

# Project “East West Transport Corridor II” (EWTC II) WP 4 – Business Opportunities in Railway Transports Task 4A – EWTC Joint Railway Concept

## REPORT on Available EWTC governing methods

Vilnius, 20-09-2010

Revised 30-09-2011

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*Note: The report is based on overview of literature and of the results of other projects, on discussions in a workshop and an interview with the experts. The report contains opinions and summaries as target data for development of the task 4A -EWTC Joint Railway Concept and for contribution to the task 3B – Development of an EWTC Green Corridor Manual in the early stage of the EWTC II project.*

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## 1. Summary

The aim of EWTC Joint Railway Concept is to offer solutions to enable more efficient, sustainable and ecological rail freight services. Enhancing of interaction between rail and other modes of transport is also important for efficiency of the whole logistics chain. Implementation of the transport policy for greening of the EWTC and selection of appropriate governance methods is very important in this case.

For “green” transport corridors, measures of transport policy which promote harmonization of competitive conditions for all modes of transport, incentive collaboration and cooperation of all stakeholders of the transport chain are required. It is especially important to use appropriate governance mechanisms for greening transport services and to increase efficiency of intermodal transport.

The institutional environment determines the choice of governance mechanisms of green transport corridors. Its configuration parameters affect the choice of governance mode and structure.

Rail market liberalization in the EU countries was carried out by separate, integrated and mixed models of the structure. The rail infrastructure is separated into a fully independent entity in case of a separate liberalization model. Activities accounting is separated but the company remains unresolved in case of an integrated liberalization model.

Liberalization of the railway market in Denmark and Sweden was carried out by a separate structural model, while in Lithuania – according to an integrated model of the structure. A German railway company Deutsche Bahn became a holding structure which is more consistent with the integrated model. The reform led to emergence of new rail carriers in all these countries, but major carriers have remained.

Negative effects have emerged in management area after liberalization of the rail freight market according to a separate structural model. The increased amount of new players with their own interests interfered with the coordination processes among terminal operators, railway carriers, the infrastructure manager and the railway traffic operator. Planning of railway operations became even more complex. Liberalization does not bring an optimal allocation of resources, like train paths, terminals equipment. It is necessary to use integrating governance methods to overcome these deficiencies. These issues were smaller when the liberalization model of integrated structure was used.

Rail transport is environmentally friendly. It is important to create favorable preconditions to increase rail freight share. It must be assumed that the principles "user pays" or "right price" are more suitable for greening of transport corridors.

Even more problems arise with the choice of governance methods due to the fact that the corridor is covered by the EU and non EU countries. Railway companies in non EU countries of EWTC are vertical integrated monopolies with a strong political dependence. In some cases, it is difficult to reach mutually beneficial agreements with Russian Railway Company for its political interests. There is an opportunity to collaborate on establishment of Green EWTC and negotiate only with a single railway company or its subsidiary in non EU countries. E.g., the project of shuttle train "Viking" launched by Lithuanian, Belarusian and Ukrainian railway companies, Klaipeda and Odessa, Ilyichevsk ports, Lithuanian, Belarusian and Ukrainian Customs Authorities demonstrate the possibility of good cooperation. There is no special governing structure. Possibilities of good control in Kena border station equipped according to the EU requirements, possibilities of IT systems to share data about cargo load with the Customs and Belarusian railway, simplification of Customs Procedures (checking documents of bill of lading with electronic data and recognizing it as customs declaration) shorten the border crossing time to 30 minutes when homogeneous goods are transported. In spite of the fact that the "Viking" is a successful case of best practice, the transport ministries and the governments of the train route countries are involved in further development of the project.

EWTC transport chain rail-sea-rail pollutes the environment less. Action Plans under the European Neighborhood Policy (ENP), as well as bilateral Partnership and Cooperation Agreements involve cooperation on transport policy, including adoption of substantial provisions of the EU transport legislation by the EU neighbor countries. The EU transport relations with Eastern non-EU countries as well as with Belarus also include ambitious plans for extension of the TEN-T network.

