Rail Freight Corridor North Sea-Mediterranean

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Essential Elements of the Transport Market Study

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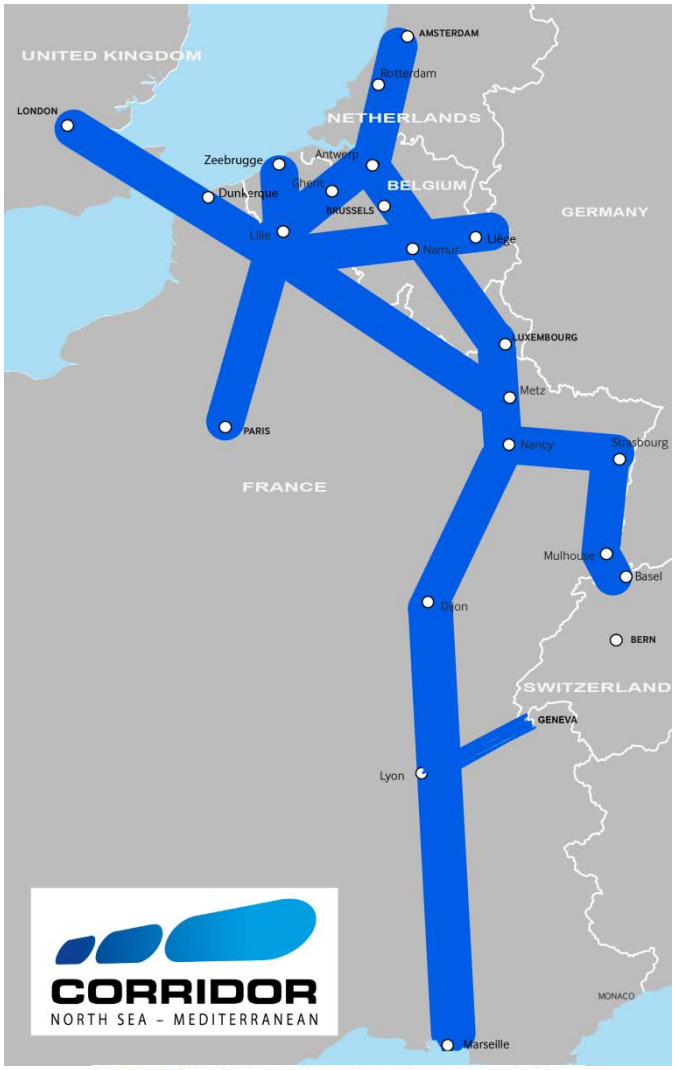
Status 2016



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1. Essential elements of the Transport Market Study

In application of Article 9 of Regulation 913/2010, the RFC 2 Management board has mandated a consortium of consultant firms to carry out a Transport Market Study. The following summarises the essential elements of this study, finalised in 2013.

1.1 Analysis of the current situation

RFC 2 has a very high added value as a maritime-railway intermodal route. It connects major ports such as Antwerp and Rotterdam to large industrial centres (Basel, Ghent, Liège, Lorraine, Nord-Pas-de-Calais and Lyon) with large commercial areas. Moreover, Rail Freight Corridors 1, 4, 6 and 8 (in 2015) are connected to RFC 2 in Rotterdam, Antwerp, Ghent, Metz, Paris (in 2015), Basel Ambérieu and Lyon providing customers with interoperable connections to the North, East and South of Europe. This is combined with potential links to important economic areas such as Nord Pas de Calais (FR) Ile de France (FR) the Liège Region (BE) and the UK market.

1.1.1 The geographic and socio-economic context

To get an overview of the context, the following elements on a NUTS 2 level have been studied:

- GDP per capita growth rates
- Purchasing power parity standards
- Employment
- Population density
- Industries

Two variables are analysed at a country level

- Purchasing power parity
- Oil prices

In total 46 NUTS2 regions in 7 countries are expected to be influenced by the RFC 2. Influenced regions are not only those passed through by the RFC 2 but include also some regions in the surroundings of the Corridor.
The primary regions of the corridor are the regions where the corridor runs through – connecting major ports such as Antwerp and Rotterdam to large industrial centres such as Basel, Ghent, Liège, Lorraine, Nord-Pas-de-Calais and Lyon.

The secondary regions are regions which are not actually part of the corridor, but of which large traffic flows pass through the corridor – for example traffic from Antwerp to the North of Italy- were taken into account in the analysis.

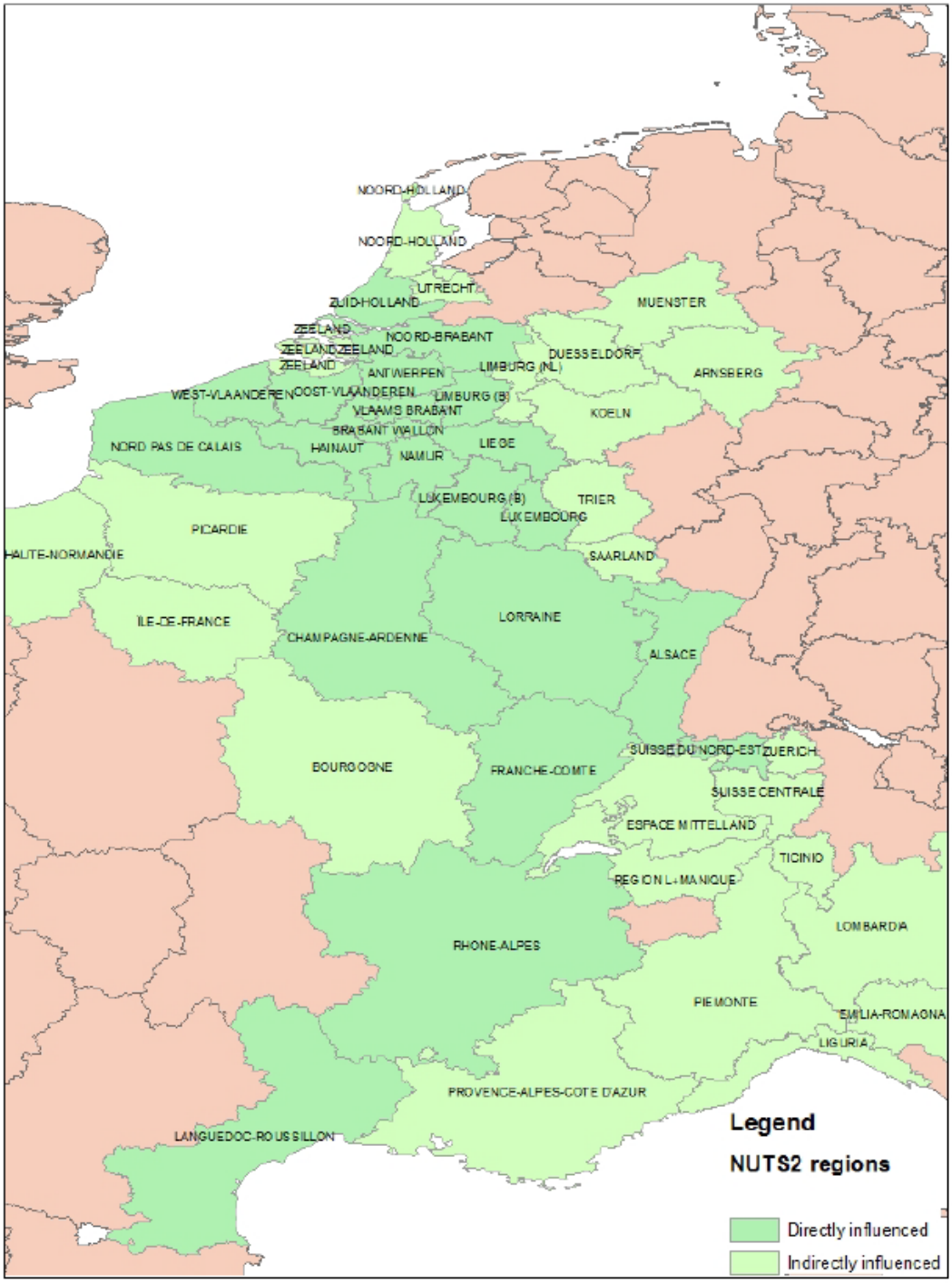
The analysis of the socio-economic variables focussed on those variables with a direct link to traffic demand such as yearly GDP per capita growth, population, fuel prices, industries, etc.

The Belgian and Dutch regions have the highest yearly GDP per capita growth, higher employment growths and are most densely populated. The largest number of local manufacturing and construction units were in the North of Italy, the North East of Belgium and the Netherlands and the region of Lyon – confirming the strength of the corridor in connecting ports to large industrial areas.

Comparing the period 2005-2009 with 2000-2004 the economic crisis showed clearly a lower yearly GDP per capita growth and PPS, even negative employment growth for some regions in the period 2005-2009. This crisis was also reflected in the traffic on RFC 2, which decreased dramatically in 2009. These evolutions are important as they confirm the strengths and weaknesses of the corridor.

Moreover, to set up forecasts, the analysis started from the current traffic flows and from the economic growth. These parameters will be important to determine the overall future traffic flows.

The figure below shows graphically the regions of which the general socio-economic situation is discussed.



regions influenced by RFC 2

1.1.2 The transport market characteristics along the corridor

Rail transport system

RFC 2 is designed to ensure the freight transport from Rotterdam to Lyon and Basel, crossing five European countries. In order to allow this transit, the infrastructure has to be compatible with standard freight trains.

The European Commission has proposed standards in the Regulation for the development of the Trans – European Transport Network (2011). In particular, the EC has proposed requirements to be respected by a rail transport infrastructure in order to become part of the TEN–T core network.

The Directive 2008/57/EC also indicates the Technical Specification for Interoperability (TSI) of the rail system for new and upgraded railway lines.

The TEN-T core network standard requirements are listed on the table below.

Criteria	Appreciation
Nominal Track Gauge	1 435 mm
Number of tracks	≥ 2
Design speed	≥ 100 km/h : for freight trains
Axle load	≥ 22,5 tonnes
Maximum Train length	≥ 750 meters (1)
Electrification	25 kV AC, 50 Hz 3 kV DC 15 kV AC, 16.7 Hz (admitted) 1,5 kV DC
Signalling	ERTMS level 1

(1) ≥ 750m for lines with regular freight traffic, otherwise ≥ 600m

TEN-T core network standard requirements

Moreover, two other technical characteristics, which are not indicated in the TENT core network standard requirement, seem to be usually expected by railways undertakings:

- Loading gauge: a criteria to appreciate a route is availability, or not, of gauge B, or gauge P/C45 in case of combined transport,
- Gradient: another criterion to appreciate a route is a gradient lower than 12.5‰.

