Study on Regulatory Options on Further Market Opening in Rail Passenger Transport

Final Report

09/09/10

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Strategic Development & Consulting NTU

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Executive Summary

Introduction

The Study was undertaken in the following phases (some of which were undertaken in parallel):

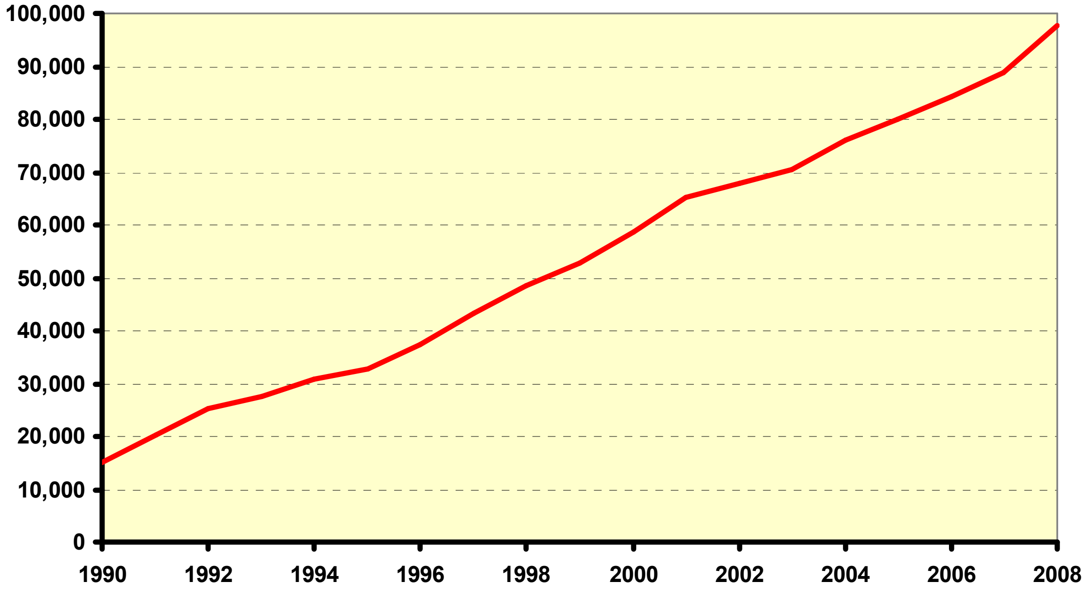
- quantitative and qualitative analysis of the rail passenger business;
- investigation the likely impact of international rail passenger market opening;
- desktop review of legal regimes in Member States was undertaken;
- case studies for four states which have opened their domestic rail passenger markets to competition to identify its impact and the lessons that can be learnt;
- investigation of market opening options used in Europe and elsewhere in the World;
- definition of possible market opening models;
- impact assessment of four selected market opening models;
- development of conclusions.

This Executive Summary briefly highlights some of the most significant findings of the Study, for full coverage of all the above issues reference should be made to the main body of the Report.

Existing Market Position of Passenger Rail

In order to properly examine the underlying current trends for the European rail passenger business it is necessary to isolate the impact of the continuing investment in the construction of Europe's high-speed rail network. This investment has been successful in capturing new traffic to rail, largely at the expense of air. Expansion and consolidation of high-speed rail services has led to high-speed's share of total rail traffic increasing from less than 4% of EU rail travel in 1990 to almost 24% in 2008. Figure ES.1 shows this explosive growth. Nevertheless this growth is essentially a one-off phenomenon associated with construction of the network: once the network is complete high-speed traffic trends can be expected to be more comparable with those of the remainder of the passenger rail industry.

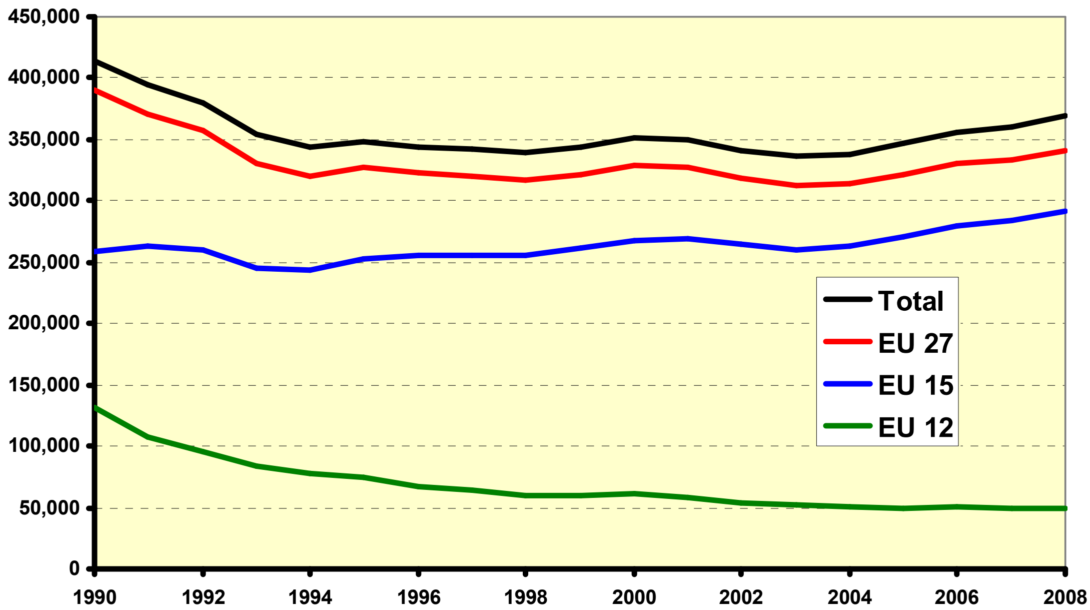
Figure ES.1. High Speed Rail Passenger Traffic Volume (M passenger-km) 1990–2008



Source: *EU energy and transport in figures*, European Commission 2010

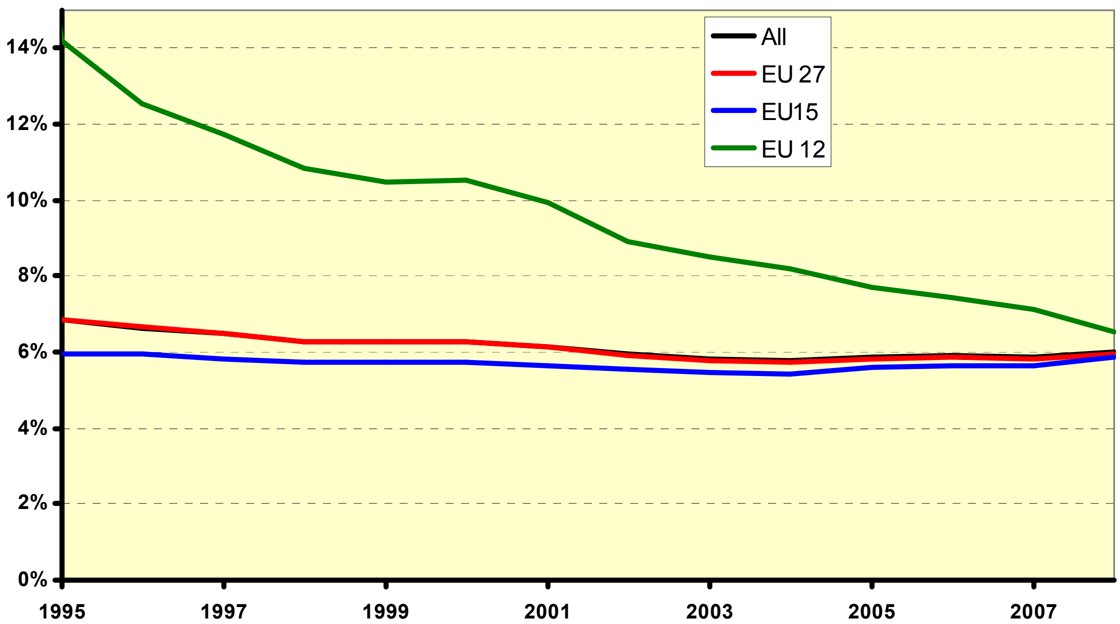
The Consortium has therefore made the necessary corrections to European rail passenger volumes to remove the inflationary impact caused by high-speed rail network construction and service expansion. It is also necessary to disaggregate performance of the pre-2003 Member States (i.e. the EU 15 group) from that of the post-2003 Member States (EU 12 Group), because of the different market conditions and rail trends between these two groups of states. Figure ES.2 illustrates corrected passenger volume trends in these two groups of states. While Figure ES.3 illustrates the corrected modal share trends.

Figure ES.2. Rail Passenger Traffic Volume Corrected for High-Speed Rail Construction (M passenger-km) 1990–2008



Source: *EU energy and transport in figures*, European Commission 2010

Figure ES.3. Rail Modal Share Corrected for High-Speed Rail Construction 1990–2008



Source: *EU energy and transport in figures*, European Commission 2010

It is considered that there are four ways in which the impact of market opening on rail modal share could be explored:

1. the extent to which open access is permitted;

2. the number of public service contracts let competitively;

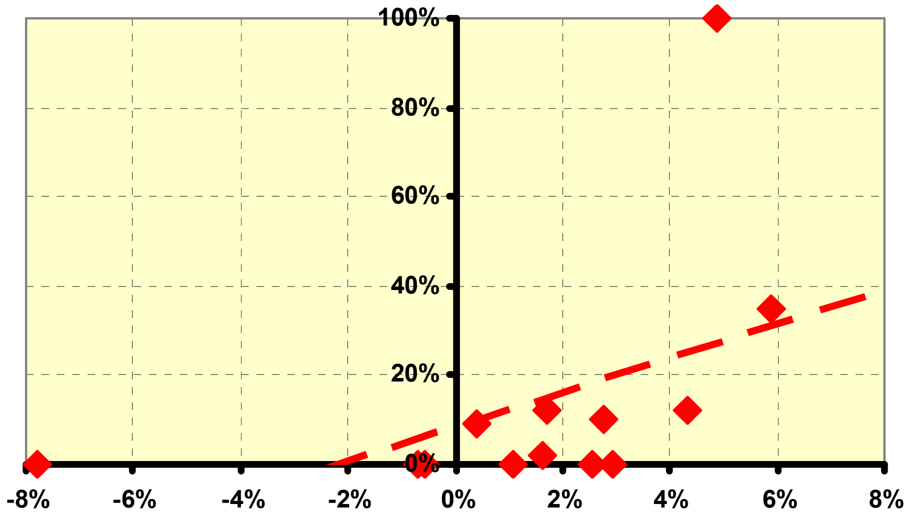
3. evaluation against a score assessing the level of market opening; or

4. the proportion of traffic that has been gained by non-incumbent RUs.

None of these options is perfect; however, on balance the fourth option is considered to be the best available.

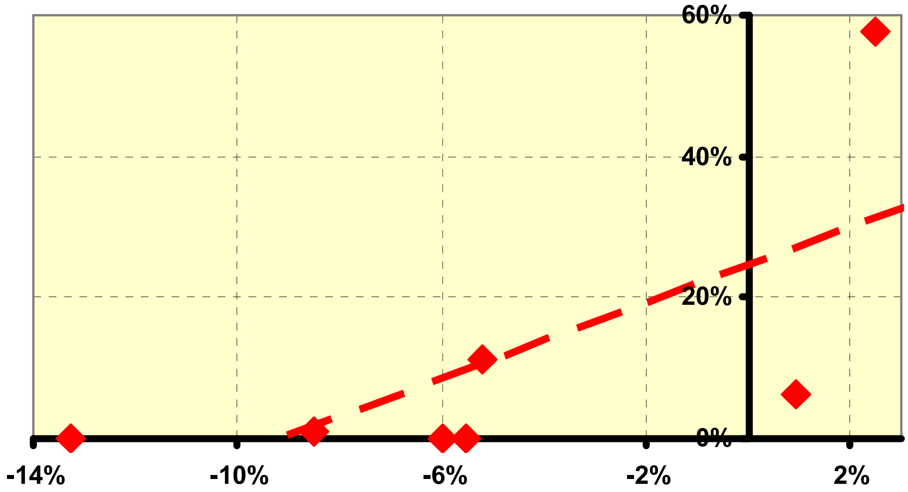
The appropriate period over which to examine whether there has been impact on modal share is 2005-2008. Figure ES.4 shows the relationship between market opening, as measured by non-incumbent market share, and underlying modal share change for EU15 states, while Figure ES.5 shows the same for EU12 states.

Figure ES.4. Non-Incumbent Passenger RUs v Relative Underlying Rail Modal Share Change 2005-2008 for EU15 G



Source: *Consortium analysis based on Eurostat & European Commission data*

Figure ES.5. Non-Incumbent Passenger RUs v Relative Underlying Rail Modal Share Change 2005-2008 for EU12 (



Source: *Consortium analysis based on Eurostat & European Commission data*

It can be seen that there is a correlation between the degree of market opening and the performance of the national passenger rail industry, measured by the relative change in modal share in both EU15 and EU12 states. In both cases a linear trend line has been automatically inserted; however, this trend line should be treated with great caution.

Market Opening for International Passenger Rail

It is considerably more complex to organise international rail passenger services than either domestic rail passenger services, or freight services. In the main, it will be only commercially attractive to overcome the considerable barriers that exist on axes with high traffic potential, which means high-speed services between major cities in competition with airlines, as well as with any other RU operating on the route.

At a practical level many of the most important rights that a new entrant RU would require to access essential facilities and obtain the licences necessary are now enshrined in EU legislation, but there would sometimes appear to be difficulties in enforcing the rights that the legislation provides. Furthermore there are other important rights where it appears that current legislation is inadequate. These inadequacies mainly concern commercial, sales, information, and promotion issues, although there are some practical issues such as access to adequate cleaning facilities, rights to use equipment at essential facilities, and access to railway telecoms networks.

It is not considered that the impact of international market opening on domestic rail passenger services will be significant: in the foreseeable future the impact is likely to be limited to a handful of routes.

Key Lessons from Case Study States

Case studies examining the impact of domestic rail passenger market opening were undertaken for Germany, Great Britain, Italy and Sweden. That for Sweden was more limited in scope than for the other three states, since the legislation for full market opening had only recently been enacted. These Case Studies can be found as Annexes 5 to 8.

The impact of market opening been more profound in Great Britain than in Germany, while in both states the impact has been considerably greater than in Italy. Indeed Italian market opening has had little impact over the course of a decade, the Consortium has found a variety of reasons for this including tenders for operation of PSO services not being written such that they encouraged competition, little help with rolling stock provision under PSOs, arrangements to share risk in PSOs appearing unbalanced, new entrants being unable to use normal sales channels, and problems faced by open access RUs in providing information on their services at stations.

The key lessons from the Case Studies included:

- the importance of effective independent economic regulation;
- the need for regulatory objectives be a simple as possible;
- the need for regulators to have all the powers that they need to collect information and enforce action;
- the desirability of having a single body responsible for both safety and economic regulation, and avoidance of multiple regulatory bodies;
- importance of access to sales and distribution channels for all RUs;
- in the case of public service contracts, when the contract duration is short the commitment of the RU to service quality has not tended to be high;
- open access is almost unknown outside the long distance segment;
- the greater the degree of centralised control exerted by government, the worse the performance of the rail industry has tended to be.

Market Opening Options

In essence there are two categories of market opening:

1. competition within the market (characterised by open access);
2. competition for the market (characterised by competitively tendered public service contracts).

As a result of process which included a study of market opening options used around the World the following market opening options were identified:

Group 1 – options where all or part of network is only operated by open access

1. services provided only by open access (i.e. RUs decide which routes and services they want to operate) ("**Model A**");

2. services provided only by open access but with public funding provided for unremunerative corridors or services by individual tender ("**Model B**");

3. services provided only by open access but with subsidies provided for unremunerative corridors or services by fixed subsidy tariff ("**Model C**");

4. services provided only by open access under individual train path auction ("**Model D**");

5. services provided only by open access on routes that are profitable, with unprofitable service groups being operated under competitively tendered public service contracts/franchises ("**Model E**");

Group 2 – options where public service contracts cover entire network

6. all lines operated under competitively tendered public service contracts/franchises, with open access permitted without restriction ("**Model F**");

7. all lines operated under competitively tendered public service contracts/franchises, with open access permitted under regulatory control ("**Model G**");

8. all lines operated under competitively tendered public service contracts/franchises, with open access permitted without restriction on certain lines ("**Model H**");

9. all services operated under competitively tendered public service contracts/franchises, with no open access permitted ("**Model J**");

Group 3 – alternative model for minor lines

10. lightly used and wholly unremunerative lines operated under vertical micro-franchises, with one of the other models listed above being used on the remainder of the network ("**Model K**").

Following the First Stakeholder Meeting held on 10 February 2010 and discussion with DG MOVE, models B, E, G and H were selected for detailed impact assessment.

Impact Assessment of Possible Regulatory Options

An impact assessment was undertaken for the four selected models against the following criteria:

- impact on passenger railway transport:
  - safety;
  - investment, turnover, profitability, & public support;
  - market structure;
  - passenger volumes;
  - regional cross-border services;
- impact on the economy:
  - state aid;
  - infrastructure efficiency;
- impact on social aspects:
  - service levels in different market segments;
  - quality & price;
  - service avaialability by market segment;
  - railway employeee numbers;
  - railway employee pay & conditions;
- impact on environmental aspects:
  - greenhouse gas emissions;
  - noise;
  - air quality.

Each model was assessed against a Base Case for a reference year of 2020. The Base Case reflects the position should no further action be taken to open domestic rail passenger markets. The Base Case is not the current *status quo*, however, as it includes both changes anticipated in the European rail industry, and also changes anticipated to other modes.

In general, the approach used was to identify the likely impact of introducing each of the selected market opening models the in three 'target states' states and from this scaling the impact up to a European level. The three target states were selected to provide a reasonable cross-section of states which have yet to open their domestic rail passenger markets. The three target states selected were Denmark, Spain and Poland and the process by which this selection was made is outlined in Annex 11.

The TRANS TOOLS V2 model was used to project the changes in passenger volume and modal share under each market opening model. Because TRANS TOOLS works on at Europe-wide level (indeed wider than the thirty states being analysed) it was possible to project some of the likely impacts (e.g. passenger volume, modal share, environmental aspects, etc) directly at a European level, without the need to scale results up from target states.

Based on the quantified results, a scored matrix was produced to enable the relative strengths and weaknesses of each option and against the Base Case to be visualised:

Attribute	Base Case	Model B	Model E	Model G	Model H
Impact on Passenger Railway Transport					
Safety	5	5	5	5	5
Investment, Turnover & Profits	5	5	6	8	7
Market Structure	5	10	6	9	7
Passenger Volumes	5	4	5	7	6
Regional Cross-Border Services	5	5	6	7	7
Impact on the Economy					
State Aid	5	7	10	6	4
IM Efficiency	5	6	6	6	6
Impact on Social Aspects					
Service Levels	5	5	5	9	7
Quality & Price	5	6	6	5	5
Service Availability	5	4	5	7	6
Employee Numbers	5	4	4	4	4
Employee Pay & Conditions	5	6	7	8	8
Impact on Environmental Aspects					
GHG Emissions	5	4	5	9	7
Noise	5	6	5	2	3

Attribute	Base Case	Model B	Model E	Model G	Model H
Air Quality	5	4	5	10	8

In this matrix each combination of impact assessment attribute and model is scored from 0 to 10, with the Base Case being scored at 5 in each instance, so that a score between 0 and 4 indicates a worse result than the Base Case, a score of 5 indicates the same or similar result as the Base Case, and a score between 6 and 10 indicates that the attribute/model combination would return a better result than the Base Case.

Note the above scores should on no account be summed to give a crude ranking for the options: the above factors vary considerably in importance and would need weighting to give an overall score. Although some tentative weightings were developed, it was concluded in consultation with DG MOVE that selection of relative weights is too subjective to be of value, particularly since the appropriate weighting varies with individual circumstances.

Conclusions

Although the general conclusion is that Model G performs best, followed Models H, E and B, difference between the various models is not great. Accordingly selection of a particular model is as much a philosophical decision as anything else.

The anticipated traffic growth from domestic passenger market opening is much more strongly influenced by the detail arrangements that surround market opening than by the model selected. There is a sharp difference between the formal/legalistic opening of the domestic rail passenger market and measures that genuinely facilitate market access by new entrants. This difference can be seen by the limited impact of market opening in Italy, and (to a lesser extent) Germany, in comparison with Great Britain.

The Consortium consider that it is on the following issues that the success or failure of market opening mainly rides:

- impartial and powerful economic regulation covering all parts of the rail industry (including the award process for public service contracts);
- a national ticketing system with inter-availability of a range of standard national tickets between RUs, backed up by a fair and impartial inter-RU revenue allocation system;
- ticketing, sales and information systems operated impartially at stations, with any customer being able to purchase a ticket for any domestic journey from a single sales point;

- an infrastructure charging system that encourages RUs to run additional trains, which also applies on a non-discriminatory basis to small RUs running only a small number of trains;
- availability of suitable rolling stock;
- full implementation of all EU Directives and Regulations affecting the rail industry in both letter and spirit.

The impact of any market opening is also determined by the level of national economic development. The greatest positive impact from market opening by 2020 would be in states with the most advanced economies that have yet to open their domestic passenger rail markets. By contrast in the new Member States (EU12 group) it is not predicted that the act of market opening would have a great impact by 2020. On the other hand no particular negative impacts are anticipated either. It is therefore considered that the impact of market opening in these states would mainly be experienced after 2020, as they develop further economically.

An important lesson that can be drawn from the experience of the Member States which have already opened their market to any extent is that in no case has a dramatic deterioration of the incumbent company, passenger traffic levels, or its workforce occurred, instead changes have taken place gradually. The only exception to this was Great Britain where a political decision was made to dismantle the incumbent; however, even here some of the franchises were won by the existing management teams, staff were transferred across *en bloc* to the new companies retaining employment conditions, and traffic levels increased.

The Consortium considers that for some local railway lines that can be regarded as *"lines and networks isolated from the rest of the Community"* Model K (vertical micro-franchises[1]) is likely to be the most appropriate market opening option. The Consortium considers that national IMs and large RUs have cost structures that are inappropriate to lightly used, low intensity lines, are organisationally remote from the local communities that they serve, and tend to run such lines as much through inertia as design. Operation would be by organisations based in the local community and who are committed to their future. It is considered that this would offer a survival strategy for parts of the network that might otherwise be lost.

[1] i.e. where the franchisee is responsible for both infrastructure and operations of individual lines or very small groups of lines.

1. Introduction

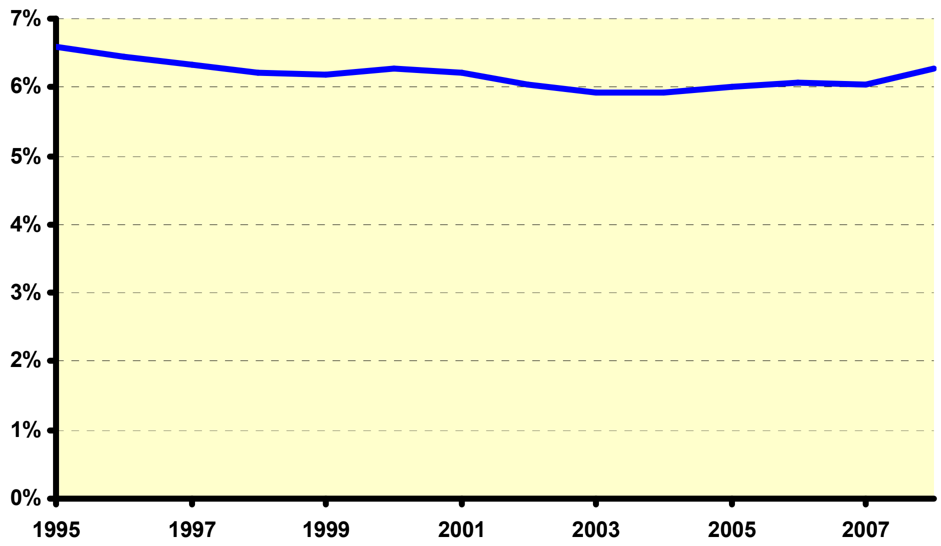
1.1. Background

1.1.1 Rail's market position

As noted in the introduction to the *Task Specification*, in general, within the EU the rail passenger business declined throughout the Twentieth Century, progressively losing modal share. This runs completely contrary to EU policy, as outlined in the 2001 white paper on *European transport policy for 2010: time to decide*, and more recently by: *A sustainable future for transport* (2009), and is understood to be one of the key factors driving European Community action in the sector. In consequence the European Commission was instrumental in developing a range of initiatives from 1991 onwards (see Section 2), which became enshrined in EU legislation, targeted at re-vitalising the rail sector.

Figure 1 shows the impact of these measures on rail passenger modal share, although this shows an overall decline since 1995, it does show that since 2003 there is evidence of rail modal share stabilising. It has remained in the 5.9% to 6.1% range between 2003 and 2007, in the wake of the *First Railway Package* (2001) and improved to 6.27% in 2008.

Figure 6. Rail Modal Share 1995-2008



Source: Data from EU Energy & Transport in Figures 2010

1.1.2 The policy context

1.1.2.1. *Overview*

There are many reasons to want the passenger rail business to enjoy a greater modal share, these include:

- safety/reduction of road fatalities;
- reduction of GHG emissions;
- reduction in congestion;
- securing the future of rail, for societal and economic reasons;
- allowing rail to play its part in providing increased transport capacity for an expanding European economy.

In addition there are legal reasons why action had to be taken, including:

- bringing the sector into compliance with the requirements of the EU Treaty;
- aligning the sector with EU competition policy.

1.1.2.2. *Importance of increasing rail modal share*

In 2009 42 448 people died on the EU's roads, while 1 276 800 were injured[2]. Whilst death and injury figures on Europe's roads have been in long-term decline, the same is true of all major modes. In 2008 just 83 railway passengers lost their lives in the EU[3]. Statistically, rail is over forty-seven times safer than road per passenger kilometre, the safety benefits of transferring passenger journeys from road to rail are therefore clear.

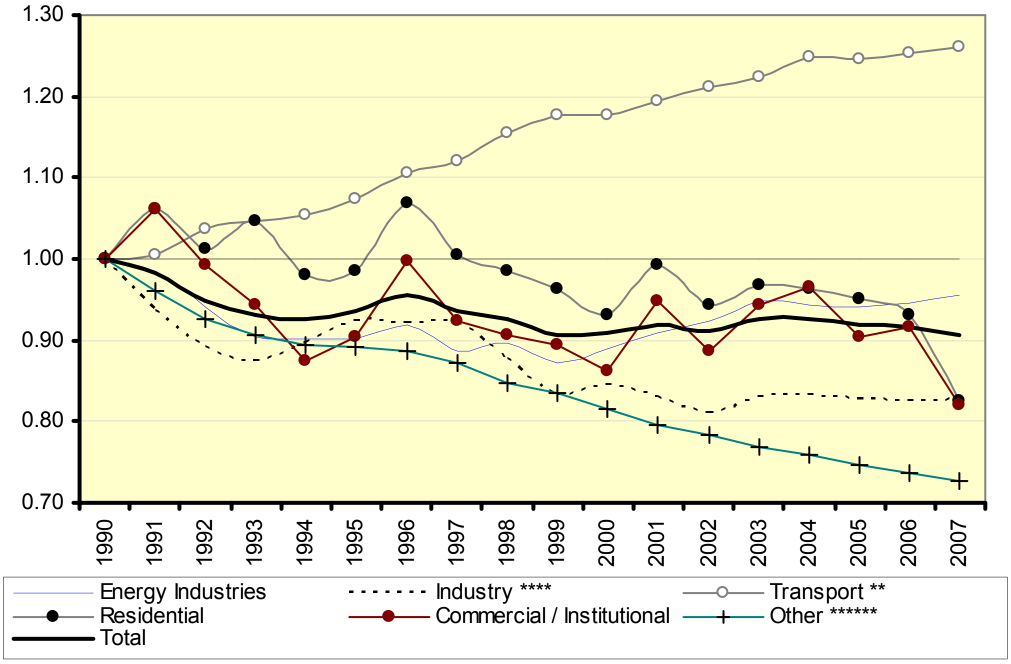
There is a need to reduce CO_2 emissions by international agreement: the EU has agreed to reduce GHG emissions by 20% by 2020 in comparison to 1990 (30% if other developed nations take similar action). In 2005 the Council of Ministers went further and set a target of a 60-80% reduction by 2050[4]. It is probable that achievement of these targets will require a reduction of 80% or more in CO_2 emissions in the transport sector by 2050. Figure 3 shows the critical importance of reducing CO_2 emissions from transport if CO_2 reduction targets are to be achieved. The problem is made more acute by the fact that transport is the only major sector where emissions are increasing and because it already represents around a third of total EU energy use. Given that CO_2 emissions from transport have actually risen by over 25% since 1990, it is clear that radical action is required to meet the EU's commitments and targets.

[2] 38 876 Fatalities and 1 232 311 personal injuries in 2008.

[3] All Eurostat data.

[4] see: http://www.euractiv.com/en/sustainability/climate-council-sets-ambitious-reduction-targets-wants-global-approach/article-136624.

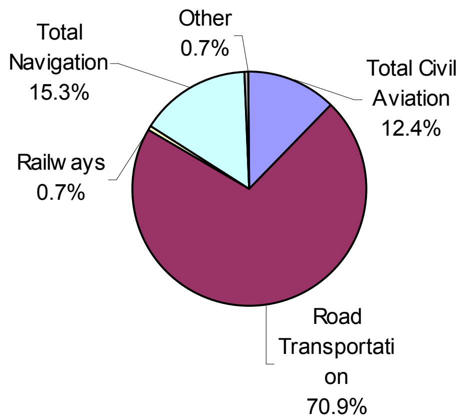
Figure 7. Increasing CO_2 Emissions from Transport



Source: EU Energy in Figures 2010

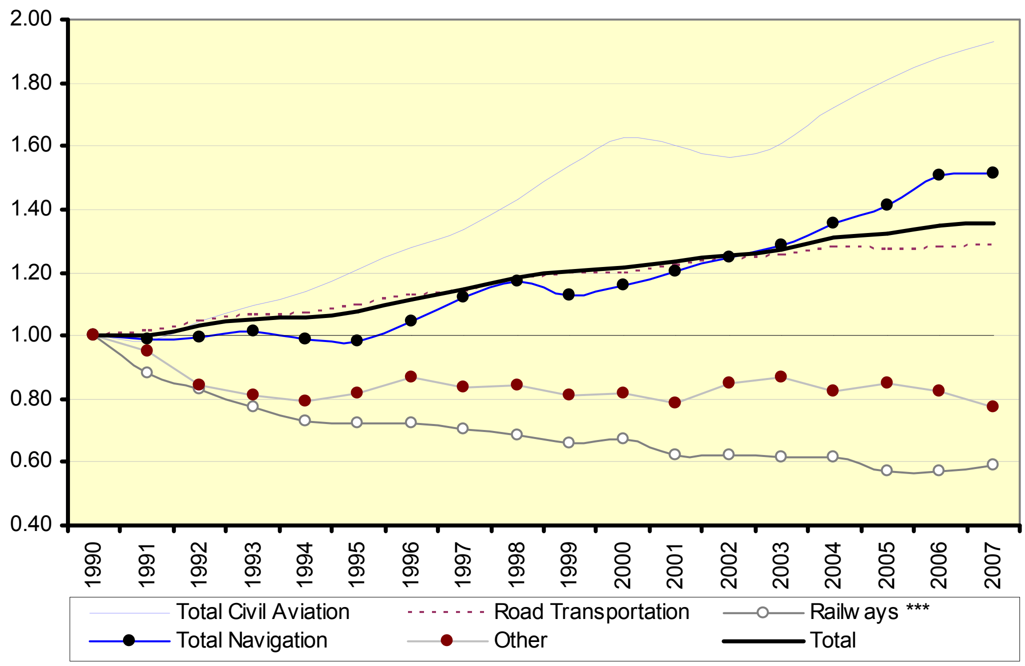
Figures 3 and 4 show how a modal shift towards the use of rail will help deliver the EU's commitments and targets. Figure 3 shows that rail is responsible for just 0.6% of EU GHG emissions (i.e. passenger km for passenger km it emits just 9% of the average for all EU transport modes) and Figure 4 shows that rail has been the only major mode that has a reducing trend of GHG emissions. Accordingly measures to make better use of rail form a vital part of a package of measures to reduce GHG emissions. These will sit alongside measures such as more fuel efficient road vehicles, uncoupling economic growth from transport growth, making users pay for the externalities of transport, etc.

Figure 8. GHG Emissions by Transport Mode 2007



Source: EU Energy in Figures 2010

Figure 9. Changes GHG Emissions by Transport Mode 1990-2007



Source: EU Energy in Figures 2010

The negative consequences of congestion were a major theme of 2001 European White Paper on Transport[5], quoting the 1993 White Paper on Growth, Competitiveness and

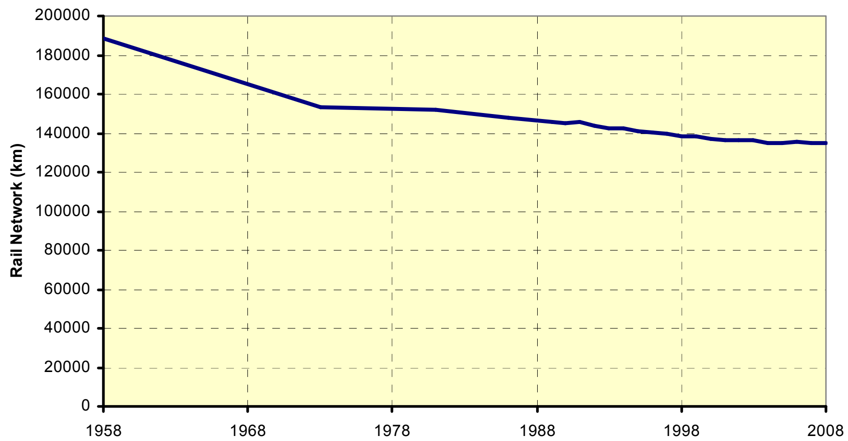
[5] *European transport policy for 2010: a time to decide*, COM(2001) 370 final, 12 September 2001.

Employment, which stated: *"Traffic jams are not only exasperating, they also cost Europe dear in terms of productivity… Networks are the arteries of the single market. They are the life blood of competitiveness, and their malfunction is reflected in lost opportunities to create new markets and hence in a level of job creation that falls short of our potential"*. Congestion of the road and air modes were identified as key problems to be addressed in the 2001 White Paper, one of the key objectives which flowed from this was *"revitalising the railways"*. This message was reinforced in the 2009 communication on the future of transport[6], which also identified the need to reduce congestion as one of the key objectives of European transport policy.

In the passenger market, rail is heavily reliant on subsidy overall (see Section 3 of this Report). This subsidy will only be provided where there is political support for the levels of public funding provided. Where rail's market position declines to an irrelevance, the tendency is for this political support to decline: in this case operation of rail services becomes almost totally dependent on subsidy, while few voters are inconvenienced by service withdrawal. The widespread withdrawal of rural rail passenger services in most parts of Europe is an example of this.

The rail network in the EU 27 reduced from 229 389 km in 1990 to 215 720 km in 2005[7], a reduction of 5.95%, continuing a long-term trend. The long term trend for the EU15 is shown in Figure 5, this again shows a trend of long term decline, albeit one that has stabilised since 2001 where construction of high speed lines has almost balanced conventional network contraction. In this context the European high-speed rail network, expanded from nothing in 1980 to 2 967 km in 2001, and some 5 760 km in 2010.

Figure 10. Reduction in EU15 Rail Network 1958-2008



Source: Eurostat (corrected for German Re-unification: former GDR network removed from post-1990 figure & other inconsistencies between various Eurostat datasets corrected)

[6] *A sustainable future for transport: towards an integrated,* technology-led and user-friendly system, COM(2009) 279 (final) of 17 June 2009.

[7] *Transport Infrastructure in the European Union and Central European Countries 1990-99,* Eurostat, and *Regional road and rail networks* (28/2008), Eurostat. Note *Energy and Transport in Figures 2009*, gives slightly different figures: 231 582 km and 215 542 km respectively

The reduction in network has been on the more lightly used parts of national rail networks, withdrawing access to rail from citizens living and working in these (predominately rural) areas. Whilst the cost profiles and flexibility of road, both for passenger and freight traffic is often more appropriate in rural areas, if passenger rail is to fulfil its potential it is essential that it does not simply become a mode providing inter-city travel and commuter travel in urban conurbations, a challenge that is discussed further in Section 2. It should be noted that the statistics presented above under-represent the gravity of the situation, as even on retained lines lightly used stations have been shut and types of service with low cost recovery have been withdrawn in many states (e.g. some types of semi-fast stopping passenger services, inter-regional services, sleeping car services, etc). There is a social and economic dimension to this problem, which was recognised in the 2001 White Paper, which in setting the objecting of changing the balance between modes, stated *"outlying areas have inadequate access to central markets"*.

1.1.2.3. Competition issues

It is understood that one of the reasons for intervention in the rail sector at an EU level was the need to bring the sector into compliance with the statutory requirements of the EU Treaty, in particular Articles 81, 82 and 87:

Article 81 prohibits arrangements that could disrupt free competition[8];

Article 82 prohibits abuse of a dominant market position[9];

Article 87 imposes limitations on the provision of state aid where it might distort competition[10].

Historically the rail sector had a considerable degree of exemption from full compliance with the competition aspects of the EU Treaty under Regulation (EEC) No 1017/68[11]; however, it is understood that by the mid-1990s the European Commission considered that the degree of exemption from competition legislation enjoyed by the railway industry was increasingly hard to justify, as exemptions enjoyed by other sectors were progressively removed, particularly once those in other transport sectors were removed in the 1980s[12].

Apart from the necessity of complying with EU legislation, it is European policy to enhance competition and access to markets: in part for the reasons outlined in *A sustainable future for transport*, which stated *"Market opening has generally led to more efficiency and lower costs"*. Accordingly the introduction of competition into the rail sector has a philosophical as well as a legal basis.

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8 See: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12002E081:EN:HTML.

9 See: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12002E082:EN:HTML.

10 See: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:12002E087:EN:HTML.

11 Regulation (EEC) No 1017/68 of the Council of 19 July 1968 *applying rules of competition to transport by rail, road and inland waterway*, OJ L75 of 23 July 1968.

12 See: *Transport Policy in the European Union*, Handley Stevens, Palgrave Macmillan, Basingstoke, 2004, for more information on the background.

1.1.3 Rail passenger market opening for international traffic

International rail passenger services were opened to competition from 1 January 2010, including cabotage rights (the rights to carry domestic passengers on international trains). It should be stressed that these rights do not extend to all international rail services automatically; the relevant Directive (2007/58/EC), which amends Directives 91/440/EEC and 2001/14/EC, does not necessarily confer rights in the following circumstances (where Member States may, subject to certain safeguards, limit rights):

- where the *"principal purpose"* of the service is not international;
- where a new service would *"compromise the economic equilibrium"* of services provided under public service contracts;
- in Member States where market opening has already taken place through open competitive tendering on the (domestic) routes concerned;
- where the service is between a Member State and a non-Member State;
- where the service transits the European Community.

In addition it should be noted that the impact of Directive 2007/58/EC on domestic rail passenger traffic will be limited in states that have already opened their domestic rail passenger markets.

Directive 2007/58/EC demands a number of ancillary measures, such as a regulatory body overseeing access rights for international trains that operates in a non-discriminatory manner. It also gives *"the authority responsible for passenger transport"* (the promoter) rights to impose a levy on open access international services, to provide compensation for abstraction of revenue from services operated under public service contracts.

The likely implications of market opening for international rail passenger services on the domestic rail passenger market are discussed in Section 4 of this Report.

1.2. Study Objectives

The key issue that the Study needs to address is to determine which regulatory option(s) for further market opening of the rail passenger business is/are considered to be most appropriate, in the event that opening the market for domestic rail passenger services is considered to be beneficial by EU legislators.

There are also a number of specific objectives set out in DG MOVE's *Task Specification*, as follows:

- to undertake a quantative and qualitative analysis of the domestic rail passenger market;

- to describe and analyse different models of market regulation;
- to assess the economic and social impacts of further market opening.

Although the technical issues discussed above have considerable importance, it is also crucial to consider the needs and reasonable aspirations of existing and (more importantly) potential future rail users. Accordingly it must be remembered throughout the course of the Study that not only is it important to meet the reasonable expectations of citizens, but also that unless using the passenger rail system that emerges is an attractive proposition for users then the required modal shift discussed above will not be achieved.

1.3. Content and Structure of the Report

This Final Report discusses the context in which the Study was undertaken, the work undertaken, the Consortium's analysis of relevant issues, possible ways in which markets might be opened, the strengths and weaknesses of the various market opening models, and the preconditions that would need to presage any market opening.

This document is structured in ten sections as follows:

1. Introduction	Background to Study, Study objectives & the issues that is addressing
2. Qualitative Analysis of Market	Review of the current state of the rail passenger business and its consequences
3. Quantative Analysis of Market	Statistical analysis of the current state of the rail passenger business
4. Analysis of International Market Opening	The likely impact of market opening for international rail passenger services, with particular focus on cabotage rights
5. Assessment of Existing Legal Regimes	Typology of legal regimes, review of previous studies on legal regime and on the European passenger rail business, and consideration of where legal regimes vary in theory and practice
6. Case Studies	Descriptions of Case Studies undertaken in states that have already opened their domestic rail passenger

	markets, and salient conclusions from these.
7. Definition of Regulatory Options	Description of market opening models already applied in Europe and elsewhere, possible market opening model, and selection of four models to take forward for detailed impact assessment.
8. Stakeholder Views	The views of stakeholders interviewed by the Consortium, and also those expressed during the Stakeholder Hearing of 10 February 2010, and the in the responses to it.
9. Evaluation of Effects of Regulatory Options	Detailed impact assessment of the four models to taken forward, and evaluation of their relative merits against the Base Case.
10. Conclusions	Which possible regulatory model for further rail passenger market opening is likely to be most appropriate (in the event that further market opening is considered to be desirable), and the pre-conditions that would be necessary before it could be implemented.

2. Qualitative Analysis of Market

2.1. History & Evolution

The development of Europe's rail network commenced in the early to mid nineteenth century. Initially lines were purely domestic[13], in most cases they were built by private interests for commercial reasons, in other cases sponsored by governments for strategic reasons (the Trans-Siberian railway being the classic example). Between these extremes were a number of quasi-commercial railways which were heavily supported by governments for national strategic, socio-political, and military purposes, such as the Austrian Southern Railway. This mix of commercial, social and strategic objectives results in sharply differing national perspectives of the appropriate relationship between railways and the state.

In the twentieth century, the railway industry become state owned throughout Europe with the attendant problem of political objectives becoming mixed in with commercial objectives. Likewise, political objectives tended to increase the focus on domestic rather than international traffic and tended to focus on the short term rather than the strategic. Other modes, offering higher quality (such as air), greater convenience (private car) or lower costs (long distance coach) attacked the rail market share and rail was slow to react. In too many cases railway management saw itself as fulfilling a vital national function rather than offering a service that was responsive to the desires of users, compounding the problem.

In consequence of the rise of other modes and ossification of the rail industry the position of rail as a mode increasingly diminished as the twentieth century progressed from a position of pre-eminence, to one that comprised less than 6% of passenger volumes within the EU.

As noted in Section 1, the increasing marginalisation of rail as a mode throughout Europe ran counter to EU policy, as did its position in respect of European competition law. Accordingly the European Commission has undertaken a number of initiatives, targeted at reversing the relative decline of rail and bringing it into compliance with the requirements of the EU Treaty. The most significant 'headline' steps in this process (some of which have subsequently amended and/or replaced) have been:

Directive 91/440/EEC	established the principle of separation of accounts for RUs and IMs, and the concept of access rights for international groupings
Directive 95/18/EC	first established the concept of licences for RUs, valid throughout the EU

[13] The first international line was constructed in 1846, between Aachen and Maastricht.

Directive 95/19/EC	first established the rights to non-discriminatory infrastructure capacity allocation and charging
Directive 96/48/EC	established the principle of establishing technical compatibility in high speed rail, through TSIs[14]
Directive 2001/12/EC	extended the scope of Directive 91/440/EC
Directive 2001/13/EC	extended the licensing requirements first established in Directive 95/18/EC
Directive 2001/14/EC	replaced Directive 95/19/EC and required a network statement from the IM, infrastructure charges to be set and collected by an independent body
Directive 2001/16/EC	extended the TSI concept to conventional rail
Directive 2004/51/EC	opened the rail freight market for competition
Regulation (EC) No 881/2004	established the European Rail Agency (ERA)
Regulation (EC) No 1370/2007	provided a framework for procuring passenger transport services by public services contracts, without mandating it for rail
Regulation (EC) No 1371/2007	on rail passengers' rights and obligations
Directive 2007/58/EC	opened market for international rail passenger services, including cabotage rights

2.2. The Challenge Facing the Industry

2.2.1 Overview

The prime challenge that the rail passenger industry faces is the threat to its position and/or future from failing to develop products and services that are as attractive to potential users as those of other modes. The industry needs to respond to this challenge whilst accommodating the changes required to meet policy objectives (e.g. Commission's *White Paper on Transport*, national policy objectives) and the demands that these place on the industry.

[14] Technical Specifications for Interoperability.

2.2.2 Threats to the position of passenger rail

2.2.2.1. Overview

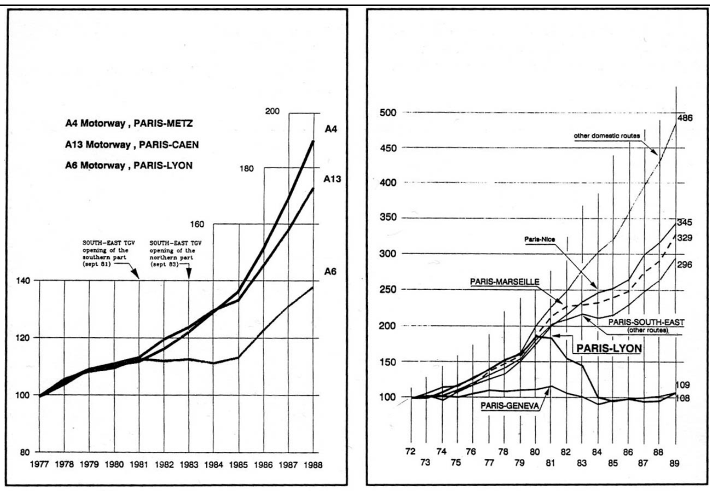
The threats faced by different parts of the rail passenger industry differ; accordingly this brief overview of this threat considers the following parts of the industry separately:

- high-speed rail;
- conventional express services;
- inter-regional and local rail;
- urban commuter services;

2.2.2.2. High-speed rail

High-speed rail has been the success stories of the rail industry capturing significant volumes of traffic from short-haul air routes and motorways, as well as generating traffic. In some cases the traffic growth from high-speed operations has masked underlying decline in conventional traffic. The European nation that has made the greatest investment in the development of a high-speed network has been France, developing a 1893 km network (2009 figure), with four major routes radiating out from Paris, more lines, including regional links, are under construction and planned and the high-speed lines are becoming a network with connectional opportunities. The impact of the first TGV line, the *TGV Sud Est*, between Paris and Lyon was studied closely. Figure 8 shows the impact of its opening on the rival air routes and motorway traffic.

Figure 11. Impact of *TGV Sud Est* on alternative air and motorway routes



The figures illustrate the effect of the opening of the TGV service on other transport modes between Paris and Lyon. Left: motorway traffic, right, air traffic

Source: *SNCF and the development of high speed trains 1950-1981*, Alain Beltran, Institut d'Histoire du Temps Present (CNRS), 1993

Notwithstanding the above, there is a looming problem: new high-speed lines have enjoyed something of a 'maintenance holiday', as the infrastructure starts to age maintenance and renewal costs have been increasing sharply. On some LGVs, RFF is understood to be finding that its infrastructure charges are starting to be insufficient to cover costs. As costs increase it is likely that, ultimately, they will be passed onto users, resulting in loss of market share to low cost airlines and road, particularly in the leisure travel segment.

Trains that run on high-speed lines are being developed to be interoperable and there is the prospect of a largely 'go-anywhere' fleet. This will contribute to flexibility, better productivity and better customer service. This also raises the prospect of easier access to high-speed rolling stock for new entrants in the medium term: one of the keys to successful trading in the rolling stock leasing business is management of the residual value of the assets after it has been discarded by its first user. The prospect of a Europe-wide market for discarded rolling stock, not only substantially 'de-risks' plans form a new RU to acquire high-speed stock for a particular service, but it also has the potential to create a market for cascaded rolling stock, and thus access to, lower cost, pre-used trainsets.

2.2.2.3. Conventional express services

Express services on conventional lines face competition from domestic air services and the private motor car in the business segment. Car remains the principal competitor for leisure travel over medium distances, but low cost airlines are becoming important over longer distances in many states, while in some states coach travel plays a role. Development of the road network and increasing personal wealth, enabling the acquisition of private cars, has resulted in decline in this part of the rail business; a process that is has reached maturity in the more economically developed states, but which is still ongoing in some of the more recent members of the EU. This can be seen in the quantitative analysis (see below). As the new Member States develop economically, their road networks improve, car ownership increases, and low cost airlines find a market, this loss of modal share by rail can be expected to continue. Reversing this decline is a major challenge, the impact of potential market opening on this downward trend will be an important consideration in evaluating the value or otherwise of domestic rail passenger market opening.

It is however, difficult to simplify the position in respect of conventional express services, as the position is quite diverse and complex. For example in some states, where there are high-speed lines, other express services have been downgraded and slowed down and face an uncertain future (France in particular, where journeys between the provinces by TGV via Paris are actively promoted[15]). In other states (for example Austria) conventional express services are keeping their position. In the context of the Study one of the measures of the value or otherwise of domestic market opening will be whether new operators would be likely to come in and fill the gap left by incumbents, and if so whether they could sustainably grow market share.

[15] For example, a through TGV from Lyon to Bordeaux via the Paris suburbs (1001 km instead of 643 km and charged as such) has been introduced to compete with direct conventional trains.

2.2.2.4. Inter-regional & local rail

It is on local and inter-regional services that the passenger rail industry has suffered its greatest decline, mainly because rail has been unable to compete with the convenience of the private car, or even the bus. The result has been large-scale line closures and in many areas rail has been reduced to an irrelevance. Retaining a foothold for rail in the local transport market in the context of economic growth and rising standards of living is a major challenge for the rail industry. If local stations close rail loses its presence and feeder services to the national rail network are lost. Maintaining this presence is however difficult, given that journey times are frequently uncompetitive with other modes, many stations are inconveniently located for the communities that they serve, and rolling stock is often outdated. Furthermore incumbent RUs often lack the local feel to exploit niche markets and suffer from inappropriate cost structures: the maintenance regime adopted by the IM can be crucial in this regard. In the context of the Study, the issue is whether market opening would bring in new RUs, which could focus better on these markets. Just as important is how this could be accomplished, given the generally unprofitable nature of these services and thus a heavy reliance on PSO funding. Alternative models for lower-cost infrastructure management might also play a role.

2.2.2.5. Urban commuter services

In contrast to the position elsewhere, rail retains a strong position in its role as a mass mover of people into major conurbations, where along with metro systems; it remains the only credible way of moving the daily workforce influx required by the most important commercial centres. In consequence it is politically and economically unthinkable to cut these services significantly, despite the high levels of public subsidy that they require. Instead the focus is moving onto cost reductions through tendering for public service contracts. The main challenges are commercial and technical: improving value for money, improving conditions and the service for users, and (in some cases) coping with rising demand. A particular problem that stakeholders have to face is that ridership is strongly linked to national economic strength: in periods of economic growth passenger volumes grow rapidly, while in economic downturns they decline. There is therefore a significant revenue risk which has to be borne either by the operator or by the promoter. This revenue risk is linked to the strength of the economy and thus not under the control of either the RU or the promoter.

Even in smaller urban areas where rail is less strong, particularly where road networks are well developed, and rail systems are limited and antiquated, there is strong support from local/national government in the more economically developed states to improve and develop rail systems. Investment in local networks in Germany is an excellent example of this.

2.2.3 Changes required to meet policy objectives

As discussed in Section 1, EU policy objectives require that rail increases its modal share. Given that increasing the use of rail is only one part of a portfolio of proposed measures[16] to reduce GHG emissions, it is debateable what modal share (passenger) rail needs to deliver in order to achieve an 80% GHG reduction by 2050. It is understood that the European Commission is currently working on this issue as a part of its review of the recent *EU Transport GHG: Routes to 2050* project, but has yet to publicly pronounce on the issue. The consultants working for the Commission have, however, considered this issue although the issue was presented as a range of options rather than clear-cut advice[17], accordingly no view yet appears to have been formed on the modal share that rail would need to deliver in order to meet the 80% target. Although figures for rail modal share of 17.3% in 2030 and 32.8% in 2050, in the long-distance market are tentatively suggested in the paper, this is more in the context of modelling the potential for GHG reductions from these values than setting them as targets.

In the Consortium's view this target would probably need rail to achieve a 20-25% modal share of the passenger market to achieve the 2050 target. This estimate is based on a shift to passenger rail delivering about 10% of the required GHG reduction, which equates to an increase in passenger rail's modal share from around 6% to around 23%. Given that the current modal share of the passenger market across the EU enjoyed by rail was just 6.3% in 2008 this is likely to prove exceptionally challenging.

Any substantial improvement in rail's modal share will require it not just to perform better in market segments in which it is already strong, such as high-speed and urban rail, but also to transform its performance in parts of the market in which it is currently weak. The main focus will need to be on axes with significant traffic potential, such as conventional inter-city routes. On these routes rail competes with a mixture of private cars, coaches and domestic air routes, depending on individual circumstances.

While there are some factors that might make other modes less attractive, such as rising fuel prices, increased road congestion, road prices, higher airport landing charges, etc, improving the market position of rail will require some combination of the following measures:

- increased price competitiveness (where market segmentation may have a role);
- reduced journey times;
- improved service frequency;

[16] Other measures include more energy efficient road vehicles, increased use of rail freight, uncoupling transport growth from economic growth, and telematics.

[17] *Modal split and decoupling options; Paper 5*, see http://www.eutransportghg2050.eu/cms/assets/4823DraftPaper-5.pdf.

- improved travel experience (crucially rolling stock, station, and information system improvements);

- improved reliability (on lines/systems where this is perceived as a problem by potential users);

- improved service accessibility;

- further imaginative added value services;

- better inter-modal integration.

The evaluation of the desirability or otherwise of market opening for domestic rail market opening therefore needs to be targeted on identifying which option is most likely to deliver the above outcomes.

Some of these measures are in the hands of RUs (e.g. quality of rolling stock), whereas others are the responsibility of IMs (e.g. station environment, in models where the IM is responsible for stations). In most cases, however, both are involved, for example, ticket prices include both operational and infrastructure costs, and significant journey time improvements generally need the IM to increase line speeds and the RU to procure higher performance rolling stock. There is therefore a need in whatever regulatory structure that emerges to include mechanisms that encourage IMs to develop infrastructure in line with rising public expectations.

Tripling or quadrupling the numbers of passengers carried on key arteries, will in most cases necessitate capacity enhancements, in some cases improved signalling and additional trackwork, but in others entirely new lines; again there need to be mechanisms in place that will facilitate this.

Overlying all of this is the role of government, given that in every European state the rail industry relies on public funding, at least in part: governments have to be prepared to play their part in investing in the development of rail.

2.3. Players Involved

2.3.1 Overview

The railway industry is complex and the delivery of passenger services involves inputs from a number of different bodies, this section briefly discusses the roles of each body, the interrelationships between them, and their aspirations as it relates to the issues considered in the present study. The bodies considered herein are:

- governments and governmental bodies;

- regulatory bodies;

- RUs;
- IMs;
- rolling stock providers;
- bodies representing passengers;
- representative bodies for the industry and trade associations

2.3.2 Governments & governmental bodies

Government has a crucial role in determining the structure of a national rail system, its size, the services provided and the funding available, either directly or indirectly. This is the direct consequence of railway passenger services requiring public funding in aggregate in every EU Member State. With obligation to provide funding comes a voice in how the funding is to be used (although it is not always clear that policy is logical and coherent). In some cases Central Government acts as the promoter for passenger services whereas in others control is exercised via an independent governmental body, in most states regional/local government acts as promoter for local and/or regional services.

Over and above the issues imposed by differing physical characteristics of states and their rail systems, one of the biggest problems with achieving a consistent and coherent service across Europe is the diversity of national attitudes to national rail systems (see Section 2.1) and its place in the priorities for government funding. To an extent this tends to be driven by the prosperity of the state in question, so that for example passenger services in states such as Germany, France, Sweden, Italy, the Netherlands, the United Kingdom, and Norway are supported by considerable public funding overall (this is not to say that some service groups in these states are not self-supporting), whereas funding to support the national rail passenger system is more constrained in states such as Bulgaria and Romania. Funding is routed differently in different states, either via the IM or as direct payments to RUs or a combination of the two.

National transport policies also affect the way rail is funded. At the extremes are the Nordic model in which rail infrastructure is supported by the government to be all but free to the user (to mirror the cost characteristics of road) and the Eastern European model in which total infrastructure costs are collected from users. Overlaying these models are differing approaches to the charging of freight and passenger railway undertakings. Significant work on these issues has been done by, amongst others, Thompson Galenson and Associates (see above).

There is political and social pressure for supported services and those provided by state railways to fulfil a social role (often ill-defined). The problems arise where there is a mismatch between the size of the network and the service intensity that is specified by Government and the funding that it is prepared to provide. In a situation where there is 'captive incumbent' RUs can be pressurised by Government to provide a service above the level that the funding can support it undermines the financial position of the RU and is ultimately unsustainable. More than one of the EU's less wealthy Member States governments is not making the full the PSO payments agreed with RUs, exacerbating the problem. The Consortium notes that this is much less likely to occur in cases where services are operated under public services that are competitively tendered between competing RUs, and there is proper contractual relationship between the RUs and the promoter, which would force the promoter to make the contracted payments, and which the bids from RUs should better reflect the true costs of providing the specified train services[18]. It should also be noted that identification of a network that can be sustained long-term, within the funding available from Government is positive, but there is a mismatch between government aspirations for network size and the funding available the network would contract[19], which is likely to result in social hardship and does not help achieve the objective of increasing rail use.

The relationship between Government and the IM has many parallels with its relationship with RUs. Figure 7 shows the extent to which IMs are reliant on public funding to cover the difference between the revenue from access charges and the costs of providing a sustainable network. There are particular difficulties in identifying the appropriate cost of maintaining railway infrastructure in perpetuity given the very long asset lives of railway infrastructure[20]; as a result it is possible to slowly 'run the infrastructure down' over many decades. A further complication is the issue of upgrading rail infrastructure in line with increasing market expectations: if rail is to retain its market share to match the improvements made by other modes, let alone increase its market share it must make improve its offer to match the improvements made by other modes, the four key areas are:

- travelling environment;
- price;
- speed; and
- reliability.

As far as the infrastructure is concerned the key issues are station environment, improvements in line speed, enhancement of capacity where this required to meet increasing demand, and minimisation of infrastructure failures. Government or its representative agency needs to have a vision of the network that it aspires to and appropriate short-term, medium-term and long-term policies to deliver this. The crucial elements in this vision are correct identification of projects, management by Government

[18] Market opening experience to date indicates that the desire of incumbent passenger RUs to retain market share has sometimes resulted in them under-pricing some of their initial bids for public service contracts; however, as bidding experience increases this problem falls away (see Swedish Case Study: Annex 8).

[19] Possibly via an intermediate stage where parts of the network falls into a worse and worse state.

[20] For example bridges normally have design lives in excess of 100 years, track components life is governed by usage and environmental factors, but concrete sleepers can have lives of over 50 years and rails on running lines can last over 30 years.

of the IM, and provision of adequate funding. Chronic under-funding of the infrastructure is major problem, particularly in the newer Member States. Experience in Great Britain shows how the funding from government on infrastructure can increase vastly where mechanisms are put into place that "force" governments to pay the true cost of maintaining infrastructure in a fully sustainable manner, and also the difficulty in properly identifying this (see Annex 6).

2.3.3 Regulatory bodies

There is a requirement under Directive 2001/14/EC for an independent economic regulator (for infrastructure issues) and under Directive 2004/49/EC[21] for a railway safety authority independent of either the IM or any RU It can therefore be assumed that all EU states will ultimately come into compliance with EU legislation. Notwithstanding this there are differences in the powers and responsibilities of the regulator in the various Member States. In some states, e.g. Germany (see Annex 5) safety and economic regulation are separate; in other states these functions are combined. In the passenger area, responsibility for such issues as competition law and employment law applied to railways may be with "rail" bodies or with national "all-industry bodies". Likewise, in some states regulation is a function of the ministry, in others a separately constituted body is responsible. It is likely that an independent body is able to be more consistent and independent.

To an extent the powers of the regulator provide a buffer between Government and the IM, and between the promoter and RUs, but the main function of economic regulation are in enforcing non-discriminatory treatment of RUs by the IM, fair competition between RUs, the protection of passenger rights, and non-discriminatory treatment of and by providers of ancillary services.

2.3.4 Railway Undertakings

The influence of the RU in determining the service provided to users varies with regulatory structure and degree of governmental control. In the classic situation of an incumbent with support for regional and urban services, services which are not supported (such as long-distance services) are largely within the total control of the railway undertaking. (SNCF's withdrawal of large numbers of interregional trains and DB's withdrawal of InterRegio trains might both be seen in this light). In an open access environment the destinations served and the frequency of the service is entirely in the hands of the RU (subject to the availability of paths), whereas where services are provided under a tightly specified public service contract these decisions are made by the promoter. Where a public service contract is structured in a looser manner around minimum service requirements that the RU could credibly exceed the service offered is a function both of the promoter's specification and the commercial decisions of the RU. There is therefore an intimate relationship between the regulatory structure and the ability to guarantee

[21] Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 *on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (Railway Safety Directive)*, OJ L164 of 30 April 2004.

service on a particular network, between particular origin-destination pairs, and the frequency (including first and last trains).

A further level of control overlies decisions on the network and timetable, involving issues such as subscription to common conditions of carriage, ticket inter-availability between different RUs, consistent classes of travel throughout the nation, compensation to passengers for delays, handling of lost property, etc. These issues can be stipulated by the regulator/promoter or can be left for RUs to decide on a commercial basis. Again there are different national attitudes to this issue as can be seen in the case studies and impact assessment work herein.

As required by Directives 95/18/EC[22] and 2004/49/EC, RUs must hold both licences and safety certificates. In principle a licence covers the whole of the EU whereas a safety certificate is specific ("*In order to be granted access to the railway infrastructure a railway undertaking must hold a safety certificate*"). The distinction between the two is that licensing deals with corporate competence of the RU (e.g. professional competence, financial fitness, to be of good repute, etc), whereas safety certification verifies that an RU is safe to operate on particular infrastructure (adherence to published national acceptance criteria). There are two parts to a safety certificate, the first part issued by the safety authority in the RUs home state and the second part by that in any state in which it operates. The RU has an ongoing duty to comply with the requirements of its safety certification and for operating in a safe manner; the RU is therefore answerable to the safety regulator in a manner that overrides all of its relationships with other bodies.

2.3.5 Infrastructure Managers

As noted above the size of a national railway network is mainly governed by government and the level of financial support that it is prepared to provide. The other bodies that IMs should be subservient to are the economic and safety regulators. As natural monopoly suppliers, IMs require powerful regulation for a number of reasons, including:

- maintenance safe of working practices by the IM[23] (safety regulation);
- IM efficiency, minimising costs and infrastructure charges (economic regulation);
- prevention of discriminatory practices against particular RUs (economic regulation);
- to make sure that the network is developed along lines that are relevant to the modern world (economic and safety regulation).

IMs are in contractual relationships with RUs, relationships in which RUs are the weaker parties.

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[22] Council Directive 95/18/EC of 19 June 1995 *on the licensing of railway undertakings*, OJ L143 of 27 June 1995.

[23] Required by Directive 2004/49/EC.

2.3.6 Rolling stock providers

In the majority of EU states passenger rolling stock is owned directly by RUs. However, as noted in Section 2.5 rolling stock leasing companies are becoming increasingly active in providing equipment to RUs, to date this has mainly been in the freight sector (outside Great Britain) but leased rolling stock is starting to become available to passenger RUs, allowing new entrants access to suitable stock.

In a market in which there is fair and open competition between a number of leasing companies, as in the case of the *Series 66* and *Eurosprinter* locomotives discussed above, there is no role for intervention by economic regulators. However, where leasing companies control unique assets that are the only rolling stock suitable for particular lines, as can sometimes occur in the passenger sector, regulatory overview to prevent undue exploitation is appropriate in some cases (generally on expiry of an original, commercial, contract).

Otherwise rolling stock leasing companies have relationships with the IM and safety authority where the companies are the entities in charge of maintenance. Likewise they have a relationship with the vehicle manufacturer (in the case of new stock), and naturally with the parties to whom they lease the stock. The lessor of the stock may be the railway undertaking but also the promoter of the service underwritten. Normally purchase contracts require the vehicle manufacturer to deliver vehicles that are ready to run and thus have been design-approved, inspected during manufacture and on commissioning.

2.3.7 Bodies representing passengers

Passenger groups have become increasingly vocal in safeguarding the interests of the travelling public, their principal function is as political pressure groups to influence decision makers; however, in some states they are officially recognised and play a role in some of the decision making bodies, either directly or as official consultees.

2.3.8 Representative bodies for the industry & trade associations

There are a wide variety of rail industry representative bodies and trade associations, these include:

- trades unions;
- standard setting bodies;
- international bodies representing IMs and RUs;
- national bodies representing RUs;
- bodies representing the railway equipment manufacturing industry.

In most cases these have no contractual involvement in the provision of services and their role is to represent the interests of their members, either politically or by direct negotiation.

2.4. Interfaces between Infrastructure Managers & Railway Undertakings

2.4.1 Role of Infrastructure Manager

The concept of separate infrastructure management is a comparatively recent one in EU law: the Infrastructure Manager (IM) was originally defined in Directive 91/440/EEC[24] as: "*any public body or undertaking responsible in particular for establishing and maintaining railway infrastructure, as well as for operating the control and safety systems*". IMs are structured differently in different states[25] and have differing powers, but IMs all have responsibility for the maintenance and traffic management on their respective national rail networks, as well as granting rights to RUs to use the national railway infrastructure. Article 30 of Directive 2001/14/EC[26] requires that IMs are accountable for their actions through independent economic regulation, including an appeal process against particular decisions.

National transport policy determines how much of the costs of infrastructure are to be recovered by access charges paid by users. National policy may also influence the balance between passenger and freight. The actual algorithm for infrastructure charging is generally a matter that is the hands of IMs (albeit that this should be subject to independent regulation), since Directive 2001/14/EC requires that infrastructure charges are set and collected by an independent body. The IM is also generally responsible for allocating capacity on the network. In either case, an IM is only permitted to do this under Directive 2001/14/EC if it is "*independent in its legal form, organisation and decision-making from any railway undertaking*".

IMs have to juggle a number of priorities: they have been charged with a number of objectives by government on establishment. Inevitably these are to an extent mutually conflicting, which can cause confusion and disagreement. These objectives can for example include providing for local passenger services, developing international freight services, increasing competition, maximising use of the railways, using the infrastructure as efficiently as possible, minimising requirement for public support, maintaining the infrastructure in perpetuity, and minimising maintenance downtime: it is apparent that it is impossible to meet all of these objectives simultaneously. One of the most crucial trade-offs in the context of the present study is that between passenger and freight services, given that these can compete for infrastructure capacity and desire infrastructure to be developed, to an extent, in divergent ways.

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24 Council Directive 91/440/EEC of 29 July 1991 *on the development of the Community's railways*; OJ L 237, of 24 August 1991.

25 Differences include features such as ownership of track in maintenance and similar depots

26 ***Allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety*** *certification*, OJ L75/29 of 15 March.2001.

2.4.2 Interactions between IM & RUs

In theory the interactions between a RU and the IM are quite simple: the RU asks for particular paths and their cost to the RU, the RU accepts, uses the paths and gets charged for their use. However, in practice the position is rather more complex: railway capacity is finite, and on the more popular axes (i.e. those that are most likely to attract the interest of an open access passenger RU), the availability of spare paths for additional passenger trains is likely to be quite limited; costing systems for use of railway infrastructure can be quite complex[27]; in some states there are compensation regimes for failures of performance[28], applying both ways; and in most states there are technical constraints that place limits on which rolling stock can be used on which lines (particularly passenger rolling stock). Accordingly, to exploit the opportunities available properly and to maximise commercial and operational effectiveness RUs need a detailed and in-depth understanding of infrastructure capabilities, the commercial arrangements for infrastructure charging, and of other traffic using the network.

For the reasons outlined above, there is an inevitable need for continuing dialogue between RUs and IMs. Indeed experience from liberalised environments is that any RU that operates more than a few trains has a dedicated team devoted entirely to negotiating with the IM over access, timetabling and charging, and (where provided for) over performance regime issues. This interaction can only occur if the IM is open and approachable. The corollary to this is that if IM is not totally even-handed in its treatment of RUs it is easy to confer an advantage to one RU over another. Openness and even-handedness from the IM is therefore a pre-condition that needs to be met before a new entrant RU can enter a new market with any realistic chance of success.

Therefore, the ability to access information on the attributes and use of the infrastructure, as well as the charging regime is vital to the appropriate operation of the IM:RU relationship. While it is important that the IM acts in an open and impartial manner to all RU and prospective RUs, it is preferable to have all relevant information available freely on the Internet. This not only ensures that the critical information is available to all, but also provides transparency, and can be seen to be even-handed. This could for example be provided as a part of the Network Statements that IMs are now required to produce (see below). The Consortium considers that the following classes of information should be readily available to all passenger RUs, prospective passenger RUs and to any other party or individual with an interest in providing passenger rail services, developing the rail network, or in regulation:

- technical restrictions that apply to the infrastructure (e.g. max axleloads, vehicle profile, electrification system, pantograph width, track:train signalling interface, etc), detailed down to the level of each and every platform and stabling siding;

[27] Varying for example by time of day, exact rolling stock type and train formation, track type, speed of train, use of particular bottlenecks, bridges or nodes, etc.

[28] In accordance with Article 11 of Directive 2001/14/EC the railway trade associations are developing and trialling a system for international application

- infrastructure capabilities (e.g. minimum signalling headway assessed in terms of "standard paths" per hour, line speeds, permanent and temporary speed restrictions, track layouts, platform and siding lengths, usage restrictions for particular lines and platforms, etc);
- planned enhancements to infrastructure capabilities;
- scheduled possessions, closures and other restrictions for maintenance purposes, and diversionary routes, available;
- detailed timing information for all trains using the network (as timetabled), and for all other reserved paths;
- platform occupation diagrams;
- full details of the infrastructure charging mechanism, and of any performance regime that applies;
- full details of the capacity allocation system that is in force.