The rail freight corridors are being implemented in the EU. It is planned to establish a separate governance entity for the entire freight corridor and to implement the European Rail Transport Management System (ERTMS). "Bravo" project is one of the examples in which the common corridor management system was implemented. It is acceptable to choose governing methods based on coordination arrangements due to huge geographical coverage of the EWTC and complexity factors affecting smooth movement of cargo through the railway of the corridor.

The most suitable form for the corridor management is the associated structure based on the coordination mechanism of "creating collective actions". The complexity of the institutional environment of the EWTC, diversity of interests of the logistics process stakeholders requires usage based on coordination governing methods. Four groups of co-ordination mechanisms have been named:

1. Introduction of incentives;
2. Creation of an interfirm alliance;
3. Change of the scope;
4. Creating collective actions

Creating collective actions is the most common and most effective coordination mechanism in a complex institutional environment and when necessary to harmonize diversity of interests of logistics chain stakeholders.

Distribution of responsibility in the rail freight business models (3PL, 3PL-RU, Agent, Anchor Customer, Corporation, Route, Corridor) are presented. The listed models differ, first of all, in the relationship with the customer and goods provider's function. Agreements with the customer are a sign in most cases of a third party logistics provider; however, the carrier contracts directly with the client in case of the Agent and the Anchor model. Responsibility for cargo operations depends on the amount of carriers and the presence of a dominant carrier. Route and corridor models are important for implementation of the EWTC Joint Rail Freight Concept.

The rail freight business models and responsibilities in rail freight domains are presented in EWTC corridor countries: Denmark, Germany, Sweden, Lithuania and Belarus.

Assessment of the methodological presumptions and of the experience of implementation of shuttle trains projects shows that the most appropriate form of governance of EWTC would be the associated structure. An association of stakeholders is suitable for coordination activity in the global and complex EWTC. The EWTC Association was established on 29th of June 2010 in Vilnius.

EWTC II project partners are responsible for revision of the corridor strategy. Implementation of the strategy will be the responsibility of the Association. Implementation of the strategy and action plans will require close collaboration and different types of cooperation between the association members and stakeholders of the EWTC. It includes activities in the following areas:

- (i) Global conventions (EU and non EU countries);
- (ii) Intergovernmental agreements/ organizations addressing regional cooperation;
- (iii) Intergovernmental agreements/ organizations addressing sub-regional cooperation;
- (iv) Programs addressing regional or sub-regional cooperation;
- (v) Frameworks for agreements;
- (vi) Guidelines for legislation;
- (vii) Business-to-business agreements.

All modes of the coordination mechanisms (Introduction of incentives; Creation of an interfirm alliance; Change of the scope; Creating collective actions) can be put in place in separate parts of EWTC or administrative governing methods for rail freight corridor management in the EU countries.

## 2. Background of the project

Volume of trade between Europe and Asia is increasing constantly. Naturally, there is a need to create a sustainable transport corridor from the Southern Baltic Sea region to Belarus, Russia, Central Asian countries, China, as well as to Ukraine and the Black Sea region. The concept of a green corridor is favored for sustainable water and rail transport modes for cargo transportation, ITS solutions for road transport, effective interaction in transport hubs and co-modal terminals, modern information exchange technologies among all stakeholders throughout the corridor.

The aim of EWTC Joint Railway Concept is to offer solutions to enable more efficient, sustainable and ecological rail freight services. Enhancement of interaction between rail and other modes of transport is also important for efficiency of the whole logistics chain. Implementation of the transport policy for greening of the EWTC and selection of appropriate governance methods is very important in this case.

The European Union's transport policy is focused on competitiveness of transport systems. But, due to its specifics, the rail market is closer to a natural monopoly; therefore, the success of the market liberalization reform was questionable. The number of carriers in the market for railway transport services was limited because of high constant costs in rail business and limited scope of transport service needs, as the road transport service share remained bigger. Limited scope of services does not allow reaching the critical point of profitability for most of small rail freight carriers. Therefore, rail services market is not perfect thus the legislation of liberalization of rail freight market can not act effectively. The liberalization process of the rail market took almost 20 years and the results of the reform are ambiguous. First, the main argument is that market liberalization has increased the volume of container transport by rail. But this is the result of cargo containerization trend overall. Freight transportation in containers by road and sea has increased much more than by rail. Second, liberalization of rail market did not increase the share of rail freight services in the freight services market.