The figures in the Chapter 1 “Characteristics of RFC 2 and measures necessary for creating RFC 2” show the sections of the Corridor that meet the TEN-T core network requirements.

Road transport system

Road transport relies on an extremely dense and intertwined infrastructure network, which is efficient for long distance transport.

Traffic congestion is mainly situated in urban areas; express roads and motorways bypasses allow most of the time to avoid these congested areas in big agglomerations.

Inland waterway system

The inland waterway network serves only partially RFC 2. Although main generators of freight traffic in the corridor's perimeter are connected to this network,

- relations between them may require transport distances greater than on the road network (for example, between Lyon and Antwerp / Rotterdam),
- it is not always possible to use large volume vessels because of limits of the river gauge in France (e.g. to link Antwerp and Paris or Lyon, or Luxembourg to Lyon).

1.2 Assessment of the market

1.2.1 Actual freight market estimation (per O/D)

The total rail freight demand in all involved countries is 121.4 million tons for year 2010.
Our methodology filtered out the specific corridor regions and the specific corridor flows.
As a result, international rail demand, which is defined as the traffic crossing at least one border of the corridor, was 21.8 million tons in 2010.

The Transport Market Study focuses only on this last type of demand (international rail demand on the corridor sphere of influence). The total number of international trains on the corridor sections was around 34.000 trains per year, including empty trains.

The international goods transported on the corridor are 75% industrial goods (bulk, metal, agricultural, etc.) and 25% miscellaneous goods mainly transported in containers. This last category is the most growing market. Rail modal split is currently at 8.1% of the total freight transport in the corridor geographical area.

If the attractiveness of the corridor can be increased there is the indicative potential of 7.0 million tonnes through corridor shift (from Corridor 1 to RFC 2). There is also potential from the road modal shift to rail. This is more complex to estimate, still benefits are also much larger, with a maximum of 28.0 million tonnes.

		DESTINATION											
		NL	BE	LU	FR	CH	DE	IT	UK	ES	SE	PL	
ORIGIN	NL	-	664	-	542	-	313	-	-	-	-	-	1 519
	BE	1 256	-	1 119	4 814	331	661	1 163	156	289	229	56	10 075
	LU	-	622	-	105	26	2	133	-	-	-	-	887
	FR	178	4 929	387	-	336	194	456	-	-	-	-	6 480
	CH	-	177	28	34	-	-	-	-	-	-	-	239
	DE	-	713	0	136	-	-	-	92	-	-	-	940
	IT	-	1 121	25	32	-	-	-	-	-	-	-	1 179
	UK	-	95	-	-	-	45	-	-	-	-	-	140
	ES	-	117	-	-	-	-	-	-	-	-	-	117
	SE	-	244	-	-	-	-	-	-	-	-	-	244
	PL	-	-	-	-	-	-	-	-	-	-	-	-
		1 434	8 680	1 560	5 663	694	1 215	1 752	248	289	229	56	21 820

tons carried by international trains on RFC 2 in 2010 (in thousand tons)

The Origin/Destination matrix shows that almost 34,000 trains crossing at least one border of the corridor are running each year on the corridor sections (here are the exact figures for year 2010).

		DESTINATIONS											
		NL	BE	LU	FR	CH	DE	IT	UK	ES	SE	PL	
ORIGINS	NL	-	867	-	562	-	290	-	-	-	-	-	1.718
	BE	1.331	-	1.711	7.522	555	836	1.863	130	241	445	224	14.857
	LU	-	1.505	-	357	43	2	185	-	-	-	-	2.092
	FR	351	7.318	394	-	514	234	653	-	-	-	-	9.463
	CH	-	241	46	387	-	-	-	-	-	-	-	674
	DE	286	1.027	1	207	-	-	-	77	-	-	-	1.599
	IT	-	2.118	119	410	-	-	-	-	-	-	-	2.647
	UK	-	79	-	-	-	38	-	-	-	-	-	117
	ES	-	98	-	-	-	-	-	-	-	-	-	98
	SE	-	447	-	-	-	-	-	-	-	-	-	447
	PL	-	150	-	-	-	-	-	-	-	-	-	150
		1.968	13.850	2.271	9.444	1.112	1.399	2.701	207	241	445	224	33.861

number of international trains on RFC 2 sections in 2010

The breakdown of the corridor traffic by NUTS regions is described in Table 10. In this table, figures are calculated as the sum of import and export of one NUTS 2 region for international flows. Tonnage shares are ranked in decreasing order.

Country	NUTS 2 Region name	Tons %	Ton-km %
Belgium	Prov Antwerpen	**18,2**	**14,1**
France	Nord - Pas-de-Calais	**10,1**	3,6
Belgium	Prov Liège	6,4	2,9
Luxembourg	Luxembourg	5,6	2,5
Belgium	Prov Oost-Vlaanderen	4,7	3,4
France	Lorraine	4,3	2,3
Belgium	Prov. Hainaut	4,3	1,7
Italy	Lombardia	3,4	**3,8**
Netherlands	Noord-Holland	2,5	1,3
Belgium	Prov West Vlaanderen	2,4	2,3
TOTAL	**in tons, ton-km / year**	**21.820.000,00**	**13.159.000.000,00**

breakdown of traffic by NUTS region

The figures show that the Antwerp region is the most active on the corridor. The region has, at first, a significant industrial activity. It also has an advantageous geographical position as it is located near a port and, in addition, it absorbs a significant amount of North and South flows in the corridor.

In general, one can notice a strong connection between the rail traffic and the existence of seaport infrastructure.

The region containing the city of Liège has significant steel industry which is supplied internationally via Dunkirk (Nord – Pas-de-Calais).

Looking beyond the top-3, the Luxembourg region obtains the fourth place in the activity ranking, due to its geographical position. The high activity of the Hainaut province is due to its geographical location, close to France and especially close to active regions such as Nord – Pas-de-Calais and Lorraine.

The Lombardy region, containing Milan, has a mix of high population and economic activity in Italy's industrialised North. Lombardy is more positioned towards the corridor and especially its corridor crossing point Basel than the also industrialised Emilia-Romagna area. The Swiss city of Basel itself and the surrounding region of Nordwestschweiz, present a relative large amount of traffic. In fact, this region is in the top 14 of regions which attract the highest amount of traffic on the corridor. On the other hand, the Alsace region, neighbouring to the Lorraine region, ranks only on the 25th position.
Further research showed that the Alsace region has a more national character and interacts highly only with Germany (traffic that is excluded from the corridor sphere of influence and therefore out of the study).

The South-Holland region (including Rotterdam) also interacts strongly with Germany and rail freight corridor 1 resulting in a low ranking as well.

Other regions which are lower than anticipated are: the Haute-Normandie area, including the port of Le Havre, the Lower-Normandy region, including the port of Cherbourg and Rhône-Alpes (including Lyon).

Research of all Rhône-Alpes traffic (not only the corridor) shows that there is a notable interaction between Lyon, Spain and Italy, yet 81% of the activity in the Rhône-Alpes region is based in France. This means that Rhône-Alpes is an active rail freight region, but most of its traffic does not cross RFC2 borders. The same analysis applies for the regions which are South of Rhône-Alpes: Languedoc-Roussillon, Provence-Alpes-Côte d'Azur and Liguria (which includes Genoa). In these regions, there is an important national rail freight traffic and an international Corridor 6 freight traffic but only a small international RFC2 traffic.

The Paris area is an exceptional case with its low international traffic. The socio-economic background demonstrates that the region activity is high: local unit manufacturing, mining, construction, accommodation (food) of a large number of people per year. The data shows that for rail freight this is largely a domestic affair as only 6% of transport with Paris as an origin or a destination is international on the corridor. By contrast the Brussels Capital Region has 41% international and Nord-Holland 33%.

International throughout traffic (also called transit traffic) of Paris is of course significant. This is also true for Antwerp and Basel. However, in the case of Paris, there is more transit traffic from Spain and Germany which are countries that are outside the scope of RFC2.

In terms of ton-km, Belgium is the biggest exporter with almost 6.3 billion ton-km and the biggest importer, with 4.9 billion ton-km. Due to the travel distance Italy has a large ton-km share on the corridor, despite the alternative of Corridor A/1.

The Netherlands and Luxembourg have a low share of tkm.

The average length of a journey on RFC2 is 603 kilometres.

		DESTINATIONS										
		BE	CH	DE	ES	FR	IT	LU	NL	PL	SE	UK	
ORIGINS	BE	-	248,00	297,00	410,00	2.625,00	1.194,00	418,00	480,00	56,00	372,00	156,00	6.256,00
	CH	131,00	-	-	-	38,00	-	15,00	-	-	-	-	184,00
	DE	332,00	-	-	-	49,00	-	-	-	-	-	184,00	565,00
	ES	166,00	-	-	-	-	-	-	-	-	-	-	166,00
	FR	2.078,00	209,00	43,00	-	-	361,00	120,00	102,00	-	-	-	2.913,00
	IT	1.189,00	15,00	-	-	27,00	-	21,00	-	-	-	-	1.252,00
	LU	231,00	-	-	-	69,00	117,00	-	-	-	-	-	417,00
	NL	229,00	-	240,00	-	337,00	-	-	-	-	-	-	806,00
	PL	-	-	-	-	-	-	-	-	-	-	-	-
	SE	396,00	-	-	-	-	-	-	-	-	-	-	396,00
	UK	146,00	-	57,00	-	-	-	-	-	-	-	-	203,00
	Total	4.900,00	472,00	636,00	410,00	3.146,00	1.671,00	574,00	582,00	56,00	372,00	340,00	13.159,00

