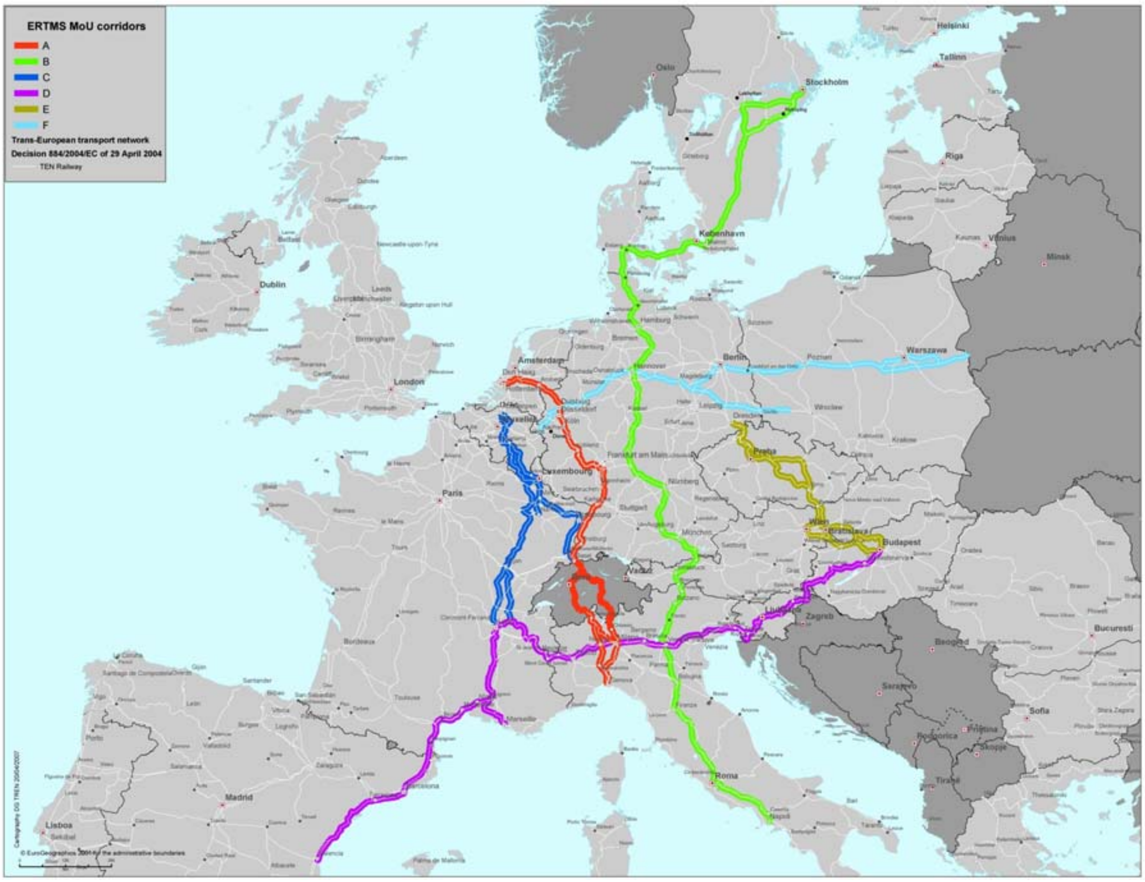
FR

ANNEXE 5

CARTE DES CORRIDORS ERTMS



ANNEXE 6

DÉFINITION DES IMPACTS OPÉRATIONNELS

➢ **Technical harmonization**

The main objectives within the technical harmonisation this intervention area are:

– increase in the productivity of each freight train (in terms of volumes transported)

– coordinated development of harmonised rail infrastructure and deployment of interoperability

The following actions have been identified by the Strategic Group of Experts to reach the above mentioned objectives:

– interoperability deployment. This will initially concern ERTMS and may also concern other interoperable systems;

– train capacity increase (this should primarily concern train length);

Technical harmonisation and interoperability throughout the different sections of the examined corridors are key factors for the creation of a rail network giving priority to freight. Harmonised infrastructures imply standardised technical features such as train length limits, loading gauge, train tonnage limits, maximum axle load.

As a consequence of the above mentioned effects, actions in this intervention area are expected to generate impacts in terms of:

– **waiting times**: reduction because of a decrease in operations of at the border stations thanks to the implementation of interoperability (i.e. safety checks such as brakes control, train signalling light, etc.). The hypothesis is that in the case of a fully harmonised the full interoperability of each section of the network will eliminate these operations and reduce the waiting times at the border stations to those strictly necessary to change the driver (5 minutes) and/or the locomotive (locomotives). These impacts are going to be expressed in terms of reduction of minutes of waiting times along the corridor;

– **capacity:** increase as a consequence of trains set at the higher standard harmonized size of each section (750 m). This impacts are going to be expressed in terms of increase in tonnes of capacity per train.

