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RETRACK

REorganisation of Transport networks by advanced RAIL freight Concepts

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Management Summary

To improve the quality of the rail freight transport on the EurAsia land bridge, WP 13.3 produced a practical road map to solve the issues identified as barriers, per different corridor, namely the TransSib, the Central and TRACECA corridor. The final objective behind the deliverable WP 13.3 is to lead to preparation for a possible demonstration. The practical road map is translated in an Action Plan including the translation of the bottlenecks into practical Actions to improve the quality, reliability and services on the different EurAsia corridors.

The key message from the RETRACK project so far is that rail transport on any studied corridor, connecting RETRACK with China can be organised. However it requires high organisational costs and requires flexibility, in particular in terms of realised transit time. For bulk type commodities this is more acceptable than for containerised transport. On the other hand, dedicated trains such as the automotive trains between France and Russia show that reliable connections can be organised.

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. In this Action Plan several measures are suggested. For each measure a number of milestones are developed. The measures and milestones are intended for the public authorities and private authorities, namely, the EC, the National Governments, Infrastructure Managers (IMs), railway operators, terminal operators, private wagon and locomotive owners and other stakeholders. But primarily focused to those in the EU, as the EC can urge them to implement them, whereas those from outside the EU only can be advised to implement them.

WP 13.3 contains 2) the methodology on how the Action Plan is generalised. 3) the main barriers in the development of the Corridor 4) the Action Plan, in which the measures and milestones are elaborated and 5) the conclusion and recommendations.

Methodology of the Action Plan

The methodology was applied in several other corridor studies and has been proven to be effective and valid. The methodology consists of four successive steps. First, we identify the objectives of this action plan. Second, we create a list of barriers. The barriers are categorised based on the aspects being addressed (e.g. capacity, market, etc.), and the physical locations they take place (e.g. within the EU or outside the EU). To each concrete barrier and problem group a problem 'owner' is assigned.

Different barriers are critical for specific groups of railway transport stakeholders who, in this case, are 'problem owners'. Problem owners are important because this category also should take the initiative solving the problem. Third, according to the main barriers, additional inputs from interviews and expert experiences, we make a draft of the Action Plan consisting of measures and milestones. For each milestone an actor is assigned to be primarily responsible. Fourth, we conduct an internal assessment of the Action Plan and we screen out the milestones and measures that do not meet the objectives of the Action Plan or the timeline requirements. This process has led to the final Action Plan for the Corridor.

Identification of the barriers

Deliverable 13.2 describes in detail different operational and technical barriers which exist on three studied corridors (see chapters 5, 6 and 7 of D13.2 for different corridors), providing the RETRACK corridor a connection with China. In total more than 40 major barriers were identified, with over half relevant to all the three studied corridors. In the table 1 of the report the abovementioned barriers are related to the studied corridors and are grouped into more general categories. These categories indicate whether the barrier is more an operational, institutional, market or technical issue. The list shows that the majority of the barriers are of an operational nature. Technical barriers are the most limited in their number. This is an important factor, as technical barriers are the most difficult and expensive to solve.

Clustering the barriers

The following problem groups were identified: border crossing, transit time, availability of wagons/containers, administrative rules and documentation, feasibility of rail transport, free market, capacity, reliability, tariff, human resources, institutional and regulatory issues. The following problem groups are of a high importance due to large number of barriers that fall into them:

- transit time (8 barriers), administrative rules and documentation (6 barriers),
- capacity and reliability (each 5 barriers).

This means that these are the problem groups to be focused on as they accumulate the most barriers and represent the major bottlenecks.

After identifying the barriers, the problem behind the barrier and the problem owner, the next section defines possible solutions to the barriers identified (see table 2). In this table it is indicated whether the identified problem owner is an EU stakeholder or a stakeholder from outside the EU. This is of utmost importance, as stakeholders from within the EU could be pressed to solve the problem, whereas a stakeholder from outside the EU can only be advised to follow up a suggestion.

The proposed solutions cover a very large range of barriers with which the railway transport stakeholders are confronted. Many of the problems can be solved with few solutions. These solutions, which are within the reach of the EU, are the focus of the Action Plan and can be bundled in 5 clusters, namely:

Creation of the Rail Corridor Project Team

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 approvals for cross-border trade, harmonisation of standards and requirements for the safety certificates with China, promotion and organisation of a one stop service with common language, identification of routes for oversized cargoes, implementation of tracking, tracing and surveillance systems and others fall under this cluster.

Investment in transshipment yards on the EU part of the border region

The transshipment yards between the European (1.435 mm) and the Russian gauge (1.520 mm) have developed over the decades. Due to the functions they are fulfilling, these stations can be better called non-transshipment yards or logistics hubs, but transshipment areas as only transshipment to trains with different gauges is performed. There is a necessity to modernise these transshipment yards and to achieve their efficient functioning. Open access to these terminals in the future will improve their competitive position. Modernisation of the transshipment yards will contribute to the optimisation of the processes and will make the transshipment process cheaper, contributing to the general competitiveness of the railway transport.

Investment in infrastructure to allow longer trains within the EU territory

There is a big difference in the maximum train length on the corridor between Western Europe and Russia / China. The regular permitted train length and the maximum possible train length are shown in the next table.

Train length in different countries along the RETRACK corridor and its extensions

Country	Normal train length	Maximum technical possible train length
Germany	700 m	835 m
Poland	600 m	600 m
Belarus	1,000 m	1,050 m
Russia	1,000 m	2,000 m
Mongolia	1,000 m	1,000 m
China	770 m	800 m
Kazakhstan	1,000 m	1,000 m

A full train coming from Western Europe is not a full train on the Russian rail network. In other words, a block train from the West will be considered to be complete in comparison to the normal train length of 1,000m on the Eastern part after transshipment between the European and Russian gauge. This can be seen as an additional interface which costs time.

Reaching the average train length of 1,000 m as in Russia, Belarus, Mongolia and Kazakhstan means an increase of capacity of 45 TEU or more (o.i.e. an additional 42% capacity per train). A concept for the technical adaptation of the studied railway corridors is essential to increase the competitiveness of the railway transport between China and the EU.

Support in creation of the unified transport system, in particular by simplification /unification of the Eurasian freight documentation

As transport on the EU-China Corridors is passing through many countries there are cost increasing risks involved due to the different legal / procedural / administrative systems in these countries. With a unified transport system the costs (and time loss) would be minimised, contributing to the community at large. Such a unified transport system is therefore to be pursued. The ongoing EU initiative

Cassandra¹ on E-freight and E-customs is considered to be the right platform to extend on in this respect.

On the railway transport within the EU-China transport corridors two different contracts for the carriage of goods are used: SMGS and COTIF. They apply different terms for the carriage, liability and for documents. Development of the electronic freight documentation and compatible IT-systems between the national railways is in a very early stage. According to field experiences, 70% of all delays in border crossing between CIM and SMGS areas is caused by unclear and improper formulations in the transport and trade documents². One major reason for this is the lack of unification

Providing support in operational and commercial solutions

The container transport on the Eurasian land bridge is hampered increasingly by a lack of wagons and containers. One major reason is the outsourcing of formerly state railway owned wagon and container parks to private daughter companies. This implies that wagons and containers are considered as private equipment and cannot be reloaded on the return voyage by third parties but usually return empty. Agreements on interchanging equipment between the different owners involved should facilitate the use of the empty wagons and the wider market entry of container and wagon leasing companies should increase the wagon stock. The latter could offer master lease agreements or time / trip related rental contracts.

Action Plan

In this section the Action Plan further elaborates concrete measures and steps for five intervention areas which are described above. The next tables describe briefly the identified measures per cluster and some concrete milestones to be implemented to reach these measures. Finally, it indicates which stakeholder is responsible.

Creation of the Rail Corridor Project Team (RCPT)

Measures	Milestones	Primary Stakeholders
I. Build the Rail Corridor Project Teams (RCPT)	(1) Establish Rail corridor project Teams: one for Central, one for TRACECA	EU
	(2) Initiate, organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridors	RCPT, EU

¹ <http://www.cassandra-project.eu/>. This concerns the E-Freight and E- customs initiative of the EC

² Presentation of Padalitzza (InterRailServices) on container train ‘East Wind’ and project of electronic train, CCTT 20th Plenary Meeting, Odessa, September 29, 2011

	(3) Realise Corridor webtool	RCPT, EU
	(4) Establish a Cross – Border customs team	RCPT, EU
II. Build up the presence of the Rail Corridor Project Teams	(1) Acknowledgement as the single point of contact	RCPT
	(2) Initiate, organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridors	
	(3) To achieve first results in starting up the rail service and facilitating the process of train run	
III. Consolidate position of the Rail Corridor Project Teams	(1) Acknowledgement as the single point of contact	RCPT
	(2) Initiate, organise and manage the actions and projects to realise reliable, sage and competitive rail services on the Corridors	
	(3) To achieve first results in starting up the rail service and facilitating the process of train run	
	(4) Higher use of the Corridor Rail Logistics Services by market	
	(5) Realise more support from local, regional and national authorities and stakeholders to faster implement solutions for the bottlenecks	
	(6) Disseminate the work and achievements	

Development of the investment programme in the transshipment yards

Measures	Milestones	Primary Stakeholders
I. Forecast	(1)Efficiency of the individual sidings	EU
	(2) Traffic volumes	
	(3) Specialisation and strength of border crossing stations	

Measures	Milestones	Primary Stakeholders
	(4) Position on TEN-T corridors	
	(5) Position for individual types of goods	
	(6) Requirements for the future design of facilities	
II. Concept	(1) Ranking the list of border crossing stations	EU together with local transshipment companies and national ministries
	(2) Consideration of the mid term and long term goods flows	
	(3) Definition of standards	
	(4) Timeline for the implementation	
III. Financing	(1) Development of uniform policy	EU
	(2) Definition of fixed prices and open access	
	(3) Definition of funds to use	
	(4) Elimination of obstacles	
IV. Concept realisation	(1) Implementation of the project team	EU, RCPT
	(2) Test for the terminal	RCPT
	(3) Expansion of the gauge	RCPT
	(4) Give consideration to industries	RCPT

development of the investment plan in infrastructure

Measures	Milestones	Primary Stakeholders
I. Research	(1) Development of an operational plan	Infrastructure authorities in the participating countries
	(2) Assessment of current situation at the marshalling yards	
	(3) Assessment of situation about the signalling	
	(4) Definition of solutions for noise reduction	
	(5) Optimisation of the rail interfaces	
	(6) Cost estimation for the expansion projects	
II. Investment plan and operational concept	Final investment concept and operational concept	Infrastructure authorities in the participating countries together with EU
III. Trial realisation	Realisation on the trial part on the corridor	Infrastructure companies in the Netherlands, Germany and Poland

Development of unified transport system

Measures	Milestones	Primary Stakeholders
I. Agreement on Corridor	(1) Institutional and legal environment for the pilot	EU, governments, RCPT

Measures	Milestones	Primary Stakeholders
Pilot	(2) Clean sheet approach elements	RCPT, EU
	(3) Identification of the stakeholders and agreement of the action plan per country	RCPT, EU
	(4) Procedural aspects	RCPT, EU
	(5) Launch of the pilot	RCPT, EU
II. Unifying Information Chain	(1) Business process architecture of the Corridor extension logistics	RCPT
	(2) Organisation of the datahub	
	(3) Organisation of Customs documentation	
III. Organisation of freight documentation	(1) Establishment of joint CIM/SGMS consignment note	RCPT, CIT International Rail Transport Committee,
	(2) Establishment of joint CIM/SGMS wagon list and container list	
	(3) Uniform Claim Note	
	(4) Uniform CIM/SGMS Eurasian corridor law	OSShD, RZD, Chinese Railways
	(5) Accession of China to joint CIM-SMGS-Consignment Note	Chinese Government, RCPT, CBCT
	(6) Virtual Corridor Control Tower	National railway companies, major container train operators
III. Unifying Physical logistics chain	(1) Improving interoperability	Wagon Owners, CRC
	(2) Dealing with gauge change	Governments, EU

Measures	Milestones	Primary Stakeholders
	(3) Dealing with locomotive change	RCPT, Governments, EU
	(4) Dealing with types of wagons	CRC
	(5) Communication system	RCPT, Governments, EU
	(6) Standardisation of container sizes and/or load units	RCPT, CRC
IV. Regulatory unification	(1) Acceptance of a separate Regulation Regime for the Corridor only	All Corridor country governments, RCPT
	(2) Development of the performance indicators	RCPT
	(3) One freight document for the corridor	CIT International Rail Transport Committee, OSShD, FIATA

Support operational and commercial solutions.