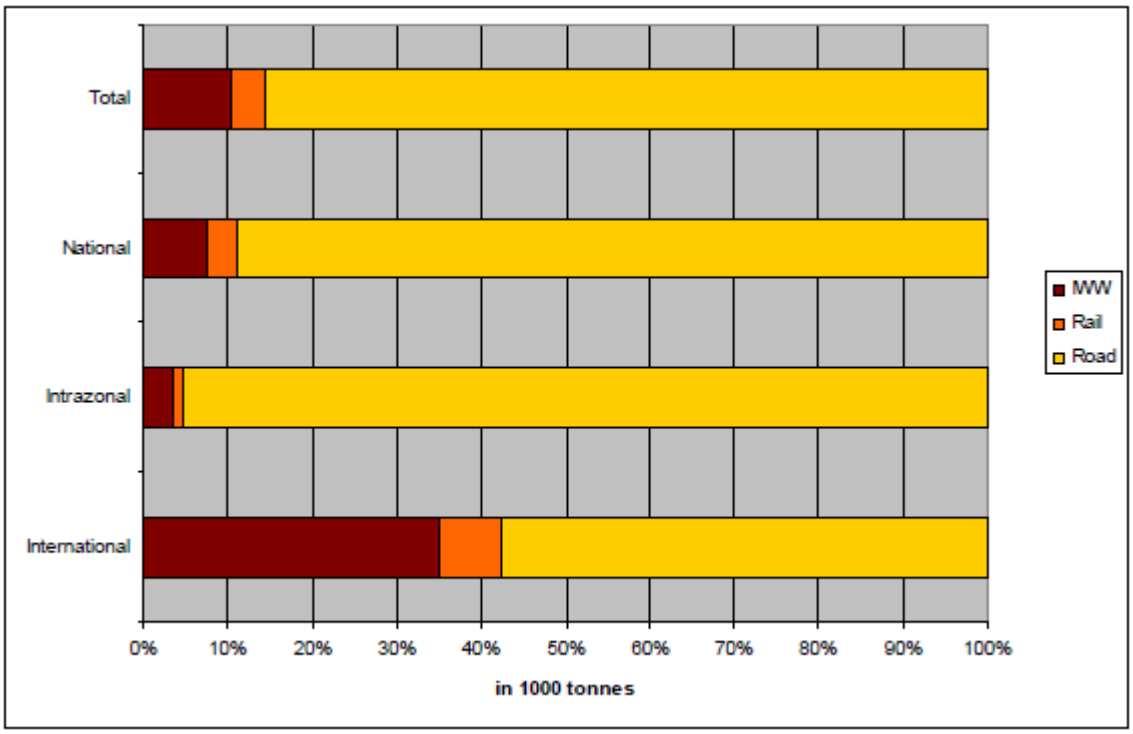
Rail transport per country on the corridor in million ton-km for 2010

The top commodity type transported by rail is metal products (NSTR5). This indicates the heavy industrial nature of the corridor, both in terms of input and output. The table below shows that a lot of bulk goods are transported on the corridor. The foodstuff and animal fodder share transported by rail represent only 2% of the total international activity. Second in ranking is commodity type 9 for miscellaneous goods mainly transported in containers. This commodity type is the only one growing in terms of volumes with 25% of the market shares.

COMMODITY	NSTR Code	in 1000 tons	%
Agricultural products and animals	0	1091	5%
Foodstuffs and animal fodder	1	436	2%
Solid mineral fuels	2	1527	7%
petroleum products	3	1964	9%
Ores and metal waste	4	1309	6%
Metal products	5	6546	**30%**
Crude minerals, building materials	6	1964	9%
Fertilizers	7	218	1%
Chemicals	8	1309	6%
Machinery and miscellaneous	9	5455	**25%**
	TOTAL	**21820**	**100%**

Commodity distribution on the Corridor for 2010

Rail data is put into perspective when other modes are considered such as road and Inland Waterway transport (IWW). Road traditionally has a big share of freight transport. For IWW this is not always true in Europe. RFC 2 is suitable for IWW since most regions are connected by water and the waterways can handle quite some capacity as well. IWW traffic moving along a North-South route faces trends similar to rail freight traffic.



Modal split per traffic type for 2010

The modal share of rail amounts to 8.1%.

The international rail freight RFC 2 traffic amounts to 21.8 million tons. This is 17.9% of the total rail freight RFC 2 (national and international) traffic that amounts to 121.4 million tons.

1.2.2 Assessment of customer needs

Objective

The objective of the interviews was to get an insight in the pros and cons of the rail system on RFC 2. The interviews serve as the basis for the assessment of customer needs of stakeholders.

Overview of stakeholders consulted

All interviews were conducted in the September-November 2012 period.

The next tables show:

- the number of stakeholders interviewed per category;
- the number of interviews per country;
- the number of shippers interviewed per category.

Category	Number
Railway operators	10
Intermodal operators	14
Logistics service suppliers	8
Shippers	19
Terminal operators	8
Ports	8
Others	4
Total	71

Overview stakeholders interviewed

Country	Number
France, Switzerland, Luxemburg	39
Belgium	17
Netherlands	19

Number of interviews per country[1]

Sector	Number
Automotive	1
Chemicals	3
Iron, ore, steel	5
Agriculture	2
FMCG (fast moving consumer goods)	7

Number of shippers interviewed per category

General observations

During the interviews, it has been highlighted that most stakeholders were not (yet) active on the corridor. The stakeholders either prefer Corridor 1 (especially to the Alsace region in France and Basel in Switzerland), or they prefer road or barge.

There is a growing interest in RFC 2 related to the increasing congestion and expected works on Corridor 1. In general, the overall opinion is that in principle RFC 2 has good prospects, but it is essential that improvements are implemented on the service, organisational, operational and technical levels.

Most of the necessary improvements need to be implemented in France and Belgium.

The improvements mentioned mostly concern a more client oriented attitude expected from the rail industry in general (railway undertakings and infrastructure managers).

[1] The total in table15 differs from the total in table 14 as in some companies several persons have been interviewed

Regarding the development of volumes in the coming years (horizon 2016), most respondents expect volumes to be stable after several weak years. Especially the automotive and the related steel sectors are weak, as is the chemical sector.

Competition with other modes / comparison with other corridors

Competition with other modes

There is strong competition from the other modes, especially from road transport. Main reasons for this strong competition are:

- Destinations on RFC 2 are within the road competing distance. 80-90% of maritime containers have a destination within 250 km.
- Road transport rates are declining due to the entrance on the market of drivers from CEE countries.
- Road transport is more flexible.
- Road transport is more reliable, and if something happens, problems can easily be solved.
- Road transport is faster (road transport from X to Y has an A-B schedule; rail transport from X to France has an A-E schedule)[2].
- SNCF stopped their single wagon load services in France.

Inland waterway transport is not always an option along the corridor. Along the Rhine for destination in Alsace, Lorraine and Basel, this mode of transport is hampered by problems with water depth, which gives chances to rail transport.
Inland waterway transport from origins in the Netherlands and Belgium to destinations in the North-Western part of France (Nord-Pas-de-Calais) and Paris is seen as a better option than rail transport. For the other parts of France, inland waterway transport is usually not an option. There are too many locks and too many transhipment points. Some routes are attractive for barges, like the route between Le Havre and Paris region, and the route between Fos-sur-Mer and Lyon.

Comparison with the other Corridors

As regards comparison with Corridor 1, most respondents indicate that they prefer this corridor over RFC 2. Main reasons for this are:

- Price level on RFC 2 is too high (20% to 25% higher than Corridor 1). (shippers & logistic service providers)
- Services are more client-oriented on Corridor 1. If problems arise, operators do their best to find solutions and stay as close as possible near the agreed schedule. Another example is the slow reaction on path requests in France. Respondents indicate that ad hoc requests should be realised within days, not weeks. A path request from the Netherlands to Basel is handled on Corridor 1 within 72 hours, on RFC 2 this may take at least 2 weeks. (all)
- From the North Sea ports to Basel, more countries must be crossed in RFC 2 than in Corridor 1. Consequently, there are less problems on corridor 1 with rules and regulations, technical issues, language issues etc. (all)

[2] A-B or A-E schedule indicate the transport time in days between destinations. A-B indicates next day arrival, whereas A-E indicates arrival after 5 days.

Freight rates rail, road, barge

It is difficult to compare the price of the rail mode with the price of other modes and the price of the rail mode on RFC 2 with the price of the rail mode on Corridor 1. The perception of interviewees varies quite substantially from one market player to another. However, the general consensus is that prices on RFC 2 are currently higher than on Corridor 1.

Remarks made by stakeholders on freight rates include:

- Rail prices have been increasing for years with 4.5% to 5% per year. But the prices of road are stable or increase at a lower rate (all)
- Increase of RFF charges was 4.3% between 2011 and 2012, and will increase further at a rate of 4.8% in 2013.
- Prices of new rail operators are substantially lower than prices of historical operators. (all)
- Improved productivity of both employees and traction should decrease prices. (all)
- Automotive: Price: if road=100 (index figure), then rail is 130/140; this is the case for all origin-destinations. (shippers & logistic service providers)
- Basel via France is 20% to 25% more expensive for the end-customer (i.e. shipping customers) than via Germany. (all)

Barriers for the development of the corridor

Overview of main barriers

Respondents have been asked to inform the Management board on what they think are the main barriers to access the corridor (the fact that a barrier is listed by a respondent doesn't necessarily mean that the Management board agrees with the existence of this barrier).

The main barriers mentioned by them include:

- Lack of a client oriented attitude,
- Lack of reliability,
- Lack of flexibility,
- Lack of information.

Besides these barriers, other issues include operational barriers, technical barriers and organisational barriers. As a general comment, it should be noted that respondents indicate that most barriers are found in France and Belgium. Although this makes sense as most kilometres are made in these countries, it only counts for the technical barriers. However for the other barriers there is no relation between the kilometres and the size or number of the barriers.

Lack of a client oriented attitude

Many respondents indicate that railway operators and rail infrastructure managers lack client orientation and client friendliness at all levels, from management to drivers.

In general what needs to be changed is that the client requests must be leading, not offered services, and operators need to understand the clients' transport needs.

Lack of reliability

At the heart of logistics is the importance of service reliability. Its success is based upon the ability to deliver freight on time with no damage. Shippers indicate that they don't have problems with longer transit times of rail transport compared to road transport. But shippers also indicate that they cannot deal with unreliable schedules, especially given the increasing complexity of logistics chains.

Longer transit times can be tackled with good planning. This means that unexpected delays can have important negative consequences for production processes.

Lack of flexibility

Flexibility, especially when compared to road transport, is not the strongest point of rail transport. However, shippers and railway operators complain about the lack of flexibility, and are apparently under the impression that progress can be made here.

An important tendency in logistics which influences the demand for flexibility is that the planning horizon of even the bigger shippers shortens, especially in the current crisis situation.

Lack of information

Information in modern logistics chains is essential. Information steers all production and assembly processes.

Given the importance of information, it is remarkable that a large majority of the respondents indicate that information services related to rail transport are very insufficient.

