

The Impact of the Channel Tunnel on Spatial Planning in Europe: the Risk of Growing Peripherality¹

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Introduction

Following a resolution of the European Parliament of September 1988, the Directorate General for Regional Policy of the Commission of the European Communities commissioned a study on the regional impacts of the Channel Tunnel throughout the Community. The study was conducted jointly by ACT Etudes and Recherches Economiques et Industrielles, Paris, France, the Institut für Raumplanung of the Universität Dortmund, FRG and Marcial Echenique & Partners Limited, Cambridge, UK between July 1990 and December 1991 (ACT et al., 1992).

The prospective opening of the Channel Tunnel in conjunction with the emerging European high-speed rail system is stimulating the imagination of national and regional policy makers in north-western Europe. Today, the British Channel with its current ferry service clearly presents a major transport barrier to free movement of passengers and goods in Europe. When through the Channel Tunnel this bottleneck will be removed, significant impacts on regional development at either end may be expected. However, many questions are not easily answered: Will the impacts be limited to the regions directly adjacent to the Tunnel exits, or will they be spread out over a larger area? Will they be more pronounced at the British or at the continental end? Will the Channel Tunnel benefit mostly the already highly industrialised and urbanised regions in central Europe and so increase concentration of activities and hence the spatial disparities in Europe, or will it tend to equalise the accessibility surface in Europe and hence have a decentralisation effect?

The Channel Tunnel when completed will form a part of the European transport networks. It will replace or supplement existing links and in so far as it is able to offer a better service and/or a better price, it will affect directly the traffic using the existing links. Wider effects will depend to a very great extent upon the other parts of the European transport networks of which the Tunnel will be a part. Therefore the Channel Tunnel cannot be seen as an isolated project but has to be studied in a systemic way in the context of both the development of the European transport system at large and the ongoing socioeconomic, technological and political changes.

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Research Method

To achieve the twofold objective of, on the one hand, obtaining a systemic overview of the impact of the Channel Tunnel on the system of regions in the Community and, on the other hand, taking an in-depth look at the opportunities and challenges the Tunnel brings for individual regions, the study is organised in two parallel but interrelated parts: the first includes *qualitative* regional analyses, the second applies a *quantitative* computer model.

Regional Analyses

In the first part of the research qualitative factors are addressed. For this purpose, thirteen in-depth case studies were conducted for regions selected not as representative regions of the EC, but as regions with representative problems or characteristics with regards to the impacts of the Tunnel (see Figure 1): Kent in England, Nord-Pas-de-Calais and Bretagne in France, West-Vlaanderen and Hainaut in Belgium, Zeeland in the Netherlands, Köln and Bremen in Germany, Piemonte in Italy, Ireland, Scotland, Pais Vasco in Spain and Norte in Portugal.

Besides the 'hard' economic factors such as transport cost and transport time that are addressed in the modelling part, the impacts of the Tunnel may be affected by other less tangible factors. These include attitudinal responses and subjective judgments which may influence the way regions adjust to changing transport opportunities, but also constellations of economic, technological and political developments which interact in a complex manner and cannot be forecast with certainty. For each region questions such as the following were addressed:

- What will be the position of the region in the future European transport network? How will the Channel Tunnel, alone or in combination with various alternatives of new transport infrastructure such as the new high-speed rail network, new motorways or new levels of service of ferry and air transport, affect that position?
- How will firms respond to the new transport opportunities? Will they consider changes in production or distribution? Where will they go? Will firms from other regions move in?
- What will be the impacts on the regional labour market? Will there be in- or outmigration?
- How will local and regional governments respond? What are their decision margins?
- What will be the impacts on intraregional transport and urban/rural form?
- Which policies of supra-regional governments would be desirable to ameliorate negative impacts or encourage positive benefits deriving from the Tunnel and associated infrastructure?

Each of the thirteen in-depth studies consisted of two stages:

- Basic indicators for each region were collected in a way designed to maximise the comparability of the data across the regions and with the data collected for the model analysis.
- In-depth interviews were conducted with policy makers and experts from the fields of political parties, local and regional governments or agencies, regional firms or industry associations, trade unions, newspapers, university researchers and national ministries or agencies.



Figure 1. The thirteen case study regions.

For each of the thirteen case study regions regional monographs summarise the findings of these two parts of the qualitative approach. After completion of the regional analyses a comparative synthesis on all thirteen case study regions was compiled for the final report of the project.