Liberalization of rail freight market has increased the number of participants of the operations in the same infrastructure. Therefore, transportation operations and management has become more complex. The used models of liberalization highlighted this complexity. There were more operational and management problems when countries carried out the liberalization of rail market in the framework of a separate structure. It was necessary to use the integration governing mechanisms to overcome the complexity which arised. There were less operational and management problems when countries carried out the liberalization of rail market in the framework of an integrated structure.

Liberalization of rail transport market has not removed the unequal conditions of competition between different transport modes and between rail transport services in separate countries. Tax exemption and taxation preferences regulation in separate countries



was introduced without EU-wide coordination. E.g., rail freight transport in Germany is charged the fuel tax while Dutch railway operators are fully exempted from this tax. Competition disparities for German companies competing internationally are caused by different social insurance contributions, motor vehicles tax rates and specific subsidies. In Lithuania, the fuel excise tax including the tax paid by Lithuanian railways is used only for road infrastructure development.

It is clear that only competition will not solve all problems. “Green” transport corridors require measures of transport policy which promote harmonization of competitive conditions for all modes of transport, incentive collaboration and cooperation of all stakeholders of the transport chain. It is especially important to use appropriate governance mechanisms for greening of transport services and to increase efficiency of intermodal transport.



### 3. Aim of the task

Creating EWTC joint railway concept is to offer solutions to enable improvement quality and competitiveness of railway services and smooth movement of cargo by rail. Therefore, it contributes to better integration between the European market and Russia, Belarus, Ukraine, Caucasus, Central Asia and Far East markets. These activities should focus on growth of cargo volumes in the corridor on the basis of improved quality railway services as a transport mode which is more environment-friendly.

The task promotes cooperation and exchange of experiences related to the development of seamless rail cargo flows in the corridor. It will contain some benchmarking activities with other transport corridors to find best practice cases in area of efficiency of application management practices for implementation of specific projects.

The report on Available EWTC governing methods is designed for review of theoretical assumptions and management practices of implementation of the EU transport policy in rail freight services and shuttle train projects. Suitable governance mechanisms for rail freight would be proposed in the context of development of the Green Transport Corridors.

#### 4. Methodological presumptions

The East-West transport corridor includes the transport infrastructure (road, railway, and fairway), hubs (ports, logistics terminals), transport equipment and machinery, IT and communications systems, operating and administrative procedures of the EU and non EU countries. With regard to the methodology of management for effective network services at the same time seeking to reduce the negative impact of transport on the environment and social costs, it is important to ensure optimal use of all elements of the transport corridor network in isolation and harmonious interaction with each other. It means the necessity to improve performance of each element of the logistics chain and to integrate interaction of all elements of the EW transport corridor to function as a coherent system.

The report is based on examination of literature sources, the EU legislation, the results of best practice projects and Eurostat data.

The EWTC Joint Railway Concept requires highlighting the essential features of the railway business and the specifics of EWTC. It is better to focus on pilot route (Figure 1) for an exact and comprehensive analysis because the corridor covers a huge territory. Therefore, it was limited to the pilot railway route which runs through Denmark, Sweden, then through the Baltic Sea, Lithuania, Belarus and Ukraine, and a branch from Germany through the Baltic Sea to Lithuania.