The following list shows some of the complaints regarding information services as indicated by respondents:

- Usually there is no information available about where the wagons are; especially after border crossings, it is often unclear where the cargo is. In fact wagons tend to disappear on a regular basis, even weekly. (shippers & logistic service providers)
- There is often no information given about delays. And when such information is given, no information is given about the new Expected Time of Arrival (ETA). (shippers & logistic service providers)
- Infrastructure managers not always give advance information about maintenance and/or repair works to operators and shippers. Respondents would like to receive such information in advance whenever possible. Preferably this information is also accompanied by a proposal of a possible solution to overcome these works. (railway undertakings)

Apart from the lack of information, respondents also indicated that information exchange is not standardised, especially information exchange with infrastructure managers.

An additional aspect of information

Another important but completely different aspect of the lack of information regarding rail transport can be most effectively illustrated by the following statement of one of the respondents (shipper):

> "Road transport is easy. You go to a trucking company. But to whom should you go if you want to transport via rail? How can you obtain the right information, the scheduled services, the price etc.?"

This statement seems to indicate that something is lacking in the promotion of rail transport.

Operational barriers

Respondents mentioned a large number of operational barriers, of which the most mentioned are:

- Extra staff is needed for shunting / coupling in France and Belgium. (railway undertakings)
- It is difficult and time consuming to get approval for locs and wagons in France and Belgium which are already approved in the Netherlands. (railway undertakings)
- SNCF has remodelled its single wagon services and offers less opportunities. Respondents indicated that single wagon services are still needed, even by shippers with large volumes. Shippers indicated that they are not (always) capable of offering large enough volumes. (shippers & logistic service providers)
- For Belgium and the Netherlands, separate wagon lists are required. In the Netherlands this procedure is easy via a simple email, in Belgium this procedure is seen as difficult. Shippers complain about a complicated website they have to use for this procedure. This is an example that there is no standard exchange of data and information between IMs and RUs (railway undertakings)
- In France each SNCF region has its own locs, and changing locs costs time. The reason behind this is that each region takes care of the maintenance of its own locs and therefore generates employment (railway undertakings)
- To enter a terminal in Belgium, first a safety agreement should be signed between the infrastructure manager Infrabel and the train operator. (railway undertakings)
- In Antwerp all terminals/shunting areas are behind each other. If one area is occupied, it is impossible to pass. This is better organised in, for example, Basel. (railway undertakings)

Technical barriers

Respondents mentioned a large number of technical barriers, of which the most mentioned are:

- The route via the Netherlands – Germany to Basel requires two different safety systems. The route via the Netherlands – Belgium – France requires three safety systems
- In Roosendaal, it is not possible to change locs of long trains. (railway undertakings)
- The slopes in the Belgian Ardennes limit the tonnage a train can carry. (railway undertakings)
- Not all cargo can be routed via Thionville – Basel (limited to P/C45); P/C70 is needed in the Arzwiller tunnel. A number of respondents indicate that they expect that adaptation of the Arzwiller tunnel could lead to 20% more volume. (railway undertakings)
- Limited tonnage on different parts of the route (1600/1300/1400 tons) (railway undertakings)
- Differences in maximum length (only 620 meters in Belgium during day) (railway undertakings)
- On Calais-Lille not all containers allowed (limited to P/C45) (railway undertakings)

Organisational barriers

Respondents mentioned a large number of organisational barriers, of which the most mentioned are:

- Regional passenger trains usually get priority over international freight trains, despite EU regulations. (railway undertakings)
- In France many intermodal terminals have been closed. Now the number of terminals in France is too low, and as a consequence terminal costs are relatively high. (all)

- Private operators have a lack of engine drivers. Drivers prefer working for state owned companies because of better primary and secondary working conditions (high wages, more holidays, security etc). (railway undertakings)
- The training of engine drivers is monopolised and in the hands of state owned companies. The training is too expensive and takes too long. Respondents indicate prices and duration are a factor 3 to 5 too high. (railway undertakings)
- In Belgium all tracks can be run from both directions what makes maintenance easier, because trains can use the opposite track. This is not possible in France. (railway undertakings)

Other barriers

Other barriers mentioned by respondents include:

- Railway operators active in France need a local office there. (railway undertakings)
- Though refunds can be awarded after delays, respondents indicate that in practise the cause of the delay is always force majeure, so no refund is paid. (railway undertakings)
- There are language problems for drivers and other staff. (railway undertakings)
- Respondents indicate that Antwerp has relatively high parking fees. (railway undertakings)
- Many respondents indicate that freight rates are often uncertain, even after lengthy negotiations (all)
- In Belgium it is very difficult to calculate traction rates, for customers wanting to order rail freight services. Via a website the rates can be calculated, but this requires rather complicated formulas with up to 12 variables that need to be filled in. Respondents indicate that they would appreciate it if the calculation software would be freely available. (railway undertakings)
- Given the number of countries involved in RFC 2, respondents mentioned that too much national legislation is a barrier for their operations. (all)
- On RFC 2 there is too little competition compared to Corridor 1. On RFC 2 apparently there are 6 operators active, while on Corridor 1 there are 20 operators active. (all)
- The last mile is too expensive. Examples given include €1000 in Lyon/Strasbourg compared to € 300 in Germany. (all)
- Engine drivers authorised in the Netherlands and in Germany are not allowed to work in France. (railway undertakings)

Prospects

Respondents were asked about the prospects they see for RFC 2. The following prospects were mentioned:

Market circumstances

- The lack of capacity on Corridor 1 will make RFC 2 a real option for shippers. (all)
- The increasing attention for environmental impact of transport will benefit rail transport, which is seen as more environmental friendly. (all)
- As a possible consequence of increasing attention for environmental impact, road transport could become more expensive due to higher road user charges. This could be beneficial for rail transport. On the other hand, road freight rates are under pressure due to increasing numbers of CEE road transport operators entering the market. (all)
- Congestion on roads could also strengthen the competitive position of rail transport. (all)

- Innovative packaging technology allows longer transport time. Due to this development, perishable commodity types like fruit and vegetables could become interesting for the rail market. (all)
- Some respondents state that the regions Ile-de-France (Paris), Rhône-Alpes (Lyon) and Nord-Pas-de-Calais (Lille) are very important economical areas. These areas will continue to grow and therefore the corridor has prospects. (all)
- The opening of the new Gothard tunnel, the opening of the new line Lyon-Turin, and better accessibility of Dunkirk, Zeebrugge, Antwerp and Rotterdam ports are seen as prospects for the corridor. (all)

Rail sector issues

- RFC 2 now runs to Lyon. An often mentioned prospect is to expand the corridor towards Spain, and combine cargo to/from Spain on the corridor. (all)
- South of Lyon, according to some respondents, is an area where the chemical industry is active. Railway operators should match the need for transport services of this area with the chemical flows north-south to get full loads both ways. (all)
- Several respondents state that if P/C70 is implemented in the tunnel of Arzwiller, volume will potentially go up with 20%. (Railway undertakings)
- Some respondents indicate that offering night jumps in rail transport offers good possibilities, though at the same time they indicate that such night jumps are attractive for many customers and therefore there will soon be a capacity bottleneck. (all)
- The pricing policy in the rail sector should be made more commercially and tailor made. As an example mentioned by some respondents, in the current situation shippers pay the same freight rates whether they bring large or small volumes. (all)
- Some respondents state that safety rules are important, but that safety rules in the rail sector may be overdone. A more reasonable safety framework would facilitate rail transport. (all)

Key success factors

Price is the key

The following statement of one of the respondents is illustrative of the relationship between price and quality factors like reliability and flexibility.

> “Reliability is one thing, but it is also relative. The main issue is costs. Reliability and speed are only an element of costs!”

In the end, and this is supported by statements of other respondents, price is the most important factor. If the price is not right, volumes will be transported by other modes. Respondents indicate that more competition is needed between rail operators on the corridor to get better prices.

An important instruction here is that even if rail transport would become reliable and flexible and client oriented etc., in the end rail transport will not be attractive if the price is not right. The price is not only the terminal to terminal price, but the door to door price. Especially the last mile can have significant impact on the total price.

Other key success factors

Assuming that the price of rail transport is competitive with the price of other modes, the next important key success factors are:

I. Service orientation

Service orientation requires a client oriented attitude and the offering of services in line with client demands instead of supply. Regular services are a prerequisite. Some respondents would want to be offered a complete door-to-door concept. Important for the management of the corridor is that there is one central point customers can communicate with.

II. Reliability

This requires a strong reduction of the number of interruptions (strikes, maintenance, etc.), guaranteed departures and arrivals. Again, transit time is not the issue as long as there is no delay. Delay is not permitted as alternatives are not available. Once the container or wagon is in the rail system, it is out of control of the forwarder – shipper.

III. Flexibility

Shippers mention flexible volumes and flexible bookings (bookings week A for week B would be preferable).

IV. Information

This concerns tracking and tracing facilities, advance information on delays, maintenance and repair works, reliable price information, easy accessible price information. This also concerns promoting the corridor and its “success stories”.

Respondents’ recommendations

Respondents were asked to give recommendations for railway operators and rail infrastructure managers. Below the most important are listed:

Service orientation

- Create trust, openness and stability. (all)
- Understand customers’ needs, understand your role in the transport chain. (all)
- Do not react in reflex answers like: this is government policy, there is a lack of funds or we only can improve services if we invest in hardware / infrastructure. (all)
- Rail transport works extremely well in Germany and Switzerland, but in France/Belgium the service is not adapted to the needs of shippers. Listen to the needs of clients! (all)
- Strongly improve market orientation of incumbent freight operators, and create a total independence between RFF and SNCF. (all)

Market opportunities

- Develop rail-ports in France. (all)
- Provide and/or support “last mile” solutions. (all)
- Start daily reliable departures and daily arrivals in Lyon instead of 3 x per week. (logistic service providers)
- Extend the corridor to Paris and Calais/Dunkirk (all)
- Develop 1 stop shopping. Establish a single point of contact and a uniform communication system. (railway undertakings)

Other issues

- Harmonise infrastructure requirements. (railway undertakings)
- Standardize specific data and information exchange processes, especially the processes with infrastructure managers (railway undertakings)
- Review the gauge calculation (P/C70 issue) between Thionville and Basel (railway undertakings)

1.3 Market projections

1.3.1 The forecasts on the geographical and socio economic context

The forecasts have been made using the Transtools model V2.5 and were based on the data gathered in the previous task. Two economic background scenarios (high economic growth and low economic growth), a reference scenario and a project scenario were analysed for three points in time: 2014, 2020 and 2030. The project scenario can be summarized as follows:

Corridor Implementation	2014	2020	2030
45 minute travel time reduction	x	x	x
15 minute border crossing time reduction		x	x
Liefkenshoek: trains from or to the left bank of the port of Antwerpen : 10% time gain		x	x
New junctions at Busigny and Aulnoye (for alternative Calais/Dunkirk–Arras–Cambrai–Aulnoye instead of Lille-Valenciennes-Aulnoye) 10% time gain		x	x
2nd track Fleurus-Auvelais : time gain			x
Reorganisation of Bettembourg command post: 5% time gain			x
New junctions in the Metz node: 5% time gain			x
4 tracks on the north of Strasbourg: 10% time gain			x
refitting of Oude-Landen junction at Ekeren and the Krijgsbaan junction			x
cost reduction of 10%		x	
cost reduction of 20%			x

project scenario

The tables below summarise the results, expressed in number of international trains, in thousands of tons and also the evolution over the years.