Model Analysis

The MEPLAN transport and regional economic model by Marcial Echenique & Partners estimates the demand for transport, both passengers and freight based on a regional input-output model framework. The demand for transport and the pattern of regional economic development are, in turn, influenced by the costs and characteristics of the supply of transport. In the Channel Tunnel application the model provides results for the whole territory of the EC. The regions of the EC are aggregated into 33 zones for modelling purposes.

Running the model, the transport infrastructure available for a specific year is the basis for the estimation by the transport module of the travel costs and times between every pair of zones. This produces a pattern of accessibility which is used in the regional economic model to determine the pattern of trade and of passenger movements between zones. These movements are then fed through the interface module and back into the transport module which estimates for each mode the tonnes of freight and the number of passengers travelling between each pair of zones. These flows are then assigned to vehicles on the links of the transport networks.

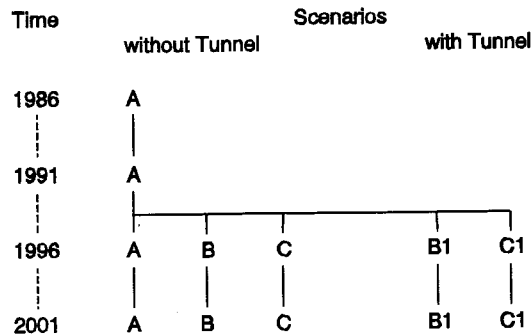


Figure 2. Simulated network scenarios.

Starting with 1986 as the base year, for which the calibration of the parameters of the model was carried out, the model is run at five-year intervals until the year 2001 (see Figure 2). Different scenarios were used to represent the effects of the Tunnel either built or not, and to represent different levels of development of the rest of the road and rail networks. Scenario A represents the current network without the Tunnel. Scenarios B (without Tunnel) and B1 (with Tunnel) assume a limited network development with substantial motorway construction, but only a medium level of rail upgrading. Scenarios C (without Tunnel) and C1 (with Tunnel) assume an extended network with a substantial number of further new high-speed rail services.

Synthesis of Model Analysis and Regional Analyses

The model analysis and the regional analyses are closely interrelated: The hypotheses generated for and in the regional analyses were a necessary input to the testing and calibration of the model; the data needed for the model and for the case studies were similar; the case studies provided the information on which new transport infrastructure, should be examined together with the Channel Tunnel in the model.

In the final phase of the project, the results of the two methodologies were brought together in a synthesis. It was examined where the impacts of the Tunnel on transport flows and regional economic development predicted by the model were in line or in disagreement with the expectations expressed by the policy makers and experts in the regions. If there was disagreement, it was discussed whether the model might have lacked essential information or whether the views held in the particular region might have been unrealistic.

Results

This section presents the results of both the quantitative and the qualitative approach in condensed form. First the forecasts on cross-Channel transport flows will be examined, then the impacts on regional development.

Impacts on Transport Flows in Europe

The effects of the Tunnel on European transport flows are the results of many complex, interacting influences. The Tunnel cannot be seen as an isolated project without the emerging European high-speed rail network. Therefore the impacts are not confined to the regions close to the Tunnel, nor do they decrease in a simple way with distance from the Tunnel; rather a more complex picture of interaction of travel time, modal characteristics, regional characteristics and orientation to the Tunnel emerges. Figure 3 is an attempt to visualise these impacts.

