENI	STAZIONI	FLIGHTS	AIRPORTS
VERONA	15,0		3,5	
MILAN	120,0	Central	43,0	Linate
MADRID	72,0		50,0	
LION	30,0		8,0	
MONACO	60,0		34,5	
PARIS	83,0	Gare Lyon	61,0	C. de Gaulle
ROME	150,0	Termini	39,0	Fiumicino

The numbers refers to the millions of passengers every year



We are considering cross road stations, where the most important traffic is represented by long-distance flights, possibly absorbable by the HS System.

Comparing the traffic by plain and by train is useful in order to make it clear that travelling by rail is preferred. As speed and efficiency are improving, transports on rail become preferable over flights and road-transports.

As a consequence, being the final-stop or even an usual stop of a HS Train System meant, for those towns involved, a modernisation or even the change in the location of the station. Stations such as the Gare de Lyon in Paris, the station of Madrid and the Central Station in Milan had been totally renovated, although maintaining their historical and architectonical value.

In other towns (Florence, for example) it was necessary to create a new project for a station. It was chosen to place it under the existing one. Protests for the environmental consequence on

this choice followed numerous. Nevertheless, this solution allowed to keep in place the pre-existing core of the structure, just in the middle of one of the most beautiful towns of the world. It's just a way, as we said, to guarantee the socio-economic balance of the region (a territory that, in such a way, can obtain great advantages).

On the contrary, the HS Station of Rome had been moved from the historical location in Roma Termini (enormous disadvantages for the local economy) to the new Tiburtina Station (good for them!).

When the location of a HS Station matches with a previous existing structure, from an economic point of view, new opportunities are exploited, connected with the demands of modern, adequate and comfortable infrastructures. Therefore, the local system of public transport has to be ameliorated, as well as the viability and so on. New investments are needed, as the demands for good and services is increasing. Regions involved in this process are automatically re-qualified and valorised.

Changing the location of a station causes the valorisation of the zone where the new station is built and, at the same time, the degradation of the first settlement (less investments, migration fluxes of the population, tourism, loss of real-estate investments, and decreasing in the work-market and in the social services).

## **ECOLOGICAL BENEFITS**

As for the environment, we have to say that, according to what as been discussed in the Kyoto Meeting (1990) and in the Copenhagen Conference (2009), more than a 20% of the CO<sub>2</sub> are due to the use of motor transportations. In this situation, the realisation of the TAV (TEN-T) system of comfortable, fast and eco-friendly communications would encourage all the clients not to use road or by air transportations. CO<sub>2</sub> would be strongly reduced (especially if compared to the levels of 1990 and 2009).

Moreover, a new connecting line, built according to the more advanced technologies, could allow us to keep it separate transports and urban environment, reducing the need to cross an inhabited area, zeroing the danger at the crossroads and, by making available the lines traditionally used by the regular traffic, ameliorating the regional and urban transport system. This is a way to reduce future kind of environmental pollution due to other means of travelling, nowadays mainly carried on by road, especially for commercial purposes.

## **INCREASING VALUE OF THE REAL-ESTATES**

HS transportations mean more if we consider their impact on an increased competition among different industries, on the specialisation in the field of new technologies and on the global circulation of wealth.

As a matter of fact, the increasing arrival of fast connections in towns is a chance to re-new themselves and to create new and more rational urban links. A few examples: Munich (G), Barcelona (S), Rome, Turin, Milan and Verona...

Moreover, the HS Project started a big improvement and re-organisation of all the towns and suburban areas that are involved. All this process requires a new attitude and a modern way to "understand" the territory and the land.

Investments, new buildings, empty spaces, opportunities become new chances of economic, financial and business development.

Following a change that take care of all the environmental requests, a town contest becomes an opportunity for the residents' welfare.

If we consider all the territories involved in this process, development and economic growth are crucial to the perception of the market value (sale or rent) of all the real-estates concerned.

## **New infrastructure stretches approved and financed by the UE**

### **1. Railway Berlin-Verona-Milano-Bologna-Napoli-Messina**

### **2. HS Railway Paris-Bruxelles-Colonia-Amsterdam-London**

### **3. HS Railway of South-oriental Europe**

(Lisbona-Porto-Madrid, Madrid-Barcellona, Barcellona-Figueras-Perpignan, Perpignan-Montpellier, Montpellier-Nîmes, Madrid-Vitoria-Irún-Hendaye, Irún-Hendaye-Dax, trans-bordering stretch, Dax-Bordeaux, Bordeaux-Tours.

### **4. TGV Est**

Parigi-Baudrecourt, Metz-Lussemburgo-Saarbrücken-Mannheim

### **5. Betuwe Line**

### **6. Railway Lione-Trieste-Koper-Lubiana-Budapest-Ukraine Borders**

Lion-St-Jean-de-Maurienne, Moncenisio tunnel, trans-border stretch Bussoleno-Turin, Turin-Venezia, Venezia-Trieste-Koper-Divaca-Lubiana-Budapest.