As a result of action by DG MOVE there are already measures in place that require publication of some of this information for example publication of an annual Network Statement is required under Article 3 of Directive 2001/14/EC[29]. However, this mainly covers infrastructure charging and capacity allocation issues. The Consortium is not aware of any European IM that currently publishes all of the information listed above in an accessible form, although note that progress is being made. Furthermore the Consortium does not consider that this should be an unreasonable burden for IMs. Firstly, since all of this information should be work that the IM should be undertaking in any event in the performance of its proper duties for stewardship of the national rail network; and secondly, detail information on train services operated and their timings should be available via a direct interface with the national rail operation IT system.

As noted above, if rail is to become a more important mode of transport in the passenger market, and indeed not to diminish to an irrelevance in crucial segments of the market it needs to develop in line with the expectations of potential users; involving actions by both RUs and IMs. There is therefore a need for a framework under which the network and facilities can be developed in line with the reasonable aspirations of passenger RUs. As with most issues in the rail sector this issue is a lot more complex than it first appears. For example:

- To what extent are enhancements desired by RUs reasonable expectations to keep the facility and network up-to-date (e.g. clean stations in good repair, offering facilities that present day passengers want), or to what extent are they particular

[29] Also see http://ec.europa.eu/transport/rail/studies/doc/2010_best_practice_guide_for_railway_network_statements.pdf for an EU study on best practice.

requirements of a particular RU (e.g. demands for introduction of product branding at stations)?

- What happens if a particular RU demands infrastructure changes which would be desirable for its users but which might exclude other RUs (e.g. demands for higher platforms to provide level access with new rolling stock, or where one railway undertaking wishes to introduce controlled access to trains under its business model, while another has on-train ticket purchase)?

- Conflicts between the needs of differing segments (e.g. RUs operating urban commuter railways with intensive service levels would want a signalling system that minimises headway between trains, whereas RUs operating express services would want signalling systems that maximise line speeds at the expense of headway).

- Who should pay for any improvements, and how should funds be channelled?

- To what extent should the IM take a longer-term view of the sort of infrastructure that is required, than RUs, which might have more short-term profit-driven priorities?

- How can the IM be incentivised to develop the network[30] in a form which makes the use of rail more attractive, rather than to preserve it in a time warp (e.g. need to increase speeds in many parts of the network)?

- The role of government in determining the shape of the national rail infrastructure.

It is for this reason that independent economic regulation of IMs is required, as some of these decisions can only be made on a case-by-case basis, whereas others are more structural. Nevertheless there is a clear need for dialogue between IMs and RUs in developing proposals to enhance the rail network to make the use of rail more attractive to would-be passengers, something that is a two-way process with each side needing to understand the other's commercial and technical case. The need is therefore for an open and approachable attitude from IMs, and for RUs to have confidence in the confidentiality of any discussions that it holds with IM, in respect of the leakage of commercially sensitive information. This is something that is hard to achieve where IMs sit within the same corporate structure as an incumbent RU.

2.4.3 Relationships between IMs and RUs

In the *Railimplement* report[31] four measures of the true independence of IMs from incumbent RUs were identified: common board members, offices in the same building, incumbent takes some infrastructure management, and incumbent controls access to some

[30] As required by Article 7 of Directive 91/440/EEC

[31] ***Railimplement – Implementation of EU Directives 2001/12/EC, 2001/13/EC and 2001/14EC***, Steer Davis & Gleave, November 2005.

assets. The Consortium considers that these are a good set of indicators, although it considers that the existence of independent economic regulation of IMs is another good indicator that should be added. Accordingly the Consortium have updated and extended (to thirty states) the table given in *Railimplement* as follows (note where regulation is provided by a government ministry and the incumbent RU is state-owned or state-controlled it is not regarded herein as independent):

Table 2.3.1 – Independence of IMs from Incumbent Passenger RU

State	No Common Board Members	Offices in Separate Building	Incumbent RU Not Involved in Infra. Mgt	Incumbent Does Not Control Any Asset Access	Independent Regulator
Belgium	✓	✓	✓	✓	×
Bulgaria	✓	✓	✓	✓	✓
Czech Rep	✓	✓	✓	×	✓
Denmark	✓	✓	✓	✓	✓
Germany	×	✓	✓	×	✓
Estonia	×	×	×	×	✓
Ireland	×	×	×	×	×
Greece	×	×	×	×	×
Spain	✓	✓	✓	?	×
France	✓	✓	×	×	✓
Italy	✓	✓	×	×	×
Lithuania	×	×	✓	?	×
Luxembourg	×	×	×	×	×
Latvia	×	✓	×	×	×
Netherlands	✓	✓	✓	✓	✓

State	No Common Board Members	Offices in Separate Building	Incumbent RU Not Involved in Infra. Mgt	Incumbent Does Not Control Any Asset Access	Independent Regulator
Hungary	✗	✓	✓	?	✓
Austria	✓	✓	✓	?	✓
Poland	✗	✓	✓	✗	✗
Portugal	✓	✓	✓	?	✓
Romania	✓	✗	✓	✓	✓
Slovenia	✗	✗	✓	✓	✗
Slovakia	✗	✓	?	?	✗
Finland	✓	✓	✓	✗	✓
Sweden	✓	✓	✓	✓	✓
UK – GB	✓	✓	✓	✓	✓
UK – NI	✗	✗	✗	✗	✗
Switzerland	✗	✓	✓	✓	✓
Norway	✓	✓	✓	✓	✓
Croatia	✓	✗	✓	✓	✗
Macedonia	✗	✗	✗	✗	✗
Turkey	✗	✗	✗	✗	✗

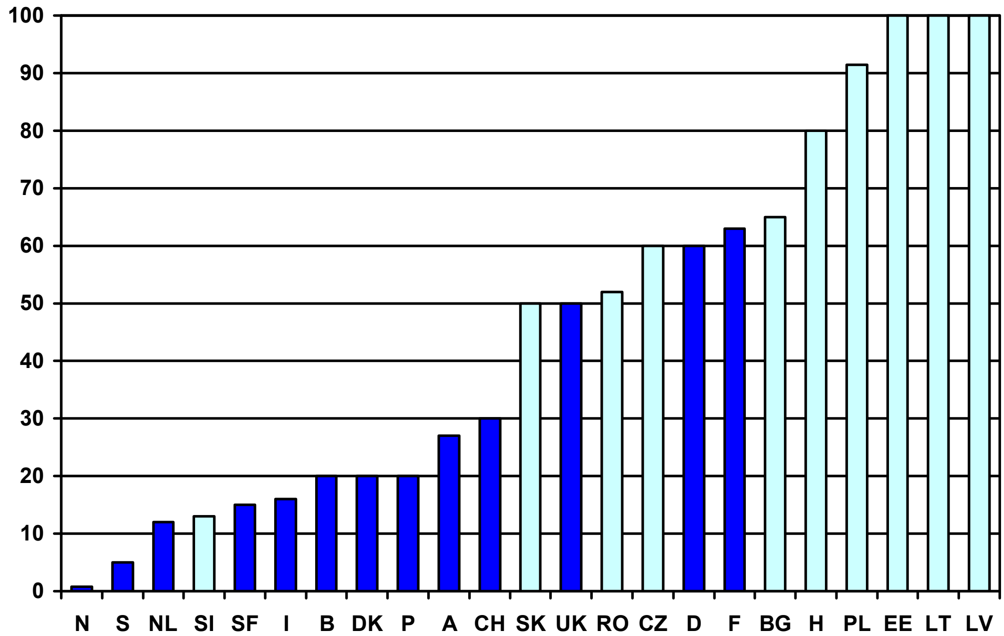
In Table 2.3.1 states where the identified measures of independence for IMs have been met are shaded in green, whereas those where none of the conditions have been met are shaded in pink. The remainder are “somewhere in the middle”. The Consortium considers that market entry is considerably more likely where there is demonstrable independence for the IM, particularly for open access RUs. Where few of the conditions are met it is considered that this prevents a formidable barrier to entry for new RUs.

2.4.4 Infrastructure charging & Government support

The principles for infrastructure charging are defined in Directive 2001/14/EC. While this directive does exert a some control of charges through the principle of sheeting charges at a level that cover direct costs and only permitting mark ups where the market can bear them, it permits considerable latitude to Member States in respect of infrastructure charging methodology and the degree of government support provided, within a set of rules which are primarily focussed on elimination of discriminatory practices and providing clarity and transparency on the charges levied. The Directive includes a number of ancillary provisions such as specifying the services that IMs are obliged to provide.

Not surprisingly the combination of the flexibility permitted by Directive 2001/14/EC, some questionable implementation of the Directive, and differing national attitudes and priorities, means that the level of support provided by national governments to their rail infrastructure varies considerably. The study undertaken for the ECMT in 2005[32] reported that all states with the exception of the three Baltic States[33] subsidise their national rail infrastructure to some extent. The findings in respect of cost recovery from infrastructure charges are shown in Figure 7.

Figure 12. Target Percentage of Total Cost Covered by Infrastructure Charges



Source: ***Pricing and Infrastructure Charging***, at the China Railway Investment and Financing Reform Forum Beijing by Stephen Perkin (ECMT)

32 *The Role of Government in European Railway Investment and Funding*, paper given by Stephen Perkins (ECMT) in Beijing Sept. 2005.

33 Estonia, Lithuania, and Latvia.

Given that in most of Europe infrastructure is heavily subsidised, the key issues are considered to be:

- any cross-subsidies between different segments of the market? In particular do any of types of traffic doing the cross-subsidising pay sufficient to achieve more than 100% cost recovery?

- do the charges levied in any way favour one RU over another, a principle that applies irrespective of the degree of cost recovery?

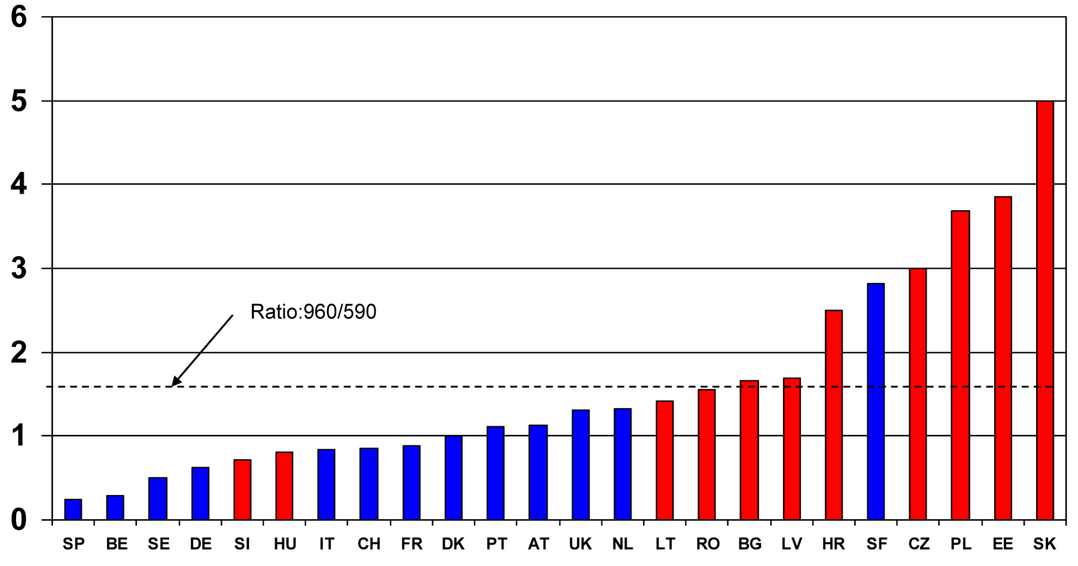
This is a complex issue because many of the infrastructure charging systems are quite complicated (and vary greatly from state-to state) [34] to the extent that there are obvious (and significant) inconsistencies between different reports on the subject.

Article 8 of Directive 2001/14/EC permits variations between the levels of charges applied to different segments of the rail market, where one segment can bear higher charges than another to help the IM obtain full cost recovery. This is subject to a requirement that the IM's *"average and marginal charges for equivalent uses of his infrastructure are comparable and that comparable services in the same market segment are subject to the same charges"*. Article 8 overrides the obligations of an IM under Article 7 to make charges directly correspond to the costs incurred by a particular service. The corollary to this is that is that if all segments of the market can afford to pay infrastructure charges that are equivalent to the costs that they actually cause the IM and that this is sufficient to achieve full cost recovery for the IM, them no variation between the level of charges borne by each segment of the market would be permitted. This is likely to occur where all passenger services are provided under competitively tendered public service contracts and freight services are fully commercial in nature.

Figures 8 and 9 show the ratios that were developed for the relative charges between "typical" freight, intercity passenger, and suburban trains. The study by Thompson Galenson and Associates from which Figures 10 and 11 were extracted not only attempted to work out charges from scratch, but also compared these with answers derived in previous studies, identifying apparent errors.

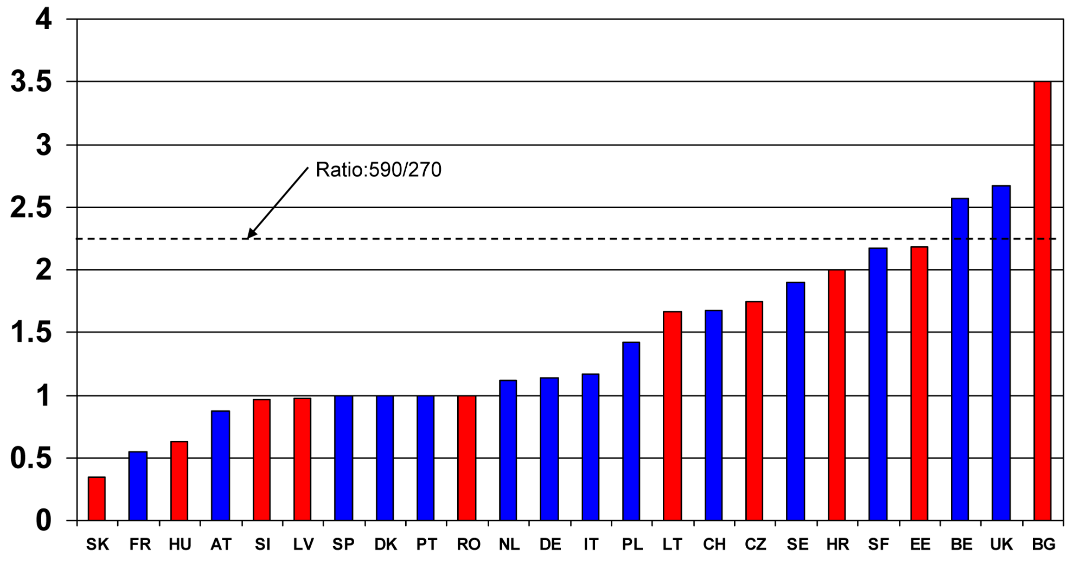
[34] See, in particular, *Charges for the Use of Rail Infrastructure 2008,* Thompson Galenson and Associates, for OECD.

Figure 13. Ratio of Typical Access Charges: 960t Freight Train v 590t Intercity Passenger Train



Source: *Charges for the Use of Rail Infrastructure 2008,* Thompson Galenson and Associates, for OECD

Figure 14. Ratio of Typical Access Charges 590t Intercity Passenger Train v 270t Suburban Train



Source: *Charges for the Use of Rail Infrastructure 2008,* Thompson Galenson and Associates, for OECD

Figures 8 and 9 illustrate the wide scatter of results that current infrastructure charging regimes generate, in both cases there is an order of magnitude between the highest and lowest differentials. Figure 8 shows that in more developed EU economies the tendency is for express passenger services to cross-subsidise freight, whereas in the newer member states the reverse is true. Figure 9 shows that in most EU states it appears that suburban passenger services cross-subsidise express passenger services. Accordingly on the basis of these graphs the tendency is for urban/suburban passenger rail to cross-subsidise the infrastructure charges of other types of rail, particularly in more economically advanced states. Given that urban/suburban services are increasingly procured under public service contracts it does not appear that generally the market segments in which open access passenger RUs would want to run trains are disadvantaged by current charging regimes. However, as noted above, this is a large and complex issue.

It can be seen that Figures 8 and 9 indicate that there are only two states where the structure of infrastructure charges is such that it inherently discourages open access passenger services (i.e. cross subsidisation by inter-city passenger trains): Belgium and Bulgaria, although in the case of Belgium (at an aggregate level) the main cross-subsidisation is of freight by passenger services as a whole. In this context it should be pointed out that Belgian infrastructure charges are considered to be notably inconsistent, accordingly the aggregate figures only show a part of the picture. There are other states where although there is little cross-subsidy within the passenger rail sector there is considerable cross subsidy of freight by passenger, notably in Finland and Sweden (see Figure 8). In most states the cross-subsidy within infrastructure charging regimes appears to favour the segments of the rail passenger market least likely to be operated under PSO (see train weight ratio trend lines in Figures 8 and 9).

None of this, however, deals the wide variation between overall charging levels between states, which makes a considerable difference to the financial viability of open access operations (see Section 7).

EU legislation provides safeguards that allow appeals by RU against specific examples of discriminatory pricing (for example high fixed charges that would deter new entrants). Action has already been taken to rectify examples that have emerged (e.g. France), as the rail liberalisation process gains maturity one would expect examples of discriminatory pricing to be gradually ironed out.

The Consortium’s interviews with stakeholders revealed concerns about the disparity in charging, about the impact of differing charging algorithms for passenger and freight on the development of passenger services, and a general lack of transparency.

2.5. Lessons from domestic freight liberalisation

As noted above, experience in liberalised markets has revealed that the inherent complexity of rail infrastructure means that successful RUs need to have an in-depth understanding of the national rail infrastructure in the state(s) in which they operate. Indeed certainly in some states RUs of any size tend to have train planning teams that shadow the work of the IM.

In most states the rules for path allocation require infrastructure managers only to be reactive, they now respond to applications for paths rather than being involved in joint commercial/operations planning teams. Accordingly, infrastructure managers say "yes" or "no" to applications from railway undertakings rather than try to optimise the use made of infrastructure. There are examples states with well advanced liberalisation of the IM refusing access which under the previous arrangements it would have accommodated by rearranging the whole service and the infrastructure manager accepting a train for a theoretical path which it would previously have refused in order to give the timetable resilience. According quite a lot of planning effort is spent challenging the proposals of the IM's train planners and jointly working towards the most mutually advantageous solution. This can only work where there is an open attitude from the IM and a willingness to listen to RUs.

Long term guarantee of paths is another issue which freight exposes: freight is by its nature volatile, so train paths which are awarded may not be used for periods of time. European law allows some flexibility and allows long term reservation of capacity in framework contracts. Initial feedback received from stakeholders consulted in the course of this Study has been that in some states, open access has been frustrated by an inability to reserve paths for more than one timetable. It was not therefore possible for investors to obtain commitments from third parties and finance. Open access implies some commitment to track access and for a period to allow amortisation of assets.

A further lesson is the difficulty of allocating capacity on congested networks as usage rises in a liberalised environment. This is particularly acute in the case of decisions on whether to favour passenger or freight traffic, a problem that can be compounded by the dissimilar speed characteristics of bulk freight trains and express passenger services, for example, which can result in significant loss of network capacity when the two types of train are mixed. In promoting a European network for competitive freight, the Commission has addressed this issue but it is likewise significant that one large railway undertaking has made a very public declaration that it sees problems for passenger RUs by reserving capacity for freight. In its published comments[35], it states that the proposal runs the risk of jeopardising train paths for regular services. It is perhaps predictable that railway undertakings would prefer to see additional investment to create infrastructure than to share the existing. It is clear that the issue of capacity will not go away.

Freight market opening has also thrown issues of access to ancillary services that new entrants have required to operate a service. As pointed out by the EIM in the course of canvassing views from stakeholders, a number of rights conferred by EU directives are incomplete, for example while Directive 2001/14/EC gives rights of access to fuelling points, it does not mean the RU actually has re-fuelling rights, similarly the rights of access to sidings does not apply if they are already 'full', something that might well be genuine, but which also might not be. One key area where rights are not conferred by Directive 2001/14/EC automatically, is access to railway telecommunications systems[36],

[35] DB position paper of January 2009 *Vorschlag für eine Verordnung "Ein Europäisches Schienennetz für einen wettwerbsfähig Güterverkehr*.

[36] Annex II to the Directive makes the telecommunications network an "*ancillary service*".

which also can include access to the railway operations IT system. Other issues have included: rights of access to rail freight terminals, where these have simply been handed over to the incumbent freight RU; where ownership of essential equipment at depots, terminals, etc has been transferred to the incumbent RU (see EIM comments above); and failure to make facilities available to enable new entrant RUs to train drivers (e.g. to acquire route knowledge[37]).

As the maturity of an open rail freight market has advanced, availability of suitable rolling stock has become less and less of an issue. Traction has been the main issue, as prior to the interoperability directives[38], even where it appeared to be technically possible to use second-hand locomotives from another state the approvals procedure tended to be so cumbersome and protracted[39] that examples of second-hand cascading were rare. Interoperability has meant that that it is now much easier to export second-hand traction from one state to another, and there are numerous examples of use of second-hand motive power in other states are now common, and a reconditioning industry for these is also emerging[40]. Equally importantly, the maturity of the market and the ability to switch locomotives of a universal design throughout Europe has given rolling stock leasing companies the confidence to invest in new locomotives for new entrants in the knowledge that should the original lessee fail, there are other users willing to take on the lease; to this end the *EMD Series 66/Class 66* design has become almost a standard European freight diesel locomotive[41], with almost 600 of these locomotives now owned by more than a dozen competing leasing companies in Europe. The *Siemens Eurosprinter* is likewise becoming the standard electric locomotive.

Hauled rolling stock has been less of an issue as interoperability was already inherent for many years in any freight wagon built to conform to the RIV, a process that has now been strengthened by the TSIs. Given the number of wagons in circulation in Europe[42] access to second-hand wagons has been less of an issue for new entrants, furthermore there is an established and mature wagon leasing industry in Europe meaning that access to modern leased wagons has not been an issue for serious new entrants.

Some parallels can be seen in passenger traffic, hauled passenger rolling stock is largely standard and freely available second-hand. In the high-speed market, there are in effect only three families of high-speed trains, the Alstom family, the ICE family and the Italian ETR train-sets. The Alstom and ICE sets can operate interoperably. As yet there is no secondary market for high-speed trains.

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[37] Despite the obligations of Article 13 of Directive 2004/49/EC.

[38] In particular Directive 2001/16/EC.

[39] For example the difficult process of obtaining certification for an ex-British Class 59 in Germany in 1997.

[40] Parallels with the mature market in US are instructive here, where there is an extensive locomotive re-manufacturing industry, for locomotives discarded by the major Class 1 Railroads, many of which find their way onto Class 2 and 3 Railroads, as affordable traction.

[41] Currently these are certified for use in Belgium, Germany, Denmark, France, Great Britain, Luxembourg, the Netherlands, Poland, Sweden, and Norway.

[42] Approximately one million wagons are registered in EU states (see Appendix J) to *Vehicle Identification and Registration Study*, C Buchanan and Partners for European Commission 2003.

On a social level market opening for freight has had both positive and negative aspects. On the positive side where there have been two or more freight RUs in competition and there has been a shortage of skilled staff (for example due to success in growing the volume of freight on rail in a competitive market) then the salaries of skilled staff such as train drivers have increased markedly. The effects of this can be seen in the German Locomotive Driver' Union distancing itself from other unions in 2002 and then organising strikes to increase salary differentials. The position for staff without marketable skills has been less positive, as Annexes 5, 6 and 8 indicate the introduction of competition has resulted in an initial headcount reduction; however, as the headcount figures quoted in Annex 6 indicate traffic growth following market opening in Great Britain has enabled direct employment in the rail sector employment to return to former levels. Employment levels in the rail sector following market opening are hard to quantify, as the former integrated incumbent railways tended to do much more 'in house' than is the case for IMs and RUs after market opening, meaning that many of the 'lost' positions have simply been transferred to external service providers, in many case also involving direct transfer of the employees concerned.

The findings of the *Railimplement* study on social issues, which studied the issue in some detail, were similar, this found that: "*the evidence suggests that wages in some skill groups, such as drivers, have risen rapidly on some networks. We found no evidence that the market opening process had resulted in a deterioration in wages and working conditions*".

2.6. Definition of Market Segments

2.6.1 Overview

Market segments are a social construct and as such they are not unambiguously defined. Different definitions emerge from three differing viewpoints:

i) the statistical definition of market segments is explained in Section 3.4;

ii) political and regulatory decisions define different market segments, e.g. by establishing different regulatory regimes like open access, some form of managed competition or exclusive rights; likewise, to realise politically desired targets (modal split, accessibility, etc) public authorities themselves act as market actors and tender rail services;

iii) as in any other business, fundamental demand and supply conditions establish different market segments from the point of view of RUs.

It is the last category that is discussed in this section, but it should be clear that there is strong interaction between regulatory/political decisions on the one hand and business decisions on the other hand. This interaction is of central importance to the Study.

Services such as the Venice Simplon Orient Express have been ignored in this Study because, whilst they run to a timetable, they cannot be considered public transport but rather a holiday product.

A business market segment is usually defined as a group of people or organisations sharing one or more characteristics that cause them to have similar product and/or service needs. A true market segment meets all of the following criteria: it is distinct from other segments (different segments have different needs), it is homogeneous within the segment (exhibits common needs); it responds similarly to a market stimulus, and it can be reached by market intervention. In the Study an enhanced definition has been used; since market entry decisions are discussed, the focus is on the demand as well as on the supply side, i.e. the characteristics of services, offered by an incumbent (usually), is taken into account.

The reason for this approach is simple; a new entrant has to match an incumbent's product or it has to "by-pass" its offer in order to attract sufficient customers. Thus, from the point of view of an entrant, market segments in the rail industry consist of:

- regional scope of the services potentially offered; generally one can distinguish;
    - connection of urban areas;
    - connection of low and middle-order centres and urban areas; and
    - connections between middle-order centres;
- targeted groups, customer groups can be differentiated according to the purpose of their trip (e.g. commuter, business, leisure travellers) or according to price-service-combinations (e.g. empirical analyses for the German market identified three groups,[43] i.e. price-sensitive customers, comfort-oriented customers and travel time-oriented customers);
- pricing strategy;
- elements of service levels, especially regular interval timetable v single trains, speed, and provision of connections between services.

In the case of regional scope, this differentiation mainly reflects differences in potential demand as well as differences in inter- and intra-modal competition. Potential demand mainly hinges on the number of inhabitants with access to the rail network, income and the attractiveness of origins and destinations; it thus reflects especially the structure of urban development.[44] The differentiation of the regional scope of services not only reflects this structure, but also the importance of competition. It is only natural that incumbent RUs, as

[43] See Perrey, J. (1998): Nutzenorientierte Marktsegmentierung. Wiesbaden: Gabler.

[44] See e.g. Wardman (2007): Rail Passenger Demand Forecasting, in: Research in Transportation Economics, Vol. 20, pp. 119-152; Wardman (2000): Rail Network Accessibility and the Demand for Inter-urban Rail Travel, in: Transport Reviews, Vol. 20, pp. 3-24.

well as bus providers, have focused their services on attractive lines, i.e. lines with high potential demand and with the possibility to establish a competitive offer in comparison to car use. Additionally, the spatial pattern of demand is also reflected by the spatial structure of airports and airline services.

In the case of pricing strategy, Different strategies are used throughout Europe[45], e.g. simple distance-based or journey-specific prices, special offers, two-part tariffs or other forms of loyalty cards, or yield management systems. From the perspective of an entrant two decisions have to be made: price level and price structure. This may also impinge on reservation and refund policies.

The pricing strategy can be regarded as a dimension of market segments since, in almost all cases, prices of the incumbent and/or competing modes represent an upper limit for the maximum price a new entrant can charge. As such the pricing strategy of others also determines, for example, whether a low-cost strategy has to be achieved or not.

The balance between service levels, regular interval timetable versus single trains, speed, and provision of connections between services (i.e. the network aspect) determines on the one hand the attractiveness for customers and thus the passenger loadings and revenues an RU can expect. On the other hand, they also influence its operating costs. As such, the design of the service quality is of central importance for new entrants.

This Study does not discuss every possible combination of values of these dimensions. Instead it starts from a restricted list of combinations that are internally consistent and can be found in several states:

- High-speed services between urban areas. Typically, this segment also implies differentiated pricing strategies, regular interval timetables (high frequencies) and a high level of connectivity from other services to it.

- Conventional services between urban areas and middle-order centres) (“conventional express services”). Typically, this segment also implies differentiated but simple pricing strategies, regular interval timetables - with a lower frequency (two to four hours) and a reasonable level of connectivity with other services.

- Conventional services between middle-order centres) (“regional services”). Typically, this segment implies simpler pricing strategies: sometimes low-price strategies, a higher share of single trains, and a lower level of connectivity with other services from other services to it.

- Urban commuter services. Typically this market segment has prices that are heavily regulated by the promoter and a simple pricing strategy with the majority of users travelling on discounted tickets, it also involves self-contained operations

[45] For a survey see Szimba, E. et al. (2007): Passenger Rail Tariffs in Europe, Arbeitsberichte Verkehrs- und Raumplanung 418, http://e-collection.ethbib.ethz.ch/view/eth:29497.

running to regular interval timetables with additional services in the weekday peak periods

These categories can only be a starting point. In the Case Studies these segments were found to give a good impression of different entry barriers (e.g. access to infrastructure, costs and implied risks of rolling stock, possible reaction of the incumbent, and importance of distribution channel and so on), allowed thus an appraisal of the profitability and likelihood of entry.

Market segments, as perceived and used by RUs have at least three reasons of potential importance for analysis:

- entrants may choose different entry strategies, e.g. gradual versus full coverage entry, timing of entry;
- entry barriers may vary between the different segments;
- the consequences of competitive entry may differ greatly, depending on the segment in which entry occurs.[46]

2.6.2 Characteristics of entrants

2.6.2.1. *Overview*

In addition to demand characteristics and market segments, the characteristics of (potential or actual) entrants are also important for an entry analysis. On one hand, the possibility of achieving synergies is of central importance in reducing the costs of entry and the operating costs of an entrant; while on the other hand, potential entrants may have different incentives and leeway for decisions. Two categories are used to indicate these differences:

- new entry versus product/market development; and
- corporate form.

2.6.2.2. *New entry versus product/market development*

A product/market development strategy occurs when a company develops new products catering for the same market (e.g. if a provider of regional passenger services introduces long-distance services) or when it moves beyond its immediate customer base towards attracting new customers for its existing products (e.g. entry of a provider of long-distance services into international markets)[47].

[46] The Consortium's analysis focuses on entry decisions leaving the importance of market segmentation for differentiated marketing strategies and so on largely aside.

[47] This category makes use of the well-known Ansoff matrix that presents the product and market choices available to an organisation; see e.g. Ansoff, H. I. (1965): Checklist for Competitive and Competence Profiles; Corporate Strategy, pp 98-99, New York: McGraw-Hill.

This distinction reflects firstly the possibility of synergy; in a new entry strategy (used in the sense of entry into a completely new market) by definition there can be no synergy. In contrast, the development strategy may allow RUs to share infrastructure, such as maintenance or cleaning facilities, rolling stock, distribution/sales channels and employees. In a broad interpretation of synergies, expertise and brand name are additional factors that can eventually be shared. The use of synergies can significantly influence the costs for a new entrant and the risk of entry, since sunk investment can be avoided, at least in part.

The development strategy can be mainly used by firms that already provide:

(i) regional passenger services (e.g. Germany),

(ii) franchised long-distance services (e.g. UK, Sweden); or

(iii) long-distance services in their national home market (this group includes national incumbents)[48].

2.6.2.3. Corporate Form

The background of RUs is another characteristic influencing the possibilities and incentives of actual or potential entrants, at least as long as incumbent RUs that are publicly owned are the dominant players in Europe.[49]

- National public incumbents like DB AG, ÖBB, PKP, SBB, SJ, SNCF, etc. These RUs provide long-distance services in their national home market as well as in international markets. A few, notably SNCF and DB AG, also provide high-speed services. Additionally, these firms are heavily involved in alliances to provide international services.
- Internationally oriented corporate groups (Veolia, Keolis, Arriva[50], and others). Their business focus is on franchised services and on regional passenger services, since, with exception of the UK, most franchises in Europe comprise regional services. Outside the UK, these firms provide only a couple of long-distance services, e.g. Arriva in Germany and Sweden.
- Private start-up-enterprises founded to establish long-distance rail services. This group comprises e.g. Locomore GmbH in Germany, WESTBahn in Austria, and Nuovo Trasporto Viaggiatori in Italy.

48 Synergies between freight and passenger services are generally considered to be too small to influence entry decisions.

49 It is noteworthy that in Germany two more groups may play an important role: on the one hand, a couple of public RUs, owned by the Federal German States, are active in regional passenger services and franchised long-distance services. On the other hand, some small to medium sized private RUs exist that are currently providing franchised regional services.

50 Taken over by DB AG in August 2010.

Currently, national public incumbents are the most important players in the market, with radically differing strategies (from growth-oriented, hence interested in entry to other markets, e.g. DB AG, SNCF or SBB, to defensive, mainly concentrating on the home-market, e.g. SJ or SNCB). Internationally oriented corporate groups focus mainly on franchises; this simply reflects the importance of this segment, but also their perception of low profitability of an entry in long-distance markets (case study Germany). Interestingly, the start-ups discussed above are currently the players who are challenging "traditional" market strategies the most.

2.6.3 Characteristics of segments

2.6.3.1. Overview

In the following analysis, the market segments discussed above, as perceived and used by RUs, are further discussed. The analysis is to a certain extent biased towards West European states that already have some experience with market opening (actual market entry or at least tangible entry plans), i.e. the case study states. This bias, which is not considered by the Consortium to be extensive, is inevitable because entry possibilities can only be assessed against the background of business analyses performed by potential entrants or through actual experience.

2.6.3.2. High-speed connections between urban areas

Overview

To enter this market segment will usually imply direct competition with the national incumbent, since this segment usually represents the core network. Results from the Case Studies, as well as actual proposals in Austria, indicate the minimum service quality that, according to market participants, has to be offered to compete with incumbents successfully is:

- regular interval timetables (a train at least every 2 hrs);
- high-quality rolling stock; and
- a speed between 200 km/h and 230 km/h (high-speed services in a narrower sense (i.e. 250 km/h or above) are generally not regarded as necessary by the present generation of entrants).

No general conclusions concerning network design exist (e.g. direct service v connections, the need to offer several routes with coordinated options to change trains).

Entry into this segment varies especially according the characteristics of the entrant.

Market entry by incumbent RUs

In the high-speed rail sector, an expansion strategy can only be introduced by an owner of suitable rolling stock, which is at present just incumbent national high-speed RUs. RUs operating conventional services do not possess suitable rolling stock at present. In this sector market entry for an existing RU in competition with an incumbent would represent a new entry to the market in the state concerned. SNCF (France), SBB (Switzerland), ÖBB (Austria) and PKP (Poland) already provide international long-distance passenger services. Benefitting from synergy effects, these services could easily be extended (e.g. extend the current services between Warszawa - Berlin to Hamburg) and set up additional intermediate stops in order to provide domestic services within Germany.

SNCF is a notably important player amongst this group of RUs, since it possesses appropriate high-speed rail rolling stock and is already providing high-speed services in Germany (i.e. between Paris and Stuttgart). However, these services are currently brought to the market through a joint venture (Alleo GmbH) formed by both SNCF and DB AG. European national railways traditionally cooperate with each other through bilateral and trilateral agreements on services, rolling stock and revenue allocation; although new organisational forms are now being introduced (see Section 4.2).

Co-operative ventures provide international transport services to an extent that almost totally excludes entry of third parties into this market. Additionally, by coordinating the service as well as having members of the consortium extend the service, market access of third parties to high-speed rail is further restricted. Furthermore, as discussed in Section 4.2, the companies who form a joint undertaking control its marketing policy.

It is likely that any co-operative strategy has implications for national markets: an aggressive entry strategy by an incumbent RU into the domestic transport market of another incumbent RU could jeopardise any international cooperation between them. This lowers potential earnings expectations from market entry.

Moreover, the RUs in question are public enterprises. Although this has not prevented competitive development in both the freight and regional passenger markets, it is questionable whether states owning the RUs in question are willing to accept more aggressive strategies for long-distance passenger rail. It can be argued that most politicians prefer a co-operative strategy aimed at strengthening the position of railways in inter-modal competition, especially in competition with air services, given issues of national prestige, the historic position of rail as a bastion of state security in the states concerned, and the potential political controversy that stems from this.

Entry by start-ups

Start-ups are the second group that the Consortium considers to be potential entrants; but the same arguments should hold for internationally oriented corporate groups.

Interviews in Germany and reports published about Austria and Sweden have firstly confirmed the characteristics required of the service, as described above, and secondly the market participants' opinion that entry can only take place with conventional rolling stock. Three reasons are usually given:

- major parts of the infrastructure do not allow a speed above 230 km/h so that high-speed trains offer only moderate advantages;

- this is further intensified by the perceived necessity or attractiveness of intermediate stops;
- the cost difference between high-speed trains and conventional trains is considerable; the use of conventional rolling stock is therefore seen as necessary to achieve a cost advantage compared to incumbents.

The entry strategy also includes partial entry, i.e. only a few connections between conurbations. Coordination of connections, to allow interchange, is planned but the setting-up of a network has been postponed (a strategy that is also followed by low-cost airlines). The quality of rolling stock and service have to match the quality that the incumbent offers, but with significantly lower prices. Lower prices are deemed necessary to compensate customers for disadvantages (speed, loss of network effects) and to match the pricing structure of the incumbent (in both states, two-part tariffs are used).[51]

The entry to the domestic market planned by Nuovo Trasporto Viaggiatori (NTV) in Italy differs from the strategy seen in Germany, Austria and Sweden in several important aspects[52]. NTV plans to use high-speed trains (twenty-five AGV units), partly in consequence, this market entry requires an investment of €650 million (see Annex 7). Additionally, NTV appears place the greatest emphasis on the high-quality segment and appears to perceive its main advantage as the improved punctuality that it anticipates delivering. As such NTV's entry may be seen as an example of a strategy that concentrates on point-to-point services (due to the geographical concentration of demand), and one that regards direct confrontation with the incumbent as promising (e.g. due to quality, specifically punctuality, problems it considers that the incumbent has experienced, and its strong financial and operational background, e.g. SNCF and investors).

2.6.3.3. Conventional rail

This sub-section describes services characterised by a speed range mainly between 160 and 200 km/h. Within this speed range, costs for rolling stock are significantly lower, expansion from tendered public services is more likely, and the competitive environment is different from the above discussed high-speed segment. Consequently, there are some clear differences compared to high-speed markets.

Particular service characteristics are likely to be developed according to the specific environment in which the route is situated; however, in general the following characteristics apply:

- intervals from hourly services to only few trains per day;
- focus on minor stations rather than main stations in larger cities to avoid capacity constraints;

[51] This kind of strategy necessarily requires the entrant to have a cost advantages. Basically, these advantages can follow from lower costs and a higher usage of the rolling stock, lower cost of distribution and a higher load factor.

[52] Nuovo Trasporto Viaggiatori (2009): http://www.ntvspa.it/en/nuovo-trasporto-viaggiatori.

- independent point-to-point services similar to low-cost airlines (coordinated timetables to follow once services are expanded);

- general low-price strategy, following two-part tariffs (e.g. railcards etc.) of the incumbent or private car operating costs as an upper price limit.

Due to limited demand, these market segments have a rather low profitability. Moreover, the segments are characterised by a low carrying capacity, i.e. only few RUs can serve the market profitably[53].

Usually all services offered by an incumbent fall under the category of the 200 km/h speed range. This can result in incumbents reacting aggressively to market entries in this segment. Thus, it is likely that competitors will use routes that are barely served or have already been abandoned by the incumbent as a starting point in order to defer direct competition to a later stage.

The quality disadvantages of services up to 200 km/h between major cities and agglomerations means that they are only promising if short-distance customers on the route are carried as well. Finally, service characteristics will depend on the strategy applied (i.e. either expansion strategy or new entry strategy).

2.6.3.4. *Regional & urban commuter rail*

Regional and urban rail services are generally perceived as unprofitable, at least from a network point of view; i.e. single routes or certain time bands could certainly be provided profitable, but not the service level that is seen as necessary from a social point of view.

Accordingly, PSO contracts dominate this segment and entry possibilities hinge mainly on the way these contracts are let, on the specification of the contracts, and on actions taken by public authorities to lower entry barriers[54]:

- contract awards may involve direct awards or tendering;

- contract design, critical for access possibilities, includes for example:

  - functional versus constructive service description[55];

  - freedom to adjust tariffs;

---

[53] See e.g. Steer, Davies & Gleave (2004).

[54] These barriers are e.g. discussed in Beck, A. (2008): *Der Ausschreibungswettbewerb im Schienenpersonennahverkehr. Markteintrittsbarrieren und Anreizmechanismen bei der Vergabe von Leistungen im SPNV*; ECMT (Ed., 2007): *Competitive Tendering of Rail Services*, Paris; Preston, J. et al. (2000): *The Franchising of Passenger Services in Britain*, in: International Review of Applied Economics, Vol. Vo. 14, pp. 99-112.

[55] A constructive tender for the scope of services is the "classical" approach. It includes a structuring as detailed as possible of the individual partial performances (positions) the prices of which are requested from the bidders. In contrast, the functional tender determines the scope of the project by the description of its function, how the service is to be performed, however, is left open.

  - design of incentive elements;

- measures to lower barriers to entry mainly involve the provision of rolling stock pools and access to incumbents' distribution channels, since investment in rolling stock and distribution channels is usually sunk and is therefore an entry risk.

These issues are discussed further in Section 7.2.6.

3. Quantative Analysis of Market

3.1. Overview & Assumptions

One of the key objectives of the quantative analysis is to determine whether or not there is evidence that market opening has had any impact on the usage of passenger rail services. To do this it is necessary to compare changes in rail use with the degree of market opening.

On the basis of available published data[56], the Consortium considers that, fundamentally, there are four main ways in which the degree of market opening could be assessed; these are to assess the change in rail use with either:

1. the extent to which open access is permitted;

2. the number of public service contracts let competitively;

3. evaluation against a score assessing the level of market opening; or

4. the proportion of traffic that has been gained by non-incumbent RUs.

It is considered that the first of these possible methods of identifying an open market is unsuitable for a number of reasons, including:

- it presupposes that open access rather than letting public service contracts is the preferred method of market opening, an issue that the Study is to determine and which cannot be assumed at the outset;

- as can be seen in the case studies of states that have undergone market opening, , there can be a disconnection between the formal degree of market opening allowed by law and the real degree of market opening provided, in particular in the case of Italy (see Annex 7) and to a lesser extent in the case of Germany (see Annex 5)), and also *soto voce* protection can be given to incumbent RUs by the detail arrangements for market opening, for example through high infrastructure charges;

- the difficulty in classifying the degree of open access provided (see below).

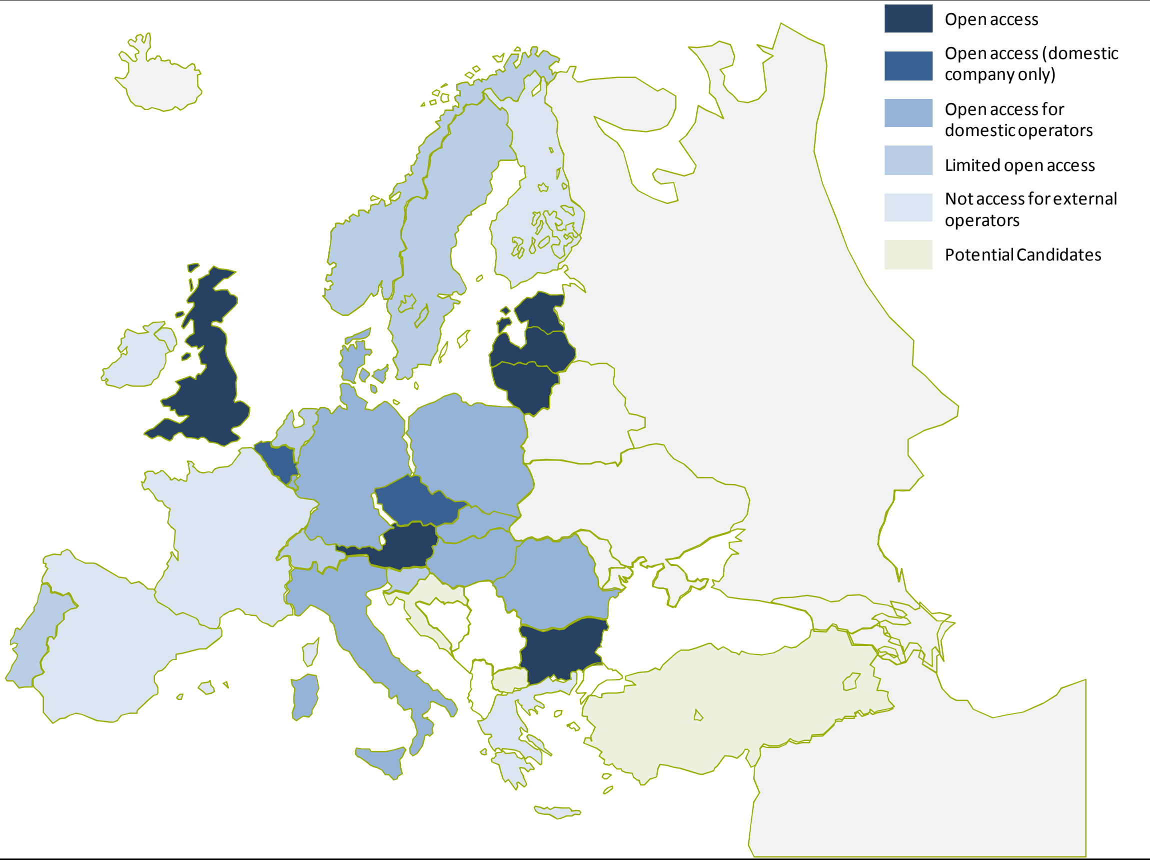
Figure 10 gives an example of how one might disaggregate between states on the basis of the degree of open access, based on the findings of a recent study[57]. One can immediately see the difficulties with this approach (note for example the way that the authors have categorised Great Britain: although universal open access rights for passenger services are theoretically available, these can only be exercised in a limited range of circumstances and are distinctly unusual: see Annex 6). It should also be noted that the classifications in this example given do not accord with Consortium's research undertaken for the German Case

[56] Quantative analysis is defined as a desktop task under the Contract (see Annex 2).

[57] *European Transport Policy – Progress and Prospects*.

Study (see Annex 5). In addition the distinctions between the second and third categories are not entirely clear to the Consortium.

Figure 15. Open Access for Commercial Passenger Services in 2009



Source: *European Transport Policy – Progress and Prospects*, ITS, citied as being based on Alexandersson, 2009

The second possible approach (number of competitive public service contracts) can be dismissed for the same reason: it is not appropriate to pre-judge whether open access or public service contracts (or indeed some combination of them) is the preferred method of market opening. In addition there are data quality issues: it is by no means clear how many fully open competitive tenders have been let (see Annex 7 for example).

The only study that has attempted to fully score the true level of market opening is the *Rail Liberalisation Index 2007* produced on behalf of DB[58]. In many ways this is an admirable and comprehensive document, use of which would provide a clear and simple way of scoring market opening against change in rail use. However, the Consortium has not been persuaded to use this document, because the criteria and especially the weightings used are debatable and especially because the approach implicitly favours open access policies over competitive tendering, this again differs from the Consortium's approach (see above).

[58] *Rail Liberalisation Index: 2007*, IBM Global Business Services, October 2007.

The Consortium has therefore used the last of the possible measures (proportion of national rail passenger traffic gained by non-incumbents). Nevertheless, also this measure has several serious drawbacks:

- it implicitly favours approaches that use structural changes;
- to an extent, it confuses the competitive process, with loss of incumbent market share being counted as a positive result;
- it implicitly and (mistakenly) denies efficiency effects if the incumbent wins a competitive tendering process, or retains a dominant market position in a genuinely competitive market for service provision.

As such, this indicator is not perfect either and its drawbacks should be kept in mind.

The figures used have been those set out in Annex 12b to the Commission staff working document accompanying the *Report from the Commission to the Council and the European Parliament on monitoring development of the rail market*[59], subject to the following modifications:

- Latvia: non-incumbent share has been taken as 0% not 9.08% as quoted in Annex 12b to the Commission's document, as this relates to AS LDZ, which a part of the incumbent passenger RU split off and given an exclusive concession for particular lines on a non-competitive basis and which can thus be regarded as an incumbent in practice;
- Hungary: non-incumbent share has been taken as 0% not 1.8% as quoted, as this relates to GySEV which is effectively an incumbent;
- Sweden: non-incumbent share has been taken as 35% based on Consortium's research (see Annex 8), as no figure is quoted in the Commission's document.

Where available, Eurostat data has been used throughout for consistency, where no suitable Eurostat data is available the source of data used is stated.

A further fundamental decision has been to disaggregate data for Member States which joined the European Community prior to 2003 ("EU15" group) from those who joined in 2004 and 2007 ("EU12" group), when performing analysis. This is to reflect the difference in market conditions for the railway industry between these two sets of states, although naturally there is considerable diversity within both of these groups[60]. For the purposes of analysing the impact of market opening only, Switzerland and Norway have

59 Commission Staff Working Document *accompanying document to the report from the commission to the council and the European parliament on monitoring development of the rail market*, COM (2009) 676 Final of 18 December 2009.

60 For example the GDP per capita in 2008 was higher in Slovenia in the EU12 group than that of Portugal in the EU15 group.

been assigned to the EU15 group, while Croatia, Macedonia, and Turkey have been assigned to the EU12 group, so far as relevant data is available.

When assessing the impact of market opening, the 2005-2008 period has been used, since 2008 is the most recent year with a complete series of Eurostat transport data, and non-incumbents providing at least some domestic passenger services in almost all cases commenced operations in or before 2005.

The Consortium considers that evaluation of the change in modal share is the best way of measuring whether there is any impact from market opening or not, being more suitable than passenger volume, as this better insulates the results from exogenous factors, such as short-term performance of the national economy. It should be noted, however, whatever indicator is used it cannot isolate the effects of rail specific developments (financial support, track access charges, and so on) from the effects of market opening.

3.2. Total Passenger Traffic

3.2.1 Aggregate traffic levels

Table 3.2.1 shows the total volume of rail passenger traffic in each of the thirty states identified in DG MOVE's *Task Specification*, in 1995, 2003, 2005, and 2008. Figure 11 shows this in graphical form over the same period.

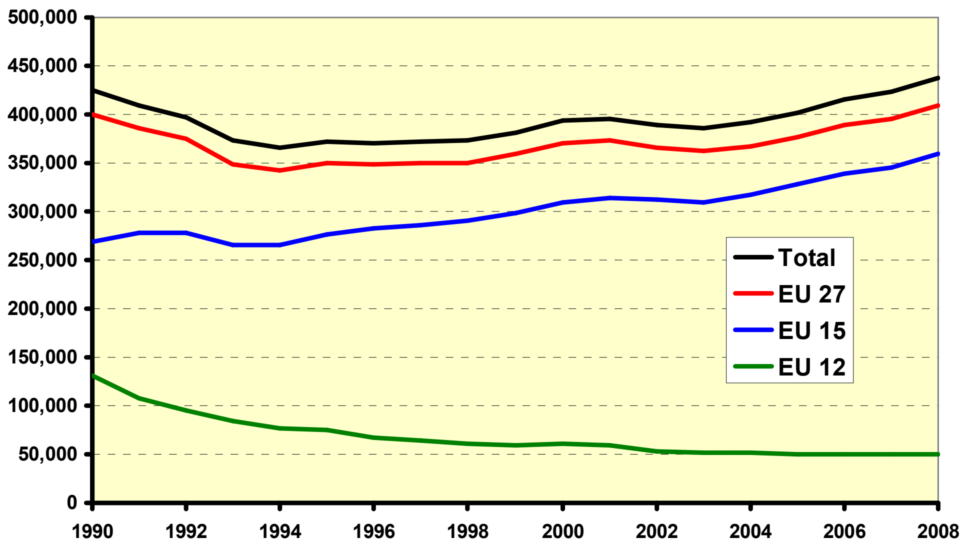
Table 3.2.1 Total rail passenger volume (M passenger-km)

	1995	**2003**	**2005**	**2008**
All	371 652	385 910	402 231	437 340
EU 27	350 525	361 887	376 968	409 198
EU15	276 133	309 962	327 391	359 942
EU12	74 392	51 925	49 577	49 256
France	55 560	71 707	76 473	84 967
Germany	70 977	71 293	74 946	81 757
United Kingdom	30 271	41 164	44 415	52 675
Italy	46 651	48 697	50 470	49 795
Spain	16,577	21 127	21 624	23 969
Poland	26 635	19 638	18 157	20 195
Switzerland	11 710	14 509	16 144	18 028
Netherlands	16 350	13 848	15 153	16 000
Sweden	6 839	8 834	8 936	11 017
Austria	10 124	8 673	9 061	10 837
Belgium	6 757	8 265	9 150	10 403
Hungary	8 441	10 286	9 851	8 293

	1995	2003	2005	2008
Romania	18 879	8 497	7 985	6 877
Czech Republic	8 023	6 518	6 667	6 803
Denmark	4 888	5 826	5 974	6 279
Turkey	5,797	5 878	5 036	5 097
Portugal	4,809	3 753	3 809	4 213
Finland	3,184	3 338	3 478	4,052
Norway	2 381	2 381	2 723	3,059
Bulgaria	4 693	2 517	2 389	2 335
Slovakia	4 202	2 316	2 182	2 296
Ireland	1 291	1 601	1 781	1 976
Croatia	1 139	1 163	1 266	1 810
Greece	1 568	1 574	1 854	1 657
Latvia	1 373	762	894	951
Slovenia	595	777	777	834
Lithuania	1 130	432	428	398
Luxembourg	287	262	267	345
Estonia	421	182	248	274
Macedonia	100	92	94	148

Source*: EU energy and transport in figures (European Commission 2010)*

Figure 16. Total Rail Passenger Traffic Volume (M passenger-km) 1990–2008

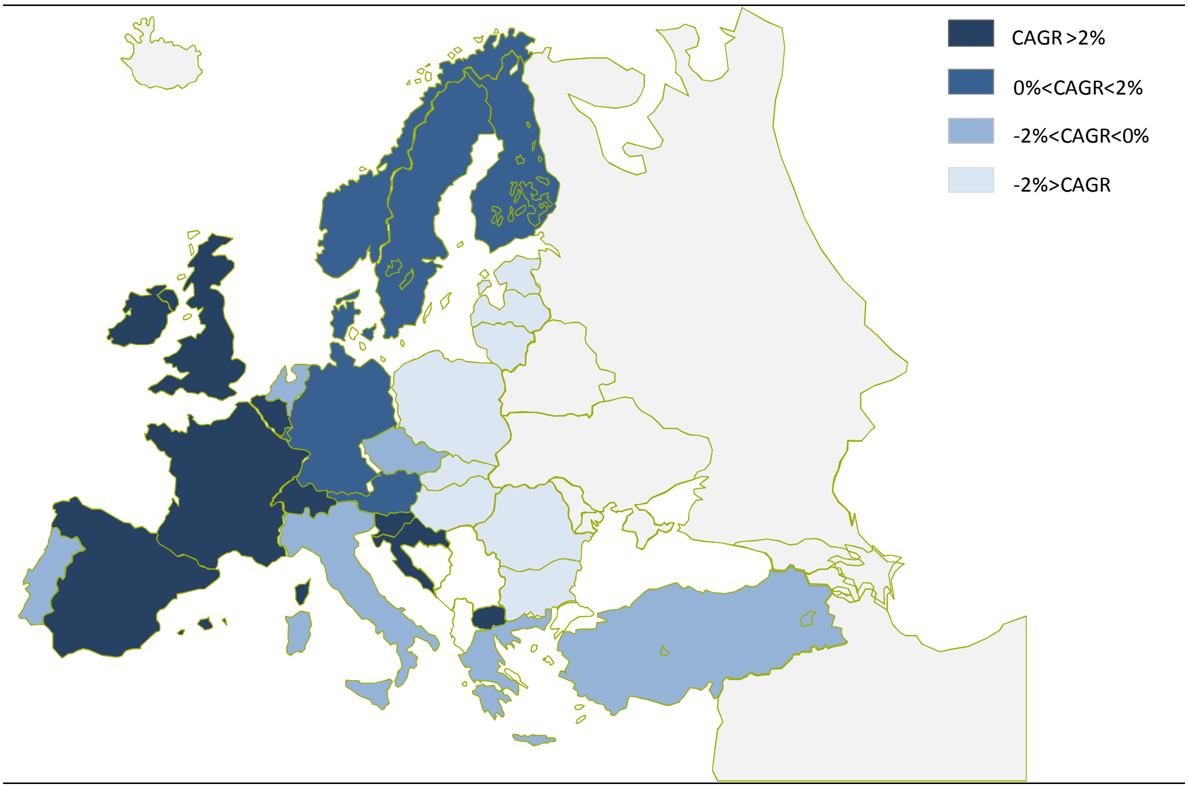


Source: *EU energy and transport in figures*, European Commission 2010

Passenger rail transport in Europe declined for many decades, until recent stabilisation, although it is arguable whether this reflects the beginnings of an upturn, or is merely a 'dead cat bounce' amplified by a one-off gain in new traffic as the high-speed rail network is constructed. In absolute terms, based on passenger volumes, passenger transport activity in the EU-27 grew between 1995 and 2008 by about 12%[61]. This, however, masked a considerable disparity in performance between states, notably between the EU15 group of states, which taken as a whole has experienced strong volume growth, and the EU12 group which has experienced a decline in passenger volumes. This decline has only showed signs of stabilising since 2005. As can be seen in Table 3.2.1 even within these two main groups there is a sharp disparity between the experiences in different states, the influence of the degree of market opening on this is explored in Section 3.3.

Figures 12 and 13 show the cumulative annual growth rates for the 1995-2008 and 2003-2008 periods respectively.

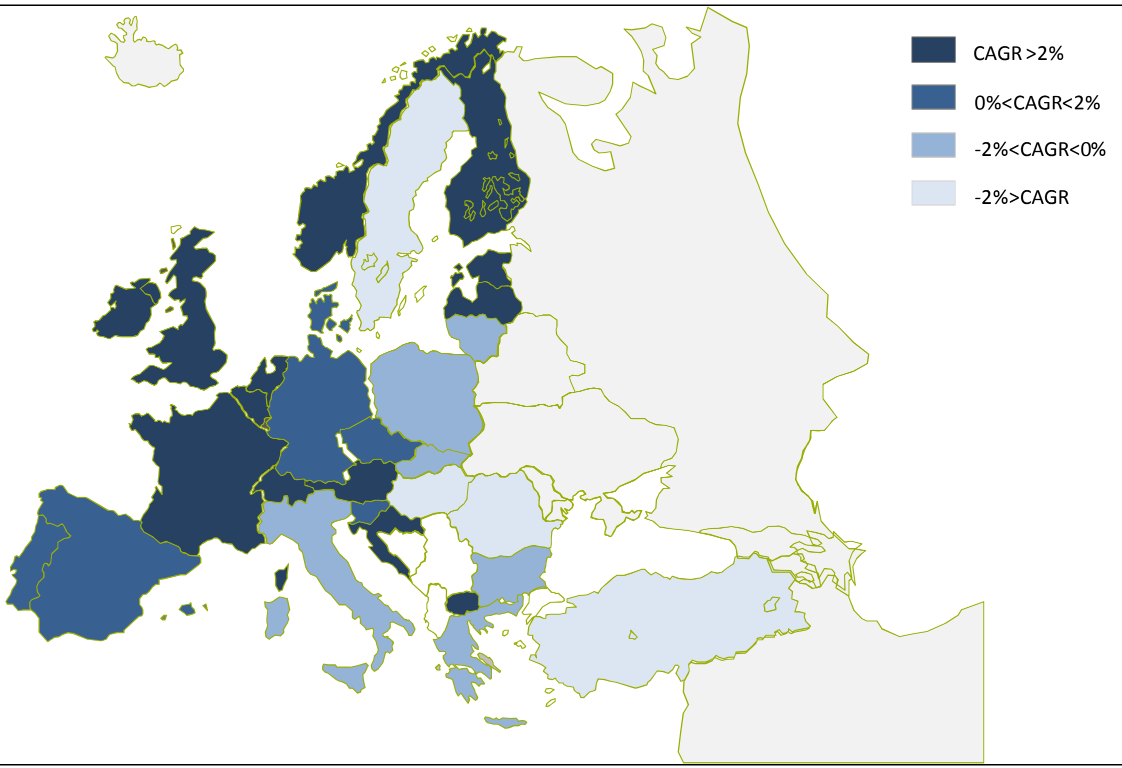
Figure 17. Total Rail Passenger Growth 1995 - 2008



Source: *European Transport Policy – Progress and Prospects*, ITS

[61] A caveat applying to all data is that the definitions of variables and methods of data collection have changed in several states over time; a classic example applies to pre-1991 German data. Accordingly there internal inconsistencies within official statistics; however, when assessed at an aggregate level it is not considered that these inconsistencies are significant.

Figure 18. Total Rail Passenger Growth 2003 - 2008



Source: *European Transport Policy – Progress and Prospects*, ITS

As noted above, the trends for the passenger rail business have improved over the past few years; passenger rail modal share has stopped falling, remaining around the 6.9% level (in the EU-27) in the 2005-07 period. This has also been a time in which some European states have undergone significant structural changes, triggered to a large extent by initiatives taken at EU level, for instance, opening up rail markets (passenger and freight) to further competition, and new improvements such as growth of high-speed rail networks.

3.2.2 The influence of high-speed rail

One of the factors complicating analysis of volume trends is the development of high-speed rail networks, which as noted in Section 2 have been successful in increasing the use of rail by attracting entirely new traffic to rail both as a result of capturing traffic from air and road but also by generating new traffic. In this regard the paper by Arie Bleijenberg *The Driving Forces Behind Transport Growth and their Implications for Policy* to the ECTM seminar in 2003 is of particular relevance[62]. This argues that growth in passenger transport is driven primarily by the availability of faster (affordable) modes in transport. Thus faster journey possibilities offered by high speed rail cause inherent growth.

[62] *Managing the Fundamental Drivers of Transport Demand*, proceedings of European Conference of Ministers of Transport 2003.

Traffic gained by the construction of new high-speed rail routes therefore tends to mask underlying trends in rail passenger use, and in order to see the trends properly it is important to remove the influence of the development of Europe's high-speed rail network from the traffic figures. The issue is not the existence of high-speed rail *per se*, but the rapid rate of expansion of the high-speed network over the period that is being assessed (expanding from 2447 km in 1995 to 5760 km in 2010: Eurostat).

Table 3.2.2 and Figure 14 show the growth in high-speed rail traffic, based on the definition of high-speed rail adopted by Eurostat.

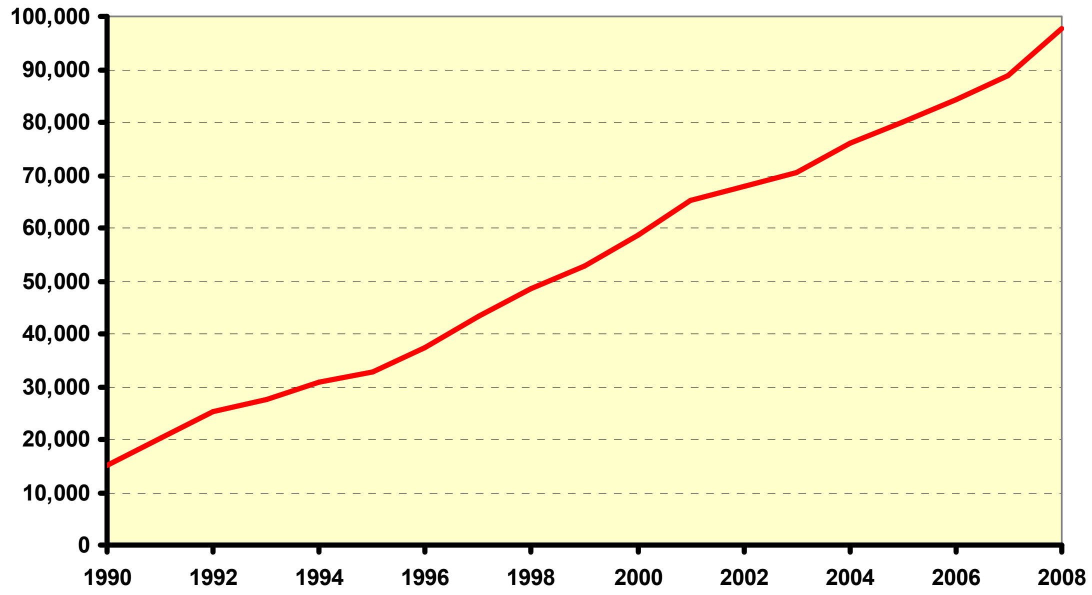
Table 3.2.2 High-speed rail passenger volume (M passenger-km)

	1995	2003	2005	2008
All	32 845	70 618	80 107	97 603
Belgium	0	878	982	1 079
Czech Republic	0	0	0	253
Germany	8 700	17 457	20 853	23 333
Spain	1 200	2 027	2 324	5 483
France	21 430	39 604	43 130	52 564
Italy	1 100	7 431	8 550	8 878
Netherlands	0	664	687	867
Finland	0	157	311	622
Portugal	0	0	490	525
Slovenia	0	0	0	14
Sweden	415	2 400	2 330	2 992
United Kingdom	n/a	n/a	450	993

Source*: EU energy and transport in figures (European Commission 2010)*

It should be noted Eurostat figures credit the Czech Republic and Slovenia with having a high-speed rail services, whereas in practice trains actually are limited to 160km/h, and thus are technically not high-speed as defined by Directive 96/48/EEC. Norwegian high-speed trains are also ignored in the Eurostat figures. Eurostat's definitions have been retained for internal consistency; indeed since the Czech and Slovenian "high-speed" volumes form an insignificant proportion of the total their inclusion therefore has an utterly trivial impact at a European level.

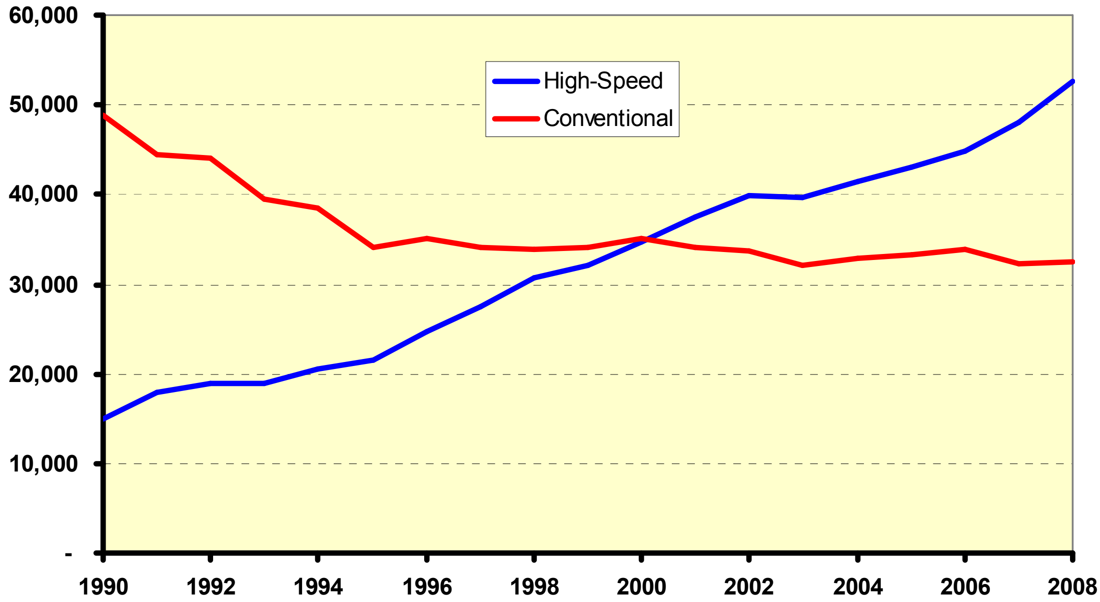
Figure 19. High Speed Rail Passenger Traffic Volume (M passenger-km) 1990–2008



Source: *EU energy and transport in figures*, European Commission 2010

Figure 14 illustrates the explosive growth of high speed rail, which has increased from less than 4% of EU rail travel in 1990 to almost 24% in 2008. The impact of the successful investment in high-speed rail on total rail use can be seen most clearly in the nation which has developed the most extensive high-speed rail network: France. It can be seen in Table 3.2.1 that over the past two decades France has overtaken Germany as the Member State with the greatest volume of passenger traffic; this is, at least partially, as a result of the investment that it has made in developing and expanding its high speed rail network. Figure 15 shows the relative trends of high-speed and conventional traffic in France.

Figure 20. French High Speed & Conventional Rail Passenger Traffic Volume (M passenger-km) 1990–2008



Source: *EU energy and transport in figures*, European Commission 2010

Between 1990 and 2008 the overall volume of rail passenger traffic increased by 33.3%, driven by an increase of 253% in the use of high-speed rail. What this success story has masked, however, has been the decline in the use of the conventional network, whose usage declined by 33.7% over the same period, and still appears to be in slow decline.

It is simplistic to argue that all high-speed traffic is new to rail, as some traffic has been transferred from the conventional express sector, particularly where these have been degraded or replaced when high-speed lines have been built in their corridors, as has happened in France (for example, diversion of conventional Bordeaux-Lyon traffic to TGV services via Paris). However, studies undertaken after the opening of *TGV Sud Est* indicated that between 1981 and 1984 the overall growth in rail's modal share on the corridor increased from 28% to 52%, in a market that grew by "around 30%"[63], the market has grown by a further 75% or so to 2000[64]. Thus even on a route which was already well served by express trains, less than a quarter of all users of the mature high-speed rail service would have been rail passengers previously. On other routes the proportion of new rail users is much higher (see for example studies made of AVE ridership in Spain). There are, however, issues with the differing ways in which high-speed rail has been applied in different states, in Spain for example, despite some projection onto conventional tracks (e.g. to Cadiz), high-speed traffic has been concentrated on new dedicated high-speed infrastructure, whereas in the case of Germany and Sweden for example high-speed trains

[63] *COST 318: Interaction between High Speed and Air passenger Transport*, for the European Commission 1995-98.

[64] Consortium research from various sources.

run extensively on conventional tracks directly replacing conventional trains, resulting in a higher proportion of existing rail users. It has therefore been assumed for the purposes of analysis of the underlying trends herein that 30% of high-speed rail ridership relates to passengers who have transferred from conventional rail[65].

3.2.3 Underlying rail volume trends

Table 3.2.3 and Figure 16 shows the underlying change in rail volumes, based on the above analysis and assumptions, once adjustment has been made for the impact of the development of Europe's High Speed Network.