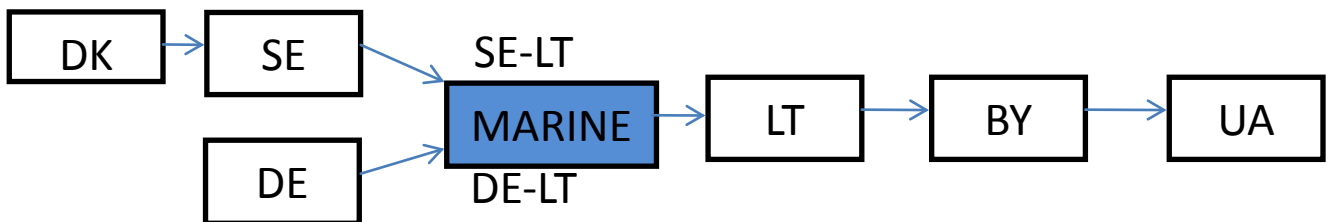


Figure 1. A pilot route of the EWTC

Selected KPIs will help design the EWTC Joint Rail Freight concept model. EWTC Joint Railway Concept model is a system for expressing the domains and elements of interaction of railway transport on different sides of the Baltic Sea. The analysis was carried out on the basis of overview of literature, the results of the best practices cases and discussions in a workshop with experts. The report contains opinions and summaries as target data for development of the task 4A -EWTC Joint Railway Concept and for contribution to the task 3B – Development of an EWTC Green Corridor Manual in the early stage of the EWTC II project.

## 5. Governing methods

### 5.1. Complexity of an item

The question of what governing mechanisms should be applied throughout the complex logistics chain in the East-West transport corridor is not simple.

First, integrated transport networks, in particular, the idea of a green transport corridor support the concept of sustainable transport development, in other words, transport systems that are economically efficient, environmentally sound, safe, secure and socially inclusive.

Second, it is important to develop understanding that not the different parts of the logistics chain, but the whole chain of the productive activity must be seen. The final results of the logistic chain are assessed by the owner of the cargo. It means *physical transport network efficiency*: the efficiency of the physical transport network as a whole is determined by the efficiencies of various individual transport modes, their intermodal integration and the modal choices actually available. *Service delivery efficiency*: the efficiency of service delivery through any given physical network system will depend on organizational and other factors. *Efficiencies in environmental and social terms*: choices made at the physical infrastructure and the organizational levels lead to a range of environmental and social impacts. Transport system efficiency in environmental and social terms can be measured in various ways, including the concepts of eco-efficiency and allocation efficiencies.

Third, it is difficult to coordinate development of the corridor and, in particular, the issues of transport services tariffs because each country and its organizations of transport modes have their own interests. The issues are not only organizational, technical and informational but also political, economic and regarding social and environmental sustainability. Such a broad spectrum of issues normally requires integration efforts of transport business organizations and its associations, representatives of transport science, ministries and governments of the corridor countries, European Union and sometimes world-level institutions.

### 5.2. Structure of the scope of the Green Transport Corridor Concept

The Concept of the Green Transport corridor is not defined precisely. Development of the concept has been carried out in the project EWTC II and known as Swedish Definition: “the aim with the Green Corridors Concept is to create freight corridors of excellence, where large and concentrated freight traffic flows between major hubs and by relatively long distances of transport can be handled in the most efficient, environmentally-friendly and business-driven manner. ... The Green Corridors are based on cooperative business and solutions where all modes of transport are available and used on the mutually complementary

basis, each of them performing at their paramount, according to the co-modality concept.” [10].

The definition includes:

- Sustainable logistics solutions;
- Integrated logistics concepts;
- Harmonized regulations; a concentration of national and international freight traffics;
- Efficient and strategically placed trans-shipment points;
- A platform for development.

### **5.3. Structure of factors affecting smooth movement of cargo through the corridor**

Smooth movement of cargo through the transport corridor depends on three groups of factors (figure 2):

- Well-equipped route (infrastructure, intermodal terminals, logistics centers, border-crossing points, other transport hubs).
- Companies involved in transport and logistics business, as well as scientific and public authorities (harmonization of interests and legal framework, political will and so on).
- Operations (existence of the cargo, rolling stocks, vehicles, technology equipment, information systems, rules and documentation, etc.).

Configuration of these factors influences the choice of governing methods in transport hubs, logistics centers, in a specific section or all transport corridors. The choice of governance methods is needed in order to clear the indicators of the state of all three groups of the factors in each case. It can accurately identify bottlenecks and provide measures for greening of transport corridor on the basis of existing indicators.

Some examples of EWTC, which show the diversity of problems and a complex configuration of factors, are here.

The EU transport policy for sustainable transport noted that development of transport must be carried out in the direction of full integration and interoperability between the different parts of the network and between networks of different mode. However, currently modal networks are largely separated or there is a lack of integration between countries within the modes.