Number of trains	Year	Short term	Mid term	Long term
	2010	2014	2020	2030
Low economic growth + reference	33853	33853	34986	36799
Low economic growth + Corridor Implementation		33882	35083	36981
High economic growth + reference	33853	33853	38237	41981
High economic growth + Corridor Implementation		33882	38343	42190
Low economic growth + reference (% growth vs 2010)	0,00%	0,00%	3,35%	8,70%
Low economic growth + Corridor Implementation (% growth vs 2010)		0,09%	3,63%	9,24%
High economic growth + reference (% growth vs 2010)	0,00%	0,00%	12,95%	24,01%
High economic growth + Corridor Implementation (% growth vs 2010)		0,09%	13,26%	24,63%

forecast results in number of trains

International tons (x1000)	*Year*	*Short term*	*Mid term*	*Long term*
	2010	*2014*	*2020*	*2030*
Low economic growth + reference	*21764*	*21764*	*22537*	*23631*
Low economic growth + Corridor Implementation		*21784*	*22600*	*23749*
High economic growth + reference	*21764*	*21764*	*24654*	*27015*
High economic growth + Corridor Implementation		*21784*	*24724*	*27151*
Low economic growth + reference (% growth vs 2010)	*0,00%*	*0,00%*	*3,55%*	*8,58%*
Low economic growth + Corridor Implementation (% growth vs 2010)		*0,09%*	*3,84%*	*9,12%*
High economic growth + reference (% growth vs 2010)	*0,00%*	*0,00%*	*13,28%*	*24,13%*
High economic growth + Corridor Implementation (% growth vs 2010)		*0,09%*	*13,60%*	*24,75%*

forecast results in thousands of tons

Compared to today, the project scenarios lead to an additional growth in the number of trains of around 9% for the low growth scenario and 25% for the high growth scenario by 2030. Note that these % do not take into account possible shifts from Corridor 1 due to congestion and works on Corridor 1. These shifts might be substantial but Transtools does not take into account capacity constraints and hence does not take into account congestion. Note that shifts due to works on Corridor 1 might only be temporary. Moreover the OD matrix used as a starting point is limited to the regions defined in Task 1 and the matrix developed in Task 2. As it is possible that some relevant traffic flows are not included within this matrix, possible shifts towards RFC 2 might be slightly underestimated. However, given that the matrix was constructed in such a way to account for most relevant traffic the total effect of this will be small.

1.3.2 Improvements in the rail transport system

This section of the study identifies limits of the current and future railway infrastructure. Two main issues are highlighted: capacity bottlenecks and sections with limited capacities for freight trains, and lack of any alternative route for some sections. These parts are currently developed in the Investment Plan at Section 4.

Taking into account the results of the traffic forecasts, the expected traffic increase, even in high-growth scenario and 2030, should be supported by the infrastructure improvement projects already identified and described, or those who are being defined by IMs.

1.3.3 SWOT analysis

The objective of the SWOT analysis is to identify the key internal and external factors that are important for the success of the corridor. The SWOT analysis is mainly based on the stakeholder assessment.

The SWOT analysis for RFC 2 shows the following points:

- **Strength:**

Handling large and regular volumes,
More access points than IWW (Inland Waterways),
Less hampered by driving bans on weekends and holidays,
Not influenced by high and low water levels,
Good connections with ports,
Avoiding road traffic congestion

- **Weakness:**

Lack of client oriented attitude,
Weak information services,
Lack of reliability,
Lack of flexibility,
Too much national legislations,
Handling small and irregular volumes,
Current price level is too high compared to road transport,
Technical bottlenecks.

- **Opportunities:**

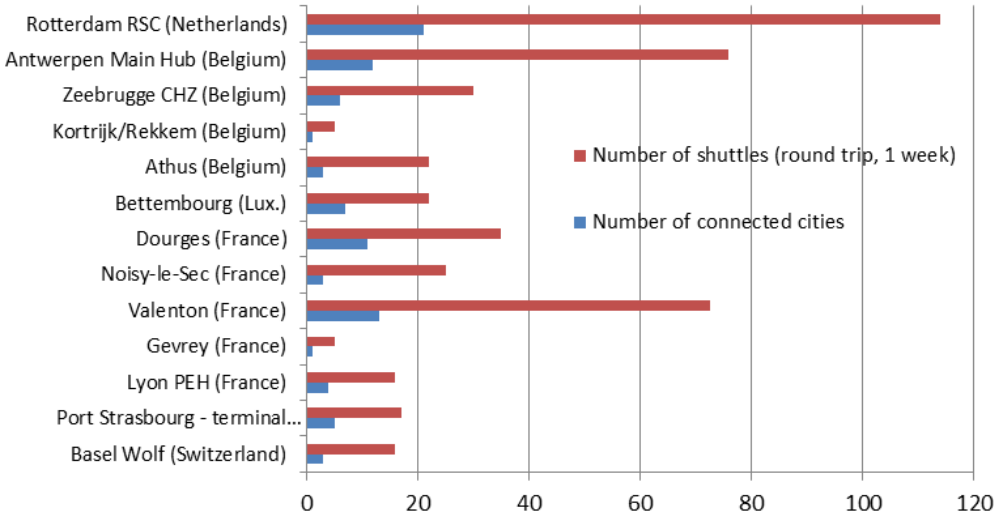
Improved competitive position compared to road transport,
Increasing environmental awareness,
Congestion on roads,
Increasing levels of road tolls,
New markets,
Expansion of client basis,
RFC 2 is situated near large economic centres,
Capacity issues on Corridor 1 may make RFC 2 an option,
Technical improvements.

- **Threats:**

Decreasing competitive position with road transports,
Weight and dimensions of trucks increasing,
Road cabotage allowed,
Opening rail national markets takes too much time,
Economic crisis,
Changing maritime transport patterns,
Last mile costs.

1.3.4 Practices and operational models

Whereas previous sub-task 3.2 mostly focused on railway infrastructures, this part focuses on *soft measures*, that is to say practices and operational models. Three main aspects were treated: combined transport terminal operating, rolling stock and international paths together with cross-border management.
In order to compare terminals, ratios were used to measure productivity on 13 major combined transport terminals, selected to cover perimeter and extensions, and diversity of situations (port, etc.). They represent 411 return services (56% of return services generated on the corridor).
For example the following chart presents the weekly number of shuttles (round trip) and number of connected cities.



weekly number of shuttles (round trip) and number of connected cities

The foremost conclusion is the diversity of situations observed: diversity in service offered (frequency, number of cities served, etc.), hinterland diversity, diversity in terminals layouts (e.g. area available, length and number of tracks) as well as operating procedures (transfer engines, etc.). This diversity is the consequence of combined transport operators' adaptability regarding on the one hand market specificities and, on the other hand, terminals' physical constrains. No particular operating model comes to light, in reality there are as many operating models as there are terminals.

This diversity is reflected only partly in transhipment costs, which are estimated at around 25-35 euros / ITU in case of inland terminals, and are above 50 euros / ITUS in case of seaport terminals. Hence, differences in economic and technical ratios are a consequence of technical and operational choices made by taking into account the terminals physical constrains, rather than of a better or a worse terminal efficiency.

However, terminals can be classified into three categories on the basis of traffic, other criteria being less useful for classification:

- main terminals have yearly traffic over 200,000 TEUs, with more than 50 shuttles per week. They represent 60% of the traffic sample and 69% of shuttles. These are: Rotterdam RSC, Valenton and Antwerpen Main Hub;
- intermediate terminals have yearly traffic between 50,000 and 150,000 TEUs. They represent 34% of the traffic sample and 21% of shuttles. These are: Dourges,

Bettembourg, Noisy-le-Sec, Zeebrugge CHZ, Athus and Strasbourg Terminal nord;

- traffic of the lowest economic importance terminals have is less than 50,000 TEUs per year. There are less than 30 shuttles per week. This is Basel Wolf, Lyon PEH, Kortrijk and Dijon.

Category	Country	City	TEUs (2012)
1	NL	Rotterdam	666.000
1	FR	Valenton	297.000
1	BE	Antwerp	270.000
2	FR	Dourges	148.100
2	LUX	Bettembourg	126.000
2	FR	Noisy le Sec	120.000
2	BE	Zeebrugge	119.000
2	BE	Athus	105.000
2	FR	Strasbourg	83.600
3	CH	Basel	45.700
3	FR	Lyon	37.300
3	BE	Rekkem	34.000
3	FR	Dijon	10.800

terminal traffic in 2012 (in TEUs)

As frequently highlighted by participants, many malfunctioning persist regarding both rolling stock (locomotive accreditation, trains) and international paths. These malfunctioning hinder the rail mode's competitiveness on international journeys compared to its main competitor, road transport. Implementation of competitive freight corridors, in particular RFC 2, is a real opportunity to facilitate international rail flows by smoothing out all of those journeys' obstacles (rolling stock accreditation, border crossing, etc.).

1.4 Multi criteria analysis and impact on the stakeholders

In the Multi Criteria Analyses the estimated impact on the performance of the corridor of the different soft measures to the different stakeholders was analysed (Coordination of works, Capacity allocation / Corridor One Stop Shop, Traffic Management, Traffic Management in the event of a disturbance, Train Performance Management and Authorised applicants).

It shows that:

- The measures of the Corridor have the strongest impact on "Reliability of service" and "Client oriented attitude". This indicates that the measures are fully in line with the results of the market study that identified reliability of service and client orientation as very important areas for overall improvement of the performance of the corridor.
- Capacity allocation/C-OSS seems to be the measure with the highest impact as it is immediately compulsory and it is a radical change compared to the reference situation.
- Coordination of works is second as this topic has been partly ignored so far. Therefore the new measures will have a strong impact. Coordination of works seems to be the easiest measure to implement.
- The impact of the traffic management measures is expected to be overall positive, but is considered less obvious as it is a complex topic and changes are hard to implement in this matter.