Table 3.2.3 Rail passenger volume after removal of impact of high-speed rail network construction (M passenger-km)

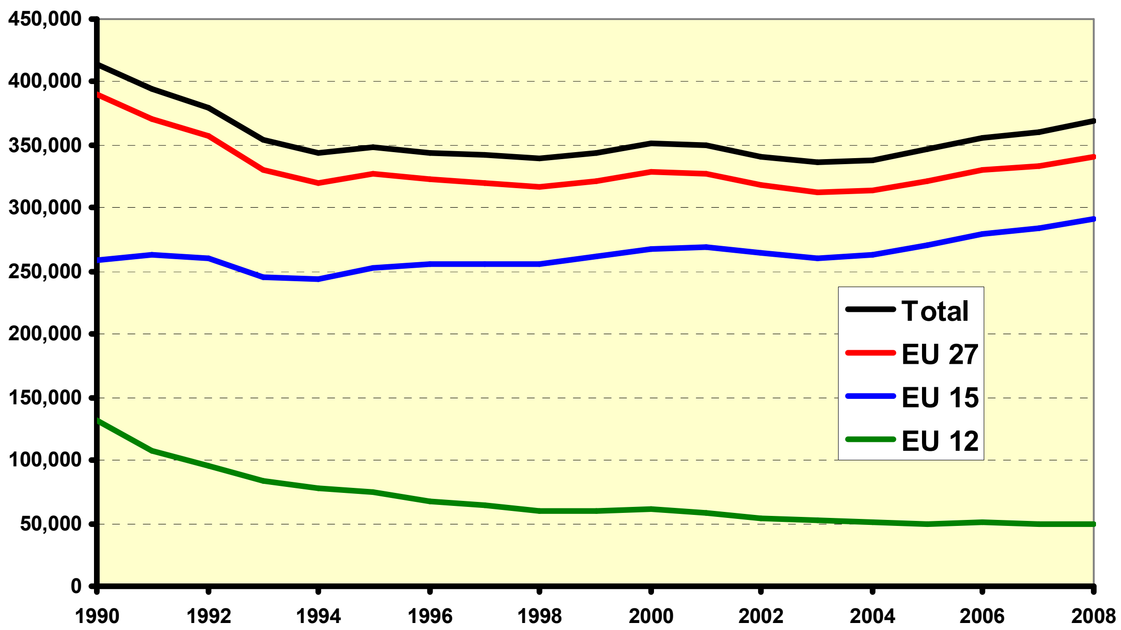
	1995	2003	2005	2008
All	348 660	336 477	346 156	369 018
EU 27	327 533	312 454	320 893	340 876
EU15	253 141	260 529	271 316	291 807
EU12	74 392	51 925	49 577	49 069
Germany	64 887	59 073	60 349	65 424
United Kingdom	30 271	41 164	44 100	51 980
France	40 559	43 984	46 282	48 172
Italy	45 881	43 495	44 485	43 580
Poland	26 635	19 638	18 157	20 195
Spain	15 737	19 708	19 997	20 131
Switzerland	11 710	14,509	16 144	18,028
Netherlands	16 350	13 383	14 672	15 393
Austria	10 124	8 673	9 061	10 837
Belgium	6 757	7 650	8 463	9 648
Sweden	6 549	7 154	7 305	8 923
Hungary	8 441	10 286	9 851	8 293
Romania	18 879	8 497	7 985	6 877
Czech Republic	8 023	6 518	6 667	6 626
Denmark	4 888	5 826	5 974	6 279
Turkey	5 797	5 878	5 036	5 097
Portugal	4 809	3 753	3 466	3 846

65 Note, however, that some rail industry sources claim far lower figures for existing ridership, indeed the following Thalys document implies that without Thalys all rail traffic would divert to other modes: http://www.thalys.com/img/guide-pratique/developpement-durable/bilan-carbone-en.pdf, the Consortium do not consider this credible.

	1995	2003	2005	2008
Finland	3 184	3 228	3 260	3 617
Norway	2 381	2 381	2 723	3 059
Bulgaria	4 693	2 517	2 389	2 335
Slovakia	4 202	2 316	2 182	2 296
Ireland	1 291	1 601	1 781	1 976
Croatia	1 139	1 163	1 266	1 810
Greece	1 568	1 574	1 854	1 657
Latvia	1 373	762	894	951
Slovenia	595	777	777	824
Lithuania	1 130	432	428	398
Luxembourg	287	262	267	345
Estonia	421	182	248	274
Macedonia	100	92	94	148

Source*: EU energy and transport in figures (European Commission 2010)*

Figure 21. Rail Passenger Traffic Volume Corrected for High-Speed Rail Construction (M passenger-km) 1990–2008



Source: *EU energy and transport in figures*, European Commission 2010

Table 3.2.3 and Figure 16 show that once one removes the impact of high-speed rail network development from the picture, the trend of strong volume growth seen in Figure 11 is considerably less pronounced.

3.2.4 Relative importance of domestic and international rail traffic

Table 3.2.4 shows the relative significance of domestic and international traffic. It can be seen that in all states domestic traffic is a much more important component of the rail passenger business than international traffic. Only in Belgium, Estonia, Luxembourg, and Austria does the proportion of international passenger traffic exceed 10% of the total.

Table 3.2.4 Disaggregation of Domestic and International Rail Traffic (M pax km)

	2007			2008		
	Total	**Internat'l**	**Domestic**	**Total**	**Internat'l**	**Domestic**
AT	10 815	2 354	8 139	11 140	2 590	8 439
BE	9 932	1 386	8 547	10 403	1 491	8 913
BG	2 423	86	2 238	2 334	70	2 264
HR	6 900	364	6 839	6 799	n/a	n/a
CZ	n/a	n/a	n/a	n/a	n/a	n/a
DK	6 353	438	5 915	6 471	488	5 983
EE	272	26	246	274	29	245
FI	3 778	103	3.675	4 052	112	3 940
FR	80 300	7 510	72 800	85 000	n/a	n/a
DE	79 103	3 587	75 516	81 765	3 856	76 909
GR	1 930	77	1.853	2 003	n/a	n/a
HU	8 752	297	8 379	8 304	310	7 923
IE	2 007	105	1.902	1 976	100	1 876
IT	n/a	n/a	n/a	n/a	n/a	n/a
LV	983	94	889	941	76	865
LT	409	24	223	398	22	235
LU	316	84	233	345	99	246
NO	2 956	61	2 895	3 114	67	3 047
NL	15 890	250	15 630	n/a	n/a	16 200
PL	19 495	723	18 772	20 258	635	19 624
PT	3 987	55	3 933	4 205	120	4 085

	2007			2008		
	Total	Internat'l	Domestic	Total	Internat'l	Domestic
RO	7 476	146	7 330	6 958	152	6 806
SK	2 148	195	1 953	2 279	202	2 077
SI	812	49	690	834	53	713
ES	19 966	618	19 348	22 072	611	21 461
SE	10 270	502	9 767	11 035	n/a	n/a
UK	50 200	1 500	48.600	52 100	1 600	50 500

Source: European Commission, it is noted that not all totals sum, although in some cases this is due to transit passengers

3.3. Rail Market Share

3.3.1 Aggregate traffic levels

Table 3.3.1 and Figure 17 show the modal share trends in the surface transport market for passenger rail as a whole.

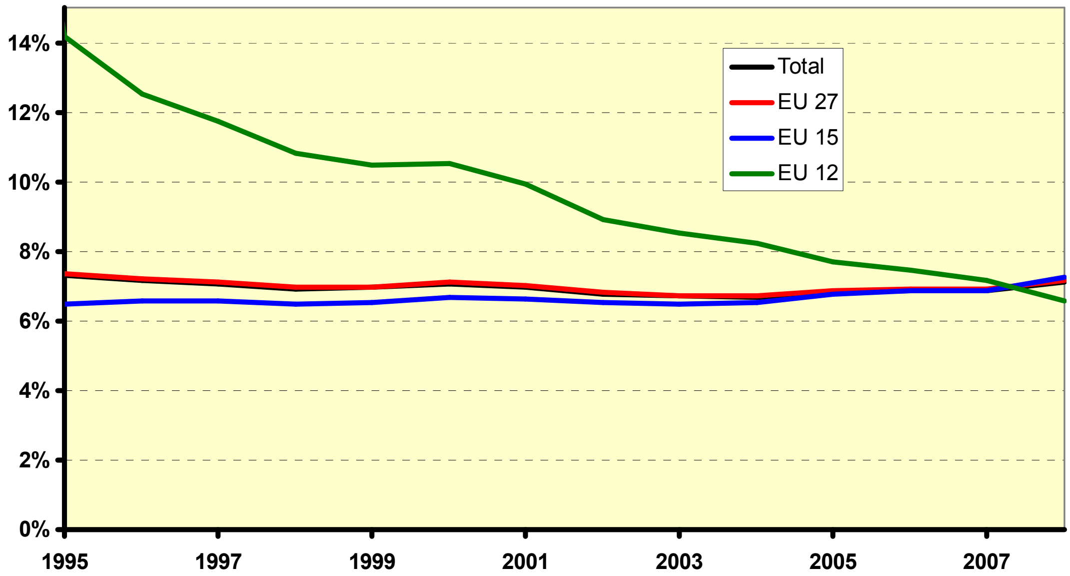
Table 3.3.1 Total rail modal share

	1995	2003	2005	2008
All	**7.32%**	**6.70%**	**6.83%**	**7.11%**
EU 27	**7.34%**	**6.71%**	**6.86%**	**7.17%**
EU15	**6.50%**	**6.48%**	**6.76%**	**7.26%**
EU12	**14.17%**	**8.50%**	**7.68%**	**6.58%**
Belgium	5.68%	6.23%	6.70%	7.29%
Bulgaria	11.30%	5.23%	4.63%	3.90%
Czech Republic	9.03%	6.59%	6.74%	6.52%
Denmark	n/a	9.08%	9.31%	9.42%
Germany	7.32%	7.05%	7.39%	8.06%
Estonia	5.45%	1.78%	1.91%	2.06%
Ireland	n/a	n/a	3.43%	3.37%
Greece	2.36%	1.56%	1.68%	1.32%
Spain	5.33%	5.31%	5.17%	5.57%
France	7.45%	8.30%	8.89%	9.80%
Italy	6.19%	5.64%	5.96%	5.66%
Latvia	12.47%	4.60%	5.53%	4.60%

	1995	2003	2005	2008
Lithuania	n/a	n/a	n/a	n/a
Luxembourg	n/a	n/a	n/a	n/a
Hungary	11.57%	13.21%	12.85%	11.80%
Netherlands	10.15%	8.02%	8.55%	9.04%
Austria	12.01%	9.57%	9.77%	11.10%
Poland	15.10%	8.67%	7.29%	6.21%
Portugal	6.96%	3.89%	3.78%	4.08%
Romania	24.45%	10.39%	9.14%	7.00%
Slovenia	n/a	n/a	n/a	n/a
Slovakia	11.34%	6.31%	5.91%	6.07%
Finland	5.17%	4.69%	4.73%	5.37%
Sweden	6.45%	7.60%	7.64%	9.15%
United Kingdom	4.32%	5.34%	5.72%	6.64%
Croatia	6.25%	4.16%	4.34%	5.40%
Macedonia	n/a	n/a	n/a	n/a
Turkey	4.02%	3.44%	2.52%	2.17%
Norway	4.65%	3.91%	4.42%	4.65%
Switzerland	12.70%	14.29%	15.42%	16.50%

Source*: Consortium analysis of Eurostat data (note exhibits small differences from official Eurostat modal split data)*

Figure 22. Rail Passenger Market Share 1995-2008



Source: *Consortium analysis based on Eurostat data*

The disparity in performance between the EU15 and EU12 groups of states is once again clear: while railways in the new Member States in the EU12 group have had difficulties in maintaining both volume and modal share in a market economy, the pre-2003 Member States in the EU15 have managed to achieve a modest improvement in modal share from 6.5% in 1995 to 7.3% in 2008. The position at an EU level is less encouraging; however, as the continuing slide in the market position in EU12 states is largely wiping out the improvement being achieved in the EU15 group. The Consortium considers that the policy implications of this is to emphasise the importance of introducing measures that are compatible with arresting the slide in market position of railways in the new Member States.

Again considerable disparity in performance between individual states in each group can be observed in Table 3.3.1.

To set the position in a longer-term context, although rail passenger traffic has enjoyed modest and steady growth since 1970, the picture in relation to modal split looks less encouraging, rail's share of passenger traffic in the EU15 group in 1970 was some 10.6%.

3.3.2 Underlying rail volume trends

Table 3.3.2 and Figure 18 shows the underlying change in modal share, based on the above analysis and assumptions, once adjustment has been made for the impact of the development of Europe's High Speed Network.

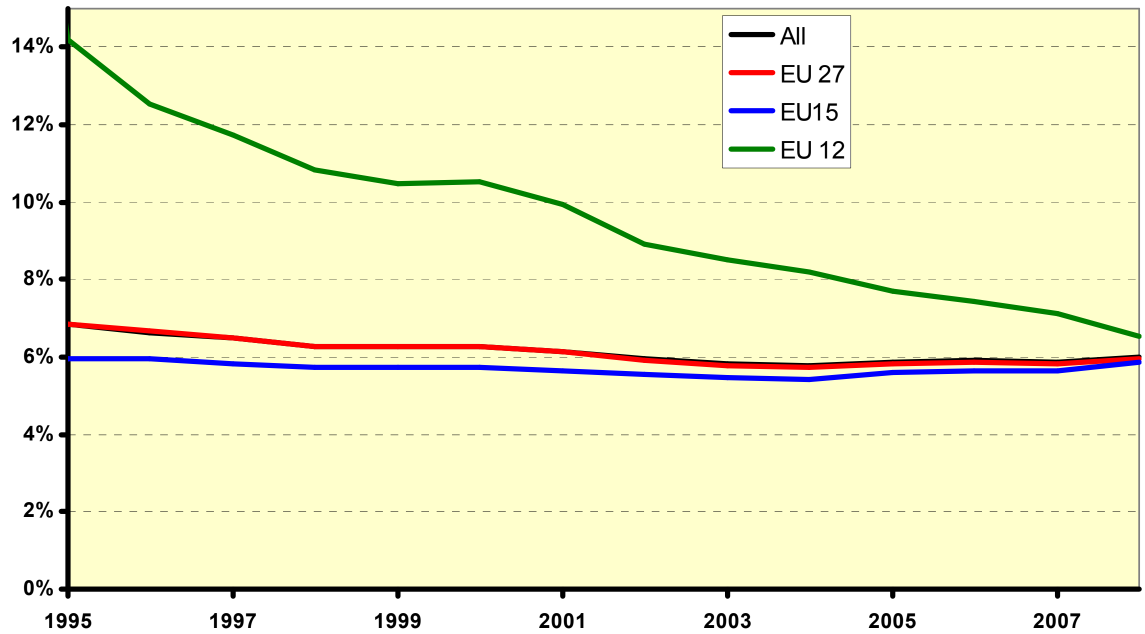
Table 3.3.2 Rail modal share after removal of impact of high-speed rail network construction

	1995	2003	2005	2008
All	**6.85%**	**5.84%**	**5.87%**	**6.00%**
EU 27	**6.85%**	**5.78%**	**5.84%**	**5.97%**
EU15	**5.95%**	**5.44%**	**5.60%**	**5.89%**
EU12	**14.17%**	**8.50%**	**7.68%**	**6.56%**
Belgium	5.68%	5.77%	6.20%	6.76%
Bulgaria	11.30%	5.23%	4.63%	3.90%
Czech Republic	9.03%	6.59%	6.74%	6.35%
Denmark	n/a	9.08%	9.31%	9.42%
Germany	6.69%	5.84%	5.95%	6.45%
Estonia	5.45%	1.78%	1.91%	2.06%
Ireland	n/a	n/a	3.43%	3.37%
Greece	2.36%	1.56%	1.68%	1.32%
Spain	5.06%	4.95%	4.78%	4.68%
France	5.44%	5.09%	5.38%	5.56%
Italy	6.09%	5.03%	5.25%	4.95%
Latvia	12.47%	4.60%	5.53%	4.60%
Lithuania	n/a	n/a	n/a	n/a
Luxembourg	n/a	n/a	n/a	n/a
Hungary	11.57%	13.21%	12.85%	11.80%
Netherlands	10.15%	7.75%	8.28%	8.69%
Austria	12.01%	9.57%	9.77%	11.10%
Poland	15.10%	8.67%	7.29%	6.21%
Portugal	6.96%	3.89%	3.44%	3.72%
Romania	24.45%	10.39%	9.14%	7.00%
Slovenia	n/a	n/a	n/a	n/a
Slovakia	11.34%	6.31%	5.91%	6.07%
Finland	5.17%	4.54%	4.44%	4.79%
Sweden	6.17%	6.15%	6.24%	7.41%
United Kingdom	4.32%	5.34%	5.68%	6.55%
Croatia	6.25%	4.16%	4.34%	5.40%
Macedonia	n/a	n/a	n/a	n/a
Turkey	4.02%	3.44%	2.52%	2.17%

	1995	2003	2005	2008
Norway	4.65%	3.91%	4.42%	4.65%
Switzerland	12.70%	14.29%	15.42%	16.50%

Source*: EU energy and transport in figures (European Commission 2010)*

Figure 23. Rail Modal Share Corrected for High-Speed Rail Construction 1990–2008



Source: *EU energy and transport in figures*, European Commission 2010

It can be seen that once one removes the impact of the inherent increase in rail use delivered by construction and development of the high-speed rail network that the picture is considerably less encouraging. There is little change in the trend previously observed for the EU12 group because of the limited scale of high-speed rail operations in new Member States; however, once one examines the underlying trends in the EU15 group the picture changes from one of modest growth to one where rail declined slowly until 2004, followed by a slight improvement. Again, however, the disparity in performance between states is significant: in the four timeframes selected in Table 3.3.2, only Belgium, and the United Kingdom have shown consistent modal share growth between each timeframe, while Sweden only fails to meet the same criteria by 0.02% in 2003. It is notable that Sweden and the United Kingdom (in Great Britain) are the Member States that have adopted the most radical changes to the structures of their railway industries.

3.3.3 Impact of market opening on modal share

The 2008 figures for the passenger market share held by non-incumbents have been taken as follows (source: *Report from the Commission to the Council and the European Parliament on monitoring development of the rail market*, amended as described in Section 3.1):

Belgium	0.00 %
Bulgaria	0.00 %
Denmark	9.00 %
Germany	10.10 %
Estonia	57.70 %
Ireland	0.00 %
Greece	0.00 %
Spain	0.00 %
France	0.00 %
Lithuania	0.00 %
Latvia	0.00 %
Hungary	0.00 %
The Netherlands	2.00 %
Austria	12.00 %
Poland	11.10 %
Romania	1.10 %
Slovakia	6.30 %
Slovenia	0.00 %
Finland	0.00 %
Sweden	35.00 %
United Kingdom	100.00 %
Norway	12.00 %

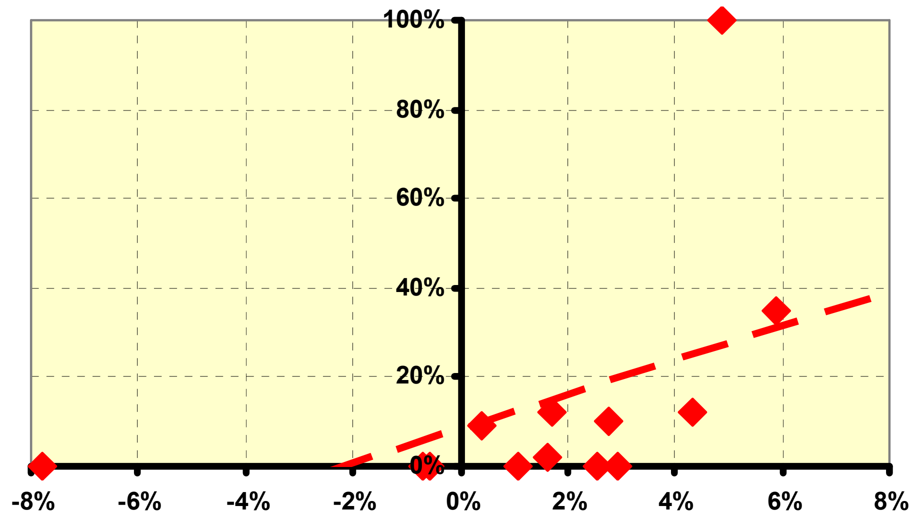
It will be noted that figures are not available for the Czech Republic, Italy, Portugal, Switzerland, Croatia, Macedonia, or Turkey, which have therefore not been included in the analysis. In addition Lithuania and Slovenia were also removed because of the lack of modal share information for 2005 and 2008. It should be noted that it is questionable whether the figure of 100% quoted for the United Kingdom, is too high in this context, given that some franchises are still operated by the descendents of management buy outs[66], even though it is strictly correct if one ignores Northern Ireland (still operated by incumbent) [67].

[66] Albeit now absorbed into larger transport groups.

[67] Northern Ireland Railways are responsible for less than 0.4% of all UK rail passenger kilometres.

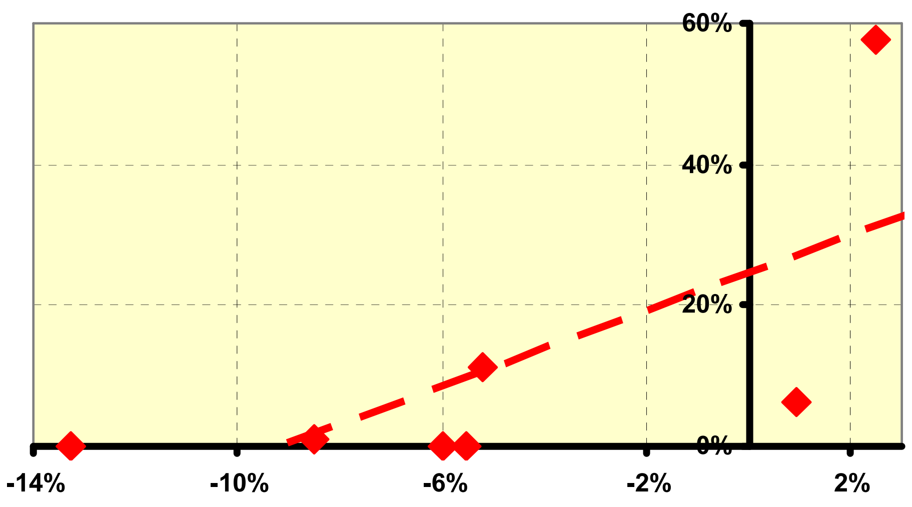
Figures 19 and 20 show the relationship between the degree of real market opening, as measured by the market share held by non-incumbents, and the change in underlying rail modal share between 2005 and 2008. Figure 19 is for the EU15 (i.e. pre-2003) Member States and Norway, while Figure 20 is for the EU12 (i.e. post-2003) Member States. (Percentage figure quoted is cumulative annual growth rate).

Figure 24. Non-Incumbent Passenger RUs v Relative Underlying Rail Modal Share Change 2005-2008 for EU15 Grou



Source: *Consortium analysis based on Eurostat & European Commission data*

Figure 25. Non-Incumbent Passenger RUs v Relative Underlying Rail Modal Share Change 2005-2008 for EU12 Gro

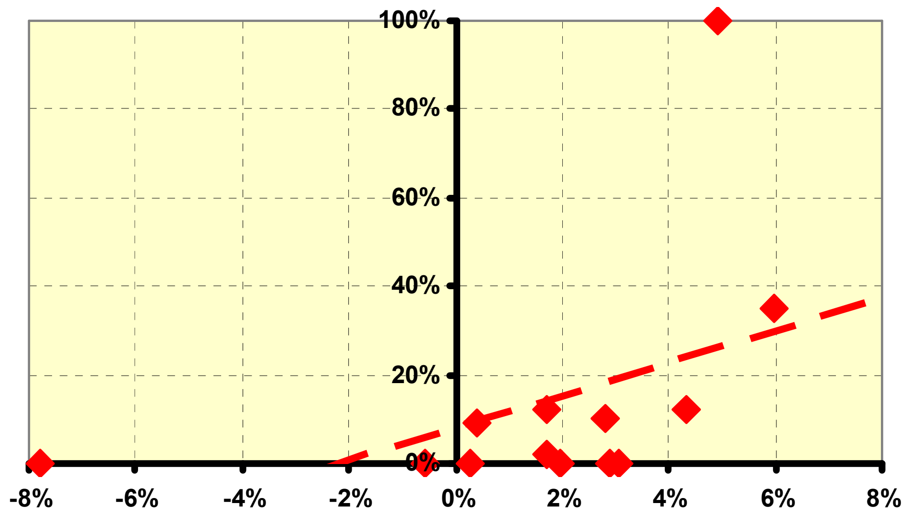


Source: *Consortium analysis based on Eurostat & European Commission data*

It can be seen that in both cases there is a correlation between the degree of market opening and the performance of the national passenger rail industry, measured by the relative change in modal share. In both cases a linear trend line has been automatically inserted; however, this should be treated with great caution, partly on account of limited data quantity, but mainly because, although the market share held by non-incumbents is considered to be the best available quantifiable measure of market opening, it is an imperfect measure (see Section 3.1). The trend line should therefore be considered as indicative of the general trend only. Furthermore there is scope for considerable debate as to form of any trend curve; although it could be argued that the curve is exponential in nature, implying that while the impact of market opening on ridership increases with the degree of market opening the rate of improvement incrementally decreases as the market becomes more open.

Sensitivity analysis has been undertaken to ascertain whether the assumptions made on proportion of passengers travelling on a mature high-speed rail system that would have otherwise used conventional rail services has had a material impact on the results for the EU15 group of states. Figure 21 shows the results if the figure is set at 50% (an implausibly high figure in the Consortium's view).

Figure 26. Impact of Market Opening – EU15 Sensitivity Test



Source: *Consortium analysis based on Eurostat & European Commission data*

It can therefore be seen that the value set for the high-speed rail ridership which would have otherwise used conventional rail services, when determining the impact of high-speed network development on the underlying traffic levels, does not materially affect the results, when the value is set within sensible bounds.

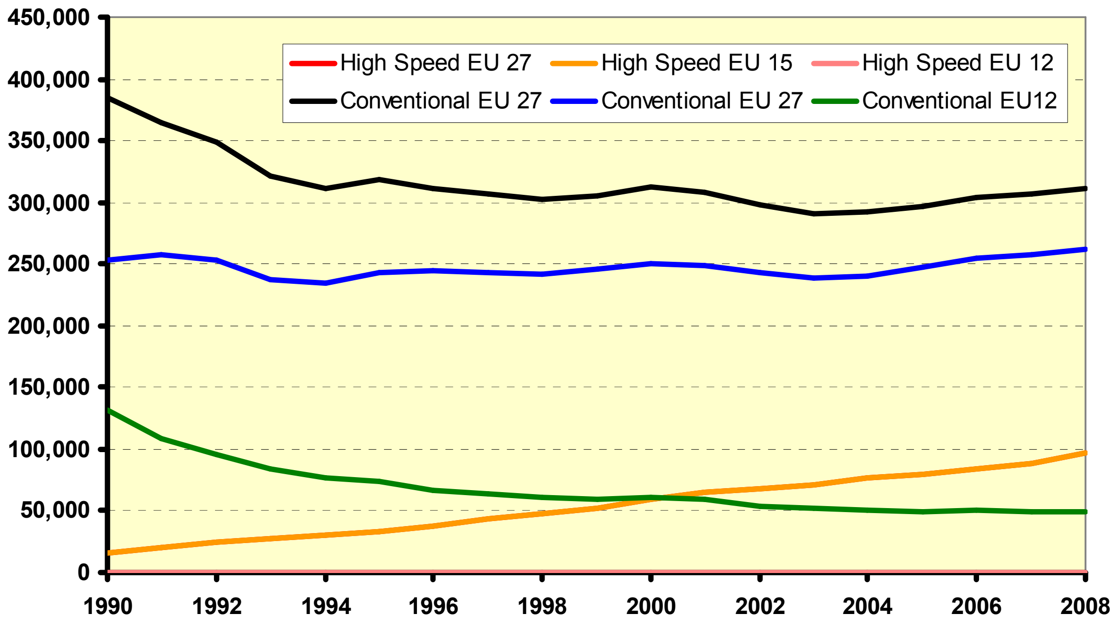
3.4. Segmented Analysis

3.4.1 High Speed in Europe

As noted above, a number of states are investing heavily in rail infrastructure for high-speed passenger services or to expand capacity and to provide new high-speed networks: high-speed rail has come to form an important part of the twenty-first century transport landscape. The use of high speed rail almost doubled in volume in the decade up between 1998 and 2008 by which time it comprised almost 24% of passenger rail travel in the EU. This trend can only to increase as further high-speed rail lines are commissioned: Turkey opened its first high speed line in 2009, Austria and Switzerland are also constructing lines to allow them to join the 'high–speed club', further high-speed lines are under construction in Spain, France, Germany and Italy, and lines are being planned in a number of other states.

Figure 22 shows the relative trends in high-speed and conventional rail use in the EU, showing the increasing importance of high-speed rail to Europe's railway industry, but also the present dominance of conventional rail. (Note "High Speed EU 27" and "High Speed EU15" lines appear superimposed in Figure 22, while the trend line for "High Speed EU12" line is indistinguishable from the x-axis).

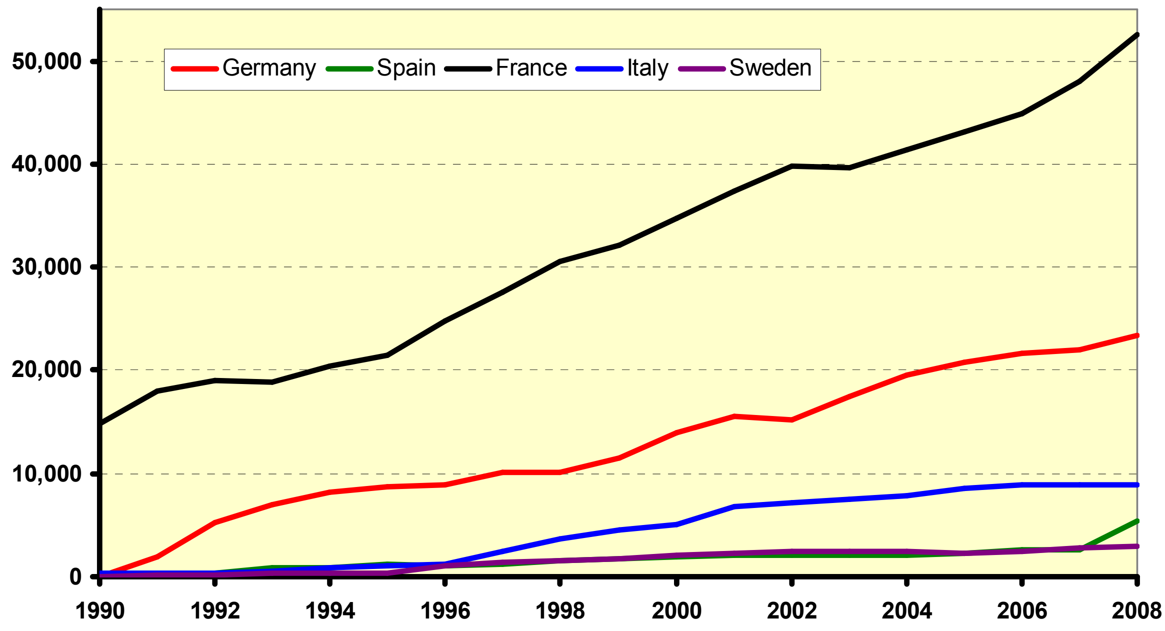
Figure 27. High-Speed & Conventional Passenger Volume Trends 1990-2008 (M passenger-km)



Source: *Eurostat*

Table 3.2.2 above, gives the passenger volumes for all states regarded by Eurostat as having high-speed rail services in 2008. Figure 23 shows the individual trends for the five states with the greatest volume of high-speed passenger traffic. All show strong trends of expansion over time, but to an extent the rate of increase in each case has been driven by the rate of investment in new high-speed routes (whether on dedicated or upgraded tracks).

Figure 28. Growth of high-speed passenger volumes 1998-2007 (M passenger-km)

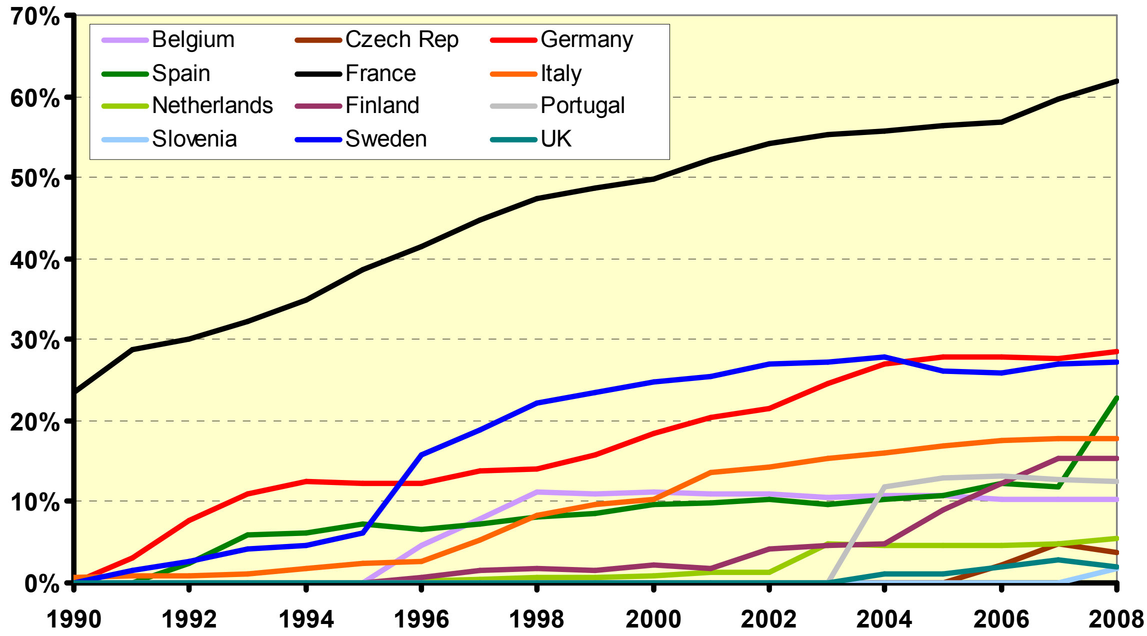


Source: *Eurostat*

The appearance of high-speed rail services in Europe in 1981 was a key element in arresting the decline of rail's modal share. Before the arrival of high-speed services, rail consistently lost market share to road and air. States which have invested heavily in high-speed have been rewarded considerable volumes of traffic on high-speed rail networks much of it gained at the expense of civil aviation.

In states that have constructed high-speed rail systems these are responsible for a high proportion of total passenger rail use: in 2008 high-speed formed 61.9% of total passenger rail traffic in France, 28.5% in Germany, 27.2% in Sweden, 22.9% in Spain, and 17.8% in Italy. Almost wherever high-speed rail services have been provided they are providing an increasing proportion of total rail use, Figure 24 shows the trends on a state-by-state basis. (Note that this is based on Eurostat's definition of high-speed rail).

Figure 29 Proportion of Passenger Rail Traffic Delivered by High-Sped Rail, by State 1990-2008



Source: *Eurostat*

As shown in Table 3.4.1, there are identifiable modal shifts from both road and air when high-speed rail corridors are opened. This tends to leave air carriers (particularly low cost carriers) just with markets between the more peripheral regions or over longer distances. In this way, for example, rail has entirely captured former air traffic between Brussels and Paris, has made substantial inroads into it between Paris and Marseille and Toulouse but air still has a substantial share of journeys between the English Midlands and Continental Europe. This reinforces the view that whereas high-speed rail is a complete response where its investment can be justified, elsewhere action to improve conventional rail is needed to enable rail to meet competitive challenges, and thus to grow its modal share in accordance with EU policy targets.

Table 3.4.1- High Speed Rail & Air Modal Shares 1998 & 2008

State & Year		**Air**	**High Speed Rail**	**Change 1998-2008**
Belgium	**2008**	30.1%	69.9%	**42.80%**
	1998	72.9%	27.1%	
Czech Republic	**2008**	68.1%	31.9%	**n/a**
	1998	n/a	n/a	

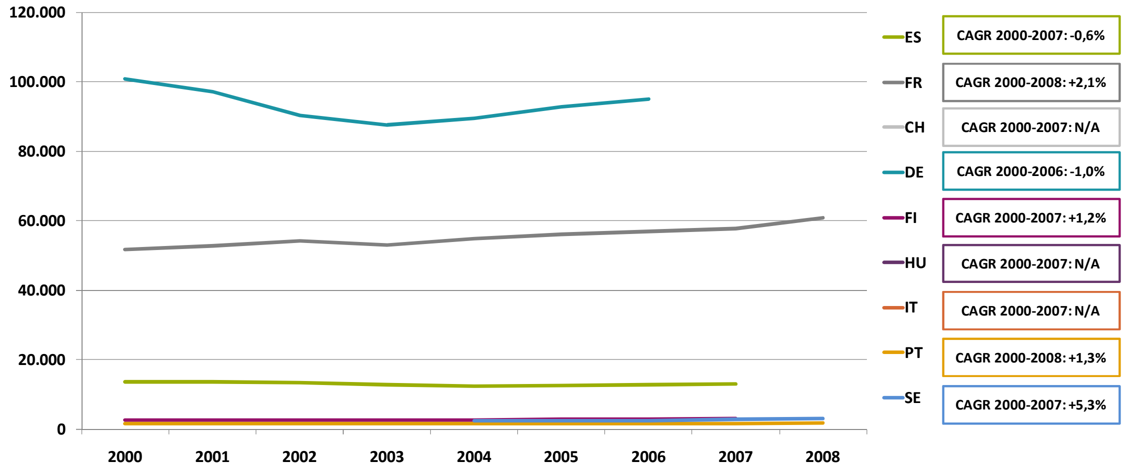
State & Year		Air	High Speed Rail	Change 1998-2008
Germany	**2008**	69.6%	30.4%	**7.50%**
	1998	77.1%	22.9%	
Spain	**2008**	84.6%	15.4%	**9.00%**
	1998	93.6%	6.4%	
France	**2008**	52.4%	47.6%	**2.10%**
	1998	54.5%	45.5%	
Italy	**2008**	82.8%	17.2%	**-6.50%**
	1998	76.3%	23.7%	
The Netherlands	**2008**	90.0%	10.0%	**7.80%**
	1998	97.8%	2.2%	
Portugal	**2008**	93.4%	6.6%	**n/a**
	1998	n/a	n/a	
Finland	**2008**	83.4%	16.6%	**13.40%**
	1998	96.8%	3.2%	
Sweden	**2008**	75.0%	25.0%	**n/a**
	1998	n/a	n/a	
United Kingdom	**2008**	n/a	n/a	**n/a**
	1998	n/a	n/a	

Source: EU *energy and transport in figures*

3.4.2 Long distance & regional rail

In 2006 the Commission published its mid-term review of progress in the 2001 Transport White Paper. This identified the need for rail to play a greater part in certain key markets such as bulk freight, long-distance freight, intercity and commuter passenger transport. Figure 25 identifies trends in the long-distance passenger rail segment.

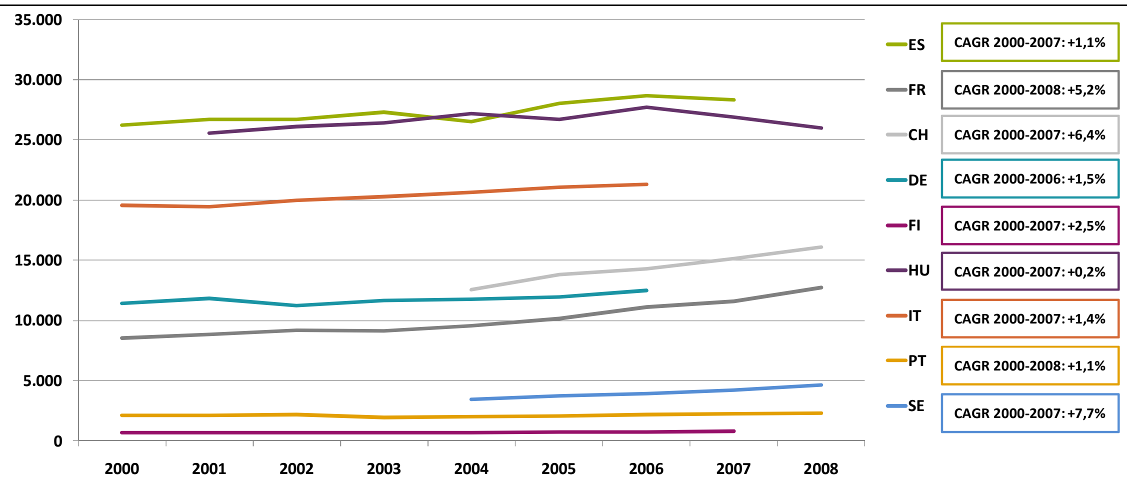
Figure 30. Long-Distance Rail Traffic Volume 2000-2008



Source: RENFE, Ministère de l'écologie, de l'énergie, du développement durable et de la mer, LENNON database and ATOC, DB - Wettbewerbsbericht 2009, Finnish Rail Administration, Hungarian Central Statistical Office, Ministero de Trasporti - CONTO NAZIONALE DELLE INFRASTRUTTURE E DEI TRASPORTI, Instituto Nacional de Estadistica, SIKA

Figure 26 shows the performance in the regional rail segment since 2000.

Figure 31. Regional Rail Traffic Volume 2000-2008



Source: RENFE, Ministère de l'écologie, de l'énergie, du développement durable et de la mer, LENNON database and ATOC, DB - Wettbewerbsbericht 2009, Finnish Rail Administration, Hungarian Central Statistical Office, Ministero de Trasporti - CONTO NAZIONALE DELLE INFRASTRUTTURE E DEI TRASPORTI, Instituto Nacional de Estadistica, SIKA

3.4.3 Public Service Obligation (PSO)

It is important to note that there are practical difficulties in distinguishing PSO and non-PSO services. In some Member States franchised operators of PSO services are free, and encouraged, to operate services over and above those required by their PSO, particularly since the marginal cost of doing so is small. These non-PSO elements of services are not accounted for separately.

A further issue is how one measures the proportion of services operated under PSO; at the present time the available data is distinctly limited and compiled under inconsistent methodology, expressed as the passenger km operated under PSO. While the most recent data provides an interesting snapshot some caution needs to be exercised when attempting to draw firm trends. Equally fundamentally, there is scope for debate of whether passenger km is the most appropriate indicator: on the positive side it provides an indication of the proportion of the passenger business in revenue terms operated under PSO, on the negative side PSO services tend to be the more lightly used ones, and thus a passenger km based figure tends to under-represent train km operated under PSO.

Table 3.4.2 Passenger km Operated Under PSO

	2005	2007	2008	Change in Proportion of PSO		
				2005-07	2007-08	2005-08
BE	100.0%	89.1%	85.7%	-10.9%	-3.9%	-14.3%
BG	14.0%	84.2%	84.5%	+502.0%	+0.3%	+503.9%
DE	45.0%	95.5%	94.1%	+112.3%	-1.5%	+109.2%
EE	100.0%	90.6%	89.4%	-9.4%	-1.3%	-10.6%
EE	45.2%	57.6%	52.5%	+27.5%	-8.9%	+16.1%
HU	100.0%	95.7%	95.4%	-4.3%	-0.4%	-4.6%
LU	20.1%	95.6%	95.1%	+376.7%	-0.6%	+373.8%
LV	100.0%	90.4%	91.9%	-9.6%	+1.6%	-8.1%
RO	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
SI	100.0%	84.9%	85.3%	-15.1%	+0.5%	-14.7%
SK	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
FR	11.5%	28.0%	n/a	+144.2%	n/a	n/a
SE	47.9%	44.8%	n/a	-6.4%	n/a	n/a
IT	1.0%	n/a	n/a	n/a	n/a	n/a
AT	n/a	100.0%	100.0%	n/a	0.0%	n/a

	2005	2007	2008	Change in Proportion of PSO		
				2005-07	2007-08	2005-08
DK	n/a	97.2%	97.0%	n/a	-0.2%	n/a
EL	n/a	0.0%	0.0%	n/a	0.0%	n/a
IE	n/a	100.0%	100.0%	n/a	0.0%	n/a
LT	n/a	54.5%	59.0%	n/a	+8.3%	n/a
PT	n/a	70.2%	67.4%	n/a	-4.0%	n/a
UK	n/a	96.4%	96.7%	n/a	+0.3%	n/a
NO	n/a	72.9%	71.8%	n/a	-1.5%	n/a
FI	n/a	35.7%	n/a	n/a	n/a	n/a
CZ	n/a	n/a	n/a	n/a	n/a	n/a
NL	n/a	n/a	n/a	n/a	n/a	n/a
PL	n/a	n/a	n/a	n/a	n/a	n/a
HR	n/a	n/a	n/a	n/a	n/a	n/a

Source: Consortium analysis of data supplied by European Commission.

Note: 2005 data relates to domestic passenger services only, whereas 2007 and 2008 data includes international traffic.

The crucial issue that the 2008 figures highlight is the high proportion of services that are operated under public service contracts in many states. Potentially, this has major implications for the possibility of any market opening model that relies upon open access: where a service is supported by a PSO grant, it would appear to be difficult in most cases to operate a commercial service in competition. Conversely where an RU operating a service under a PSO is paying a premium for the right to operate a service, competition issues would be raised if an open access operator, which is not required to pay a premium, emerged. However, open tendering between RUs for the right to operate a particular service or service group is a valid market opening mechanism; the issue is that where a high proportion of services are operated under PSOs regulatory options involving competition for the market than rather competition in the market tend to be more suitable.

As can be seen in Table 3.4.2, the trend over recent years has been for an increasing proportion of services to be operated under PSOs; although the proportion of PSO operated services has fallen in around half the states for which figures are available, these falls have been much less than the increases in other states. Furthermore, the only states in which there has been a significant fall in PSO services (over 10%) already had 100% of services operated under PSO in 2005. Further caveats in respect of apparent small changes in PSO use are the difference in calculation methodology between the 2005 figures on one hand and the 2007 and 2008 figures on the other, and also the use of passenger kms as an indicator.

3.5. Profits, Revenues and Costs

In this section, the financial situation of European RUs is discussed, i.e. profitability, revenues and some information on costs. Since financial and earnings statements of RUs are the only near complete information source available, the following text is exclusively based on this source. Since the financial situation of RUs has been dealt in depth in a recent study by RGL Forensics, Frontier Economics and AECOM for the European Commission only selected points will be discussed herein[68].

For the purpose of the Study, information on the financial situation can be helpful for two reasons:

- firstly, information on the profitability and revenues of services could provide an indication of entry possibilities; and
- secondly, the same kind of information could shed some light on the vulnerability of incumbent railways, i.e. show whether RUs earn supernormal profits that would allow them to stay in the market even if competitors threaten their market position.

Accounting information is rarely sufficiently detailed to fulfil these needs; this is particularly true for the rail sector:

- identification of entry possibilities requires more disaggregated information about demand, revenues and profits than accounting information systems typically deliver: route or network specific information would be needed, while accounting systems typically only provide information at an aggregate, company, level. For example, RGL Forensics, Frontier Economics and AECOM (page 7) state, e.g., that "*whilst many of the passenger companies include public funding for PSOs in their accounts, they do not provide a disaggregation of this figure by individual contracts*";
- similarly, it is widely accepted in economic theory and competition policy that concepts such as profits are difficult to use in practice, since accounting standards allow considerable discretionary decisions[69]. Outsourcing decisions, the determination of access charges within company or holding structures (vertical integration of infrastructure and operations) or internal transfer prices are examples for measures that can be used to 'design' the profitability of RUs. Consequentially, RGL Forensics, Frontier Economics and AECOM (p. 8) find that *"accounting*

[68] See RGL Forensics, Frontier Economics and AECOM: *Study on Separation of Accounts of Railway Undertakings and Rail infrastructure Managers*, October 2009.

[69] For a thorough discussion see e.g. Paul A. Grout/Ania Zalewska (2008): Measuring the Rate of Return for Competition Law. In: Journal of Competition Law and Economics, Vol. 4, pp. 155-176.

> *losses and profits, as currently reported in separated accounts of railway businesses are unlikely to show measures of costs and profits correctly identifying whether or not cross subsidisation is taking place".*

Keeping these caveats in mind Table 3.5.1 presents some financial ratios for passenger RUs. RGL Forensics, Frontier Economics and AECOM have identified thirty-eight companies that can be classified as passenger RUs and which published financial statements in 2007. The focus on passenger RUs is appropriate for this Study, since vertically integrated (i.e. responsible for both infrastructure and operations) or horizontally integrated (i.e. responsible for both passenger and freight operations) companies provide insufficient information to disentangle the divisions, in general.

Table 3.5.1 shows an impressive diversity:

- RUs differ dramatically in size (revenues), profitability, and in their dependence on public funding;
- generally, the profitability, measured by the absolute operating profit, the operating profit margin or the return on assets, of the passenger transport segment is not high. The highest profitability is achieved by some national incumbents (e.g. Netherlands and Germany) followed by British passenger RUs.[70] On the other hand, one national incumbent and an international provider (Eurostar) score worst;
- simple one dimensional explanations for the different operating profits do not provide further insights (simple linear regressions between operating profit and revenues/unit costs/public funding). Figure 27 shows as an example a plot of revenues against the absolute operating profit. The plot may be interpreted as suggesting, that the use of public tenders (UK companies, shown by unfilled marks on graph) is more capable of controlling profits than direct awards to RUs (e.g. DB Regio, Nederlandse Spoorwegen).

Considering the issue of profitability further, it should be noted, it can be strongly affected by two aspects, external to a single RU: the level of access charges, and public support. Both payments directly influence profitability without a real chance for RUs to influence them. Their absolute influence on profitability is unambiguous.

Beyond that, the level of access charges does not have a clear-cut influence on the relative profitability of the RUs (relative to other RUs). In some cases, these two measures show the expected effect: low access charges result in slightly more profitable RUs (e.g. Poland). But Italy, for example, is an example of high public support, average access charges and a high deficit. Also, two of the most profitable companies, Nederlandse Spoorwegen and DB Regio AG are in different positions in respect of access charges and public support: according to *Thompson (2007)*, access charges in Germany are significantly higher than in the Netherlands, but according to

70 The high return on assets of UK RUs simply reflects the fact that they lease their rolling stock.

RGL Forensics, Frontier Economics and AECOM (2009) only DB Regio receives a high level of public support.

These examples highlight two aspects:

1. whilst access charges and public support directly influence profitability, other aspects of the market and the companies, such as demand volume, appropriate services and optimal pricing, and cost efficiency, can be more important;

2. the example of Germany and the Netherlands shows the interaction between public funds for infrastructure (with their influence on track access charges), public funds for PSO services and company profitability (or deficits); both kinds of funds can be close substitutes.

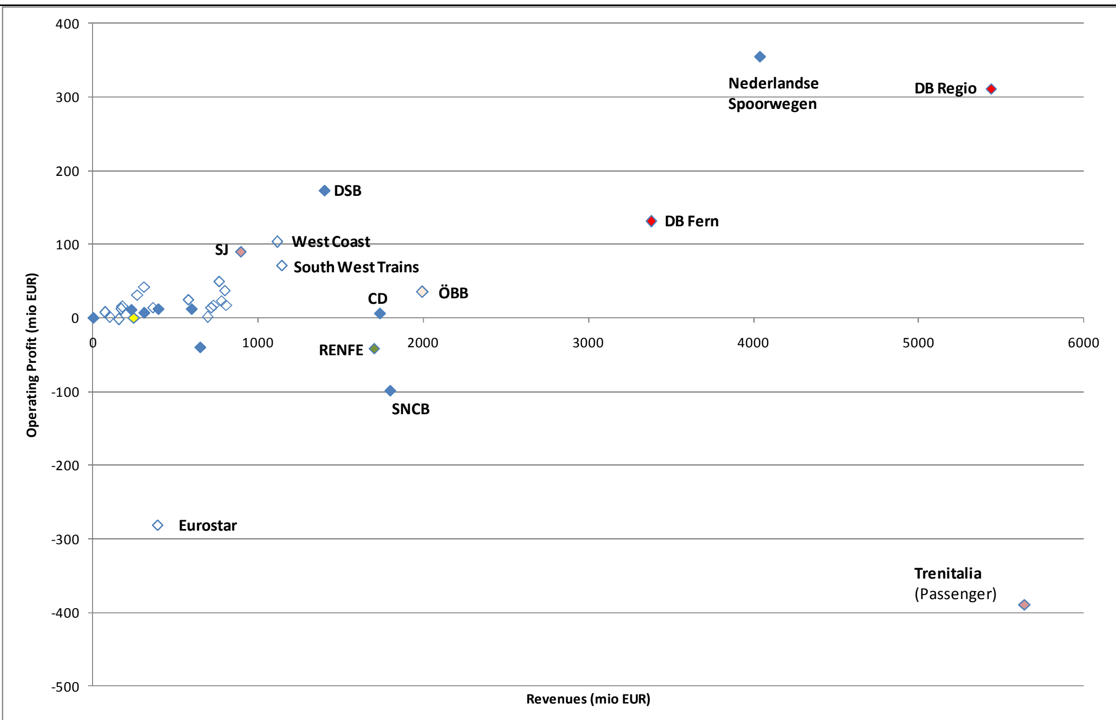
Table 3.5.1- Financial Ratios for Passenger RUs (2007)

Company Name	Country	Revenues (€m)	Operating profit (€m)	Operating profit margin	Return on assets	Unit operating costs (€ '000)	Total Revenue per Passenger Km (€)	Total public income (€m)	Public funding / costs	Public funding / revenue
OBB Personenverkehr AG	AUS	1,996	35	2%	0%	0	0.16	468	**24%**	**23%**
SNCB	BEL	1,803	-99	-5%	1%	215	0.20	844	**44%**	**47%**
CD	CZR	1,740	6	0%	0%	253	0.25	339	**20%**	**20%**
DSB	DEN	1,405	173	12%	3%	211	0.24	1.038	**84%**	**74%**
Elektriraudtee AS	EST	6	0	-5%	-3%	-	-	3	**50%**	**52%**
DB Fernverkehr	GER	3,382	131	4%	3%	102	0.11	8	**0%**	**0%**
DB Regio	GER	5,440	311	6%	11%	200	0.21	3,458	**67%**	**64%**
MAV	HUN	400	12	3%	-85%	-	-	7	**2%**	**2%**
Trenitalia (Passenger)	ITA	5,642	-389	-7%	-6%	131	0.12	2,069	**34%**	**37%**
Nederlandse Spoorwegen	NTL	4,040	355	9%	6%	237	0.26	0	**0%**	**0%**
PKP Intercity	POL	237	11	5%	0%	12	0.06	16	**7%**	**7%**
PKP Regional	POL	601	12	2%	0%	0	0.05	242	**41%**	**40%**
CFR Calatori	ROM	653	-40	-6%	-4%	93	0.09	280	**40%**	**43%**
ZSSK	SLK	249	0	0%	-1%	116	0.12	161	**65%**	**65%**
RENFE	SPA	1,705	-42	-2%	-	76	0.09	326	**21%**	**19%**
SJ	SWE	894	90	10%	7%	149	0.17	0	**0%**	**0%**
Arriva Trains Wales	UK	363	14	4%	17%	366	0.38	216	**62%**	**60%**
c2c	UK	156	-2	-1%	-14%	172	0.17	25	**16%**	**16%**
Chiltern Railways	UK	180	15	8%	14%	213	0.20	33	**17%**	**19%**
CrossCountry	UK	697	1	0%	2%	238	0.24	269	**39%**	**39%**
East Midlands	UK	270	31	11%	35%	152	0.17	0	**0%**	**0%**
Eurostar UK	UK	390	-281	-72%	-116%	-	-	0	**0%**	**0%**
First Capital Connect	UK	576	25	4%	17%	172	0.18	0	**0%**	**0%**

Company Name	Country	Revenues (€m)	Operating profit (€m)	Operating profit margin	Return on assets	Unit operating costs (€ '000)	Total Revenue per Passenger Km (€)	Total public income (€m)	Public funding / costs	Public funding / revenue
First Scotrail	UK	732	17	2%	10%	297	0.30	401	**56%**	**55%**
First Transpennine	UK	312	42	13%	38%	252	0.29	149	**55%**	**48%**
Gatwick Express	UK	99	1	1%	7%	447	0.45	0	**0%**	**0%**
Heathrow Express	UK	75	7	9%	16%	-	-	0	**0%**	**0%**
London Midland	UK	314	7	2%	11%	519	0.53	0	**0%**	**0%**
Merseyrail	UK	169	12	7%	31%	-	-	0	**0%**	**0%**
Northern Rail	UK	776	23	3%	21%	411	0.42	509	**68%**	**66%**
NX East Anglia	UK	719	14	2%	10%	179	0.18	0	**0%**	**0%**
NXEC (then GNER)	UK	808	17	2%	83%	184	0.19	0	**0%**	**0%**
South West Trains	UK	1,146	71	6%	271%	219	0.23	265	**25%**	**23%**
Southeastern	UK	800	37	5%	19%	198	0.21	0	**0%**	**0%**
Southern	UK	765	50	7%	28%	209	0.22	0	**0%**	**0%**
West Coast	UK	1,118	103	9%	33%	241	0.27	170	**17%**	**15%**

Source*: RGL Forensics, Frontier Economics and AECOM (2009), p. 11 et seqq.*

Figure 32. Revenues and Operating Profits of Passenger RUs



Source: *IGES*

In the passenger rail market, two recent developments threaten the financial situation of incumbent RUs in Central and Eastern Europe:

i) amongst the EU12 group of states the agreed 2009 PSO contributions from the state are not always being fully paid, the underpayment being 50% in some cases. This is why the level of PSO payment is generally planned to decrease in 2010, affecting the ability of RUs to pay track access charges and embark on new investment to replace obsolete rolling stock;

ii) a drop in passenger volumes and farebox revenues.

The compounded impact of these two factors will aggravate the weak financial situation of incumbent RUs in Central and Eastern Europe, worsen their debt position and credit worthiness. These financial difficulties are likely to lead to deterioration of rail services and infrastructure, reinforcing the downward spiral in the railway sector.

Table 3.5.2 State Financial Support to Rail

	State spending on rail infra. (€\M)	Traffic units (bn pkm+tkm)	Track length (km)	State spending per traffic unit (€)	State spending per track km (€)
LU	394	0.7	619	0.53	636 511
IE	603	2.1	2 334	0.29	258 355
BE	3 226	18.2	6 067	0.18	531 729
NL	2 687	20.0	6 517	0.13	412 306
DK	937	8.0	3 286	0.12	285 149
GR	275	2.5	2 997	0.11	91 758
UK	6 601	70.2	31 701	0.09	208 227
FR	10 100	119.7	52 820	0.08	191 215
IT	5 126	70.6	23 193	0.07	221 016
SE	1 415	31.6	13 496	0.04	104 846
SI	186	4.2	2 193	0.04	84 815
DE	8 001	186.0	64 219	0.04	124 589
FI	467	14.7	8 830	0.03	52 888
HU	560	19.8	7 942	0.03	70 511
AT	637	30.3	9 874	0.02	64 513
SK	223	12.2	6 867	0.02	32 474
ES	563	33.7	18 791	0.02	29 961
DZ	270	22.7	16 049	0.01	16 823

	State spending on rail infra. (€\M)	Traffic units (bn pkm+tkm)	Track length (km)	State spending per traffic unit (€)	State spending per track km (€)
PT	74	6.3	3 613	0.01	20 482
BG	61	7.8	7 216	0.01	8 453
PL	310	71.7	37 504	0.00	8 266
LV	31	17.8	3 436	0.00	9 022
EE	12	10.7	1 583	0.00	7 581
LT	3	13.3	3 519	0.00	853
RO	3	23.9	20 384	0.00	147

Source: *European Transport policy progress and prospects*

In respect of costs and cost structures, it is instructive first of all to look at general cost items and drivers. Table 3.5.3 depicts a costing system that is widely shared within the rail community. Neither the cost items identified in the table nor the cost drivers can be extracted from published accounts; instead, one has to use 'proxies', e.g. depreciation of rolling stock instead of leasing expenditures, etc. Table 3.5.4 provides an example for the German incumbent DB Fernverkehr[71].

Table 3.5.3 shows the importance of infrastructure and energy costs (c38%) and the importance of rolling stock costs (c20%).

Table 3.5.3 - Rail Cost Drivers

Cost Item	Description	Cost Driver
Infrastructure	Fixed access charge	Fixed
	Maintenance and renewal	Train km
Energy	Electricity or fuel costs	Train km
Stations costs	Use of stations/depots	Train hour
Rolling stock charges	Leasing charges	Train km/hours
	Maintenance and servicing	Train km/hours
Passenger service costs	e.g., catering	Passenger km

[71] The method used here is described in detail in Steer Davies Gleave (2006): Air and Rail Competition and Complementarity. Report for European Commission DG MOVE, London, app. B

Cost Item	Description	Cost Driver
Staff costs	Operating staff wages	Train hour
	Management and administrative staff wages	Train hour
General administration	e.g., overheads	Train hour
Passenger	Refunds or compensation to	Passenger km
compensation	passengers in the event of delays, cancellations, etc	
Other costs	e.g., industry and professional services, marketing and advertising, and overheads (such as pension contributions)	Train hour

Source*: Steer Davies Gleave (2006): Air and Rail Competition and Complementarity. Report for European Commission DG MOVE, London, p. 35*

Table 3.5.4 – Operating Costs DB Fernverkehr AG

Cost Item	M EUR		EUR/train-km	
	2004	2008	2004	2008
Access charges: infrastructure[1]	730	772	5.29	5.59
Access charges: stations[1]	87	96	0.63	0.70
Energy[1]	258	283	1.87	2.05
Staff costs	599	637	4.34	4.61
Rental costs	127	129	0.92	0.93
IT costs	37	31	0.27	0.22
Intercompany Recharges	143	53	1.04	0.38
Cost of purchased materials and services (./. Access charges)	399	464	2.89	3.36

Cost Item	M EUR		EUR/train-km	
	2004	2008	2004	2008
Cost of raw materials, consumables and of purchased merchandise (./.Energy)	33	56	0.24	0.41
Maintenance costs	274	343	1.98	2.48
Depreciation of rolling stock	307	288	2.22	2.09
Total	**2,994**	**3,152**	**21.68**	**22.82**

Source*: DB Fernverkehr AG: Annual reports (2004, 2008) DB AG: Annual reports (2004, 2008)*

3.6. Conclusions – Quantitative Analysis

Passenger volumes and modal share trends are different for the pre-2003 Member States EU15 group and for the post-2003 Member States in the EU12 group. The former group has seen underlying[72] volume growth and underlying modal share stabilising since 2004, while the latter group has seen both continuing to fall in the difficult market conditions that rail faces in the new Member States.

The quantative analysis herein indicates that the greatest underlying growth in rail passenger modal share has been in states that have opened their markets: there is a clear correlation between market opening and modal share growth. Although this holds true for both Member States with more established economies in the EU15 group and for newer Member States in the EU12 group, the trend line for each is different as a result of the difference in conditions between the two groups of states.

High speed rail in Europe has proved to be highly successful, notably against airlines, both domestically and internationally. This market has been won largely on quality. High speed rail offers higher net speeds and higher quality ambiance than any of its competitors and its success is not surprising therefore. However the number of corridors on which high speed rail can be justified is limited because of the costs of infrastructure and other assets. The cost problem is exacerbated in geographically difficult areas (mountains and sea crossings) and in areas of low population density. In the foreseeable future it would seem difficult to envisage high speed links in areas such as Northern Scandinavia, most of Romania, or Bulgaria for example. Even in France the limits are being reached, and current proposals rest heavily on social and political justification.

Where there has been direct high-speed rail:air competition, this has largely been resolved in favour of rail, although it is true to say that even high speed rail cannot compete on axes such as Amsterdam – Marseille.

[72] i.e. after removing growth due to construction and development of high-speed lines.

Conventional long distance inter-regional services (particularly between provincial centres) are a much more difficult issue, the traffic base, the quality of the infrastructure and rolling stock all serve to condemn the service to be second rate and the financial results tend to be likewise. Opportunities to use open access competition as a weapon to transform this situation are limited by the traffic base in many cases. Letting public service contracts might provide a solution to bringing competition to bear and, potentially, more market-orientated services, where traffic levels are too low for open access.

Local services, both rural and urban have long required subvention. It is likely that this alone will prompt calls for more radical solutions, tram-type techniques to reduce costs and gain access to city centres, simplified infrastructure and signalling, even, in rural areas, replacement of the rail service by another mode, etc. These technical solutions are outside the scope of this Study but do have an effect on the regulatory options. Closer links with urban services imply common treatment with their financing. Simplified infrastructure may imply different models for infrastructure management.

The wildly differing level of infrastructure charges provides a major complication to the adoption of a common regulatory structure throughout the EU: where charges are low (e.g. Sweden) open access for an RU is a considerably more attractive option than where charges are high (e.g. Channel Tunnel).

There are wide variations in the number of services operated under PSOs, although it should be noted that most of the states where a low proportion of services operate under PSO contracts are those that do not permit competition in the passenger rail market, and thus the low proportion of PSO supported services actually reflects a lack of competition and largely closed markets. Nevertheless where there is a high proportion of services operated under a PSO there are difficulties with the open access model, other than in niche markets, either because of the difficulty of competing with a subsidised service, or where premium payments are made by the PSO RU to the letting body (i.e. ultimately to government at some level), there are issues of competition in permitting this RU to be ‘undercut’ by an open access operator, free from the burden of paying premia. Thus where there are high proportions of PSO-supported services one will tend to get competition for the market, rather than competition in the market, other than in niches.

A further complication to the PSO issue arises from the failure of governments, generally from Member States who have joined the European Community in recent years, to pay the contracted sums due under PSO contracts in full. This problem has two implications:

1. it brings into question the sustainability of the PSO model on the widespread basis that it is currently used, particularly in states with less well-developed economies; and

2. given that funding shortfalls are driven by government funding issues it brings into question the sustainability of the size of the passenger rail networks in the states concerned, with consequent negative implications for the achievement of EU policy targets.

4. Analysis of the Impact of Market Opening for International Passenger Traffic

4.1. Background and Approach

Article 1(8) of Directive 2007/58/EC[73] amending Article 10 of Directive 91/440/EEC[74] provided for *the right of access to the infrastructure in all Member States for the purpose of operating an international passenger service. Railway undertakings shall, in the course of an international passenger service, have the right to pick up passengers at any station located on the international route and set them down at another, including stations located in the same Member State* with effect from 1 January 2010[75].

In providing that right, the recitals to Directive 2007/58/EC correctly identified that *"it is essential to authorise new market entrants to pick up and set down passengers along the route in order to ensure that such operations have a realistic chance of being economically viable and to avoid placing potential competitors at a disadvantage to existing operators, which have the right to pick up and set down passengers along the route"*[76]. (This right may be qualified to prevent an essentially domestic service to masquerade as an international one and to prevent services undermining the revenue base of socially supported services.)

Within the context of this study, the central question is whether the opening for international passenger traffic and the permissibility of cabotage in particular will make further regulatory actions intended to open domestic markets unnecessary. Cabotage is of special interest here because it might reduce barriers to entry in international services and it spurs domestic competition. These aspects are two sides of the same coin.

To analyse the consequences of opening international markets/cabotage and further measures to open domestic markets it is necessary to draw on existing evidence of entry in international markets first. Whilst lessons are drawn herein from existing operations, at present there are too few to provide reliable indicators. Market opening for freight traffic has also been used to extrapolate the likely impact of international passenger market opening. The prospect of further entry, after the opening of international markets, is then discussed. Differences between international traffic with cabotage and domestic market opening measures are subsequently discussed. The last sub-section draws some conclusions. While the two questions discussed here (can one expect entry on international routes and cabotage to happen on a large scale and does this substitute for

[73] Directive 2007/58/EC of the European Parliament and of the Council of 23 October 2007 amending Council Directive 91/440/EEC on the development of the Community's railways and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure published in OJEU L315 of 3 December 2007.

[74] Council Directive 91/440/EEC of 29 July 1991 on the development of the Community's railways originally published in OJ L237 of 24 August 1991.

[75] It should be noted that the definition of "international passenger service" is so tightly drawn that it would have excluded the *Orient Express* for example (because not all coaches made an international journey).

[76] Recital 7 to Directive 2007/58/EC.

domestic competition) are essential for the question of the necessity of further market openings, it has to be stressed that this section can only deliver tendencies as a profound analysis of international traffic is beyond the scope of this study.

In this study, operations such as the Venice Simplon Orient Express have been ignored, although it runs to a timetable and provides international transport it is a holiday product rather than a means of transport.

It has been assumed herein that the provisions of Directive 2007/58/EC will be respected by all Member States in both letter and spirit. It is noted, however, that on 3 June 2010 the European Commission submitted a reasoned opinion to Denmark, Lithuania, Luxembourg, and the Netherlands for failure to notify the measures taken to transpose the Directive [77].

4.2. The Present Situation

There has been surprisingly little evidence that use of this new right is proposed in the short term. The low level of interest in the use of the cabotage rights which will be available in 2010 contrasts markedly with the active interest in operating purely domestic services shown by the Hamburg–Köln Express, and Nuovo Trasporto Viaggiatori.

The furthest advanced, and perhaps the most interesting (because it represents an assault on major axes by a significant player) is the application by the Italian incumbent, Trenitalia, for access in France. The press reports that Trenitalia has applied for train paths from Milano to Paris via Torino and Chambéry (two paths) and from Genova to Paris via Nice and Marseille (two paths). It is understood that Trenitalia received its safety certification for France on 31 March 2010 but has yet to agree the provision of station services with SNCF, although the process has started. Whilst Trenitalia declares it fully intends to run these services, the total absence of specific plans may be significant. Both these proposed Trenitalia services have significant implications for cabotage since most of the journey is in France. It is understood that Trenitalia will be using high-speed rolling stock. If this is the case, other factors, such as competition on price may not be enough to allow Trenitalia to sustain the service, so will be interesting to see what flows Trenitalia target and what their unique selling proposition will be. Without a coherent business model and marketing plan, Trenitalia’s competition could be an irrelevance.

Some other national incumbents have also announced their interest in establishing international services outside of their previous international alliances or the traditional bilateral agreements. DB AG, for example, has announced interest in high-speed services on the Rhine – Rhône line and proposes to test-run an ICE to London as part of plans to provide a Frankfurt – London service. SNCF likewise has announced interest in running services between Frankfurt and Berlin/Hamburg[78] and in due course between Berlin and Köln. But, this kind of announcement is not new and may also be interpreted as part of

[77] http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/666&format=PDF&aged=0&language=EN&guiLanguage=en.

[78] It is not clear whether SNCF plans to offer purely domestic services or to extent its current services between e.g. Paris and Frankfurt.

ongoing negotiations over influence on existing or planned joint ventures or the share in this business.[79]

The Georg Verkehrsorganisation has likewise applied for paths between Germany and southern and western France. Georg has normally addressed the German holiday market and it is to be assumed that that is once again the intention. Issues such as rolling stock productivity may be significant.