Measures	Milestones	Primary Stakeholders
I. Learning action on availability of wagons and containers	(1) Research on solutions for utilisation and availability of transport equipment	European Commission, railway and container operators
	(2) Dissemination of good practices	
	(3) Preparation of concrete actions	
II. Learning action on logistics and control systems	(1) Research of solutions of IT based wagon and container logistics systems	European Commission, with railway and container operators
	(2) Dissemination of good practices	

	(3) Preparation of concrete actions	
III. Learning action on pricing and tariffs	(1) Creating awareness	European Commission, with railway and container operators
	(2) Analysis of pricing and tariff systems	
	(2) Dissemination of good practices	
	(3) Preparation of concrete actions	
IV. Provision of the free access to the RETRACK corridor and its extensions to China	(1) Monitoring of the corridor	European Commission, with railway and container operators
	(2) Measure to ensure free access	
	(3) Support of cooperation and consolidation of the corridor	

Conclusion and recommendations

The Action Plan has been drawn up to overcome the barriers which were identified in the previous task of WP13; namely 13.2. The barriers are listed and ranked. All barriers are classified as “serious”. Only three barriers are classified as “highly grave”, namely on high and unstable tariffs, on the missing consensus between countries on tariff matters and the TRACECA route involving the intermodal transport. All other barriers are classified as “medium grave” and “grave”. (between 3 and 4 on the scale of 5)

The ability to overcome the barriers provides a more mixed overview. The technical barriers are the most difficult to overcome; which is not surprising taking the huge investments into account on for example, the gauge width and safety systems, The operational and market barriers are more easy to overcome which is based on the fact that most of these barriers are based on administrative and organisational aspects which are less costly and less time consuming to overcome.

When combining the most grave barriers with the possibility to overcome them; it is clear that it is nearly impossible to overcome the difficulties when crossing the sea twice and when taking the TRACECA route. However, agreeing on lower and stable tariffs which between the different countries is less difficult to organise.

As the technical barriers are the most difficult to solve due to the high costs and long period, the focus of the Action Plan is given to the operational, institutional and market barriers as solving these barriers is less costly and less time consuming. Therefore, the Action Plan is focused on five intervention areas. Namely:

- Creation of Rail Corridor Project Teams
- Investment in the transshipment yards on the EU territory of the cross border region
- Investment in infrastructure to allow longer trains on EU territory
- Support in creation of the unified transport system, in particular by simplification/unification of the Eurasian freight documentation
- Providing support in operational and commercial solutions

In total, 19 measures are brought forward within the clusters, each of which presents the development of one specific aspect of the RETRACK Corridor extension. Under each measure a set of milestones are generated. For each milestone, the stakeholders, namely, the European Union, Rail Corridor Project Team, National Ministries, Transshipment companies, Infrastructure authorities, Railway Operators, Terminal Operators, Transport operators and Shippers or international organisations active in rail transport are selected as the primary stakeholders responsible for the execution of the milestone. A set of tables clarify the measures (the overall goal) and the set of milestones to support the measures and indicates the primary stakeholder responsible for the milestone.

The proposed solutions cover a vast range of barriers with which the railway transport stakeholders are confronted. Many of the problems can be solved with few solutions. The solutions proposed in the Action Plan should be within the reach of the EU, as stakeholders from within the EU could be pressed to solve the problem, whereas a stakeholder from outside the EU can only be advised to follow up a suggestion.

The proposed measures can mostly be described as organisational, administrative and operational which makes the investments less costly and the time horizon visible within some years. However, this implicates that all involved stakeholders should cooperate and the EU and National Governments should enforce the cooperation and implementation of the proposed measures.

When taking into account the most serious barriers which are also possible to overcome, which are dealing about the high and unstable tariffs and on the missing consensus between countries on tariff matters; following measure is proposed: A learning action of pricing and tariffs. This includes the following actions:

1. Creating awareness about the problem and the chances to overcome

2. Analysis of the pricing and tariff systems in the Eurasian corridors

3. Discussion and dissemination of good practices in cost accounting, pricing and tariffs in the railway sector but also in other modes of transport and their benefits

4. Learning actions on modern costing and pricing policies and tariff systems

Considering the severity of most barriers, the magnitude, the differences in background, mentality, regulations, and in business environment, all indicate that the realisation of a seamless functioning, reliable, safe and commercially attractive Eurasian rail Corridor is not a project that will quickly see results. It will take time, effort, persistence and perseverance to realise it. Indicated solutions are good input towards the bilateral discussions and negotiations with third countries, especially between bilateral discussion between the EC and Russia on railways. During these discussions the priority of implementing the milestones should be made, after consultation of the stakeholders.

This Action Plan provides the European Commission with concrete steps to be undertaken in order to decrease the severity of barriers and to create favourable conditions for the organisation of the demonstration train, connecting the RETRACK corridor with China through one of the proposed routes.

1 Introduction

This section presents the Action Plan for the extension of the RETRACK corridor (the Corridor extension) to China. The Action Plan aims at enhancing the overall framework conditions of the Corridor extension, which includes improving the capacity of railway, as well as the rail freight service quality, namely; reliability, costs, transit time, and flexibility. The implementation of the proposed measures should lead to an increase in rail freight traffic.

The results of tasks 1 and 2 of WP 13 provide an extensive overview of recent and planned rail freight strategies in Russia, China and other countries involved in Eurasian rail land bridges. Deliverable 13.2 in particular has identified three extension possibilities of the RETRACK corridor to China: via the Trans-Siberian, Central Kazakhstan and TRACECA corridors. Each of these corridors was further elaborated in detail through concrete routes. Several connection possibilities between the identified corridors/routes and the main RETRACK corridor Rotterdam – Constanca were described. The assessment of the Corridor extension and of the relevant connections has shown that a number of bottlenecks exist per corridor preventing smooth and reliable railway transport between Europe and China.

The main objective of Task 3 is to elaborate these results further and to produce a practical road map to solve the issues identified as barriers per corridor. The final objective behind the deliverable 13.3 is to lead to preparation for a possible demonstration. The practical road map is translated in an Action Plan including the translation of the bottlenecks into practical Actions to improve the quality, reliability and services on the different EurAsia corridors.

The outcomes of the deliverable 13.2 have clearly illustrated that in order to make the organisation of the train run demonstration possible, a large scope of barriers first need to be softened or overcome. The format of the Action Plan was chosen in a concise way and translates the barriers into the measures and concrete actions. Realisation of these measures and actions will make the organisation of the train run demonstration possible. In particular, this Action Plan is relevant and takes into account the recent EC – Russia initiative to discuss the further development of the railway market on a bilateral basis. It will assist the EC in identification of the discussion points and tackle the possible solutions of the defined problems.

Therefore, the Action Plan is a first and important step in the facilitation of the Eurasian railway transport and in the preparation of the demonstration runs on the identified routes.

The proposed Action Plan follows the same approach for the three main corridors identified. Even though the barriers differ per corridor, they all group the same operational, technical and administrative clusters which can be resolved within the proposed approach. Therefore, for the clarity and consistency of approach, the Action Plan covers all three main rail bridges proposed in the deliverable 13.2. It identifies the main stakeholders and reviews the necessary administrative

arrangements. In particular, the Action Plan focuses on the areas which can be influenced by the EU stakeholders (e.g. the Ministries of Transport (MoTs), Railway Operators, Terminal Operators, Customs, Safety Authorities/Inspectorates private wagon owners, Transport Operators and Shippers). For each suggested measure a number of milestones are defined.

The outline of the Deliverable 13.3 is as follows. Section 2 describes the main items of the Action Plan methodology. In Section 3 the main barriers towards the development of the Corridor extensions are listed, ranked, clustered and possible solutions proposed. Section 4 presents the Action Plan and proposed mitigation measures respectively. Section 5 provides the conclusions and recommendations to the Action Plan.

2 Action Plan Methodology

Section 2 describes how the Action Plan has been developed. This methodology is adopted from previous rail corridor studies, which has been proven to be effective and valid. The Action Plan is a practical tool for the stakeholders to improve the quality of the corridor with small or medium sized measures. It is not focused on infrastructure shortcomings, but on practical actions to improve the corridor from organisational, operational, institutional, market and technical perspectives.

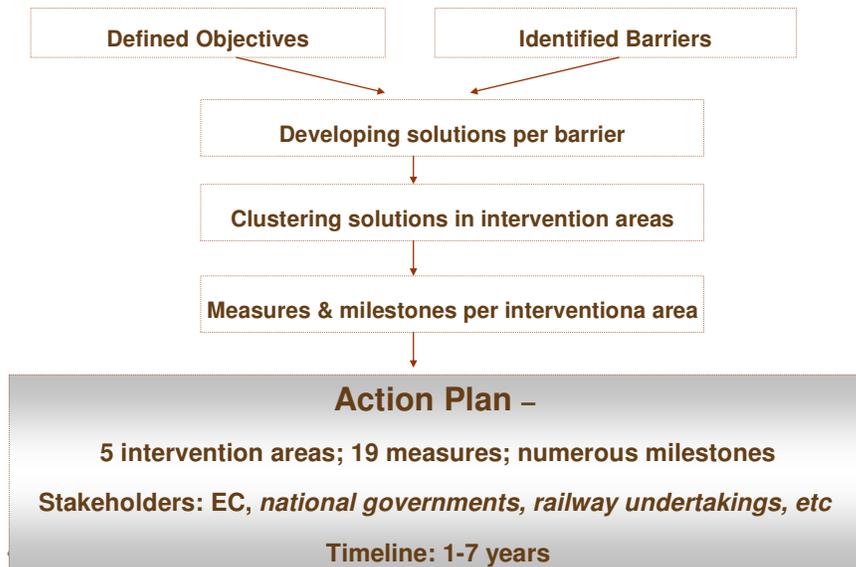
The Action Plan methodology consists of four successive steps. First, on the basis of the outcomes of the Deliverable 13.2 a long list of barriers that the Corridor extension to China (through 3 possible corridors) is facing, is made. For simplification and for the purposes of analysis, we further group them under the more general categories: identifying whether the barrier falls under the operational, institutional, market or technical category and specifying in each concrete case what a problem group is and who is a problem owner. Problem owners are important because this category also indicates who should take the initiative solving the problem.

Second, we identify which of them can be fully or partially overcome by the EU and EU actors and which depend more on non-EU players. Potential solutions for the barrier facilitation or resolution are proposed. These potential solutions are further grouped in five major intervention areas.

In the third step a draft of the Action Plan is made. This is based on the information collected in 13.2 and is combined with additional inputs from interviews and experiences from other corridor studies. The Action Plan includes the mitigation measures. Each measure is detailed by concrete milestones and actions, described in detail. This process has led to the draft Action Plan for the extension of the RETRACK Corridor.

Finally an internal assessment of the Action Plan is made and all the milestones and measures we propose are screened out to secure that all meet the objectives of the Action Plan. This process has led to the final Action Plan for the Corridor.

Figure 1. Methodology of the Action Plan



The proposed methodology makes two levels of analysis possible:

- analysis of all the barriers which hinder the organisation of the Eurasian rail transport and
- in-depth analysis and possible solutions for the barriers which can be influenced by the EU stakeholders.

3 Development of an Action Plan

3.1 Identification of the Corridor extension barriers

Deliverable 13.2 describes in detail different operational and technical barriers which exist on the three studied corridors (see chapters 5, 6 and 7 of D13.2 for different corridors), providing the RETRACK corridor connection with China. In total, more than 40 major barriers were identified, with over half being relevant to all studied corridors.

In the table 1 the above mentioned barriers are related to the studied corridors and are grouped into more general categories. These categories indicate whether the barrier is more an operational, institutional, market or technical issue. Within the categories the identified barriers are labelled to a problem group, such as 'border crossing' or 'transit time'. To each concrete barrier and problem group a problem 'owner' is assigned. Different barriers are critical for specific groups of railway transport stakeholders who, in this case, are 'problem owners'. Problem owners are important because this category also indicates who should take the initiative solving the problem. The list does not rank the barriers yet; the barriers are mentioned at random and will only get classified in the next paragraph.