Recommendations of the Transport Market Study consultants

Based on the results of the market survey, the SWOT analysis, the analysis of the market conditions, the infrastructure analysis and previous experiences with other corridors an Action Plan has been proposed, focusing on enabling growth of rail freight volumes on the RFC 2. The Action Plan is targeting to all stakeholders and not limited to the Infrastructure Managers.

The Action Plan aims at enhancing the overall framework condition of the Corridor, which includes improving the capacity of the railway, as well as the rail freight services. The proposed solutions cover a very large range of barriers the railway transport stakeholders face to. It should be noted that most of the proposed actions are already implemented or in the process of being implemented.

These solutions are the focus of the Action Plan and can be bundled in 6 clusters:

- **Corridor management**

This cluster refers to actions aimed at enhancing the corridor management. There are several solutions for the identified problems which can be overcome or at least alleviated if there is one actor with a clear agenda taking actions on it, while being supported by all key stakeholders at the highest level. Solutions such as the introduction of multi system locomotives and authorisation for cross-border trade, harmonisation of standards and safety requirements, promotion and organisation of a one stop service with common language, implementation of tracking, tracing and surveillance systems and others fall under this cluster. The Corridor management should be leading the way to initiate solutions to turn infrastructure managers and railway undertakings into client oriented companies, improve information services and strive for standardisation and find solutions for technical problems.

- **Client oriented attitude**

This cluster is focused on transforming the rail corridor organisation into a client oriented service organisation at all levels. The introducing the recommendations of the recently established RAG (Railway Advisory Group) and TAG (Terminal Advisory Group) will increase the client orientation of the IM's.

- **Information services and standardised / harmonised procedures**

This cluster is focused on finding solutions for the lack of information all clients complain about. The cluster also includes actions aimed at standardisation of information exchange between client, railway operators and infrastructure managers.

- **Pricing**

This cluster focuses on actions bringing clarity in pricing schemes, harmonisation of pricing systems and analysis of the total costs of rail transport, including terminal costs and last-mile costs

- **Legislation**

This cluster aims to harmonise national legislation in such a way that rail transport along the corridor is facilitated.

- **Technical barriers**

Action in this cluster focuses on finding solutions for the technical problems as identified in the previous Tasks.
The table below lists the different possible actions for each of these clusters.

Corridor management		
Action	**Stakeholder**	**Description**
Establish working groups within the Corridor Management, with participation of all stakeholders	IM	Establish working groups in the following fields: - Information services - Pricing & marketing - Legislation - Technical barriers
Develop action and implementation plans for working groups	IM	- Develop action plans for the working groups based on prioritised barriers - Check prioritisation with stakeholders and especially clients - Develop realistic implementation plans
Infrastructure improvement projects	IM	- Favour implementation of rail capacity projects - Support technical studies aiming at increasing railway capacity beyond already planned projects
Improvement of paths coordination at borders		- Improve national paths' coordination at borders (i.e take into account time for administrative and management procedures)
Develop a monitoring procedure	IM	- Monitor progress of the defined Actions
Liberalisation	- Ministry - IM	- Continue to work on minimising the dependence between the IMs and the incumbent railway undertakings in corridor states. - Facilitate more competition on the corridor
Extension of the Corridor	Ministry & IM	- Consider extension of the Corridor
Client orientation		
Action	**Stakeholder**	**Description**
License/safety certificate	Ministries/ NSA	- Speed up license/safety certificate process along the corridor to facilitate quicker access of the RUs.
Path allocation and real time traffic	IM (all described actions)	- Analyse the different national procedures for path allocation. - Design an efficient and effective and flexible procedure that is in line with client's demand. - Reduce response time for path requests by setting up corridor monitoring system, particularly with regard to ad-hoc path requests. - In case of maintenance and construction works, provide paths on alternative route with similar performance (energy, speed, tonnage, etc) - Provide the paths which adapt as much as possible to the logistical requirements of the applicants (e.g. several route options and associated charge options and transport time.) Dialogue with the railway undertakings concerning their satisfaction of the paths allocated compared to their requests. - Improve the transparency of path allocation processes - In case of delays aim to keep the train as close as possible to the original path - Give an unique path ID number from end-to-end
Train personnel in client orientation	RU	- Develop and implement training for personnel (all levels) in client orientation. Discuss additional activities with drivers that save costs (i.e. opening gates during shunting etc)
Language	Ministry & IM - All - All	- Investigate on opportunities for a single working language on Corridor (operational level, information level) - Give language training to personnel that works on the corridor - Recruit new personnel with good language skills

Information services and standardised / harmonised procedures		
Action	**Stakeholder**	**Description**
Set up / improve tracking & tracing information services	IM (all described actions)	- Set up information services that allow clients to monitor international transport progress - Distribute new ETAs in case of delays - Set up a corridor monitoring system
Harmonise / standardise information requested by different stakeholders	IM (all described actions)	- Harmonise information requested by IMs (i.e. wagon lists differs in B and NL) - Harmonise how information should be supplied to IMs (differs in B and NL)
Give information about delays due to maintenance / construction works	IM (all described actions)	- Distribute in advance and as early possible information of maintenance and construction works that cause delays - Give easy access to information on maintenance and construction works - Make critical traffic information (e.g. delays) timely available to the terminal operators, RUs, and the rail operators.
Promotion	IM	- Actively promote the use of the Corridor. Be good and tell it.
Pricing		
Action	**Stakeholder**	**Description**
Harmonise price and tariff systems	IM (all described actions)	- Analyse national price and tariff systems. - Offer better information on factors influencing rail charges variation in middle-term - Prepare recommendations to harmonise different levels of calculation of access charges and/or other charging methods. - Distribute information on prices and tariffs and methods to calculate these among all interested parties.
Develop new pricing policies	IM	- Make flexible and tailor made price arrangements with clients. Clients complain about rigid pricing systems and lack of facilities like price savings for larger volumes. Discuss with clients about pricing policies.
Monitor total costs	IM	- Monitor total costs for clients using the corridor. An insight in other costs (terminals, last mile, parking fees) is essential to stay competitive.
Legislation		
Action	**Stakeholder**	**Description**
Approval of locos and wagons	NSA	- Introduce cross-acceptance of authorisation procedures of locs and freight wagons along the corridor.
Approval of loc drivers	NSA	- Harmonise approval of loc drivers. In the current situation loc drivers approved in The Netherlands and in Germany are not allowed to work in France.
Technical issues		
Action	**Stakeholder**	**Description**
Strive to introduce TSI and TENT-T core network standards for rail corridors	IM (all described actions)	- Investigate introduction possibilities of uniform loading gauge profile (P400 or UIC GC), train length (750m at least) and axle load (22,5t) throughout the corridor - Explore opportunities for operating longer, heavier, and faster trains along the Corridor, paying attention to their fitting with the track, waiting tracks, sidings, and the rail terminals
Investigate Arzwiller tunnel	IM	- Investigate possibilities to upgrade the Arzwiller tunnel gauge.
Prioritise bottlenecks and plan removal	IM	- Removal of bottlenecks, construction of dedicated freight tracks, urban bypasses and encouragement of the building of new (open-access) terminal capacities
Improvement of shunting areas	IM & RU	- Implement measures to make operations at shunting areas more flexible (e. g. Antwerpen is a major problem area)
Lengthening of yard tracks to allow 750m's trains operations	IM	- Lengthening of yard tracks to allow 750m's trains operations between Lorraine and Belgium/Luxemburg. Significant increase of 750m's trains number is expected
Speed up track maintenance	IM	- Monitor new technological developments in track maintenance

possible actions for each barrier, as proposed by consultants

The proposed actions will lead to:

- **Enhancing the quality of rail freight services**: more transparency, more competition, new concepts to enable a more efficient traffic management.
- **Enhancement of infrastructure capacity**: uniform loading gauge profile (P400 or UIC GC), train length (750m) and axle load (22,5t) throughout rail freight corridors, measurement of the existing loading gauge, intensive capacity extension and removal of bottlenecks and encouragement of the building of new (open-access) terminal capacity
- **A level intermodal playing-field**: introduction of a more competitive infrastructure access charging scheme providing an intermodal level playing field.
- **Moderate investments in infrastructure**: the transport forecast shows a moderate growth of the freight volumes on the corridor, which can be absorbed with the current infrastructure; if some of the most stringent bottlenecks are deleted.

Management board conclusion

The Management board reviewed the Transport Market Study and took note of stakeholders' comments. It has already taken into consideration or will take into consideration many of these comments. Indeed, the implementation of RFC 2 in itself as well as actions which will be taken by the corridor following studies which are currently being carried out constitute, at this stage, the Management board's answer to reduce barriers on RFC 2.

Concerning the setting up of RFC 2,

- the amount of pre-arranged paths provides more flexibility for applicants;
- allocated pre-arranged paths benefit from a legal protection and therefore be more reliable
- the corridor - one-stop shop enables applicants to have a single contact point;
- the coordination of works at corridor level secures capacity;
- the coordination of traffic management provides more reliability;
- by publishing the Corridor Information Document, including the Implementation Plan, as well as works scheduled on the corridor lines, the Management board provides more information to customers;
- the creation of the railway advisory group enables the Management board to be closer to market's needs and therefore more customer oriented;
- the train performance management contributes to the improvement of rail performance.

Following meetings held up to now with the Railway advisory group, the Management board has undertaken to work with railway undertakings on the following four subjects, with the ultimate aim to implement news measures to improve railway service:

- infrastructure charges and railway undertaking costs;
- infrastructure upgrade (loading gauge in a first step, then longer trains along the whole corridor);
- cross border acceptance to border stations;
- coordination of works.

- The Management board will set up and regularly update an action plan in which will be listed the main barriers to the development of rail freight and the measures to reduce them, as discussed with the RAG

2. Transport Market Study: addendum United Kingdom

In application of Article 9 of Regulation (EU) 913/2010, the RFC North Sea-Mediterranean Management board has mandated a consortium of consultant firms to carry out a Transport Market Study. This study was carried out in 2012 and 2013. The essential elements of the study have already been published and are available in the previous versions of this book V of the CID on the website of RFC North Sea-Mediterranean.

This new addendum assesses the market for international rail freight in the United Kingdom. It also addresses possible routes and terminals for the UK extension of RFC 2 and assesses capacity issues.

The addendum is based on the UK's Freight Market Study (FMS), which was published by Network Rail in October 2013. The aim of the FMS was to assess the demand for rail freight over a thirty year period. The FMS, together with similar studies for the passenger markets, is part of Network Rail's Long Term Planning Process (LTPP), which will help determine investment priorities for the UK's rail network over the next few years. The FMS addresses rail freight demand in Great Britain, including international rail freight demand through the Channel Tunnel.