The EWTC rail network is fairly specific, because the western part of the European track is 1435 mm gauge, while the eastern part of the 1520 mm gauge railway network and

there are no direct links of infrastructure between them. There are some specific difficulties because of this.

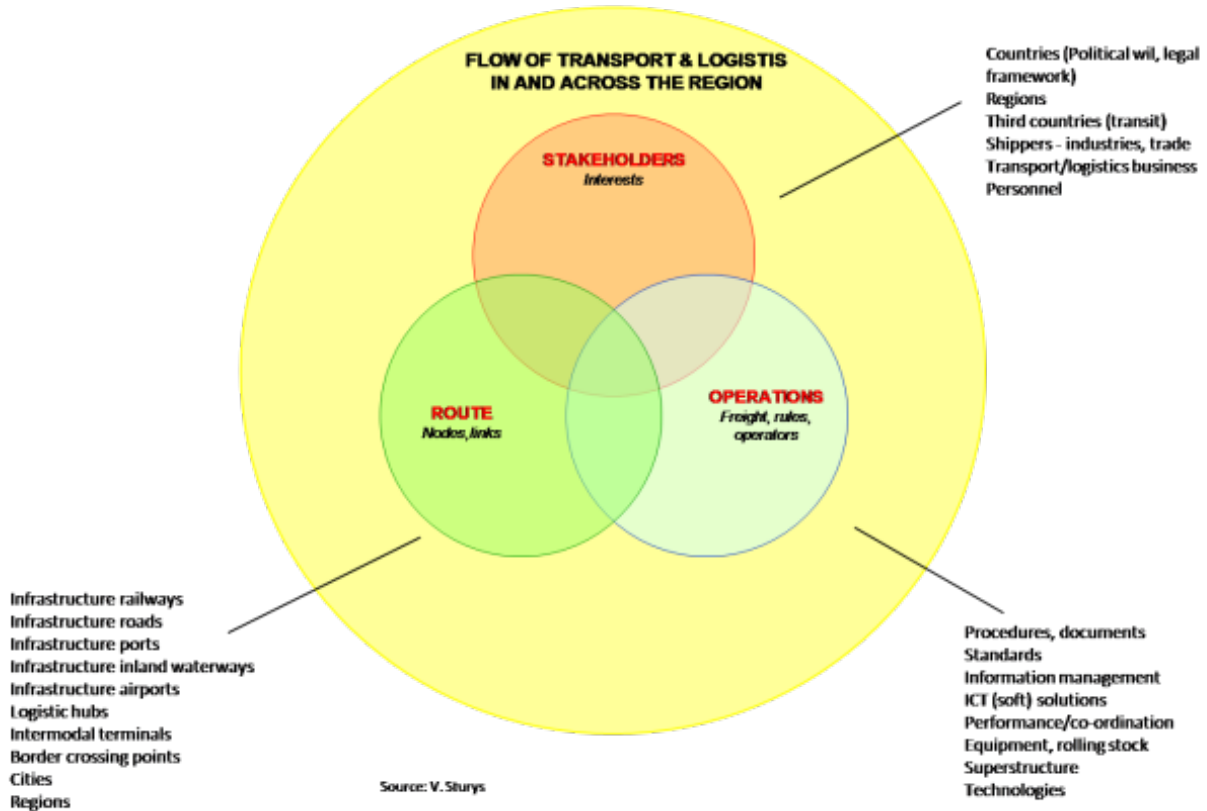


Figure 2. Factors affecting smooth movement of cargo through the corridor

The infrastructure of Lithuanian railways in the route from the border with Belarus to the Klaipeda port (main route of EWTC in Lithuania) is not electrified for cargo transportation. It is an important bottleneck for the green transport corridor.

The conditions of competition between different modes of transport business in European Union countries or between the same modes of transport in the countries are unequal [9]. The principles "user pays" or "right price" when external costs are considered, are not implemented in most EU countries so far. E.g., German rail freight transport companies are at a disadvantage compared to their Dutch competitors. A full fuel tax is charged in Germany, while Dutch railway operators are fully exempted from this tax. In Lithuania, fuel excise tax is used for road infrastructure development including the tax paid by Lithuanian railways.

A great variety of used of operational procedures, standards, information systems for the transportation of goods in the corridor EWTC complicates the corridor management processes.