Table 1. List of barriers within the different Corridors in relation to the problem groups and problem owners

Category	Identified barriers	Corridors	Problem group	Problem owner
Operational	Limited capacity and outdated infrastructure at gauge change stations and transshipment stations	All	Border crossing	Railway undertakings (infrastructure companies), forwarding agencies (if infrastructure is privately owned)
	Custom procedures, delays at border crossings	All	Border crossing	Customs authorities
	Many technical stops for changing locomotives and drivers	All	Transit time	Railway undertakings especially outside EU
	Unequal traffic handling capacities in the ports of TRACECA corridor	TRACECA	Transit time	Port authorities outside EU
	Intermodal transport including two sea legs	TRACECA	Transit time	Companies responsible for transport on TRACECA

Category	Identified barriers	Corridors	Problem group	Problem owner
				corridor
	Block train transport intermingled with single wagon transport	All	Transit time	Railway undertakings outside EU
	Optimisation of wagon fleet, especially in Ukraine and in private sector in Russia	TransSib, Central	Availability of wagons	Russian wagon providers, Ukraine state railway
	Availability of wagons in ports	TRACECA	Availability of wagons	State railways on the TRACECA corridor
	Safety certificate China	All, for Chinese part	Administrative rules and documentation	State of China
	Confirmation of discharge in Chinese container terminals	All, for Chinese part	Administrative rules and documentation	State of China
	Differences in administrative rules and freight documentation	All	Administrative rules and documentation	Railway companies, Container operators, Customs authorities, involved states
	Information flows on base of manual methods like telephone	Central, TRACECA	Administrative rules and documentation	All corridor stakeholders
	No oversized cargo can be moved through Caucasus	TRACECA	Feasibility of rail transport	Involved railway authorities on CENTRAL and TRACECA corridor
	No reliability for hazardous goods	Central	Feasibility of rail transport	Involved railway authorities on CENTRAL corridor
	Semi-monopolistic railway structures, no real competition allowed	All	Free market	Companies operating on the corridor

Category	Identified barriers	Corridors	Problem group	Problem owner
	Differences in maximum allowed length and weight of trains	All	Capacity	Companies operating on the corridor
	Linguistic problems due to present documents in national or in prevailing work languages or by different letter sets	All	Administrative rules and documentation	Companies operating on the corridor
	Availability and disposition of containers	All	Availability of containers	Forwarders, Container operators, Container owners
	Unpunctuality and unreliable transit time	All	Transit time	Forwarders, Operators, Railway undertakings, Container operators
	Availability of platform wagons and wagon disposition	All, especially TransSib	Availability of wagons	Wagon owner, Railway undertakings, Repair facility operators
	High share of corruption, political arbitrariness, high impact of political situation on the transport reliability	TransSib (Belarus), Central	Reliability	Several non-EU governmental bodies
	Damages and theft	Central, TRACECA	Reliability	Forwarder, Railway undertakings, Container operators
Institutional	Limited interest of further international development of corridor because of high share of domestic movements	TransSib	Capacity	Russian Railways
	Not enough money for investment in competitive rail infrastructure	All	Capacity	National governments (both EU and non EU countries)
	No consensus between countries on tariff matters	TRACECA	Tariff	National governments and companies operating on the corridors
	Only return fee for the ferry booking	TRACECA	Tariff	Companies operating on the

Category	Identified barriers	Corridors	Problem group	Problem owner
	in the Caspian Sea			TRACECA corridor
	Customs guarantee for transit movements	TransSib, Central	Tariff	Companies operating on the corridors
	Insufficient progress in infrastructure development from the political side	Central	Capacity	National governments
	Lack of common interpretation of related laws and regulations	Central, TRACECA	Administrative rules and documentation	Rail authorities along the corridors
	Human resource development and training	All	Human resources	Railway companies, container operators, forwarders on all routes
Market	Low/insufficient volume and imbalance of cargo flows, insufficient cargo volumes in order to organise scheduled train runs corridor (not a rail specific problem)	All	Capacity	Companies operating on the corridors
	The condition of carriage, delivery and liability of different parties are unclear for the user	TRACECA	Reliability	Shippers
	Different criteria for loading equipment in the different countries, especially China (e.g.: European tank containers are not allowed in China, Chinese tank containers are incompatible in European unloading stations, chemicals in barrels are not allowed (what can be handled all over the world but not in China, etc.))	All, for Chinese part	Feasibility of rail transport	Companies operating in a corridor
	High and unstable tariffs	All	Tariff	Railway undertakings especially outside EU
	Priority given to certain types of cargo	All	Reliability	Operators and forwarders,

Category	Identified barriers	Corridors	Problem group	Problem owner
	transported			Railway undertakings
	Unfair competition	All	Institutional and regulatory issues	All private companies engaged in this corridor, State regulatory bodies
Technical	Different electrical systems on the separate segments	All	Transit time	Railway undertakings on the complete corridor (general problem which cannot be solved also in the future)
	Different signalling / control systems on the separate segments	All	Transit time	Railway undertakings on the complete corridor (general problem which cannot be solved also in the future)
	Absence of modern tracking and tracing equipment	Central, TRACECA	Reliability	Railway undertakings on the complete corridor
	Different railway gauge	All	Transit time	Railway undertakings
	Inefficient and outdated standard of tracks in transshipment stations between European and Russian gauge	All	Border crossing	Railway undertakings (infrastructure companies), forwarding agencies (if infrastructure is private owned)

As can be seen from the table, the majority of the barriers are of an operational nature. Technical barriers are the most limited in their number.

The following problem groups were identified: border crossing, transit time, availability of wagons/containers, administrative rules and documentation, feasibility of rail transport, free market, capacity, reliability, tariff, human resources, institutional and regulatory issues. The following problem groups are of high importance because a large number of barriers falls into these groups:

- transit time (8 barriers),
- administrative rules and documentation (6 barriers),

- capacity and reliability (each 5 barriers).

This means that these are the problem groups to be focused on as they accumulate the most barriers and represent the major bottlenecks.

3.2 Ranking barriers

Following overview provides an indication of the gravity of impact of the barrier and the ability to overcome the barrier measured in time and costs. However there is no link between the importance of the barrier and the ability of overcoming the barrier. The assessment is based on expert opinions.

Table 2. List of the gravity of the barrier and the ability to overcome

Category	Identified barriers	gravity of impact	Ability to overcome (time, costs)
		1 very low ... 5 very high	1 very low ... 5 very high (e.g. low costs)
Operational	Limited capacity and outdated infrastructure at gauge change stations and transshipment stations	4	2
	Custom procedures, delays at border crossings	4	4
	Many technical stops for changing locomotives and drivers	3	2
	Unequal traffic handling capacities in the ports of TRACECA corridor	2	2
	Intermodal transport including two sea legs	5	1
	Block train transport intermingled with single wagon transport	4	5
	Optimisation of wagon fleet, especially in Ukraine and in private sector in Russia	4	3
	Availability of wagons in ports	4	4
	Safety certificate China	3	3
	Confirmation of discharge in Chinese container terminals	3	3
	Differences in administrative rules and freight documentation	3	5
	Information flows on base of manual methods like telephone	4	3
	No oversized cargo can be moved through Caucasus	3	1
	No reliability for hazardous goods	3	3
	Semi-monopolistic railway structures, no real competition allowed	4	3
	Differences in maximum allowed length and weight of trains	3	1
	Linguistic problems due to present documents in national or in prevailing work languages or by different letter sets	3	4
	Availability and disposition of containers	3	4
	Unpunctuality and unreliable transit time	4	4
Availability of platform wagons and wagon disposition	3	4	

	High share of corruption, political arbitrariness, high impact of political situation on the transport reliability	4	2
	Damages and theft	3	3
Institutional	Limited interest of further international development of corridor because of high share of domestic movements	3	4
	Not enough money for investment in competitive rail infrastructure	4	2
	No consensus between countries on tariff matters	5	3
	Only return fee for the ferry booking in the Caspian Sea	3	2
	Customs guarantee for transit movements	3	3
	Insufficient progress in infrastructure development from the political side	3	4
	Lack of common interpretation of related laws and regulations	3	5
	Human resource development and training	3	3
Market	Low/insufficient volume and imbalance of cargo flows, insufficient cargo volumes in order to organise scheduled train runs corridor (not a rail specific problem)	4	1
	The condition of carriage, delivery and liability of different parties are unclear for the user	3	5
	Different criteria for equipment	3	3
	High and unstable tariffs	5	3
	Priority given to certain types of cargo transported	3	3
	Unfair competition	4	3
Technical	Different electrical systems on the separate segments	4	1
	Different signalling / control systems on the separate segments	4	1
	Absence of modern tracking and tracing equipment	4	3
	Different railway gauge	4	1
	Inefficient and outdated standard of tracks in transshipment stations between European and Russian gauge	4	3

The table shows that all indicated barriers are grave. Only three barriers are classified as very grave, namely on high and unstable tariffs, on the missing consensus between countries on tariff matters and the TRACECA route involving the intermodal transport. All other barriers are classified as medium grave and grave. (between 3 and 4 on the scale of 5)

The figures on the ability to overcome the barriers provides a more mixed overview. The technical barriers are the most difficult to overcome (huge investments), whereas the operational and market barriers are most easy to overcome. When combining the most grave barriers with the possibility to overcome them; it is clear that it is nearly impossible to overcome the difficulties crossing twice the

sea when taking the TRACECA route. However getting lower and stable tariffs which are agreed upon between the different countries is medium difficult to organise.

3.3 Areas for the EU intervention and possible mitigation measures

After identifying the barriers, the problem behind the barrier and the problem owner, this section defines possible solutions towards the barriers identified. In the following table it is indicated whether the identified problem owner is an EU stakeholder or a stakeholder outside of the EU. This is of utmost importance, because stakeholders from within the EU could be pressed to solve the problem, whereas a stakeholder outside of the EU can only be advised to follow up a suggestion.

Table 3. Identification of the solutions for barriers for the problem owners inside and outside of EU

Aspect	Identified barriers	Indication of solution if problem owner is inside EU	Indication of solution if problem owner is outside EU
Operational	Limited capacity and outdated infrastructure at gauge change stations and transshipment stations	Infrastructure Needs Assessment along the corridor, prioritisation of investment needs Investment programme for transshipment yards (with support from state and EU)	Investment programme for transshipment yards (with support from state and International Financing Institutions)
	Custom procedures, delays at border crossings	Simplification of transport documents (CIM/SGMS); Harmonisation of different customs codes	Simplification of transport documents (CIM/SGMS); Harmonisation of different customs codes; electronic pre-declaration
	Many technical stops for changing locomotives and drivers	Introduction of Multi system locomotives and approvals for cross-border trade	Introduction of Multi system locomotives and approvals for cross-border trade
	Unequal traffic handling capacities in the ports of TRACECA corridor	n/a	Upgrade / extend the handling capacities to provide a seamless logistic chain
	Intermodal transport including the handling time and costs in the ports	n/a	Minimise time and cost constraints
	Block train transport intermingled with single wagon transport	n/a	Further development of rail production system; hub network for single wagon loads; organisation of

Aspect	Identified barriers	Indication of solution if problem owner is inside EU	Indication of solution if problem owner is outside EU
			the bloc trains; through going bloc trains
	Optimisation of wagon fleet, especially in Ukraine and in private sector in Russia	n/a	Interchange agreements and wagon pools
	Safety certificate China	Harmonised Standards and requirements	Harmonised Standards and requirements
	Confirmation of discharge in Chinese container terminals	n/a	Improvement of container status information system
	Differences in administrative rules and freight documentation	Joint freight way bill (CIM/SGMS); electronic waybill; multimodal documents	Joint freight way bill (CIM/SGMS); electronic waybill; multimodal documents
	Information flows on basis of manual methods like telephone	One stop service with common language (if EU part is involved); electronic waybill and accompanying documents	Electronic waybill and accompanying documents
	No oversized cargo can be moved through Caucasus	Identification of routes for oversized cargo; clarification of application and permission	Identification of routes for oversized cargo; clarification of application and permission
	No reliability for hazardous goods	n/a	Establishing rules for hazardous cargo
	Semi-monopolistic railway structures, no real competition allowed	Common framework of rules and regulations and standards on non-discriminatory infrastructure access and free and fair competition	Division between infrastructure operation and transport operation
	Differences in maximum allowed length and weight of trains	Investment in main corridors towards Russia and Central Asia to allow longer train (especially Germany and Poland in the North and Germany, Austria, Hungary on the South axis)	n/a