The figures in this addendum are based on FMS data, unless stated. In this report, international rail demand is defined as the "through-rail" services using the Channel Tunnel; freight on the HGV shuttle service through the Channel Tunnel is excluded. The FMS forecasts refer to demand on the Network Rail "conventional" or "classic" network and do not explicitly address demand on HS1.

The structure of this addendum is as follows: Section 1 assesses the current market, Section 2 provides market projections, Section 3 addresses possible routes and terminals for the UK extension of RFC 2, Section 4 assesses capacity issues and Section 5 provides some conclusions.

2.1. Assessment of the market

Total rail freight demand in the GB market was 111.3 million tonnes (i.e. net tonnes lifted) in the financial year 2011/12. International rail demand was 1.3 million tonnes in 2011 calendar year (source: Eurotunnel), representing 1.2% of the total. The total number of freight trains run in GB in 2011/12 was 270,645. The total number of international trains was 2,388 in 2011 (source: Eurotunnel), representing 0.9% of the total.

The international goods transported consisted of 41% intermodal / containers and 59% other commodity groups (mainly metals, general merchandise and industrial minerals). These figures refer to the proportion of total net tonnes lifted in 2011/12.

International rail freight's market (or modal) share, defined as international rail's share of total unitised trade between Europe and Great Britain, is estimated by the FMS at 2% in 2011/12 (in terms of tonnes lifted). The market is dominated by shipping in combination with road haulage. By contrast, national rail freight's market share, defined as rail's share of total GB domestic freight (including coastal shipping and pipelines) is estimated at 9% in terms of tonne kms moved in 2010 (source: Department for Transport (DfT)).

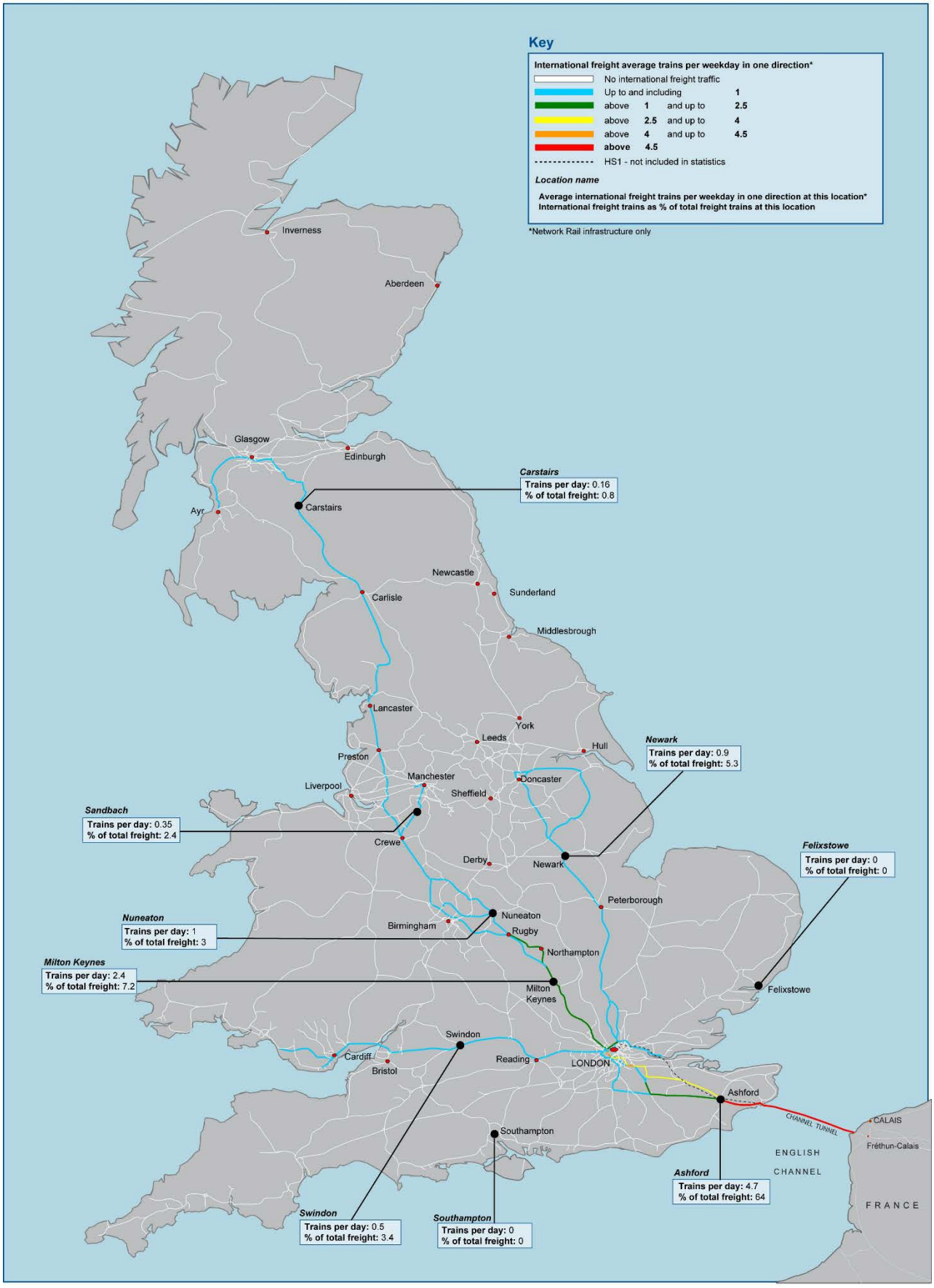
The distribution of international freight trains on the GB network is shown in Figure 1 (see below). This data indicates that the London area, the Midlands, the North West, Yorkshire and South Wales are the main origins or destinations of the trains within GB. This data, for 2012/13, is from Network Rail. The data covers traffic on the classic network only and excludes HS1.

Figure 1 indicates that almost all the international traffic is travelling through the London area, with about 20% terminating there (i.e. a fifth of the total) and 80% travelling onwards to other locations within Great Britain, mainly the Midlands, the North West, Yorkshire and South Wales.

Figure 1 also shows the importance of international freight traffic relative to total freight traffic at key locations. At Ashford, for example, international traffic accounts for 64% of total traffic. At Milton Keynes the proportion is 7%.

In 2011/12 international rail freight demand was 0.45 billion tonne kilometres (i.e. net tonne kms moved within GB only), implying that the average haul length was about 320 km, within GB only.

Figure 1: Distribution of international freight trains within GB in 2012/13



2.2 Market projections

The FMS includes forecasts for international rail freight for the financial years 2023/24, 2033/34 and 2043/44. The base year for the forecasts was the year to September 2012. The forecasts are based on an assessment of the potential demand for rail freight; they do not assess the GB, Eurotunnel or European rail networks' ability to meet these demands i.e. they do not take account of capacity constraints. These forecast freight volumes are conditional on being deliverable in a manner which represents both value for money and affordability to funders and is deliverable operationally, technically and physically. The forecasts are used as the basis for the long term planning of the GB rail network, through the LTPP process. This planning process considers the 30 year long term view but also prioritises more immediate interventions.

The forecasts are based on MDS Transmodal's Great Britain Freight Model (GBFM). The central case forecasts cover these three years, while the higher and lower scenarios are for 2033/34 only.

The main assumptions behind the central case forecasts for international freight are:
Short-sea containerised cargo trade, between Europe and the UK, grows by 1.2% per annum to 2023/24, by 1.9% per annum between 2023/24 and 2033/34 and by 1.6% per annum between 2033/34 and 2043/44.

International costs for rail freight per container, or per container equivalent, fall by £20 relative to other modes, from 2023/24. This is to reflect forecast fuel and wage cost increases (which favor rail relative to road), the introduction of the French eco tax, increased fuel costs for ships following the introduction of the low sulphur zone and the DfT's new charging system for HGVs. No real-terms changes in Channel Tunnel charges are assumed

Expansion of rail-connected warehousing sites within GB.

While the central case forecasts modelled these specific factors, the FMS recognises that significant growth requires other factors to be addressed, such as improved operational performance, improved information en-route and reduced border constraints. The FMS acknowledges that the corridor should help address these factors.

The higher scenario assumes a £50 per container (or per container equivalent) reduction in international costs from 2023/24, compared with the £20 reduction in the central case. The difference reflects an assumed £20 reduction in Channel Tunnel charges and a larger reduction in international rail costs relative to road costs than assumed under the central case; this reflects improvements in rail productivity relative to road productivity, for example.

The lower scenario reflects lower expansion of rail-connected warehousing sites than was assumed under the central case.

Further details of the assumptions used in the central case and the scenarios are provided in the FMS.

The forecasts for the number of international trains and international tons per annum are shown in Tables 1 and 2 respectively.

As discussed above, the FMS forecasts do not explicitly address demand on HS1. However the forecasts do reflect the scale of potential increases in demand on HS1 as well as on the classic network, and the 2014 figures from Eurotunnel in Tables 1 and 2 include both demand on HS1 and on the classic network. The FMS forecasts suggest that there is significant potential growth on HS1 as well as on the classic network. The same factors which drive growth on the classic network can be expected to provide growth on HS1. Although this market study does not currently address demand (or capacity constraints) on HS1, this will be kept under review, considering the evolution of market demand.

Note that the FMS does not present separate "with" and "without" corridor extension scenarios (or "reference" and "corridor implementation" scenarios, as presented in the corridor implementation plan). The central case forecasts and the scenarios do not explicitly model the impact of corridor extension, although (as stated above) the FMS recognises that the corridor should help address various factors which would facilitate growth. In this sense, the central case forecasts and the scenarios can be considered as "with" corridor implementation scenarios.

Table 1: Forecast results for number of trains

Number of international trains per annum (aggregate in both directions)	Year			
	2014	2023/24	2033/34	2043/44
Central case	2,900	4,300	6,000	8,300
Higher scenario	2,900	N/A	12,800	N/A
Lower scenario	2,900	N/A	5,100	N/A
Central case (% growth vs 2014)	N/A	48%	107%	186%
Higher scenario (% growth vs 2014)	N/A	N/A	341%	N/A
Lower scenario (% growth vs 2014)	N/A	N/A	76%	N/A
Notes: The 2014 figure is the actual calendar year figure from Eurotunnel. Forecasts of train numbers are based on FMS. All figures are rounded.				