Given that there were no general rights before 2010,[80] examples of international open access are quite rare and are limited to atypical international services. Two examples of operations in the recent past may suffice to show the problems. The first is the *Georg* overnight service from Stockholm to Berlin and the second the UnionsExpressen service from Stockholm to Oslo. Neither route is fast, between Stockholm and Berlin the train takes the ferry, between Stockholm and Oslo the route is long and tortuous. In both cases the incumbent state railways had withdrawn through services over these routes and private operators stepped in. Their services were innovative in the sense that *Georg* offered more customer-friendly ticketing and UnionsExpressen offered a luxury service intended to compare with the Orient Express or Blue Train.

Neither of these services were dramatically successful however (*Georg* continues to run but only three times a week in summer, UnionsExpressen has ceased operating, at least for the present), and in retrospect the reasons why are evident. The fact that the incumbent railways had withdrawn from both routes suggests poor commercial prospects (the routes have modest traffic potential and their physical characteristics favour other modes) and furthermore the two new products were niche products. All over Europe, night train carryings are falling, cannibalised by much faster day trains and airlines. The UnionsExpressen selling proposition of luxury was not successful. In both cases there were other factors, the open access railway undertakings did not have cabotage rights to carry domestic passengers. The incumbent RUs appeared to adopt countermeasures or, from the view of the entrants, anti-competitive practices (DB charged high prices for traction and NSB/SJ re-introduced a competing service).

Even so, it is difficult to escape the conclusion that open access requires strong traffic flows and more than niche markets to be successful. By definition, the benefits of competition can only arise where there are two or more railway undertakings and by implication enough traffic to justify each offering a credible train service.

Thus, the international market is currently dominated by international alliances between national incumbents. European national railways traditionally cooperate with each other through bilateral and trilateral agreements regarding services, rolling stock and revenue

[79] Economic theory as well as experience indicates that one can improve its bargaining position by strengthening its outside options – the profit you can realise if a negotiation fails.

[80] Despite the lack of a general right, one must remember that several Member States offer entry options for domestic as well as international operations, e.g. Germany, UK.

allocation. In recent years, however, new organisational forms have been introduced in order to strengthen rail's position in international passenger transport markets:[81]

- *Alleo*: joint venture formed by DB AG and SNCF (which also took over certain tasks by Rhealys);
- *Elipsos*: joint venture between SNCF and RENFE (Spain);
- *Eurostar*: joint enterprise by SNCF, SNCB (Belgium) and Eurostar UK Ltd., offering services between UK, Belgium and France;
- *Railteam*: cooperative association of European railways with trains subject to reservation (i.e. DB AG, SNCF, Eurostar, the Dutch NS Hispeed, ÖBB; SBB, SNCB) and their subsidiaries Thalys (see below) and Eurostar. Unlike the joint undertakings Thalys and Eurostar, Railteam does not have any operational activities but co-ordinates services. Hence, its aim is to establish international services that can compete with air traffic;
- *Rhealys*: SPV formed by DB AG, SNCF, SBB and CFL. Its aim is to make provisions for high-speed rail services in the Southern part of Germany, Luxembourg, Basel-Zurich and the Paris agglomeration;
- *TEE Rail Alliance* by DB AG, SBB and ÖBB;
- *TGV Lyria*: subsidiary of SNCF, also involving SBB;
- *Thalys*: joint enterprise by SNCF (62% capital share), SNCB (28%) and DB AG (10%), providing international services between their states and the UK. The trains used are owned by the participating enterprises. The Thalys PBKA trains are equipped with a number of signalling and power supply systems which allow them to be used on international services.

The co-operative ventures provide international transport services to the almost total exclusion of domestic ones. However, by coordinating the service as well as having members of the consortium extend the service, market access of third parties to high-speed rail is actually restricted.

4.3. Parallels with Open Access in Freight

The parallel with freight traffic may be instructive. As economic theory would suggest, freight railway undertakings have chosen to compete for the most profitable traffic: trainload flows. Trainload flows are not only the most profitable traffics for freight railway undertakings, they are also the easiest to organise. Interestingly and significantly even those undertakings that are subsidiaries of incumbent undertakings in other states (the various scions of DB Schenker Rail or Trenitalia, etc) have developed domestic trainload rather than find international traffic to exchange. Economic geography predicts larger

81 See e.g. Friederiszick, H., Gantumur, T., Jayaraman, R., Röller, L.-H., Weinmann, J. (2009): Railway Alliances in EC Long-Distance Passenger Transport: A Competitive Assessment Post-Liberalization 2010. ESMT White Paper No. WP-109-01.. http://www.esmt.org/fm/292/WP-109-01.pdf.

flows over shorter distances; therefore it is likely that domestic flows will be larger than international ones. In both passenger and freight traffic, domestic traffic is easier to organise and execute, only one infrastructure manager is involved, lead times are shorter (particularly important for freight) and there are no linguistic issues.

By contrast, new railway undertakings have made almost no attempt to provide for wagonload traffic. Wagonload rates are much higher than trainload but the costs are very much higher and the operation requires significant investment in facilities. It is loss-making across Europe. Additionally, more sophisticated services have failed (e.g. logistic trains by IKEA) or are at least quantitatively negligible.

Given that traditionally international freight services were operated on the basis of exchange of wagons between incumbent national railways at border stations, market opening for international rail freight has highlighted new barriers as RUs have operated services across national borders. These barriers have been experienced by both incumbent RUs running into neighbouring states and new entrants. The barriers encountered by new entrants in domestic market opening are discussed in Section 2.5. International market opening brings with it additional barriers such as the need to have drivers who are certified to operate in more than one state, and the need for locomotives with the technical characteristics to operate in more than one state (e.g. with vehicle approvals for both states, fitted with appropriate track:train signalling interfaces, correct electrification systems, etc). These additional barriers have meant that interpenetration to utilise assets more productively is still not universal in Europe, indeed the picture is somewhat uneven with interpenetration being more common in northern and parts of Central Europe, whereas exchange at traditional border stations has tended to remain the norm in southern and Eastern Europe. Interpenetration/interoperation tends to be more common where there is a degree of technical similarity between adjoining states (between Germany and Austria, for example), and thus the issues and costs of interpenetration/interoperation are less.

Attempting to draw lessons from these parallels, it would seem likely that new passenger RUs will prefer to compete in domestic markets (where that is permitted) rather than international ones. Traffic flows on domestic axes are likely to be greater and the issues involved in introducing services (international employment issues, traction compatibility issues, etc.) fewer.

This in turn is likely to mean that the effects of the liberalisation of international traffic will be much less profound than the liberalisation of domestic traffic.

4.4. Prospects of Entry in International Passenger Markets

4.4.1 Markets & players

Using the market segmentation framework developed in Section 2.6 two main types of markets and two types of players can be distinguished.

The routes most likely to be the subject of international "open access" operation, and therefore those that are most likely make use of cabotage rights, are those with the greatest traffic potential. That traffic potential may be international or indeed domestic (provided the Member State in question does not have the right to limit the right of access in accordance with Directive 2007/58/EC). Accordingly one may expect to see cabotage on the busiest routes first because those routes offer the best chances of a viable operation. High speed lines fit this profile perfectly but at the cost of requiring specialist rolling stock. These routes typically connect major metropolises such as London, Paris, Brussels, Wien, München, etc. These services need to offer high-speed connections and a high quality level to be economically viable, since they have to compete with direct air services.

A second possible market segment is more regionally oriented, e.g. connecting regions that form a single labour market or connecting regions with high recreational/holiday value. An example is connections between East German regions and Poland or Czech Republic. Services can be heavily differentiated in this segment, ranging from narrow timetables (commuter oriented) to single trains (recreational activities oriented), etc.

Two types of RU might enter the new international rail passenger transport market: national incumbents and new entrants. The first group is best prepared, since these companies have experience of operating international traffic, and possess suitable equipment and the corporate infrastructure, including rolling stock, planning capabilities and supporting facilities in their national base. New entrants (internationally oriented corporate groups and private start-up-enterprises) may have some advantages from approach unfettered by the constraints of existing practices, but generally, entry in international routes is even more difficult than domestic entry (larger scale of operation and thus higher investment, almost no possibility to use synergies, need for assets, staff, certification for more than one state, etc).

Entry barriers are a point of central concern for both groups of markets and for both groups of players; these are discussed in the following paragraphs.

Rolling stock is an issue for open access railway undertakings. Many RUs will want to use existing stock to reduce start-up costs or to limit risk (both Georg and UnionsExpressen used reconditioned rolling stock). Second-hand hauled passenger rolling stock is fairly freely available. Traction is increasingly available either for purchase second-hand (as many new entrants obtained them in the freight sector) or by leasing or spot hire from traction providers. Locomotives are also available second-hand (for example Romanian RUs have acquired second-hand locomotives from a wide variety of sources including SNCF, DSB, DB, HŽ, and China Railways). Nevertheless, real competition will only come when competitors have equipment which matches that used by incumbents. That may require external finance[82] and a history of successful and profitable operations.

A precondition for the operation of open-access international services is the provision of facilities. Article 5 of Directive 2001/14/EC already provides a number of rights

[82] The European Community's imminent accession to the Luxembourg Protocol on financing of railway equipment may help here.

(described in Annex II) but there are further rights which open-access railway undertakings will want to ensure. These further rights are not specifically included in the general descriptions in Point 2 Annex II and include access to cleaning facilities (discharge facilities for train toilets, in particular), on-station sales facilities, the rights to put publicity on stations, timetable entries, etc.

Paths for any new international services also need to be found, given that viable routes are likely to be those with significant traffic potential, this implies the need to use intensively used (and hence congested) parts of domestic infrastructure, for example to serve major cities. Experience has shown that it is difficult to align paths in domestic timetables to provide suitable international paths (e.g. planning the introduction of *Eurostar* services before completion of the Belgian and British high-speed lines), and doing so takes considerable goodwill. It is more likely that this can be achieved where the trains requiring re-timing are operated by the same RU that is attempting to introduce the international train, thereby in many cases incumbents have an inherent advantage in finding suitable paths.

It may be, of course, that other factors such as a common heritage will play a role (the Czech "Student Agency", which runs coach services, is said to be developing proposals for operations within the former Czechoslovakia[83]). Routes with a high traffic potential can offer the prospect that a competitive service can develop a traffic base sufficient to justify a number of trains in a day. (Frequency is essential, both to get good utilisation of assets and to provide a commercially attractive product, UnionsExpressen only ran one round trip daily for example, which cannot have been helpful in either containing costs or stimulating use).

The practicalities of setting up this type of operation also need to be borne in mind. The classic organisation of incumbents is to have national companies each responsible for national activities. That simplifies issues such as employment law, taxation and language but at the expense of continuity within the organisation. In any event, such an operation will require (at least) two Part B safety certificates, training of its staff to meet the requirements of all infrastructure used, and to have suitable rolling stock. This is quite a demanding list and clearly favours organisations with existing operations.

Staffing of trains that cross national borders can be a difficult issue, as noted above train crew need to be competent, and in the case of drivers certificated, for the different national infrastructures used. In addition the train crew needs to speak all of the languages used. This is an issue whose severity varies considerably between different state pairs and groups, for example the human aspects of interoperation between, say Italy and Slovenia are harder to resolve than between Germany and Austria, and thus more costly.

The complexities of setting up international operations described above inevitably 'come with a price tag attached', this limits the ability to enter the market to those RUs with the capital resources to make the investment.

[83] Report Czech Radio http://www.radio.cz/en/article/115855

In conclusion therefore, it is considerably more complex to organise international rail passenger services than either domestic rail passenger services, or freight services. In the main, it will be only commercially attractive to overcome the considerable barriers that exist on axes with high traffic potential, which means high speed services between major cities in competition with airlines, as well as with any other RU operating on the route. Whilst Directive 2001/14/EC sets down requirements for infrastructure access, its provisions are very general and stakeholders stated that in practice it is difficult to get access to some facilities at the times they would be required, particularly where the facilities in question are in practice controlled by the incumbent RU. Many of the most important rights to access essential facilities and obtain the licences necessary are now enshrined in EU legislation, but there would sometimes appear to be difficulties in enforcing the rights that the legislation provides. Furthermore there are other important rights where it appears that current legislation is inadequate. These inadequacies mainly concern commercial, sales, information, and promotion issues, although there are some practical issues such as access to adequate cleaning facilities, rights to use equipment at essential facilities, and access to railway telecoms networks. Evidence, in Italy for example, has shown that new entrants find it difficult to get ticket sales points on stations, difficult to get their publicity displayed, and in general to provide the "shop front" for their product. Likewise there are problems with access to sidings (which are declared to be "full" at the time they are required) and with fuelling and servicing, the facilities for which may not be under the infrastructure manager's control (and therefore not covered by Directive 2001/14/EC) [84].

4.4.2 Open access operation by incumbents

Incumbents have on-going agreements with railway undertakings in adjoining states with whom they exchange traffic (these are required in accordance with the new COTIF which requires consent to accept traffic). In most cases these agreements to exchange traffic are complemented by agreements to market services, set fares, agree timetables, etc. In the case of high-speed services these may be complemented by joint ownership and maintenance of rolling stock (e.g. *Eurostar*, *Thalys*). Unravelling such agreements would take time and significant management commitment. Incumbents therefore have a difficult choice: run the risk of being accused of having agreements not to compete, or taking the "nuclear option" of abandoning their joint arrangements in favour of separate and competing services.

Separate and competing services hold a number of risks for railway undertakings. They require separation of sales channels with the attendant risk of loss of the marketing message, loss of network effect if tickets are not inter-available and many quasi-technical problems linked to safety, rolling stock management, employment law, etc. Where, for example, one RU believes in 100% reservation and yield management but another does not, customer confusion is inevitable. Problems are magnified in the event of disruption.

[84] Note, however, that Article 5.1 of Directive 2001/14/EC requires "*If the services are not offered by one infrastructure manager, the provider of the 'main infrastructure' shall use all reasonable endeavours to facilitate the provision of these services*." This emphasises the issues of inadequate impartial regulation in some Member States.

If a railway undertaking withdraws from co-operative services, it has to set up operations and bases in other states: it is likely to find it difficult to sub-contract activities back to its former partner, once it is in competition with it. It therefore faces the problem of establishing operations in an environment which is alien, where practices are different, where employment law is different and where the language may be different. It needs however to be acknowledged that some of these problems may disappear to the extent that technical practices become more standardised; the creation of more rail service companies may similarly allow some of these activities to be contracted out to local specialists.

The joint DB/ÖBB service from München to Milano has met some of these commercial/operating problems in Italy. Given the practical difficulties and the costs associated with resolving them, it is not surprising that there appears to have been little interest in this "nuclear option" to date. Breaking an existing joint operation to offer a quite separate product might be appropriate for international journeys which involve deliberation and reservation so that marketing and revenues can be kept separate. It is less appropriate where domestic and international flows use the same services and where frequency and flexibility is an important part of the offer (between Köln and Rotterdam for example). Incumbent railway undertakings may choose some mid-way option (for example with common ticketing but more precise allocation of revenue to services).

One representative body informed the Consortium that volatility in infrastructure charges is also an issue and that it does not expect incumbents to make any moves until there is more stability. It also considered that investment in rolling stock is an important consideration, since the cost of new rolling stock is such that the business case must be firmly established before there can be any contested market penetration.

SNCF are said to be inviting tenders for 35 more TGV trains to *"satisfy the group's European ambitions"*[85], these units will be equipped to operate outside France and seemingly have been ordered specifically with a view to open-access operation. A subsequent tender[86] from the *TGV Lyria* consortium (SNCF and SBB) to order a further thirteen train sets suggests that incumbents are keeping all options open and have not decided definitely to embrace open-access on all routes.

Given the difficulty of breaking an existing relationship, it is interesting that incumbents have shown interest in acting in effect as open access railway undertakings on other axes (Deutsche Bahn between London and Paris for example).

Technical factors will be crucial in determining whether a competitive service will be started. The primary one will be whether a credible offer can be marketed. This will depend on the extent to which trains are part of a complete service or whether a discrete alternative can be offered. The following examples should make this clear: if an hourly joint NS/SNCB Amsterdam-Brussels service is replaced by two railway undertakings each offering a service with a two hourly frequency without inter-availability of tickets, the effective service frequency is halved and there is a risk of loss of competitiveness. On the

85 Reported in Le Parisien 11 October 2009 as having been decided in July 2009.

86 Reported in France Bourse 26 September 2009.

other hand, a new service over a route which has significant potential but which is poorly served (a semi-fast service from London to Lille for example) might be quite attractive. Much ingenuity is likely to be given to finding unsatisfied markets. This issue of creating a distinctive marketable product has a number of facets and includes not only the route in question but also the degree to which connecting journeys can be accommodated, and the degree to which ancillary services (ticket sales channels, for example) can be sourced.

The commercial arrangements for some existing international train services already resemble those for open access. The most significant of these are night trains: following some years of unsatisfactory economics, incumbent railway undertakings decided to operate night trains on a sponsorship rather than joint venture basis. Accordingly rather than split revenues leaving each railway undertaking to absorb its own costs, revenues are allocated to a single sponsor who pays the train operation costs of all the railway undertakings in the chain. This does however differ from real open access in that all the railway undertakings in the chain cooperate (and, for example, sell tickets). By their nature international night trains do not encourage short distance (i.e. domestic) journeys.

In conclusion therefore, incumbent RUs are locked into agreements with their neighbours in adjoining states that are difficult to unravel, there is a reluctance to make the investment to operate open access international services until there is perceived stability, and doubts on many axes whether a credible service can be operated in competition to a an established operation without ticket inter-availability. The main potential for open access international operation by incumbent passenger RUs appears to be development of services between origin-destination pairs that are poorly served at present.

4.4.3 Open access operation by new Railway Undertakings

New railway undertakings are likely to have fewer reservations than incumbents over setting up new services, since they do not have long-established agreements to unwind. This is likely to be doubly true of self-contained services.

There are already several new railway undertakings with passenger businesses spread across several European states, Veolia, Arriva, etc. Their attitude to competition and innovation means that these firms are likely to be prime candidates for starting new services. The fact that, at the time of writing, there no genuine open access services provided by new RUs, other than in niche markets[87], points to the difficulties of establishing viable open-access rail passenger services. Combinations of new and old are wholly possible (such as the Arriva/DSB combination operating over the Øresund Crossing). Evidence of late 2009 and early 2010 is however that independent passenger railway undertaking groups are candidates for take-over by incumbents (just indeed has happened in the freight market), for example the €1.8 billion take over of Arriva by DB in April-August 2010. It is likely that the companies taken over in this way will be left as separate companies within a group and that there will be competition to provide services in some form (for example in Germany there will be Vias, Abellio, SBB, Keolis and any

[87] The Georg and (discontinued) Unions Expressen services previously discussed.

successor to Arriva[88]). The future structure of the market and degree of real competition is, however, not wholly clear.

One organisation representing independent railway undertakings informed the Consortium that it doubted if 2010 would bring much change because of the dominant position of the incumbents. It believed however that there would be a slow take up of the new rights.

In so far as wholly new companies are concerned, the lesson from freight is that railway undertakings develop from linked activities. In the rail passenger business Stagecoach and Virgin in Great Britain developed rail businesses using (and occasionally misapplying) principles from the road and air modes. Georg and Student Travel have a background in travel agencies. It is possible that freight companies themselves will see potential in the passenger market. In this context some of the relationships in Eastern Europe in which international groups of railway undertakings[89] are being built up are interesting.

In conclusion therefore, the greatest likelihood of open access international operations is likely to come from RUs that have been new entrants to the domestic passenger market, and have reached a scale that is sufficient to make the considerable investment required to commence international passenger operations, and who have experience of operating in more than one state. It is also possible that new freight RUs might diversify into the passenger business. The dynamic therefore is that of take-up of international passenger market opening spreading from domestic passenger market opening, rather than the other way around.

4.5. Cabotage & Competition

In principle, international services using cabotage rights and domestic competition can be perfect substitutes. Some idea of the likely effect on domestic traffic axes of an international service with cabotage rights may be obtained from studying the effects of open access on established railway undertakings.

Research[90] on these effects has been done in Great Britain for the Rail Regulator. In the cases studied, services from Sunderland and from Hull (both off the main line) join the main line at York and Doncaster respectively and then serve a variety of points competing with the established railway undertaking. If Sunderland and Hull can be regarded as points in another state, the parallel is good. Open access providers provide between 10% and 20% of the services at stations served in common and can therefore be regarded as providing credible competition. The research showed that the new providers offered lower dedicated fares between station pairs that are served by both RUs, and also that this competition slowed the rate of general fares increases between these station pairs, the existence of new services increased the attractiveness of the rail product as a whole and the new services encouraged the existing provider to increase its route structure. Significant

88 Indeed the German competition authorities required that Arriva's German rail activities are divested as a condition of approving the takeover.

89 Such as the Grampet companies with railway undertakings in Romania, Hungary and Bulgaria.

90 *Assessment of Alternative Track Access Applications on the East Coast Mainline*, MVA Consultancy 2009

social benefits were identified (although mainly to the stations off the main line). The studies showed different effects for individual stations, so that stations with 'cabotage' services received benefits while others, perhaps 20 km away, did not. (In this example, most of the data was aggregated and so it has not been possible to quantify the benefits of the 'cabotage' section.)

Competition between franchise holders has also been seen in some states; typically a suburban railway undertaking offers lower prices for the use of its stopping trains to points at the end of its services which are also served by the fast trains of a competitor, sometimes along the same route, sometimes by a different route[91]. In these cases service frequencies by both alternatives have been acceptable and there is therefore a straight trade-off between fare and journey time. Informed, but unofficial, estimates of the market split suggest that the fast trains at a higher but inter-available fare have some 70% of the market in Great Britain.

Other examples in which railway undertakings have offered very infrequent competitive services at low prices[92] demonstrate that a service has to be credible (in terms of speed, frequency, ambiance, etc.) to be successful.

Differences between cabotage and domestic competition together with the regulatory measures making them possible may arise from operational restrictions and the requirements of serving dedicated market segments.

Railway operations usually have to respect the concept of round-trips, i.e. to use central facilities for maintenance, cleaning, etc and to use staff efficiently; this is true as long the service network (number of connections offered, frequency of trains) is of small to medium scale. Therefore, international services will be rather restricted in scope, concentrating on dedicated routes. Any cabotage will have to take place on this route. Thus, unless international services are a masquerade for intended domestic services the direct regional scope of cabotage will be limited.

There is one way in which the impact of cabotage at a regional level is likely to have a more significant impact, however, this where local and regional rail networks work as feeders for new international rail services. This has an impact that is positive for both: the regional networks increase passenger loadings on the international trains, and the new journey potentials offered increases use of local rail networks, helping underpin their future. This interchange between local networks and international services has been developed for example at Lille, and København, and is likely to develop in Barcelona in the near future.

States which are small or are surrounded by neighbouring states (e.g. Belgium) are therefore more likely to be the subject of cabotage operations than large or peripheral

[91] Routes include London to Ipswich, Peterborough and Birmingham.

[92] Such as a single daily service from Bristol to London Waterloo composed of two coaches and described as "underused", or an attempt by North West Trains to project its services to London Euston, using rolling stock unsuitable for long-distance journeys.

states (e.g. Sweden). There is potential for this asymmetry to create market distortions, for example, a railway undertaking operating in a large state and fairly free from competition could use its strength to undermine and absorb smaller potential competitors in a smaller (not necessarily adjacent) state. This type of action was commonplace within the bus industry in the United Kingdom a decade ago[93]. The role of economic regulatory structures to prevent abuse is discussed below.

Secondly, revenues generated by cabotage may be an important add-on but may be not decisive for the design of the service. For example, a (hypothetical) service between München and Wien may designed to attract business travellers primarily, concentrating on connections in the early morning and the evening; an extension of the service to Graz may be reasonable but cannot be expected to attract domestic business travellers or commuters while domestic competition could focus on these groups resulting in different departure and arrival times or frequencies.

From a general perspective, since domestic and international services require differently designed services one cannot expect cabotage and domestic competition to lead to the same results.

Nevertheless, international services and cabotage can be interpreted as rungs of a "ladder of investment"[94]. Cabotage will result in better knowledge of local markets, adapted rolling stock suitable for operation in the new state, and possibly even the set-up establishment by an RU of its own distribution channels in the new state. This will lower the barriers to enter domestic markets once legal and regulatory barriers to entry are removed.

4.6. Conclusions

Overall the key question is whether the opening of international markets and the possibility of cabotage in particular will render further measures to open domestic markets pointless. In answering this question four points are particularly important:

- entry barriers are quite high in international markets, particularly for new entrants, thus, entry by new entrant RUs is unlikely to take place on a large scale;
- entry by national incumbent RUs is possible but this will not necessarily take place in a competitive manner; cooperative agreements are and possibly will continue to be the dominant transaction form in future;
- the most likely entrants are RUs who have started as new entrants domestically and have reached a size where they are active in more than one state, the key issue here is that take up of international market opening is likely to spread from domestic market opening rather than the other way round;

[93] Oxera Research Group: *"predatory pricing cases in the UK bus industry are legendary …"*

[94] This entry concept is discussed for telecommunications markets; see e.g. Martin Cave (2006): Encouraging infrastructure competition via the ladder of investment. In: Telecommunications Policy, Vol. 30, pp. 223-237.

- finally, technical and marketing requirements restrict the form of cabotage traffic, thus, it cannot be assumed that cabotage and domestic competition are perfect substitutes.

Many of the difficulties of operating across borders are inherent, such as the operational constraints imposed by staff and rolling stock rosters, obtaining safety certification in all states involved, procuring traction that is capable of operating in all states in which it is used, need for bilingual (and in some cases tri-lingual) train crew, and drivers who are certified to operate in the states involved. Nevertheless there are some issues that inhibit take up of the possibilities offered by international market opening which that might be resolved. These issues include:

- more consistent infrastructure charges between states, that would give confidence to an open access RU;

- infrastructure charges which are low enough to give headroom to the fare level in which an open access operator might operate;

- more powerful (and explicit) rights of access to use essential facilities and equipment (e.g. rights to actually have fuel put in a locomotive at a fuelling point even where vital pieces of equipment have been transferred to the incumbent RU, ability to have retention toilet tanks emptied, access to national railway telecoms and IT systems, etc);

- access to sales, commercial facilities, and promotional facilities (e.g. rights to have tickets sold in a non-discriminatory manner in station ticket offices, trains of all RUs displayed on station information boards and screens, all trains shown on timetables displayed at stations, right to have publicity materials displayed at stations, etc);

- compulsory ticket inter-availability between competing services (other than for special low-price tickets valid only on the trains of a particular RU), for fares based on the national fare structure, overseen by powerful independent economic regulation.

It should be noted that many of these issues are also pre-conditions for successful domestic market opening (see Section 10).

5. Assessment of Existing Legal Regimes

5.1. Typology of Legal Regimes

5.1.1 Overview

Legal regimes include the following aspects:

- regulatory regime;
- competition policy;
- rules for the organisation of public service contracts; and
- financial support of RUs.

Regulatory regimes can be characterised according to:

- their scope: the services/facilities that are regulated;
- the depth of the regulation: the extent to which enterprises are restricted; and
- 'regulatory style': the fundamental philosophy behind the regulatory approach.

Several further aspects are important and need to be highlighted, particularly the question of institutional implementation, and the closely interrelated question of regulatory effectiveness.

While the general framework for the regulatory system is well defined by several European Directives, comparative studies have shown that Member States have implemented this framework in quite different ways[95]. These differences reflect less national "regulatory styles" than differing targets pursued by Member States (e.g. financial v modal split targets), differing financing systems for the rail sector, and differing views on public ownership.

5.1.2 Market delineation & responsibility

The first key issue is whether the legal regime draws a distinction between different market segments. This question is of importance not only to identify the relevant set of regulatory rules, but, crucially, to identify potential entry barriers that can result from ambiguous legal delineation between market segments.

For the purpose of this Study, the key issues are whether legal differences exist between:

- local/regional and long-distance passenger services and/or;

95 See for example *IBM: Rail Liberalisation Index* 2002, 2004 and 2007; Thompson: *Railway Access Charges in the EU. Current Status and Development since 2004*, 2008.

- commercial and public service contracts.

Both categories may coincide, but this is not necessarily the case. Thus far, there has been no trend to consolidation of legal regimes that can be discerned. Some examples are:

- Germany formally differentiates between regional passenger and long-distance passenger services, the latter being directly awarded or tendered by special public authorities or the Federal States. In principle, an open access regime exists for commercial services in both segments; therefore public service contracts are non-exclusive. In practice, however, usually unsubsidised entrants are not able to compete or co-exist with RUs subsidised by public service contracts. Furthermore, no distinction is made between profitable and unprofitable services; as a result, the public authorities also now tender long-distance rail passenger services under PSO contracts. This ensures that socially valuable, but (for the incumbent) commercially unattractive services are still offered.

- In Sweden, commercial passenger services were until 2009 legally the preserve of SJ, the incumbent. Long-distance passenger or regional passenger services provided under public service contracts were put out to public tender, these contracts conferred exclusive rights.

- In Great Britain the majority of routes are awarded via concessions, including long-distance and regional services. For commercial services a moderated competition regime is in place; it includes, for example, *"consideration of whether there is sufficient capacity available to accommodate the rights sought, the performance impact on other operators, the net benefits to new and existing passengers. ... [ORR] will also look specifically at whether the new competing services would be primarily abstractive of the revenue of existing operators ..."*[96].

- In the Netherlands the incumbent NS enjoys an exclusive fifteen year concession for self-supporting passenger traffic and for new high-speed lines. Public service contracts for publicly supported rail passenger services are directly awarded or put out to tender.

As these examples suggest, the legal differentiation of market segments can:

1. forestall/discourage entry in long-distance segments where there are competing services provided under public service contracts, whether or these are granted on an exclusive or a non-exclusive basis;

2. lower transparency and thus raise entry barriers if profitability is used as a criterion.

[96] ORR: Moderation of competition: final conclusions, May 2004, p. 20.

5.1.3 Access to the market: Entry Regimes

Naturally, the entry regime directly influences entry possibilities, in this, two questions are of key importance:

1. What form of regulation is used? and
2. Do special rules exist for national/foreign RUs or groupings of RUs?

Three different regimes may be distinguished for the form of regulation:

1. Exclusivity rules: entry is not allowed either because the national incumbent has some monopoly rights or because of concession/franchising rights.
2. Restricted entry: entry is only allowed under specified circumstances, e.g. benefits to the public, no change in profits for incumbents.
3. Open access: only technical requirements need to be met.

5.1.4 Regulation of market behaviour (only RUs)

The legal system may contain regulatory rules that target the behaviour of market participants. The regulation of market behaviour can facilitate entry if it prevents the incumbent from an unfairly aggressive response to market entry, or if it allows new entrants to participate in an incumbent's services; on the other hand behaviour regulation can also restrict new entrants' freedom for manoeuvre.

The important questions involve question of:

1. the kind of behaviour that is regulated;
2. the form of regulation and whether regulation is symmetric (same restrictions for entrant and incumbent).

Parameters that might be regulated include:

- fares;
- through ticketing;
- information for passengers;
- service quality, e.g. frequency;
- market exit.

Market behaviour can be regulated in different ways:

- direct specification of behaviour (e.g. fares, frequency, requirements of through ticketing, information provided to passengers);
- cost based or incentivised regulation of fares;
- financial incentives to achieve defined quality levels (e.g. frequency).

5.1.5 Access to infrastructure and to framework contracts

It is important to distinguish the difference between the access to the market and track access, one is useless without the other but in many Member States the rights are not co-ordinated.

Access to infrastructure is an essential condition for entry. Since vertical integration of infrastructure services changes an incumbent's incentives and options to impede entry, two kinds of regulations may be distinguished:

1. structural regulation (separation of infrastructure and operation); and
2. behavioural regulation.

In the case of structural regulation, the key questions are whether services are separated legally from train operations and if so, which services are affected. In the case of behavioural regulation the key questions are what form of regulation is used and what services are affected.

In both cases, the following services can be affected:

- access to tracks;
- access to stations;
- shared use of information systems;
- shared use of marketing systems;
- access to other facilities (fuelling points workshops, stabling sidings, cleaning facilities, etc).

Structural regulation can take the form of accounting separation, an organisational separation within a company (e.g. holding company model), or as separation into separate, independent companies. In the case of behavioural regulation *ex ante* specification of access conditions and *ex post* control should be distinguished.

Whether framework contracts, that ensure an entrants' access to infrastructure for a longer period, are offered is a special aspect of access to tracks and stations. Since entry requires significant investment in rolling stock[97] (at least partially involving sunk costs) the assurance of access for a time period of ten to fifteen years can be an essential condition for financing these investments. Therefore, whether framework contracts are offered, the terms of contracts and whether incumbents and entrants are treated symmetrically can be of vital importance.

5.1.6 Access to the network of services provided by other operators (incumbent)

Access to an incumbent's network of complementary services can facilitate entry since it should lower entry costs/operating costs. Additionally, it can prevent the incumbent from an unfairly aggressive response towards entry.

The following services can be affected:

- distribution channel (i.e. sales);
- passenger information system;
- ticketing system;
- reservation system;
- a large number of local services such platform assistance.

In respect of regulation, *ex ante* specification of access conditions and *ex post* control should be distinguished:

1. What services are affected by regulation?
2. What form of regulation is used?
3. Which services are affected?

5.1.7 Access to complementing services (independent providers)

Lastly, access to complementing non-infrastructure services in a non-discriminatory way is essential to provide a level playing field. Services possibly affected are provision of rolling stock and distribution channels, e.g. travel agencies.

The issue is whether special legislative measures, differing from "normal" competition law, are used to provide a level playing field and if so, what services are affected and what measures are taken.

[97] Whether directly by an RU or indirectly via a rolling stock leasing company.

5.2. Investigation of Previous Studies

5.2.1 Studies examined

The following studies have been examined:

- all relevant EU Directives and Regulations;
- *EU Rail Passenger Liberalisation: Extended Impact Assessment*, Steer Davis & Gleave, March 2004;
- *Railimplement: The Implementation of EU Directives 2001/12/EC, 2001/13/EC, and 2001/14/EC*, Steer Davis & Gleave, November 2005;
- *Rail Liberalisation Index:2007*, IBM Global Business Services, October 2007;
- *Competitive Tendering of Rail Services*, European Conference of Ministers of Transport, OECD (ed.) Paris 2007;
- *Rail Safety and Privatisation*; Prof. A Evans, University of London, 2007;
- *Charges for the Use of Rail Infrastructure 2008*; OECD;
- *Successes and Lessons of Rail Liberalisation in the UK*, Rail Freight Group in association with ATOC, Network Rail, & Railway Industries Association, 2008;
- *European Transport Policy - Progress and Prospects*, Institute of Transport Studies, University of Leeds (published by the CER), October 2009.
- *Liberalizzazione e competizione: lo sviluppo delle infrastrutture e dei servizi ferroviari in Europa e in Italia,* The European House-Ambrosetti, 2009;
- *Railway Alliances in EC Long-Distance Passenger Transport: A Competitive Assessment Post-Liberalization 2010*. ESMT White Paper No. WP-109-01, Study for German Rail, Friederiszick, H., Röller, L.-H. et al., Berlin 2009[98];
- *Study on market prospects in long distance passenger markets in Germany*, IGES;
- *Communication of the European Commission concerning the 1st railway package*.

[98] http://www.esmt.org/fm/292/WP-109-01.pdf.

5.2.2 Key findings

5.2.2.1. Freight market opening

The results of market opening in the rail freight sector provide some pointers to possible outcomes of permitting further market access in the passenger rail sector. Accordingly the paragraphs below discuss the impacts of freight market opening, using evidence from the studies listed above.

An important distinction needs to be made at this point between the degree to which EU rail legislation has been implemented, the number of new freight RUs operating in the market and the success of the rail mode in increasing modal share. A correlation between these parameters would tend to support the view that liberalisation is a contributory factor in increasing market share.

States in the northernmost, central, and south-eastern regions of Europe vary considerably in the degree of implementation of the First Infrastructure Package and Interoperability Directive. Empirical analyses unearthed a polarised picture of legislative compliance and competition in rail freight markets analysed here. Norway, Sweden and Finland emerged as one cluster of states characterised by complete legislative fulfilment, but whose national freight RUs are not yet exposed to significant competition from new entrants. Nonetheless, these states' national carriers have managed to re-structure themselves and now compete successfully with road haulage by offering high quality inter-modal service, without, however, increasing rail freight's modal share in the national markets.

On the other end of spectrum are Poland, Hungary, the Czech Republic, Austria and Greece, which lag behind in implementing the legislation. New operators are emerging in Austria, Hungary[99]) and Poland[100], however, perhaps indicating that in some circumstances new entrant RUs can flourish despite rather than because of market opening legislation.

These outcomes indicate that a very tenuous causal relationship could be inferred between the legislative completeness and market dynamics. One may conclude thus that market developments in both categories of states, i.e. these which have fulfilled all legislative requirements, and those which have yet a long way to go, deviate from the expectations of the European lawmaker.

Despite the fact that freight markets in the Nordic states and in Central and South-eastern Europe grew continuously over the past decade, in neither region did RUs manage to increase their modal share. In the Nordic states rail competition did not reward Cargo Net with higher market share in Norway and Sweden, merely preventing its downward slide against the road alternative. In the new Member States (i.e. those joining after 2003) intra-rail competition took place in a declining rail market and under explosive growth of domestic and international freight tonnage which mainly is served by road. Road haulage

99 Such as RTS and Hungrail.

100 Some as subsidiaries of British or German groups.

operators managed thus to capture the market lost by railways and capitalise on the net growth in volumes of freight shipped.

Consequently, EU legislation to open the European rail freight market has yet to reduce the socio-environmental disbenefits stemming from the dominance of road in the European freight market. This finding suggests that the legislative obligations imposed by the First Infrastructure Package and the Interoperability Directives may need to be accompanied by executive measures that will take into account the national idiosyncrasies of railway systems and the state's role in enforcement of market opening. More specifically, two types of measures may be needed

- those facilitating the termination of national rail monopolies, and
- those providing financial and regulatory assistance to aspiring rail entrepreneurs.

However, some states have gone further. Some have removed all ties between the IM and RUs, and even between passenger and freight businesses, while others have merely separated their accounts within a holding company structure. Most states have divided the railway industry into a number of layers: government, which contains the various ministries (usually of economy and transport); regulatory and competition authorities; infrastructure manager; and railway undertakings. In many cases, these layers overlap, with government bodies undertaking regulatory and competition authority activities and/or the infrastructure manager responsible for capacity allocation.

More recently, two further packages have introduced important measures regarding safety and interoperability, and crucially, most states have been obliged to open up the market for both domestic and international freight traffic completely, and the market for international passenger traffic[101]. But it is important to take into account some key Directives, in particular, Directive 2001/12/EC Article 7 which requires accounting separation of funds provided by the state for public service obligations (PSOs). Separation of the assets used to provide PSO and non PSO services may however cause diseconomies of scale; where assets are shared it may be possible to use them in such a way that fewer are required. (In this context, it is understood that finance for S-Bahn lines in Germany was often provided on the basis that other services could not use the same infrastructure). If there is a requirement to "ring-fence" assets in this way, a possible response might be simply to declare all services to be subject to a PSO, thereby preserving these efficiency gains. In these circumstances, the accounting distinction between the services would be lost.

Three principal types of barrier to the market opening of rail markets have been indentified[102]:

- **Technical**, arising from fundamental technical differences between different railway networks (traction and signalling in particular), which can only be

[101] *European Transport Policy - Progress and Prospects,* October 2009

[102] *Railimplement: The Implementation of EU Directives 2001/12/EC, 2001/13/EC, and 2001/14/EC,* Steer Davis & Gleave, November 2005

addressed as the railway assets are gradually replaced with interoperable equipment, although there will always be limits imposed by fundamental technical differences (e.g. broad gauge on the Iberian peninsular, small loading gauge in Great Britain, etc).

- **Legislative**, arising from different approaches to the ownership, control, management, funding and accounting of railways, which are being addressed through the various Railway Packages.

- **Behavioural**, arising from range of industry player behaviours occurring within the legislative framework as transposed and implemented in each state.

Problems remain with the workings of some of the new legislation, particularly relating to infrastructure charges, and in the practical application of the provisions on regulation and access to ancillary facilities, whilst the problem of the financial architecture of railways is even an more acute and growing problem in many of the new Member States, where the financing of socially necessary services is proving particularly problematic. Rather than finance social services by discrete payments for specific services, some national governments appear to have tried to subsidise local passenger access to infrastructure at the expense of freight companies or long distance trains (see Figures 8 and 9). Bulgaria was specifically warned by the Commission in May 2009 about its charging methodology[103]. Likewise, charges for access to infrastructure, set for full cost recovery, have been at levels which are beyond the reach of railway undertakings. Without tackling the issues of adequate funding, both of infrastructure and of social obligations regarding passenger services, the liberalisation of railways cannot have the results hoped for.

Much of the legislation, including the complete opening up of the freight market in 2007, has only taken effect very recently, and adaptation to it is still taking place[104]. As noted above, implementation has been inadequate in many Member States. It is clear that much remains to be done, both in carrying the legislation through to its logical conclusion in many states.

At the same time, research to identify best practice on these issues is very important, and the Commission has an important part to play in encouraging dissemination[105] and take up of the results. It may be that ultimately further legislation will be needed on these issues.

Previous studies indicate that the EU as a whole gains from competitive markets and that it is important that progress is made in pushing competitive forces forward. There are a number of potential models. It may be that no single model can be applied across the entire EU (or indeed even in one state) for economic, geographical, constitutional or social reasons. It may be therefore that only the principles that underpin the development of a competitive market can be common.

[103] IP/10/509 of 5 May 2010
[104] *European Transport Policy - Progress and Prospects,* October 2009
[105] One regulator made the specific point that inter-regulator discussions are very valuable.

5.2.2.2. Regulatory structures

The implementation of the First Railway Package has been changing rapidly during the last few years. Thus although many problems can be found, for instance regarding access to facilities such as terminals and marshalling yards, the content of network statements and lack of independence of regulatory authorities, and it is expected many of these to be overcome in time. However, several Member States have failed to transpose the First Railway Package correctly. Whilst in some cases the failure related to minor details in others it was more serious. Amongst the prominent issues were:

- a failure to ensure adequate independence of the infrastructure manager from train operators where these were still part of the same company
- insufficient implementation of the charging framework set out in Directive 2001/14/EC, including lack of the required performance regime
- failure to establish an independent regulator with appropriate powers and accessibility
- insufficient incentives for the infrastructure manager to reduce costs and the level of access charges

What does seem clear is that states which have undertaken a well planned and sensibly phased package of reforms are, on average, performing better than those that have resisted reform. At the same time, there is evidence that adequate investment in infrastructure, including both high speed passenger and capacity and quality for freight, is another key ingredient to success.

The majority of EU Member States have notified the Commission that they have transposed the three Railway Packages into national law. Transposition can be in name only until all the relevant domestic legislation is in place and its requirements have been complied with. It has shown that some Member States have passed the necessary primary legislation required for implementation but have still to put in place some or all of the processes and procedures that it requires. Even where they have transposed and implemented them, states have interpreted the provisions of the Directives in different ways.

5.2.2.3. Passenger market opening

The progress and prospects for the market opening that is taking place for international passenger traffic have been discussed in Section 4.

The first country in Europe to completely open up its domestic market for new entry of commercial passenger operators was Germany, which did so in 1994[106]. In the case of services subject to a public service obligation, competitive tendering is widely practiced in

[106] *European Transport Policy - Progress and Prospects*, October 2009

Sweden, Germany, Great Britain, and Denmark. Specifically relating to franchising of passenger services, ECMT (2007) provides a wealth of evidence about experience to date. In Germany, the Netherlands and Denmark, there were some problems with unrealistic bids, leading to bankruptcies or premature withdrawals from the market but in Great Britain (Smith, Nash and Wheat, 2009) and Australia (Kain, 2007) some commentators consider that the problem has been acute, and contributed to a significant failure to achieve the aims of the exercise with early cost reductions being more than offset by later increases in the case of Great Britain[107]. The conclusion seems to be that franchising is not always successful, but that it is important to have at least the threat of competition to ensure value for money in terms of the cost and quality of service of the incumbent.

5.3. Differences between Legal Regime in Theory/on Statute Books & that in Practice

5.3.1 Structure of sub-section

This sub-section is based on the review of the studies previously identified[108]; it looks at the theoretical legal regimes, legislation on statute books, and its application in practice. In this section the Consortium identify differences in key areas between theory and practice.

The restructuring of the modern rail industry commenced with Directive 91/440/EEC; however, the majority of the operational measures which lay the foundations of market opening come from the three railway packages. The rights and obligations that arise from the railway packages are considered below.

5.3.2 Overview of regulatory framework

<u>The First Railway Package</u> was adopted on 26 February 2001 by the European Parliament and the Council. Its main objective was to open the international rail freight market, through the following three Directives:

- 2001/12/EC, which established a general framework for the development of the European railways, Article 4 requires railway undertakings to have *"independent status"* for their assets and finances. Article 6 requires separate accounts for the provision of transport services and the management of infrastructure, it also prohibits the transfer of public funds from one activity to the other;
- 2001/13/EC, regarding licensing to freight operators; and
- 2001/14/EC, concerning capacity allocation and infrastructure charging.

[107] This is not, however, the view of the Consortium which considers that the reasons for the large increase in the level of public support required in Great Britain has been as a result of infrastructure maintenance and renewal issues that are quite separate from the market opening mechanism; this issue is discussed in some detail in Annex 5.

[108] See Annex 3.

In fact implementation has been incomplete and *"after detailed enquiries about implementation in every Member State, the Commission opened infringement proceedings in June 2008 against 24 Member States. Following modifications introduced in their domestic legislation by several Member States in order to comply with EU legislation on a number of issues, the Commission sent reasoned opinions to 21 Member States in October 2009 on the remaining infringements. After having analysed the replies of the Member States to the reasoned opinions, the Commission has decided to refer 13 Member States, which still do not implement EU rules properly, to the Court of Justice."* [109] The thirteen Member States in question are Austria, the Czech Republic, Germany, France, Hungary, Ireland, Italy, Luxembourg, Poland, Portugal, Slovenia and Spain. The Commission goes on to say that the infringements are most often *"by not sufficiently ensuring the independence of the rail infrastructure manager, through inadequate implementation of the provisions concerning rail access charging and/or due to a failure to set up an independent regulatory body"*.

<u>The Second Railway Package</u> was adopted on 29 April 2004 and it consists of:

- Directive 2004/49/EC on railway safety in the Community;
- Directive 2004/50/EC on the interoperability of the trans-European high-speed and conventional systems respectively;
- Directive 2004/51/EC on the development of railway undertakings of the Community, which established the market opening for both national and international freight services across the entire European network from 1 January 2007; and
- Regulation (EC) 881/2004 on the establishment of a European Railway Agency.

The period set for the implementation of the Second Railway Package into national law ran until April 2006[110]. All EU Member States have notified transposition of the relevant Directives[111].

In the present context, Directive 2004/49/EC is particularly important. It is therefore examined later in this section.

<u>The Third Railway Package</u> was adopted on 23 October 2007. The objectives of the package included opening up international passenger services to competition within the EU from 1 January 2010. The package contained the following elements:

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109 Quote from IP/10/807 of 24 June 2009

110 Directive 2004/51/EC had to be implemented by 31 December 2005.

111 Nevertheless, in October 2006 the Commission decided to pursue infringement proceedings against thirteen EU Member States that had failed to notify the transposition of Directives 2004/49/EC and 2004/50/EC: Estonia and Spain, that had failed to notify 2004/49/EC; France, that had failed to notify 2004/50/EC; Belgium, Germany, Greece, Italy, Luxemburg, the Netherlands, Portugal Sweden, Slovenia and Slovak Republic, that had failed to notify both Directives.

- Directive 2007/58/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure;

- Directive 2007/59/EC on the certification of train drivers operating locomotives and trains on the railway system in the Community; and

- Regulation (EC) 1371/2007 on rail passengers' rights and obligations.

The required transposition date for Directive 2007/58/EC was 4 June 2009. Nevertheless, as of 24 June 2010 infringement procedures for non-communication of transposition measures were on-going against Denmark, Lithuania, Luxembourg and the Netherlands[112].

Directive 2007/59/EC was due for transposition by 3 December 2009, but as of 24 June 2010 infringement procedures for non-communication of transposition measures were on-going against nineteen states: Belgium, Czech Republic, Denmark, Estonia, Germany, Greece, France, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, The Netherlands, Poland, Portugal, Slovenia, Spain and Sweden. [113]

Because the relevant Directives of the Third Railway Package have not been fully transposed into national law for all Member States, a study on the practical implementation of these Directives has not been developed.

This section of the Report considers the following issues, considered of utmost importance for the creation of a European rail market:

- separation between infrastructure manager and railway undertakings;

- establishment of a regulatory body;

- administrative barriers for a RU to enter a new market; and

- safety.

As already noted, the revision of these issues across Member States is based on the studies identified in Annex 3.

5.3.3 Separation

Article 6 of Directive 2001/12/EC defines the following requirements for separation:

- accounting separation between the infrastructure manager and railway undertakings;

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[112] Commission website.

[113] Commission website

- separation of regulatory functions and infrastructure related functions from railway operations (licensing of railway undertakings, the allocation of capacity, the issues related to infrastructure charging and the monitoring of public service contracts required in the provision of certain services).

Accounting separation has been achieved in all Member States considered in this section[114]. With regard to the separation of essential functions from railway operators, the current corporate structures of the rail infrastructure managers in the EU Member States are[115]:

- Category 1: Fully legally, organisationally and institutionally independent infrastructure manager undertaking capacity allocation;

- Category 2: Independent infrastructure manager allocating capacity having delegated certain infrastructure management functions (e.g. traffic management, maintenance) to one of the RUs/integrated infrastructure manager working alongside an independent body in charge of capacity allocation;

- Category 3: Legally (but not institutionally) independent infrastructure manager undertaking capacity allocation owned by a holding company which also owns one of the RUs; and

- Category 4: Infrastructure manager in charge of allocating capacity and railway undertaking still integrated.

Table 5.3.1 – Categorisation of IM Status

Category	State or network
1	Great Britain, Finland, Denmark, Netherlands, Norway, Spain, Sweden, Portugal, Slovakia, Lithuania, Romania, Czech Republic, Greece
2	Estonia, France, Hungary, Slovenia, Luxembourg, Latvia
3	Austria, Belgium, Germany, Italy, Poland
4	Ireland, Northern Ireland

Article 9 of Directive 2001/12/EC requires accounting separation of freight and passenger businesses. Most Member States have separate balance sheets for the freight and passenger businesses of their incumbent RUs and increasingly the businesses are also being physically separated particularly with separate traction and drivers. Whilst EU law

[114] *Rail Liberalisation Index 2007*, IBM Global Business Services, October 2007.

[115] *Accompanying document to the report from the Commission to the Council and the European Parliament on monitoring development of the rail market,* Commission staff working document, 18 December 2009.

makes no stipulations whatsoever in this regard this separation encourages concentration on core activities and allows more precise identification of costs.

Currently a number of Member States have still failed to comply with the separation requirements completely though. Accordingly, the European Commission initiated infringement procedures against the following Member States in October 2009[116]: Austria, Belgium, Czech Republic, Germany, Estonia, Spain, France, Hungary, Italy, Luxembourg, Latvia, Poland, Portugal, Sweden, and Slovenia.

Infringement action is currently (Summer 2010) in progress against thirteen states: Austria, the Czech Republic, Germany, France, Hungary, Ireland, Italy, Luxembourg, Poland, Portugal, Slovenia and Spain for what the Commission describes as not sufficiently ensuring the independence of the rail infrastructure manager amongst other issues.

5.3.4 Regulatory body

Article 30 of Directive 2001/14/EC requires Member States to establish a regulatory body to which applicants shall have a right to appeal against decisions adopted by the infrastructure manager, or railway undertakings where appropriate, concerning infrastructure access issues. This body is required to ensure that charges set by the infrastructure manager are non-discriminatory, and to have the powers to request relevant information and to make binding decisions on all parties.

Under Article 30 *"this body can be the Ministry responsible for transport matters or any other body"*. It also states that the regulatory body shall be independent from any infrastructure manager, charging body, allocation body or applicant. In this sense, each state has implemented the Directive differently so different types of regulatory body have been set up[117]:

An updated list of the regulatory bodies and contact points can be found on DG MOVE's website at: http://ec.europa.eu/transport/rail/market/regulatory_bodies_en.htm.

Ireland is the only state that has yet to establish a regulatory body[118]. Nevertheless, in many Member States the regulator is weak or insufficiently independent from the political authorities[119].

Infringement action is currently (Summer 2010) in progress against thirteen states: Austria, the Czech Republic, Germany, France, Hungary, Ireland, Italy, Luxembourg, Poland,

116 *Accompanying document to the report from the Commission to the Council and the European Parliament on monitoring development of the rail market,* Commission staff working document, 18 December 2009.

117 *Accompanying document to the report from the Commission to the Council and the European Parliament on monitoring development of the rail market,* Commission staff working document, 18 December 2009.

118 Note, however, that Ireland had an exemption from the requirement to establish a regulatory body until March 2008 under Article 33 of Directive 2001/14/EC.

119 *European Transport Policy - Progress and Prospects*, Institute for Transport Studies, September 2009. This study also states that new entrants support the creation of a truly independent regulator, and so do incumbents, since this is the best way to put an end to unjustified and damaging suspicion.

Portugal, Slovenia and Spain for what the Commission describes as due to a failure to set up an independent regulatory body amongst other issues.

5.3.5 Administrative barriers

5.3.5.1. Overview

A new entrant RU to a market must go through a number of steps, including administrative processes. The following text discusses three of the most important issues: licensing, safety certification, and rolling stock approvals.

5.3.5.2. Licensing

Directive 95/18/EC, as modified by Directive 2001/13/EC, requires states to put in place measures to grant licenses to RUs through which their capacity as railway undertakings is recognised. Article 5 of Directive 2001/13/EC requires that a railway undertaking must "*at any time be able to meet the requirements relating to good repute, financial fitness, professional competence and cover for its civil liability*"[120]. However, the Directive does not contain requirements on the licensing authority, so the body in charge of licensing varies between states[121].

An updated (but incomplete) list of national licence issuing offices is shown on the ERA website at http://www.era.europa.eu/Core-Activities/Safety/Pages/licences-and-certificates.aspx. It is supplemented by further information on the "ERADIS" public database of safety documents (http://pdb.era.europa.eu/safety_docs/licences/default.aspx). It is intended to combine these sites in due course. In the meantime both need to be consulted to derive a full list.

Directive 2001/13/EC covers licensing requirements; it amends Directive 95/18/EC but contains few compulsory provisions, although it does require a review of licenses at least every five years by the licensing authority, a decision on an application no later than three months after all relevant information has been submitted, but leaving to national law the specification of any other requirements, such as technical and safety matters, or provisions on health and social conditions of workers and consumers. Key attributes of the licenses granted in different states as in 2007 are shown in Table 5.3.2[122].

Table 5.3.2 – Key Licence Attributes

	Licenses
AT	- Valid for an indefinite period of time. - Licences issued in other EU states and in Switzerland are recognised.

120 Articles 6 to 9 of Directive 2001/13/EC estipulate the basic requirements that a railway undertaking must fulfil in order to be awarded a license.

121 *Accompanying document to the report from the Commission to the Council and the European Parliament on monitoring development of the rail market,* Commission staff working document, 18 December 2009.

122 *Rail Liberalisation Index 2007*, IBM Global Business Services, October 2007.

	Licenses
	- No explicit paid-up capital contribution is necessary. - The applicant must be able to fulfil its current and future financial obligations for the next twelve months.
BE	- Valid for five years, but expires after six months if unused. - Must be issued within three months of submission of all necessary documents. - Recognition of a licence takes two months. - While licences from other EU states are recognised, they can only be used for international traffic i.e. not for cabotage.
BG	Licences of the safety certificate from other EU Member States are recognised.
CH	- Valid for ten years, with no verification during this period. - Issued within three months of submission of all the necessary documents.
CZ	- Valid for an indefinite period of time, but expire after twelve months if unused. - Verified every five years. - Takes two months to issue a licence. - Licences from other EU Member States are recognised.
DE	- Valid for fifteen years. - Subject to verification every five years. - Issued within three months.
DK	Licences from other EU Member States are recognised only for transit traffic and cross-border freight transports.
EE	- Separate licenses for passenger and freight transport. - Valid for an indefinite period of time (and regular verification is not prescribed by law). - One month of legal period for issuing a license (after the submission of all documents). - Licenses from other Member States are recognised.
ES	- Licences from other EU Member States are recognised. - Issued within three months.
FI	- Can be obtained without proof of insurance. - No statutory provisions.
FR	Licences from other EU Member States are recognised.
UK	- Valid either for passenger or for freight transport. - Have to be processed within three months. - Valid for an indefinite period of time (the law does not prescribe specific verification intervals). - Licences of other EU Member States are recognised.
GR	- Licences of other EU Member States are recognised. - No new entrant has completed the license issues process, so no empirical values of the time taken to succeed with an application are available.

	Licenses
HU	- Although legal specification prescribes a period of two months, issuing a license takes three to four months. - Separate licences for freight and passenger traffic. - Licences issued by other EU Member States are recognised.
IE	- Valid without restriction, but are verified by the competent authorities after five years. - Unused licences expire after six months. - Processed within three months by law (but no empirical values available). - Licences issued by other EU Member States are recognised.
IT[123]	- Valid indefinitely, but revision every five years (at least) by the Ministry of Infrastructure and Transport of the position of each railway company holding a license to verify effective compliance with legal requirements. - Issued within three months from the receipt of necessary information. - The licence is valid throughout the European Union.
LT	- Valid for the entire national rail network. - Licences are verified every three years. - Processed within one month by law (but empirical values between two and four months). - Licences from other EU Member States are recognised.
LU	- Valid for the entire Luxembourg rail network. - Processed within three months. - Licences issued by other EU Member States are recognised.
LV	-Valid for a period of five years.
NL	- Valid for an indefinite period of time. - Verified every five years. - Processed within thirteen weeks. - Licences issued in other EU Member States are recognised.
NO	- Valid for an indefinite period, with verification intervals varying in accordance with the risk rating of the individual RU. - Licences issued in EU Member States are recognised in Norway.
PL	- Valid for an indefinite period (regular verification is not prescribed by law). - Expire after six months if unused. - Processed within a maximum of two months by law (although experience indicates that the duration is up to three months in practice). - Valid on the entire state rail network. - Licences from other EU Member States are recognised only for freight RUs, not for passenger RUs.
PT	.

[123] This information is based on the DECRETO LEGISLATIVO 188/2003 of the Italian law.

	Licenses
RO	- Valid for a period of five years and subject to annual verification. - Processed within two months. - Licences issued by other EU Member States are recognised without examination.
SE	- Valid for passenger and rail freight transport. - Valid for an indefinite period of time and have to be verified every five years. - Processed within three months. - Licences issued in a Member State of the European Economic Area or Switzerland are recognised.
SI	No external RUs have obtained a national license, so no empirical values available.
SK	- Valid for an indefinite period of time and remain valid, even if not used. - Licences are verified at irregular, unspecified intervals. - Issued within a period of two months. - Licences of other Member States are recognised on the rail network of the Slovakian Republic.

As can be seen from the table above[124], numerous Member States currently fail to comply with Directive 2001/13/EC regarding the requirement for regular revision of licences: at least every five years. Estonia, United Kingdom and Poland do not prescribe a regular verification of licenses by law. Norway, where verification intervals vary in accordance with the risk rating of the individual RU, and Slovakia revise licenses, but the intervals appear unspecified.

In terms of the time taken to make a decision on an application once the relevant information has been submitted, several Member States can be identified as complying with Directive 2001/13/EC on statute books, but not in practice. This includes Hungary, where issuing a license takes three to four months, and Lithuania, where empirical values demonstrate that issuing a license takes between two and four months. In the case of the Netherlands the issue is more technical: its national law stipulates a maximum period of thirteen weeks, which on occasion could be slightly longer than the three months stipulated by Directive 2001/13/EC. For Member States where no new entrants have emerged, e.g. Greece, Ireland, it is not possible to assess whether the law is being applied properly.

5.3.5.3. Safety certification

Article 10 (1) of Directive 2004/49/EC requires that a railway undertaking must hold a safety certificate to access to the railway infrastructure. Paragraph 3 of Article 10(1) requires that the safety certificate is granted by the safety authority that every Member State is required to establish. Details of safety authorities are shown on the ERA website at http://pdb.era.europa.eu/public/organisations.aspx.

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124 The findings developed in this section on licensing are based on the information contained in "*Rail Liberalisation Index 2007*, IBM Global Business Services, October 2007".

In most states, the safety authority issuing safety certificates is also the licensing authority. This makes it easier for an RU to enter a new state, since it has to deal with only one institution to obtain both the license and the safety certificate. In contrast, nine Member States have different safety and licensing authorities: Belgium, Estonia, Finland, France, Greece, Hungary, Italy, Latvia, and Romania. Nevertheless, in some cases these two authorities are not an independent entities and belong to the same body or Ministry, e.g. Romania and Greece.

5.3.5.4. Rolling stock approval

A railway undertaking wishing to enter a market has to complete another essential process; to have its rolling stock approved. As in the cases of licenses and safety certificates, every Member State has designated a body or bodies for granting technical approval for rolling stock[125]. The rolling stock process differs depending on whether the infrastructure is interoperable or not. In the case of interoperable infrastructure (i.e. that which is accordance with the requirements of Directive 96/48/EC in the case of high-speed infrastructure or Directive 2001/16/EC in the case of conventional infrastructure), approval of the rolling stock any *notified body* that the stock in question conforms with the relevant TSIs is sufficient. However, given that it will take many decades before the whole of Europe's conventional railway infrastructure is TSI compliant, the normal process is somewhat more complex, in the case of new rolling stock there is a two stage process: certification of TSI compliance by the notified body followed by verification at a national level that the interfaces with the national infrastructure are appropriate (which might be a multi-stage process).

5.3.5.5. Combination of competences

A variety of different organisations issue certificates required by RUs at a national level, since there is no statutory requirement in this respect[126]:

- Group 1: Authorities are neither those that licence railway undertakings nor issue safety certificates: Austria, Belgium[127], Denmark, Ireland, Norway, Romania and United Kingdom;

- Group 2: Authorities which licence railway undertakings but do not issue safety certificates: Italy and Latvia;

- Group 3: Authorities which issue safety certificates but do not licence railway undertakings: Estonia, Finland, France, Hungary and Greece; and

125 *Accompanying document to the report from the Commission to the Council and the European Parliament on monitoring development of the rail market,* Commission staff working document, 18 December 2009.

126 For states where contacts have not been provided regarding the authority issuing homologation certificates for rolling stock, the authority in charge of this process has been considered the Ministry of Transport.

127 In this case the authority in charge of rolling stock approval is the infrastructure manager (Infrabel), which could lead to a conflict of interest since Infrabel is owned by a holding company which also owns one of the operators (see findings about "Separation" in this section).

- Group 4: Authorities which both licence railway undertakings and issue safety certificates: Bulgaria, Switzerland, Czech Republic, Germany, Spain, Lithuania, Luxemburg, the Netherlands, Poland, Portugal, Sweden, Slovenia and Slovakia;

States in this last group each have a single organisation to deal with for the three administrative requirements that a foreign RU must achieve to operate on a national rail system: licence, safety certificate and technical acceptance of rolling stock. This may simplify applications from foreign RUs.

On the other hand, a foreign RU wishing to operate the rail system in states within the first group has to deal with three different institutions to obtain access rights; this may make applications more complex and slower.

A final factor that should be borne in mind when dealing with administrative processes is the language in which information is available. Some states have specific information only in their national language(s)[128] i.e. Bulgaria, Switzerland (network statements in German), Estonia, Germany, Denmark, Hungary, etc. This presents additional difficulties in terms of administrative processes. In the Consortium's view that while it should be expected that an RU operating in a state should have a high level of competence in all official languages used, information on the requirements that an RU would need to meet should be available in an accessible form to enable RUs to make an informed decision on whether it is 'worth the effort' of attempting to enter a particular national market.

In conclusion[129], the administrative barriers revised in this section (issuing of licenses, safety certificates and rolling stock approval) are wholly necessary processes but are still relatively time and cost-intensive in many states, such as Belgium, Italy, France, Greece, Portugal and Spain. On the other hand, these processes are most efficient and effective in Sweden, Hungary, Switzerland and United Kingdom.

5.3.6 Market opening

The level of market opening varies across different states and between passenger and freight services. A number of states have introduced competition to the market by means of competitive tendering for some or all subsidised passenger services. An overview of market opening in the European railway sector is shown in Table 5.3.3[130]. Note that this data originally comes from the study *Rail Privatisation and Competitive Tendering in Europe*, by G Alexandersson for Banverket and although the ITS study was published in 2009, most of the data relates to 2006 so it may not represent the current position accurately. Indeed ITS specifically warned that the information for Germany understated the development of competition in the meantime.

128 *Rail Liberalisation Index 2007*, IBM Global Business Services, October 2007.

129 *Rail Liberalisation Index 2007*, IBM Global Business Services, October 2007.

130 *European Transport Policy - Progress and Prospects*, Institute for Transport Studies, September 2009.

Table 5.3.3 – Market Opening Overview (as given in ITS Study)

	Formal Award Procedure for Public Service Contracts	Access: Commercial Passenger Services	Access: Freight Services
AT	Direct negotiation and competitive tendering	Open access*	Open access
BE	Direct negotiation	Open access (domestic companies only)	Open access
BG	Direct negotiation	Open access	Open access
CH	Direct negotiation	Limited open access (only for irregular services)	Open access
CZ	Direct negotiation and competitive tendering	Open access (domestic companies only)	Open access
DE	Direct and public negotiation and competitive tendering	Open access for domestic operators*	Open access
DK	Direct negotiation and competitive tendering	Open access for domestic operators	Open access
EE	Competitive tendering	Open access	Open access
ES	Direct negotiation	No access for external operators	Open access*
FI	Direct negotiation	No access for external operators	Open access*
FR	Direct negotiation	No access for external operators	Open access
UK	Competitive tendering	Open access	Open access
GR	Direct negotiation	No access for external operators	Open access
HU	Direct negotiation	Open access for domestic operators*	Open access
IE	Direct negotiation	No access for external operators	Open access

	Formal Award Procedure for Public Service Contracts	Access: Commercial Passenger Services	Access: Freight Services
IT	Direct negotiation and competitive tendering	Open access for domestic operators*	Open access*
LT	Direct negotiation and competitive tendering	Open access	Open access*
LU	Direct negotiation	Open access for domestic operators*	Open access
LV	Direct negotiation and competitive tendering	Open access*	Open access
NL	Direct and public negotiation and competitive tendering	National services closed for new entry until 2015	Open access
NO	Direct negotiation and competitive tendering	Open access only on disused lines*	Open access
PL	Direct negotiation and competitive tendering	Open access for domestic operators*	Open access
PT	Direct negotiation and competitive tendering	Limited open access (international groupings)	Open access*
RO	Competitive tendering	Open access for domestic operators*	Open access
SE	Competitive tendering	Open access for night trains and chartered trains only	Open access*
SI	Direct negotiation	Open access only to cross-border services for foreign companies	Open access*

* Some restrictions for foreign operators, although the nature of these are not defined in the source reports.

As one can see[131], all Member States permitted open access to domestic RUs for freight operations, whilst the majority permitted open access for foreign RUs. Only seven states

[131] The findings developed in the following three paragraphs about "Market opening" are based on the information contained in "*European Transport Policy - Progress and Prospects*, Institute for Transport Studies, September 2009".

placed some restrictions on foreign RUs: Spain, Finland, Italy, Lithuania, Portugal Sweden and Slovenia, although it is questionable how much of an impediment this really was, given the practical need for any new entrant to establish some kind of physical presence in a state.

For passenger transport, the landscape was substantially different. Numerous states blocked their national rail passenger transport market to external RUs completely. This was the case in Spain, Finland, France, Greece and Ireland, while, other states allowed access only under specific circumstances: irregular services, disused lines, night and chartered trains, etc, or for domestic operators.

Finally, it may be observed that passenger services provided under a public service contract are being increasingly subjected to competitive tendering, the intention of which is to increase competition levels in the rail passenger transport market.

The information in the table above can now be compared with the 2008 rail market opening score for both the freight and passenger markets, which has recently been published by the European Commission[132].

Table 5.3.4 – Rail Market Opening Score (per European Commission)

	Freight			**Passenger**		
	No. of valid railway licenses	**Non-incumbent mkt share (% of tkm)**	**Rail freight market opening score***	**No. of valid railway licenses**	**Non-incumbent mkt share (% of pkm)**	**Rail pass market opening score***
AT	17	14	0.740	13	12	0.774
BE	5	6.1	0.882	1	-	-
BG	6	-	-	2	-	-
CZ	33	-	-	11	0	-
DE	315	22	0.608	302	10.1	0.792
DK	11	-	-	12	9	0.828
EE	13	49	0.0389	2	57.7	0.179

132 Annex 13 of "*Accompanying document to the report from the Commission to the Council and the European Parliament on monitoring development of the rail market,* Commission staff working document, 18 December 2009". Information about Switzerland is not available.

	Freight			Passenger		
	No. of valid railway licenses	Non-incumbent mkt share (% of tkm)	Rail freight market opening score*	No. of valid railway licenses	Non-incumbent mkt share (% of pkm)	Rail pass market opening score*
ES	10	5	0.903	-	0	1
FI	1	0	1	1	0	1
FR	7	10	0.81	2	0	1
UK	26	100	0.311	45	100	0.001
GR	0	0	-	-	0	1
HU	22	14.4	0.733	3	1.8	0.964
IE	-	-	-	-	0	1
IT	-	-	-	-	-	-
LT	21	0	1	6	0	1
LU	2	-	-	1	-	-
LV	4	9.6	0.818	3	9.1	0.824
NL	-	25	-	-	-	-
NO	8	21	0.62	4	12	0.77
PL	67	24	0.47	29	11.1	0.790
PT	2	0	1	1	-	-
RO	25	41	0.35	4	1.1	0.978
SE	17	-	-	8	-	-
SI	2	0	1	1	0	1
SK	1	-	-	4	0	1

*As used in the Commission's document, rail market opening score calculated on the basis of the Herfindahl-Hirschman Index which estimates the concentration ratio in an industry and serves as an indicator of the amount of competition in the respective market. The Herfindahl-Hirschman Index is defined as the sum of squares of the market shares of each individual firm. As such, it can range from 0 to 1 moving from a very large amount of very small firms to a single monopolistic producer. Here an approximation based on the square of the market share of the most important company is provided.

In terms of the rail passenger market, as already noted, five states block their national market to external RUs completely: Spain, Finland, France, Greece and Ireland. Naturally, it may be that these barriers could be resolved simply by registering a subsidiary company in the state in question. Their opening scores in the table above correspond with this situation, as they all score 1. In addition, there are three other states scoring 1 in the opening score: Lithuania, Slovenia and Slovakia. Slovenia and Slovakia restrict access for foreign operators in certain cases[133], which may explain their scores. Nevertheless, Lithuania's score is contradictory, since it is one of the four states offering fully open access with no restrictions in the rail passenger market. The other three states with full open access are Bulgaria, Estonia and the United Kingdom. The table above does not contain an opening score for the Bulgarian passenger market, but the other two states have the best opening scores (United Kingdom 0.001; Estonia 0.179).