Aspect	Identified barriers	Indication of solution if problem owner is inside EU	Indication of solution if problem owner is outside EU
	Linguistic problems due to present documents in national or in prevailing work languages or by different letter sets	Agreement on commonly accepted languages for a coding system for international documentation (partly implemented, only)	Agreement on commonly accepted languages for international documentation (partly implemented, only)
	Availability and disposition of containers	Interchange agreement, container pooling, inland container depots, reduction of imbalances, container logistics systems	Interchange agreement, container pooling, inland container depots, reduction of imbalances, container logistics systems
	Unpunctuality and unreliable transit time	Open container block trains with fixed timetable as alternative for single wagon load traffic; investment in infrastructure for longer trains	Open container block trains with fixed timetable as alternative for single wagon load traffic
	Availability of platform wagons and wagon disposition	Internationally active, commercial supplies and wagon providers supply market demand on lease of charter contract bases in addition to manufacturers and railway organisations/owners subject to market conditions ; investment in infrastructure for longer trains	Container operator may enter long term agreements with wagon owners or establish subsidiary wagon companies; Interchange agreements and wagon pooling between wagon owners
	High share of corruption, political arbitrariness, high impact of political situation on the transport reliability	Rules and regulations on free and fair completion, and institutional and legal framework for enforcement in place	Several non-countries
	Damages and theft	Tracking, tracing and surveillance systems	Tracking, tracing and surveillance systems
Institutional	Limited interest of further international development of corridor because of high share of domestic (export) movements	Importance of passenger trains within the EU claiming track capacity.	Relate investments by international bodies (e.g. IFC, ADB) to performance requirements / service level agreements for Corridor transports
	Not enough money for investment in competitive rail infrastructure	Investment programme for international corridors; investment in infrastructure for longer trains	Investment programme for international corridors, funded by the EU

Aspect	Identified barriers	Indication of solution if problem owner is inside EU	Indication of solution if problem owner is outside EU
	No consensus between countries on tariff matters	One stop shop service for whole corridor	Unification of tariffs; deregulation of tariffs
	Customs deposit for transit movements	n/a	One guarantee for the total Corridor (e.g. e-freight)
	Insufficient progress in infrastructure development from the political side	Investment programme for international corridors; investment in infrastructure for longer trains	Investment programme for international corridors
	Lack of common interpretation of related laws and regulations	Simplification of transport documents (CIM/SGMS)	Simplification of transport documents (CIM/SGMS)
	Human resource development and training	Partnership agreements between EU – Non-EU railways (e.g. DB AG – KTZ) HRD programmes, management training (best practice, twinning), improvement of shift planning	Partnership agreements between EU – Non-EU railways (e.g. DB AG – KTZ) HRD programmes, management training (best practice, twinning), improvement of shift planning
	Deeply entrenched requirements for unofficial payments	Cash payments widely replaced by electronic banking against formal bills, and transparency rules legally enforced	Replacement of the cash payments by electronic banking against formal bills. Legal enforcement of the transparency rules
Market	Low/insufficient volume and imbalance of cargo flows, insufficient cargo volumes in order to organise scheduled train runs	Opening of private bloc trains for public use; information and promotion activities; pricing policy	Development of public transport logistics and industrial centres along corridors (including rail terminals)
	The condition of carriage, delivery and liability of different parties are unclear for the user	One stop shop service for whole corridor; e.g. through implementation of multimodal operators, contracts and documents	One stop shop service for whole corridor; e.g. through implementation of multimodal operators, contracts and documents
	Different criteria for equipment	Develop and implement special equipment requirement regime for Corridor transport	Develop and implement special equipment requirement regime for Corridor transport

Aspect	Identified barriers	Indication of solution if problem owner is inside EU	Indication of solution if problem owner is outside EU
	High and unstable tariffs	Tariffs widely replaced by market prices at intra-modal competition conditions. Clearings and regulatory bodies installed for supervision or clearing of claims in many major railway Rules	Improvement of pricing policy (e.g. stable basic tariffs and temporary surcharges; from full cost pricing to marginal cost pricing; consideration of impact on traffic). One fair tariff to be set at total Corridor level. Can be coupled to investments from international finance institutions. In similar manner as Eurocontrol sets tariffs for the European flyzone
	Priority given to certain types of cargo transported	Right of path agreements with all infrastructure managers on the route	Right of path agreements with all infrastructure managers on the route
	Unfair competition	Rules and regulations on free and fair completion, and institutional and legal framework for enforcement in place	Rules and regulations on free and fair completion, and institutional and legal framework for enforcement in place
Technical	Different electrical systems on the separate segments	Introduction of multi system locomotives approved for cross-border trade	Introduction of multi system locomotives approved for cross-border trade
	Different signalling / control systems on the separate segments	Common European standard agreed (ERTMS) and partly implemented. Engines are equipped with different devices to bridge the problem	Introduction of multi system locomotives approved for cross-border trade
	Absence of modern tracking and tracing equipment	One stop shop service for whole corridor at selected routes,	Implementation of train, wagon and container related tracking and tracing systems
	Inefficient and outdated standard of tracks in transshipment stations between European and Russian gauge	Investment programme for transshipment yards (with support from state and EU); innovative technologies for interoperational wagons and locomotives	Investment programme for transshipment yards (with support from state and IFI); innovative technologies for interoperational wagons and locomotives

The above proposed solutions cover a vast range of barriers with which the railway transport stakeholders are confronted. Many of the problems can be solved with few solutions. For some

problems such as 'only return fee for the ferry booking in the Caspian sea' and 'availability of wagons in ports', solutions were not identified so they are not mentioned in the table.

Indicated solutions when the problem owner is outside of the EU are good input towards the bilateral discussions and negotiations with third countries. These are also indications for the priorities in neighbouring policy development.

The Action Plan further focuses on those solutions which can be influenced by the problem owners within the EU.

3.4 Action Plan solution clusters

Table 2 provided a list of solutions which impact EU problem owners. These solutions are of focus in the Action Plan and can be bundled in 5 clusters:

- (1) Creation of the Rail Corridor Project Teams
- (2) Investment in the transshipment yards on the EU part of the cross-border region
- (3) Investment in infrastructure to allow longer trains on the EU territory
- (4) Support in creation of the unified transport system, in particular by simplification/unification of the Eurasian freight documentation
- (5) Providing support in operational and commercial solutions

Creation of the Rail Corridor Project Teams

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 and amongst others, the introduction of multi system locomotives and approvals for cross-border trade, harmonisation of standards and requirements for the safety certificates with China, promotion and organisation of a one-stop service with a common language, identification of routes for oversized cargos, implementation of tracking, tracing and surveillance systems fall within this cluster.

The rail transport on the China-EU corridors is finding itself in a similar situation where the transport Corridors / TEN-T axes in Europe were a number of years ago: when too many variables had to be handled at the same time by too many stakeholders with too many interests. The chosen route was to nominate a high level person with a high level of public sector experience to lead the efforts of realising the Corridor in the time efficient manner aligning all stakeholders. A similar type of set-up, built upon the fundamentals of the EU market sector knowledge and requirements can be seen as a

fundamental building block for realising efficient rail Corridors between the EU and China and all other countries involved.

Investment in transshipment yards on the EU part of the border region

The transshipment yards between the European (1.435 mm) and the Russian gauge (1.520 mm) have developed over the decades. Initially, on both sides of the border the stations were built and if one of them was at maximum capacity, the next one was chosen for the implementation of the necessary tasks. These stations are connected by tracks in both gauges. Due to the functions they are fulfilling, these stations can better be named non-transshipment yards or logistics hubs, but transshipment areas as only transshipment to trains with a different gauge is performed. The examples of the most important transshipment areas for the RETRACK corridor are:

- Malaszewice (Poland – Russia)
- Dorohusk (Poland – Ukraine)
- Przemysl / Medyka (Poland – Ukraine)
- Ciernar / Matovce (Slovakia – Ukraine)
- Zahony (Hungary – Ukraine)
- Ungheni (Romania – Moldova)

For example, in the border area Zahony between Hungary and Ukraine, only the Hungarian part is an area of 85 km² with five independent railway stations. Eight shunting locos only have the task to connect these stations. 450 employees are responsible for transshipment only. The theoretical capacity of the Zahony port is 16 Mln t per year, but only 3,6 Mln t are realised. Although millions of Euros were invested the entire infrastructure (with the exception of the new facilities for chemical products) is in poor condition. There is a 35 year investment backlog.

Although there are plans from the Russian Government to connect Russia with the relevant final destinations in Central Europe through the Russian gauge tracks, this is not a realistic solution for short and medium term. Therefore, currently there is a necessity to modernise these transshipment yards and to achieve their efficient functioning. The transshipment of a mixed train is expensive if the train has to be divided into several parts with an additional shunting for every wagon group. Additionally, the open access to these terminals in the future will improve their competitive position. Until now the majority of transshipment yards have been in the hands of the traditional incumbents.

Therefore, large investments are required which cannot be financed by only the national railways. European investment programmes are necessary. Modernisation of the transshipment yards will contribute to the optimisation of the processes and will make the transshipment process cheaper, contributing to the general competitiveness of the railway transport.

Investment in infrastructure to allow longer trains on the EU territory

There is a big difference in the maximum train length on the corridor between Western Europe and Russia / China. The regular permitted train length and the maximum possible train length are shown in table 3.

Table 4. Train length in different countries along the RETRACK corridor and its extensions

Country	Normal train length	Maximum technical possible train length
Germany	700 m	835 m
Poland	600 m	600 m
Belarus	1.000 m	1.050 m
Russia	1.000 m	2.000 m
Mongolia	1.000 m	1.000 m
China	770 m	800 m
Kazakhstan	1.000 m	1.000 m

A full train coming from Western Europe is not a full train on the Russian rail network. In other words, a block train from the West will be considered as complete in comparison with the normal train length of 1,000m on the Eastern part after transshipment between the European and Russian gauge. This can be seen as an additional interface which costs time.

As of spring 2012 trains longer than 700 m are allowed between the Danish border and the marshalling yard Maschen in Germany. Trains with a maximum length of 835 m are running on this connection. This can be seen as a first step towards optimisation of the train length which is essential for operators because of the low margin in the combined business. The continuation of this process is important for RETRACK in order to improve interoperability between railway systems within different countries and to gain greater benefit from a single train run on the Eurasian continent.

Reaching the average train length of 1,000 m as in Russia, Belarus, Mongolia and Kazakhstan, will mean an increase of the capacity of 45 TEU or more (o.i.e. an additional 42% capacity per train). A concept for the technical adaptation of the studied railway corridors is essential to increase the competitiveness of the railway transport between China and the EU. The planning framework needs to be prepared to enable similar technical standards in all corridors involved.

Support in creation of the unified transport system, in particular by simplification /unification of the Eurasian freight documentation

Maximum change reduction between different railway systems on the Corridor extensions is a key element to be pursued by all stakeholders, private and public. As transport on the EU-China Corridors passes through many countries there are cost increasing risks involved due to the different legal / procedural / administrative systems within these countries. With a unified transport system the costs (and time loss) would be minimised to the maximum, contributing to the community at large. Such a unified transport system is therefore to be pursued. The ongoing EU initiative Cassandra³ on E-freight and E-customs is considered to form the right platform to extend on in this respect.

Container transportation by shipping lines is far ahead of the railways in terms of door-to-door integration of different transport modes. Shipping lines usually offer a written Multimodal Transport Bill of Lading with a clear liability and a single, uniform and bankable freight document. In the case of Sea Way Bills electronic documentation is widely used.

On the railway transport within the EU-China transport corridors two different contracts for the carriage of goods are used: SMGS and COTIF. They apply different terms for carriage, liability and documents. Development of the electronic freight documentation and compatible IT-systems between the national railways is in a very early stage. According to field experiences, 70% of all delays in border crossing between CIM and SMGS areas is caused by unclear and improper formulations in the transport and trade documents⁴. One major reason for this is the lack of unification of transport and trade documentation and the lack of e-document solutions.

In order to overcome this obstacle COTIF and SMGS jointly have started a process of documentation, claim handling rules and liability harmonisation. The final aim is to establish a uniform CIM/SMGS law for the Eurasian rail traffic. This simplification of documentation and the harmonisation of the legal basis concern the relation between railway companies and container train operators which is the intra-rail transport part of the multimodal door-to-door transportation of containers. It will facilitate rail transport and border crossing. The major drivers for this development are the CIT and the OSShD.