Table 2: Forecast results for tonnes lifted

International tonnes per annum (x1000, aggregate in both directions)	Year			
	2014	2023/24	2033/34	2043/44
Central case	1,600	2,300	3,300	4,600
Higher scenario	1,600	N/A	7,100	N/A
Lower scenario	1,600	N/A	2,800	N/A
Central case (% growth vs 2014)	N/A	44%	106%	188%
Higher scenario (% growth vs 2014)	N/A	N/A	344%	N/A
Lower scenario (% growth vs 2014)	N/A	N/A	75%	N/A
Notes: The 2014 figure is the actual calendar year figure from Eurotunnel. Forecasts of tonnes are based on FMS. All figures are net tonnes and are rounded.				

The tables indicate that under the central case the number of international trains is forecast to increase by 107% by 2033/34, while total international tons are forecast to increase by 106% over this period. Under the higher scenario, the number of trains is forecast to increase by 341% (over this period) and the number of tons is forecast to increase by 344%.

The forecast increase in international tons under the central case mainly reflects growth in intermodal traffic. By 2033/34 the intermodal / containers sector is projected to account for 67% of total net tons, compared with 41% in 2011/12 (see above). Other commodity groups,

including metals, general merchandise and industrial minerals, are projected to account for 33% of total net tons in 2033/34.

Under the central case international rail's share of total unitised trade between Europe and Great Britain (in terms of tons lifted) increases from 2% in 2011/12 to 4% in 2033/34.

The FMS forecasts were prepared before Eurotunnel announced the ETICA program and other initiatives. Therefore the FMS forecasts do not take account of these developments.

Eurotunnel published in May 2013 its incentive program for the creation of new cross-Channel intermodal freight services named ETICA (Eurotunnel Incentive for Capacity Additions), inspired by the EU Marco Polo grant system, and as provided for by EC Directives. It was open for applications during 2013/14.

Following the success of the ETICA initiative in 2013, and in agreement with national and European authorities, Eurotunnel decided to launch in June 2014 a further initiative for the benefit of rail freight services, aiming to intensify its efforts for the development of cross-Channel rail freight. The initiative in 2014 comprised:
An extension of the ETICA start-up incentives program, with the application period extended to 2018 and the range of eligible traffic broadened to five new categories; and
A reduction in access charges for night-time periods for regular traffic (-25% to -33%) and a price freeze to 2018 inclusive.

This initiative called on the authorities and other parties concerned to take the necessary measures to resolve the barriers to development (gauge clearance, train length, train path capacity etc.) to contribute to the competitiveness and development of cross-Channel rail freight.

Subject to the progressive resolution of these barriers to development, the objective of Eurotunnel's 2014 initiative for freight is to reach 5,000 trains by 2018, doubling traffic levels compared with 2013 (2,547).

Eurotunnel's objective of 5,000 trains by 2018 is broadly consistent with the higher scenario shown in Table 1. The figure of 12,800 trains in 2033/34 implies approximately 4,000 trains in 2018/19 and 6,000 trains in 2023/24 (assuming a constant compound annual growth rate), so Eurotunnel's objective brings forward the achievement of the higher scenario.

To achieve the number of trains and tons shown under the higher scenario for 2033/34 (i.e. 12,800 trains and 7.1 million tons) will require a step change in rail's competitiveness. An increase in gauge clearance on relevant routes on the GB network, for example, could be a key factor behind such a step-change, providing a potential cost reduction per container of £80. Timescales for the achievement of these increases depend on the timing of relevant investment projects and other factors such as market conditions; it may be possible to achieve these increases in advance of 2033, subject to the timing of the investment projects, to favorable market conditions and to resolving other barriers to development.

2.3. Routes and terminals

This section addresses possible routes and terminals for the extension of the corridor to the UK.

Figure 2 (see below) shows that there are three possible routes between Dollands Moor and the London area on the conventional (non-HS1) network; there is a principal route (via Maidstone East) and two diversionary routes (via Redhill and Sevenoaks).

Figure 2 also shows the three possible terminals: Dollands Moor Yard, Wembley European Freight Yard and Willesden Euro Freight Terminal.

HS1 is not included among the possible routes at present since this market study currently excludes HS1, as indicated above. Also HS1 currently accounts for a relatively small proportion of the total traffic between the Channel Tunnel and London (i.e. HS1 currently accounts for 200 to 300 trains per annum in each direction). However the exclusion of HS1 will be kept under review, considering the evolution of market demand.

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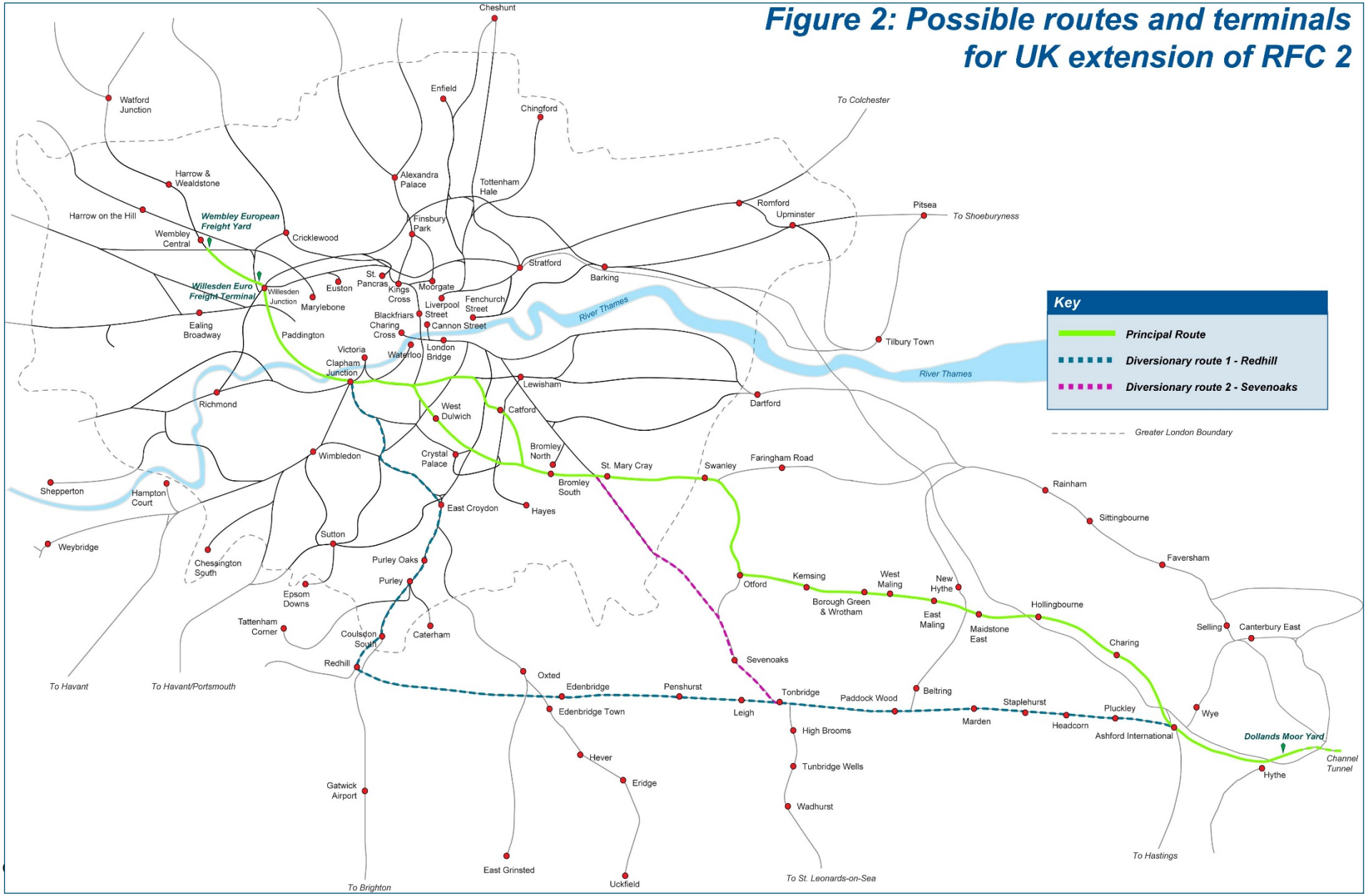
Figure 2: Possible routes and terminals for UK extension of RFC 2



2.4. Capacity

This section addresses the availability of rail freight capacity on the Channel Tunnel and the GB rail network.

The Channel Tunnel and the GB rail network between the tunnel and London (Wembley) on the GB rail network (not HS1) currently has secured capacity for 35 freight paths in each direction per weekday, under the Treaty of Canterbury. This represents over 10,000 paths per annum in each direction (after allowing for weekend traffic) or over 20,000 paths per annum in both directions. This compares with the forecast demand of 6,000 trains (aggregate in both directions) in 2033/34 and 8,300 in 2043/44 under the central case scenario and for 12,800 trains in 2033/34 under the higher scenario (see Table 1). Although higher scenario results are not available for 2043/44, even if the number of trains was double the central case figure (i.e. 16,600) there would be sufficient capacity.

This suggests that there is sufficient capacity on the Channel Tunnel and the GB conventional rail network to London to meet the FMS forecast demand until at least 2033/34, and probably until 2043/44.

It should also be noted that the historic data indicates that there is significant capacity available. In 1998 (calendar year), through-rail demand was at its peak level of 3.1 million tonnes (source: DfT and Eurotunnel) compared with 1.6 million tonnes in 2014 (Eurotunnel). This indicates that growth of 95% would return volumes to 1998 levels.

At this stage, Network Rail would not envisage capacity as being an issue on the GB conventional rail network part of this corridor extension. However, it should be noted that Network Rail is in the process of reviewing future capacity requirements for the whole GB network, assessing both passenger and freight requirements for a mixed use railway, as part of the LTPP.

2.5. Conclusions

The UK's Freight Market Study forecasts strong growth in international freight demand, with total tonnes lifted increasing by 106% by 2033/34 relative to 2014 under the central case. Under the higher scenario, growth over this period is over 300%.

Three possible routes and three possible terminals for the extension of RFC 2 to the UK are identified. The HS1 route is not included at present, but this will be kept under review, considering the evolution of market demand.

The analysis in this Addendum suggests that there is sufficient capacity on the Channel Tunnel and the GB classic rail network to London to meet forecast demand, at least until 2033/34. At this stage, Network Rail would not envisage capacity as being an issue on the GB conventional rail network part of this corridor extension. However, it should be noted that Network Rail is in the process of reviewing future capacity requirements for the whole GB network, as part of the Long Term Planning Process.