### **7. Motorway stretch Igoumenitsa-Patrasso-Atene-Sofia-Budapest**

Via Egnatia-Pathe-motorway Sofia-Kulata-border-Greec-/Bulgaria, with the stretch Promahon-Kulata as trans-border, motorway Nadlac-Sibiu (deviation Bucarest and Costanza)

### **8. Multiple Line Portugal/Spain together with the remaining part of Europe**

Railway La Coruña-Lisbona-Sines, Railway Lisbona-Valladolid, Railway Lisbona-Faro, Autostrada Lisbona-Valladolid, Motorway La Coruña-Lisbona, Motorway Siviglia-Lisbona, New Airport of Lisbona

### **9. Railway Cork-Dublino-Belfast-Stranraer**

### **10. Airport Malpensa, Milano, Italy**

### **11. Regular Link with Öesund (ended-2000)**

### **12. Railway/road in the North**

Rail and motorway projects in Sweden, Motorway Helsinki-Turku, Railway Kerava-Lahti, Motorway Helsinki-Vaalimaa, Railway Helsinki-Vainikkala (Russian border)

### **13. Motorway UK/IRELAND/BENELUX**

### **14. Railway along the west coast of UK**

### **15. Railway GALILEO**

### **16. Commercial Railway Sines-Madrid-Paris**

New HS Railway through the Pyrenean, Railway Sines-Badajoz.

#### **17. Railway Paris-Strasburgo –Stoccarda-Wien-Bratislava**

Paris-Baudrecourt, Metz-Lusseburgo, Saarbrücken-Mannheim, Baudrecourt-Strasburgo Stoccarda, bridge of Kehl as trans-border stretch, Stoccarda-Ulma, Monaco-Salisburgo, trans-border stretch, Salisburgo-Vienna, Vienna-Bratislava trans-border stretch.

#### **18. Boats Reno-Mosa-Meno-Danubio**

RenoMosa dam of Lanay as trans-border stretch, Vilshofen-Straubing, Vienna-Bratislava, trans-border stretch, Palkovicovo-Mohács, retards in Romania e Bulgaria.

#### **19. Intreactions among the different HS systems in the Spanish zone**

Madrid-Andalusia, Nordeste, Madrid-Est and Mediterraneo, norte/nordeste way, Vigo-Porto, Estremadura Line included.

#### **20. Railway of the Fehmarn Belt**

Regular connection road/rail on the Fehmarn Belt, Railway to Denmark through the Öresund, Railway to Germany from Hannover, Railway Hannover-Amburgo-Brema,

#### **21. Sea Motorway**

Following projects:

Baltico Motorway (connecting Countries on the Baltic Sea and central-western Europe)  
Western-Europe Motoway (Spain, through the Atlantic and the Northen Sea to Ireland,  
Southern-East Motorway (Adriatic Sea to Ionian Sae and East-Mediterranean, Cipro included,  
Southern-West Motorway (West Mediterranean), to link Spain, France, Italy (Malta included),  
connected to the Southern-East Motorway.

#### **22. Railway Atene-Sofia-Budapest-Vienna-Praga-Norimberga -Dresda [8]**

Railway Creek border-Bulgaria-Kulata-Sofia-Vidin-Calafat, Railway Curtici-Brasov (to Bucarest and Costanza), Railway Budapest-Vienna, trans-border stretch.

Railway Brno-Praga-Norimberga, with the stretch Norimberga-Praga as trans-border.

#### **23. Railway Danzica-Varsavia-Brno/Bratislava-Vienna [9]**

Railway Danzica-Varsavia-Katowice, Railway Katowice-Brno-Breclav, Katowice-Zilina-Nove Misto n.V.

#### **24. Railway Lione-Genova-Basilea-Duisburg-Rotterdam-Anversa**

Lione-Mulhouse-Mülheim with Mulhouse-Mülheim as trans-border stretch, Genova-Milano-Novara-Swiss borders, Basilea-Karlsruhe, Francoforte-Mannheim, Duisburg-Emmerich, "Rhin ferré" - Rheidt-Anversa

#### **25. Motorway Danzica-Brno-Bratislava-Vienna**

Motorway Danzica-Katowice, Motorway Katowice-Brno-Zilina, trans-border,

Motorwy Brno-Vienna, trans-border.

#### **26. Railway/MOTorway Ireland/UK/Europe**

Railway/road line from Dublin to the North (Belfast-Larne) and the South (Cork),



Railway/road line Hull-Liverpool, Railway Felixstowe-Nuneaton, Railway CreweHolyhead, main line following the western coast in UK.

**27. "Rail Baltica": Railway Varsavia-Kaunas-Riga-Tallinn**

Varsavia – Kaunas, Kaunas – Riga, Riga - Tallinn

**28. «Eurocaprail» on the Railway Bruxelles-Lussemburgo-Strasbourg.**

**29. Railway along the interactive Ionian-Adriatic Connection.**

Table about the different speed in the various stretches of the railway system:



## **BIOGRAPHICAL NOTES**

Academic experience: University Degree in law

Current position: Member of the Consiglio Nazionale Geometri e Geometri Laureati

President of the Collegio Provinciale di Chieti

Activities in home and International relations:

FIG, Commission 8 Italian delegate

Member of CLGE – The Council of European Geodetic Surveyors

## **CONTACTS**

Enrico Rispoli  
Consiglio Nazionale Geometri e Geometri Laureati  
Piazza Colonna, 361 - 00187  
Rome  
ITALY  
Tel. +39 06 4203161  
Fax + 39 06 48 14 026  
Email: [e.rispoli@cng.it](mailto:e.rispoli@cng.it)  
Web site: <http://www.cng.it>