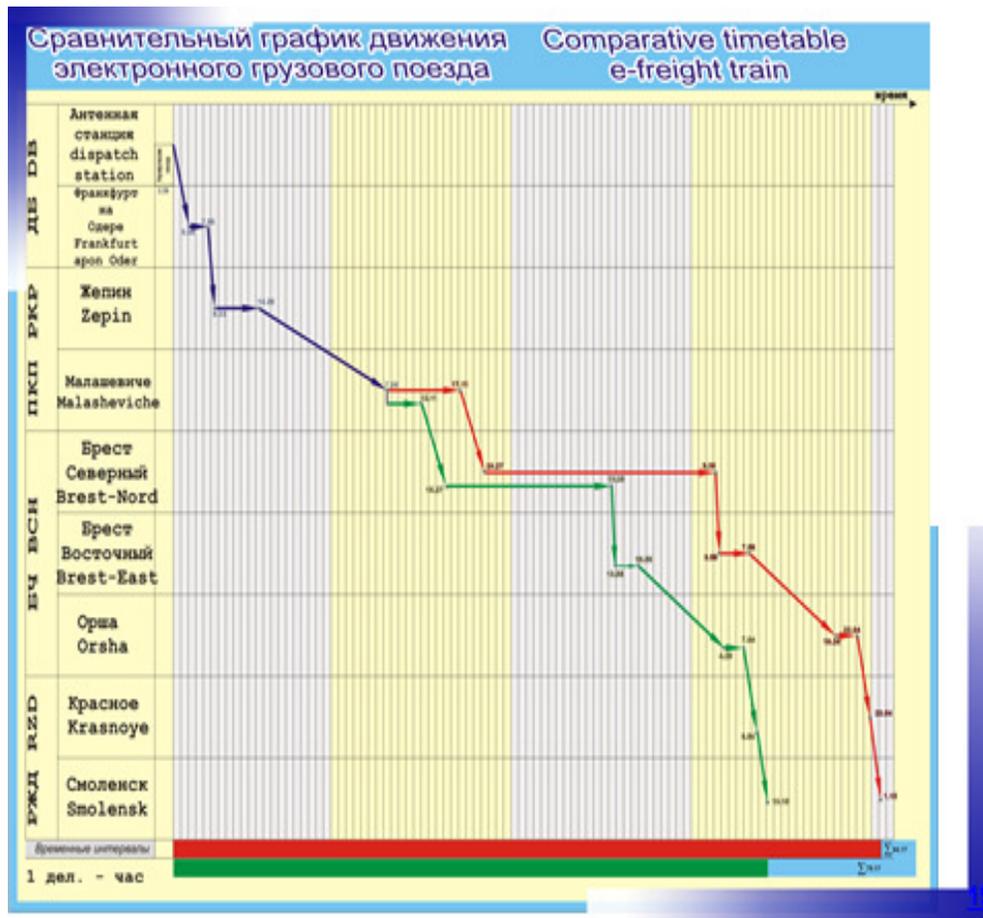
In regards to the relation between the freight forwarder as clients of the train operators on the one side and the shippers on the other side, the forwarders are free to offer genuine multimodal transport documents as is already the case in sea transport. This allows full flexibility in the actual realisation of transport by different modes and comparability with the sea freight documentation. The FIATA Bill of Lading could serve as a multimodal document in these cases. Although this is not yet used in the Eurasian freight traffic it offers an option for the future.

³ <http://www.cassandra-project.eu/>. This concerns the E-Freight and E- customs initiative of the EC

⁴ Presentation of Padalitzza (InterRailServices) on container train 'East Wind' and project of electronic train, CCTT 20th Plenary Meeting, Odessa, September 29, 2011

The uniform CIM/SMGS freight documentation based on the UN Layout Key for Trade Documents⁵ can facilitate the application of electronic freight documentation. It is planned to use the container train ‘EastWind’ as a pilot for e-freight documentation. This would allow the considerable reduction of time spent at border crossings. The following chart shows the possible reduction from 94,17 hrs to 79,17 hrs transport time from a German station to the Russian station Smolensk in the case of an electronic train.

Figure 2. Comparison of timetable for conventional and e-train



Source: Padalitz, CTTT Annual meeting, Odessa 2011

Providing support in operational and commercial solutions

The container transport on the Eurasian land bridge is hampered increasingly by a lack of wagons and containers. One major reason is the outsourcing of formerly state railway owned wagon and container parks to private daughter companies. This implies that wagons and containers are considered as

⁵ See above

private equipment and cannot be re-loaded on the return voyage by third parties but usually return empty. Agreements on interchanging equipment between the different owners involved should facilitate the use of the empty wagons and the wider market entry of container and wagon leasing companies should increase the wagon stock. The latter could offer master lease agreements or time / trip related rental contracts. Finally, it should be a market driven solution.

Another bottleneck is the lack of modern logistics and control systems for wagons and containers. The ever larger amount of empty wagons and container wagons to be returned considerably increases the asset and operational costs. The forecast and the control of imbalances in wagons and containers shall be improved through logistics control centres with modern IT and/or GPS based tracking and tracing systems. Potentially, this can be a role for the Rail Corridor Project Team as a neutral provider of the services.

Experience shows that with the setting up of block trains the cost must be covered. As such, the initiator of the train is forced to sign contracts with larger shippers in order to have an occupancy rate of 80% which often is the break-even point. Open, public trains imply the risk of non-full-capacity utilisation for the container train operator. The operators seek to run private, low risk trains for bigger clients and frequent flows on a long term contract basis. Therefore, private container block trains are considered to be the most efficient solution for the Eurasian container traffic, in particular in the initial phase of organisation of the block train runs. In some cases shippers with smaller quantities gain access to these trains when break-even is reached. In other cases private trains stay closed for competitive reasons, depending on the shipper's decision. Should the latter case prevail then there will be a problem as these trains will be closed to third parties, especially to small and medium sized enterprises. Possibilities for at least mixed private / public trains should be explored and promoted.

Concerning price and tariffs it should be noted that the CIM rules allow for contractual freedom while the SMGS rules include the obligation to set and publish tariffs and to carry. This obligation existed in the EU as well, but was abolished. A solution could be the revision of the SMGS rules and their approach to the CIM rules in this respect. The inflexible and national split setting of railway tariffs as well as the differentiation between national and international rail tariffs, is another hampering factor for the Eurasian container rail traffic.

4 Action Plan

In this section the Action Plan further elaborates concrete measures and steps for five intervention areas described above, namely:

- Creation of Rail Corridor Project Teams
- Investment in the transshipment yards within the EU territory of the cross-border region
- Investment in infrastructure to allow longer trains within EU territory
- Support in creation of the unified transport system, in particular by simplification/unification of the Eurasian freight documentation
- Providing support in operational and commercial solutions

Each intervention area is described in more detail, presenting a general set-up and some concrete features. In a next step, a summary table presents a set of measures, which are detailed by milestones. Primary stakeholders, those who need to take action on a concrete milestone, are indicated. The summary table is followed by an additional detailed break down for each measure. This way the stakeholders, including the EU countries, railway operators including private sector entities, etc. can have an overview of steps to be taken as well as to receive detailed information on which concrete actions to be taken.

4.1 Creation of Rail Corridor Project Teams

Many bottlenecks identified require actions that will take several years to be implemented in a manner that supports the realisation of an efficient rail shuttle service. It is of paramount importance that such actions are driven by key stakeholder interest (the automotive trains between France and Russia and the EU TEN-T corridors prove that such approach works). The recommended solution is to have a powerful market consortium which is supported by key authorities along the two identified Corridor extensions; TRACECA and Central, as these two routes are relatively underdeveloped compared to the TRANSSIB Corridor. This consortium can take form within the dedicated Rail Corridor Project Team.

Barriers listed in table 3 provide some valuable inputs to the working agenda for the Rail Corridor Project Team. They can be grouped in three overall objectives to be dealt with:

1. Develop a business environment that provides the rail shuttles a level playing field vis-à-vis other transport modes and routes (example of barriers to be dealt with: differences in maximum allowed length and weight of trains; frequent change of locomotives and drivers; language problems; transport reliability issues; low interest of further international development of corridor because of high share of domestic (export) movements; insufficient progress in infrastructure development from the political

side; human resource development and training; lack of common interpretation of related laws and regulations).

There are many, difficult and time consuming barriers to develop and run efficient and commercially viable shuttle trains on the Corridor. Shippers and forwarders will, as seen for example with newly introduced shuttle trains inside the European Union (e.g. Rotterdam – Bratislava), only slowly take up the available transport capacity on the train, unless it is a dedicated ‘one client train’ such as is the case of the automotive trains between France and Russia. Shippers and forwarders will only book cargo in substantial numbers once the service is reliable, proven safe and competitive.

It is therefore important to first overcome the barriers which hamper the reliability, safety and competitiveness of the Corridor rail services.

2. Organise the corridor as such that the rail shuttle services fulfil all market requirements (example of barriers to overcome are: availability and disposition of containers; unpunctuality and unreliable transit time; no consensus between countries on tariff matters; the condition of carriage, delivery and liability of different parties are unclear for the user; high and unstable tariffs; priority given to certain types of cargo transported).

3. Facilitate a transparent and reliable flow of information and control instruments and mechanisms that do not interfere with a seamless execution of the physical logistics chain (example of barriers to overcome: custom procedures, delays at border crossings; customs guarantee for transit movements; safety certificate China; confirmation of discharge at Chinese container terminals; differences in administrative rules and freight documentation; information flows on the basis of manual methods such as telephone, damages and theft; absence of modern tracking and tracing equipment).

The areas of intervention of the Rail Corridor Project Team ranges from public to purely private commercial elements. Therefore, the team will have to consist of a combination of public and private sector representatives.

As rail transport is in the interest of all authorities given the environmental benefits, and as building the Team needs an actor that is pro-actively driving the Corridor agenda, unit supported and financed by the authorities need to be put forward. The development of a viable and competitive rail connection with the Far East will increase the efficiency of serving Europe logistically and as such contribute to the competitiveness of Europe internationally. It is therefore in the interest of the EU to launch and develop the Corridor Team while the EU acts as an initiator and funding source of the process.

It is suggested that the Rail corridor Team have three layers:

- Advisory board: recommended to consist of persons similar to the EU special commissioners responsible for the EU TEN-T Corridors

- Management: recommendation to be chaired by non-rail persons as the approach to barriers is best served by persons with a deep understanding of enterprise supply chain criteria
- Project team: recommended to consist of experts from multiple countries reflecting the Corridor.

Notwithstanding is that the Rail Corridor Project Team will play a critical role in the other four Action Plan clusters. Therefore, the key expertise required for the Rail Corridor Team should encompass: Business process architecture; Customs; Forwarding; Legal; Interoperability.

The activities of the Rail Corridor Project Team, given it is a public entity, are to be limited to the pre-commercial aspects of the development of efficient operating rail corridors and rail services. The Team will act as an extension of an infrastructure manager; creating, supporting and continuously developing an efficient business environment for the rail services.

The commercial development of the Rail Corridor Services has to be market driven. Competition is to be promoted and fostered. However, competition on rail infrastructure only manifests when the total system has been proven to be effective. Therefore, it is recommended to provide a 'grace' period of 5 years to the first company / group of companies (hereafter referred to as 'Corridor Rail Consortium – CRC') to establish and run the first Corridor Shuttle.

In order to implement this structure and take action on slashing the barriers a number of measures and milestones are proposed (Table 5). Due to the complexity of the barriers to be overcome it is recommended to allocate a period of five years towards the implementation of this action.

Table 5. Overview of measures, milestones and primary stakeholders which contribute to the Creation of the Rail Corridor Project Team (RCPT)

Measures	Milestones	Primary Stakeholders
I. Build the Rail Corridor Project Teams (RCPT)	(1) Establish Rail corridor project Teams: one for Central, one for TRACECA	EU
	(2) Initiate, organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridors	RCPT, EU
	(3) Realise Corridor web tool	RCPT, EU
	(4) Establish a Cross – Border customs team	RCPT, EU
II. Build up the presence of the Rail Corridor Project Teams	(1) Acknowledgement as the single point of contact	RCPT
	(2) Initiate, organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridors	
	(3) To achieve first results in starting up the rail service and facilitating the process of train run	
III. Consolidate position of the Rail Corridor Project Teams	(1) Acknowledgement as the single point of contact	RCPT
	(2) Initiate, organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridors	
	(3) To achieve first results in starting up the rail service and facilitating the process of train run	
	(4) Higher use of the Corridor Rail Logistics Services by market	
	(5) Realise more support from local, regional and national authorities and stakeholders to faster implement solutions for the bottlenecks	
	(6) Disseminate the work and achievements	

These measures and detailing them milestones are elaborated in the following paragraphs.

I. Build the Rail Corridor Project Teams

Measure 'Build the Rail Corridor Project Team' concerns a set of milestones that deals with the establishment and operation of the Rail Corridor Project Team for Central and TRACECA corridors. In total there are four milestones generated in this measure.

- (1) It is suggested that the EU will establish the Rail Corridor Project Team at EU level, for a period of 5 years. Proposed central office for Central corridor is Bratislava and for TRACECA is Bucharest.
- (2) To initiate, organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridor. This should cover implementation of the roadmap laid out by the RETRACK project and enhancement of this roadmap by developing annual plans. Organise first stakeholder meetings along the Corridor to raise awareness for the barriers, and to start up a dialogue with stakeholders.
- (3) Develop a web tool per Corridor to create a single (data, support, booking, tracking & tracing, invoicing) desk for the users of freight rail services and other stakeholders on the Corridor
- (4) Establish the Cross-Border Customs Team (CBCT) responsible for the seamless and timely management, clearance and administration of all transport (customs) documentation

Timing

- Month 1 - 4 to establish the Rail Corridor Project Teams
- Month 3- 12 to have the presented actions carried out

II. Build up the Presence of the Rail Corridor Project Team

Measure 'Build up the Presence of the Rail Corridor Project Team' concerns a set of milestones to reinforce the role of the Rail Corridor Project Team.