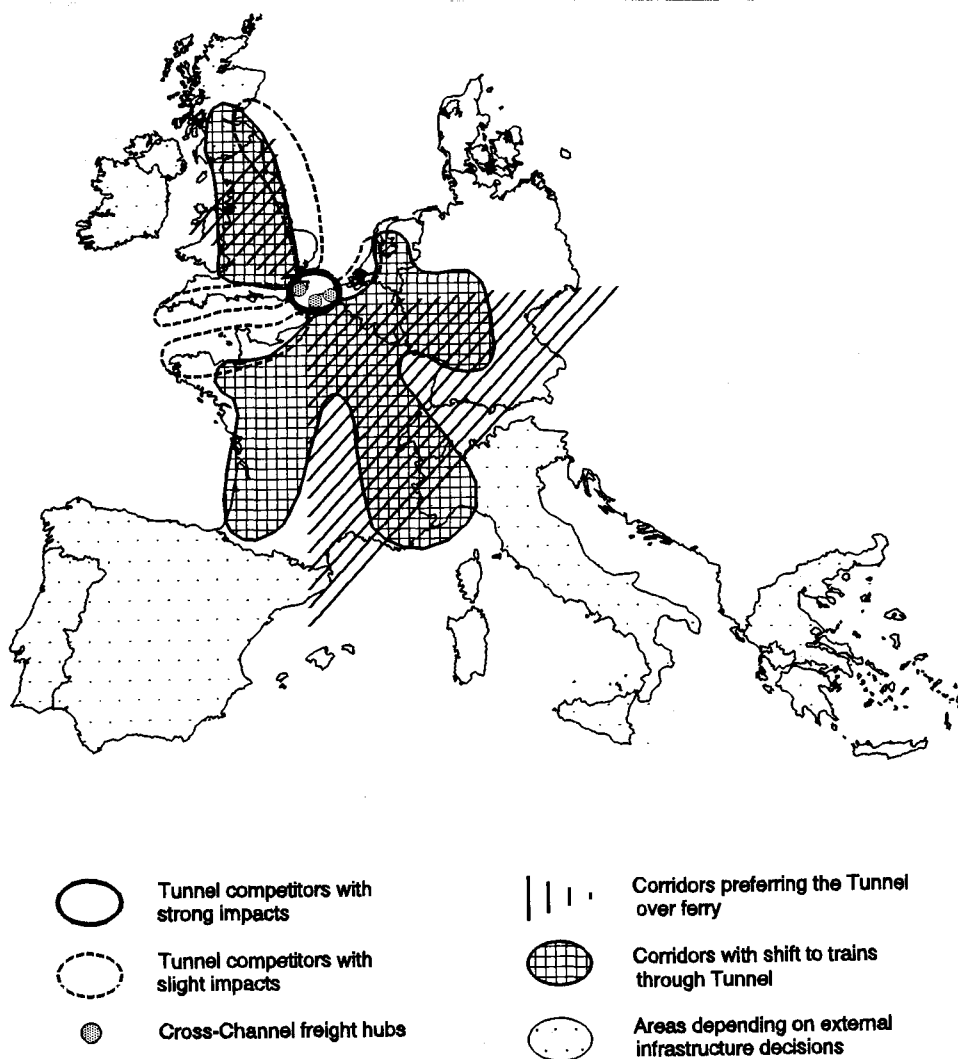


Figure 3. Impacts of the Channel Tunnel on transport flows.

Tunnel competitors with strong impacts: Ferries are in direct competition with the Channel Tunnel for cross-Channel transport. However, the impacts depend on geographical characteristics of the single routes. Therefore, regions with cross-Channel transport are not affected in the same manner. Only in its vicinity, the Tunnel will cause a major reduction of transport volume for short sea crossings. The Tunnel has its strongest impacts on ferry lines with both ports within the regions of Kent, Nord-Pas-de-Calais and also, but to a lesser extent, West-Vlaanderen. In the first years after the Tunnel starts operating, these ferry lines will lose passengers, in particular coach and foot passengers, and lorry traffic. This traffic will take advantage of the time savings provided by the Tunnel. However, because cross-Channel transport volume will grow significantly, there will be a secure future for these companies and ports if they survive in the first years of Tunnel operation. A less desirable side effect of the Tunnel will be the large increases in road traffic in these regions.

Tunnel competitors with slight impacts: Most of the regions with cross-Channel transport are much less affected by the Tunnel. This is true for areas along the western Channel, mid and north England ports, parts of West-Vlaanderen and the Netherlands. Here, ferry lines will have slightly decreasing transport volumes if the second port is located in one of the above regions with strong Tunnel impacts. However, this initial decrease will soon be offset by the total growth in cross-Channel transport. For other ferry routes there will be only a slight reduction in growth *potential*, i.e. growth would be even more pronounced without the Tunnel.

Cross-Channel freight hubs: Three regions will serve, as today, as main freight hubs between mainland Europe and the UK: on the continent Nord-Pas-de-Calais for lorry traffic going through the Tunnel and West-Vlaanderen for unaccompanied RoRo traffic going to or coming from Thames estuary and mid England ports; in the UK Kent for both kinds of RoRo: Dover for lorry traffic going through the Tunnel and, with less importance, north Kent ports for unaccompanied RoRo traffic. The difference compared with today is the shift within Kent and Nord-Pas-de-Calais from the ports to the Tunnel for lorries. It depends primarily on the regional strategies whether these hub functions can be enlarged and used as a base for future economic growth.