In general, it can be observed that the information about market opening from the Institute for Transport Studies report[134] corresponds with the opening score data recently released by the European Commission[135], except in the case of the rail passenger market in Lithuania.

5.3.7 Conclusions

According to the IBM report[136], "*the legal requirements are further developed, and the practical market access conditions for external RUs in most countries are not as pronounced and developed as the legal prerequisites*". This suggests that EU Directives were not implemented properly at the time that this study was produced; this is still the case for, as noted above, infringement action is currently being taken by the European Commission against being taken against no less than twenty-three of twenty-five EU states with rail systems: only Finland and the United Kingdom are not subject to infringement action at the time of writing, although it should be noted that the magnitude of the infringements varies considerably between states: varying between minor and substantial.

However, the Consortium notes that there is a distinction between merely transposing a Directive and implementing it properly. It is possible for a Member State to set up a body or a mechanism and thus be able to claim transposition without (for example) giving the body sufficient funds or staff to do its job properly. This distinction is important in practice. Thus there are states from the group against whom infringement action is being

133 Slovenia has open access only for cross-border services for foreign companies, whilst Slovakia has open access for domestic operators with some restrictions for foreign operators.

134 *European Transport Policy - Progress and Prospects*, Institute for Transport Studies, September 2009.

135 Annex 13 of "*Accompanying document to the report from the Commission to the Council and the European Parliament on monitoring development of the rail market,* Commission staff working document, 18 December 2009".

136 *Rail Liberalisation Index 2007*, IBM Global Business Services, October 2007.

taken that in practice have achieved a higher degree of market opening than one or two states in the ‘no infringement’ group (e.g. a comparison between Germany and Finland).

The IBM report principally examines access in terms of the existence of barriers to access, four criteria are used, the existence of information on access, administrative procedures, practical infrastructure access issues and the conditions of which access had in fact been granted. Practical infrastructure access issues were given the highest weight.

The report groups states into two groups in terms of the practical conditions for external access to the (freight and passenger) markets. In the first group, the states with the most favourable conditions for external access to the market, come Switzerland, Denmark, Austria, the United Kingdom, the Netherlands, Germany and Sweden. In the remaining twenty states considered in that report, market access is more difficult in practice. The IBM report does not identify any common theme limiting access to the market but identifies (in the passenger market) that Belgium, France and Spain totally excluded external RUs from their market; that infrastructure charges were high in France, Italy and Spain and were regressive in Hungary and Italy. The IBM work has not been repeated since the cut-off date for their report (of May 2007) but liberalisation has moved on and (for example) states such as Belgium, France and Spain are now required to permit some access.

The IBM report also highlights the fact that (naturally) the states which exhibit better practical market access conditions have had the most experience with competition on rail. Nevertheless, no particular areas can be identified that are common to the leading states in terms of the practical approach to market access.

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The situation, identified in the IBM report, in which transposition of the law runs ahead of implementation of practical measures can be explained as being the result of a number of different factors. First of all, a number of states fail to comply with the provisions contained in the different EU Directives, even though they have notified their transposition into national law. This argument is supported by the infringement procedure initiated by the Commission against several Member States regarding their failure to implement the First Railway Package legislation properly. With regard to the First Railway Package, a proper implementation of the provisions concerning the separation of infrastructure managers and railway undertakings as well as regulatory body issues appears to be critical.

The First and Second Railway Packages are intended to boost competition within European railway markets and to increase the competitiveness of railways in relation to other modes of transport. Therefore, their proper implementation is crucial. The short time which has passed since the transposition of the different Directives into national law, and/or lack of resources, may be the reasons behind the inadequate implementation of EU Directives to date.

As for the Third Railway Package, although one of the two Directives, 2007/58/EC, was due for transposition on 4th June 2009, Commission sources show that infringement proceedings have been undertaken against Denmark, Lithuania, Luxembourg and the Netherlands for failing to notify transposition[137].

As can be seen, there is still room for improvement with regard to the practical implementation of EU law. In this context, the role of the European Commission is of utmost importance. It should continue to monitor the current status in each country and identify gaps between legal requirements on statute books and practical developments, until a full implementation of the relevant Directives is in place.

[137] http://ec.europa.eu/transport/infringements/directives/doc/infringements_transport.pdf dated 24 June 2010.

6. Case Studies

6.1. Selection of Case Studies

The purpose of the Case Studies was to examine the impact of liberalisation in states that have already opened their domestic rail passenger markets to competition. In particular, to explore the positive and negative aspects of the differing models used, and to obtain quantative data on their relative effectiveness to be used in the assessment of the impact of opening the domestic rail passenger market for states with a lower degree of liberalisation.

In discussions with DG MOVE it was agreed that Case Studies should be undertaken for the following states: Germany, Great Britain[138], Italy and Sweden. It has been further agreed that in view of the recent enactment of the relevant legislation in Sweden that the Case Study for Sweden should be confined solely to exploration of the legal and regulatory framework.

6.2. Information Collection

6.2.1 Overview

Information was collected through desktop research, from interviews with key stakeholders and from written questionnaires with a wider set of stakeholders.

As a general rule, face-to-face interviews were held with the following:

- transport ministry;
- regulatory body;
- IM;
- at least two passenger RUs, normally including the incumbent and a new entrant.

Questionnaires were disseminated more widely, as general rule, they were dispatched to:

- all of the most important passenger RUs;
- a representative selection of passenger RUs;
- rolling stock leasing companies;
- representative bodies for (rail) transport users:
- railway trades unions.

[138] Northern Ireland has an entirely different and less liberalised legal framework for railways; accordingly Great Britain rather than the United Kingdom is the appropriate case to examine.

6.2.2 Interviews conducted at a European level

The following face-to-face interviews with the following pan-European bodies were held:

- Community of European Railways and Infrastructure Managers;
- European Infrastructure Managers' Association;
- International Association of Public Transport;
- European Passenger Transport Operators;
- European Passenger Federation (however, this organisation declined a face-to-face interview, expressing a preference to submit a written response).

The views expressed in these interviews with pan-European bodies are reported in Section 8.

6.3. Conclusions from Case Studies

6.3.1 Germany

6.3.1.1. Qualitative

The restructuring of the German railway sector and of DB in particular had widespread public support and is, overall, regarded as a big step ahead for the sector. Despite allowing open access as early as 1994, the German approach can best be characterised as a gradual one: the regulatory system has been developed step by step over the last fifteen years, and major revisions are just as frequently discussed. For regional passenger services, a new institutional infrastructure (public authorities) and a new financial system were implemented quite early (1996). However, the use of competitive tendering has evolved only slowly, while direct award of public service contracts secured the financial viability of the incumbent.

What are the lessons to be learned?

- Rail restructuring in Germany required massive financial public support, which was aggravated by the unique problem of German reunification. The transfer of historic debt and employees from DB to Government as well as the creation of the regionalisation fund was necessary to clarify the roles of the parties: DB as a commercially oriented, although publicly owned enterprise; government as purchaser of services and as regulator. Additionally, the public support gave restructuring a smooth passage, e.g. the use of job security contracts by DB.
- The **regional rail passenger market** is now dominated by public service contracts. Due to the financial support, but also due to the evolving competency of the public authorities, this segment has achieved stable traffic growth. Public service

contracts are now much more sophisticated than at the beginning of regionalisation, comprising regular interval timetables, new tariff systems, targets on service quality, bonus-penalty schemes and so on.

The use of competitive tendering, though still limited, has also proved successful. Public authorities' costs per train-km have declined significantly; the authorities have used this effect to further improve quality. Some large competitors have established themselves, and the incumbent is gradually, but consistently losing market share. The degree of competitiveness would be considerably strengthened if the vertical ties between the infrastructure manager and DB Regio were loosened, so that tie-sales would be reduced. The Consortium considers that stricter rules forcing federal states to use more competitive instruments when awarding PSO contracts would also be helpful.

Accordingly, a key conclusion of the German Case is that not only can rail reform secure public services but that it can even improve them.

- The **long-distance passenger market** is characterised by open access and the absence of public service obligations. This segment comprises approximately 20% of all passenger train-km, 5% of all passenger journeys and 43% of passenger km in Germany. Since 1994, the incumbent RU has restructured its services comprehensively, introducing new services (especially high speed ICE-services), a new tariff system and so on. The commercialisation of DB has resulted in some economic successes, but also in the downgrade of several services. Whether PSOs are also required for this market segment is a point currently under discussion in Germany.

  It is notable that despite open access rights, few entrant open access RUs have emerged to date. Several reasons can be given, e.g. regulatory uncertainty (mirroring the evolving regulatory system), the strong market position of the incumbent, and commercial risk of entry.

  In future, it is considered to be plausible that some on-track competition will finally evolve in Germany, if the general regulatory environment were to be improved along the following lines:

  - stricter access regulation with improved information rights for the regulator about the allocation of slots, which would reduce entrants' and their financers' uncertainties about the practical realities of access;

  - adaptation of framework contracts to the needs of entrants would help in the same way;

  - more effective regulation of access charges is also important, particularly since access charges are comparatively high in Germany (by Western European standards);

- improved interoperability, based on a strengthening of TSI norms, would greatly improve the availability of rolling stock for entrants;
- access to DB's marketing systems would further improve conditions for new entrants.

Overall, open access is clearly not an easy approach and requires a sound implementation of regulatory principles and a commercially attractive environment if it is to succeed.

6.3.1.2. *Quantative*

The following summation of key quantitative measures distinguishes between regional and long-distance rail passenger services. Several circumstances impede the quantitative assessment:

- some information for the years preceding restructuring of the rail system in 1994 is not available, including differentiated price statistics (published since 1995) and service frequencies (published since 2000);
- before the rail reform, almost all DB activities were quite heavily in deficit; however, public funds were not strictly assigned to infrastructure and the individual transport services (freight, regional and long-distance passenger), thus, the development of public funding for passenger services cannot be traced back;
- classifications and methodologies of several datasets have been changed over the period examined, this is relevant for passenger volume and modal split.

For these reasons, the following quantitative information should be viewed and used quite cautiously. Please also note that different time periods had to be used to illustrate different developments, reflecting data availability. Additionally, 1995 has been used as the year before the implementation of the Regionalisation Act, as the base year, although the rail reform commenced in 1994; again, this reflects the availability of data.

Between 1995 and 2007 regional services developed as follows:

- Passenger volume has increased by 30%.
- Modal share has increased from 3.4% to 4.1% (a relative improvement of 19%).
- Fare level has increased (inflation-corrected) by 50%; with a ten per cent increase in 1995 alone, so the result is very sensitive against the choice of the base year. Compared to the consumer price index for car use the fare level increased by 34%.
- Service frequency, measured as train-km, has increased by 27.7% between 1994 and 2007.

- The level of public support of regional rail services has increased by 8% between 1997 and 2007 (total amount of Regionalisation Funds, i.e. including money spend on purposes other than regional rail services).

In long-distance rail passenger services, the following changes occurred between 1995 and 2007:

- Passenger volume has declined by 4%.

- Modal share has declined from 3.5% to 3.1% (a relative decline of 12%).

- Fare levels have increased (inflation-corrected) by 15.5%, it is interesting to note that fare increases almost exactly mirrored the increase of the consumer price index for car use.

- Service frequency of DB AG, measured as train-km, declined by 15% between 2000 and 2008.

- In terms of public support, the profitability of long-distance passenger which has turned from an unquantifiable, but nonetheless substantial deficit before 1994 into a current surplus.

The disparity in performance between the regional segment (operated under public service contracts) and the long-distance segment (open access) is stark. Parts of the network on which rail services have been procured by competitive tendering of public service contracts have performed vastly better in terms of ridership and service level than parts of the network operated under open access: the former expanding considerably while the latter has declined (it should be noted that to a certain extent this simply reflects "redefinitions" between the two segments). Conversely the parts of the network operated under open access exhibited a lower fare increase than where operation was by means of public service contracts, and also has reduced deficits drastically, while the network operated under public service contracts requires heavy public support. As such, the German case shows that to forego intra-modal competition does not secure the provision of unprofitable, but socially beneficial services. These services can only be protected on a contractual basis between public authorities and an RU, but this contractual basis also allows the introduction of competition for the market.

6.3.2 Great Britain

6.3.2.1. Qualitative

The practical aspects of franchising system have remained fairly stable over the some fifteen years of its existence. Bids are required to run particular packages of services, rolling stock is still largely supplied by third parties, the bidders remain entitled to paths throughout the life of the franchise and remain indemnified against changes in the cost of paths. The same companies dominate the franchise holders. There have been changes in the composition of services which form franchises and the parties involved in regulation have changed but these have not been changes of principle.

Notwithstanding that, the Government has made a number of changes to the model and the process to address issues of the day. This pragmatism might be interpreted as a lack of consistency in the regulatory structure and the objectives of the process; undoubtedly political dogma has also played a role. In essence there can be regarded as three distinct phases of regulatory structure:

- 1993/4 to 2000/1 – privatised IM, considerable freedom for franchise holders, and totally independent economic regulation: a period when costs were kept under control, fares were stable in real terms, service frequency increased, but where there were questions over the adequacy of infrastructure maintenance and renewal.
- 2000/1 to 2006 - 'not for profit' IM, less freedom for franchise holders, Strategic Rail Authority set up, complicating the regulatory structure: a period when costs rose, but fare levels remained stable and service frequency continued to increase, quality of infrastructure maintenance and renewal progressively improved to a standard not seen for several decades, but characterised by inconsistent and sluggish leadership from the SRA.
- 2006 to present - SRA abolished, centralised control from Department for Transport, allowing franchise holders little freedom, effectively franchises have become management contracts to tight standards, although total costs have begun to decrease they are still much higher than in the 1994-2001 period, despite above inflation increases in fares and more risk being held by government, regulatory structure has been simplified, with clearly defined responsibilities and a more integrated structure, but economic regulation is now subject to guidance from government.

Overall, it is considered that three important lessons can be learnt from the British experience in terms of the overall regulatory structure:

1. a private sector, profit seeking, infrastructure manager was a mistake;
2. the regulatory structure was too complex, particularly in the 2001-2006 period when the SRA was in existence: excessively complex regulatory structures led to confused objectives and higher costs;

3. other than in the field of infrastructure maintenance, costs and fares were lower, while the growth in passenger numbers and service frequency were higher in the early years of franchising: as centralised control by government has increased the performance the rail passenger industry has been less impressive.

On an operational level, there are three important lessons that can be drawn:

1. Short franchise length: franchise holders are only concerned about the 'here and now', with little thought of the future. Given indeed that most franchises have changed hands on being re-let this has led to extreme short-termism[139]. This is reflected not only in conscious management decisions but right through the organisation, publicity and signage is changed, new slogans adopted, commercial policies change, staff receive new uniforms, staff and their representatives regard the management as temporary and that shows through.

2. Government policy is to make price the final criterion of choice in the franchise negotiation, whilst understandable as the only parameter than can be indisputably quantified, it has wholly logically consequences. Policies, such as those for fares collected on trains, are widely regarded as being unreasonable, indeed rapacious. The British railway undertakings were described by an influential civil servant as *"thinly capitalised equity profiteers of the worst kind"*[140] and are regarded by the public as *"grasping profiteers"*[141]. This has clear implications for the assessment of the role of rail in British society.

3. Problems caused by the definition of service to be provided being made by the central Government: central Government is not well placed to make that judgement (even if it believes the political process leaves it no choice). It is certainly true that price and service content must be balanced in the franchise negotiation and the public must be protected against the withdrawal of socially necessary, but expensive, services, but a move towards more local involvement and/or more specification by the railway undertaking would seem desirable.

6.3.2.2. Quantative

Passenger volume has increased by 70.1% under the franchising system.

Modal share has increased from just under 5% to just under 7.2% (a relative improvement of some 43.7%) under the franchising system.

Fare levels have increased by 22.7% under the franchising system.

Service frequency has increased by 36.7% under the franchising system.

[139] An open access railway undertaking said that there could be merit in keeping on a successful franchise holder.
[140] Shriti (now Baroness) Vadera an influential advisor to the Chancellor
[141] Typical of one of a hundred selected comments on the BBC website about a fare rise in 2004.

The level of public support has increased by 114% under the franchising system.

When measured on a unit cost basis productivity has improved by 24.1% per train km and by 39.5% per passenger km.

6.3.3 Italy

6.3.3.1. *Qualitative*

Italy starts from a tradition of having a number of privately owned regional railways and thus a tradition of rail services being provided by other than the state railway. Italy has also made great strides in setting up the regulatory framework. Services which are "commercial" and those which require to be supported are in process of being defined. Twenty-five new high-speed trains are being delivered for an open access railway undertaking which will compete on the core Italian routes. Open-access regional operations have started.

Nevertheless it would seem the process is not working as it should. Tenders for operation of PSO services are not being written in such a way as to encourage competition (although this may not be deliberate). In particular, there is little help with rolling stock provision, and arrangements to share risk appear unbalanced. One example in particular, suggests that infrastructure allocation and the rights to use stations are being distorted. The operators of the (international) service between Milano and Innsbruck have found co-operation (on such issues as ticket sales) with Trenitalia impossible.

Some progress is being made, the Italian Antitrust Authority has developed solutions for rolling stock provision, and the infrastructure manager is empowered to conclude framework agreements for ten years where they are required to justify investment. PSO contracts penalise repeated cancellation of the same train more heavily.

Accordingly, the Consortium considers that the Italian rail system needs to be reformed in order to benefit from the advantages arising from the market opening, especially infrastructural, and overcame the gap which today separates Italy from direct competitors in other European states.

1. Ensuring that systems to open the market are implemented properly and that there are no compromises

2. Ensuring that tenders for services are realistic in terms of their length, the sharing of risk and allocation of benefit

3. Ensuring that competition is not constrained by secondary factors such as availability of rolling stock

Ensuring funds are available to pay for the services the community decides to sponsor

6.3.3.2. Quantative

Full market opening of the Italian rail passenger market is far from having taken place; accordingly the Consortium place no value on the results that have been recorded to date in Italy; however, for the record these are as follows:

- Passenger volume decreased by 2.9% between 2000 and 2008.
- Modal share remained almost unchanged between 2000 and 2008, the change being from 5.80% to 5.81%.
- Fare levels increased by 24% between 2000 and 2007, some 6% more than the inflationary trend over the period.
- Service frequency, overall, increased by 8.6% between 2000 and 2008.
- The level of public support increased by 5.4% between 2000 and 2007.
- When measured on a unit cost basis productivity improved by 24% per train km between 2000 and 2009.

6.3.4 Sweden

6.3.4.1. Qualitative

The Swedish government considers that the greatest achievements in Sweden have been to create a "level playing field" for all actors. The success of the Swedish model has created a more equal playing field for road and rail users, where users pay for actually using the infrastructure. Demonstrating this belief has been the recent (April 2010) merger of the Swedish Rail Agency and Swedish Road Agency, into one, the Swedish Transport Agency (*Transportstyrelsen*). Stronger regulations and the continuous development of the legal framework have been key factors in the efforts to create an efficient rail system, and to address some of the problems that needed solving.

While the Swedish freight market has experienced a larger number of new entrants, the passenger rail market is still dominated by SJ AB, which holds 65% of all rail traffic in the country. SJ AB still maintains a monopoly on all inter-city routes between all large Swedish cities, although this will end in October 2010. Irrespective of the 'rights and wrongs' of this particular case, the example of UnionsExpressen demonstrates that new entrants can face challenges and regulatory hurdles if they wish to enter the Swedish market, evidence from other RUs also supports this assertion[142]. While Tågåkeret I Bergslagen's experience with entering the passenger rail market is considered smoother than that of UnionsExpressen, it entered into a direct partnership agreement with SJ AB beforehand, defeating the purposes of full market opening and introduction of competition to the Swedish market.

[142] JVS – Sector analysis of railway undertakings 2006/07

The Swedish Rail Agency is, however, aware of these problems and it has been suggested in their own reports that there should be a requirement for SJ AB to shed some of its locomotives and rolling stock, allowing other firms more equal access. How to achieve this remains unclear and will be a challenge; nevertheless this would make it easier for new entrants to enter the market while allowing existing firms more possibilities to expand operations.

Banverket's position, as the main IM, has appeared to improve relations within the Swedish rail market, and has created a more efficient and equal means for new entrants to gain access. Because new RUs compete "for the tracks", it is vital that the paths allocated to RUs are allocated in a fair and non-discriminatory manner, and that are able to create sufficient revenue. A bad allocation can effectively kill a new RUs chance of success. There is, however, a general feeling in Swedish circles that the incremental approach which Sweden has taken on its path to full market opening has proved beneficial for the passenger rail market but that more competition is needed.

Because complete rail passenger market opening is not planned to commence until October 2010 it is too early to say how successful this will be, or to appraise any successes and failures of the market opening structure that will be adopted. Some RUs think that the passenger rail market will develop along the same lines as the freight market did, in that there will be a few large and international players, combined with a few RUs offering niche services. Similarly it is also not possible to say how the value of the service offered to customers is likely to change.

There are various issues which the Consortium considers could improve the operation of the rail market in Sweden or the experience for users. These include:

- addressing issues of access to suitable rolling stock for new entrants;
- more transparent access to ancillary services for new entrants; and possibly
- a more streamlined system for accessing train and ticket information, as the current system in Sweden is a mix and match of different information systems and ticketing options, which can confuse passengers.

These issues could possibly be addressed as part as any measures that might be introduced at an EU for further rail passenger market opening.

6.3.4.2. Quantative

Full market opening of the Swedish rail passenger market has still to take place; accordingly it is not possible to quantify its impacts at this stage, it having been agreed with DG MOVE that the Swedish Case Study should be focussed on study of the legal aspects.

Nevertheless since the process of decentralising control of local passenger rail services commenced in 1995, permitting competition for public service contracts in a systematic way, and 2008:

- Passenger volume increased by 61% between 2000 and 2008.
- Modal share increased from 6.45% to 9.15%

7. Definition of Regulatory Options

7.1. Objectives of Process

The key objectives were to:

- identify/develop the three or four most suitable models for the a regulatory structure that could be applied across the EU, to enable evaluation against the Base Case (no specific action to open domestic rail passenger markets at an EU level);

- develop options suitable for each segment of the market (note that this does not necessarily mean that any particular model should be applicable in all market segments: it may well be that different solutions may be applicable in different market segments).

Possible regulatory models were assessed against the following criteria to arrive at a shortlist of three/four most suitable models to take forward for evaluation:

- are practical to implement, including legal, political, economic, and social aspects;

- assist in increasing rail modal share;

- maintain socially necessary services (including services on un-remunerative lines retained for social purposes, calls at intermediate stations, late night services, etc);

- provide answers to customers' needs, and thus public benefits (e.g. new (direct) journey possibilities, reduction in fares, increased service frequency, etc);

- maintain integrated service for users (e.g. ticketing inter-availability, timetabled connections between services, etc) irrespective of RU providing service; and

- minimise public funding and does not lead to a loss in net public revenues.

In selecting the final shortlist the final objective of the sorting process has been to select models that are as dissimilar from each other as is reasonably practical.

Necessarily, this section of the Report is written as if market opening option is an end that needs to be achieved, since the objective is to identify the most appropriate market opening models for testing against the Base Case, analysis that is undertaken in the next section of this report (Section 8).

7.2. Regulatory Models Used for Rail Passenger Services

7.2.1 Overview

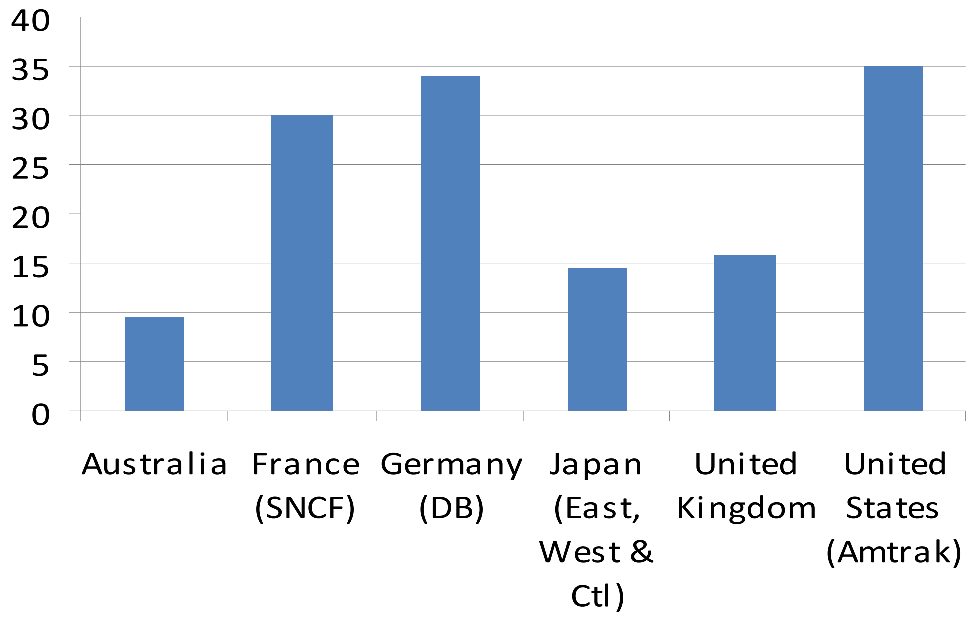
The models used to provide rail passenger services, particularly those that provide competition or market opening, have been examined in the following parts of the world:

- Asia;
- Australasia;
- Europe; and
- North America.

The object of this process has been to identify the market opening mechanisms that are already in use, and the successes and weaknesses identified.

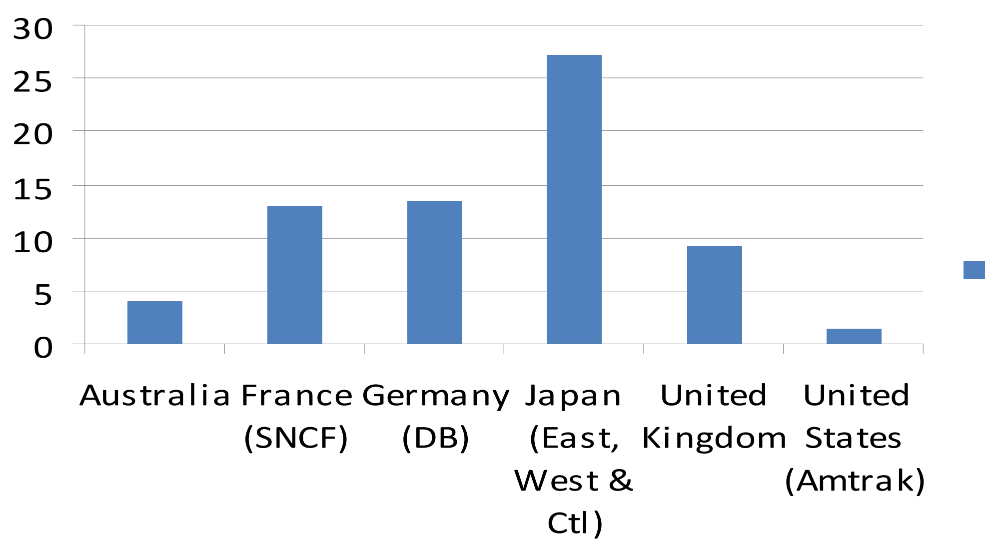
To provide some background to these analyses, some comparative charts can be found in Figures 28, 29 and 30:

Figure 33. Route Length (thousand km)



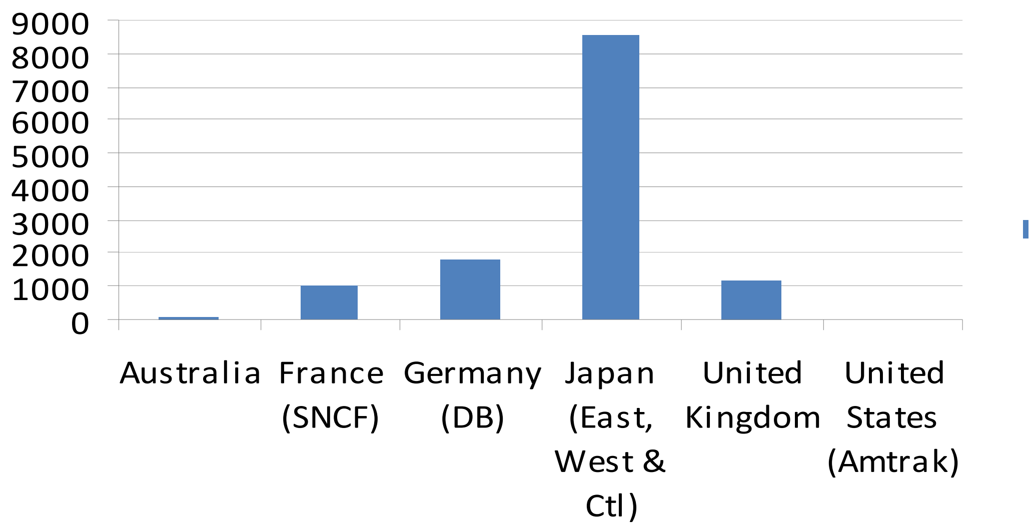
Source: UIC

Figure 34. Passenger Revenue (€ bn)



Source: UIC

Figure 35. Numbers of Passengers in 2007 (million)



Source: UIC

The above figures have been taken from UIC statistics for 2007. For a number of reasons they are not strictly comparable but the orders of magnitude allow the different models described below to be reviewed with a fuller appreciation of the context.

It will be immediately evident the Japan has an exceptionally high traffic density whereas the United States has a huge network which (insofar as, the national passenger operator *Amtrak* is concerned) is almost deserted. Europe lies somewhere between these two extremes, as does Australia.

In looking at regulatory models outside Europe, it is rare to find the basic European presumption of a split between infrastructure and train operation satisfied. Nevertheless, many of the problems found in Europe, how to draw a line between 'commercial' and 'public service' activities, how to control rail costs in public service contracts, the approach to service levels, etc, have direct parallels elsewhere and might therefore contain lessons for Europe. The issues of improving service quality, creating coherent public transport and providing value for customers are much the same everywhere.

7.2.2 Freestanding commercial railways

This model (which very much resembles the private railways of Ireland, France, Spain, etc. in the Nineteenth Century) is essentially the model adopted in Japan. Japan is a country which facilitates the rail mode, the narrow coastal bands in which a large population is concentrated leads to significant linear flows. Trunk roads are (or were until recently) tolled, speed limits on roads are low (the general limit is 60 km/h). Figures 28 to 30 indicate the magnitude of the traffic density. Under these favourable conditions passenger rail modal share is no less than 27%[143], which in turn makes passenger railways more profitable than is usual in Europe and enables many railway companies to be free-standing commercial entities.

Under this model railways are integrated businesses (owning infrastructure and operating trains), are privately owned and balance their books without public support. Some railways are quoted on the Japanese stock market. The bulk of the network and all high speed lines were formerly owned by Japanese National Railways (JNR), a state corporation. In addition to the companies with their origin in the former JNR, there are a large number of local private railways whose total traffic levels represent about 40% of those of the former JNR.

There is no arrangement for state support of socially necessary routes; however, Japanese railways avoid closure as a matter of policy. Japanese commentators regard this as a serious problem. *"it should also be noted that heavy cross subsidization still exists in the three major JR companies which cover enormous losses from rural services with profits from shinkansen [high-speed lines] and urban services*[144] *"Unless we square up to the current difficulties of the Island Companies [and JNR Freight] as soon as possible, future generations will judge the initial success of the 1987 reforms as the prelude to a disaster"*[145]. Profitable lines thus cross-subsidise the loss-making lines, for example railways on some of the remoter islands do not succeed in balancing their books and are

[143] Japanese Ministry of Transport figure for 2000.
[144] Tatsuhiko Suga writing in *Japan Railway & Transport Review March 2007*
[145] Yoshitaka Fukui writing in *Japan Railway & Transport Review March 2008*

supported by a complex financial device which in effect transfers the cost to the profitable mainland railways.

The operation of the Japanese railway system relies on the special and somewhat paternalistic way in which Japanese corporations tend to operate, so that for example heavily loss making lines are not shut by commercial organisations largely, it appears, out of a perception that it is not the behaviour that Government would expect of them. The Consortium would suggest that, even if the same level of profitability were attainable in Europe, that European companies would be unlikely to respond to informal pressures in the same way.

Fares in Japan are subject to government control to prevent the exploitation of a monopoly. Ceilings for fares are set by the Ministry of Transport which adopts benchmarking techniques to assess what should be the costs of service provision. In this way the fare paying public has some protection against inefficiency borne of monopoly. Efficient operators, in effect, are permitted higher profits.

Again, just as happened in the Nineteenth Century, railways can negotiate running rights subject to paying fees for the use of the infrastructure. This negotiated approach is the normal approach in Japan; rights of access underpin the negotiations. Open access competition is permitted and is regulated by the Ministry of Transport. The criteria for giving or withholding permission do not include the effects on other carriers. Infrastructure charges for open access railway undertakings must be approved by the Ministry but there is no standard system for calculating them. Railway companies set their own timetables.

Network benefits have been retained in that JNR ticketing practices and reservation systems have been continued.

This model is only possible because of the incredible density of traffic in Japan, which means that income is adequate to meet full costs and provide a surplus. This model cannot be applied in Europe since the levels of ridership are inadequate to support it, furthermore the informal aspects of the arrangements used to maintain unprofitable but socially necessary lines are considered unlikely to work in a European corporate environment.

7.2.3 Integrated ownership with public support

Twenty-five years ago European national railways were all structured in this way. Following initiatives in a number of Member States and as a result of the requirements for the separation of roles in Directive 91/44/EEC, etc, this model is becoming increasingly rare in Europe. It continues outside the EU.

For a modern interpretation of this model it is necessary to look at the way which it is applied to the urban and suburban rail systems of North America. Whilst described as urban and suburban they can be very significant in their own right, for example New York's Metropolitan Transit Authority is a large undertaking carrying more rail passengers than all the *S Bahn* networks in Germany put together. The New York network consists of classic metro lines together with suburban and regional services stretching up to 180 km from New York.

In this model, the operation tends to be run as an integrated operation by professional managers with policy determined by a board dominated by political appointees. The fare box typically contributes about half the revenue but proportions vary from 30% in Boston to 85% in Toronto. Revenue subvention comes from local (rather than national funds), typically from local taxes, but there are a number of sub-variants in financing and operation.

In New York all operations are 'in-house' and the staff are all employees. In Chicago the train service is bought in (by means of a non-competitive tender) from the railroads that own the infrastructure. Boston's operations are in-house but some routes are run over infrastructure owned by freight railroads. In Toronto train operation (and maintenance) is provided by the train supplier, Bombardier. In Boston some lines are shared with Amtrak, although no attempt is made to integrate services (maps for example, show the road network but not stations with connections to Amtrak trains, each organisation's timetable totally ignores the other). This lack of integrated and multi-modal ticketing is a more general phenomenon even within individual public transport organisations.

American traditions of distrust of collective solutions will be evident and it will be apparent that some of the models used are less than ideal. It is clear that, to date, little attempt has been made to open the market and even where services are actually provided by private corporations, the transaction is normally negotiated rather than based on a competitive tender. The lessons from local operations in North America are also political: there must be a shared commitment to public transport and the arrangements for buying it in must be such that normal commercial forces play a decisive role. It is considered that there are no models for regulatory structure that are applicable to Europe.

7.2.4 Open access passenger services with public support

This is the model adopted by Amtrak in the United States and VIA Rail in Canada; in both cases these (mainly) provide passenger services on otherwise freight railroads.

Amtrak was set up as a public corporation[146] in 1971 and took on the obligation held by private railroads to run long distance passenger services (an obligation which they found onerous) in return for priority access to their tracks at avoidable cost. VIA Rail followed a similar path.

Amtrak requires subvention to support both operations and capital spending. The spending is controlled through the US Department of Transportation. Support is currently running at some $1.3 bn (almost €900M in 2008, converted at purchasing power parity) per annum, representing about a third of total expenses. Amtrak is required to run a service defined by

[146] Wholly owned by the Federal Government.

the Federal Government[147] and the subvention is in effect calculated service by service on the basis of the expected difference between the fare box and costs. Any difference between the budget and actual is for Amtrak. National fares are not controlled; tickets are not inter-available between Amtrak and local services. Support from the Federal Government is supplemented by funds from fourteen individual states for supplementing the network or providing additional trains. These additional funds are likewise structured as support to meet the expected difference between revenue and costs. Local support may be conditional on control of fares.

In the main, Amtrak operates over the tracks of freight railroads and pays the avoidable infrastructure costs caused by its operations. However, Amtrak owns the infrastructure and is responsible for its operation maintenance and development on the Boston to Washington corridor as well as a number of other short lengths of infrastructure elsewhere, e.g. terminal railway stations.

With the exception of the Boston to Washington corridor (on which some 38% of Amtrak's passenger journeys are made) and similar medium distance corridors in California and around Chicago, traffic density is light and journey purpose skewed towards leisure. The top ten stations account for 95% of journeys. The Boston to Washington route is the only one which can really be compared to European routes in terms of length, train speed, traffic mix and density. On this corridor the modal share of rail in the rail/air market is 56% between New York and Washington and 41% between New York and Boston[148]. On other routes, particularly in the Mid West, services can be less frequent than daily, trains slow and unpunctual and rail modal share (perhaps in consequence) over the country as a whole is only 0.3%.

Open access operation of passenger trains by other operators is permitted in law but the freight railroads (owners of the infrastructure) do not tolerate it in practice. Amtrak is not required to permit and does not permit competition on its own tracks, except to the extent that its tracks are already shared by local services. Intra-modal competition is not therefore a feature of American inter-city rail operations.

Arrangements are not dissimilar in Canada, indeed VIA Rail, the Canadian equivalent of Amtrak was directly inspired by Amtrak, when it was set up in 1977. Revenue support is received from the Canadian Government and amounts to approximately half the operating expenses. Fares in Canada and the US are similar, they average about €0.12/km (2008, converted at purchasing power parity). VIA Rail has suffered even more than Amtrak from being something of a 'political football' since, unlike Amtrak, it is directly controlled by the Government of the day, some of which have regarded rail passenger services as an irrelevance and have instituted large-scale service cuts.

It should be noted that whilst there is safety regulation in the United States and Canada, there is a tendency to leave economic regulation to the market, bolstered by strong anti-trust legislation (legislation to ensure free competition). In the cases studied therefore

147 Under the "Passenger Rail Improvement and Investment Act of 2007"
148 Amtrak figures.

there is no economic regulation and, since the transport systems studied are all run by government in some form, there is no anti-trust issue. It is not even always the case that fares are subject to political control.

Neither Amtrak nor Via Rail provide examples of market opening, since both are effectively monopoly suppliers of (long distance) rail passenger services. This model is not dissimilar to models adopted in Europe where market opening in the passenger rail sector has not occurred, and where a discrete amount of support is provided on a non-competitive basis to an effective monopoly supplier for a specific service and access to infrastructure determined by contract. However Amtrak's (and to a lesser extent VIA Rail's) results are not encouraging, service quality falls far below the best European standards (in part because freight takes priority), and the financial results are not what might be expected. North America also provides warnings of the dangers to passenger rail systems if they become lightly used and of little concern to the majority of the voting public.

7.2.5 The Australian Model

European style separation of the functions both with and without public financial support has been adopted in Australia, in part following the European lead. Australia has many similarities to Europe in that the railway system was promoted and operated independently at a state level where the primary focus was on internal communication within the state with considerable technical and operating differences between state rail systems. The Australian Government has been working towards creation of a national rail system for several decades, but it was not until 1995 that all state capitals were even linked by standard gauge tracks: even now considerable technical and operational diversity exists between states.

In further parallels to Europe, national government has been encouraging states to 'liberalise' their rail systems with varying results: some states have vertically integrated railways, whereas others have split their state railways into separate companies, and in some cases sold some of these companies to the private sector. All states have been obliged to split their, formerly, integrated national railways into infrastructure, passenger and freight businesses units. There has also been much work undertaken to move towards technical and operational standardisation.

Access to state railway systems for new entrant RUs is required by national legislation.

A variety of different models have been used for the organisation of state passenger rail businesses. In the majority of states with an extensive rail passenger network, suburban rail operations, serving the state capital, have been separated from intra-state long-distance and rural passenger services; however, Queensland Rail remains an integrated railway. Several different models are used for suburban passenger rail operations, ranging from state ownership (e.g. New South Wales[149], South Australia), to franchising (e.g. Victoria).

[149] See: http://www.news.com.au/aussie-train-services-among-worlds-worst/story-e6frfkp9-1111113192116.

In the case of Victoria, where the franchisee has recently changed, the franchise length is eight years with an option to extend this to fifteen years.

Inter-state long-distance rail services are provided only by the profit-making open access operator Great Southern Railways (including all trans-continental services) and two state-owned RUs: CountryLink (the long-distance and rural passenger arm of RailCorp the New South Wales RU) and Queensland Rail. Rural rail passenger services are operated by state-owned RUs in all cases, including Victoria.

The Australian Rail Track Corporation (ARTC) was incorporated in February 1998 to facilitate open access inter-state operations (including seamless and transparent track access), to facilitate the development of the inter-state rail network and technical standardisation. It directly either owns or manages parts of the national rail network, currently amounting to over 10 000 km of standard gauge interstate trackage, and is responsible for selling access rights on some other sections of track, in total this amounts to one third of the national rail network. ARTC is owned by the national government. In April 2008 responsibility for overseeing the development of that national rail system passed to a new body: Infrastructure Australia.

Despite this process it was only agreed in December 2009 that a national rail safety and accident investigation body will be established[150].

There are currently nine RUs using ARTC infrastructure, there is one open access passenger operator (Great Southern Railways) providing niche services mainly targeted at the tourist market, of the others three are state railways operating passenger services, but in only one case does this involve inter-penetration into neighbouring states, the remainder are open access freight operators.

Infrastructure access charges vary by line even on ARTC controlled infrastructure, at state level each IM sets its own access charges, but these are obliged to be non-discriminatory. The technical standards and operational rules that pertain to interstate infrastructure are available to RUs on the Internet[151].

The models used in Australia therefore tend to follow those used in Europe and as the experience of market opening is less than in Europe the number of lessons that can be drawn for use in Europe is limited. However, in the reliance on open access without public support to provide inter-state connections (other than in the more populous south-eastern corner of Australia) it is significant that the only open access railway undertaking operating provides high-margin services for tourists. The only other novelty is the existence of a continent-wide infrastructure manager to manage and develop rail infrastructure for journeys between states, which overlies the infrastructure managers in individual states, in some cases meaning that an RU only has to interface with a single RU to provide inter-state services.

150 In the latter case taking over responsibility from the existing independent accident investigation body: the Australian Transport Safety Bureau.

151 See: http://www.artc.com.au/Content.aspx?p=15

7.2.6 European models

7.2.6.1. *Policy considerations*

Policy towards the provision of rail services in European Member States is driven by a number of factors. Social policy requires services which provide mobility to remote areas (such as the Massif Central), economic policy requires commuter services which allow the great cities to function (such as the *S Bahn* networks around each major German city) and likewise express services are required for business and leisure purposes. Despite inroads being made into rail carryings over distances of more than 500 km by airlines, there is ample evidence that high-speed rail can be competitive and for conventional express service, to an extent frequency is a surrogate for speed.

In general, high-speed services operate without support and in some cases are also able to support the capital costs of the infrastructure. However, most rail services in Europe require financial support. This need for financial support and the interest of governmental bodies (both national and local) in defining the rail service that they consider to be relevant to the needs of the community have led to the creation of formal relationships between governmental bodies and railway undertakings. Typically, both the train service to be offered and the financial support to be provided are defined by the promoter (who may be local: the tendency in Germany, France, and the Netherlands, or national: the tendency in Great Britain).

The role of the market in the provision of train services is a further issue. European States have differing views on the general role of competition within the rail sector, and differing approaches to creating competition in the market for providing rail services. Although all Member States have, due to European legislation, to some extent restructured their rail markets, there is still no common approach to the framework for providing rail services. The general types listed below may however be distinguished, although even within a state a combination of these types of model may be found. It should be noted that to a degree these models have been idealised, they do not reflect all the adjustments and compromised forced by technical and geographical constraints (and indeed political forces):

- a block grant paid to an incumbent to balance its accounts (not a market opening system);
- direct award of public service contracts to operate services without competitive tender (not a market opening system);
- direct award of network services: the Swiss model;
- tendering of public service contracts through competitive public service contracts (market opening);
- open access (market opening).

These options may be combined with different promoters (local or national), different structures (concessions or franchises), differing lengths of contracts, alternatives for sharing revenue and ticketing systems, for providing rolling stock, for control of fares, etc.

7.2.6.2. Block grant

The block grant represents the least advanced approach to managing a national railway system although administratively simple. The government merely pays the difference between the costs of running the passenger services and the receipts collected to the incumbent railway undertaking. The incumbent undertaking keeps the revenue and thus balances its books. It will be evident that the pressure to make economies through greater efficiency and to increase revenues by providing better services will be less intense with this model. By contrast the management of the undertaking will be motivated to satisfy the demands of Government and will administer rather than manage its activity. Certainly there will be no pressure from potential on-rail competitors. This was the approach generally adopted in Europe in the past; but it is generally incompatible with EU state aid guidelines and as such it has been largely abandoned.

7.2.6.3. Direct award of public service contracts

Under this system, award of contracts to operate services requires services or service groups to be distinguished and their accounts to be separated out. As noted in the German case study, some 70% of contracts for regional services have been awarded directly to DB AG. In France, Article 21-4 of the law on domestic transport[152] actually requires regional services to be contracted to SNCF.

Whether a contract is directly awarded or not does not necessarily determine the terms of the contract, although it is reasonable to assume that it has an influence. If the contract is awarded directly (mostly to the national/regional incumbent RU[153]) there is a risk that the recipient is overpaid in comparison to tendered contracts: with given budgets this may result in a sub-optimal quantity and quality of services, that quality requirements are lower, and incentive systems less developed. One can argue that direct awards make less use of the knowledge and creativity of RUs, but this depends on the question whether the public authority would use functional or constructive tenders instead. Additionally, contracts that are directly awarded are often long-term contracts; this can reduce performance incentives, due to a lower risk of losing the contract.

Nevertheless evidence (see below) points to regional authorities driving a bargain, even when they are forced to use the incumbent RU. In France, the timetable, quality criteria (of trains and stations) and punctuality criteria are all set by promoters. It may be significant that the regional authorities normally also finance the bus network. Since the same railway undertaking continues on, there is not necessarily any change to rolling stock, operating methods or ticketing systems, etc. Nevertheless experience in both France

[152] Loi n°82-1153 du 30 décembre 1982 *d'orientation des transports intérieurs* (consolidated version as at 1 May 2010).

[153] In some cases, regional services in Germany were also directly awarded to state-owned RUs , but on a negligible scale. In these cases, the same arguments apply.

and Germany is that contracts with the regions did trigger significant investment in new rolling stock, station improvements and more frequent services[154]. Investment in new rolling stock financed by regions in France was equivalent to €80M in 1997.

In addition, it has been argued by some that direct awards minimise disruption, economise on transaction costs, and that contractual arrangements under direct awards allow a more flexible adjustment in the event that conditions change (depending on the structure of the contract, the promoter could be entitled to change to service patterns, for example, with the costs or savings being passed on). Additionally, direct awards may by definition avoid costs associated with a change of the provider.

7.2.6.4. Direct award of network services, the Swiss model

The Swiss approach is a variant of the direct award system (see above). Its interest lies in the ticketing and network solutions which have been adopted and the use of short-term contracts. In Switzerland major railways have reorganised into separate infrastructure and train operation divisions (although within holding groups). However, there are also a significant number of integrated minor railways (all with a local governmental shareholding). A highly coordinated national network is operated in which there is significant running over "foreign" infrastructure. A single ticketing system has been adopted and in principle all tickets are valid on all trains[155]. No trains require reservations for domestic journeys. This approach to fares policy lowers passengers' information and other transaction costs and creates a high flexibility. Its cost is that passengers cannot enjoy train-specific discounts and railway undertakings are not able to increase revenue by aligning prices, services and quality to regional demand.

All services are contracted through direct award of contracts to provide services, usually on a short term basis. A tendering process is provided for but not used in practice; nevertheless there is some evidence that the multiplicity of potential providers allows promoters to change service providers. Changes at the margin, for example by extending or restricting the operation of services over foreign infrastructure, and the short-term nature of contracts provide limited assurances of efficiency.

The fact that rights to operate domestic services are exclusive and that services are not in practice tendered, means that there is not currently any scope for new entrants on domestic services.

7.2.6.5. Tendering of public service contacts

The popularity of this method within the European rail industry has grown from nothing over the past twenty years, to the extent that it is now widely (but not universally) practiced; however, it takes a number of forms, including sponsorship by local or national government, narrow or broad definition of the service to be provided, sharing of revenue or not, rolling stock with the service or to be provided and so on. The essential element is that tenders are invited. The tenders are for the right to offer services (competition for the

[154] See the German case study (Annex 5) Section 3.3.1.1 and *the Railway Gazette* February 2001.

[155] Very tentative steps have been taken to offer modest reductions on specific trains.

market, rather than within it), but it does not necessarily include a legal exclusiveness clause. The bid may constitute the offer to pay a premium to operate the service or the offer to operate the service in return for support.

The tender will have clear preconditions (the railway undertaking and all its staff and equipment will have to be properly approved) but may also have preconditions in terms of the service provided (routes, timetables, etc), quality thresholds or specifications (age of rolling stock, punctuality and cleanliness criteria for trains, for example), information requirements, bonus-penalty systems. As such, a central question is whether a functional or a constructive tender is used. A second central question is, whether gross or net cost contracts are used, influencing the risk allocation between RU and public authority and the incentives of the RU to provide services, optimally adjusted to demand. Additionally, third question, there may be full freedom to set fares (or some of them, such as first class) or fares may be controlled, either individually or as a basket. Contract award is by national or regional criteria.

It is perhaps significant that some states appear to be able to attract more bids than others. Typically four bids for franchises are received in Great Britain, only one or two for PSO contracts in Germany

The advantage of tendering (particularly where there are three or more bids) is that bidders are incentivised to become efficient and encouraged to develop revenue by offering attractive services (if net cost contracts are used). If functional tendering is used, new services (stopping patterns and destinations, ticketing schemes, etc.) may be developed.

The process of bidding is certainly expensive but not significant when considered in relation to a contract with a duration of many years. However, the contractual structure may be complex and lead to some inflexibility if circumstances change. Experience in Great Britain, which has had the longest experience, has led to a refinement of the process but no inclination to change its fundamentals.

There are numerous sub-variants, whose implications are as follows:

- Local or national specification. National specification (as in Great Britain) has the merit of allowing a team to develop expertise in the area (in the first phase of franchising, the last franchises were settled very quickly) and providing consistency. Regional sponsorship (the norm elsewhere) can result in services more closely adjusted to regional needs, preferences and resources.

- The product to be provided is defined in some detail everywhere. In Germany as well as in Great Britain there has been a movement towards ever closer specification; the British case study identifies the political factors driving that (see Annex 6).

- Provision of rolling stock is a further variable. Rolling stock may be provided by the promoter as one of the assets (and passed on at the end of the contract). Arriva stated that rolling stock on its Pågatag franchise in Sweden is provided free of charge. The franchise holder may be required to provide it but rolling stock is an expensive resource and providing modern rolling stock for a short contract is effectively un-financeable. This was an issue specifically identified by Arriva in its presentation to investors in 2007. A market for leasing trains has been developed; Alpha trains, a leader in this market, say that leasing is well suited to concession periods of eight to twelve years[156] and that it now leases almost 240 train-sets to companies in Germany and Denmark. Arriva (an Alpha customer) confirms that in Denmark and on the Noord Nederland routes it has to provide the rolling stock (by an operating lease). Keolis likewise bought the trains it uses in Nord Rhein Westfalen. Other options to provide rolling stock are possible, including capital grants. Germany reflects all these options: rolling stock is provided by public authorities (e.g. Lower Saxony) or owned by RUs or some sort of risk sharing is used (e.g. public authorities provide guarantees, that rolling stock will be used after the contract expired). It is clear that there are a number of solutions to this issue, and the solution in each case is likely to be linked to the availability of rolling stock, the specificity of the stock being used, the term of the contract, etc.

- Length of contract is a variable (contract periods of between two and twenty years have been used so far). Arriva reports contracts of between two and ten years in Germany, fourteen years in the Netherlands and a nine year contract in Sweden, while in Italy the standard contract length is seven years, extensible for a further seven. Various durations have been used in Great Britain, before a standard ten year duration was decided upon. A long contract allows the holder to plan long-term and make investments with the certainty there will be time for pay-back. It runs the risk however that it will be impossible to remove an unsatisfactory service provider. Break-points in the contract can provide a partial solution to this issue. On the other hand shorter contracts are based a concept of public service contracts being a management contract to run a service in accordance with the promoter's vision, where the promoter is responsible for medium and long-term planning. British experience has been mixed; some long franchises have been very successful; others have had to be renegotiated (see the British case study for details). The consensus is moving towards longer franchises with break points.

- Sharing of revenue is a further issue (described by railway undertakings as gross cost where the revenue is passed to the promoter and net cost where the revenue is retained by the railway undertaking). In many cases, traffic receipts are kept by the successful bidder. This encourages the bidder to increase revenue by offering attractive services. Revenue however may be taken by the promoter particularly where revenues could be heavily affected by developments outside of the contractors' control, e.g. when revenues depend heavily on the performance of several companies (e.g. coordinated rail or bus-rail services) or strong inter-modal competition. If the railway undertaking is not to keep the revenue from the concession, then it is highly desirable that some other mechanism is provided to

[156] Alpha trains website: www.alphatrains.eu

reward an attractive service. Arriva[157] identifies "some" operations in Sweden and Germany as being gross cost whereas contracts in the Netherlands are net cost. A clear picture has yet to emerge in Germany, for example, of the circumstances under which public authorities use each particular model.

- The decision on whether to adopt gross or net cost contracts is not the only aspect influencing the degree of risk sharing. Bertil Hylén points out that a variety of models for cost and revenue sharing are used in Sweden[158]. In the new Stuttgart contract, the revenue risk is with DB although the revenue is pooled (in return for accepting the revenue risk, DB has the right to amend service levels). Increasing the risk, RUs have to take, will always result higher tender prices; so, it may be financially advantageous for public authorities to take some of the risk themselves. Indeed the British experience has been that once the revenue risk of exogenous factors to the revenue stream became clear many bidders were simply not prepared (or unable) to submit bids without "cap and collar" arrangements in place.

- Since railways have a social role, governments have always wanted to control fares. This of course runs counter to the principle of giving freedom to the commercial instincts of the railway undertaking. There is no doubt that there must be some controls where the service has any element of a monopoly (commuter services, for example) and as described above most promoters go further than that to control all fares. Likewise conditions, such as those for the use of cheaper tickets must be subject to control. The freedom allowed to British railway undertakings is unusual, whilst basic fares are controlled, others (such as first class) are not. In other states, the practice is for all fares for supported services to be controlled (it might be mentioned that in Germany, for example, many types of local tickets are not valid on long distance trains).

- Network issues are important. It is important that services which are let under public service contracts accept a wide range of tickets, and that all services are shown in timetables. In the main, these objectives are achieved; in the Netherlands 'national' tickets are available on all franchised services. As explained in the case studies, inter-available ticketing is a point of discussion in Germany and Sweden.

- Systems that the winning RU is expected to operate/permit also need to be set out in any tendering process, together with any necessary standards. These include such issues as the smart cards used for local journeys in the Netherlands.

- In addition to network issues, commercial freedom for individual companies to distinguish their products and services needs to be weighed against consistent product and image issues for rail as a whole. There is a need to allow freedom for commercial initiatives but yet it is desirable that rail as a whole has a common image. How, for example, should the location of stations be marked, should there

157 Arriva website and investors' open day 2007.

158 Railways: *Franchising and beyond* ETC 1996.

be consistent marking of first class or catering facilities? Likewise the consistent product approach in Switzerland has been noted: a totally uniform product with a highly standardised approach to customer service issues, but each company uses its own signage. In Germany, public authorities require the use of their own branding.

Whilst the nature of the tendering process and indeed the service being tendered for can take a number of forms, the central element is that the market is opened by calling for bids. For the process to work properly, it is essential that the potential rewards are attractive enough to encourage bidders. This has implications for the length of the concession, the degree of specificity, where exogenous risks are borne, the practical ability for bidders to take over an operation (e.g. rolling stock availability), and controls on commercial practices. If these factors can be reconciled with the needs of public policy, to ensure attractive public transport at an acceptable price for the community, then tendering offers a transparent means of developing the market.

7.2.6.6. Open access

Open-access may complement one of the other models in some form or be a model in its own right. In essence open-access allows a railway undertaking to operate services without constraint but without public financial support. By definition therefore the routes must be profitable. This very much limits its scope to highly trafficked routes or to states where infrastructure charges are low.

In Europe open access rights have been confined to specific market segments, in particular conventional express services and high-speed services. Some consensus exists that open access is not appropriate for urban commuter railways, where the requirement to maximise efficiency of utilisation of infrastructure capacity and the need to offer integrated service for these essential arteries of urban life has led to one of the other models described above being employed, as integrated services and ticketing systems are hard to achieve with open access.

As can be seen in the case studies for Germany and Italy, use of open access rights by new entrants has been distinctly patchy. This reflects the number of pre-conditions that are required before a new entrant is prepared to take on an incumbent 'head-to-head' in an open access environment. In contrast, options involving competition for the market assure tenderers of at least a significant degree of exclusivity, and thus a greater degree of market entry has tended to take place under the public service contract route.

Overlap between open access services and services operated under public service contracts bring up particular issues, not least that of revenue abstraction. In Germany there would not appear to have been significant abstraction between long-distance (open) services and local (supported) services. While in Great Britain there has been open access both regulated (a number of services between London Kings Cross and the North East) and unregulated (on the line to London Heathrow). These have been successful in all respects, although it has been claimed (with scant justification in the view of the Consortium) that the Kings Cross routes undermined the finances of the franchise holder. The public benefit criteria which are used in reaching regulatory decisions on open access applications are described in more detail in Annex 6.

7.2.6.7. *Summary of European models*

There are a variety of approaches in use in Europe, pragmatic solutions have been found to suit national circumstances. By contrast with the rest of the world, European systems for regulation appear to be much more sophisticated (and more complex), more models are in use and each of these models is subject to subtle local variation. In particular there would seem to be much more interest in preserving network benefits in Europe than in most other parts of the World.

7.2.7 Summary

It is evident that few regulatory models used to provide rail passenger services are "pure", all show evidence of pragmatic adjustment to fit circumstances. It is also evident that circumstances vary in different parts of the world and between different countries, thus the models used are not necessarily transferrable between states, for example the model used in Japan works well in Japan but would not work in Europe. Fundamentally it is considered that the lessons that can be drawn from the regulatory structures that are already used can be disaggregated as follows:

1. high level lessons;
2. detail lessons on individual models.

It is considered that the following high level lessons can be drawn:

- it is essential that there is political support for the railway services that operate, once use of passenger rail becomes a minority activity (e.g. North America) political support for services dwindles;
- this political support must be consistent through time to provide the confidence required to invest in new facilities;
- political support must come from the community at large, narrow support causes instability.

It is considered that the following detail lessons on the application of particular models can be drawn:

- the use of open access for unremunerative long-distance services is unlikely to result in a service being provided for normal passengers (example of Australian inter-state services);

- effective monopoly suppliers operating with public financial support can result in poor service quality, and poor financial performance by the RU concerned (example of Amtrak);

- differences in the model used at a state level do not stop operation of intra-state services (see services between New South Wales and South Australia).

7.3. Identification of Possible Models

7.3.1 Structure of sub-section

This sub-section of the Report, firstly, considers the main (high level) options available for market opening (7.3.2) and then the various detail options/sub-options that (mostly) flow from these (7.3.3). These detail options are then appraised in the next subsection (7.4).

The principal advantages and disadvantages of each main option are described in 7.3.2, and those of each detail option in 7.3.3. To avoid excessive repetition the advantages and disadvantages that flow from the main option from which it is derived are not reprised in the sub-option discussion, but both are pulled together in the appraisal process. The advantages and disadvantages listed draw on the lessons learnt where similar market opening mechanisms have been used previously, as well as logical analysis.

The factors/market conditions that would make each detail option most likely to succeed and those that would make it least likely to succeed are discussed at the end of each sub-section.

7.3.2 Main options

7.3.2.1. Available options

In essence there are two main options for opening the rail passenger market:

1. competition within the market;

2. competition for the market

As, identified below there are a number of ways in which these two mechanisms can be combined, in addition to their application in a 'pure' manner.

<u>Competition in the market</u> is characterised by open access rail operations, where RUs compete against each other for traffic. In analysing the impacts of open access it has been assumed that the commercial aspects of open access operations are not regulated (except where stated otherwise). This implies that railway undertakings would charge whatever fares they chose, serve whichever destinations that they wish (on routes open to competition), and provide whatever service frequency that they chose (given train paths). Nevertheless, the following assumes that some basic requirements to secure network effects persist, especially information of passengers (national timetable e.g. provided by

infrastructure company) and the duty to sell through tickets (but this does not include the duty to coordinate tariffs or to accept tickets of competitors, both of which are difficult to achieve with open access).

Open access competition can appear in two forms: direct on-track competition between two or more companies, and potential competition (i.e. services still operated by the incumbent but with the threat of competition). Empirical studies in other network industries have shown that both forms of competition can be beneficial with actual competition being the more effective.

Competition for the market is characterised by rail services operated under public service contracts (franchising), where RUs compete against each other for exclusive rights to operate particular services.

It should be noted that public service contracts for operation of passenger rail services can be procured in two forms, one competitive and one non-competitive:

1. where there is a competitive tendering process for the franchise to operate the public service; and

2. where there is no such competitive process.

Both of these options are permitted under Regulation (EC) No 1370/2007; however, it should be noted that although the former is a market opening option for the services concerned the second is usually not. There are options, however, that involve opening part of the market, while other parts remain closed: thus it is theoretically possible that having some public service contracts not awarded by competitive tender could be a part of a wider market opening strategy.

In the preliminary phase, analysis of the available options included analysis of parallel pairs of options: one where public service contracts would be awarded by open and impartial competitive tendering and one where those which would not. In every case the option involving competitive tendering was found to be superior; accordingly, as instructed by DG MOVE, the sub-options involving non-competitive tendering have not been separately identified herein. This was to improve comprehensibility by reducing the number of sub-options reported. In essence there were three main reasons why options involving non-tendered public service contracts were rejected:

- increase in the amount of public subsidy required;

- competition issues;

- potential for use as mechanism to frustrate market opening.

The likely increase in public subsidy would result from open access operations extracting profits that are currently used to cross-subsidise the remainder of the network: since the subsidy on lines operated under public service contracts cannot be expected to fall much under non-competitive conditions, it is almost inevitable that external funding requirements would increase if open access operations are more than trivial. Naturally, the magnitude of this effect is dependent on the number of open access services operated/proportion of network on which open access is permitted. However, if only minimal open access takes place, in cases where the public service contract market remains closed, the option in question would therefore be ineffective as a market opening option.

The competition issues mainly concern the potential capability for 'excessively subsidised' incumbent RUs to compete unfairly with new entrant RUs: incumbent RUs could use their public subsidy to compete with open access RUs by cutting fares/running abstractive services in manner that would not be justified by the business case. This can be difficult to police even with powerful independent economic regulation.

If market opening for domestic rail passenger services were to be enshrined at an EU level, there is the potential for public bodies opposed to market opening to use public service contracts as a means of very largely preventing market opening by issuing public service contracts to the incumbent RU for all of the most important parts of the rail network. Indeed there have been complaints by some of the RUs interviewed in the course of the Study that this is already occurring.

7.3.2.2. Advantages & disadvantages of open access

The main advantages of open access for passenger rail services are as follows:

- services require no subsidy;
- totally non-discriminatory for RUs, with relatively low barriers to entry: new entrant RUs could enter market operating a single service[159];
- on popular routes with strong multi-operator competition, service frequency could be expected to increase (subject to infrastructure capacity), and fares could be expected to fall;
- gives RUs freedom to develop linkages between origin-destination pairs not currently directly served, where there is nevertheless a market that can be developed: optimum decisions on routes, frequencies, prices, etc, are not made by public authorities but by companies that have to be sensitive to passenger preferences due to intra- and intermodal competition.

[159] But, it has to be stressed that there are a number of preconditions that need to be in place before any open access RU can enter the market: the ease of entry hinges on several questions, i.e. whether the national incumbent is vertically integrated/effectiveness of infrastructure regulation, the market position of the incumbent (and, accordingly, its strategic possibilities to deter entry), access to rolling stock and its specifity, the carrying capacity of routes, etc.

The main disadvantages of open access for passenger rail services are as follows:

- only 'profitable' services (routes and times of day) would be operated: this is likely to comprise those services which make a profit when assessed on a full cost basis, plus add-on services that can be accommodated at the margin; thus

- routes/services that are not profitable would be unlikely to be served by an open access RU, including those that are socially necessary but not profitable (e.g. many busy commuter routes);

- even potentially profitable routes might lose their services if no RU chooses to serve them;

- likelihood of 'cherry-picking' on most popular routes: tendency for operators to come in to operate at the most popular times of the day to the detriment to providing a service throughout the day, although it is possible to put controls into place to prevent this;

- likelihood of network instability as operators 'chop and change' their network of services in search of profits (note, for example, the way that airline routes are unstable);

- where services are provided by a mixture of open access and public service contracts, the profits made by open access RUs remove cross-subsidy from the system, meaning that the total public financial support required by the system would increase, unless other ways could be found to reduce the cost of providing socially necessary but un-remunerative services[160];

- the provision of a co-ordinated national service in respect of issues such as connections, ticketing inter-availability, publicity, etc, tends to require regulatory action to put into place;

- sensitive to differential between infrastructure charges and fare levels acceptable to users: i.e. if infrastructure charges are high and/or fares that the travelling public are prepared to pay are low there is little scope for open access operations, conversely the lower infrastructure charges become the greater the number of routes that would be served;

- because rail services require significant pre-planning, commitment to train paths and rolling stock, there might be significant reluctance to commit to any market which could be contested.

[160] Note that from the standpoint of a doctrinaire economist this would not necessarily be seen as a disadvantage: it might be argued that the true level of support for each service should be transparent, thereby enabling an evaluation of whether the benefits provided justifies the level of public support provided.

7.3.2.3. Advantages & disadvantages of public service contracts/franchising

The main advantages of using public service contracts/franchises to provide passenger rail services are as follows:

- ensures that a national network of passenger rail services is provided that meets at least the minimum standard required by government (or other promoter);
- where there is genuine competitive tendering, it should reduce the cost to government/promoter of providing domestic rail passenger services;
- relatively straightforward to provide a coherent and integrated national network with integrated ticketing, a common timetable, common information systems, publicity, etc;
- provides stability throughout duration of franchise/contract;
- insensitive to level of infrastructure charges, provided that public funds are not too limited to support the rail network and services desired;
- fare controls/fare regulation is compatible with this option.

The main disadvantages of using public service contracts/franchises to provide passenger rail services are as follows:

- allows less leeway for development of new services that are not in the present timetable, such as those an open access operator might identify and exploit, for example between origin:destination pairs that are not currently served;
- does not allow free reign to innovative ideas and techniques which commercial enterprise can bring, and might allow the RU operating the contract to become complacent; however, this point is crucially dependent on the form of procurement (constructive tendering leading to a kind of pure cost-oriented competition while functional tendering gives RUs the possibility of bringing in new ideas[161]) and the kind of incentive system used (determines the importance of passenger preferences to the RU);
- public authorities are responsible for determining level and quality of services, in general these tend to be less sensitive to passengers' preferences than under a commercially driven model;
- dependency on public funds endangers sustainable service development;

[161] The constructive tender for the scope of services is the "classical" approach. It includes structuring the service in a detailed manner (timetable, rolling stock, distribution, etc.)., by contrast the functional tender determines the scope of the project by the description of its function, but how the service is to be performed is left open.

- no competitive pressures from open access operators to reduce fare levels: minimum fare levels would be determined by considerations of the maximum yield level by RUs, or fare regulation (see the Japanese example above);

- if the public contracts are let for 'large chunks' of the network the barriers to entry become high for new entrants, although there ways in which this can be reduced (e.g. provision of rolling stock by the promoter);

- the tendering process introduces transaction costs, which need to be outweighed by reductions in cost of providing the service through tendering if the overall level of public financial support is not to increase.

7.3.3 Detail options & sub-options

It is considered that, in theory, the following regulatory models could be used to further open the domestic rail passenger market in Europe, it should be noted that some of these are impractical and are listed for the sake of completeness:

Group 1 – options where all or part of network is only operated by open access

1. services provided only by open access (i.e. RUs decide which routes and services they want to operate) ("**Model A**");

2. services provided only by open access but with public funding provided for unremunerative corridors or services by individual tender ("**Model B**");

3. services provided only by open access but with subsidies provided for unremunerative corridors or services by fixed subsidy tariff ("**Model C**");

4. services provided only by open access under individual train path auction ("**Model D**");

5. services provided only by open access on routes that are profitable, with unprofitable service groups being operated under competitively tendered public service contracts/franchises ("**Model E**");

Group 2 – options where public service contracts cover entire network

6. all lines operated under competitively tendered public service contracts/franchises, with open access permitted without restriction ("**Model F**");

7. all lines operated under competitively tendered public service contracts/franchises, with open access permitted under regulatory control ("**Model G**");

8. all lines operated under competitively tendered public service contracts/franchises, with open access permitted without restriction on certain lines ("**Model H**");

9. all services operated under competitively tendered public service contracts/franchises, with no open access permitted (“**Model J**”);

Group 3 – alternative model for minor lines

10. lightly used and wholly unremunerative lines operated under vertical micro-franchises, with one of the other models listed above being used on the remainder of the network (“**Model K**”).

The salient features of these models, and their chief advantages and disadvantages are discussed in the following sub-sections in a consistent format.

Options that would not provide market opening are, by definition, not relevant, and have therefore not been included in the list of possible detail options to take forward, for example the option of operating all lines under public service contracts where there is no real competition for the contracts.

7.3.4 Model A – open access only

7.3.4.1. Description

All services would be provided by open access operators, who would choose which services they would operate and when. As noted above, this is likely to comprise those services which make a profit when assessed on a full cost basis, plus add-on services that can be accommodated at the margin.

An example of Model A in operation is for the majority of inter-state rail services in Australia.

7.3.4.2. Advantages

See above under *Main Options* for inherent advantages and disadvantages of open access.

7.3.4.3. Disadvantages

See above under *Main Options* for inherent advantages and disadvantages of open access.

Loss of coherent national network unless almost all services are profitable (near universal profitability of rail passenger services unlikely in Europe in the foreseeable future).

7.3.4.4. Factors that would make option more likely to succeed

All or almost all national rail services profitable.

Low or free infrastructure charges.

High population density on rail corridors.