- (1) RCPT to be acknowledged as the single point of contact for half of all actors and stakeholders directly and indirectly related to / involved in the Corridor
- (2) To initiate, organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridor. The Actions to be taken within this milestone are the following:
 - Prepare and execute a tender for the CRC (Corridor Rail Consortium) to establish and run the first Corridor Shuttle Train
 - Select a CRC and support the CRC to start operating
 - Expand the Team with representatives from the intermediary countries on the Corridor
 - Develop and implement through the CBCT a Clearing House for all (customs) documents needed on the Corridor
 - Design a single transport document for the total Corridor based on existing initiatives and available documents with the same / similar objective⁶
 - Organise stakeholder meetings along the Corridor to raise awareness for the barriers, and to continue the dialogues with stakeholders
 - Organise quarterly dialogue meetings with representatives from the market sector (manufacturers, forwarders, traders, logistics companies, carriers, railway undertakings)
 - Develop training modules for all relevant activities and know-how parts concerned and related to the Corridor
 - Launch first round of training to stakeholders
- (3) RCPT need to provide the first results:
 - Corridor Rail Consortium starting up the rail service
 - Single desk operating
 - One single transport document for total Corridor

⁶ On 18 April 2007, the Inter-State Council of EurAsEC agreed that Member State governments would recommend to their national customs and transportation authorities the introduction of a universal (AIGTR) waybill. This would act as a customs document for the purposes of transit through EurAsEC (Source: 'The EurAsEC Transport Corridors', sector report March 2009, Eurasian Development Bank)

- Timing: Month 12 - 36

III. Consolidate Position of the Rail Corridor Project Team

Measure 'Consolidate Position of the Rail Corridor Project Team' deals with four milestones which aim to confirm the position of the RCPT as one of the key players in the corridor development.

(1) To be acknowledged as the single point of contact for all actors and stakeholders directly and indirectly related to / involved in the Corridor

(2) To organise and manage the actions and projects to realise reliable, safe and competitive rail services on the Corridor. This action includes organisation and execution per action item of a strict agenda and timeframe. Organisation of quarterly dialogue meetings with representatives from the market sector (manufacturers, forwarders, traders, logistics companies, carriers, railway undertakings). Implementation of the improvement programme of the Corridor logistics product for the users:

- Agree with all countries to allow no change of locomotives and drivers (in alignment with practise in Europe)
- Roll-out a KPI system with bonus & penalty structure for all the parties on the Corridor in charge of execution: infrastructure manager, railway undertaking, operator, carrier, forwarder
- Further roll-out the Corridor web tool specifically to accommodate:
 1. An integrated horizontal Corridor customs control mechanism
 2. Information on the General Corridor Transport Conditions
 3. Real-time information chain accessible to all stakeholders
 4. Information on pricing of the logistics services on the Corridor
 5. Performance of the rail services (dissemination of KPI's)
- Reliability of the shuttle service at 95% or higher
- Develop and implement one common regulation active for the total corridor including one set of general conditions (liability) for total Corridor
- Train all key stakeholders on Corridor requirements, operations and seamless support delivery
- Agree on investment programme by international finance institutions coupled to Corridor capacity reservation

(3) RCPT need to provide further results:

- Real-time information chain accessible to all stakeholders⁷
- No changes of locomotives and drivers
- Integrated horizontal Corridor customs control mechanism⁸
- Reliability of the shuttle service at 95% or higher
- Clear and transparent pricing of the logistics services on the Corridor
- One common regulation active for the total corridor including one set of general conditions (liability) for total Corridor
- All key stakeholders trained on Corridor requirements, operations and seamless support delivery
- Agreed on investment programme by international finance institutions coupled to Corridor capacity reservation

(4) Higher use of the Corridor Rail Logistics Services by the market

(5) Realise more support from local, regional and national authorities and stakeholders to faster implement solutions for the bottlenecks

(6) Disseminate the works and achievements

Timing

- Month 36 – 60

⁷ Including aspects such as tracking & tracing, single hub for transport- and customs documentation, availability of wagon capacity

⁸ In line with functioning of 'Green Lanes' and 'Extended Customs Gate' concepts as in function on sea routes between Asia and Europe

4.2 Investment in the transshipment yards on the EU part of the border crossing region

The development of the transshipment yards in the border region was done step-by-step over the last 150 years. In chapter 1.3 we have described that as a result, an inefficient network of transshipment stations was created. Nowadays, the objective is to develop efficient transshipment yards with an optimised shunting process and lower binding capacity (for personnel, equipment, and infrastructure).

In the first step the process on the main freight corridors and transshipment areas have to be set-up:

- Malaszewice (Poland – Russia)
- Dorohusk (Poland – Ukraine)
- Przemysl / Medyka (Poland – Ukraine)
- Ciernar / Matovce (Slovakia – Ukraine)
- Zahony (Hungary – Ukraine)
- Ungheni (Romania – Moldova)

Table 6 presents an overview of measures, milestones and primary stakeholders which contribute to the implementation of the second solution group.

Table 6. Overview of measures, milestones and primary stakeholders which contribute to the development of the investment programme in the transshipment yards

Measures	Milestones	Primary Stakeholders
I. Forecast	(1) Efficiency of the individual sidings	EU
	(2) Traffic volumes	
	(3) Specialisation and strength of border crossing stations	
	(4) Position on TEN-T corridors	
	(5) Position for individual types of goods	
	(6) Requirements for the future design of facilities	
II. Concept	(1) Ranking the list of border crossing stations	EU together with local transshipment companies and national ministries
	(2) Consideration of the mid term and long term goods flows	
	(3) Definition of standards	
	(4) Timeline for the implementation	

Measures	Milestones	Primary Stakeholders
III. Financing	(1) Development of uniform policy	EU
	(2) Definition of fixed prices and open access	
	(3) Definition of funds to use	
	(4) Elimination of obstacles	
IV. Concept realisation	(1) Implementation of the project team	EU, RCPT
	(2) Test for the terminal	RCPT
	(3) Expansion of the gauge	RCPT
	(4) Give consideration to industries	RCPT

The following tables explain the measures and milestones to be achieved within the proposed Action Plan in more detail.

I. Forecast

Measure 'Forecast' deals with the forecast of the future traffic volumes and types of goods on the main corridors and most important transshipment areas.

History has shown that nearly all transshipments are possible in all transshipment areas not making efficiency gains of specialisation. Before making a concept the future needs have to be defined for the main rail corridors between Western Europe and Asia. This forecast has to be made for all relevant commodities and their volumes.

In particular the realisation of this measure has the following milestones:

- (1) Determine the efficiency of the individual sidings (number of tracks, condition, capacity of terminals and gauge change possibilities, handling facilities, age of the terminals)
- (2) Collect information on current volumes of goods and handlings (products, type of handling, and efficiency of handling in comparison between the different border stations) and make a medium and long terms forecasts
- (3) Determine specialties and strengths of the different border stations

- (4) Position on TEN-corridors and to relevant consumers
- (5) Prepare a volume forecast for individual types of goods
- (6) Derivation of requirements for the future design of the handling facilities

Timing:

Month 1- 18

II. Concept

Measure 'Concept' concerns the development of the concept for optimisation of the transshipment areas (centralisation, more efficiency, less binding capacities, cheaper production)

On the basis of step 1 a European strategy concept has to be drawn up. It has to include all major transshipment areas with the relevant flows, volumes and destinations. So the future size and type of cargo handling facilities can be defined as well as the necessary funding framework. The advantage for this common concept for all transshipment yards is to strengthen the individual sidings.

Transshipment has to become cheaper, faster and more efficient. The concept should include statements concerning the following issues:

- (1) Ranking list of the border stations and definition as international main hub or regional hub. This ranking list should include all border stations between the European and the Russian gauge.
- (2) Consideration of the midterm and long term development of good flows, centralisation of functions in the separate border stations to warrant high investments in bigger new terminals
- (3) Definition of standards in the terminal for both levels (main and regional hub). The definition has to be made for number and length of tracks, equipment in container terminals and all other handling facilities.
- (4) Working out a timeline for the implementation of the concept.

Timing:

Month 18 – 36

III. Financing

Measure 'Financing' deals with the development of the Investment programme for transshipment yards

The European Commission is asked to provide a common investment programme together with the states involved. The European level is necessary to avoid national interests of the individual states. Rail freight traffic between Europe and Asia is a topic of international relevance and not of local interests. This investment programme should finance the relevant transshipment areas on the basis of the afore described forecast and the concept. Investments will only be done if the new or reconstructed terminals allow open access for all market participants. The focus of the funding programme should be directed to the following points:

- (1) Uniform policy for funding programme for containers as well as for conventional goods
- (2) Definition of fixed prices and open access in handling areas
- (3) Integration of national subsidy funds
- (4) Easier access for applicants and investors for international funding programmes
- (5) Elimination of bureaucratic obstacles

Timing:

Month 37 – 48

IV. Concept realisation

Measure 'Concept realisation' is focused on the realisation of the concept in one model area.

It is recommended to realise this general concept in one model area. Therefore, we suggest the corner region where the four countries Slovakia, Hungary, Romania and Ukraine meet. The region includes the border areas Ciernar / Matovce (Slovakia – Ukraine), Zahony (Hungary – Ukraine) as well as the Ukrainian transshipment stations Chop and Batove. In addition, a track with European gauge connects Slovakia directly via Ukraine with Romania. This region has the chance to become the most important transshipment area on the RETRACK central corridor. The idea of the division of functions can be shown here. In addition, investment in this region can be seen as a positive structural development in a disadvantaged region. In particular, the following detailed steps have to be considered:

- (1) Implementation of an international project team consisting of members of the four countries involved, the European Commission as well as railway experts if applicable also with members of the suggested Rail Corridor Project Team.
- (2) Test whether an international joint terminal can be built (as a counterpart to the Kazakh / Chinese free trade zone Khorgos).
- (3) Expansion of the existing standard gauge track in transit through the Ukraine to increase the goods flow via rail between Eastern Slovakia and Romania.
- (4) Consideration of the existing and planned large industries in Eastern Slovakia and Hungary to allow the best possible rail connection.

Timing:

Month 48 – 84

4.3 Investment in infrastructure to allow longer trains on the EU territory

There is a difference in length and gross weight of trains on the European and the Russian gauge. In Russia, Belarus and Kazakhstan longer trains are possible. It is necessary to allow longer trains on the main trans-European corridors to decrease costs and in particular for the light container trains. The RETRACK corridor and its three proposed extensions can be a pilot for this purpose.

Market studies were made, for example, by the Deutsche Bahn on how this would fit into the infrastructure. Trains up to 835 m on the corridor Denmark – Germany were then realised. These experiences should be analysed and transferred to the neighbouring countries/railway infrastructure managers. Mainly container trains are not so heavy, so the geography of the corridors will be not a problem. Only three bottlenecks will remain: the length of the sidings to allow the overtaking of faster trains and the distances between the signals. In addition, we have to consider the technical adjustment of the rail freight wagons (heavier trains can only be achieved through technical changes).

Table 7 presents an overview of measures, milestones and primary stakeholders which contribute to the development of the investment plan in infrastructure.

Table 7. Overview of measures, milestones and primary stakeholders which contribute to the development of the investment plan in infrastructure

Measures	Milestones	Primary Stakeholders
I. Research	(1) Development of an operational plan	Infrastructure authorities in the participating countries
	(2) Assessment of current situation at the marshalling yards	
	(3) Assessment of situation about the signalling	
	(4) Definition of solutions for noise reduction	
	(5) Optimisation of the rail interfaces	
	(6) Cost estimation for the expansion projects	
II. Investment plan and operational concept	Final investment concept and operational concept	Infrastructure authorities in the participating countries together with EU
III. Trial realisation	Realisation on the trial part on the corridor	Infrastructure companies in the Netherlands, Germany and Poland

The following tables explain more in detail the milestones and measures to be achieved within the proposed Action Plan.

I. Research

Measure 'Research' concerns research of possibilities to introduce trains with a length of 1,000 m on the RETRACK corridor.