Corridors preferring the Tunnel over ferry: There is a clear pattern of regions that prefer the Tunnel over the ferries for cross-Channel road transport. In general, these regions are the ones that today prefer short ferry crossings. They are located in a central corridor along the extended Tunnel axis on both sides of the Channel. With growing distance from the Tunnel other ferry options become more attractive.

Corridors with shift to trains through Tunnel: The future European high-speed rail network will significantly reduce cross-Channel travel times. Particularly along the high-speed rail lines in France, Belgium, the Netherlands and Germany, but also in Piemonte and parts of the UK, the Tunnel will induce a shift towards rail for cross-Channel passenger transport. There will also be a shift of some freight towards rail in these zones, but again this depends on the implementation of respective links and services.

Areas depending on external infrastructure decisions: The study has shown that the area of influence of the Tunnel on transport flows is limited. The European periphery is more or less excluded from the improved communication network in the European core. Scotland and Ireland, Spain, Portugal and Greece, but to a certain extent also Italy belong to this group. However, these areas are at the same time dependent on infrastructure decisions taken mostly outside their own nation if they are to be physically included in the ongoing integration of Europe.

Impact of the Channel Tunnel on Regional Development in Europe

Figure 4 shows the summarised impacts of the Channel Tunnel on regional developments for the thirteen case study regions:

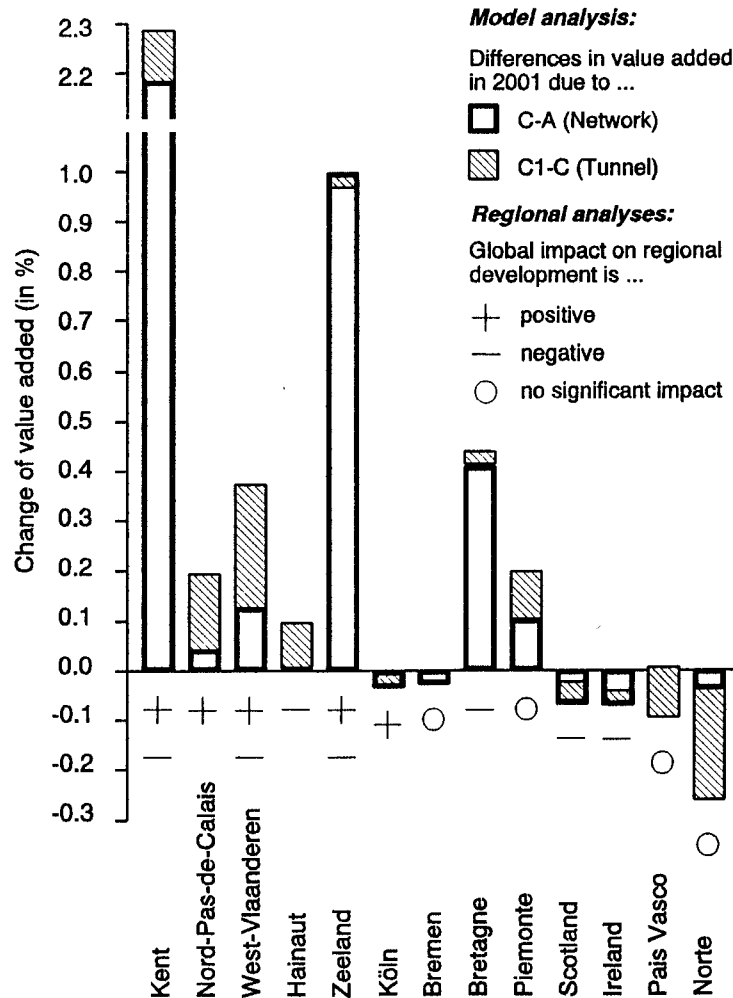


Figure 4. Impact of the Channel Tunnel on the case study regions.

The model forecasts for regional economic development are expressed as change of total value added (the sum of payments on taxation, labour and profits of all goods and services produced in a region) in the year 2001. The diagram shows two *differences* between 2001 values: The difference between scenarios C and A (white) indicates the additional growth in the regions due to changes in transport infrastructure without taking account of the Channel Tunnel. The difference between scenarios C1 and C (shaded), however, shows the positive or negative impact of the Tunnel. If only the first kind of change is considered, Kent, Zeeland and Bretagne achieve the largest gains. As already indicated, this can be attributed to motorway construction in Zeeland and Bretagne and to high-speed rail investment in Kent. Negative impacts of transport investments, however small, are found in Köln, Bremen, Scotland, Ireland and Norte. The additional impacts of the Tunnel are largest in the regions closest to the Tunnel: Kent, Nord-Pas-

de-Calais, West-Vlaanderen and Hainaut. Negative Tunnel effects are found in Köln, Scotland, Ireland, Pais Vasco and Norte. However, it should be noted that in no case the isolated Tunnel effect exceeded one third of a percent.