Where a market is poorly served at present.

Existing rail fare levels are high.

Adequate spare infrastructure capacity for new services.

7.3.4.5. *Environment in which option is less likely to succeed*

Where a route and/or a service group is unprofitable.

Where there are high infrastructure charges.

Where there is low population density.

Where fare levels are low and/or heavily subsidised.

Where the railway infrastructure is already at or close to capacity.

On densely served commuter networks, particularly those with complex service patterns and high levels of inter-service integration.

7.3.5 Model B – open access only with public funding for unremunerative services through individual tenders

7.3.5.1. *Description*

All services would be provided by open access operators, who would choose which services they would operate and when, but unlike Model A, a public financial support would be available for operating any service in a list of defined services that are not profitable: which would be operated by the open access operator offering to run them for the lowest price, the test of profitability would be where an RU would not otherwise provide a service. The list of defined services (by route, or origin:destination) that need to be served would be set by the promoter (i.e. government or other public body).

In detail the process would be that if no RU were prepared to provide a particular service under open access, the route first would be offered for exclusivity to any RU willing to operate it without payment, then if there were still 'no takers' a tender process would determine the RU willing to operate it for the lowest price. These would be short-term contracts, of say twelve month duration, but with their start and end dates staggered, creating a continuous market with a large volume of individually small contracts.

An example of Model B in operation will occur once market opening for passenger rail services in Sweden is complete later in 2010.

7.3.5.2. *Advantages*

See above under *Main Options* for inherent advantages of open access.

Should allow unprofitable but socially necessary services to survive: the tendering process should mean that an operator would be found for every service.

Although difficult, it should be possible to provide a co-ordinated service in respect of issues such as connections, ticketing inter-availability, publicity, etc, by requiring RUs to provide these as a condition of public funding.

Where the majority of services receive public funding there is likely to be a reduction in the public support requirement as the cost savings by competitive tendering for unremunerative services is likely to exceed loss of cross-subsidisation from profit abstraction by open access operators, and the transaction costs of the tendering process.

7.3.5.3. Disadvantages

See above under *Main Options* for inherent disadvantages of open access.

Complex to administer: need to let a large number of small contracts.

Profit abstraction by open access operators that currently cross-subsidise unprofitable but socially necessary services (but see above).

7.3.5.4. Factors that would make option more likely to succeed

Competent and fully impartial economic regulation.

Commercial and current ridership information readily available to all potential tenderers.

Transparent and rapid publication of results of each tender, making the public support provided for each service clear.

Ready availability of suitable rolling stock, and where this is line specific, a mechanism exists to enable it to be turned over to the new operator (e.g. rolling stock leasing companies).

Transferability of key staff from one RU to another, while enabling staff to retain their employment rights.

7.3.5.5. Environment in which option is less likely to succeed

Lack of impartial economic regulation.

Lack of transparency in tendering process.

‘Culture of secrecy’.

Line and route specific rolling stock not available to other than incumbent RU.

7.3.6 Model C - open access only with public funding for unremunerative services by fixed schedule of payments

7.3.6.1. Description

All services would be provided by open access operators, who would choose which services they would operate and when; however, unremunerative services would be supported by a fixed schedule of subsidies paid to any RUs operating them (e.g. sum per train km operated). These schedules could either be applied simply by line type or in a more sophisticated way as an individual rate for specific lines or by origin-destination pair.

Under this mechanism a fixed schedule of premium payments by RUs could also be applied to profitable services, to cross-subsidise the payments for those that are unremunerative.

The payments would need to be available to all and any RU wishing to provide a service: if payments were made on a 'first come first served' basis it would be likely that these would be 'vacuumed up' by the incumbent and no market opening would occur.

An example of Model C in operation occurs in the case of some German local bus services.

7.3.6.2. Advantages

See above under *Main Options* for inherent advantages of open access.

Should allow unprofitable but socially necessary services to survive.

Although difficult, it should be possible to provide a co-ordinated service in respect of issues such as connections, ticketing inter-availability, publicity, etc, by requiring RUs to provide these as a condition of public funding.

Scheme simple to operate for promoter, and easily comprehensible by RUs.

Gives RUs confidence with predictable future revenue streams, encouraging both market entry and stable service patterns.

Lower transaction costs than Model B.

7.3.6.3. Disadvantages

See above under *Main Options* for inherent disadvantages of open access.

No guarantee that an operator would come forward to provide all services all routes and at times of day that government (or other promoter) desires, even if public financial support is provided.

With a fixed schedule of support payments it would be almost impossible to prevent perverse impacts: where payment levels are set too low no operator is likely to come forward and socially necessary services would be lost, but on the other hand if payment levels are set too high then an inappropriately heavy service is likely to be provided[162]. It is suggested that given the complexity of rail networks, the multiplicity of local factors, and RU's radically different cost structures, that it would be impossible to provide a schedule of rates that prevents these perverse impacts.

Almost impossible to deliver service frequencies across the network that accord with public need: RUs' decision making will be driven not only by demand, but also by the attractiveness of the support available on particular lines, etc.

Cost to the promoter difficult to control: if a new large-scale player enters the market (e.g. an incumbent RU from an adjoining state) then the public funding requirement is likely to increase substantially, potentially with limited benefits to users.

Positively encourages the provision of low quality services where support payment is higher than farebox revenue: the predictable part of the revenue stream is the support payment, therefore cost minimisation would be the key element of commercial success. The corollary of this is that investment in new equipment for rural lines, for example, is unlikely.

7.3.6.4. Factors that would make option more likely to succeed

Well targeted subsidy levels and well thought-out structure of subsidy tariffs.

Low or free infrastructure charges.

7.3.6.5. Environment in which option is less likely to succeed

Where subsidy levels are either too high or too low.

Where the structure of the subsidy system provides perverse incentives.

Where there are high infrastructure charges.

7.3.7 Model D - open access only with train path auction

7.3.7.1. Description

All services would be provided by open access operators. There would be regular bidding rounds between RUs, say every twelve months, for the rights to operate each train, but with the bids for different services staggered throughout the course of the year. In each bidding round competing RUs would bid for each and every passenger train path specified by the promoter (e.g. government), the winner would be the RU offering either the highest premium payment or the lowest subsidy payment to operate the service. The promoter would need to identify every service and station stop required and to specify the

[162] In the most extreme form it is entirely possible that the level of support for some lightly-used lines would be set be higher than the cost + profit that some RUs could operate them for, ultimately this would lead to a frequent service on a lightly used line, with the majority of trains running virtually empty.

characteristics of the service in some detail. Given that a day's train service between say Roma and Napoli might be provided by several different RUs ticketing inter-availability and revenue allocation systems would be a fundamental pre-condition.

The Consortium are not aware of any example of use of Model D in the public transport sector, although this model was considered in the run-up to rail privatisation in Great Britain before being rejected.

7.3.7.2. Advantages

See above under *Main Options* for inherent advantages of open access.

Should allow unprofitable but socially necessary services to survive: the tendering process should mean that an operator would be found for every service.

Maintains cross-subsidy across network: premium payments for profitable services would help support the cost of unremunerative services.

Although difficult, it should be possible to provide a co-ordinated service in respect of issues such as connections, ticketing inter-availability, publicity, etc, by requiring RUs to provide these as a condition of the tendering process.

If ease of entry to the market for new entrant RUs is an objective, this model has low barriers to entry.

7.3.7.3. Disadvantages

See above under *Main Options* for inherent disadvantages of open access.

Exceptionally complex to administer with a very large number of contracts and complex inter-RU co-ordination required, to the point of being impractical.

Provides few of inherent advantages of open access: service pattern would be set rigidly by the promoter with little scope for entrepreneurial behaviour by RUs.

Almost impossible for individual RUs to differentiate their services from each other.

As with Model C, positively encourages the provision of low quality services where farebox revenue is low: tenders would be won by the operation 'with least frills'.

Potentially a daily service might be provided by a number of different RUs, thus each would have little stake in the overall service provided, and would largely rely on the performance of the others for the overall quality of the service. Thus the commitment of each RU to maintain and improve service quality is likely to be limited.

7.3.7.4. Factors that would make option more likely to succeed

Competent and fully impartial economic regulation.

Commercial and current ridership information readily available to all potential tenderers.

Transparent and rapid publication of results of each tender, making the public support provided for each service clear.

Ready availability of suitable rolling stock, and where this is line specific, a mechanism enabling it to be turned over to the new operator in a timely manner (e.g. rolling stock leasing companies).

Transferability of key staff from one RU to another, while enabling staff to retain their employment rights.

Impartially operated inter-RU revenue allocation system.

7.3.7.5. Environment in which option is less likely to succeed

Lack of impartial economic regulation.

Lack of transparency in tendering process.

'Culture of secrecy'.

7.3.8 Model E - open access on profitable routes only, competitive franchising for remainder

7.3.8.1. Description

Services provided by open access services alone on profitable routes. On the remainder of the network services would be provided by public service contracts/franchises let under a transparent and impartial tendering process. Note the difference between this and Model B is that under Model E the contracts would be multi-year contracts and would be for bigger geographical areas.

An example of Model E in operation is the German passenger rail business.

7.3.8.2. Advantages

See above under *Main Options* for inherent advantages of open access and public service contracts/franchises.

Guarantees that a service that meets at least the minimum required standard is provided on parts of the national rail network that are provided for social reasons, even where they are unremunerative.

May lower barriers to entry compared to pure open access (RUs that have won public service contracts can use them as a starting point for expansion into open access segments).

7.3.8.3. Disadvantages

See above under *Main Options* for inherent disadvantages of open access and public service contracts/franchises.

Relies on accurate identification of profitable and unprofitable routes/service groups by government/the promoter: difficult to perceive of a mechanism that could reliably identify status as "profitable" or not. This may create subtle interdependencies between the segments (if public service contracts are defined too generously this discourages entry by open access RUs, attractiveness of open access entry depends on complementary public service contracts, and so on).

Danger of loss of service from the parts of national network operated through open access if circumstances change significantly making operations unprofitable (e.g. economic downturn reducing passenger volumes, increases in infrastructure charges, etc).

Abstraction of profits by open access operators used to cross-subsidise unremunerative services might not be balanced by cost savings from franchised services.

7.3.8.4. Factors that would make option more likely to succeed

Low or free infrastructure charges.

Sufficient number of economically viable routes (e.g. due to high population density on rail corridors), to enable intra-modal competition can build-up.

Strong independent regulatory bodies.

Ticket inter-availability between RUs, backed up by an impartial inter-RU revenue allocation system.

7.3.8.5. Environment in which option is less likely to succeed

Incorrect identification of routes that would be profitable to open access RU.

Where there are high infrastructure charges.

Where the open access element is widespread (see issues identified for Model A above).

Lack of impartial and strong economic regulation.

Where access to commercial facilities is denied to open access operators (e.g. ticket sales facilities at stations).

7.3.9 Model F - universal competitively tendered public service contracts with unrestricted open access

7.3.9.1. Description

The entire national rail network is operated under public service contracts/franchises let through an open and transparent tendering process, but open access RUs are also permitted to serve any line without restriction.

7.3.9.2. Advantages

See above under *Main Options* for inherent advantages of open access and public service contracts/franchises.

Potential to reduce costs of providing national passenger rail service through competitive tendering for public service contracts (but see also comments below under "Disadvantages").

Public service contracts for major urban rail networks would be unlikely to suffer seriously from 'cherry picking' by open access RUs, since most have little or no spare infrastructure capacity to accommodate many open access services.

7.3.9.3. Disadvantages

See above under *Main Options* for inherent disadvantages of open access and public service contracts/franchises.

Open access RUs would abstract revenues from RUs operating the public service contracts, with a consequent negative impact on their anticipated revenue streams. This also raises the potential for competitive abuse: large and powerful RUs could run deliberately abstractive open access services from smaller RUs fulfilling public service contracts with the intention of forcing them into financial difficulty and taking them over (see parallels to practices that occurred after bus deregulation in the UK).

Difficulty of getting "a good price" in tenders for public service contracts because of risk of revenue abstraction.

Possible need to underwrite the abstracted revenue arising from open access operations for RUs fulfilling public service contracts for the reasons outlined above, potentially increasing the costs of providing the national passenger rail network.

Difficult to force open access RUs to have ticket inter-availability with franchised services.

Infrastructure capacity issues might become critical: in places it would be impossible to superimpose open access services over the services operated under public service contracts. This could frustrate any market opening where a public service contract has been handed to an incumbent without proper competition.

7.3.9.4. Factors that would make option more likely to succeed

If there were little real competition for the public service contracts, open access would have a positive impact.

If domestic rail passenger rail services are few in number.

If there is widespread under-provision of passenger rail services in comparison to the latent demand.

Ready availability of rolling stock suitable for use in the public service contracts in sufficient quantity (e.g. from rolling stock leasing companies).

7.3.9.5. Environment in which option is less likely to succeed

A complex national rail system where a diverse and balanced mixture of rail services are already provided, that broadly meets the demand for rail use.

Where there is no mechanism to compensate RUs operating public service contracts from revenue abstraction caused by open access operations.

7.3.10 Model G - universal public service contracts with open access permitted under regulatory control

7.3.10.1. Description

The entire national rail network would be operated under public service contracts/franchises that are awarded in a transparent and open competition, but open access RUs are also permitted to serve any line, but only if the independent economic regulator rules that this is in the public interest, in the event of any challenge from the RU operating under the public service contract.

An example of Model G in operation is the passenger rail business in Great Britain.

7.3.10.2. Advantages

See above under *Main Options* for characteristic inherent advantages of public service contracts/franchises.

Where open access services operate, service frequency and choice for users is enhanced.

RUs operating public service contracts are protected against ‘unfair competition’ from open access operators by the independent economic regulator.

Provides benefits to travelling public where open access operators develop new routes, services, ticketing options and other benefits not traditionally provided, developing new markets.

Open access operators, can be forced by the regulatory process to provide ticket inter-availability and adhere to common standards (e.g. lost property handling, timetable planning, customer information, etc).

Provides a, potentially transparent, framework for excluding open access services where there is insufficient network capacity or undue revenue abstraction under impartial regulation.

7.3.10.3. Disadvantages

See above under *Main Options* for characteristic inherent disadvantages of public service contracts/franchises.

Opportunities for open access limited by network capacity issues and by timescales imposed by the need to demonstrate that revenue abstraction from public service contracts is balanced by the wider benefits of the proposed open access service.

Slightly cumbersome process required before new open access service can be introduced.

Complex to administer, particularly where there is a need for revenue allocation under a common ticking system.

Possible need for to underwrite the abstracted revenue arising from open access operations for RUs fulfilling public service contract (but this is less likely to be required if the proportion of open access operations is kept low).

Needs competent and fully impartial economic regulator for system to work properly.

7.3.10.4. Factors that would make option more likely to succeed

Competent and fully impartial economic regulation.

Ready availability of rolling stock suitable for use in the public service contracts in sufficient quantity (e.g. from rolling stock leasing companies).

Low levels of public support or premium payments by franchisees on public service contracts.

7.3.10.5. Environment in which option is less likely to succeed

Where there is little real competition for the public service contracts and economic regulation is not impartial.

7.3.11 Model H - universal competitively tendered public service contracts with unrestricted open access on defined lines only

7.3.11.1. *Description*

The entire national rail network would be operated under public service contracts/franchises, but open access RUs are also permitted to provide a service on either defined lines/corridors, or on defined types of lines (e.g. inter-city). The tendering process for the public service contracts would be open and impartial under this option.

Those routes opened up for competition would be those that are widely recognised as profitable, or are poorly served by the incumbent at present.

7.3.11.2. *Advantages*

See above under *Main Options* for inherent advantages of public service contracts/franchises.

Potential to reduce costs of providing national passenger rail service through competitive tendering for public service contracts (but see also comments below under "Disadvantages").

Allows non-discriminatory access to the market for open-access RUs. but only on defined parts of the network.

Where open access services operate, service frequency and choice for users is enhanced.

Provides benefits to travelling public where open access operators develop new routes, services, ticketing options and other benefits not traditionally provided, developing new markets.

Simpler to establish open access operations than under Model G.

7.3.11.3. *Disadvantages*

See above under *Main Options* for inherent disadvantages of public service contracts/franchises.

Difficulty of establishing the boundary where open access is permitted to give the most cost-effective solution.

RUs would abstract revenues from RUs operating the public service contracts, with a consequent negative impact on their anticipated revenue streams.

Difficulty of getting competitive tenders where there will be competition from open access RUs, unless arrangements to protect public service RUs from revenue lost to open access RUs

7.3.11.4. Factors that would make option more likely to succeed

Ready availability of rolling stock suitable for use in the public service contracts in sufficient quantity (e.g. from rolling stock leasing companies).

Low levels of public support or premium payments by franchisees on public service contracts.

7.3.11.5. Environment in which option is less likely to succeed

Where there is little real competition for the public service contracts on the routes on which open access is not permitted and economic regulation is not impartial.

7.3.12 Model J - universal public service contracts, open access not permitted

7.3.12.1. Description

The entire national rail network is operated under public service contracts/franchises, let through a transparent and open tendering process. Open access is not permitted (other than for international services). There two sub-options:

1. where the services to be provided are tightly specified and franchisees have little freedom for innovation;

2. where the tendering is against a set of minimum service requirements and franchisees have considerable scope to flex services around these.

There are likely to be profound differences between the outcomes of these two sub-options: the first implies centralised control and planning of a network, whereas the second implies a more responsive (and probably more intensive) service, but one that might (but will not necessarily) be less well co-ordinated nationally, with less consistency between RUs operating different contracts. As can be seen in the case of the Great Britain Case Study (see Annex 6) the second of these two options has a record of delivering a better increase in modal share than the former. Accordingly the second of these two sub-options has been assumed in this analysis.

7.3.12.2. Advantages

See above under *Main Options* for inherent advantages/disadvantages of public service contracts/franchising.

Simplicity of concept.

No issues of revenue abstraction from open access operators.

7.3.12.3. Disadvantages

See above under *Main Options* for inherent advantages/disadvantages of public service contracts/franchising.

7.3.12.4. Factors that would make option more likely to succeed

Ready availability of rolling stock suitable for use in the public service contracts in sufficient quantity (e.g. from rolling stock leasing companies).

7.3.12.5. Environment in which option is less likely to succeed

Where there is little real competition for the public service contracts and the award process for these is not impartial.

7.3.13 Model K – vertical micro-franchises

7.3.13.1. Description

Lightly used and wholly unremunerative lines would be operated under vertical micro-franchises (i.e. franchises for operation of single lines or very limited local networks), where the franchisee would be responsible for both infrastructure and operations. The intention is that the lines would be run by organisations established in the local community, rather than a larger firm agglomerating a large number of these micro-franchises.

The analogy would be a passenger version of US Short Line operations (although local freight services might also be operated under the micro-franchise). The Model can also be found in Germany, on a very small scale, where local or regional authorities have assumed ownership of secondary lines that DB Netz AG intended to close down.

7.3.13.2. Advantages

Management would be located much closer to the market, and thus with a greater understanding of its nuances.

Small lean local organisation should be able to operate the line more much cheaply than a large RU and IM, with inappropriate cost structures.

Line is of considerably more importance to franchisee than it would be to a larger RU, who would be unlikely to give much management thought to its operation. The franchisee is therefore likely to be more innovative and successful.

Gives a prospect of survival to unprofitable lines, which might otherwise have a bleak long-term future.

7.3.13.3. Disadvantages

The concept would appear to be in conflict with EU legislation, particularly the requirement for separation between infrastructure and operations, unless the lines concerned were to be regarded as *"lines and networks isolated from the rest of the Community"*.

Danger of being 'written off' the national rail map by bigger RUs, unless they are obliged to include it in timetables, etc.

Possible difficulties with through ticketing to remainder of national network.

Franchisee is likely to be under-capitalised, accordingly expensive repairs to major structures, etc, are likely to be problematical, unless underwritten from other sources. Similarly finding investment in better assets to match improvements in travelling environment achieved by other modes is likely to be difficult.

Danger of use as a mechanism to protect the incumbent RU from need to comply with EU legislation on parts of its 'home turf': controls required.

7.3.13.4. Factors that would make option more likely to succeed

Ready availability of low-cost rolling stock.

Entrepreneurial culture in the community.

No/few costly pieces of infrastructure to maintain (e.g. major viaducts, unstable embankments, etc).

7.3.13.5. Environment in which option is less likely to succeed

No culture of entrepreneurialism and/or lack of appropriate skills in the local community.

Where there is no real interest or enthusiasm in keeping the line running.

Where infrastructure requires major investment and the economic and social benefits from continued operation do not warrant retention of the line.

7.4. Evaluation of Possible Models

The evaluation matrix in Table 7.4.1 compares, in qualitative terms, the performance of each of each of the detail options listed above against the criteria listed at the beginning of this section. The objective of this matrix is to determine which of the options should be taken forward for detailed quantative and qualitative analysis ("short listing"), weeding out models that are plainly unsuitable. It should be stressed that the initial short listing process is not an analysis of which of these options represents the most effective market opening mechanism, or indeed if any are preferable to the Base Case of making no EU level initiatives to open domestic rail passenger markets: this is undertaken in Section 8.

The evaluation matrix was initially scored by the Consortium, and then discussed at the Stakeholder Meeting on 10 February 2010. The evaluation criteria and the evaluation of each model was then reconsidered in the light of comments received at the meeting and following receipt of written comments from stakeholders, to arrive at both the final scoring of options and those short listed for detailed impact assessment modelling.

It should be noted that Model K is only applicable to lightly used (and heavily loss-making) rural routes that would benefit from being run on a low cost basis under local management, in close touch with the market, as an alternative to possible eventual closure. It is not applicable to any other market segment. Indeed it is essentially not in competition with any of the other detail options listed other than at the margins. Accordingly it has not been included in the matrix in Table 7.4.1. Essentially it is complimentary to the other models rather than in competition with them.

Table 7.4.1 – Initial Evaluation of Possible Regulatory Options

	Practical to Implement	Helps Increase Modal Share	Keeps Socially Necessary Services	Provides Answers to Public Needs	Integrated Services for Users	Minimises Public Funding
Model A	✓	✗	✗	some	✗	✓
Model B	complex	✓	✓	✓	some	probably
Model C	✗	possibly	possibly	possibly	some	possibly
Model D	✗	✗	✓	✗	✓	✓
Model E	some sub-options	✓	possibly	✓	some	possibly
Model F	✗	✓	✓	✓	some	possibly
Model G	✓	✓	✓	✓	✓	✓
Model H	✓	✓	✓	✓	✓	probably

	Practical to Implement	Helps Increase Modal Share	Keeps Socially Necessary Services	Provides Answers to Public Needs	Integrated Services for Users	Minimises Public Funding
Model J	✓	✓	✓	possibly	✓	✓

7.5. Selection of Models for Further Evaluation

Model A can be dismissed easily, since it would fail to meet three of the key high-level initial evaluation criteria: it would not increase passenger rail's modal share, unremunerative but socially important services would be lost, as would integrated services for users. Even more importantly, it would result in severe deterioration in the ability of Europe's citizens to access rail passenger services. Model A is considered to be the least satisfactory option of any of the models discussed above.

Model C is another option that can be dismissed fairly easily, since it would fail to meet one of the key high-level initial evaluation criteria: practicality of implementation. The reason for this is there would be serious practical difficulties in attempting to identify "profitable" and "unprofitable" services. This would be particularly problematical as, even if the incumbent RU's cost structure were comprehensible and transparent, the incumbent's cost structure might not be relevant to a new entrant, even before one starts to consider issues such as operation of some services at full cost recovery and others at their marginal cost.

Model D can be also dismissed for failing to meet the criterion of being practical to implement. It is also considered that it would also fail to meet the criteria of increasing (passenger rail's modal share) and of meeting public needs: the patchwork of numerous RUs, with little individual stake in the service being provided and with little opportunity to differentiate their individual services is considered unlikely to result in an attractive service that is responsive to improvements being made by other modes.

Model F can be dismissed for failing to meet the initial assessment criterion of being practical to implement in view of its major potential difficulties from a competition angle, given the clear potential for abuse by open access RUs.

This leaves models B, E, G, H and J all of which are considered to meet all of the six high-level initial evaluation criteria to some degree. When considering the three/four models taken forward for evaluation it was preferable to include a cross-section of models that were as varied as possible. In particular it was essential that models that included both competition within the market (i.e. models B and E) and competition for the market (i.e. models G, H and J) were represented in the detailed impact assessment process.

Both **Model B** and **Model E** were taken forward as these two models have considerable differences both in principle and in operation.

In considering options that provide competition for the market (i.e. Models G, H and J), **Model G** was taken forward since this model was considered to meet the six initial high-level evaluation criteria better than any other model. The Stakeholder Meeting indicated some support for Model H, but little support of Model J. Accordingly **Model H** was also selected for detailed impact assessment, while **Model J** was rejected.

Models B, E, G and H were therefore been taken forward for further evaluation in the impact assessment work.

It is further recommended that, although not a model suitable for other than 'backwaters' of national rail networks that, irrespective of the results of the impact assessment work, Model K has applications in appropriate circumstances. But only under strict control to prevent it being used as mechanism to circumvent the objectives of EU rail legislation.

7.6. Further Desirable Attributes of Models

There are further issues which cannot be particularly associated with particular models, but which nevertheless have a significant effect on the passenger market:

- infrastructure charges: lower marginal charges for the use of infrastructure encourage extra services. Lower marginal charges can be justified on the basis that the costs of extra trains are marginal: wear and tear, traction current, etc;
- the degree to which the model encourages the setting of differentiated fares: differentiated fares have many advantages, they allow consumer surpluses to be exploited, they assist in managing peaks and they allow attractive fares to be offered to the less well-off; however, politicians sometimes see them as discriminatory;
- in considering any form of public specification, the degree to which the specification shapes the train service is crucial: for example, the degree to which frequency or fares are controlled, the arrangements for ticket inter-availability (including inter-modal availability) and lastly of course how the contractor is rewarded for attention to detail.

It is important to bear in mind that these factors appear to have a greater impact on the success or failure of national arrangements than the actual model that is selected (see Sections 9 and 10).

8. Stakeholder Views

8.1. Interviews undertaken by Consortium

8.1.1 Community of European Railways (CER)

The CER was concerned that liberalisation of the passenger market should only take place when the framework for passenger operations is stable and fair to passenger undertakings, or while this stable and fair framework is being implemented. The CER instanced the need to avoid volatility in infrastructure access charges, the need for infrastructure charging to be transparent and the need to ensure that Member States honoured their bargains when contracting for passenger service provision through PSOs. The CER pointed out that some Member States had written off infrastructure managers debts whilst others had not; this produced a great disparity of charges across Europe. The CER thought these conditions should be in place either before any liberalisation of the domestic passenger market was contemplated, or as a part of it. In this context the CER thought that some states already satisfied these requirements (such as Germany, Sweden, and the UK) but that others (principally in the "new" Member States and in France) did not.

The CER was also concerned that an "independent" infrastructure manager might become less responsive to the commercial imperatives of the market and more responsive to dictats of government on regional development or social issues, for example.

The CER was also concerned about an orderly market. The CER instanced freight in Romania as being an example to be avoided. In the view of the CER freight liberalisation in Romania (and other states) had been made under very bad framework conditions for rail (i.e. high infrastructure charges on rail compared to zero on road and no infrastructure investments in rail while most public investments went to road). In this context of almost non-existent public financing, the introduction of competition in rail freight led to unnecessary price decreases in block train operations, reducing rail margins and limiting even further the capacity of the rail system to self-finance. As a result, the CER felt that competition had accelerated decline rather than boosting growth (as should have been the case if infrastructure financing and charging had been put on the correct footing). Other states in Eastern and even Western Europe (e.g. France) suffer the same predicament in the view of the CER.

8.1.2 European Rail Infrastructure Managers (EIM)

The EIM pointed out that infrastructure managers were subject to state policies on infrastructure financing and that charges for the use of infrastructure (full cost recovery from railway undertakings in Estonia, almost free to the user in Norway) were often outside the control of IMs.

On the wider question of infrastructure costs, the EIM pointed out that a variety of different models are used successfully for infrastructure maintenance and construction.

The key issue however is that the infrastructure managers must know the state of the infrastructure (by owning the asset register) and have knowledge of techniques and costs. This then allows an informed choice of whether to renew or maintain and the information necessary to instruct contractors or direct-labour staff. Multi-annual contracts or agreements with government (local or central) are essential to be able to manage costs and allow long-term relationships with contractors.

Having said that, the EIM laid down some principles for an appropriate relationship with passenger railway undertakings:

- the infrastructure manager has an important central and coordinating role, it should, for example, publish the timetable including station departure details and have some influence over such issues as the trade off between frequency and connections;

- it is important that stations used by multiple railway undertakings are managed independently, the EIM considered that the infrastructure manager is the logical choice. Central management by the infrastructure manager also allows coordinated discussions with chains of retailers (such as Hachette);

- smaller stations can be managed by railway undertakings (who are on-site): a relatively stable regime and appropriate agreements are required however.

Of regulatory models in general, the EIM thought it important that:

- the regulatory regime is totally transparent;

- the incumbent has no role in it (instancing one state in which the incumbent's staff are used for safety checks);

- a reference to the regulator does not sour relationships;

- the EIM considers that coordination of regulatory decisions and action is important but did not advocate a regulator at a pan-European level.

The EIM thought that domestic passenger regulation could learn lessons from freight, in particular that rights must go beyond access. The EIM instanced cases where there was "access to fuelling points" but the incumbent was not prepared to provide fuel; where there was "access to stations" but the platforms were "full with the incumbent's trains", where trains could not be cleaned, or locomotives released from trains.

8.1.3 European Passenger Transport Operators Association (EPTO)

EPTO asked for stability and transparency in infrastructure charging but nevertheless did not ask for further regulatory powers over infrastructure managers. EPTO said that the cost quality relationship was crucial (instancing examples from freight) and therefore welcomed the introduction of performance regimes. EPTO favoured infrastructure schemes being financed through railway undertakings as providing a customer/supplier relationship for investment spending. In that context, EPTO saw benefit in further contracting out of infrastructure maintenance, instancing the RFF start to move away from SNCF as the contractor.

EPTO saw logic in three groups of services, local services subject a tendering process, longer distance regional services subject to a public service contract and long distance (TGV type) services as open access.

EPTO thought that there was a need for formal liaison between regulatory authorities, they saw no need for an authority at European level but did think the differing ranges of powers given to national regulators could become problematic.

EPTO thought that a single model for domestic liberalisation is not feasible, rather that each Member State should be free to develop its own within parameters. EPTO instanced the differing geographical factors (such as population density), political factors (such as federal states), social conditions (the stronger role played by employees in some states), etc. as reasons for adopting a variety of models.

In the same way, EPTO thought that a variety of different financing models were logical, depending on circumstances.

In general, EPTO were concerned about the costs and problems of change. In particular they were concerned about staffing issues, where contracts transferred between railway undertakings, some appropriate arrangements needed to be made for the staff of the former provider.

8.1.4 European Transport Workers Federation (ETF)

ETF noted that rail services are a prime example of a *service d'intérêt général*, rail is the predominant public transport provider. ETF has difficulty firstly with the concept of private provision of a public service in principle, and secondly thought it is unreasonable to have profits being taken in some areas whilst the public purse supports others. Given that it is a public service, ETF believes decisions on what the service is and how it is to be provided, should be national (subsidiarity principle). ETF does not believe the system is broken and thinks that attempts to fix it, certainly in some states, will be to invite disaster. ETF has particular difficulties with open access, believing it will lead to uncoordinated services, no interest in connections, non-inter-available tickets. ETF has concerns that open access operators may be simply exploitive, with no investment in safety, training, etc.

ETF has particular concerns over the rights of employees and thinks that if the Commission wants to extend liberalisation, it ought also to guarantee employee rights, in particular transfer between undertakings with the same conditions on employment guaranteed by statute together with the same collective rights.

ETF had reservations about ‘cherry-picking’, which it believed could well lead to secondary services being ignored as railway undertakings invested all their energies in contested routes. This could lead to non-investment in those routes and sub-optimal social outcomes.

ETF considers that studies are too centred on economic issues and that the social dimension is ignored.

ETF was concerned that passenger market opening would lead to review of the PSO Directive.[163]

8.1.5 International Association of Public Transport (UITP)

UITP is concerned about cabotage and its possible impact on urban, suburban and regional passenger transport covered by public service contacts. Considering that in practice it pays little role as long as transparent and neutral procedures exist to limit cabotage when the economic equilibrium of public service contacts is endangered.

Members did not want to accept exogenous risk but did not want to be labour-only sub-contractors: they wanted to be able to contribute and benefit from success. UITP members state that they are ready to accept more risk as long as they have the levers to manage it.

The UITP was also concerned about the impact and relevance of TSIs: they might impose “big railway” requirements and costs on “little railway” operations, of which there are many in Germany, Italy, Austria, etc, if the relevant constraints of rail services operated under public service requirements are not properly taken into account.

The UITP was also concerned about service specification under Public Service Contracts, noting that on occasion it has been so precise as to close down options for potential re-use of stock, due to the length of contracts in comparison to the lifetime of rolling stock. The UITP also had concerns about infrastructure use issues, but most UITP services are ‘first on the graph’. This may change with the implementation of the “priority rail freight corridors” and UITP requests that this should not impede the development of ‘clock-face’ rail services and interchanges with other public transport modes.

8.1.6 International Union of Railways (UIC)

The UIC did not wish to be interviewed, stating that it was content to be represented by the CER.

[163] Note that, as with the other summaries of discussions with stakeholders, the ETF was given the opportunity to comment on this record, but did not do so before the publication date.

8.2. Stakeholder Meeting

8.2.1 Purpose & structure

A stakeholder meeting was hosted by DG MOVE on 10 February 2010. The purpose of this meeting was to share some of the work undertaken by the Consortium up to that time and gain feedback from the stakeholders. A total of 85 stakeholders were invited to the meeting, of whom 70 eventually attended, despite severe adverse weather conditions.

After an introduction and welcome from DG MOVE, the meeting was structured in four sessions as follows:

Session 1: Market Analysis

Session 2: Case Studies

Session 3: Possible Regulatory Options

Session 4: Impact Assessment & Workplan to Completion

Each session commenced with a presentation by a member of the Consortium, followed by a discussion chaired by DG TREN. In Session 2 three presentations were given, covering the German, British and Swedish case studies, and Session 4 was split in two. Copies of the presentations can be found on the European Commission website at http://ec.europa.eu/transport/rail/studies/rail_en.htm.

8.2.2 Comments received

8.2.2.1. *Comments received at meeting*

In response to the first session a wide range of divergent views were expressed, these included:

- most respondents felt that the initial conclusions of the market analysis were generally appropriate;
- concern that particular issues were apparently not being addressed by the study team (mostly these stemmed from the need to concentrate the work done to fit into a ten minute presentation and the consequent inability to cover everything within the available window);
- detail points of difference where experience in particular states ran counter to the findings (while these were noted by the Consortium, in the main the points raised were isolated incidences of individual experiences running counter to the general trend);

- comments about the perceived errors of emphasis in DG MOVE's specification for the Study (not agreed by DG MOVE).

In the second session, the meeting generally agreed with the findings of the three case studies that were presented (Germany, Great Britain, and Sweden). A few comments were made about detail points, which (where appropriate) have been reflected in the final versions of these documents included herein as Annexes 5 to 7. The Italian Case Study was not presented to the meeting as it was not complete at that stage.

In the third session the regulatory options outlined in Section 7 were outlined together with a brief summary of their main perceived advantages and disadvantages, the views expressed from the floor included:

- pleas from the floor to allow Member States to choose their own market opening mechanisms under the principle of subsidiarity;

- concern that the reduced list of evaluation criteria used to select the three/four options to be taken forward does not reflect the full range of evaluation criteria used in the impact assessment (specific comments noted and some changes made, but the Consortium's approach is 'fit for purpose');

- some questioning of a few of the assumptions underlying decisions about the advantages and disadvantages of various models (see Annex 9 for further details and the Consortium's response);

- a range of detailed comments relating to matters such of how practicality to implement should be taken into account, perceived need for flexibility in any arrangements, 'cherry picking', incentives required under the models, etc (see Annex 9 for further details and the Consortium's response);

- concerns about railway workers' rights, pay, and working conditions from their representative (issue is considered in the impact assessment).

Although some time was spent presenting the possible regulatory options and offering a forum for stakeholders to discuss the issue or to suggest any further possible models, there was little discussion on the merits or otherwise of particular models, as a result no clear consensus emerged on the models that should be taken forward for further analysis.

Under the discussion of the impact assessment methodology in the fourth session, the issues raised from the floor included:

- difficulty of being able to make meaningful comments without seeing the completed work;

- safety omitted from list of impact assessment parameters presented by the Consortium at the meeting (it was confirmed that safety is included in the *Task Specification* and was being assessed by the Consortium);

- concern whether social aspects were being included in the impact assessment (they were);
- a suggestion that customer approval should be introduced as an impact assessment evaluation criteria (not a requirement of the *Project Specification*, and it is considered that this is already implicitly covered by other aspects of the impact assessment work);
- concern about difficulty of extrapolating results for thirty states from three states (noted but an explicit requirement of the *Project Specification*).

Fuller notes of the meeting can be found as Annex 9.

8.2.2.2. Subsequent written responses

Written responses were received from the following organisations:

- ATOC;
- CER;
- DB;
- EIM;
- EPTO;
- FS;
- NS;
- SNCF;
- Swedish Transport Agency.

The response from each of these organisations has been treated as confidential. Not surprisingly the views expressed were diverse, and in some cases directly contradictory (including contradictory views expressed in two responses from the same organisation). There was for example total disagreement on the validity of lessons learned from freight market opening, and even respondents who thought that it was important that the lessons learned are taken aboard for any further passenger market opening were not agreed on what the lessons that should be drawn are. However, common themes that emerged were:

- concerns that a ‘one size fits all’ approach is not appropriate;
- defence of national positions;

- defence of member's positions by representative bodies.

While, naturally, most respondents had issues that wished to raise, the majority of respondents broadly agreed with the findings of the Study to date and the Consortium's approach; however, others had fundamental concerns in respect of the study methodology, including a desire for the impact assessment work to be undertaken individually on a state-by-state basis.

Only three respondents provided a view on which models should be taken forward for impact assessment: one respondent identifying three models, one respondent two, and the third a single model. While the comments made and the reasoning behind each was noted, it is not considered that a total of three responses, together with the lack of this response on this issue at the meeting enables any view to be formed on the general view of stakeholders on the appropriate model(s) for market opening. The Consortium considers the desire for flexibility in the arrangements expressed by several respondents to be more telling.

Notwithstanding the lack of any clear consensus, every response made at least one useful point of useful piece of information, and in most cases several. After careful study of the responses received, the Consortium's work plan to completion was adjusted to make use of and respond to valid points made. Some of the Case Studies were also re-visited and amended in response to specific comments made, or to add further information to them.

9. Evaluation of the Effects of Regulatory Options

9.1. Methodology

9.1.1 Outline of methodology

The fundamental principle on which the impact assessment work was based was to consider how the attributes being evaluated changed in the Case Study states after market opening in the passenger rail sector took place. These results were then used to predict how that particular regulatory option would perform in the states on the impact assessment work was undertaken ("Target States"). The impact for each regulatory option was assessed against a Base Case, which reflects the projected outcome should no regulatory change be made.

The raw data that emerged from the Case Study work was necessarily used unchanged, and was modified for one (or more) of the following three reasons:

- the results that emerged from the Case Studies was subjected to expert review to ascertain the extent that the changes in the attribute concerned was due to the regulatory option adopted;
- where the regulatory options selected for analysis are not identical to those used in the Case Study states;
- as a result of national peculiarities in either the Case Study states or the target states that necessitated modification of the projected impacts.

The impact assessment work was undertaken separately for each market segment for each Target State. The results were then scaled up to an EU level.

The one exception to the process outlined above was the demand modelling work (i.e. forecast passenger volumes and modal shares) which was undertaken using the TRANS-TOOLS V2 model (see Annex 12). This model assessed all thirty states and all market segments simultaneously; there is therefore no need to scale up the results. The modelling work was undertaken on behalf of the Consortium by Rapidis using input data for the various regulatory models supplied by the Consortium. The input parameters used and the process used to derive them are given in Annex 13.

The base year used for impact assessment is 2020; this is consistent with the validated output of the TRANS-TOOLS model as used for the *TEN Connect Programme*, for DG MOVE.

9.1.2 Limitations of methodology & mitigating measures

It must be stressed that quantified results obtained from the impact assessment are indicative rather than definitive: there are a wide variety of endogenous and exogenous factors that can influence the results not all of which can be predicted with confidence.

Factors such as macro and micro economic circumstances, inevitable imperfections in projecting the evolution of the transport market, demographic changes, changes in public taste and public attitudes, legislative changes, developments in transport technology, the nature of any competitive response by other modes, and good/bad management of dominant transport companies, will inevitably impact on the results in practice. The accuracy of projections diminishes as period projected forward increases. The Consortium consider that projecting forward a decade to 2020 should not amplify these imperfections unduly.

A second reason why the results should be regarded as indicative is the technique of undertaking the impact assessment on three "target states" and then scaling the results up to a European level. Inevitably this approach might fail to capture national peculiarities that might have an impact on the results, albeit there is some expectation that the impact of these might 'balance out' overall. This approach was a required by the *Task Specification* (see Annex 2), to keep the scale of the Study within Client requirements. The Consortium has, however, sought to minimise unreliability emanating from this source through the following mitigating measures:

- surpassing the requirements of the *Task Specification* by using the previously calibrated and 'approved' TRANS-TOOLS models to assess some key attributes at a European level, thereby avoiding the need to scale these results up;

- careful selection of the target states for impact assessment, to make them as a representative a cross-section as was reasonably practical;

- the Consortium's knowledge of the European rail industry was used when scaling results up to a European level to take account of national peculiarities.

A third reason for deviance between predicted and actual results is the complexity of the subject: while it is relatively easy to define market opening options at a broad level there are, as previously noted, numerous ways in which the detail arrangements could vary (e.g. structure of access charges, fare controls, ticketing inter-availability, degree of government specification/intervention, etc), giving an almost infinite number of permutations for each model. Therefore the detail arrangements of any practical application of a particular market opening model will inevitable differ to some extent from that assumed herein.

While the approach adopted of seeking to transpose and adapt results from the case study states to the target stages is preferable to a purely theoretical process where it relates to practical elements, it also needs to be borne in mind that this also has the potential to introduce distortions. The Consortium have sought to make allowances for national differences in transposing results from case study states, however.

9.2. Selection of States for Impact Assessment

The criteria and process used to select the target states for impact assessment are described in Annex 11, as is the selection process itself.

As described in Annex 11 the Target States selected for impact assessment were:

- Denmark;
- Spain;
- Poland.

9.3. The Base Case

As noted in Section 7 the Base Case reflects the position should no further action be taken to open domestic rail passenger markets. This is not the current *status quo*, however, as it includes both changes anticipated in the European rail industry, and also other changes anticipated to other modes that have already been incorporated into the TRANS-TOOLS model. The Base Case year for assessment is taken as 2020, in part this date has been chosen for compatibility with the TRANS-TOOLS models and in part because any market opening measures that are unconstrained by *soto voce* protectionism should reach maturity by then.

The anticipated changes to the European rail industry incorporated in the Base Case are:

- all states coming into compliance with current EU rail legislation (in both letter and spirit);
- further extension of the European high-speed rail network, planned for completion by 2020;
- full impact of international passenger market opening, including development of cabotage rights
- rail fares increase at 50% of the GDP growth rate, but capped at a 30% rise.

Changes anticipated to other modes incorporated within the Base Case, include:

- all transport infrastructure work agreed by Member States that is scheduled for completion within the next ten years is completed, as have priority projects already completed, under construction or expected to be initiated before the end of 2010, and the Fehmarn link, in the TRANS-TOOLS model this includes:
    - 95 new roads;
    - 1700 existing roads upgraded to highway standard;
    - 66 new rail sections;
    - 722 existing rail sections upgraded to high speed lines;
- oil price rises in line with IEA estimates;

- road fuel efficiency improves by 0.5% per annum;
- road passenger vehicle operation costs increase
- air fares unchanged in real terms.

9.4. Impact on Passenger Railway Transport

9.4.1 Safety

9.4.1.1. Base Case in Target States

Safety is crucial to railway operation. Railway undertakings are required to demonstrate they are competent before obtaining a safety certificate. The safety regime specifically requires appropriate standards for each type of service (Article 3 (e) Directive 2004/449/EC). Rolling stock must also be certified that it is safe to operate before it can be used, and is subject to safety checks and requirements to adhere to an approved maintenance regime in service, under Article 14a of Directive 2004/49/EC[164]. Under the Base Case therefore an intrinsic level of safety must be delivered by the RUs' management structures and from their staff and equipment before they can operate and to continue to operate. Safety levels have been improving as lines and rolling stock are equipped with new systems (ERTMS, for example) and features such as level crossings are eliminated.

There are a number of measures of safety (measurement of accidents of all types, of injuries or of fatalities, for example.) In making international comparisons, definition of "injury" and indeed of "accident" can vary between states[165]. Likewise differing groups may be considered (just passengers, passengers and staff or all victims, including users of level crossings and trespassers). To avoid difficulties with definitions, the conventional measure of passenger fatalities per billion passenger-km has been adopted herein.

By far the most comprehensive safety data available in Europe is that for Great Britain, this is presented in Annex 6 in graphic form, and shows a continuing trend of reduction in accidents, both under the (state owned) British Rail and its numerous private sector successors. Unfortunately similar long-term trend information is not available for the target states but a similar trend can be observed for Europe as whole. Figure 31 below shows safety trends for European members of the UIC[166]. Similar data has been criticised by the European Transport Safety Council in its paper on *Priorities for Rail Safety*. The criticisms are that the figures only apply to UIC members and are influenced by changes in organisation. They do indicate a trend however. Unfortunately neither Eurostat nor the ERA present such a long time series in their data.

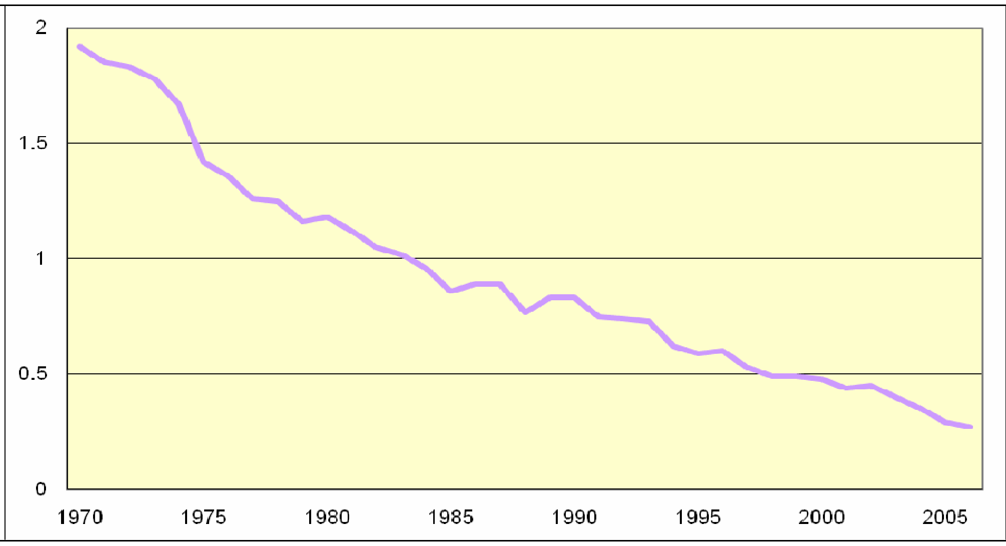
164 As amended by Directive 2008/110/EC of the European Parliament and of the Council of 16 December 2008 OJEU L345 of 23 December 2008.

165 Note for example the wildly inconsistent passenger injury figures within the Eurostat database, not only between states but also from year to year for the same state (including for the target states).

166 Note that the Eurostat figures are too incomplete to use to derive similar trends.

However, UIC members provide both the majority of passenger kilometres and accidents and the statistics have been prepared consistently so the chart is valid as an indication of trend.

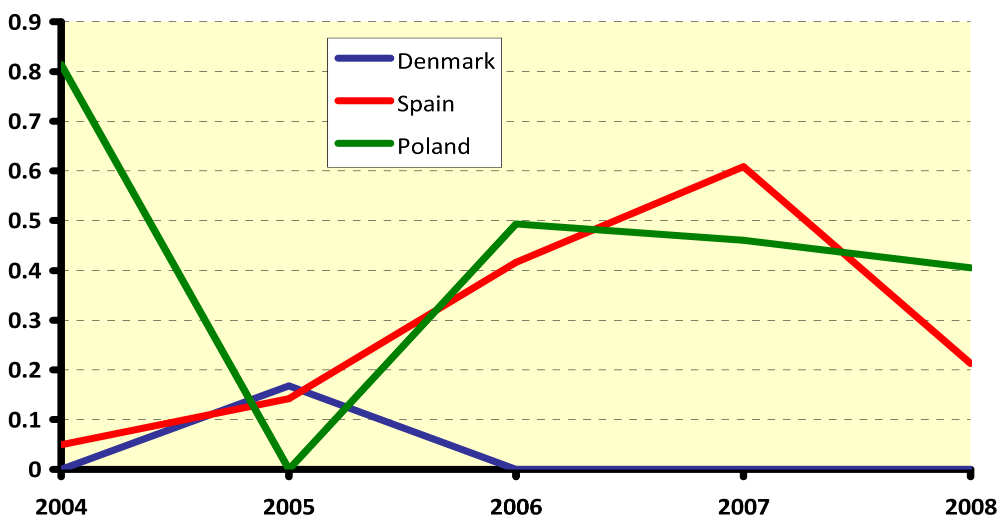
Figure 36. European railway passenger fatalities per billion passenger-km 1970-2006



Source: UIC (figures smoothed over a five year running average)

Currently, Eurostat data is only available for the three target states for the 2004-2008 period and is shown in Figure 32. It will be noted that the incidence of fatalities varies considerably from year to year. This is to be expected, fatal railway accidents are rare events, therefore it can be seen that it is difficult to draw trends using figures available at a target state level.

Figure 37. Railway passenger fatalities per billion passenger-km in Target States 2004-2008



Source: Eurostat

Accordingly, based on trends at a European level it is considered that the mean accident rate in the three target states would be reduced under the Base Case to 0.2 fatalities per billion passenger-km. This appears to be compatible with the position in the target states indicated in Figure 32.

9.4.1.2. General comments applying to all market segments

Whilst it is commonly believed that that it is axiomatic that the multiplicity of interfaces and commercial pressures on railway undertakings mean that liberalising the market for the provision of rail services necessarily increases safety risks, the evidence is quite to the contrary. Full details are provided in Annex 6, but in summary independent academic studies show that accident levels in Great Britain fell at a faster rate after market opening than before it[167]. Given profound changes particularly in maintenance practices, at the time of the reorganisations it may not be possible to say the relationship is causal but there is certainly no evidence that liberalisation jeopardises safety. Likewise in Germany, stakeholders did not believe that safety was likely to be jeopardised by market opening (see Annex 5). Accordingly it is unlikely that that any of the more commercial regulatory models will give rise to an unacceptable reduction in safety levels.

In any event, many aspects of safety are in fact under the control of the infrastructure manager (the signalling system, for example). Furthermore, the safety certification regime ensures that would-be railway undertakings must show they can meet safety requirements. The paragraphs below examine if there is any reason to qualify these assertions in specific market segments.

9.4.1.3. Impact on high-speed services in Target States

New high-speed lines are built to very high standards with sophisticated safety systems built into the rolling stock and infrastructure. These systems reduce the impact of human failures to negligible levels. As a result high-speed lines have an incredibly good safety record[168]. There is no reason to suppose that any of the regulatory models will have any effect on this high level of safety.

9.4.1.4. Impact on conventional express services in Target States

By 2020, significant parts of the network used for conventional express services will have been equipped with ERTMS systems, which can be expected to play a major part in sustaining the predicted continuation in accidents. The levels of safety provided by these systems are quite independent of the regulatory model.

9.4.1.5. Impact on regional services in Target States

Regional routes are likely to be those with the least sophisticated safety systems and the segment with the most potential safety issues (such as single lines and level crossings).

167 Evans A W *Fatal Train Accidents on Britain's Main Line Railways (an annual analysis).*

168 The line open the longest, the Tokaido line in Japan, has yet to record a train movement fatality despite over forty years of service and some six billion passengers.

However, many of these safety issues have more to do with the infrastructure manager than the railway undertaking and are therefore unaffected by the regulatory model.

9.4.1.6. *Impact on commuter services in Target States*

Whilst commuter lines have not been equipped with such sophisticated systems as high-speed lines; their density of traffic both requires and justifies a high level of spend on safety systems. As a result they achieve high levels of safety; it is not likely that the regulatory model would have any bearing on that.

9.4.1.7. *Quantification*

Accordingly it is considered that the accident rate in the three target states would be reduced under all the models to 0.2 fatalities per billion passenger-km, the same figure as is predicted for the Base Case.

9.4.2 Investment, turnover, profitability & public support

9.4.2.1. *Base Case in Target States*

Structure of sub section

This sub-section is an analysis the effect of the different regulatory options on financial indicators, i.e. profitability (turnover, costs), investment and public support. The analyses are mainly based on publicly available information, particularly annual accounts. This approach forces concentration on RUs that publish annual accounts, mainly incumbents. Therefore, a short and general description of the passenger markets in the target states is always included first to give information on the market structure, i.e. number and name of market actors and importance of different market segments. Subsequently, the method and results of the financial analyses are presented.

Denmark

Description of passenger rail market

The passenger rail market in Denmark is dominated by the government-owned Danish State Railways (DSB), which operates more than 83% of all passenger-km (2008). Other companies active in the market include Arriva, which operates regional lines in Western Jutland (approx. 4% of total pkm on the basis of a tendered contract), and foreign companies, as DB DG and Nord-Ostsee-Bahn, which provide international services. PSO contracts play a decisive role in Denmark; up to now, the DSB contracts are directly awarded, with the exception of the Kystbanen suburban line which was tendered as part of the international Øresund contract, and the Arriva contracts (1st phase 2003-2010, 2nd phase 2010-2018) were awarded by competitive tendering.

DSB differentiates mainly between three divisions:

- DSBFirst, an alliance between DSB and FirstGroup, that operates Kystbanen or The Coast Line, a regional railway line between Helsingør and København, as well as services within Sweden and international services between Sweden and Denmark;

- S-tog, a subsidiary (DSB S-tog a/s) which operates the suburban rail network of the København area, that connects the city centre with the inner suburbs;

- long-distance and regional trains that comprises the remaining rail services.

2008, DSB operated a total of 5 352 M passenger km; of these, 1 974 M passenger km can be regarded as inter-regional services connecting East and West Denmark (all trains that cross the Storebælt bridge). Traffic inside each of these regions amounted to 1 459 M passenger km in East Denmark, and 835 M passenger km in West Denmark. Inter-regional traffic to and from Bornholm is regarded as international traffic as it involves a section in Sweden. Suburban and local traffic are counted as one category for the greater København area (1 084 M passenger km) and treated as regional traffic for the rest of Denmark: there are no suburban/commuter trains outside the København area.

Financial analysis

The existing financial information only allows us to differentiate explicitly between services in the København area (“regional”) on the one hand and regional/inter-regional services (“conventional”) on the other hand.

For the Base Case, the financial situation in 2020 had to be appraised. For this financial information for DSB for 2008 was used and assumed to be broadly representative for the entire Danish railway industry. To extrapolate the financial situation, constant real operational costs per train-km and revenues per passenger km have been assumed and these key numbers have been combined with the regulatory model. Please note that incorporating general productivity trends or inflation would have no effect on the relative effects of the scenarios.

As such, the financial situation in 2020 reflects the situation in 2007:

- both market segments entail PSO services and, accordingly, are quite dependent on public support. Regional/inter-regional services achieve a revenue-to-cost ratio of 75%, the ratio for services in the København area is 57%;

- in both segments, the sum of fare income and public support allows the companies to realise profits;

- both segments differ significantly in operational characteristics like cost per train-km, revenue per passenger km and so on.

Concerning investment no assumptions have been made for the Base Case. Investment needs for existing services would not influence the ranking of the regulatory models: for every model, the financial gap between operational revenues and costs is identified, taking into account a target operating margin, price, frequency and demand effects of the model; and it was assumed that this gap is closed by additional public support.

As such, the complete financial effects are reflected by changes in the public support while profits are frozen. This approach offers a direct comparability between scenarios and countries. This is also the only way to maintain consistency between the financial appraisal and the modelling exercise. A reduction of profits (especially negative ones) would lead to service reductions that are not incorporated in the transport market model.

A side-effect is, as mentioned, that the ability to invest into modernisation of the existing fleet is not changed between the scenarios; what changes is the necessity to invest due to additional services (higher frequency, i.e. more train-km). This effect is discussed in the description of the impact of the different scenarios.

Spain

Description of passenger rail market

Rail passenger services are presently mainly provided by the state-owned and state-managed operator RENFE Operadora.[169] There are no privately-operated passenger services currently (although there are some private freight operators). There are some narrow gauge lines owned and operated by a succession of independent companies (mainly owned by regional governments but with a large central government railway too) with limited exchange of traffic between them. However, these are not a part of the national rail network and are thus outwith the Study.

RENFE operates two kinds of passenger rail services:

- Suburban and regional transport services (Cercanías and Media Distancia Activity Area) under a public service contract with the State or the Autonomous Communities.
- Long distance and high speed services (Alta Velocidad-Larga Distancia) "*that are subject to the regime that prepares for free competition*"[170].

Financial analysis

To assess the financial situation for the Base Case (2020), financial information for RENFE in 2006-2007 was assumed to be broadly representative for the whole industry. To extrapolate the financial situation, constant real operational costs per train-km and revenues per passenger km have been assumed and these key numbers have been combined with the regulatory model. Please note that incorporating general productivity trends or inflation would have no effect on the relative effects of the regulatory models.

[169] For the following see Steer Davies Gleave (2009): Comparisons between fares and ticketing in Britain and continental Europe; IBM (2007)

[170] Ministerio de Economía Y Hacienda (no year): RENFE-Operadora Group (2008), Consolidated Annual Accounts, p. 2.

As such, the financial situation in 2020 reflects the situation in 2006-2007:

- Both market segments were in deficit; although the suburban and regional transport services segment received considerable public support (330-370 M euro). In a case like this, unpaid dividends to the owner (the government) and deficits have to be treated as (implicit) public support.

  Although it is understood that state contributions have been drastically restructured in the last years (e.g. by introducing a clear distinction between service-oriented support, support for efficiency improvement projects, and support to offset operating deficits, and by introducing incentive elements), a simple approach had to be used to assess the support necessary in 2020 to achieve economic viability of the market segments. Accordingly, the level of public support has been adjusted, after calculating operational profits, such that both segments deliver (with public support) an operating margin of approximately 17%.

- Both segments differ significantly in operational characteristics like cost per train-km, revenue per passenger km, etc.

In respect of investment, as explained above, no assumptions have been made for the Base Case.

Poland

Description of passenger rail market

The Polish rail market is institutionally divided into two main segments: local and regional rail and long-distance (interregional) rail segments.

Local and regional services are mainly offered by public companies owned by the Voivodeship (provinces). The most important RUs are:

- Przewozy Regionalne Sp. z o.o., the former PKP regional rail subsidiary that was transferred to the Voivodeships end of 2008.

- Koleje Mazowieckie Sp. z o.o., a regional rail operator in the Masovian Voivodship and now completely owned by the Voivodship.

- Koleje Dolnośląskie SA, a regional rail operator in the Lower Silesian Voivodship completely owned by this Voivodship.

- Szybka Kolej Miejska w Trójmieście Sp. z o.o., mainly a provider of urban rail transport that is a member of the PKP Group, the national RU.

- Warszawska Kolej Dojazdowa Sp. z o.o., a company that operates light rail trains around Warsaw. It used to be a subsidiary of PKP, but was sold to the Mazowsze regional authority at the end of 2004.

- Privat: Arriva–PCC, a joint venture between Arriva and PCC (now owned by DB Schenker Polska) that offers regional services in the Kujawsko-Pomorskie region. A contract with the Voivodeships, won in 2007, provides the basis.

Long-distance services and interregional services are mainly provided by PKP Intercity S.A., a subsidiary of the PKP Group. There is no high-speed rail in Poland.

There are plans to construct high speed lines in Poland but it is not hoped to commence operation the of the first line until 2020, therefore, given the potential for programme slippage, it is considered that high-speed rail can be disregarded in Poland as well for the purposes of this analysis[171].

Financial analysis

For the Base Case, the financial situation in 2020 had to be appraised. For this, financial information of PKP Intercity and Przewozy Regionalne for 2007, the last year for which the PKP Group published an annual report covering both companies, was assumed to be broadly representative for the whole industry.[172] Again, constant real operational costs per train-km and revenues per passenger km have been assumed and these key numbers combined with the regulatory model.

As such, the financial situation in 2020 reflects the situation in 2007:

- Both, regional and long-distance services receive financial support from the government respectively the Voivodeships. In both segments this support mainly covers publicly requested price deductions and the provision of otherwise unprofitable interregional services.[173]

- While operational revenues cover operational costs in the long-distance segment (revenue-to-cost ratio: 104%), the regional segments are characterised by operational deficits (revenue-to-cost ratio: 69%).

- In both segments, the sum of fare income and public support allows the companies to realise profits; e.g. the operating margin is slightly above 9%.

- Both segments differ significantly in operational characteristics like cost per train-km, revenue per passenger km and so on.

Concerning investment, again, no assumptions have been made for the Base Case, although several authors argue that the Polish rail market is characterised by a massive backlog in modernising rolling stock (see Section 9.6.2). Nevertheless, it can be

171 It is noted that there are also plans to upgrade the Warszawa – Kraków for high speed operations within the meaning of Directive 96/48/EC but this appears more of an aspiration than a firm commitment.

172 In 2007, these two companies were responsible for 84% of all rail passenger-km in Poland. The remaining companies, with the exception of Koleje Mazowieckie and Arriva–PCC provide mainly urban commuter services: a segment that is not included in the transport market model.

173 Public support of the restructuring of the companies has not been taken into account. It is assumed, that these measures will finish by 2020.

assumed that the major part of the investment should be done until 2020 and even if this assumption was wrong investment needs for existing services, as noted above, this would not influence the ranking of the regulatory models.

9.4.2.2. General comments applying to all market segments

Tables 9.4.1, 9.4.2 and 9.4.3 show the assumed effects of the different models. As can be seen, the effects of the scenarios are rather moderate. This is not only true for the aggregate (passenger km) but also for the relation between the different, more disaggregated segments (e.g. national versus international services, different travel distances or purposes). Generally, the TRANS TOOLS model uses very low elasticities of demand with respect to increases in frequency, so that even relatively high increases of train-km result in only minor increases of passenger km.

Table 9.4.1 - Service Impact - Denmark

Operative value	Model B	Model E	Model G	Model H
Frequency	3%	9%	30%	25%
Price	-0.2%	-0.3%	0%	-0.1%
Quality	0%	0%	0%	0%
Passenger km	0.7%	1.6%	6.2%	3.0%

Table 9.4.2 - Service Impact - Spain

Operative value	Model B	Model E	Model G	Model H
Frequency	3%	11%	30%	25%
Price	-0.2%	-0.3%	0%	-0.1%
Quality	0%	0%	0%	0%
Passenger km	0.7%	2.9%	8.5%	5.5%

Table 9.4.3 - Service Impact - Poland

Operative value	Model B	Model E	Model G	Model H
Frequency	0%	4%	8%	7%
Price	0%	0%	0%	0%
Quality	0%	0%	0%	0%
Passenger km	0%	0.55%	0.95%	0.70%

In all three states, three effects drive the overall financial results of the scenarios (shown in 9.4.2.7):

- the increase of frequency would result in higher operating costs;
- the increase of passenger volume results in higher revenues, although it should be noted that the TRANS TOOL model predicts that demand increases only slightly with frequency, the overall effect is negative, i.e. the additional revenues would not cover the additional costs;
- a decisive effect of the scenarios stems from predicted productivity increases. Scenarios E, G, and H imply the competitive tendering of at least regional and local services: the case studies indicate that competitive tendering would reduce costs significantly, resulting in lower public support (necessary to allow firms to realise their target operating margin).

Concerning investments, a clear distinction between the different sectors cannot be drawn in any of the countries. Hence, the general results discussed in 9.4.2.7 apply to conventional express services and regional and commuter services. Although one can argue that the investment needs in conventional express services may be higher due to higher costs, these differences fall within the range of uncertainty; so, not to differentiate between these segments is a more sound approach.

9.4.2.3. *Impact on high-speed services in Target States*

In view of the lack of high-speed railways in Denmark and Poland, only Spain is discussed herein.

In Spain, the long distance and high-speed as well as the suburban and regional segment (Madrid-Puertollano, Córdoba-Sevilla, Madrid-Toledo) offer high-speed services, although these services are only of low importance in the suburban and regional segment (e.g. high-speed accounts for less than 4% of passenger km and less than 6% of all ticket revenues of this segment). The annual reports do not provide other information that would allow the financial situation to be analysed, or operational characteristics of high-speed services to be evaluated on a stand-alone basis.

The Consortium generally considers entry (on an open access basis) into high-speed segments to be more difficult and afflicted with a significantly higher risk than entry in the conventional express segments. Specific hurdles in Spain result from the different rail gauges in use (which reduces regional usability, increases investment needs if adjustable wheel sets are to be used, and increases specific investments) and the fact, that, at least, the long-distance segment as a whole is loss-making[174].

Consequently, entry into the high-speed segment has been assumed in the calculations to be quite unlikely in the foreseeable future, i.e. by 2020. It could be argued that the

[174] On profitability see e.g. de Rus, G./Nombela, G. (2007): *Is investment in high speed rail socially profitable?*, in: Journal of Transport Economics and Policy, Vol. 41, pp. 3-23.

planned extension of the high-speed network could improve entry conditions, for example through better use of network effects and the opening of financially interesting routes. On the other hand, Spain's programme emphasises interconnectivity with its neighbours France and Portugal,[175] and as such, the programme concerns a segment, international services, that is already liberalised. Additionally, the barriers mentioned above, especially profitability, are still of importance.

9.4.2.4. Impact on conventional express services in Target States

Overview

In all three states, the Consortium considers that the reform models generally have a smaller impact in the conventional express segment as compared to the regional and commuter segments. Conventional express services are often perceived to be self-financing. This implies a higher pressure on costs already in the Base Case. Moreover, going from a self-financed system to a tendered system will also have a cost increasing effect, since public agencies will probably be less cost-effective in their network planning than a self-financed company. Thus, while a cost-decreasing effect is still assumed due to tendering, it will be smaller in the conventional express segment than in regional services.

Denmark

For Denmark, looking at the total impact, Model B is anticipated to result in only minor changes to train frequency and fares and accordingly passenger-km; due to the small impact of this scenario only small productivity effects have been assumed; this productivity increase not only compensates for the additional costs of a higher frequency, but also permits a moderate reduction in public support. Model G results in a strong increase of frequency and, thus, the highest increase of passenger km and revenues are achieved. But, from a financial point of view, this increase offsets most of the productivity gains that result from competitive tendering. Model E leads only to moderate changes in frequency but, due to the high share of PSO-services a considerable cost reductions due to tendering; consequently, it allows a considerable reduction of public support in comparison to the Base Case. Model H lies between Models E and G, resulting in this case in higher public subsidies.

The differentiation of effects discussed above between conventional express on the one hand and regional and commuter traffic on the other is less pronounced in Denmark than in other states. The reason for this is that in this segment in Denmark inter-regional/regional trains, that provide conventional express services, require significant public support, as is also the case for regional and commuter services. In consequence, only small productivity differences have been assumed between the two segments studied.

175 See e.g. Freemark, Y. (2009): *The World's 7 Best High Speed Rail Networks*, in: The Infrastructurist; available at: http://www.infrastructurist.com/2009/03/26/the-worlds-7-best-high-speed-rail-networks/.

Spain

In Spain it is considered that Model E would be the most favourable with regard to public support, while Model G would result in the strongest increase of frequency and revenues, which can only be maintained by additional public support that absorbs almost totally the productivity increase of public tendering. Model E on the other hand is predicted to lead to only moderate changes in frequency but achieves almost the same cost reduction due to tendering; consequently, it should permit a considerable reduction of public support in comparison to the Base Case. Model H lies between Models E and G, resulting in this case in higher public subsidies. Under Model B it is considered that slight increases in productivity would outweigh the slight cost increase due to additional train-km.

Poland

Models E, G, and H imply the competitive tendering of at least the regional services. If quite modest productivity increases are assumed through the competitive tendering process, it would result in drastic cost decreases in regional services, and consequently less financial support from public funds.

Under Model G, tendering is predicted to have cost-decreasing effects on long distance services as well, although this impact would be less pronounced. As is the case in Germany (see Annex 5), conventional express services are viewed as self-financing in Poland. As explained above, this implies that cost reductions as result of tendering will be smaller in the conventional express segment than in regional services in Poland.

9.4.2.5. Impact on regional services in Target States

Denmark

To date, public support has insulated regional services from inter-modal competition and large-scale introduction of efficiency enhancing public sector management methods. Accordingly, the potential effect of cost reduction through competition is highest in this segment.

Spain

As in Denmark public support has insulated this segment from inter-modal competition by these segments from intermodal competition and the large-scale introduction of efficiency enhancing public sector management methods, so far. Accordingly, the potential effect of cost reduction through competition is highest in this segment.

Poland

As in Denmark and Spain, until now, public support has insulated these segments from inter-modal competition and the large-scale introduction of efficiency enhancing public sector management methods. Accordingly, the potential effect of competition is highest in this segment.

Interestingly, the results, see 9.4.2.7, indicate that even moderate cost reductions will lead to a substantial reduction of public support.

9.4.2.6. *Impact on commuter services in Target States*

The available information does not allow commuter services to be distinguished from other regional services. As such, the results of 9.4.2.5 also apply to this segment.

9.4.2.7. *Quantification*

Tables 9.4.4, 9.4.5 and 9.4.6 show the effects on financial values (as percentage of the Base Case value). The results have been discussed in the sub-sections above.

Table 9.4.4 - Financial Impact - Denmark

Operative value	Model B	Model E	Model G	Model H
Operative Revenues	0.5%	1.3%	6.2%	3.8%
Operative Costs	-1.1%	-4.3%	4.1%	5.3%
Public support	-3.4%	-12.1%	-0.7%	6.1%
Profits	0.0%	0.0%	0.0%	0.0%

Table 9.4.5 - Financial Impact - Spain

Operative value	Model B	Model E	Model G	Model H
Operative Revenues	0.5%	2.1%	8.5%	5.4%
Operative Costs	-1.1%	-6.3%	6.3%	5.5%
Public support	-4.3%	-22.5%	-1.3%	3.6%
Profits	0.0%	0.0%	0.0%	0.0%

Table 9.4.6 - Financial Impact - Poland

Operative value	Model B	Model E	Model G	Model H
Operative Revenues	0.0%	0.5%	0.9%	0.7%
Operative Costs	0.0%	-6.3%	-5.1%	-3.6%
Public support	0.0%	-23.2%	-20.5%	-14.4%
Profits	0.0%	0.0%	0.0%	0.0%

Considering investment needs, the most direct way to express it is to use the increase in train-km per year (frequency). This percentage value gives a reasonable indication of the need to invest in new rolling stock as a percentage of the existing fleet. Implicitly, this approach assumes that new trains realise the same operational performance (km p.a.) as the existing, and that the composition of the new fleet (e.g. share of diesel and electric units, locomotives and railcars and so on) remains unchanged, assumptions that can be questioned. For Germany e.g., the IGES Data Base on Regional Rail Passenger Contracts shows investment values between 8 and 25 M EUR per M train-km, reflecting different operational performance (180 000-300 000 train-km per year) and different rolling stock unit costs. Unfortunately, no such information appears to be available for Denmark (DSB, Arriva Denmark), Poland (Arriva-PCC, Koleje Mazowieckie) or Spain (RENFE).