– reduction in **operating costs not variable with train size** (driver and loco amortization & maintenance). In fact, an increase in train size does not imply increase in costs items such driver wages and locomotive amortization & maintenance (as far as a second locomotive is not required), while the tonnage transported by the train increases. As a consequence, an increase in train size generates a reduction of the driver costs per ton (expressed in terms of €/tons*hour) and of the costs for locomotives amortization & maintenance per ton (expressed in terms of €/tons*km).

The above-described approach is synthesized in the following tables.

Affected variable	Situation	Practices and expected effects on the variable	
		Lines requiring locomotive change even after intervention	Lines not requiring locomotive change even after intervention
Waiting times	**Baseline situation**	**Current waiting times (*)**	**Current waiting times (*)**
	Situation after intervention	**30 minutes (due to loco change)**	**5/10 minutes (due only to driver change)**
Train size	**Baseline situation**	**Trains set at the minimum (common) size (depending on the corridor) (**)**	
	Situation after intervention	**Trains set at the standard harmonized size of each section (usually 750 m)**	
Operating costs	**Baseline situation**	**Baseline operating costs** **Train cost = $X_0 + x_0 * t_0$ → Cost per ton = $c_0 = (X_0/t + x_0)$**	
	Situation after intervention	**Reduction of the cost per ton that are not variable with train size (driver and locomotive amortization & maintenance ***)** **No change on other operating costs** **Train cost = $X_0 + x_0 * t_1$ con $t_1 > t_0$** **→ Cost per ton $c_1 = (X_0/t_1 + x_0) < c_0$**	

(*) Source data: TEMA

(**) Source data: ERIM

(***) an increase in train size might require in some situations additional locomotives creating also an increase in fixed costs.

- **Path allocation rules**

For the intervention area "path allocation rules" the Tasks Specifications have set the following objectives:

– smooth and efficient path allocation process for international freight trains;

– possibility for applicants other than railway undertakings to request train paths.

The Strategic Group of Experts has identified the following actions to be but in place by the Infrastructure Managers to meet the above listed objectives:

– reserve a pre-defined amount of good paths after having carried out a needs assessment by way of a **market study**;

– set up a **catalogue** of good ad hoc paths;

– it will not be possible for IM to cancel paths for freight to serve passenger traffic;

– **revise timetabling procedure** so that requests for freight paths can be better satisfied;

– propose **differentiated paths** in terms of quality, i.e. in terms of journey time and/or risk of delay and attach commitments, for both contractors (operator and IM), to these different quality levels;

– set up procedures and processes to ensure the consistency of the capacity distributed to freight applicants for cross-border trains composed by paths from different IM.

The above listed actions are expected to affect the following variables:

– **commercial speed**: the actions identified by the Strategic Group of Experts aim at providing paths set at (relatively) high speed for strategic freight trains, as result of the approach of differentiating paths in terms of quality;

– **line capacity**: all of the actions proposed by the Strategic Group of Experts go in the direction of a better usage of line available capacity for freight. Such improvement shall be expressed in the number of new paths available on the network result as a consequence of a strategy aiming at setting rail train paths according to market needs.

It is worth noticing that, even if the expected impact of the proposed actions is on quantitative variables, data availability on these issues is relatively poor. This might affect an effective quantitative measurement of such impacts.

Affected variable	Situation	Practices and expected effects on the variable
Commercial train speed	**Baseline situation**	**Most/ freight train path set at the same speed**
	Situation after intervention	**Better journey time/commercial speed for "strategic" freight trains**
Line capacity (for freight)	**Baseline situation**	**Current path allocation : number / type of freight train path set mainy according to residual capacity after planning the passenger path (even if according to dir 2001/14, international freight trains shall already have "adequate" priority)**
	Situation after intervention	**Path allocation on the basis of a specific market study** **→ Number of available freight train paths set according to market needs**

1.1.Traffic management

In the traffic management intervention area two main needs have been identified in the Tasks Specifications:

– the need for a sufficient priority to freight trains in case of infrastructure congestion. Performance schemes are mandatory and should ensure a good reliability of train paths. Unfortunately such schemes are not in force in many MS. When they exist, they are not sufficiently efficient and there is a high risk that they will not be in the next years. Furthermore, binding financial compensation scheme exist for passenger trains customers and not for freight trains. This may lead, in cases of mixed traffic where prioritisation of traffic is necessary, to a form of discrimination unfavourable to freight trains;

– good coordination between national/regional operational centres for international traffic.

In order to meet these objectives the Strategic Group of Experts has recommended the publication publish priority rules for traffic management in the reference document of the corridor, providing that these rules can :

– either include 2 or 3 levels of priority that will be set according to socio-economic value of trains;

– or be "a train on time remains on time".

The Strategic Group also proposed that Corridors will also set up procedures, processes and systems that will ensure a good coordination of traffic management along the corridor; dispatching centres on both sides of the borders will thus coordinate their action on cross-border traffic.

These actions appear to have an high potential in terms of generating positive impacts on punctuality. It is expected that their implementation is going to reduce the percentage of freight trains on delay on the network. Nevertheless a lack in data availability (both on the baseline and on the to-be situation) makes it difficult to proceed to a quantitative measurement.

The following table shows the comparison on the basis of which the above impacts should be measured as the gap existing between the baseline and the after – intervention situations.