Figure 5 visualises these changes in terms of criteria such as economic state, strategic capacity and degree of centrality in Europe. The arrows indicate the direction of change in the position of the individual regions. Nord-Pas-de-Calais is the only region moving from one class of centrality and economic position to another taking advantage of its potential hub functions in north-west Europe. All other regions remain more or less inside their previous category; all, however, are affected by the Tunnel either with a tendency of moving or maintaining their position. The latter is true for Köln, Piemonte, West-Vlaanderen and Zeeland. Kent, Hainaut and Ireland and Scotland have the opportunity to improve their economic situation, but this depends mainly on their pursued strategies or on decisions and support from outside. All regions classified as situated 'along a pipe', Zeeland, West-Vlaanderen, Hainaut and Kent, will face increasing transit traffic through their regions without gaining too many opportunities from it. Bremen, and even more so Pais Vasco and Norte, are drifting away.

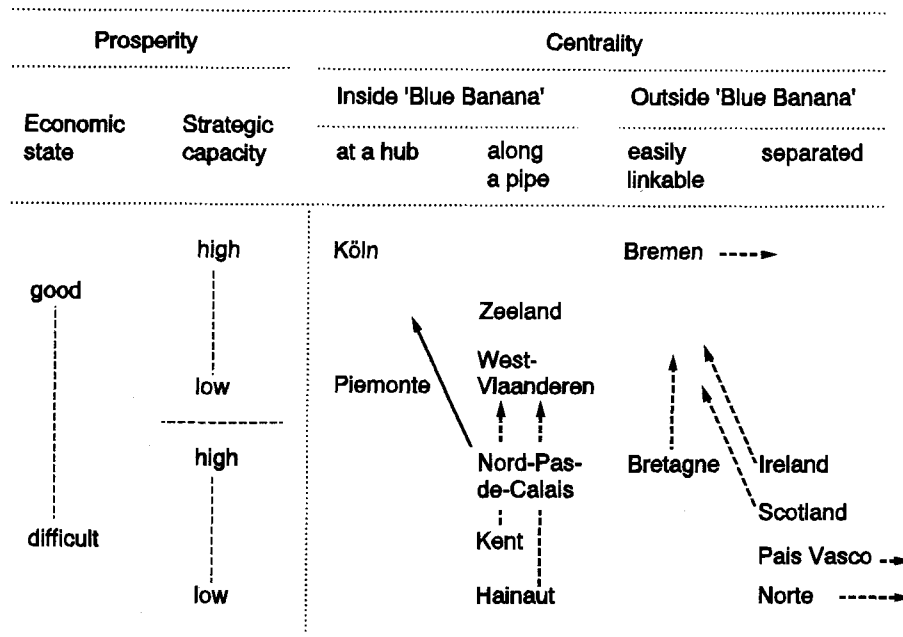


Figure 5. Impact of the Channel Tunnel on prosperity and centrality.

It therefore appears that the transport network to be built in conjunction with the Channel Tunnel will to a certain degree modify positions of the regions with regard to core and periphery under a double effect of polarisation and diffusion: tightening up the core area on one side and spreading out positive impacts from a north-west/south-east central corridor.

Figure 6 is an attempt to show the main areas of relative growth and decline of *value added* induced by the Channel Tunnel and the related transport infrastructure for manufacturing, services and tourism. It is important to note that in order to arrive at employment forecasts, these results have to be seen together with sectoral productivity gains, i.e. even a gain in value added can imply a decline in employment.