Thus basing estimates on the German research, by assuming investment needs of 16.5 M EUR per additional M train-km. Tables 9.4.7, 9.4.8 and 9.4.9 shows the implications for the three states.

Table 9.4.7 - Investment Impact - Denmark

Operative value	Model B	Model E	Model G	Model H
Increase in train-km	3%	9%	30%	25%
Investment (M EUR)	27.0	80.9	269.5	224.6
Rate of investment	0.06%	0.18%	0.56%	0.48%

Table 9.4.8 - Investment Impact - Spain

Operative value	Model B	Model E	Model G	Model H
Increase in train-km	3%	11%	30%	25%
Investment (M EUR)	67.1	246.1	671.2	559.3
Rate of investment	5.3%	19.3%	49.4%	42.4%

Table 9.4.9 - Investment Impact - Poland

Operative value	Model B	Model E	Model G	Model H
Increase in train-km	0%	4%	8%	7%
Investment (M EUR)	0	122.1	244.2	213.7
Rate of investment	0%	1.09%	2.18%	1.91%

9.4.3 Market structure

9.4.3.1. Base Case in Target States

The Base Case assumes that the present diversity within the target states continues in line with current trends in these states.

Denmark

Most of the infrastructure in Denmark is owned by Banedanmark but a significant number of minor lines are privately owned. Train services on the Banedanmark infrastructure are let by concession but until now most contracts are directly awarded to the national incumbent DSB. Entry in the non-PSO segment has yet to occur. Services on the private lines are operated by five RUs, but dominated by the incumbent DSB, which held a market share of 91% of all passenger km in 2008.

It is assumed that this situation would continue under the Base Case and that there will be a mix of private and public railway undertakings. Firstly, this reflects the very slow development over the past ten years. Secondly, the long-distance segment is dominated by a strong, government-owned incumbent; thus new entrants would have to expect strategic responses to market entry. Additionally, mainly due to the geographical situation, i.e. dominance of the København area, entry into long-distance segment appears unattractive: "*At the moment, all of Denmark's rail passenger transport is under a public service contract. The access regime permits RUs to offer purely commercial passenger transport in competition with these services. However, this does not take place at the moment, as there is scarcely any additional market potential alongside transport under a public service contract*."[176]

Under the Base Case it is anticipated that the number of RUs would increase and the market share of DSB would decline, but it would still be the dominant RU. It is assumed that, under the Base Case, urban trains in København would continue to be operated by DSB S-tog.

Spain

The vast majority of Spanish infrastructure is of 1 668mm gauge, the Iberian gauge. With the exception of a primarily touristic line in Catalonia, the only passenger operator on that network is RENFE Operadora, the incumbent. The high-speed lines from Madrid to Seville, Malaga, Barcelona and Valladolid are standard gauge and again exclusively operated by RENFE. RENFE also operate the change-of-gauge trains running between the high-speed and Iberian lines and between Spain and France.

The remaining lines in Spain are metre gauge and mainly along the Northern coast of the country. The metre gauge network is owned and operated by a succession of independent companies (mainly owned by regional governments but with a large central government railway too) with limited exchange of traffic between them. However, these are not a part of the national rail network are thus outwith the Study.

[176] IBM, 2007, p. 112.

Accordingly, the passenger railway undertakings are effectively wholly state owned (although by different organs of the state).

The market for rail passenger services is closed to new entrants in Spain, being devoted to public providers owned by the State or the Autonomous Communities. While it is planned to open the market for high-speed and long-distances services, no such plans exist, to the best of the Consortium's knowledge, for suburban and regional trains.

For the Base Case, it has been assumed that no fundamental change will happen, since the opening of the market for high-speed and long-distances services can be expected to take a considerable time, without external stimulus, and a rapid response to market opening from potential entrants is considered to be unlikely. Entry in this segment requires a lengthy period for planning, procuring rolling stock, setting up distribution channels, etc. Additionally, as the German case study has shown, potential entrants will monitor the incumbent's adjustments to the new situation and the operation of the new legal regime before taking any concrete steps. In suburban and regional market segment, some resistance to tendering from public enterprises can be anticipated.

Poland

The state railway, PKP was reorganised in 2001. Three passenger companies were created as part of the reorganisation, PKP Inter-City, PKP PR (to operate regional services) and PKP SKM Trojmiescie (to operate local services in Baltic tri-city area).

The long-distance segment is dominated by a strong, publicly owned incumbent; thus new entrants would have to expect strategic responses to any market entry. Additionally, the Polish passenger rail market is unattractive from an economic point of view: profit margins are currently low, in part due to a combination of an income level that is below European average and intense inter-modal competition, and, in parts, problematic infrastructure quality. There is little reason to believe that this position would be likely to change by 2020.

Under the Base Case continuation of existing policy to award concessions for operating regional services is assumed (Arriva PCC has a concession to operate train services in *Pomorze/*Pomerania) is expected to continue; however, this is very much the exception rather than the rule. The Voivodeships have been responsible for regional passenger services since 1999, and have set up institutions and acquired knowledge necessary to use competitive tendering. On the other hand the Voivodeships own almost all service providers in this segment: experience in other states shows that this reduces the willingness to tender services significantly.

9.4.3.2. General comments applying to all market segments

Denmark

Denmark already has a nucleus of independent passenger railway undertakings able to expand activities in the event that further market opening takes place.

Spain

Whilst there are privately owned freight companies, they are neither large nor numerous, there is therefore some doubt about the speed with which competition would emerge without new entrants from abroad. It has been judged that the tendering process will be less well supported on the Spanish broad gauge lines because bidders will not be able to share facilities outside the Iberian peninsula (workshops, for example). This comment does not however apply to the high-speed services, since the high-speed network will be connected to the European standard gauge network in the Base Case.

Poland

There are already a significant number of independent freight companies in Poland with many of the skills required to operate passenger services. It is likely therefore that a competitive passenger environment could be set up.

9.4.3.3. *Impact on high-speed services in Target States*

The Consortium predicts significant differences in the impact of the various models on high-speed services, mainly depending on the difference between open access and competitive tendering. Entry in this segment is difficult and commercially risky, due to high barriers to entry and that a head-to-head competition with a state-owned company which has invested heavily in this segment is not very promising. Accordingly, the Consortium expects no significant change of market structure for Models B and E.

By contrast, a system of competitive tendering significantly reduces the risk of entry. Nevertheless, entry in this segment is still more difficult than for example to regional services, since more specific investments have to be made (rolling stock has significantly fewer alternative possible uses, maintenance services have to be established, and distribution channels have to be set-up, since ticket machines are of lower importance). Public authorities can reduce these barriers for example by establishing train leasing companies, or by requiring the incumbent to sell rolling stock that it does not use (if legally possible), and by establishing access to important services (maintenance, distribution). So, accompanying political decisions are of major importance for the change of market structure that can be expected. Taking the uncertainty on political decisions into account, it is predicted that under Models G and H the market share of the incumbent would decrease moderately but significantly.

It should also be noted that under Models G and H there would also be the prospect of a second operator using open access rights (if that were permitted for the line/service in question). However, as noted in Section 7, the potential for revenue abstraction by open access operators is likely to have a deterrent impact on bidders for the public service contracts, but the severity of this issue would be governed by the detail arrangements.

Nevertheless, operating high-speed services requires a specialised skill set in addition to commercial drive. The number of railway undertakings with these skills is limited and the number of bidders therefore likewise.

9.4.3.4. Impact on conventional express services in Target States

It is not anticipated that there would be a great difference in market diversity by 2020 between any of the models considered in this market segment; however, Models B, G and H, are likely to develop a diverse market faster than Model E and thus there are likely to be fewer active RUs under Model E. In the event that widespread open access competition is permitted in the conventional express segment and there are no adequate arrangements to compensate holders of PSO contracts for open access revenue abstraction, Model H might not perform as well as the other models.

To the extent that the services are not profitable, all four models are likely to produce bids from the same range of bidders so it is not anticipated that there would be a great difference in market diversity by 2020 between any of the models considered in this market segment. In Models G and H an open access competitor is very unlikely. Model B, with annual contracts, may create a range of bidders rather faster than the other models (experience in states that have already opened their markets has been that potential bidders like to bid for small contracts to gain experience without significant risk).

9.4.3.5. Impact on regional services in Target States

All three target states have regional services. They are unlikely to be profitable, all four models are likely to produce bids from the same range of bidders so it is not anticipated that there would be a great difference in market diversity by 2020 between any of the models considered in this market segment. In Models G and H an open access competitor is very unlikely. Model B, with annual contracts, may create a range of bidders rather faster than the other models.

9.4.3.6. Impact on commuter services in Target States

All three target states have commuter services, but in Denmark the only commuter network is that around København. There is already substantial third party operation on the more minor lines but it is difficult to see other than a single operator of the S-tog network. Bidders to operate this service will always be available in the open market (DB, for example). In the other states, there is more than one commuter network and a “ready-made” range of providers is therefore conceivable. All three models are likely to produce bids from the same range of bidders so it is not anticipated that there would be a great difference in market diversity by 2020 between any of the models considered in this market segment. In Models G and H an open access competitor is very unlikely. Model B, with annual contracts, may create a range of bidders rather faster than the other models.

9.4.3.7. Quantification

For all target states the ranking of the scenarios is identical. Model G with its radical approach of tendering all services offers in any case the highest opportunity for new entrants and accordingly for de-concentration. In Models E and H some market segments, especially long-distance services, are excluded from tendering. In these segments, market entry is not impossible, but existing entry barriers, as discussed in the case studies, would mean that the incumbent will keep a more important role. Model B by contrast should produce the highest number of bidders: the small scale of each tender and the continuous rounds of bidding reduce the barriers to market entry, other than in specialised segments, such as high-speed rail.

The estimated market diversity in 2020 in Denmark, Spain and Poland for each combination of model and market segment is given in Table 9.4.10, 9.4.11, and 9.4.12 respectively.

Table 9.4.10 - Market Diversity - Denmark

	Base Case	Model B	Model E	Model G	Model H
High-speed	n/a	n/a	n/a	n/a	n/a
Conventional Express	Low	High	Low	Moderate	Low
Regional	Moderate	High	Low	High	Moderate
Commuter	Moderate	High	High	High	High

Table 9.4.11 - Market Diversity - Spain

	Base Case	Model B	Model E	Model G	Model H
High-speed	Low	Low	Low	High	Moderate
Conventional Express	Low	High	Low	High	Moderate
Regional	Low	High	Moderate	High	Moderate
Commuter	Low	High	High	High	High

Table 9.4.12 - Market Diversity - Poland

	Base Case	Model B	Model E	Model G	Model H
High-speed	n/a	n/a	n/a	n/a	n/a
Conventional Express	Low	High	Low	High	Moderate
Regional	Moderate	High	Low	High	Moderate
Commuter	Moderate	High	High	High	High

9.4.4 Passenger volumes

9.4.4.1. Base Case

The change in passenger volume between the "Base 2020" (i.e. *status quo* projected forward) and Base Case traffic level is predicted by the TRANS-TOOL model to be as given in Table 9.4.13

Table 9.4.13 - Base Case Passenger Volume

State	Change
Belgium	11.85%
Bulgaria	0.57%
Czech Republic	1.50%
Denmark	3.06%
Germany	4.28%
Estonia	0.91%
Ireland	3.13%
Greece	1.30%
Spain	2.50%
France	2.95%
Italy	1.70%
Lithuania	0.96%
Latvia	0.15%
Luxembourg	5.44%
The Netherlands	5.26%
Hungary	0.94%
Austria	2.72%
Poland	1.28%
Portugal	0.87%
Romania	0.58%
Slovenia	1.24%
Slovakia	1.24%
Finland	2.39%
Sweden	1.52%

State	Change
Switzerland	3.62%
United Kingdom	9.01%
Croatia	0.96%
Macedonia	0.81%
Norway	10.20%
Turkey	1.38%
Overall Change	3.81%
Non-Opened EU15	3.58%
EU12 (New Member States)	1.07%

It can be seen that the predicted growth as a result of the measures already included in the Base Case is considerably greater in the EU15 group of states than it is in new Member States. The Consortium considers that the main reasons for this are fairly clear, and can be ascribed to investment in rectifying under-developed road networks, and increasing prosperity as a result of EU membership increasing car ownership and air travel.

It should also be noted that the greatest impact is projected to be occur in Belgium, the United Kingdom, and Norway. In all cases this due to projected modal shift from road to rail use, as a result of anticipated road congestion issues and/or anticipated road pricing schemes.

Naturally, the modelling process produces answers that are aligned with global market segments rather than the, inevitably more product orientated, railway market segments used herein, which therefore inhibits the ability to undertake a segmental analysis in the same way as has been done for other impact assessment aspects. The global market segments available from the TRANS-TOOLS model (see Annex 9.4.4.1) are as follows:

- business;
- commuter;
- holiday;
- private.

Table 9.4.14 shows the predicted change in passenger volume between the “Base 2020” and Base Case traffic level by global market segment.

Table 9.4.14 - Predicted Difference between Base 2020 and Base Case Traffic Level

Global Market Segment	Change
Business	3.63%
Commuter	5.49%
Holiday	0.88%
Private	6.45%

The above changes occur as a result of the assumptions discussed in Section 9.3, and occur through a mix of measures that make passenger rail relatively more attractive as a mode in relation to other modes. The difficulty that rail has in making any headway in the holiday market is immediately apparent, however, and would be expected given the greater perceived convenience of road and air travel to holidaymakers, other than in a few niche markets.

If one attempts to reconcile these trends with rail market segments the following can be deduced in respect of the difference between the Base Case and "Base 2020" figures:

High-speed rail	given the importance of business travel to high speed rail services[177] and also its penetration of the leisure market, the change in passenger volume would be between the private and business figures (3-6%);
Conventional express	conventional express services have a mixed clientele, business use to and from major conurbations tends to be high, long-distance commuters use them and they are extensively used for leisure purposes, thus the volume improvement should be slightly greater than that for high-speed rail;
Regional services	commuting and leisure travellers are a more significant market for regional services than they are for express services, although there limited use by business travellers, thus the change is likely to be between the figure for commuter traffic and that for private travel (5-7%);
Commuter services	this can be deducted almost directly from the model output at an increase of around 5.5%.

177 Rail has for example high-speed rail a 40% share of business travel of the total market on the Paris-Lyon, Paris-Lille and Paris Nantes routes (source CWT).

9.4.4.2. Quantification

The predicted increase in passenger rail volume under each model relative to the Base Case on passenger volume is given in Table 9.4.15.

Table 9.4.15 - Predicted Increase in Passenger Rail Volume for Each Model by State

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Belgium	0.34%	0.71%	1.50%	1.17%
Bulgaria	0.01%	0.03%	0.09%	0.06%
Czech Republic	0.02%	0.14%	0.25%	0.20%
Denmark	0.68%	1.59%	6.16%	3.87%
Germany	-0.57%	0.01%	2.78%	1.50%
Estonia	0.01%	0.00%	0.43%	0.20%
Ireland	0.41%	1.25%	2.39%	1.80%
Greece	-0.05%	0.47%	0.64%	0.62%
Spain	0.69%	2.38%	8.54%	5.50%
France	0.89%	1.53%	5.07%	3.31%
Italy	0.01%	0.03%	2.92%	1.53%
Lithuania	0.05%	0.04%	0.64%	0.35%
Latvia	0.00%	0.00%	0.05%	0.02%
Luxembourg	0.42%	0.83%	2.36%	1.65%
The Netherlands	0.17%	0.32%	0.70%	0.55%
Hungary	0.01%	0.19%	0.67%	0.45%
Austria	-0.10%	0.27%	0.84%	0.60%
Poland	0.01%	0.47%	0.95%	0.70%
Portugal	0.47%	1.47%	5.89%	3.77%
Romania	0.00%	0.04%	0.09%	0.07%
Slovenia	0.42%	0.69%	1.05%	0.91%
Slovakia	0.00%	0.11%	0.23%	0.18%
Finland	0.59%	1.29%	5.19%	3.40%
Sweden	0.60%	0.62%	1.95%	0.88%

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Switzerland	0.20%	0.30%	0.39%	0.34%
United Kingdom	-5.85%	-3.93%	0.23%	-2.01%
Croatia	0.04%	0.15%	0.39%	0.27%
Macedonia	-0.02%	0.06%	0.08%	0.06%
Norway	0.36%	0.61%	1.43%	1.02%
Turkey	-0.02%	0.03%	0.11%	0.07%
Overall Change	**-0.57%**	**0.09%**	**2.74%**	**1.43%**
EU15 States without Market Opening	**0.65%**	**1.37%**	**4.59%**	**3.01%**
EU12 (New Member States)	**0.01%**	**0.26%**	**0.59%**	**0.43%**

Note: stochastic factors within model mean that the option values for states that actually use one of these models (e.g. Model E for Germany, and Model G for Great Britain differ from zero.

The ranking of the various models is fairly consistent: Model G delivers a greater projected increase in traffic volume than any other model, followed by Model H, and Model E, with Model B bringing up the rear. There is a projected positive traffic growth that is ascribable to further market opening in comparison to the Base Case., but the impacts are fairly modest. However, three factors need to be borne in mind:

- some growth, beyond that occurring anyway from inherent market trends, is already inherent in Base Case;
- the results diverge significantly between different parts of the EU;
- regulatory options for market opening are only one part of a range of associated measures that can increase rail use (see below).

The greatest impact from market opening is predicted to occur in states which have the more advanced economies in the European Union and which have yet to open their domestic rail passenger markets. The only exceptions to this rule are states such as the Netherlands which have a rail network that is already densely used on the main rail corridors, meaning that there is limited potential to run additional services (thus there is limited scope for enough new services to emerge and change the *status quo*), and/or those that have fare levels that are relatively modest (and where therefore there is little potential to grow the market by reducing fares).

The results predict that none of the market opening models evaluated will have a significant impact in the new Member States. It is considered that there are three main reasons for this: fare levels are generally low (and in most cases infrastructure charges are high relative to the national cost base), meaning that there is limited scope for new RUs to enter the market for models involving open access; in the case of models involving competitively tendered public service contracts it is considered that the rail network of many new Member States is larger than they could afford to support if the full cost of maintaining infrastructure and services was borne, rather than being 'slowly run into the ground' as appears to be the case at present; and the difficulty of preventing the growth in private car use as a result of increasing ownership and improving road standards that is and will continue to occur in these emerging economies.

Market opening for passenger rail can be accompanied by a range of ancillary measures, the four case studies have shown that it is these ancillary measures that make market opening either a success or a failure. Key issues include whether the infrastructure charging mechanism encourages the operation of extra trains, whether there is a comprehensive national ticketing system that all RUs must be a part of, including ticket inter-availability enabling the travelling public to benefit from a more frequent service when a new RU commences operations, whether there is any regulation of fares, and whether RUs have non-discriminatory access to suitable rolling stock.

A clear example of this can be found by reference to the Great Britain Case Study (see Annex 6). This shows that the Consortium considers that the model used in Great Britain delivers an inherent ridership growth of +48%; however, using the same input parameters as resulted in Great Britain from introduction Model G, the model indicates that the impact of reverting to a closed market would be of the order of -4 to -6%[178]. This would imply that an impact of approximately 40% is due to measures that facilitate real market opening, with the selection of the model being a relatively insignificant factor. Further underscoring this finding is the experience in Germany and Italy (see Annexes 5 and 7) where despite market opening significant barriers for new entrants remain, including issues such as lack of a neutral national ticketing system encompassing all RUs which would enable any passenger to buy any ticket from any station ticket office or ticket machine, and lack of a mature rolling stock leasing market. As a result passenger growth following market opening has been much less impressive in these states.

Naturally exogenous factors (such as macro-economic performance) can also influence the ridership both from year to year and over time, in some cases strongly[179]. However, these external factors do not affect the issue of which regulatory model and market arrangements are best: the optimum model will always perform best in any economic circumstances.

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178 Differences between Model G and Models E and B, respectively: across Europe Model E is projected to have a ridership very similar to the Base Case, and Model B slightly worse than the Base Case.

179 Commuter rail services being a classic example: during economic upturns there are higher employment levels in major urban areas, leading to higher rail use, conversely job losses during downturns reduces rail use.

The predicted increase in passenger rail volume under each model relative to the Base Case in passenger volume by global market segment is given in Table 9.4.16.

Table 9.4.16 - Predicted Increase in Passenger Rail Volume for Each Model by Global Market Segment

Global Market Segment	Model B	Model E	Model G	Model H
Business	-2.76%	-0.06%	11.08%	5.57%
Commuter	0.06%	0.08%	0.04%	0.06%
Holiday	0.05%	0.07%	0.02%	0.02%
Private	-0.52%	0.17%	2.95%	1.59%

It can be seen immediately that market opening mechanism is only anticipated to have a discernable impact in the business and private market segments, with the largest effects being experienced in the former segment. This illustrates the extent to which the commuter market is a captive one for rail, and that rail in no longer the preferred means of holiday travel, other than in niche markets. Volume changes for rail in both the commuter and holiday markets are driven by a combination of economic growth and external factors making alternative modes either more or less attractive.

If one attempts to reconcile these trends with rail market segments the following can be deduced:

High-speed rail	as noted above, business travel is important to high speed rail services as is the leisure market; the change in passenger volume for each model would be between the private and business figures;
Conventional express	as noted above, conventional express services have a mixed clientele, thus the impact of each model would be less than that for high-speed rail;
Regional services	given that commuting and leisure travellers are more important to regional services than they are for express services, and business travellers less important, the change for each model with respect to the Base Case is likely to be around the level of or below the private figure;
Commuter services	none of the models are expected to show any significant difference from the Base Case, and can be considered to be zero for all models for the purposes of the present analysis.

9.4.5 Regional cross-border services

9.4.5.1. Base Case in Target States

The issue is the extent to which the various regulatory models affect the provision of cross-border train services. This might be through the opening of new routes on lines that are currently abandoned or increasing frequency on existing routes. The services in question are not international in the sense they are Paris to Madrid or København to Warszawa but rather local movements such as Salamanca to Porto or Esbjerg to Hamburg. For reasons of geography and population distribution, the three target states have quite different patterns of cross-border services and therefore they must be treated individually.

It should be noted however that there is a reluctance by Member States to support cross-border services: "*Replies to a questionnaire on public services in rail transport sent by the Commission to the Member States reveal that only in very few cases was a public service contract concluded for cross-border services as these services are usually not profitable.*[180]" That the same problems are still arising would seem to be demonstrated by problems in financing the Niebüll - Tønder service.

Denmark

By 2020 it is likely that Denmark will have a physical link across the Fehmarn Sound and that the majority of trains between Germany and Denmark will have been diverted to it. The existence of the physical link and the acceleration of journey times are likely to give rise to a significant increase in traffic (and to transit traffic from/to Sweden) in the Base Case. This is also likely to divert much of the traffic of the main existing cross-border service via Sassnitz.

Spain

By the target year of 2020 Spain is likely to have a standard gauge high-speed line from Barcelona into France in the Base Case and possibly also into Portugal[181].

In examining the traffic flows over the last twenty years, the interesting and surprising thing was how little conventional cross-border express services in the target states have changed (and indeed how poor the conventional express cross-border services on most routes are). The Base Case therefore assumes a continuation of these existing services.

The cross-Pyrenean routes at Canfranc and La Tour de Carol are in effect four long branch lines[182] that just happen to meet. Patterns of habitation and journey times mean that the lines are largely irrelevant for international traffic (the only significant logical flow is Toulouse to Barcelona, which is much better provided for via Perpignan).

Routes to Portugal have been rationalised, so that there is only one route from Madrid to Lisboã and no direct route to Porto. Population density in the frontier areas are such

180 COM 2002(18) final *Towards an Integrated Railway Area*

181 *The Railway Gazette* reported on 16 December 2009 that completion is planned by 2013.

182 One of which has been closed to all traffic for almost forty years although not officially abandoned.

that the only significant traffic flows are international. There has been discussion of links between the Algarve and Seville. The Base Case is therefore very much the status quo (plus the projected high-speed line).

Poland

Services across Polish frontiers have increased significantly in recent years. Routes have been resuscitated (especially with Germany) and trains increased in number (in some cases dramatically so). The Base Case therefore includes these improved services but making the assumption that they are the direct result of the expansion of the EU, that no other new services would develop by 2020.

9.4.5.2. Impact on high-speed services in Target States

There are no plans to construct high-speed lines in Denmark; accordingly regulatory models will have no impact on high-speed services.

As noted above, although there are plans to construct high speed lines in Poland but it is not hoped to commence operation of the first line until 2020 and even this might not be achieved.

By 2020 there will, however, be high-speed lines between Spain and France and perhaps Portugal. All the models see high-speed as primarily commercial, the issue therefore is the extent to which the various different models differ in their provision of local cross-border services. Despite the possibility of open-access, it is not likely that any will see regional cross-border traffic as other than marginal and so likely to be little or no provision of regional cross-border services under any of the models. As an example of a specific case, local movement on the Barcelona – Perpignan axis is likely to be left to existing local services, there will be no local services on the high-speed line. In the particular case of model B, the short duration of the contract is likely to mean that no notice will be taken of the smaller flows.

High-speed lines are not intended or designed to cater for local cross border services, their routing, station pattern and timetable strategy make no allowance for local services. Existing routes by contrast have a denser network of stations and are better able to provide for local flows. The Base Case and the regulatory models are the same in this respect.

9.4.5.3. Impact on conventional express services in Target States

There is indeed scope for invigoration to develop cross-border markets and it is likely that the options that give most scope to commercial initiative are likely to be most successful. Both models B and E provide commercial incentives, Model G does likewise and also allows the prospect of open access. Model G is therefore marginally more preferable. In the particular case of model B, the short duration of the contract is likely to mean that no notice will be taken of the smaller flows. Model H would have similar results to model G, as a function of the routes selected for open access.

The initiatives which the more commercial models would give rise to include more attractive pricing[183], adjustments to services and stopping patterns to permit out and back journeys in a day, encouragement of traffic by promotion of local events and tourism. Model B might be restricted in its ability to change timetables and stopping patterns and indeed reduce the scope for the other initiatives.

9.4.5.4. *Impact on regional services in Target States*

It would be logical to assume that regional services will show the most sensitivity to the various models. It is clear that the combination of open frontiers, official encouragement and imaginative railway undertakings can provide attractive services.

Both Models B and E provide commercial incentives, Models G and H do likewise although the prospect of open access they allow is unlikely to be taken up in the opinion of the Consortium. The initiatives which the more commercial models would give rise to include more attractive pricing, adjustments to services and stopping patterns to permit out and back journeys in a day, intermodal fares to allow a journey to be made one way by road, encouragement of traffic by promotion of local events and tourism. Running of extra trains is only likely if it is directly sponsored, or if it can be done at marginal cost. In the particular case of Model B, the short duration of the contract is likely to mean that little notice will be taken of the smaller flows. Model B will also be restricted in its ability to change timetables and stopping patterns and likewise the scope for the other initiatives will be reduced.

9.4.5.5. *Impact on commuter services in Target States*

In the target states the only service that comes within this definition is the service across the Øresund bridge. This is already operated under a franchise (under a regime similar to Model E). The Base Case is therefore one of the models. It is possible to speculate that Models G and H might produce new services, a direct train from south of København, for example.

9.4.5.6. *Quantification*

Local cross-border flows are best served by regional train services. The services in the Base Case vary so much (from a frequency of every twenty minutes to once a day) that it is difficult to make anything but generalised comments about the effect of the various models.

In the case of high-speed services it is not expected that high-speed railway undertakings will make any serious attempt to provide local services and the effect is therefore zero for every model. For conventional express services, it might be expected that there may be adjustments to timetables and stopping patterns to cater for local traffics, extra services under any of the models are highly unlikely.

Although the raison d'être of regional services is local traffic the promoters of concessions and franchises tend to give little weight to international traffic when

183 International fares are normally calculated as the sum of the full tariff in each state.

deciding levels of sponsorship. Models E, G and H are therefore all likely to give rise to initiatives to improve the cross-border offer. This is likely however to fall short of extra trains unless directly sponsored or it can be done at marginal cost. Model B is subject to the same limitations and the further comment that many of the other initiatives will not be possible because of the length of the contract.

The only case of a cross border commuter services already has a lavish service in the Base Case. It is possible to speculate that Model G or H might produce additional services (hourly?) to Ystad or to destinations south of København.

9.5. Impact on the Economy

9.5.1 State Aid

See Section 9.4.2.

9.5.2 Infrastructure Manager efficiency

9.5.2.1. Base Case in Target States

The Base Case assumes that infrastructure has been modernised and developed in accordance with current and planned trends (as appropriate) until at least 2020[184]. This means new and more sophisticated equipment. It has been assumed that the additional costs of maintaining more sophisticated equipment have been approximately offset by efficiencies.

In analysing efficiencies there are two major aspects, the infrastructure manager's internal efficiencies, the outputs that it gets from its inputs of staff and materials, and the productivity of the infrastructure, the trends in infrastructure costs per train kilometre which arise from the various models. These are treated separately.

9.5.2.2. General comments applying to all market segments

The conduct of the infrastructure manager's own business, its internal efficiency, depends on factors such as having a full understanding of the state of the infrastructure and of maintenance costs as well as longer-term stability to allow proper planning of renewals and acquisition of plant. However, it is also affected by pressure from railway undertakings and by the contractual and operational interface between the railway undertaking and the infrastructure manager. Equally, whatever the regulatory model, where the full costs of the infrastructure are allocated to users, infrastructure managers will be under much greater pressure from railway undertakings to reduce costs than where infrastructure costs are supported by government.

Views about cost drivers from contractors with international exposure:

[184] Development in line with current trends has been assumed, except where there are clear development plans such as construction of new high-speed lines, installation of ERTMS, etc.

Planning	Consistent, output-based planning and work programming, freezing of deadlines and compliance
Possessions	Industrial engineering driven track possession and utilisation policy
Standardisation	Standardisation of asset configurations for economies of scale and leaner processes
Quality	A genuine quality approach to asset condition and skilled labour

Source: study on infrastructure cost benchmarking by Lloyds Register/BSL for Network Rail

Where infrastructure costs are largely met by government, any pressure to reduce costs will come from government. It is a moot point whether this pressure from the paymaster will be more effective than pressure from customers in the form of railway undertakings, but it is certainly true that support of infrastructure costs is a factor in encouraging the provision of services.

There are clear trade-offs between the interests of railway undertakings and infrastructure managers, most noticeably in the railway undertaking's interest in a 24/7 railway and the infrastructure manager's interest in having long periods for uninterrupted maintenance (which allows dramatic cost savings). Likewise the use of heavier rolling stock (to support air-conditioning and other passenger facilities) may require a more intensive maintenance regime.

The operational interface will be most efficient where both parties (RU and IM) have clear understanding of their respective roles and are incentivised to work for solutions which reduce the total costs (the balance between line closures and maintenance costs, for example). In addition, the management of stations and similar facilities have an effect on the infrastructure managers' business. In the Consortium's discussions with them, infrastructure managers saw benefit in their having control of stations to ensure independence in station operation and to collate relationships with commercial tenants on stations. To that extent therefore, the models can influence infrastructure manager results.

For the infrastructure proper, infrastructure managers did not see the regulatory models for passenger operations as having a bearing on their activities (although clearly higher levels of train movement do mean higher costs).

The particular case of Model B, with its short duration, is not likely to allow mature relationships to be set up between the railway undertaking and infrastructure manager. This is likely to limit efficiencies, particularly in station operations.

When considering the second aspect the rather more trite costs per train kilometre run, one has to take into account the changes in costs to which the various models give rise and the changes in train kilometres. The costs include those of maintenance and renewals together with signalling costs. Additional costs may of course include capital costs to support new service patterns or indeed new rolling stock. As a general rule however, changes in the number of trains do not bring commensurate changes in costs.

These factors are not likely to vary between the three states.

9.5.2.3. Impact on high-speed services in Target States

Denmark and Poland have no high-speed lines; this section therefore only refers to Spain.

Maintenance of high-speed lines is to very high standards and is costly. The infrastructure manager's own efficiency will be affected by time available for maintenance, whilst the models might theoretically imply more or less time for maintenance, the likelihood is that the infrastructure manager will insist on the same long "white period" (probably at night) for maintenance for all the models.

To the extent that the regulatory model chosen increases train movements, then costs will increase but the ability to spread fixed costs over a larger base should nevertheless enable the infrastructure cost per train km to fall, thereby decreasing costs per unit of output. If it is assumed that high-speed lines are profitable, then Models B and E could be expected to produce a higher level of train service than the Base Case. Contracts let under Models G and H might likewise increase train movement if the franchise was structured to encourage increased service frequency. Both might also permit extra open access trains. Nevertheless the increase in costs (just wear and tear) is likely to be marginal.

9.5.2.4. Impact on conventional express services in Target States

All three target states have conventional express services.

The infrastructure manager's internal efficiency will be affected by periods available for maintenance, the opportunities for efficient provision of station services and the railway undertaking using "benign" rolling stock. The models which involve commercial operation of services (whether B, E, G or H) are most likely to be those where pressure is put on the infrastructure manager to limit maintenance periods so that trains may be run. For supported services where the fare box makes a smaller contribution, railway undertakings will be less insistent on a 24/7 railway. The efficiency of station services is a function of the power of the parties, where the railway undertaking has more power; costs (for extra facilities, etc.) are likely to be imposed on the infrastructure manager. This will be a function of the organisational split in the state in question and the agreements made in the tendering process rather than the various models. Although newer rolling stock tends to be heavier (more automatic equipment, air conditioning, etc.) it is not necessarily true that that imposes higher maintenance costs, as more advanced bogies can offset these.

For the productivity of the infrastructure, if it were to be assumed that conventional express services are profitable then Models B and E could both be expected to produce a higher level of train service than the Base Case. Contracts let under Models G and H might likewise increase train movement if the franchise was structured to encourage increased service frequency. Both might also permit extra open access trains. The increase in costs will include those costs that are dependent on facilities that are staffed for services and not just wear and tear, nevertheless running more trains should deliver an automatic efficiency improvement. Likewise models which involve more sophisticated services (car-carrying trains, for example) will increase costs. If services are not profitable, all the models will produce the same results, the basic defined service.

9.5.2.5. Impact on regional services in Target States

The comments for this market segment are the same as those for conventional express services, as discussed above.

9.5.2.6. Impact on commuter services in Target States

The comments on IM internal efficiency in this market segment are as discussed above for conventional express services.

To the extent that the regulatory model chosen affects commuter services by demanding more facilities (better signalling, for example) by increasing train movements, then costs will increase, as should measurable outputs of IM efficiency. Given the scope of commuter services (intense service, service over most of the day, etc.) it is likely that increases in operating costs from any of the models considered will be marginal.

9.5.2.7. Quantification

Table 9.5.1 shows the estimated change in the infrastructure manager's internal efficiency compared with the Base Case for each market segment (and disregards automatic improvements in measures of IM efficiency that occur purely from increases in the number of trains). The estimates apply to all three target states, except where shown otherwise.

Table 9.5.1- Predicted Change in IM Internal Efficiency Relative to Base Case

	Model B	**Model E**	**Model G**	**Model H**
High-speed (Spain only)	0 %	0 %	0 %	0 %
Conventional Express	+2 %	+1 %	+1 %	+1 %
Regional	0 %	0 %	0 %	0 %
Commuter	0 %	0 %	0 %	0 %

Table 9.5.2 shows the estimated change in infrastructure costs (costs per train-km) compared with the Base Case of each market segment. The estimates apply to all three target states, except where shown otherwise.

Table 9.5.2 - Predicted Change in Infrastructure Costs Relative to Base Case

	Model B	Model E	Model G	Model H
High-speed (Spain only)	-3 %	-3 %	-3 %	-3 %
Conventional Express	-2 %	-2 %	-2 %	-2 %
Regional	0 %	0 %	0 %	0 %
Commuter	0 %	0 %	0 %	0 %

9.6. Impact on Social Aspects

9.6.1 Service levels in different market segments

9.6.1.1. Definition

The definition used for service level herein is the span and density of the timetable, the range of destinations served, stopping patterns and whether enough accommodation is provided. Passenger complaints are considered under service quality.

9.6.1.2. Base Case in Target States

Overview of target states

Service levels in the target states vary considerably.

Denmark

Denmark has no high-speed services. Conventional express services and regional services in general currently have an hourly frequency and operate over a long day (international trains to Germany are less frequent and there are lower frequencies in the more isolated areas of *Jylland*/Jutland). Commuter services in København are frequent. This pattern is assumed be the same in 2020 under the Base Case.

Poland

Poland has no high-speed services. Conventional express services are not currently over-provided (for example, the service between Gdansk and Warsaw is less than hourly) and services are not "clock-face". Regional services are infrequent and PKP has a line closure programme. Major cities have commuter services, and these are frequent in the case of Warsaw and Gdansk. The Base Case assumes that by 2020 the conventional express services have become hourly on main routes and that the pattern of regional services is stable.

Spain

Currently services on Spanish high-speed lines are frequent (basically two per hour to Barcelona and one per hour to destinations in Andalucía). Conventional express services are likewise hourly along the Mediterranean coast but on routes towards the west distinctly infrequent. Compulsory seat reservation policies on long distance trains mean that accommodation is always adequate but at the cost of suppressing demand at peak times. Very few regional services remain, on those that do remain, trains are infrequent. There are well developed commuter services in Madrid and Barcelona. The Base Case assumes that some conventional services (particularly towards the North West) are replaced by the projection of high speed trains (completion of the "Basque triangle" in 2013 is planned). No change to regional or commuter services by 2020 are assumed.

9.6.1.3. General comments applying to all market segments

Experience with market opening in Great Britain suggests problems with the amount of accommodation on trains supplied when services are specified by contract. The root cause appears to be that the promoter is too remote from the service and the railway undertaking is not prepared to provide resources in excess of the specification (at its own cost). Where financial support is required, all the models are potentially affected by this issue.

9.6.1.4. Impact on high-speed services in Target States

As noted above, Spain is the only target state with high-speed rail. All the models see high-speed as primarily commercial, the issue therefore is the extent to which the various different models encourage more variety in routings, more trains, different stopping patterns, and changes in the provision of rolling stock. Model B, with very short contract periods is unlikely to allow scope for planning and developing changes to routing or stopping patterns (the timetable cycle requires formal bids eight months before the start date). It may allow extra trains to be run at the margin and certainly allows train formations to be changed. Models E, G and H all allow full scope for changes to all these factors. The open access aspects of all models offers the prospect of services using imaginative new routings or stopping patterns (Barcelona to León and beyond via the high-speed lines for example).

A system of competitive tendering can be expected to result in a significant increase in high-speed service frequencies. Firstly, because the Spanish government has promoted this sector heavily in recent years, not least as a means of overcoming deficiencies in international rail passenger transport and the problems caused by fragmented infrastructure, and to offer an attractive alternative to air and road. The Consortium considers there to be a strong commitment to expand this segment further, i.e. to invest productivity gains in a higher service level. Secondly, competitive tendering should result in improvements, particularly if room is left for the operators to optimise their services.

On the other hand, entry in this segment is rather difficult due to the high barriers to entry and open access is also risky and due to the fact, that head-to-head competition with a state-owned company that invested heavily in this segment is not very promising. Accordingly, the Consortium considers that market entry in the high-speed market segment to be less than in the conventional express segment.

9.6.1.5. Impact on conventional express services in Target States

If one assumes that conventional express services are profitable then the open access aspects of Models B and E could both produce bids with a higher level of train service than the Base Case. Model B, with very short contract periods is unlikely to allow scope for planning and developing changes to routing or stopping patterns (the timetable cycle requires formal bids eight months before the start date). It may allow extra trains to be run at the margin and certainly allows train formations to be changed. Models E, G and H all allow full scope for changes to all these factors if the franchises are so structured. Models G and H also offer the prospect of additional, open access, services using imaginative new routings or stopping patterns.

Policy on compulsory reservation will have a bearing on the provision of services and rolling stock. Railway undertakings that continue the current Spanish policy of compulsory reservation will be inclined to try to manage service provision and channel demand to increase load factors. This will reduce the attraction of rail and thus passenger numbers but improve the finances of those trains which are run. Models E, G, and H may encourage open access railway undertakings to offer a ‘walk-on’ service.

If services are not profitable, there is less likelihood of the basic pattern of train services, locations served, stopping points, timetable and rolling stock defined by the promoter being improved upon. This is however, dependent on the detail arrangements for infrastructure charging and/or revenue allocation: if infrastructure charges incentivise operation of additional trains by allowing them to be operated at their short-run avoidable cost for example, then it is possible that RUs operating public service contracts might run additional services even if the service group as a whole is supported by public funding under a public service contract.

Lack of potentially profitable services for open access operators or an incentive for operators of public service contracts to increase service levels is likely to be a particular problem in the case of Poland, given the low fare levels.

9.6.1.6. Impact on regional services in Target States

The pattern of train services, locations served, stopping points, timetable and rolling stock provided for these services (which are almost certain to require support) will be that demanded by the promoter. It is possible that railway undertakings will find ways to use facilities to operate additional services at marginal cost (assuming infrastructure charges for margin use are modest). In addition as noted above infrastructure charging and/or revenue allocation systems that incentivise operation of additional trains are likely to result in some increase in the number of trains operated under public service contracts, provided these give the necessary freedom so to do. The magnitude of this increase is likely to be dependent on the strength of the business case, in this, factors such as affluence and population density also key rail corridors are key drivers, accordingly this impact would be stronger in Denmark than in Spain, while the case in Poland would be weaker again.

The impact of a market opening model in this market segment will be less than that for conventional express services, as regional services tend to be inherently less profitable. Although as noted in Section 9.4.2, it is considered that market opening could be expected to introduce competition and lead to productivity gains in this segment, the Consortium considers that governments will use these gains to reduce subsidies, rather than to increase service levels.

There is unlikely to be any significant impact from Models B or E in this market segment, in the former case because of the combination of short contract duration and limited segment profitability, and in the latter as a result of abstraction by open access operators where regional and express services overlap. The largest impact would occur under Model G, as medium to long-term public service contracts would allow RUs to develop regional traffic. Model H would exhibit similar results, but less strongly so.

9.6.1.7. *Impact on commuter services in Target States*

Similar comments apply as for regional services. Although it should be noted that the ability to run additional trains on major commuter routes would be limited by capacity constraints.

9.6.1.8. *Quantification*

Tables 9.6.1, 9.6.2, and 9.6.3 shows the estimated change in service provision measured in train km for each of the models compared with the Base Case for each of the service types in Denmark, Spain and Poland respectively.

Table 9.6.1- Estimated Change in Train km Relative to Base Case in Denmark

	Model B	Model E	Model G	Model H
High-speed (Spain only)	n/a	n/a	n/a	n/a
Conventional Express	+5 %	+10 %	+50 %	+30 %
Regional	0 %	0 %	+30 %	+20 %
Commuter	+2 %	+15 %	+15 %	+15 %

Table 9.6.2 - Estimated Change in Train km Relative to Base Case in Spain

	Model B	Model E	Model G	Model H
High-speed (Spain only)	+5 %	+10 %	+50 %	+30 %
Conventional Express	0 %	+5 %	+25 %	+15 %
Regional	0 %	0 %	+10 %	+5 %

	Model B	Model E	Model G	Model H
Commuter	0 %	0 %	+15 %	+15 %

Table 9.6.3 - Estimated Change in Train km Relative to Base Case in Poland

	Model B	Model E	Model G	Model H
High-speed (Spain only)	n/a	n/a	n/a	n/a
Conventional Express	0 %	+2 %	+10 %	+5 %
Regional	0 %	0 %	+5 %	+5 %
Commuter	0 %	+10 %	+10 %	+5 %

9.6.2 Quality & price

9.6.2.1. Overview

Parameters evaluated

The issues discussed under the heading of quality and price are as follows:

- price (i.e. average fare levels experienced by passengers);
- punctuality;
- overcrowding;
- average age of rolling stock.

Naturally there are other aspects of quality as perceived by users; changes in service frequency are discussed in Section 9.6.1, and added value services are discussed in Section 9.6.3, whereas the more indefinable aspects of quality are not really quantifiable at the level being considered herein, including aspects such as ambience, décor, etc.

Punctuality

Punctuality is a measure of compliance with the timetable. National practice varies, applying different criteria to differing definitions of service types, although it is common to allow more tolerance for long-distance trains than for commuter trains. Some railways count a certain lateness as being on time (in Belgium, for example, "on time" means within six minutes of booked time). Punctuality statistics are normally linked to cancellation statistics and both are treated in this section. There are definitional problems where trains are cancelled *en route* (because of technical failure or in order to turn them round for their next work) or where trains run but do not make timetabled stops to make up time. Punctuality may not be entirely within the control of the railway undertaking. The figures for Poland quoted herein may, for example, have been influenced by inclement weather conditions. Differences in climatic conditions and as well as differences in measurement methodology and techniques makes comparison of the figures for one state with another a risky business.

Overcrowding

The normal concept to measure overcrowding is passengers in excess of capacity (PiXC), which is expressed as a percentage of the seats provided. The measure needs to be treated with some reserve, on commuter routes, for example, the overcrowding may be for just for the last ten minutes of the journey, a measure of overcrowding on this section may not be typical of the service as a whole. Likewise peak loads may only apply to just one or two trains in a whole service.

Careful consideration needs to be given when deciding if and what targets are to be set for PiXC. Railway undertakings which are set targets may be incentivised to provide small seats at high-density which are wholly inappropriate for attracting custom off peak but yet inadequate in the peak

Average age of rolling stock

The average age of rolling stock is a simple concept; the mean age of rolling stock used for passenger traffic. No adjustment is made for the extent of use (older stock is likely to be used on marginal flows) nor is the measure the median age.

9.6.2.2. Base Case in Target States

Price

As discussed in the previous section only moderate price changes have been assumed for the Base Case.

Punctuality

Recent Danish[185] reliability and punctuality figures are:

- Arriva: trains run 99.6%; trains less than 5 minutes late 98.1%;
- DSB: trains run 97.5%; trains less than 6 minutes late 91.8%.

Recent punctuality figures provided by RENFE for Spain are:

- Commuter 96.83%;
- High speed medium distance 99.50%
- Medium distance conventional 96.42%

185 Danish Ministry of Transport, Arriva and DSB, most recent available.

- High speed long distance 80.83%
- AVE Madrid-Seville 98.29%
- AVE Madrid-Catalonia 93%

Whilst these figures are commendably disaggregated, they fail to indicate the threshold for punctuality. (RENFE pay high levels of compensation for delay, but triggered after different intervals, it is not clear if these figures, taken from the RENFE Annual Report 2007 refer to trains triggering compensation.) There are no figures for cancellations.

Recent Polish reliability and punctuality figures are:

- PKP (all services)[186]: trains run 86.4%; trains less than 5 minutes late 93.2%

It must be assumed that the proportion less than 5 minutes late was taken from those that ran.

The Base Case assumes that by 2020 more reliable equipment will reduce both delays and cancellations, resolving sliding doors that jam, for example. Techniques can also be expected to improve over time, for example, attention to detail, identifying track equipment which frequently fails, timetables which are insufficiently robust, etc will help. Regulation (EC) No 1371/2007 will also have an effect: payment of compensation for delay is likely to concentrate minds on the issue.

The Base Case therefore assumes that cancellations will be brought below 3% in all states and that punctuality will be that at least 95% of all trains are within five minutes of ‘right time’.

Overcrowding

Overcrowding is a phenomenon arising from both supply and demand. In Spain and Poland, demand is managed physically to equate to supply. In both states the physical management is currently coupled with differential fares to introduce an economic element to help bring supply and demand into balance. It has been assumed that there are no fundamental changes in the pattern of demand (that, for example, there would be no new initiatives to stagger office hours or annual holidays).

The supply of accommodation is a function of train service frequency, rolling stock and train length. Service frequency is an aspect of service availability, and this thus treated in Section 9.6.3, while train size is a function of service level and is therefore discussed in Section 9.6.1; accordingly it is necessary to consider some aspects of Sections 9.6.2 and 9.6.3 simultaneously.

Despite PiXC being a standard concept, no figures were available in Spain and Poland and they were only available for commuter services in Denmark. The Consortium was surprised by this apparent lack of highly relevant management information, although

[186] PKP PLK, the infrastructure manager, figures for January 2009, which may not be representative.

this is partly explained by reservation policies in Spain and Poland. Under Base Case it is predicted that current trends would continue:

- Denmark: load factors were said to peak at 92% on the København S Bane, otherwise there were no figures. Reservation of seats on longer distance trains is offered in Denmark but commercial documentation makes it explicit that reservations are never required.

- Spain: long distance trains in Spain are 100% reservation. In Spain, the reservation tradition is of long-standing and arises from the former extended journey times. In theory therefore there cannot be any overcrowding on long-distance trains. Regional services in Spain are not associated with high load factors. Commuter services by contrast may be fuller, anecdotal evidence does not, however, suggest overcrowding that is particularly severe in relation to that experienced in major urban areas in other Member States. The Consortium has assumed a continuation of the existing reservation policy, and that in normal circumstances that overcrowding is not a serious issue under the Base Case.

- Poland: many long distance trains are reservation only, for example on the axis from Poznań to Warszawa, the present complete daytime service of eighteen trains available by reservation only. The Consortium understands that reservation practices in Poland are more a means of enforcing differential fares than in order to control numbers travelling. In theory, however, there cannot be any overcrowding. Regional services in Poland are not associated with high load factors. Commuter services by contrast may be more subject to overcrowding. The Consortium has assumed in normal circumstances that overcrowding is not a serious issue under the Base Case.

Average age of rolling stock

The following data can be derived from official sources:

- Denmark: suburban and local rolling stock 7 years, other rolling stock 14 years;

- Spain: no data for average age is available from official sources. The Consortium estimate average age to be about 10 years (based on significant investment in high-speed stock and trains for local services in recent years);

- Poland: PKP estimated that its rolling stock is some 25 years old on average, this is illustrative of the twin issues of shortage of investment funds and also the uncertain future of parts of the network to PKP.

Large quantities of rolling stock have already been constructed for Spanish high-speed lines (the first stock was delivered in 1991) so in 2020 replacement may not have started. Nevertheless stock deliveries will have continued for the extensions to the network[187]. Given the age profile of the existing stock it would be reasonable to assume that Danish and other Spanish rolling stock will be older by the target year, perhaps five years older on average, but that replacement rates for Polish rolling stock will start to increase. The average age for Poland may therefore come down to 15 years (after the oldest stock has been scrapped without replacement), although this depends on the availability of public funding, and also on the assumption that further network contraction would take place[188].

9.6.2.3. General comments applying to models in market segments

Price

None.

Punctuality

Delays and cancellations arise from numerous causes, some quite outside the control of the railway industry (suicides, action by emergency services, etc.) other delays and cancellations arise from the infrastructure. Figures from Infrabel suggest that fewer than half the delays (45.8%) and cancellations (44.3%) in Belgium are under the control of the railway undertaking. However no less than 28% of delays were due to problems with rolling stock. Most of these are expected to be eliminated under the Base Case but to the extent that regulatory models cause new rolling stock to be introduced, a further reduction in delays might be expected. The parallel comments in this sub-section on replacement of rolling stock conclude that the no model, of itself, can be associated with newer rolling stock. Likewise new regulatory models might introduce new factors such as a less stable operating pattern through intensive use of resources, for example. Reductions in performance for such regions are again judged to be marginal.

Overcrowding

It is conceivable that a competing railway undertaking could introduce a non-reservation service in Spain or Poland (this is the norm in Germany in Switzerland and indeed in Denmark) in order to introduce some flexibility and spontaneity into the market. Models E, G, and H may encourage railway undertakings to offer a ‘walk-on’ service. It is unlikely that open-access railway undertakings would voluntarily choose to overload their services and so none of those options are expected to lead to overcrowding (i.e. where open access RUs are present reservation systems are only likely to be relaxed where no overcrowding is considered likely by the RU).

Average age of rolling stock

When operation of an existing service changes hands, there may be a provision to require the rolling stock to be passed over (to ensure stock is available, this practice is found in Sweden). If this is done then the age profile of rolling stock would not change

[187] The Spanish high-speed lines already under construction would increase the network length from 2230 km in 2010 (1590 km in 2009) to 3782 km.

[188] A further factor which is likely to drive down the average of Polish is the development of Polish high-speed rail network: the first lines is planned to open 2019, the new stock for this line should have a significant impact on the average fleet age in 2020.

from the Base Case. On the other hand if the new operator is required to find rolling stock and given that there is not yet a ready market of rolling stock for hire, it is most likely it will opt for one of two extremes, new rolling stock or second-hand rolling stock at the end of its life. New operators in Denmark, Germany and the Netherlands have typically bought or leased new rolling stock, whilst in Romania old rolling stock has been used. The former reduces the average age of stock whilst the latter increases it. It should be noted that the decision on whether rolling stock is a property of the route and service is not linked to any particular model (although linkage is probably implicit under Model B). (Further examples of rolling stock acquisition practices may be found in section 7.2.6 examining various models already used in Europe).

By contrast, the financial commitment to be made for open access will incline open-access railway undertakings towards second-hand rolling stock, at least at first although the ability to acquire new rolling stock is likely to increase in the event that the RU has built a record of successful operations[189]. It is to be noted that there is no second-hand high-speed rolling stock.

9.6.2.4. Impact on high-speed services in Target States

Price

As there are no high-speed services in either Denmark or Poland at present, only Spanish high speed services are discussed herein.

Only in the case of open access can price effects be expected: reflecting the need for new entrants to gain market share. Since entry, as discussed, will only take place on a small scale, the pricing effect is projected to be rather small.

Under regimes that permit tendering of high-speed services the question is what use public authorities will make of the productivity increases. The assumption herein is that prices will not be changed. This reflects the proposition discussed above that Spain would mainly aim to further improve services.

Punctuality

No change in punctuality with respect to the Base Case can be associated with any model for the reasons outlined above. Any changes in the level of punctuality would be governed by the detail arrangements of any market opening mechanism that is adopted, for example by the fine detail of the contracts between the IM and RUs, by the way in which the regulator performs its duties and any penalty regime in public service contracts.

Overcrowding

Reservation policies on Spanish high-speed services mean that passengers will always be below capacity, and are anticipated to continue under any of the models. It has been

[189] An established open-access railway undertaking said that it now had the financial resources and credibility to buy new stock.

assumed that the French practice of accepting passengers on TGVs over and above nominal capacity to take seats of 'no-shows' would not be adopted by a new entrant.

Average age of rolling stock

The cost of high-speed rolling stock (at roundly two million euro per vehicle) is likely to mean transfer of rolling stock with any change of railway undertaking, either as a formal requirement or as a commercial transaction between the parties. Spanish practice is also to build gauge changing technology into vehicles (rather than lay track as dual gauge) and many services are projected off the high-speed (standard gauge) routes to conventional (broad gauge) destinations; this makes rolling stock highly specific to Spain.

High-speed open access means new rolling stock, as will options that result in an increase in passengers (although given the reservation policy, the decision might be to manage peak traffics). Given operation of high-speed rail services is likely to be inherently profitable, implying some scope for open access operations, it is therefore likely that there might be a small, but relatively insignificant, reduction in the age of rolling stock under any other options. This impact is likely to be slightly greater under Models B, E and H, which would involve unfettered open access on high-speed lines.

9.6.2.5. Impact on conventional express services in Target States

Price

In the case of all three target states, fare level change has only been assumed if open access takes place. Consequently, since open access is rather unlikely, though not prohibited, in Model G, changes in fares levels have only be assumed in the remaining models.

Fare changes are an important weapon in the armoury of open access RUs, in achieving successful market entry. As long as entry is not restricted to market segments that previously have not been served, a case of limited relevance, an entrant has to offer lower fares or higher quality compared to an incumbent to gain market shares. The magnitude of the price effect (fare reduction) reflects the share of services that falls in the category open access and the magnitude of entry that can be expected.

Punctuality

No change in punctuality with respect to the Base Case can be associated with any model for the reasons outlined above. Any changes in the level of punctuality would be governed by the detail arrangements of any market opening mechanism that is adopted.

Overcrowding

Reservation policies mean that passengers on conventional express services in Spain and many in Poland will always be below capacity. See the parallel assessment of the provision of accommodation and service density for a discussion of the adequacy of the offer in terms of frequency and train size.

Average age of rolling stock

The general comments above applying to all market segments are valid. Models G and H, as PSO elements of Model E, well might be identified with new rolling stock if the period of the concession is long (to allow financing) and there is no provision for transfer of rolling stock. The impact under Model G and on parts of the network operated under PSO in Model E could be expected to be slightly greater, as the greater degree of exclusivity offered is likely to give rise to more favourable conditions to finance new rolling stock. Most of these factors (length of concession, transfer (or not) of rolling stock) are quite independent of the model adopted.

9.6.2.6. Impact on regional services in Target States

Price

For regional services it has generally been assumed that fares would not change, although an increase in productivity generated by competitive tendering has been assumed. Instead, it has been assumed that public authorities will use the increase in productivity mainly to reduce public support.

The way in which public authorities use productivity increases should be noted: either a reduction of public support, price decrease, quality increase, or a mixture of these measures, reflects national or regional preferences, as well as institutional and general economic aspects. This is a difficult issue to model without a high degree of arbitrariness; however, the general assumption herein provides consistency with the transport model and allows a clearer comparison of the various models.

Punctuality

No change in punctuality with respect to the Base Case can be associated with any model for the reasons outlined above. Any changes in the level of punctuality would be governed by the detail arrangements of any market opening mechanism that is adopted.

Overcrowding

See the parallel assessment of the provision of accommodation and service density for a discussion of the adequacy of the offer in terms of frequency and train size.

Average age of rolling stock

Comments for conventional express services apply.

9.6.2.7. Impact on commuter services in Target States

Price

Commuter services, as a central part of regional services, have been treated in exactly the same way as regional services.

Punctuality

No change in punctuality with respect to the Base Case can be associated with any model for the reasons outlined above. Any changes in the level of punctuality would be governed by the detail arrangements of any market opening mechanism that is adopted.

Overcrowding

See the parallel assessment of the provision of accommodation and service density for a discussion of the adequacy of the offer in terms of frequency and train size.

Average age of rolling stock

Comments for conventional express services apply.

9.6.2.8. Quantification

Price

Table 9.6.4 shows the price effects of the different models.

Table 9.6.4 - Predicted Price Impacts Relative to Base Case

State	Change of fare levels compared to Base Case			
	Model B	Model E	Model G	Model H
Denmark	-0.2%	-0.3%	0.0%	-0.1%
Poland	0.0%	0.0%	0.0%	0.0%
Spain	-0.2%	-0.3%	0.0%	-0.1%

The table reflects the fact that Model G generally entails little open access. Model E offers the best opportunity for open access with a restriction of PSO services to regional services and a clear distinction of the segments. But, reflecting the previous experiences with open access, the scale of entry is judged to be quite low. As already discussed there is almost no place for open access in Poland. The impact of Models B and H lie in between, reflecting less clear segment delineation and the case-by-case variation.

Punctuality

No change in punctuality with respect to the Base Case can be associated with any model.

Overcrowding

Section 9.6.1 provides estimates for changes in train service provision for each of the models. In no case does the expected change in passenger volume exceed the change in rolling stock provision by more than 1%. For commuter traffic, where overcrowding is most likely to occur, only Models B and E show an increase, in each case the increase is less than 0.1%, well outside statistical reliability. It can therefore be concluded that none of the models, by themselves, seem likely to increase overcrowding compared with the Base Case.

The main drivers of large changes in ridership are likely to derive from the detail arrangements of any market opening model rather than any inherent feature of a particular model; see Section 9.4.4.2.

Average age of rolling stock

The impact of any particular model is likely to be considerably less important than the whether or not detail arrangements that surround any further market opening adopted encourage replacement of rolling stock at a faster rate than under the Base Case or not. However, under conditions favourable to open access, Models B, E and H should deliver slightly higher rates of rolling stock replacement, while where public support is required in the form of public service contracts then Models E and G could be expected to deliver a slightly higher rate of replacement.

9.6.3 Service availability by market segment

9.6.3.1. Definition

The definition used for service availability herein is the range of services offered, the sort of services which provide added value, such as the Swiss service to handle airline baggage to local stations, the range of accommodation provided or differing catering options. Issues concerning the timetable such as frequency of service, adequacy of the service (in terms of the accommodation provided) and range of destinations are considered in service level.

9.6.3.2. Base Case in Target States

Service availability is increasing in all sectors of the rail market and the Base Case therefore assumes that by 2020 there will be widespread availability of such facilities as air conditioning, wide-ranging sales channels, multi-lingual services and Wi-Fi on trains. There are already different levels of service availability in the target states. Spain offers “Trenhotel” (quality night trains), and it is assumed they will continue. It is assumed that the rather Spartan services in Poland will be enhanced as new rolling stock is provided and stations modernised. Denmark is assumed to continue in the forefront of the range of services.

9.6.3.3. General comments on all market segments

An important issue in making the passenger railway relevant to the community is that it should provide a full service. At the most basic level this includes such issues as adequate space for luggage and push chairs, the provision of seat reservations on longer journeys and appropriate catering. Community citizens, however, are entitled to expect more to reflect both the improvements being made by other modes and to make rail travel more effective; if passenger rail is to increase its modal share, railway undertakings should be imaginative and responsive in their provision of services. It might be thought that where the service is sponsored, the promoter might be less imaginative and less inclined to encourage the railway undertaking to think "outside the box". The experience of open access railway undertakings is that they do provide more imaginative offerings. UnionsExpressen in Norway/Sweden making a feature of dining for example. More imaginative sales channels are a further option.

Amongst the services which might be offered by innovative RUs are specific services for business travellers, better connections with other trains and with other modes, guarantees of cross platform connections between particular services, and assistance with luggage (many potential passengers are deterred by transfers).

9.6.3.4. Impact on high-speed services in Target States

At the moment service levels for high speed services are fairly standardised. The products offered by the various providers differ only in the policy for reservation (not required in Germany, required elsewhere), the number of classes (three in Spain) and the provision of meals (provided on Eurostar, Thalys and in Spain). Interestingly, NTV plans to offer greater luxury than Trenitalia, television and "cinema-standard film viewing"[190]. In these circumstances, it seems logical to see the only prospect for wider availability of services to come from models which offer open access that delivers competition for the market (Models B, E, and H).

9.6.3.5. Impact on conventional express services in Target States

There are significant opportunities to offer further imaginative new services in this market segment. Some development of new features has been seen in open access services (luxury in the case of UnionsExpressen). The tight contract specification and limited contract length envisaged in Model B would very much limit the scope for designing and developing new services not to mention the short period in which they can be exploited. It is likely therefore that Model B would give rise to no service development in any of the target states. Where the railway undertaking has an opportunity to benefit from the commercial success of service development (essentially where the terms of the franchise allow it), then Models E, G and H would provide new ideas, new catering initiatives, for example. However the most promising option of all is the open access options allowed by Models G and H where all evidence suggests that open access operators are the most inventive and successful in providing new offers for the market.

The fairly short journeys in Denmark may reduce the scope for initiative but longer journeys in Spain and Poland would allow full scope for innovation.

9.6.3.6. Impact on regional services in Target States

There is scope for imaginative additional services in the regional market, they might include more imaginative inter-modal options, services that are locally designed to be better targeted to essentially rural demand. The scope for new services however is likely to be constrained by prescription in the tender specification (these services will require support). It is unlikely there is any prospect of open access. Whilst Models B

190 *Financial Times* 25 May 2010

and E are theoretically better, their advantages are not likely to be brought to bear because there are no profitable options for open access. Indeed Model G might actually provide most additional services in practice as an RU holding a public service contract with lasting several years seeks to build patronage.

9.6.3.7. *Impact on commuter services in Target States*

Given the traffic base of most urban services, there is considerable scope for ancillary services which add value to the basic product. Again, it is likely that services which are closely specified will not allow the railway undertaking much scope in enhancing its service. Open access is unlikely to be either viable or practical in this market segment. Accordingly it is not considered that there would be much difference between the different models in this market segment.

9.6.3.8. *Quantification*

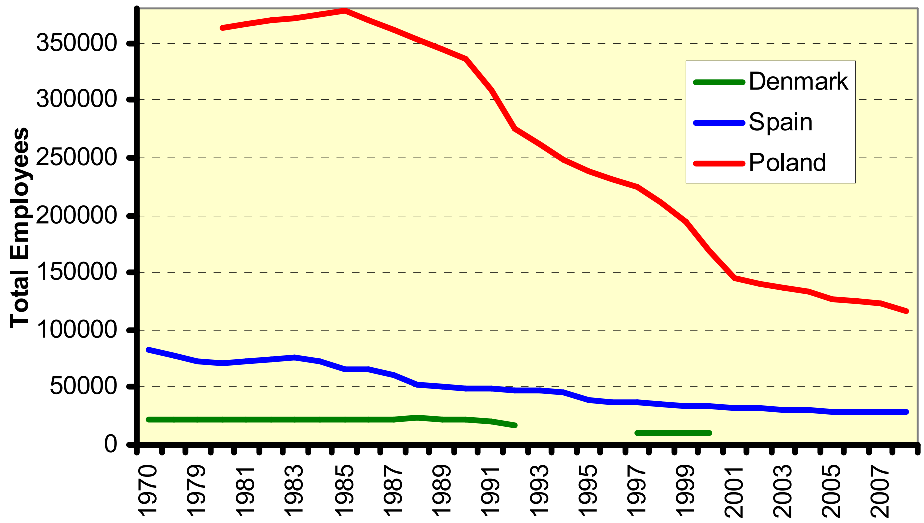
No quantification of this aspect is possible: the issues are qualitative.

9.6.4 Railway employee numbers

9.6.4.1. *Base Case in Target States*

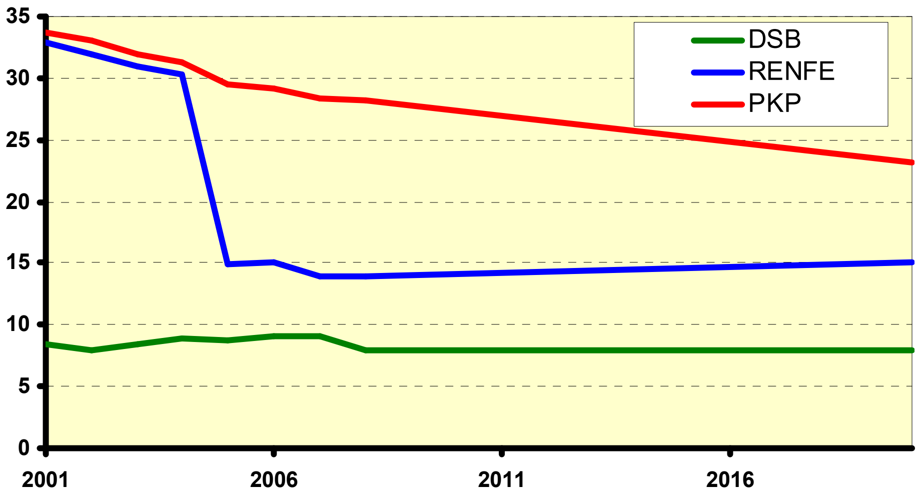
Eurostat statistics for the total number of employees in the railway industry in the three target states is shown in Figure 33. It can be seen that the data series are not complete, particularly for Denmark where figures are not available after the Year 2000. In addition it is not possible to disaggregate passenger and freight in the Eurostat numbers. These two factors limit the usefulness of the Eurostat data for the impact assessment work; however, it can be seen that in all the target states staff numbers have been in long-term decline, in Spain's case since at least 1970, in Poland's case since the mid 1980s and in Denmark's case since the late 1980s. In each case the fall in direct employment by the railway has been dramatic, railway employment in Denmark more than halving in the 1990s and almost having in Poland in the in the same period, a trend that is still on-going. In an attempt to isolate trends in the passenger rail industry UIC statistics have been consulted, which show a mixed pattern for passenger RU staff levels as can be seen in Figure 34. There has been a general reduction in headcount, particularly through the 1990s, followed by more stability in recent years. It is likely that the changes in Poland and Spain are due to restructuring (for example the creation of ADIF on 1 January 2005). It is assumed that the process will continue in Poland, where more processes are manual than in other states, but is expected to be complete by 2020.

Figure 38. Total railway industry employees in Denmark, Spain and Poland



Source: Eurostat

Figure 39. Passenger RU employees in Denmark, Spain and Poland



Source: UIC, extrapolated by Pegasus Transconsult (Spanish numbers include modest numbers of freight staff)

It should be stressed that there is a difference between the number of direct employees of railway companies and the number of jobs ultimately supported by the railway industry. Section 0 discusses reasons why market opening would be likely to result in a widening of this gap; this is a gap that has always been present and is quite impossible to quantify accurately. There have been attempts to quantify the total employment supported by the rail industry, however, these have been little more than educated guesses[191]. For example, passenger rail supports jobs in sectors as diverse as railway way equipment manufacturing, construction engineering, product and materials supply, catering and hospitality, taxi drivers, and positions resulting from general economic growth from the increase in total travel volumes delivered by rail (e.g. in retail outlets).

9.6.4.2. General comments applying to all market segments

Compared with an incumbent, market opening is likely to lead to many specialist skills being outsourced. Individual railway undertakings will not, for example, be able to afford a bogie engineer. Accordingly all the models will show an apparent reduction in direct employment; however, many jobs that appear to have been 'lost' have simply been transferred to external service providers, in some cases also involving direct transfer of the employees concerned. In some cases even core tasks such as ticket examination have been out-sourced to third parties.

For mainstream jobs it has been assumed there is a non-linear relationship between traffic levels and employment levels. This has certainly been the case in Great Britain where there has been a 40% increase in traffic levels without a commensurate increase in staff numbers (see Annex 6). There has been a fundamental improvement in rail staff productivity in which it has been possible to negotiate changes in working practices in return for higher wages (see Section 9.6.5) and thus made it possible to operate more trains with the same number of staff. Typical of the changes is annual contracts in terms of driver hours rather than fixed shifts (not dissimilar to many aircrew contracts for example).

Reductions in train crew per train km or train crew per train hour are therefore likely to be achieved as rolling stock and staff are used more effectively. Nevertheless where train km increase by more than 15% (in Models G and H) additional staff are likely to be required. Set-off against that will be probable out-sourcing of other tasks. The net effect will be a net reduction in directly employed staff in all models and for all train service types. The reductions are likely to be the least where train km are predicted to increase the most (primarily in Denmark and in Spain and in Models G and H).