The introduction of longer trains is not a new idea and was already investigated within the EU. Some additional research would be necessary in order to adapt these concepts to the RETRACK corridor. The concept has to include:

- (1) Development of the operational plan and operations management on the corridors including the possible extensions
- (2) Assessment of the current situation at the marshalling yards or stations with the length of all main tracks
- (3) Assessment of current situation about the signalling of the corridors and expansion projects on ERMTS-standard
- (4) Development of possible solutions for noise reductions
- (5) Optimisation of the rail interfaces
- (6) Cost estimation for expansion projects as well as and implementation of a standard cost-benefit-analysis

Timing:

Month 1 - 6

II. Investment Plan and Operational concept

The objective of this measure is to produce an investment plan and operational concept. The main target is to increase volumes via rail and improve reliability for customers with a parallel decrease of transport prices per TEU. At the same time the noise- and environmental pollution can be reduced which is an important “brick” on the way to implementing green logistics on international rail corridors as well.

Based on step 1 the necessary investment plan and the operational concept have to be developed.

The operational concept will describe the implementation of the longer side tracks including the adjustment of the signalling system and the possibilities for freight trains to run with a speed of minimum 100 km/h (where possible 120 km/h) on the entire corridor.

Investment plan will be done for the RETRACK corridor and its three possible extensions.

Timing:

Month 7 – 24

III. Trial realisation

Measure ‘Trial realisation’ deals with testing of the concept on the RETRACK corridor and one of its possible extensions.

It is suggested to start with the corridor Rotterdam – Brest / Malaszewice as this is the main West-East corridor at present. The development of the other axles and of the rail market and in particular via the Central route, will take some time. Between Rotterdam and Brest the infrastructure has a relatively good standard so that the necessary adjustments can be made in a relatively short time.

After the start of longer trains on this corridor the experiences can be analysed and transferred for other corridors.

Timing:

Month 25 – 48

4.4 Support in creation of the unified transport system, in particular by simplification/unification of the Eurasian freight documentation

Unifying transport systems has many appearances: one gauge, one (type of) locomotive(s), one document for the total route (including mode change at start and end terminals), one power system, one communication system, one language, one type of wagon, one stop service, one type of container, one size of pallet, et cetera.

Having more systems in any of these aspects brings more costs and mostly more time and more risks. These are the three main considerations on supply chain optimisation and consequently are the drivers for the market (the transport users) to evaluate the logistics chain between the origin of their product and the sales location. Each item is bringing extra costs that is borne by the final user in the supply chain and which is increasing the price on the market and not bringing any added value to the product. Reduction to the maximum the number of changes to be made is therefore a key element to be pursued by all stakeholders, private and public. As transport on the EU-China Corridors is passing through many countries there are cost increasing risks involved due to the different legal / procedural / administrative systems in these countries. With a unified transport system the costs (and time loss) would be minimised, contributing to the community at large. Such a unified transport system is therefore to be pursued to the maximum.

The elements in a unified transport system can be split up in:

- Information chain:
 - Transport documentation
 - Customs documentation
 - Language
 - One stop service
 - Tracking & tracing
- Physical logistics chain:
 - Gauge change
 - Locomotive change
 - Type(s) of wagons
 - Locomotive power system
 - Communication system
 - Container sizes

- Regulatory:
 - Different rules/regulations in different countries (e.g. axle load, loading units, cargo packaging)

Today the transit time of wagons and containers is too long due to the difficult freight documentation. To simplify the process it should be possible to:

- Prepare a uniform CIM/SGMS consignment note and accompanying documents (CIM/SMGS wagon list, CIM/SMGS container list) at the departure station:
- To optimise customs clearance, e.g. through harmonisation of different national customs tariff codes and electronic pre-declaration at the departure station and full acceptance of customs seals in transit traffic;
- Declaration of acceptance at Chinese container terminals should be sent to the departure station (today border station);
- Unified process for example, on the basis of a joint electronic documentation with standard UN Layout (EDIFACT). It is recommended to build a virtual Corridor Control Tower where all physical and information flows are visual to all stakeholders (according to their user rights) in the Corridor via access to the system. This way e.g. customs documents can be sent instantly to the next station, whilst providing all parties along the Corridor with real-time information.

Legally it could set-up in the same manner as Eurocontrol (European airspace management body), where all income from all flights over Europe first goes to Eurocontrol where they further distribute it to the countries and users. Examples of a similar data warehouse exist as well in the seaports⁹, where all users (terminal, stevedoring, forwarders, shipping lines and customs) have access to the consignment data relevant for each party. This system avoids double work and failures through re-typing documents and considerably facilitates the process.

The overall approach to the creation of the unified transport system on the RETRACK corridor and its extensions is that all stakeholders agree that the Corridor is treated like a pilot area, an area where existing national legislation and regulations are not valid for the time of the pilot project and the geographical area of the Corridor¹⁰. It is necessary that all high level stakeholders agree that the Corridor is treated like a pilot area, an area where existing national legislation and regulations are not valid for the time of the pilot project and the geographical area of the Corridor.

⁹ See www.portbase.com

¹⁰ Similar to e.g. the test on the Dutch road network of 3TEU trucks

High level stakeholders are those stakeholders who can steer, guide and control other stakeholders, e.g. a Ministry of Transport representative is appointed as the representative for all institutional aspects (economy, environment, legal, financial, customs) of a country. Top-down approach is suggested and is seen as an essential ingredient for the realisation of the measure.

The suggested top-down approach to:

- limit the discussions between the Corridor countries to the high level stakeholders,
- limit the pilot to a clear defined particular shuttle train service with further limitations such as particular right-of-path timeframe, departure and arrival stations and duration of the pilot,
- design the pilot fully from a clean sheet approach fulfilling logistics, commercial, and risk mitigation market requirements (e.g. one document, one information chain, one type of control, one system, one defined length of train, no loc change other than at gauge change, et cetera),

The pilot project results are then to be evaluated and upon positive evaluation a further roll-out can be initiated.

Considering the complexity of implementation of a unified transport system, sufficient time is needed to achieve even the first results. Reaching an agreement to use the Corridor as a pilot case environment would be a long way in laying the fundament for unification. In the table below actions are focused on the realisation of cost-effective and relatively short-term (1 – 3 years in duration) results which will act as example cases for more extended and/or high investment actions at a later date.

Table 8. Overview of measures, milestones and primary stakeholders which contribute to the development of unified transport system

Measures	Milestones	Primary Stakeholders
I. Agreement on Corridor Pilot	(1) Institutional and legal environment for the pilot	EU, governments, RCPT
	(2) Clean sheet approach elements	RCPT, EU
	(3) Identification of the stakeholders and agreement of the action plan per country	RCPT, EU
	(4) Procedural aspects	RCPT, EU

Measures	Milestones	Primary Stakeholders
	(5) Launch of the pilot	RCPT, EU
II. Unifying Information Chain	(1) Business process architecture of the Corridor extension logistics	RCPT
	(2) Organisation of the datahub	
	(3) Organisation of Customs documentation	
III. Organisation of freight documentation	(1) Establishment of joint CIM/SGMS consignment note	RCPT, CIT International Rail Transport Committee,
	(2) Establishment of joint CIM/SGMS wagon list and container list	
	(3) Uniform Claim Note	OSShD, RZD, Chinese Railways
	(4) Uniform CIM/SGMS Eurasian corridor law	
	(5) Accession of China to joint CIM-SMGS-Consignment Note	Chinese Government, RCPT, CBCT
	(6) Virtual Corridor Control Tower	National railway companies, major container train operators
III. Unifying Physical logistics chain	(1) Improving interoperability	Wagon Owners, CRC
	(2) Dealing with gauge change	Governments, EU
	(3) Dealing with locomotive change	RCPT, Governments, EU
	(4) Dealing with types of wagons	CRC
	(5) Communication system	RCPT, Governments, EU

Measures	Milestones	Primary Stakeholders
	(6) Standardisation of container sizes and/or load units	RCPT, CRC
IV. Regulatory unification	(1) Acceptance of a separate Regulation Regime for the Corridor only	All Corridor country governments, RCPT
	(2) Development of the performance indicators	RCPT
	(3) One freight document for the corridor	CIT International Rail Transport Committee, OSShD, FIATA

The following tables explain more in detail the milestones and measures to be achieved within the proposed Action Plan.

I. Agreement on the Corridor Pilot

Measure 'Agreement on the Corridor Pilot' focuses on the steps to develop and launch the Pilot Corridor Project.

1. Assess and describe the institutional and legal environment in which an international pilot project can be executed; Discuss with international bodies such as, ADB, UNECE, and TRACECA (IGC) the establishment of a Corridor Pilot and establish the institutional international framework as such;
2. Define the clean sheet approach elements;
3. Identify all relevant stakeholders per country and develop an action plan per country on how the country's representative is to handle the required country stakeholder agreement; Agree with the relevant high level stakeholders the exact scope of the pilot (e.g. a particular block train service (run by CRC), at a particular route, with a particular document and customs flow and operation), see also action 4 below; Define and agree on the contribution of all high level stakeholders in the pilot;
4. Define the procedural aspects of management, control, review and dissemination aspects of the pilot. Define in accordance to these elements clear KPI's and use the Corridor Web tool to communicate them;
5. Sign the pilot project agreement and launch the pilot project.

It is expected that the above steps can be put into practice within a period of around 18 months when the presented conditions are met.

II. Unifying information chain

The Measure 'Unifying information chain' is recommended to be drawn up by a team in which RCPT, CBCT and the CRC are closely working together. The measure comprises a set of concrete actions.

1. Developing business process architecture of the total Corridor logistics chain based on assessing all input and output information data per actor in the chain. This assessment is to include the time/timing of the data input and data output.
2. As part of the Corridor web tool (see aspect 1 Rail Corridor Project Team) a data hub has to be organised. This data hub serves as the central databank in which each actor in the chain is inputting its information data and is taking out the information data required for its own operations and administration ('One Transport Document'). This is the most straightforward and simple manner to reach a unified information system.
3. Regarding the customs document this system can first be used by each customs authority in the same manner, inputting the information data coming from that authority and sourcing the information data required for its own activities. Experiences with such a 'change management' methodology within the industry has shown that the actors (in this case the customs authorities) themselves are automatically going to voice that there is an opportunity to simplify the documentation (using human behavioural characteristics by visualising the solution which lowers the workload). At that stage all relevant actors will be supportive to take away any regulatory or procedural procedure and take action towards the realisation of a 'One Customs Document' for the entire Corridor.

III. Organisation of freight documentation

In this Measure the focus is on the provision of the unified freight documentation along the Corridor and its extensions to China.

1. Joint CIM/SGMS consignment note has to be established and accepted by OTIF and OSShD
2. Joint CIM/SGMS wagon list and containers list have to be established and accepted by OTIF and OSShD
3. Uniform Claim Note has to be accepted by OTIF and OSShD
4. Uniform CIM/SGMS Eurasian Corridor Law has to be accepted by OTIF and OSShD
5. Accession of China to joint CIM-SMGS-Consignment Note has to be promoted and supported
6. Agreement between major stakeholders on the establishment of the control tower and non-discriminatory access to it has to be achieved

IV. Unifying Physical Logistics chain

Measure 'Unifying Physical Logistics Chain' focuses on the solutions to improve technical and operational interoperability on the corridor.

1. Each of the main physical logistics chain elements (gauge change; locomotive change; type(s) of wagon(s); locomotive power system, communication system; container sizes) is expected to remain a barrier when a total Corridor solution that is too rigid is pursued. Practical approaches are needed to start up improvements which generate a continuous momentum in the market (on both private sector and public sector side) to continue improvements.
2. Gauge differences between on the one hand the EU and China and on the other hand Russia and the CIS countries is expected to remain for a longer period of time. Consequently, the primary possible solution is to introduce wagons with flexible axes. This needs detailed assessment on consequences for weight, speed, load capacity, investment and operational costs, tariff consequences and competitiveness from resulting time and cargo safety reduction vis-à-vis cost increases. It is recommended to establish a combined team of Chinese and EU research institutions to execute such a project
3. One of the key aspects is to minimise the amount of locomotive changes to those required for gauge change. EU developments and also the automotive shuttle trains between France and Russia should act as points of departure for a further implementation of the 'one loc solution'. This should also include the aspect of uniform power systems along the Corridor.
4. Further focus on the introduction of wagons with flexible axes will need to be done. The wagon types are to be full in line with the requirements set forth by the type(s) of cargo(es) transported.
5. Communication system: Adoption of the Web tool by the Corridor Team
6. Container sizes have seen a widening variety¹¹ in the last decades. Both in length, width and height, each serving specific requirements set by the market demand. An increasing common split is seen in the sea transport between Asia and Europe which is predominantly using ISO standard containers and the intra-European transport, which is moving increasingly towards 45' foot, (Euro) pallet wide containers. Additionally, a number of developments such as the SWAP body, ACTS ('Abroll Container Transport System') and Modalohr¹² are mixing with systems that have been used longer, such as containers and RoLa. Discussions on standardisation of container sizes have been ongoing for a long time but despite these efforts in practice, only an increase in differentiation has been seen. It is considered essential that the standardisation of container sizes and/or type of load units follows first and foremost three key

¹¹ 'Intermodal Loading Units – Sustainable Surface Transport', 6th Framework Programme, priority 6, Maritime Transport Coordination Platform, 2005

¹² See www.modalohr.com

elements: the right type of load unit for the target cargo on the Corridor; the operational requirements and operation options of CRC; and the positioning and balancing of the load units along the Corridor. Upon selection of the CRC the topic of container size / load unit standardisation is to be put on the agenda for the RCPT.