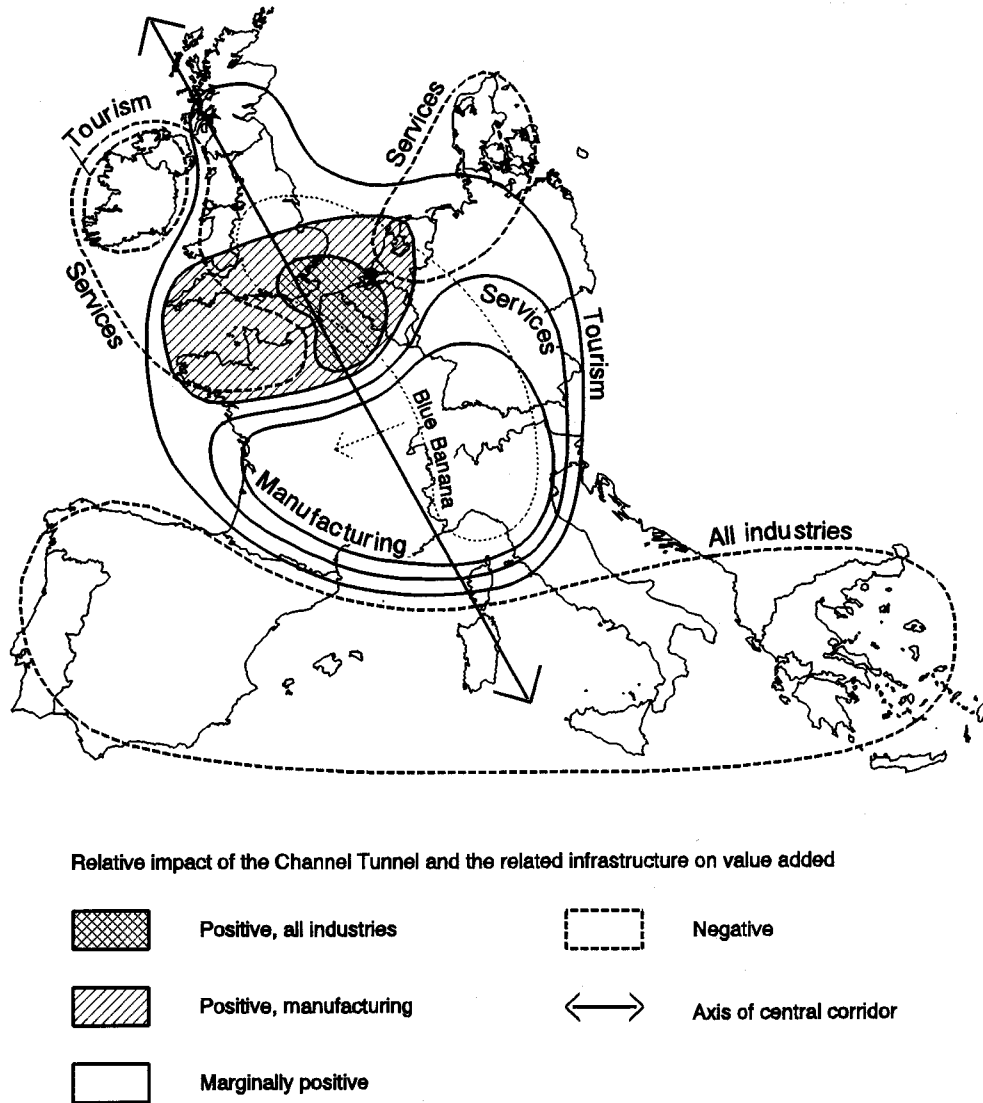


Figure 6. Impacts of the Channel Tunnel on economic development.

Manufacturing: The changes in industrial value added due only to the Tunnel will be relatively small ranging from -0.17 percent in Portugal to +0.17 percent for Ireland in 2001. The regions benefitting most are not only among the closest to the Tunnel but include a large portion of north-western and central Europe.

Services: New rail passenger services will favour service industries in metropolitan areas and 'hub regions'. Cities such as Köln or Lille are aware of the new opportunities offered by the Tunnel and the related infrastructure; they have designed very active policies to take advantage of this opportunity. As a result, the concentration trend in services will be reinforced.

Tourism: The Tunnel and the extended rail and road networks tend to redistribute tourist flows away from their traditional destinations. This is especially true for British tourists who are likely to shift somewhat from air travel to Mediterranean Europe in favour of road and rail travel to France, Germany and the Netherlands. Compared to other sectors, the impacts on tourism are more polarised, but gains are spread out to a greater number of regions.