Affected variable	Situation	Practices and expected effects on the variable
Punctuality (% of freight train arriving on delay)	**Baseline situation**	**No publication of priority rules Current traffic management procedures not always including specific measures for punctuality** **→ Current punctuality on the corridor**
	Situation after intervention	**Implementation within traffic management procedures of specific measures for punctuality** **→ Reduction/Elimination of high priority freight train delays due to disruptions on passenger traffic** **→ Relative increase of delays for passenger trains**

The New Opera case study on changing priority among trains (increasing the one of freight trains) may support the estimate of the change in expected delays.

1.2.Terminals

Concerning terminals, the main needs have been identified in Tasks Specifications:

– adequacy between infrastructure capacity, terminals capacity and needs of freight trains;

– fair access to ancillary services.

To meet these objectives the Strategic Group have indicated the following actions to be put in place by infrastructure managers:

– identify the needs in terms of terminals (intermodal and marshalling yards) along the corridor;

– define a network of strategic terminals;

– plan and stimulate the development of the strategic terminals;

– set up procedures and systems to coordinate traffic management of the infrastructure and management of the operations in strategic terminals.

These actions are expected to affect the following variables:

– Train size: planning and stimulating the development of a network of strategic terminals characterized with the highest technical standards, would bring to an higher capacity per train eliminating the necessity to split the trains in two or three parts in order to perform transshipment operations;

– **Waiting times**: the coordinated planning and stimulation of the development of a network of strategic terminals is expected to lead to a situation with no lack of shunting for cutting/assembling trains. As a consequence of this average reduction in waiting times are expected to occur up to, in the case of the highest impact, 30 minutes;

– **Operating costs**: reduction on operating are expected as an effect in terms a reduction in:

  - <u>shunting operations costs</u> only for trains transfer into terminals;
  - <u>operating costs not variable with train size</u> (driver and loco amortization & maintenance)

Affected variable	Situation	Practices and expected effects on the variable
Train size	**Baseline situation**	**Transshipment tracks shorter than maximum train length allowed on the main network** **→ Necessity to split the trains in two or three parts in order to perform transshipment operations (and to assembly the parts before departing)** **→ More shunting operations required**
	Situation after intervention	**Transshipment tracks longer at least as the maximum train length allowed on the main network** **→ No train split / assembling operations required**
Waiting times	**Baseline situation**	**Waiting times due to uncoordinated planning of long run rail path and terminal slot and no need of shunting for cutting/assembling trains** **→ Current waiting times**

	Situation after intervention	**Reduced waiting times due to coordinated planning and no lack of shunting for cutting/assembling trains** **→ Expected reduction in waiting times after intervention (up to 30 minutes)**
Operating costs	**Baseline situation**	**Cost of shunting operations required due to train cutting / assembling & trains transfer into terminals**
	Situation after intervention	**Cost of shunting operation only for trains transfer into terminals**

ANNEXE 7

CARACTERISTIQUES PRINCIPALES DES 6 CORRIDORS ERTMS

Corridor	Length	Involved countries		Geographic orientation	Border stations (number)	Border stations (list)	2005 Freight traffic level						Level of Technical Harmonisation				
							International		National		Share of freight traffic on total corridor traffic	Share of international freight traffic on total freight corridor traffic	Track gauge	Train lenghth		Loading gauge	Axle loa
	km	number	names				Million tkm	Million tkm / km	Million tkm	Million tkm / km	% on TU.km	% on tkm	Sections <> 1435 mm (Y/N)	Available length 600 m	Sections <750 m (Y/N)	Sections <Gabarit GB	Sections <22,5 t
Corridor A	2.548	4	Germany Italy Netherlands Switzerland	N - S	3	Domodossola Chiasso Basel Venlo	17.047	6,69	10.408	4,08	68%	62%	0%	73%	Y	79%	99%
Corridor B	3.467	5	Austria Denmark Germany Italy Sweden	N - S	4	Brennero Kufstein Flensburg Lernacken	11.102	3,20	9.150	2,64	54%	55%	0%	87%	Y	97%	97%
Corridor C	1.680	4	Belgium France Luxembourg Switzerland	N - S	3	Athus Thionville Basel	6.281	3,74	6.956	4,14	68%	47%	0%	100%	Y	98%	100%
Corridor D	2.220	4	France Italy Slovenia Spain	E - W	5	Cerbere Port Bou Modane Villa Opicina Hodos	5.681	2,56	5.184	2,34	47%	52%	24%	58%	Y	73%	100%
Corridor E	1.621	5	Austria Cz. Republic Germany Hungary Slovakia	E - W	5	Hegeyshalom Sturovo Bratislava-Petržalka Breclav Dolní Žleb / Decin	6.680	4,12	2.277	1,40	75%	75%	0%	94%	Y	100%	89%
Corridor F	1.934	2	Germany Poland	E - W	1	Frankfurt (Oder)	14.826	7,67	11.329	5,86	83%	57%	0%	84%	Y	100%	77%
Total	**13.470**						**61.617**	**28**	**45.304**	**20**	**66%**	**58%**					