9.6.4.3. Quantification

The ultimate change in the number of staff directly employed in the railway industry relative to the Base Case is dependent on the degree to which the detailed arrangements for any market opening incentivise the operation of addition trains and encourage rail volume growth. As a worst case assumption that they do not, the forecast change in direct employment level for each combination of target state and regulatory model, relative to the Base Case, is shown in Table 9.6.5.

191 See for example http://www.invensysrail.com/whitepapers/uk-rail-a-case-for-investment.pdf.

Table 9.6.5 - Forecast Total Railway Employee Numbers Under Each Mode relative to Base Case

	Model B	Model E	Model G	Model H
Denmark	Decrease	Stable	Stable/slight increase	Slight decrease
Spain	Decrease	Stable	Slight increase	Slight decrease
Poland	Decrease	Stable	Stable	Stable

It should be noted that these predictions are on the basis of the forecast traffic volume changes under each model as predicted by the TRANS-TOOL model. However, as noted in Section 9.4.4.2 it is considered that if the arrangements accompanying any market opening are favourable it is possible that considerably more passengers could be carried than predicted by the traffic forecasting work. In this case the number of employees would be greater than predicted in Table 9.6.5.

9.6.5 Railway employee pay & conditions

9.6.5.1. Base Case in Target States

Overview

Full details of pay scales for rail staff in Denmark and Poland were not available; the information below is therefore that collected informally.

Denmark

Salaries for medium skill jobs are close to the national average for that type of job but for lower-skill jobs and highly skilled jobs, the salaries fall below those in the community at large. No details of differentials between Arriva (principal competitor to DSB for franchise awards) and DSB salaries were available, although investigation did reveal, however, that Arriva salaries had to be substantially higher to attract DSB staff to compensate them for the loss of security of employment.

Spain

Compared with the national average salary (of € 20 390 in 2009), an average RENFE staff member earns:

Driver:	141%
Rolling stock technician:	213%
Middle Management	160%
Admin Staff	90%

Supervisor	153%

Poland

Compared with the national average salary (of PLN 37 200), an average PKP staff member earns:

Driver	76%
Admin Staff	58 – 75%

The Base Case assumes that salary levels on PKP would rise to the national median as a result of the on-going process of franchising some regional services. No changes to differentials in Denmark or Spain are assumed.

9.6.5.2. *General comments relating to all market segments*

There are already useful indicators of what the various regulatory models might produce. Notably, the experience of the liberalisation of freight in a number of Member States together with the experience of passenger liberalisation in the states studied.

On the positive side where there have been two or more freight RUs in competition and there has been a shortage of skilled staff (for example due to success in growing the volume of freight on rail in a competitive market) then the salaries of skilled staff such as train drivers have increased markedly. This issue is covered in the Case Study report on Great Britain (Annex 6). The increases in wage levels have been driven in part by competition between RUs for key staff and in part by agreements to work more flexibly (and thus productively) in exchange for greater remuneration.

Other staff categories have not benefitted quite so much but as the British case study shows, salaries in general have risen faster than the national mean under conditions of market opening.

The findings of the *Railimplement* study on social issues, which studied the issue in some detail, were similar, this found that: "*the evidence suggests that wages in some skill groups, such as drivers, have risen rapidly on some networks. We found no evidence that the market opening process had resulted in a deterioration in wages and working conditions*".

In terms of staff conditions, giving that maximum working hours are controlled by legislation, the most significant issue relates to staff travel concessions. It has proved to be possible to retain staff travel concessions (although in a modified form for new staff) in Great Britain. A will to resolve the problems is needed but in principle none of the models implies the discontinuance of travel schemes.

9.6.5.3. *Impact on high-speed services in Target States*

Naturally, models which increase output and those which create a competitive market for staff will be those in which staff conditions will most improve. It is worth commenting that *Eurostar* driver salaries place them in the top 15% of earners in Great Britain. The models can be expected to be about equal in their effects on pay, although it should be noted, however, that Model B provides only short-term contracts for railway undertakings, this is likely to have an effect on staff contracts, both in security of employment and linked issues such as pension rights.

9.6.5.4. *Impact on conventional express services in Target States*

The comments on high-speed services also apply to conventional express services.

9.6.5.5. *Impact on regional services in Target States*

The comments on high-speed services also apply to regional services.

9.6.5.6. *Impact on commuter services in Target States*

The comments on high-speed services also apply to commuter services.

9.6.5.7. *Quantification*

It should be remembered that the salary levels in the Base Case are not at current levels. Further changes in salary levels from the Base Case are forecast to be as given in Table 9.6.6 (these are averages for all staff, it is expected however that scarce skills, drivers in particular, would receive higher rates of pay, while unskilled staff would do less well).

Table 9.6.6 - Predicted Salary Levels for Each Option Relative to Base Case

	Model B	Model E	Model G	Model H
Denmark	+ 5%	+7%	+9%	+9%
Spain	0%	+2%	+4%	+4%
Poland	+15%	+17%	+20%	+20%

9.7. Impact on Environmental Aspects

9.7.1 Greenhouse gas emissions

9.7.1.1. *Base Case - overall*

The predicted change in modal share between the "Base 2020" (i.e. *status quo* projected forward) and Base Case traffic level is shown in Table 9.7.1. The numbers in this table give the percentage relative change in modal share (NOT the absolute change in modal share[192]).

[192] Thus in a state where rail has, say, a 10% modal share under the *Base 2020* figures, a modal share change of 10%, would represent an increase in modal share from 10% under *Base 2020* to 11% under the *Base Case*.

Table 9.7.1 - Predicted Modal Share Change between Base Case and Base 2020 Scenario by State

State	Modal Share Change
Belgium	12.46%
Bulgaria	1.54%
Czech Republic	2.33%
Denmark	4.35%
Germany	6.61%
Estonia	1.99%
Ireland	4.26%
Greece	2.08%
Spain	3.18%
France	3.90%
Italy	2.64%
Lithuania	2.05%
Latvia	0.53%
Luxembourg	6.29%
The Netherlands	6.21%
Hungary	1.44%
Austria	3.22%
Poland	2.19%
Portugal	1.53%
Romania	1.55%
Slovenia	1.79%
Slovakia	1.81%
Finland	3.49%
Sweden	2.48%
Switzerland	4.18%
United Kingdom	13.94%
Croatia	1.69%

State	Modal Share Change
Macedonia	1.35%
Norway	21.83%
Turkey	2.03%
Overall Change	**5.66%**
Non-Opened EU15	**4.01%**
EU12 (New Member States)	**1.88%**

The above changes are compatible with the changes in passenger volumes already discussed in Section 9.4.4.2.

In environmental terms the impact of a modal share change in favour of rail depends on the extent to which diversion is from car and how much is from civil aviation. This issue is further complicated by considerations such as load factors for various modes and how these change with demand[193], speed of travel, stopping pattern, fuel type, electricity generation method[194], whether trips are short or long[195], etc. Accordingly, there is considerable variation between studies on both the relative and absolute GHG emission differences between modes. The Consortium has therefore used the latest research being undertaken for the European Commission under the *EU Transport GHG: Routes to 2050?* project to maintain consistency between workstreams being undertaken for the Commission.

The changes in passenger km for the various models between the *Base 2020* and *Base Case* figures imply that approximately 98.8% of the modal split to rail in the Base Case is from road and the remaining 1.2% from air. The TRANS-TOOL model is based on 2005 base data; in 2005 the total CHG emissions from transport in the thirty states under consideration amounted to some 1320.9 Mt CO_2 equivalent[196], which equates to 1574.0 Mt on the *Base 2020* figures.

Modal transfer from road to rail achieves an average reduction in GHG emissions of between 30% and 70% per passenger km[197]. The *EU Transport GHG: Routes to 2050?* Project has not been able to establish a figure for emission reduction for air to rail modal shift; however, Eurostat figures indicate that in 2007 civil aviation emitted 159.6 Mt

193 For example is an increase in rail use can be accommodated by improving the load factor on existing services this is more efficient in environmental terms than running additional trains to carry the extra passengers.

194 For example the TGV network in France is effective at reducing GHG emissions, despite the high energy consumption of high-speed trains, as most French electricity generation is nuclear or renewable.

195 Short distance trips tend to be much more energy intensive, particularly those by private car.

196 Source: *Energy and Transport in Figures 2009*, published by the Directorate General for Energy and Transport.

197 Source: *EU Transport GHG: Routes to 2050? Modal Split and Decoupling Options, Paper 5*, Consortium led by AEA for DG Environment, 22 December 2009.

CO_2 equivalent for 572 billion passenger km and 3 billion tonne km of freight, while rail emitted some 8.2 Mt CO_2 equivalent for 395 billion passenger km and 453 billion tonne km of freight[198], implying that, across the EU as a whole, rail that modal transfer from air to rail achieves a 96% reduction in GHG emissions per passenger km at present[199].

On the basis of the above a 1% change in modal share in favour of rail across the European Community should achieve a GHG reduction of between 0.35% and 0.7%. The Base Case therefore delivers **a GHG reduction of between 2.0% and 4.0**%, or something **between 30 and 60 Mt in CO_2 equivalent** terms in 2020.

9.7.1.2. Base Case – by market segment

The predicted change in modal share between the "Base 2020" and Base Case traffic level by global market segment is shown in Figure 9.7.2.

Table 9.7.2 - Predicted Modal Share Change between Base Case and Base 2020 Scenario by Global Market Segment

Global Market Segment	Change
Business	4.50%
Commuter	7.96%
Holiday	1.46%
Private	9.28%

If one attempts to reconcile these trends with rail market segments the following can be deduced in respect of the difference between the Base Case and "Base 2020" figures:

High-speed rail	comments as for passenger volume, thus the change in modal share would be between the private and business figures (5-9%);
Conventional express	comments as for passenger volume, thus the modal share improvement should be slightly greater than that for high-speed rail;
Regional services	comments as for passenger volume, thus the change is likely to be between the figure for commuter traffic and that for private travel (8-9%);

198 Source: *Energy and Transport in Figures 2010*, published by the European Commission.

199 Using the convention that a passenger km is equivalent to a tonne km as a unit of output.

Commuter services	this can be deducted almost directly from the model output at an increase of around 8%.

On the basis of the methodology outlined in Section 9.7.1.1 the anticipated GHG reductions inherent in the Base Case for each market segment should be as given in Table 9.7.3.

Table 9.7.3 - Predicted Change in GHG Emissions Relative to Base Case by Market Segment

	Low	**Mid**	**High**
High-speed	**1.6%**	**4.0%**	**6.3%**
Conventional Express	**1.8%**	**4.2%**	**6.5%**
Regional	**2.8%**	**4.7%**	**6.5%**
Commuter	**2.8%**	**4.2%**	**5.6%**

Note figures above are rounded to nearest 0.1% and relate solely to the traffic in the relevant market segment.

9.7.1.3. Quantification of Regulatory Models - Global

The predicted impact of each model relative to the Base Case on modal share is given in Table 9.7.4 (again the figures below are the relative not the absolute change in modal share).

Table 9.7.4 - Predicted Change in GHG Emissions Relative to Base Case by State

State	**Change Relative to Base Case**			
	Model B	**Model E**	**Model G**	**Model H**
Belgium	0.33%	0.71%	1.59%	1.20%
Bulgaria	-0.07%	0.00%	0.12%	0.09%
Czech Republic	0.02%	0.14%	0.29%	0.22%
Denmark	0.64%	1.53%	6.27%	3.87%
Germany	-0.54%	0.02%	2.70%	1.45%
Estonia	0.02%	-0.01%	0.75%	0.37%
Ireland	0.39%	1.30%	2.51%	1.86%
Greece	0.07%	0.42%	0.85%	0.58%
Spain	0.71%	2.45%	8.73%	5.61%
France	0.86%	1.49%	4.99%	3.24%

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Italy	0.02%	0.03%	2.90%	1.51%
Lithuania	0.04%	0.01%	0.73%	0.42%
Latvia	0.00%	0.07%	0.28%	0.07%
Luxembourg	0.41%	0.82%	2.43%	1.65%
The Netherlands	0.16%	0.34%	0.80%	0.58%
Hungary	0.00%	0.20%	0.67%	0.46%
Austria	-0.10%	0.28%	0.88%	0.60%
Poland	0.02%	0.50%	1.01%	0.71%
Portugal	0.45%	1.51%	6.06%	3.88%
Romania	-0.04%	0.13%	0.31%	0.21%
Slovenia	0.42%	0.70%	1.12%	0.92%
Slovakia	-0.02%	0.13%	0.31%	0.21%
Finland	1.30%	1.30%	5.44%	3.48%
Sweden	0.57%	0.76%	2.46%	1.09%
Switzerland	0.19%	0.31%	0.48%	0.37%
United Kingdom	-5.82%	-3.94%	0.22%	-1.98%
Croatia	0.09%	0.23%	0.45%	0.39%
Macedonia	0.03%	0.35%	0.40%	0.22%
Norway	0.28%	0.58%	1.60%	1.39%
Turkey	0.00%	0.15%	0.30%	0.13%
Overall Change	**-0.56%**	**0.10%**	**2.78%**	**1.44%**
Non-Opened EU15	**1.04%**	**1.78%**	**5.07%**	**3.43%**
EU12 (New Member States)	**0.03%**	**0.05%**	**0.66%**	**0.48%**

Again the above figures in modal share are compatible with the changes in passenger volume discussed in Section 09.4.4, with the greatest impacts being felt in EU15 states that do not have fully opened domestic passenger markets at present, and with only a small impact in new the Member States. The same comments also apply as in Section 09.4.4.2 on the modest changes relative to the Base Case.

On the basis of the methodology outlined above the GHG reductions over and above those that the Base Case would deliver, the various models would achieve, if they were implemented in all thirty states under evaluation in 2020 is shown in Table 9.7.5.

Table 9.7.5 - Predicted GHG Reductions for Each Model

	Low		High	
	GHG Reduction	CO_2 Saved (Mt)	GHG Reduction	CO_2 Saved (Mt)
Model B	-0.2 %	-3	-0.3 %	-6
Model E	0.0 %	1	0.1 %	1
Model G	1.0 %	15	1.9 %	31
Model H	0.5 %	8	1.0 %	16

Note figures above are rounded to nearest 0.1%/1Mt

9.7.1.4. Quantification of Regulatory Models – by market segment

The predicted increase in passenger rail volume under each model relative to the Base Case in modal share by global market segment is shown in Table 9.7.6.

Table 9.7.6 - Predicted Increase in Passenger Rail Volume Relative to Base Case

Global Market Segment	Model B	Model E	Model G	Model H
Business	-2.78%	0.00%	11.11%	5.60%
Commuter	0.05%	0.08%	0.04%	0.05%
Holiday	0.07%	0.08%	0.04%	0.02%
Private	-0.50%	0.18%	3.00%	1.61%

It can be seen immediately that market opening mechanism is only anticipated to have an impact in the business and private market segments, with the largest effects being experienced in the former segment. This illustrates the extent to which the commuter market is a captive one for rail, and that rail in no longer the preferred means of holiday travel other than in niche markets. Modal share changes for rail in both the commuter and holiday markets are driven by a combination of economic growth and external factors making alternative modes either more or less attractive.

If one attempts to reconcile these trends with rail market segments the following can be deduced:

High-speed rail	comments as for passenger volume, thus the change in passenger volume for each model would be between the private and business figures;
Conventional express	comments as for passenger volume, thus the impact of each model would be less than that for high-speed rail, except under Models B and E;
Regional services	comments as for passenger volume, thus the change for each model with respect to the Base Case is likely to be around the level of or below the private figure;
Commuter services	none of the models are expected to show any significant difference from the Base Case, and can be considered to be zero for all models for the purposes of the present analysis.

On the basis of the methodology outlined above the estimated GHG reductions for each model relative to the Base Case for each market segment is as shown in Table 9.7.7, 9.7.8 and 9.7.9, for the low, mid range, and high estimate respectively.

Table 9.7.7 - Low Estimate of GHG Reductions Relative to Base Case

	Model B	Model E	Model G	Model H
High-speed	**-1.9%**	**0.0%**	**1.1%**	**0.6%**
Conventional Express	**-1.4%**	**0.0%**	**1.1%**	**0.6%**
Regional	**-0.4%**	**0.0%**	**0.5%**	**0.3%**
Commuter	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Note figures above are rounded to nearest 0.1% and relate solely to the traffic in the relevant market segment.

Table 9.7.8 - Mid-Range Estimate of GHG Reductions Relative to Base Case

	Model B	Model E	Model G	Model H
High-speed	**-1.1%**	**0.1%**	**4.4%**	**2.2%**
Conventional Express	**-0.8%**	**0.1%**	**4.0%**	**2.0%**

	Model B	Model E	Model G	Model H
Regional	-0.2%	0.1%	1.3%	1.4%
Commuter	0.0%	0.0%	0.0%	0.0%

Note figures above are rounded to nearest 0.1% and relate solely to the traffic in the relevant market segment.

Table 9.7.8 - High Estimate of GHG Reductions Relative to Base Case

	Model B	Model E	Model G	Model H
High-speed	-0.2%	0.1%	7.7%	3.9%
Conventional Express	-0.1%	0.1%	7.0%	3.5%
Regional	-0.1%	0.1%	2.1%	1.1%
Commuter	0.0%	0.0%	0.0%	0.0%

Note figures above are rounded to nearest 0.1% and relate solely to the traffic in the relevant market segment.

9.7.2 Noise

9.7.2.1. Base Case

The most current published research in this area for the European Commission was undertaken under the IMPACTS project[200], and is a thorough and complex piece of work that calculates the unpaid external costs for the relevant modes. As would be expected, the handbook concludes that externalities are heavily influenced by individual circumstances; accordingly when dealing with aggregate results as herein, considerable compression of this work is required. The summary values given in the handbook are as follows:

Passenger Car, Urban, Day	€ 0.46 /passenger km
Passenger Car, Urban, Night	€ 0.84 /passenger km
Passenger Car, Interurban, Day	€ 0.07 /passenger km
Passenger Car, Interurban, Night	€ 0.14 /passenger km
Passenger Train, Urban, Day	€ 0.25 /passenger km

200 *Handbook on estimation of external cost in the transport sector: Produced within the study Internalisation Measures and Policies for All external Cost of Transport (IMPACT), Version 1.1*, CE Delft, February 2008.

Passenger Train, Urban, Night	€ 0.82 /passenger km
Passenger Train, Interurban, Day	€ 0.14 /passenger km
Passenger Train, Interurban, Night	€ 0.23 /passenger km
Aircraft, weighted	€ 228 per flight

Directive 2002/49/EC[201] defines the default values for day time as being 07.00h to 19.00h and night-time a being 23.00h to 07.00h. While there is very wide variation in the length of the operating day between lines and across Europe[202], normally within the range of twelve to twenty-four hours, typical figures for a busy express line would be 17 hours between first and last trains and 19 hours on a busy commuter line. Thus for the purposes of the present exercise the mean value of modal shift from road to rail for commuter trains can be taken as € 0.16 per passenger km, and for all other types of train can be taken as -€ 0.07 per passenger km.

Eurostat data for the EU 27 indicates that that the average European flight delivered 49 660 passenger km in 2008[203], implying an unpaid noise externality of €0.46 per passenger km, and a value of € 0.30 per passenger km for modal transfer from air to rail.

As noted above approximately 98.8% of the modal shift is estimated to come from road and 1.2% from air. None of the air diversion will consist of urban commuter traffic, which the TRANS TOOL predicts will account for 11.56% of the modal shift under the Base Case. It can therefore be assumed that, in noise terms the value of the modal shift under the Base Case is about € 0.16 per passenger km in the urban commuter segment, and that for all other types of rail is -€ 0.02 per passenger km.

On the basis of the assumptions outlined above, the total value in noise pollution terms for all thirty states of the modal shift inherent in the Base Case for each global market segment should be as given in Table 9.7.9.

Table 9.7.9 - Value of Noise Pollution Reductions in Base Case, Relative to Base 2020 Scenario

	Value
Business	-€ 37M
Commuter	€ 260M
Holiday	-€ 74M

201 Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 *relating to the assessment and management of environmental noise*, OJ 189 of 18 July 2002.

202 The considerable difference between the length of the operating day for French TGV services, and German ICE services being a case in point.

203 561 billion passenger km and 11 297 383 flights.

	Value
Private	-€ 187M
TOTAL	**-€ 38M**

Unfortunately other than to identify the likely savings in the urban commuter rail segment as it is not possible to credibly disaggregate the above by global market segment.

9.7.2.2. Quantification of regulatory models

On the basis of the above, the total value in noise pollution terms for all thirty states of the modal shift for each regulatory option for each global market segment should be as given in Table 9.7.10

Table 9.7.10 - Value of Noise Pollution Reductions Relative to Base Case

	Model B	Model E	Model G	Model H
Business	€ 28M	€ 1M	-€ 112M	-€ 56M
Commuter	€ 3M	€ 4M	€ 2M	€ 3M
Holiday	-€ 1M	-€2 M	-€ 1M	€ 0M
Private	€ 15M	-€ 5M	-€ 86M	-€ 46M
TOTAL	**€ 45M**	**-€ 2M**	**-€ 197M**	**-€ 99M**

It should be noted that although Model B appears to perform the best when considering noise pollution; this is only because it is predicted to result in a slight loss of rail modal share, and because, outside urban areas modal shift to rail does not deliver benefits if viewed purely from a noise pollution standpoint.

9.7.3 Air quality

9.7.3.1. Base Case

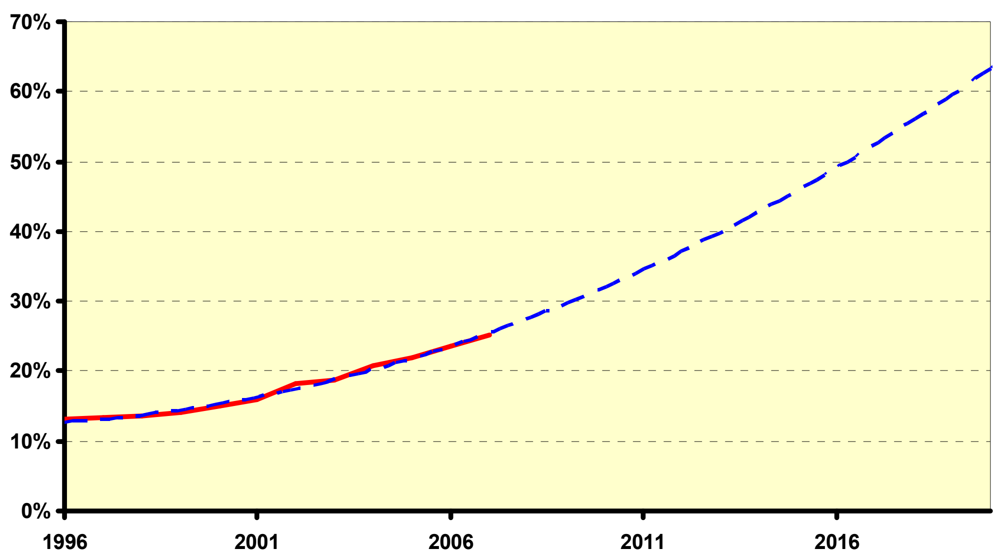
The *Handbook on estimation of external cost in the transport sector* is also the most current source on air pollution externalities. The summary values given in the handbook are as follows:

Urban, Petrol Car	€ 0.10 /passenger km
Urban, Diesel Car	€ 0.93 /passenger km

Interurban, Petrol Car	€ 0.05 /passenger km
Interurban, Diesel Car	€ 0.55 /passenger km
Urban, Electric Passenger Train	€ 0.00 /passenger km
Urban, Diesel Passenger Train	€ 1.51 /passenger km
Interurban, Electric Passenger Train	€ 0.00 /passenger km
Interurban, Diesel Passenger Train	€ 0.61 /passenger km
Aircraft, weighted	€ 117 per flight

Eurostat data for the nine states that have provided a continuous series of data on the stock of petrol and diesel cars between 1996 and 2007[204] is presented in Figure 35. As shown, if current trends continue around 63% of the European vehicle stock will have diesel engines by 2020. Accordingly the mean air quality externality for a car can be taken as € 0.63 per passenger km for an urban trip and € 0.36 per passenger km for an interurban journey for the purposes of the current exercise.

Figure 40. Diesel Powered Motor Car Population 1996-2020



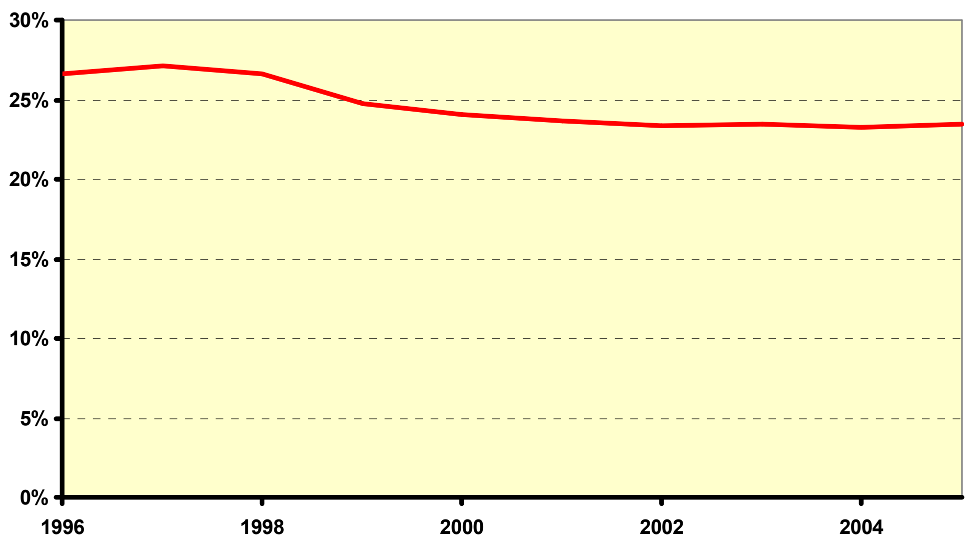
Source: *Eurostat 1996-2007, extrapolation 2008-2020 by Pegasus Transconsult*

On the basis of the calculation described above for the noise impact assessment a civil aviation air pollution externality of € 117 per flight can be taken as € 0.24 per passenger km.

204 Belgium, Czech Republic, Germany, Latvia, Austria, Poland, Finland, Sweden and the United Kingdom.

Eurostat data showing the passenger train kms operated by electric and diesel traction are available from Eurostat either as a complete series for the 1996-2005 period or needing only minor interpolation to complete for eleven states[205]. This shows only slight reduction in the proportion of passenger train km operated by diesel traction over the period: from 26.63% in 1996 to 23.44% in 2005 and a somewhat inconsistent trend as can be seen in Figure 36. Given that since 2001 the proportion of train kms operated by diesel traction has stabilised around the 23.5% mark, it is considered appropriate to project that 23.5% of passenger train km will be diesel and 76.5% electric in 2020. As noted below in densely populated urban areas, where most commuter traffic is generated services are almost exclusively provided by electric multiple unit trains. Accordingly urban commuter services can be regarded as being provided by electric trains, while interurban services used by other global market segments are served by a mixture of diesel and electric trains. Examination of the traffic patterns in Great Britain, an opened market reveals that in 2007-8 some 24.6% of train km were operated by RUs whose function is exclusively or primarily commuter[206]. For the purposes of this exercise therefore some 75% of passenger train km can be regarded as interurban, thus 31.3% of them can be assumed to be diesel hauled and 68.7% electrically hauled. Thus the air quality eternality of an interurban train can be taken as € 0.19 per passenger km, which equates to a value of € 0.17 per passenger km for modal transfer from road to rail, or € 0.05 per passenger km for modal transfer from air to rail.

Figure 41. Diesel Powered Passenger Train km 1996-2005



Source: *Eurostat*

[205] Belgium, Bulgaria, Czech Republic, Spain, France, Latvia, Lithuania, Hungary, Poland, Slovenia, Slovakia & Croatia. Spanish data interpolated for 2003, some Hungarian data interpolated for 1997 & 1998, decimal point corrected on one Hungarian dataset in 1999, 2000 & 2001, Slovenian data interpolated in 2003, as is the Slovak data for 1999.

[206] Source: *National Train Trends 2008-2009 Yearbook*, published by the Office of Rail Regulation.

Dealing with urban commuter traffic first, in major urban areas commuter rail services are almost exclusively provided by electric multiple unit trains, and any modal shift to rail would be from road. Accordingly the value of the air quality benefit delivered can be taken as € 0.63 per passenger km.

In respect of inter-urban traffic given that modal shift is predicted by the transport model to comprise 98.8% from road and 1.2% from air, all of the latter arising from inter-urban travel, and that 88.44% of the model shift under the Base Case would be inter-urban traffic. Accordingly the value of the air quality benefit delivered can be taken as € 0.17 per passenger km.

On the basis of the assumptions outlined above, the total value in air pollution terms for all thirty states of the modal shift inherent in the Base Case for each global market segment should be as given in Table 9.7.11.

Table 9.7.11 - Value of Air Pollution Reductions in Base Case, Relative to Base 2020 Scenario

	Value
Business	€312 M
Commuter	€1 022 M
Holiday	€206 M
Private	€1 593 M
TOTAL	**€3 133 M**

Unfortunately other than to identify the likely savings in the urban commuter rail segment as it is not possible to credibly disaggregate the above by global market segment.

9.7.3.2. Quantification of Regulatory Models

On the basis of the above, the total value in air quality terms for all thirty states of the modal shift for each regulatory option for each global market segment should be as given in Table 9.7.12

Table 9.7.12 - Value of Air Pollution Reductions Relative to Base Case

	Model B	**Model E**	**Model G**	**Model H**
Business	-€238 M	-€5 M	€953 M	€479 M
Commuter	€10 M	€16 M	€8 M	€11 M

	Model B	Model E	Model G	Model H
Holiday	€15 M	€15 M	€4 M	€4 M
Private	-€128 M	€42 M	€729 M	€394 M
TOTAL	**-€341 M**	**€68 M**	**€1694 M**	**€888 M**

9.8. Scaling Results up to EU Level

9.8.1 Safety

There is no reason to regard the target states as being other than typical, the results of all models in the three target states therefore be applied to the whole EU: none of the models would produce level of safety that is measurably different from that of the Base Case.

9.8.2 Investment, turnover & profitability

The methodology used has been to assume that any changes in profits would be wiped out by changes in public support (see section 9.8.6). In addition, turnover change has been taken as being identical to passenger volume change; therefore, turnover and passenger numbers cannot be used as to independent scores.

Investment needs have been taken as proportional to changes in train-km. The rates of change in train kilometres therefore provide a reasonable reflection of the relative investment needs are given in Table 9.8.1

Table 9.8.1 - Predicted Changes in Train km Relative to Base Case

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Belgium	+7%	+11%	+20%	+16%
Bulgaria	0%	+2%	+7%	+5%
Czech Republic	0%	+6%	+9%	+8%
Denmark	+3%	+9%	+40%	+25%
Germany	-3%	+0%	+15%	+8%
Estonia	0%	0%	+10%	+5%
Ireland	+4%	+10%	+20%	+15%
Greece	+0%	+10%	+20%	+15%
Spain	+3%	+11%	+40%	+26%

State	Change Relative to Base Case			
	Model B	**Model E**	**Model G**	**Model H**
France	+4%	+7%	+25%	+16%
Italy	0%	0%	+25%	+13%
Lithuania	0%	0%	+10%	+5%
Latvia	0%	0%	+10%	+5%
Luxembourg	-1%	+4%	+40%	+22%
The Netherlands	0%	+2%	+8%	+5%
Hungary	0%	+4%	+15%	+10%
Austria	-2%	+5%	+20%	+13%
Poland	0%	+4%	+8%	+6%
Portugal	+2%	+7%	+30%	+19%
Romania	0%	+3%	+8%	+6%
Slovenia	+6%	+10%	+15%	+13%
Slovakia	+0%	+6%	+9%	+8%
Finland	+3%	+7%	+30%	+19%
Sweden	0%	0%	+15%	+8%
United Kingdom	-30%	-20%	0%	-10%
Croatia	0%	+6%	+20%	+13%
Macedonia	0%	+6%	+8%	+7%
Norway	+7%	+15%	+40%	+28%
Switzerland	+7%	+14%	+20%	+17%
Turkey	0%	+4%	+15%	+10%
EU 27	**-3%**	**+1%**	**+18%**	**+10%**
EU 15	**-4%**	**0%**	**+19%**	**+10%**
EU 12	**0%**	**+4%**	**+10%**	**+7%**
Total	**-3%**	**+2%**	**+18%**	**+10%**

9.8.3 Market structure

The three target states are regarded as being generally representative of the Community as a whole, and thus enable lessons to be drawn from them that are applicable at a European level.

Market structure has a European dimension as well as a national dimension: as has already been seen in the experience of market opening to date, large RUs will emerge with commercial interests in a number of states. It is likely that there would only be a small number of pan-European RUs, which will differ significantly in size. In a diverse market these would be supplemented by a larger number of smaller RUs active in a small number of states, and a still larger number of RUs active on a national basis.

One can also anticipate significant differences in the structure of the market between different market segments, with the more difficult and specialist segments such as high-speed rail being almost the exclusive province of large pan-European RUs and national incumbents. Whilst smaller nationally based RUs would be far more significant in the regional and commuter segments. The number of RUs and the market dominance of the largest RUs would be different under open access and under public service contracts, a smaller number of RUs and greater dominance by the largest RUs could be expected under an open access environment, since economies of scale would be lower in a tendered environment.

Modal B will produce the most diverse market structure: a huge volume of individually small contracts would give the lowest barriers to entry. The main differences between Models E, G and H are likely to occur in sectors where there is a prospect of open access. For parts of the network operated under public service contracts, with open access not permitted then the impact for all three models should be similar (e.g. urban commuter lines), whereas if open access is permitted (e.g. busy express routes) then there is likely to be quite a significant difference in 2020. Model G, by forcing the pace of market entry, will produce a more diverse structure than the other two models. The impact of Model H is likely to be similar, although the prospect of revenue abstraction from open access RUs is likely to have some deterrent impact on routes where there is a credible prospect of open access. Model E by contrast provides a significant degree of protection to the incumbent where it is large and powerful, as it has the power to drive out competition by running loss making services in competition with a new entrant, a perception which could be expected to deter market entry. Similarly under Model E fear of powerful competition from larger neighbours could be expected to force incumbent in small state into amalgamation with their neighbours, reducing market diversity.

The market diversity in each market segment in 2020 is predicted to be as given in Table 9.8.2 (naturally significant variation in the experience between states can be anticipated).

Table 9.8.2 - Market Diversity Predicted Under Each Model

	Base Case	Model B	Model E	Model G	Model H
High-speed	Low	Low	Low	High	Moderate
Conventional Express	Low	Moderate	Low	High	Moderate
Regional	Low	V High	Moderate	High	High
Commuter	Low	V High	High	High	High

9.8.4 Passenger volumes

As noted in 9.1 the demand modelling work has already been scaled up to an EU level, accordingly the definitive results are given in 9.4.4.

9.8.5 Regional cross-border services

In the case of high-speed services it is not expected that high-speed railway undertakings will make any serious attempt to provide local services in any part of the EU for any model (note, for example, the absence of any intermediate stations between Lille and Bruxelles/Brussel). For conventional express services, it might be expected that there may be adjustments to timetables and stopping patterns to cater for local traffics, extra services under any of the models are highly unlikely.

Local cross-border flows are best served by regional train services. Given however the lack of support identified by the Commission itself, the provision of cross-border services will depend more on the inclinations of local politicians than the model chosen. There are precedents however (such as the Gronau – Enschede route, reopened after having been closed for some twenty years).

Commuter services hardly play any international role.

9.8.6 State Aid

Table 8.3 shows the effects of the models on public support (expressed as percentage change in public support relative to the Base Case).

Table 9.8.3 - Change in Public Support Relative to Base Case

	Model B	Model E	Model G	Model H
Denmark	-3.4%	-12.1%	-0.7%	+6.1%
Spain	-4.3%	-22.5%	-1.3%	+3.6%

	Model B	Model E	Model G	Model H
Poland	0.0%	-23.2%	-20.5%	-14.4%

The absolute effects differ dramatically from state to state, reflecting among other things differences between the financial situation in the Base Case, effects of the models on passenger volume and train-km and productivity changes under the various models. Consequently, an aggregation of the data for all Member States would require detailed analysis for each state. Nevertheless, the relative ranking between the different models is stable. Therefore the best way to aggregate the results is to use the following scoring:

	Model B	Model E	Model G	Model H
Score	7	10	6	4

9.8.7 Infrastructure manager efficiency

Two aspects for infrastructure manager efficiency were identified, the infrastructure manager's own internal efficiency and the change in unit costs due to changes in traffic levels. The target states are regarded as representative and accordingly the changes expected are shown in Tables 9.8.4 and 9.8.5.

Table 9.8.4 - Infrastructure Manager's Internal Efficiency

	Model B	Model E	Model G	Model H
High-speed	0 %	0 %	0 %	0 %
Conventional Express	+2 %	+1 %	+1 %	+1 %
Regional	0 %	0 %	0 %	0 %
Commuter	0 %	0 %	0 %	0 %

Table 9.8.5 - Change in infrastructure costs (costs per train-km)

	Model B	Model E	Model G	Model H
High-speed (Spain only)	-3 %	-3 %	-3 %	-3 %
Conventional Express	-2 %	-2 %	-2 %	-2 %
Regional	0 %	0 %	0 %	0 %

	Model B	Model E	Model G	Model H
Commuter	0 %	0 %	0 %	0 %

9.8.8 Service levels in different market segments

This section deals with the changes in service provision (essentially train km planned in the timetable). Whilst Spain and Poland have generally lower levels of train provision than Denmark in the Base Case. A sharp divergence was identified between the target states, in the simplest terms, the greater the GDP per capita greater the impact is likely to be, although the relationship is considerably more complex than this, factors such as the current intensity of a state's rail infrastructure, national fare levels, and population distribution all have an impact.

The impact of market opening on service levels is predicted to be greater in the high-speed and express segments than in the regional and commuter segments, although the ranking is not consistent between the target states.

Table 9.8.6 shows the changes expected under each model at an aggregate European level with respect to the Base Case.

Table 9.8.6 - Changes in Service Levels Relative to Base Case by Market Segment

	Model B	Model E	Model G	Model H
High-speed	+7%	+2%	+36%	+19%
Conventional Express	+3%	+1%	+18%	+10%
Regional	0%	0%	+9%	+6%
Commuter	-1%	+2%	+8%	+5%

The mean changes in service level each state considered are given in Table 9.8.7

Table 9.8.7 - Changes in Service Levels Relative to Base Case by State

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Belgium	+7%	+11%	+20%	+16%
Bulgaria	0%	+2%	+7%	+5%
Czech Republic	0%	+6%	+9%	+8%
Denmark	+3%	+9%	+40%	+25%

State	Change Relative to Base Case			
	Model B	**Model E**	**Model G**	**Model H**
Germany	-3%	+0%	+15%	+8%
Estonia	0%	0%	+10%	+5%
Ireland	+4%	+10%	+20%	+15%
Greece	+0%	+10%	+20%	+15%
Spain	+3%	+11%	+40%	+26%
France	+4%	+7%	+25%	+16%
Italy	0%	0%	+25%	+13%
Lithuania	0%	0%	+10%	+5%
Latvia	0%	0%	+10%	+5%
Luxembourg	-1%	+4%	+40%	+22%
The Netherlands	0%	+2%	+8%	+5%
Hungary	0%	+4%	+15%	+10%
Austria	-2%	+5%	+20%	+13%
Poland	0%	+4%	+8%	+6%
Portugal	+2%	+7%	+30%	+19%
Romania	0%	+3%	+8%	+6%
Slovenia	+6%	+10%	+15%	+13%
Slovakia	+0%	+6%	+9%	+8%
Finland	+3%	+7%	+30%	+19%
Sweden	0%	0%	+15%	+8%
United Kingdom	-30%	-20%	0%	-10%
Croatia	0%	+6%	+20%	+13%
Macedonia	0%	+6%	+8%	+7%
Norway	+7%	+15%	+40%	+28%
Switzerland	+7%	+14%	+20%	+17%
Turkey	0%	+4%	+15%	+10%
EU 27	**-3%**	**+1%**	**+18%**	**+10%**
EU 15	**-4%**	**0%**	**+19%**	**+10%**
EU 12	**0%**	**+4%**	**+10%**	**+7%**

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Total	**-3%**	**+2%**	**+18%**	**+10%**

9.8.9 Price & quality

This section deals with price effects, since quality is a qualitative rather than a quantitative measure, and as noted, it is not envisages that any of the models have inherent characteristics that would have a particular impact on quality (this being driven by the detail arrangements). The Consortium generally expects price effects only in connection with open access, while in case of tendering it is more plausible that train frequency would be increased.

The mean changes in price level each state considered are shown in Table 9.8.8.

Table 9.8.8 - Changes in Price Levels Relative to Base Case by Market Segment

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Belgium	0.0%	-0.1%	0.0%	0.0%
Bulgaria	0.0%	0.0%	0.0%	0.0%
Czech Republic	0.0%	0.0%	0.0%	0.0%
Denmark	-0.2%	-0.3%	0.0%	-0.1%
Germany	0.0%	0.0%	0.0%	0.0%
Estonia	0.0%	0.0%	0.0%	0.0%
Ireland	-0.1%	-0.3%	0.0%	-0.1%
Greece	0.0%	-0.2%	0.0%	-0.1%
Spain	-0.2%	-0.3%	0.0%	-0.1%
France	-0.2%	-0.3%	0.0%	-0.1%
Italy	0.0%	0.0%	0.0%	0.0%
Lithuania	0.0%	0.0%	0.0%	0.0%
Latvia	0.0%	0.0%	0.0%	0.0%
Luxembourg	-0.1%	-0.1%	0.0%	0.0%
The Netherlands	-0.1%	-0.1%	0.0%	0.0%
Hungary	0.0%	0.0%	0.0%	0.0%
Austria	0.0%	-0.1%	0.0%	0.0%

State	Change Relative to Base Case			
	Model B	Model E	Model G	Model H
Poland	0.0%	0.0%	0.0%	0.0%
Portugal	-0.2%	-0.2%	0.0%	-0.1%
Romania	0.0%	0.0%	0.0%	0.0%
Slovenia	-0.1%	-0.1%	0.0%	0.0%
Slovakia	0.0%	0.0%	0.0%	0.0%
Finland	-0.2%	-0.2%	0.0%	-0.1%
Sweden	0.0%	0.0%	0.0%	0.0%
United Kingdom	-2.0%	-0.3%	0.0%	-0.1%
Croatia	0.0%	0.0%	0.0%	0.0%
Macedonia	0.0%	0.0%	0.0%	0.0%
Norway	-0.2%	-0.2%	0.0%	-0.1%
Switzerland	-0.2%	-0.2%	0.0%	0.0%
Turkey	0.0%	0.0%	0.0%	0.0%
EU 27	**-0.5%**	**-0.2%**	**0.0%**	**-0.1%**
EU 15	**-0.5%**	**-0.2%**	**0.0%**	**-0.1%**
EU 12	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Total	**-0.5%**	**-0.2%**	**0.0%**	**0.0%**

9.8.10 Service availability by market segment

No quantification of this aspect is possible: the issues are qualitative; the position at an EU level is the same as discussed for the target states in Section 9.6.3. As a qualitative item, scoring is the best form of differentiating between models:

	Model B	Model E	Model G	Model H
Score	4	5	7	6

9.8.11 Railway employee numbers

Extrapolating the figures for the target states, the forecast total number of rail staff engaged in the passenger business is given in Table 9.8.9.

Table 9.8.9 - Predicted Employment Level Change in Passenger Rail Business

	Model B	Model E	Model G	Model H
EU15 + NO & CH	Decrease	Stable	Stable/slight increase	Stable/slight increase
EU12 + Candidates	Decrease	Stable	Stable	Stable

As noted in Section 9.6.4 the changes in headcount implied above take no account of posts transferred to external service providers and are almost a 'worse case scenario', as experience with market opening in Great Britain indicates that an appropriate package of ancillary measures accompanying market opening can boost ridership to a greater extent than forecast herein. To the extent under British experience that there has been no net headcount loss at all.

9.8.12 Railway employee pay

Table 9.8.10 shows the predicted change in salary levels relative to the Base Case, based on extrapolation of the estimates for the target states.

Table 9.8.10 - Predicted Salary Levels in Passenger Rail Business Relative to Base Case

Model B	Model E	Model G	Model H
+ 5%	+7%	+9%	+9%

It should be noted that, again the impact would be unequal between states, with increases projected to be higher in the new Member States.

9.8.13 Greenhouse gas emissions

The results have already been scaled up to an EU level in 9.4.49.7.1.

9.8.14 Noise

The results have already been scaled up to an EU level in 9.4.49.7.2.

9.8.15 Air quality

The results have already been scaled up to an EU level in 9.7.3.

9.9. Evaluation

A scored matrix has been used rate the anticipated performance of each of the four models subjected to impact assessment against each of the impact assessment criteria outlined above. The matrix is scored on an aggregate basis for all thirty states considered and all marked segments, in part for reasons of comprehensibility, to condense the impact assessment into a simple and easily understood table, and in part because a market segment by market segment approach is not possible, in a credible way, in view of the inevitable differences between the market-orientated segmentation of the transport model and the production orientation needed to segment the railway passenger business.

In the matrix shown in Table 9.9.1, each combination of impact assessment attribute and model is scored from 0 to 10, with the Base Case being scored at 5 in each instance, so that a score between 0 and 4 indicates a worse result than the Base Case, a score of 5 indicates the same or similar result as the Base Case, and a score between 6 and 10 indicates that the attribute/model combination would return a better result than the Base Case.

Table 9.9.1- Evaluation of Models

Attribute	**Base Case**	**Model B**	**Model E**	**Model G**	**Model H**
Impact on Passenger Railway Transport					
Safety	5	5	5	5	5
Investment, Turnover & Profits	5	5	6	8	7
Market Structure	5	10	6	9	7
Passenger Volumes	5	4	5	7	6
Regional Cross-Border Services	5	5	6	7	7
Impact on the Economy					
State Aid	5	7	10	6	4
IM Efficiency	5	6	6	6	6
Impact on Social Aspects					
Service Levels	5	5	5	9	7
Quality & Price	5	6	6	5	5

Attribute	Base Case	Model B	Model E	Model G	Model H
Service Availability	5	4	5	7	6
Employee Numbers	5	4	4	4	4
Employee Pay & Conditions	5	6	7	8	8
Impact on Environmental Aspects					
GHG Emissions	5	4	5	9	7
Noise	5	6	5	2	3
Air Quality	5	4	5	10	8

Note the above scores should on no account be summed to give a crude ranking for the options: the above factors vary considerably in importance and would need weighting to give an overall score. Although some tentative weightings were developed, it was concluded in consultation with DG MOVE that selection of relative weights is too subjective to be of value, particularly since the appropriate weighting varies with individual circumstances.

The above table should therefore be used as means of visualising the relative strengths and weaknesses of the various models, relative to the Base Case and to each other.

10. Conclusions

10.1. Optimum Regulatory Model for Market Opening

10.1.1 Overview

Four Options were subjected to detail impact assessment:

Model B: open access only, but with public funding for unremunerative Services through individual tender.

Model E: open access on profitable routes only, with competitive franchising for remainder.

Model G: universal public service contracts with open access permitted under regulatory control.

Model H: universal competitively tendered public service contracts with unrestricted open access on defined lines only.

Model G scores better against more of the impact assessment criteria than any of the other models, and in most cases Model H comes second, followed by Model E and then Model B. However, in absolute terms the difference between the various models is not great. Accordingly selection of a particular model is as much a philosophical decision as anything else.

Given that most rail passenger services require public funding, Model B is effectively a service contract that gives the promoter a high degree of control over the outputs and leaves responsibility for development of a nation's passenger rail network firmly in the hands of the IM, and Government/governmental agencies. However, the promoter would have much less control over any parts of the network that could be operated profitably by open access RUs at or above a defined minimum service level.

The open access aspects of Model E are fundamentally different to Model B in outlook. Under Model E the level of service would be left entirely to the market, development of network would still mainly be in the hands of the promoter/Government, but major open access RUs, in for the long-term, would also have a say. Nevertheless under this model the promoter is still assured that a service to a specification set by the promoter would be provided on parts of the network retained for social reasons.

In the case of Model G, the medium-long term nature of a service gives RUs operating public service contracts much more of a long-term stake in the future passenger railway. Perhaps more than under any other option there are almost an infinite variety of different shades between vesting responsibility for deciding what services are provided and what the long-term vision for the network should be between the RUs and the promoter/Government, depending on the detail arrangements. Nevertheless Government has a fundamental role in deciding the size of the national passenger rail network that it is prepared to support.

Model H is effectively a combination of Models E and G, under which the promoter/Government guarantees a minimum service level over a defined minimum national passenger network, while permitting the service to be determined by market forces on parts of the network where it is believed that open access RUs could operate profitably. The biggest issue with this model is likely to be difficulty in obtaining competitive bids for contracts covering parts of the network where open access is also permitted, unless there are clear ways of recompensing the RU providing the PSO against open access revenue abstraction.

10.1.2 Variable impact between states

The impact assessment has thrown into sharp relief the extent to which the impact of market opening would be determined by the level of economic development of a nation's economy. The greatest positive impact from market opening by 2020 would be in states with the most advanced economies that have yet to open their domestic passenger rail markets. In this context it is notable that the Member States who have already opened their domestic rail passenger markets are those whose economies are amongst Europe's largest[207].

By contrast in the new Member States (EU12 group) it is not predicted that the act of market opening would have a great impact by 2020. On the other hand no particular negative impacts are anticipated either. It is therefore considered that the impact of market opening in these states would mainly be experienced after 2020, as they develop further economically.

The Consortium considers that the main impact of passenger market opening in the EU12 group of states would be to enforce a more commercial and businesslike relationship between Government and the railway industry. There is a mismatch between governmental aspirations of the extent of the national rail passenger network and the funding that it is prepared to provide in many EU12 states. The imposition of a more contractual relationship between Government and the incumbent RU, and giving the incumbent more independence from Government would make it harder for promoters not to pay in full the monies owed to RUs for operating public service contracts (as happens in a few states). It should also force Government into funding its national (passenger) railway system and associated infrastructure in a sustainable manner. The negative consequences of this are that Government would either need to take a more realistic view on the size of a network that it can afford, or to increase the level of public support that it provides.

In EU15 group of states the experience from the forerunners of market opening can most easily be transferred, so that no drastic disruption should be expected in this group of states. In the new Member States (EU12 group), the most drastic changes have

[207] The four states who have opened their domestic rail passenger markets the most are the first, second, fourth and eighth largest economies in the EU.

already taken place in the transition years immediately after 1990[208], market opening is unlikely to have such a profound impact.

An important lesson that can be drawn from the experience of the Member States which have already opened their market to any extent is that in no case has a dramatic deterioration of the incumbent company, passenger traffic levels, or its workforce occurred, instead changes have taken place gradually. The only exception to this was Great Britain where a political decision was made to dismantle the incumbent; however, even here some of the franchises were won by the existing management teams, staff were transferred across *en bloc* to the new companies retaining employment conditions, and traffic levels increased.

10.1.3 Strengths & weaknesses of particular models

The key strengths and weaknesses of each of the models subjected to impact assessment analysis can be summarised as follows:

	Main Strengths	Main Weaknesses
Model B	Gives the promoter full control of the service provided Lowest barriers to entry Produces most diverse market structure Open access aspects are likely to reduce Base Case fare levels	Gives franchisees little long-term interest in success of operation Complex to arrange and manage Potentially high transaction costs Little or no inherent ridership growth under this model Does not encourage innovation Delivers little or no environmental benefit

[208] In effect, this is true to some degree for Western European states as well, since basic railway reforms commenced at the end of the 1980s in most states.

	Main Strengths	Main Weaknesses
Model E	Minimises public support requirement: lower than any other model Likely to deliver lower fare levels than any other option Leaves design of long-distance network to the market, thus promoting efficient design and financial sustainability of passenger network Cost effective regional and commuter services are promoted by PSO tendering	Little or no inherent ridership growth in long-distance services under this model No guarantee of adequate or stable public service where services are to be provided by open access Difficult to provide an integrated national network for passengers No protection from commercial excess Likely to lead to least diverse market structure Delivers little or no environmental benefit Requires low infrastructure charges for the open access element to work
Model G	Delivers highest rail ridership and modal share Delivers greatest environmental benefits Produces most dynamic rail industry of any model, with biggest turnover, greatest investment levels, more employees, and greater innovation Produces a diverse market structure quickly Has more potential for increased service frequency than any other model Delivers better employee pay and conditions than any other option	Potential for increased requirement for public support than Models B and E, albeit driven by greater use Limited role for market forces to determine the shape of network: largely reliant on planning by Government/governmental bodies

	Main Strengths	Main Weaknesses
Model H		Has most of advantages and disadvantages of Model G, in a weaker form, without offering any real unique advantages of its own Likely to be difficult to obtain competitive bids from PSO tenderers where revenue abstraction from open access competition appears possible Above issue and open access revenue abstraction is likely to higher public support than any of the other models

It is considered that, operating within the framework of the EU's *Railway Packages*, all models would deliver a level of safety comparable to that delivered under the Base Case.

10.1.4 Model K – a special case?

Notwithstanding the above, and as noted in Section 7, the Consortium also considers that in some cases Model K (vertical micro-franchises[209]) is likely to be the most appropriate market opening option. The Consortium considers that national IMs and large RUs have cost structures that are inappropriate to lightly used, low intensity lines, are organisationally remote from the local communities that they serve, and tend to run such lines as much through inertia as design.

Vertical franchising is an essential part of a micro franchise as it is on the IM side of the partnership that the most inappropriate cost structures for minor lines are generally found. It is considered that running wholly unremunerative lines on a low-cost basis by organisations based in the local community and who are committed to their future[210], offers a survival strategy for parts of the network that might otherwise be lost.

It should be noted, however, that it appears that it would be necessary to regard such lines as *"lines and networks isolated from the rest of the Community"* for Model K to be compatible with EU legislation. There are also a number of other preconditions that would need to be scrutinised for compliance before micro-franchising could be used in a particular case; these are discussed in Section 7 herein.

209 i.e. where the franchisee is responsible for both infrastructure and operations of individual lines or very small groups of lines.

210 This could include both bespoke companies set up to run particular lines, and established local businesses, such as small local transport operators. Naturally the concept would only work in places where there is sufficient local entrepreneurialism, and where the standards of business probity are appropriate.

10.2. Preconditions for Market Opening

It is considered that it would not be possible to open the European domestic rail passenger market until the following preconditions are met throughout Europe:

- complete transposition of all EU rail legislation including the three Railway Packages into national law and their full implementation;
- an entrepreneurial business culture in Member States, that functions in an appropriate manner;
- a commitment to the future and success of rail from Member States;
- an IM that acts in an open and even-handed manner, this is most easily accomplished where the IM is independent and not dependent on an RU for any of its functions (it is noted that this should be the case with complete and proper implementation of EU law).

10.3. Increasing the Impact of Market Opening

10.3.1 Key attributes

The predicted impact of each market opening model *per se* is likely to be comparatively modest, when compared with the Base Case. Rather the factors that can cause significant growth following market opening, as seen in Great Britain, are considered by the Consortium to be due to measures that accompany market opening rather than the mere act of opening markets. Accordingly it is considered that if the decision is made to further open domestic passenger markets, it is not critical which market opening model is adopted, from among those considered herein, BUT what is important is the detail arrangements that accompany the model used. Any formal market opening should be considered a precondition of a wider reform package considered to make the market opening practical as well as formal. It takes more than just formal market opening in order to develop markets: the limited impact of rail passenger market opening in Italy to date shows the result when the aspects of accompanying measures are seriously sub-optimal.

It is considered that it is on the following issues that the success or failure of market opening mainly rides:

- impartial and powerful economic regulation covering all parts of the rail industry (including the award process for public service contracts);
- a national ticketing system with inter-availability of a range of standard national tickets between RUs, backed up by a fair and impartial inter-RU revenue allocation system;

- ticketing, sales and information systems operated impartially at stations, with any customer being able to purchase a ticket for any domestic journey from a single sales point;

- an infrastructure charging system that encourages RUs to run additional trains, which also applies on a non-discriminatory basis to small RUs running only a small number of trains;

- availability of suitable rolling stock;

- full implementation of all EU Directives and Regulations affecting the rail industry in both letter and spirit.

These issues are briefly discussed in turn in the following sub-sections.

10.3.2 Impartial economic regulation

Totally impartial, independent and powerful economic regulation is a *sine qua non* of effective market opening, while establishment of a regulator is mandated in Directive 2001/14/EC current European legislation only covers regulation of the IM, and in same states has resulted in rather ineffectual regulation. As the example of Germany illustrates it is pointless to have economic regulation unless the regulatory body has all the powers that it needs (see Annex 5), this specifically relates to power to collect all the information that it needs as well as powers of enforcement.

The awarding procedures for public service contracts require careful monitoring by regulatory institutions. In states where the incumbent RU and the IM have close linkages, a close watch needs to be kept for side-deals influencing contract awards (e.g. infrastructure investment or locating facilities employing substantial numbers of staff). It may be that a European regulatory institution would be best suited for this regulatory task, since PSO contracts are awarded by government agencies.

If any passenger market opening is have a significant impact it is considered that regulation of potential anti-competitive behaviour between RUs is important, particularly where one RU controls or has ownership of particular assets that are required by other RUs (e.g. carriage sidings, marketing facilities, etc).

Effective regulation is also needed to enforce the rights of passengers: despite the reforms of the past decade, large parts of the railway industry remain inwardly focussed and production orientated, with too little attention paid to the needs and aspirations of the travelling public. These issues go beyond those covered by the Passengers' Rights Regulation. Issues such as non-discriminatory provision of information, sale of the lowest cost appropriate ticket, efficient and courteous customer services are all areas where there is scope for regulatory intervention to improve performance.

The experience of Great Britain shows the most effective regulation has a simple structure and combines both economic and safety regulation. A complex regulatory structure with different bodies jockeying for position reduces the performance of the entire rail industry as could be seen in Great Britain in the 2000-2005 period while the Strategic Rail Authority was in existence (see Annex 6). Combination of economic and safety regulation within a single body enables a more coherent approach to regulation to be undertaken.

Setting clear objectives and targets for the regulator is also crucial: experience has shown that setting a large number of targets makes some of them mutually contradictory (e.g. a requirement to maximise efficient infrastructure capacity use, a requirement to promote both passenger and freight use, and a requirement to encourage competition). Therefore the targets set for regulators in their constitution should be as simple and as few in number as possible, and direction should be provided in their terms of reference on how any inherent conflict between objectives should be handled. Given, that differing national circumstances mean that it is unlikely that a standardised European set of objectives could be used, it may be appropriate for DG MOVE to have powers to approve regulatory targets and objectives proposed by Member States.

10.3.3 National ticketing system

Ticket inter-availability is a vital plank in achieving benefits for the travelling public from market opening: if more than one RU operates on a route, unless customers can use tickets on any train they could actually experience an effective decrease of service frequency even though the number of trains operating has actually increased. It is also important for passengers to be able to buy tickets to cover their entire journeys easily: the more complex the process of buying a ticket is the less likely a potential passenger is to use rail.

Involved in this issue is the question of the degree to which railway undertakings operating services under franchises or concessions are free to make non-standard offers. On the one hand it can be argued that giving freedom to commercial organisations invigorates the market, on the other that a variety of times of day at which cheap fares are available (for example) merely serves to confuse potential customers. An example of permitting freedom in the marketplace might be yield management as used in the airline industry where it was a crucial factor in enabling competitive airlines to penetrate the market, triggering a general fall in air fares. This would not be possible with a rigid fare structure. However, freedom to make non-standard offers does not preclude that companies being required to accept the full range of standard national tickets as well.

An advantage of a national ticketing system is that it can be used to coordinate aspects common to all tickets, such as classes of travel, a single annual re-pricing date, and conditions of carriage. This in turn makes the travel experience comprehensible for average members of the travelling public: a confusing plethora of different pricing structures and travel conditions suppresses rail use. In addition, subject to compatibility with the regulatory model, a standardised national fare structure and regulated fares can be imposed for a common national range of tickets.

Experience in Great Britain with a national ticketing system and numerous RUs has shown that a national ticketing system can work well, as can the apparently complex inter-RU revenue allocation system, if operated impartially. A revenue allocation system should reflect the services and routes passengers actually used, thereby rewarding RUs providing more attractive services and thus maintaining/driving up standards.

The foregoing does not prevent an RU offering special low-price tickets valid only on its trains, provided tickets can be issued for the journey as single sale, including any use of other RUs' trains on other legs of a journey. It is important that customers should not have to go to a variety of sales points to buy the lowest price tickets for a single journey (as can be possible when making multi-leg journeys by air).

Similarly the system could also allow RUs to offer low cost tickets purchased in advance using yield management techniques, in much the same way that airlines do, provided that:

(i) tickets can be purchased that cover the passenger's entire rail journey at the lowest price available for all RUs involved; and

(ii) passengers can still 'turn-up and go' purchasing tickets at the station at competitive prices, with the sole exception of reservation-only services on which every seat has genuinely already been sold: this is considered by the Consortium to be a fundamental passenger right.

10.3.4 Impartial commercial & information systems

The ability for any customer to be able to purchase a ticket for any national journey at any station ticket office or ticket machine is a key part of equitable competition between RUs and also of any national ticketing system. It is considered the non-discriminatory functioning of the ticketing system should be overseen by independent economic regulation. It is noted that in Germany for example DB charges fees for selling other RUs tickets that are commercially unattractive (see Annex 5); it is considered that ticket office costs should be regarded as a central industry cost and recovered accordingly, with ticket offices either run by the IM or an RU holding a public service contract where the ticket office costs are recovered as a part of its price when bidding for the contact.

The same issue applies to other activities at stations with a commercial impact, including making station announcements for all trains, having all trains shown on station departure boards, and shown on public timetables displayed at stations, irrespective of RU. Similarly promotional material (e.g. timetable leaflets) should be displayed at a single point for all RUs, station help points should provide information on all services using the station, and services such as lost property should be common to all RUs. In the view of the Consortium, the majority of these services should be centrally funded and be regarded as an overhead of the national rail system and recovered as such.

Universal rights are also required to operational facilities at stations required by RUs to operate services, such as re-filling vehicle water tanks, vehicle examination, cleaning, traincrew messing, etc. Stakeholders told the Consortium that they did not find these issues to be unambiguously covered by Annex II to Directive 2001/14/EC.

The Consortium considers that a further shortcoming of Directive 2001/14/EC, even from the standpoint of the market opening that has already been legislated for, is that it does not give RUs automatic rights to access railway communications systems (and associated operational IT systems)[211]. It is considered the mandatory rights would increase the impact of any market opening legislated for.

In the view of the Consortium essential facilities at railway stations are as much a part of national rail infrastructure as tracks and signalling systems, and should be owned by the IM, with access being overseen by independent economic regulation. In both Germany[212] and Italy the incumbent RU has laid claim to ownership of facilities such as ticket offices, which has impeded the operation of 'turn up and go' sales for other RUs, and thus the impact of market opening. This does not mean that it might not be appropriate for smaller stations to be operated by an RU (particular under public service contracts, where station management could become part of the services tendered), provided that arrangements exist for non-discriminatory access, and that it is overseen and enforced by the independent regulator. Accordingly although Annex II to Directive 2001/14/EC gives RUs rights to use *"passenger stations, their buildings and other facilities"* it would appear that more explicit legislation is required to set down both rights and the permissible charges for their use more explicitly. It is understood that DG MOVE intends to address this matter under the forthcoming recast of the First Railway Package.

10.3.5 Infrastructure charging systems

The way in which the infrastructure charging system works is a key determinant of the change in service frequency that could be expected after market opening. In a service operated under a public service contract, the access charge is often covered by the promoter. However, sometimes the RU might decide whether or not to run additional services. Its decision is then akin to that which would be made by an open access RU: are the revenues that would be generated by each additional service higher than its cost? The magnitude of the infrastructure charge is a crucial element in this decision: if there is insufficient headroom between the total infrastructure charge and the additional revenue that the train would generate to cover the RUs train provision and operation costs, then the additional service will not run.

Given that EU policy is to achieve a modal shift from road and air to rail, it is considered that increasing train frequency to induce more users (either through higher frequency, or by improvement of travel conditions, e.g. less over-crowding, more

211 These are listed as "ancillary services" rather than part of the minimum access package, for which automatic rights exist, defined in Directive 2001/14/EC.

212 DB is, however, prepared to sell tickets on behalf of other RUs, but the terms that it offers are commercially unattractive (see Annex 5).

chance of a seat, etc) is a desirable objective. Accordingly it is considered that the infrastructure charging regime should encourage this. When making decisions on how to support the railway system states therefore need to consider whether selective reductions in infrastructure charges might be more effective than straight service subsidy. For example, one might allow RUs to run additional services, over their contracted PSO level, at charges from the IM that equate to the short-run avoidable cost for each additional train.

10.3.6 Availability of suitable rolling stock

Without suitable rolling stock new entrants cannot enter the market, basically RUs have three options:

(i) they could acquire new rolling stock;

(ii) they could acquire second-hand rolling stock; or

(iii) they could lease new or second-hand rolling stock.

For small new entrants the first avenue is closed off: few potential market entrants can demonstrate a sufficiently robust financial case to finance new rolling stock[213], and the timescales involved are prohibitive. As leasing companies are unlikely to order new rolling stock speculatively in an immature market, second-hand stock represents the only viable option for most potential new entrants, particularly those operating in the conventional express, regional, and urban commuter segments.

In three out of the four states that have opened their domestic rail passenger markets (Germany, Italy, and Sweden) the incumbent RU has ended up owning all or almost all suitable passenger rolling stock. It is outwith the remit of this Study to consider whether this was appropriate or not, given the role of state aid in their original purchase, all that can be said herein is that this action has made it more difficult for new entrants. Where Government has reclaimed the rolling stock of the former national railway and used it to establish a leasing market (and raise revenue), as occurred in Great Britain not only has it proved much easier for new entrants, but has also permitted them enter the market in a large scale manner, providing a greater impact from market opening.

Therefore if market opening were to be accompanied by measures to transfer, say, not less than one third of all rolling stock, comprising a reasonable cross-section of the entire fleet[214], to leasing companies the impact of market opening should be much greater. Naturally any RU, including the incumbent, should have the right lease rolling stock in a non-discriminatory manner.

The interaction between the national markets within the EU is also important in this respect. If more markets were to be opened up to competition and an increasing

213 An associated issue is that without long-term guarantees of paths this becomes virtually impossible.

214 Even in Great Britain access to high-speed rolling stock is difficult for open access RUs, as all suitable rolling stock has tended be 'tied up by' franchisees.

proportion of rolling stock is TSI compliant and is able to be used in several Member States, then a common European market for second-hand rolling stock can emerge. A problem of financing rolling stock new builds is that national markets for second-hand equipment are so thin: hence the requirements from leasing companies for long leases at the outset (typically of about fifteen years). With a viable EU-wide market for PSO contracts, a RU operating on an international scale could more easily de-risk its rolling stock financing, and bid for shorter public service contracts, on the basis that the stock could be transferred to another state at the end of the contract. Or, if it cannot use it, it has a strong resale value to another RU.

Notwithstanding the above, the Consortium consider that the issue of availability of rolling stock is an issue whose importance has been overstated in many studies on market opening: if there is viable market, leasing companies will step in, as is happening following freight market opening. The issue is one of providing the initial ‘seed corn’ to get the process moving.

10.3.7 Proper implementation of EU legislation

There is a distinction between mechanical transposition of EU legislation into national law and its full implementation in spirit. The issue of the difficultly of actually being able to refuel at refuelling points to which access rights can be exercised under Directive 2001/14/EC is a classic example of this. It is suggested that there are a very large number of ways in which the practical needs of new entrant RUs could be frustrated, and that it would be difficult to eradicate all of these with specific EU legislation.

It is considered that main way of tackling this issue is through independent, powerful and effective economic regulation of the entire rail industry (see above).

ANNEX 1 - GLOSSARY

ACRONYM	MEANING
ATOC	Association of Train Operating Companies: a British umbrella organisation for passenger *RU*s.
AVE	Alta Velocidad Española: Spanish high-speed trains
CAGR	Cumulative annual growth rate
CER	Community of European Railways: a representative body on European issues for *RU*s, national railways, and other railway industry interests
CFL	Société Nationale des Chemins de fer Luxembourgeois: Luxembourg's incumbent passenger *RU*
CO_2	Carbon Dioxide
COTIF	Conditions générales de transport pour le transport international ferroviaire des voyageurs): Uniform Rules concerning the Contract for International Carriage of Passengers and Luggage by Rail (commonly referred to as Convention Concerning International Carriage by Rail)
DB	Deutsche Bahn: the holding group including the German national IM and incumbent passenger RU
DG MOVE	The Directorate-General for Mobility and Transport of the European Commission
DSB	Danske Statsbaner: the Danish incumbent *RU*
ECMT	European Conference of Council of Ministers
EIM	European Rail Infrastructure Managers: a representative body for *IM*s
EPTO	European Passenger Transport Operators Association: a representative body
EU	European Union
GHG	Greenhouse Gas
IM	Infrastructure Manager
HŽ	Hrvatske Željeznice: the Croatian IM and incumbent RU
ICE	Inter-city Express: German high-speed trains
IT	Information Technology
LGV	Lignes à Grand Vitesse: French high-speed rail lines
LRPS	Long-distance Rail Passenger Services
NS	Nederlandse Spoorwegen: the Dutch incumbent *RU*
NTV	Nuovo Trasporto Viaggiatori
ÖBB	Österreichische Bundesbahnen: the holding group including the Austrian national IM and incumbent passenger RU
OSE	Organismos Sidirodromon Ellados: the holding group including the Greek national *IM* and incumbent passenger *RU*
PKP	Polskie Koleje Panstwowe: the holding group including the Polish

ACRONYM	MEANING
	national *IM* and incumbent passenger *RU*
PRM	Persons of Reduced Mobility
PSO	Public Service Obligation
RENFE	Red Nacional de los Ferrocarriles Españoles: the Spanish incumbent *RU*
RFF	Réseau Ferré de France: the French *IM*
RIC	Regolamento Internazionale delle Carrozze: Agreement Governing the Exchange and Use of Coaches in International Traffic
RIV	Regolamento Internazionale Veicoli: Agreement Governing the Exchange and Use of Wagons between Railway Undertakings
RRPS	Regional Railway Passenger Service
RU	Railway Undertaking
SBB	Schweizerische Bundesbahnen: the Swiss national *IM* and main incumbent passenger *RU*
SJ	Statens Järnvägar: the Swedish iincumbent passenger *RU*
SNCB	Société Nationale des Chemins de fer Belges: the Belgian incumbent *RU*
SNCF	Société Nationale des Chemins de fer France: the French incumbent *RU*
TGV	Trains à Grande Vitesse: French high-speed rail trains
TSI	Technical Specifications for Interoperability
UIC	Union International des Chemins de fer