It has been suggested above that the Tunnel and related infrastructure will have a twofold effect of polarisation and diffusion. These effects can now be extended to the whole Community territory by classifying the regions into groups with similar impacts:

Cross-Channel space: the most advantaged triangle: The greatest impacts will be concentrated in the London-Bruxelles-Paris triangle, with positive value-added increases for London, Kent, Nord-Pas-de-Calais, West-Vlaanderen and Ile-de-France. Although Hainaut and parts of Normandie are included in a geographical sense, they do not fully participate in this growth.

The central corridor and its expansion: The Tunnel cannot be considered alone without taking into account its related infrastructure which is primarily a high-speed rail and motorway network. In particular, the French TGV is responsible for an expansion of the so-called 'Blue Banana' towards Paris and Lyon and for a diffusion of the positive impacts of the Tunnel across France, except Normandie and peripheral Bretagne. The future extension of the European high-speed rail network will benefit Belgium, mid and south Germany and northern Italy.

Grey service zones at the Tunnel exits: The polarisation effect tends to deprive regions next to regions with positive impacts on both sides of the Tunnel exits. In this sense, the Tunnel and the related infrastructure create economic grey zones, in particular for service industries. Normandie appears to be one of the regions located in the geographic core of Europe without really belonging to its economic core. In this way the Tunnel creates *interstitial spaces* on both sides of the area along the continental sea shore. A tentative explanation is that the Tunnel tends to exert a centripetal effect at its two exits, concentrating all positive impacts in a restricted zone and that these impacts are diffused on each side of the main axis beyond a certain distance from the Tunnel.

Increasing relative peripherality: The likely impact of the Channel Tunnel is to tighten up the core, while the polarisation effect induces negative trends even in regions close to the Tunnel such as northern Italy, northern Germany, Denmark, Pais Vasco and parts of the rest of Spain. In this sense, the periphery starts in direct proximity to the central corridor. The southern peripheral regions will suffer in all economic sectors from not being connected to the European core.

Conclusions for Norte

The study has shown that, at least in the highly urbanised centre of Europe, the removal of a bottleneck like the Channel Tunnel does not necessarily induce economic gains in all adjacent regions. Much more important for regional economic development than the reduction of transport costs are two other factors: to be well integrated in the European high-speed transport networks and an active *political response* of the regions to take advantage from opportunities like the Channel Tunnel.

Moreover, the changes in regional development induced by the Tunnel are small compared with the expected general growth in the regions. In particular the negative impacts are very small. Therefore no general programme of the Commission to compensate for negative economic impacts of the Channel Tunnel seems to be necessary. However, the Tunnel may have specific negative impacts for some individual regions, and these may require Community action.

As Norte was one of the case study regions, it is possible to summarise the impacts of the Channel Tunnel on this region (CODES, 1991).

As Figure 3 has shown, Norte is too far away from the Tunnel, to participate in its direct benefits. Far more important for Norte are the completion of the motorway to Valladolid and the modernisation of the railway links to Lisboa and Madrid. Only through these transport infrastructure improvements will the land connection between Norte and north-western Europe become competitive against the sea route, even though the average truck journey will still take between one and two days. As also the volume of trade of Norte with the UK is stagnating, a further shift from sea to rail and road transport is likely. This will put the ports of Norte, in particular Leixoes, under significant pressure to modernise its operations.

In economic terms, the Tunnel opening will coincide with the ongoing economic restructuring of the region, but it is not expected that it will contribute much to opening new markets, attracting investors or increasing tourist flows. The small savings in overall transport costs are more than offset by the *relative* deterioration of its spatial position in Europe.

Nevertheless, the Channel Tunnel, in combination with the infrastructure improvements mentioned above, will change long established practices of trade and passenger relations between Norte and north-western Europe, in particular with the UK. Transport-related firms will have to adjust by better organisation and higher productivity, in particular in port operations. Other industries will have to realise that the relative advantage regions like Norte suffer from the introduction of new high-level transport infrastructure can only to a small part be compensated by financial assistance from national governments or the European Community, but that they have to rely on their own endogenous potential to restructure and modernise their economy.

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References

ACT Etudes and Recherches Economiques et Industrielles, Institut für Raumplanung and Marcial Echenique & Partners Limited (1992): *The Regional Impacts of the Channel Tunnel throughout the Community*. Final Report to the Commission of the European Communities. Paris/Dortmund/Cambridge: ACT/IRPUD/ME&P.

CODES, Gabinete de Estudos e Projectos de Desenvolvimento Sócio-Económico (1991): *Regional Impact of the Channel Tunnel throughout the Community: Regional Analysis of Norte*. Porto: CODES.