The unification of the physical logistics chain requires a continuous focus on unification (and thus simplification leading to lower costs). In terms of timeframe, the reference actions on these items within Europe indicate that it will take a substantial amount of years to realise unification on the Corridor. Annual work programmes with clear cut milestones are recommended to be established in order to keep the process rolling.

IV. Regulatory unification

Measure 'Regulatory unification' is related to the existence of different rules/regulations in different countries (e.g. axle load, loading units, cargo packaging). .

1. It is recommended to agree with all Corridor countries that the Corridor receives, e.g. for a number of pilot years, a special regime (see action 1). A regime separate from existing national regulations, but one developed from the perspective of a seamless operating and efficient running rail service on the Corridor. Clearly, such a regime has to be transparent and controllable.
2. Performance indicators are to be developed. They can be monitored and evaluated through special access to the Corridor Web tool.
3. Overall, on the Corridor pilot project the 'one document' is to be used as the information chain backbone and this should include both the transport documentation items as well as the customs data items.

Overall, this is seen as an agenda point for the RCPT to initiate and develop in close collaboration with the EU and other major stakeholders. The realisation of such a separate regime allows the countries to also evaluate the working and where viable, initiate a process to leverage the Corridor experiences and regulations to other areas in their country. The timeframe of this action is to fit within action 1.

4.5 Support in operational and commercial solutions

Operational and commercial solutions are market driven in general. The activities of the states involved and of the European Commission should focus on promoting learning actions, research and development and to ensure the non-discriminatory market access.

The implementation of modern IT and GPS based tracking and tracing systems for wagons and containers on the Eurasian corridor requires a high research and development investment which could exceed the possibilities of the market players.

The present status of the incumbents shows a need for implementation of market related costing and pricing policies and systems. Most of the EU railways have undergone a structural and market driven reform process in the 90's which has created a lot of experiences which could be useful for the state railways as well.

Although a direct market intervention by the European Commission is not recommended it could be considered if it is in the interest of the European Commission to promote R&D and common learning actions with the Eurasian corridors.

The container shipping markets have created highly efficient business solutions which could also serve as examples and benchmarks for the railway sector. For example: mutual agreements between shipping lines to provide slots on a bilateral or pool basis; tailor made solutions and contracts by container leasing companies (master lease, time / trip lease etc.); container interchange agreements between shipping lines; intermodal networks of inland container terminals to ensure re-loading and to avoid empty runs. If the availability of wagons and containers and their productivity is improved, then the highly segmented Eurasian railway market will need to have innovative business solutions. Such solutions should enable common production platforms without neglecting the natural interest of the market players to ensure their competitive market position. The European Commission could support this development by promoting common learning actions.

The lack of modern logistics and control systems for wagons and containers hampers the efficient operation of the rolling stock and the containers. Modern tracking and tracing systems comprising the whole corridor as well as IT based monitoring of the wagon and container parks are needed in the course of the further increase of cargo volumes along the corridors. The already existing solutions for container and wagon related tracking and tracing systems need to be further developed. GPS and in the future Galileo offer new possibilities to track and trace equipment and to transmit equipment and cargo related data to the control centres (e.g. data on location, temperature, intrusion etc.). The modelling of wagon and container flows allows the investigating of different scenarios of timetabling, additional trains and routes etc. as an important precondition for optimum operation. An unsolved problem is the forecast of container and wagon flows and stocks at the different locations in order to locate and to utilise the equipment more efficiently. The ever growing amount of empty wagons and

container wagons to be returned increases the asset costs and the operational costs considerably. The forecast and the control of imbalances in wagons and containers shall be improved through logistics control centres with modern IT and/or GPS based tracking and tracing systems.

Another measure to improve the competitiveness of the railway corridors is to establish more flexible tariffs and market oriented pricing policies. As mentioned above the contractual freedom should prevail as laid down in the CIM rules. The revision of the SMGS rules and their approach to the CIM rules in this respect is recommended. In order to overcome the inflexible and national split setting of railway tariffs as well as the differentiation between national and international rail tariffs, different optional solutions shall be explored and discussed. Very often the basis for pricing are average total costs and there is no transparency with regards to the route and container transport related actual costs and therefore no basis for a more market related, marginal cost based pricing. Therefore, a first step might be the analysis and improvement of cost accounting. Other reasons for non-market adequate tariffs may be the absence of a demand and competition oriented pricing,

From the institutional point of view the segmentation of pricing and tariffs between the various railway undertakings is clearly a disadvantage in comparison to airlines and shipping lines which usually are responsible for the entire journey. One possible solution could be the establishment of a joint sales organisation which sells container transport on behalf of the participating railways and disposes over a certain discount budget on the freight tariffs in order to be able to be flexible according to market needs. From the European Commission point of view a common learning action for the market players could promote the implementation of modern pricing and tariff systems

Finally, the establishment of powerful market consortia and the focus on more cost-effective private container block trains are an important step towards strengthening the Eurasian container traffic but may imply the risk of a semi monopolistic supply structure which decrease the free and non-discriminatory market access. Small and medium sized companies may face problems when booking container transportation with competitive conditions due to usually being excluded from private trains. Possibilities for at least mixed private / public trains should be explored, discussed and promoted. Semi-monopolistic structures and cartels should be avoided. Attempts of consortia to form market cartels shall be prevented according to European Competition Law.

Table 9. presents an overview of measures and milestones of possible interactions by the European Commission which contribute to the implementation of the sixth solution group.

Measures	Milestones	Primary Stakeholders
I. Learning action on availability of wagons and containers	(1) Research on solutions for utilisation and availability of transport equipment	European Commission, railway and container operators
	(2) Dissemination of good practices	
	(3) Preparation of concrete actions	
II. Learning action on logistics and control systems	(1) Research of solutions of IT based wagon and container logistics systems	European Commission, with railway and container operators
	(2) Dissemination of good practices	
	(3) Preparation of concrete actions	
III. Learning action on pricing and tariffs	(1) Creating awareness	European Commission, with railway and container operators
	(2) Analysis of pricing and tariff systems	
	(2) Dissemination of good practices	
	(3) Preparation of concrete actions	
IV. Provision of the free access to the RETRACK corridor and its extensions to China	(1) Monitoring of the corridor	European Commission, with railway and container operators
	(2) Measure to ensure free access	
	(3) Support of cooperation and consolidation of the corridor	

The following tables explain more in detail the milestones to be achieved within the proposed Action Plan.

I. Learning action on availability of wagons and containers

Measure 'Learning action on availability of wagons and containers' deals with the development of new market driven solutions in order to ensure a high availability of wagons and containers and their efficient operation.

Three concrete actions can be taken to implement this measure.

1. Research of contractual and operational solutions for efficient utilisation and availability of transport equipment in other modes of transport (especially shipping)
2. Dissemination of good practices, tools and standards
3. Discussion and preparation of solutions for and with the market players in the railway sector and with container operators

II. Learning action on logistics and control systems

Learning action on logistics and control systems for wagons and containers focuses on the search of the new IT solutions and dissemination of the best practices. It is implemented through three actions:

1. Research of preconditions and possible solutions for IT based wagon and container logistics systems
2. Analysis and dissemination of good practices, systems, tools and standards
3. Discussion and preparation of solutions for and with the market players in the railway sector and with container operators

II. Learning action on pricing and tariffs

Learning action on pricing and tariffs include the following actions:

1. Creating awareness about the problem and the chances to overcome
2. Analysis of the pricing and tariff systems in the Eurasian corridors
3. Discussion and dissemination of good practices in cost accounting, pricing and tariffs in the railway sector but also in other modes of transport and their benefits
4. Learning actions on modern costing and pricing policies and tariff systems

IV. Provision of the free access to the RETRACK corridor and its extensions to China

From the point of the European Commission the following measures are subject for decision and eventual implementation:

1. Frequent monitoring of Eurasian corridor, e.g. through frequent market survey on the market structure and on the supply and costs of services in their impact on trade
2. Proactive and counter measures to ensure free access
3. Support to facilitation of cooperation and consolidation on the Eurasian corridor, e.g. through the establishment of Web based freight broker systems in order to consolidate cargoes from SMEs and to improve utilisation of public trains

5 Conclusions and recommendation

The Action Plan has been drawn up to overcome the barriers which were identified in the previous task of WP13; namely 13.2. The barriers are listed and ranked. All barriers are classified as “serious”. Only three barriers are classified as “highly grave”, namely on high and unstable tariffs, on the missing consensus between countries on tariff matters and the TRACECA route involving the intermodal transport. All other barriers are classified as “medium grave” and “grave”. (between 3 and 4 on the scale of 5)

The ability to overcome the barriers provides a more mixed overview. The technical barriers are the most difficult to overcome; which is not surprising taking the huge investments into account on for example, the gauge width and safety systems, The operational and market barriers are more easy to overcome which is based on the fact that most of these barriers are based on administrative and organisational aspects which are less costly and less time consuming to overcome.

When combining the most grave barriers with the possibility to overcome them; it is clear that it is nearly impossible to overcome the difficulties when crossing the sea twice and when taking the TRACECA route. However, agreeing on lower and stable tariffs which between the different countries is less difficult to organise.

As the technical barriers are the most difficult to solve due to the high costs and long period, the focus of the Action Plan is given to the operational, institutional and market barriers as solving these barriers is less costly and less time consuming. Therefore, the Action Plan is focused on five intervention areas. Namely:

- Creation of Rail Corridor Project Teams
- Investment in the transshipment yards on the EU territory of the cross border region
- Investment in infrastructure to allow longer trains on EU territory
- Support in creation of the unified transport system, in particular by simplification/unification of the Eurasian freight documentation
- Providing support in operational and commercial solutions

In total, 19 measures are brought forward within the clusters, each of which presents the development of one specific aspect of the RETRACK Corridor extension. Under each measure a set of milestones are generated. For each milestone, the stakeholders, namely, the European Union, Rail Corridor Project Team, National Ministries, Transshipment companies, Infrastructure authorities, Railway Operators, Terminal Operators, Transport operators and Shippers or international organisations active

in rail transport are selected as the primary stakeholders responsible for the execution of the milestone. A set of tables clarify the measures (the overall goal) and the set of milestones to support the measures and indicates the primary stakeholder responsible for the milestone.

The proposed solutions cover a vast range of barriers with which the railway transport stakeholders are confronted. Many of the problems can be solved with few solutions. The solutions proposed in the Action Plan should be within the reach of the EU, as stakeholders from within the EU could be pressed to solve the problem, whereas a stakeholder from outside the EU can only be advised to follow up a suggestion.

The proposed measures can mostly be described as organisational, administrative and operational which makes the investments less costly and the time horizon visible within some years. However, this implicates that all involved stakeholders should cooperate and the EU and National Governments should enforce the cooperation and implementation of the proposed measures.

When taking into account the most serious barriers which are also possible to overcome, which are dealing about the high and unstable tariffs and on the missing consensus between countries on tariff matters; following measure is proposed: A learning action of pricing and tariffs. This includes the following actions:

1. Creating awareness about the problem and the chances to overcome
2. Analysis of the pricing and tariff systems in the Eurasian corridors
3. Discussion and dissemination of good practices in cost accounting, pricing and tariffs in the railway sector but also in other modes of transport and their benefits
4. Learning actions on modern costing and pricing policies and tariff systems

Considering the severity of most barriers, the magnitude, the differences in background, mentality, regulations, and in business environment, all indicate that the realisation of a seamless functioning, reliable, safe and commercially attractive Eurasian rail Corridor is not a project that will quickly see results. It will take time, effort, persistence and perseverance to realise it. Indicated solutions are good input towards the bilateral discussions and negotiations with third countries, especially between bilateral discussion between the EC and Russia on railways. During these discussions the priority of implementing the milestones should be made, after consultation of the stakeholders.

This Action Plan provides the European Commission with concrete steps to be undertaken in order to decrease the severity of barriers and to create favourable conditions for the organisation of the demonstration train, connecting the RETRACK corridor with China through one of the proposed routes.