Significant new opportunities for implementation of the Green Corridor concept exist also. The Lithuanian rail network is well-integrated with the rail network of the CIS countries. An integrated 1520 mm gauge rail system, a set of container terminals, existing common wagons stock, interoperability of procedures and exchange of data, strong collaboration relationships between the railway companies allow implementing the projects of shuttles in a large Euro-Asian space. Large amounts of cargo transportation together and formation of long cargo trains are in line with the EU transport policy guidelines outlined in the White Paper. These provisions are applied in 1520 mm gauge rail system.

Thus management must be oriented at implementation of the provisions of the Green Transport Corridor Concept on the basis of existing opportunities. A reliable KPIs system for management of the Green transport corridor is needed. KPIs system is to help identify existing barriers to smooth movement of goods and prepare an action plan to overcome them.

#### **5.4. KPI system structure of the railway transport concept**

While implementing the task Joint rail freight concept of EWTC (the task 4A), the domains that are important for smooth movement of freight by rail in the corridor and for selection KPIs were identified. (figure 3). (A more in-depth examination of KPIs is presented in a separate report).

The participants of the task 4A workshop in Malmö on 2011-05-24, business representatives ranked the key performance for the Joint railway concept indicators at first: 1<sup>st</sup> place was awarded to the cost of transport, service quality and transportation time. But it was recognized that a number of indicators from all domains is very important for greening of transport corridors.

Greening of the transport corridor and the selection of management methods were recognized as important KPIs for reflection of the stakeholders' interests.

DOMAIN	ELEMENTS	APPEARANCE
POLITICAL	Common vision, strategy Interests Legislation Investment policy Spirit of co-operation	Nodes, links PPP State aid International R&D projects Common projects
SOCIAL	Personnel „Green“ approach	Training
TECHNOLOGICAL	Rolling stock Operations Infrastructure Traffic management Information technologies Comodality Coordination with extended systems Standardization	Wagons Vehicles Availability Interoperability Reliability Charges Quality agreements Customer satisfaction Flexibility Loading and carriage Transported payload Costs Safety Security Monitoring Tracking/tracing After sale operations Availability Reliability Capability Track Gauge Electric Systems Border and Nodal Stations Access to terminals, junctions, yards Charges Number of trains (frequency) Path description/identification – parameters Placement Scheduling Rescheduling Punctuality Quality of train plan Corridor management scheme Manual/description/instructions Quality management system Information Schedule for extending systems (across the sea) Long-Term Planning Signal and Security Systems Telematic applications ERTMS TAF-TSI Customer information system Online monitoring Logistic centres Intermodal terminals Quality of ports node Warehouses Loading equipment Plan – across Baltic sea Black sea Loading and carriage interoperability
ADMINISTRATIVE	Documentation Customs Border crossings	
BUSINESS	Economy Corridor partners Marketing Scope of services, service design EWTC Association Corridor management scheme Co-ordination activities	Tariffs, pricing, charges Governments Transport network manager traffic, infrastructure Transport user: demand Transport service provider: supply Transport regulator: regulation

Figure 3. Domains for selection of KPIs.

### 5.5. Development of the governance system of the EWTC

The institutional environment determines the choice of governance mechanisms of green transport corridors. Its configuration parameters affect the choice of the governance mode and structure.

Rail market liberalization in the EU countries was carried out by separate, integrated and mixed models of the structure. The rail infrastructure is separated into a fully independent entity in case of a separate liberalization model. Activities accounting is separated but the company remains unresolved in case of an integrated liberalization model.

Liberalization of the railway market in Denmark and Sweden was carried out by separate structural model, while in Lithuania – according to an integrated model of the structure. A German railway company Deutsche Bahn became a holding structure which is



more consistent with the integrated model. The reform led to emergence of new rail carriers in all these countries, but major carriers have remained.

Assessment of the consequences of the liberalization reform did not give an unambiguous reply of its success. E.g., it is argued that the increase of the number of rail carriers has increased the freight volume. However, the volume of container freight has increased in all countries during recent years and it is a general trend. The volume of cargo transported by rail across the traffic has not increased and remained at the same level. E.g., the share of railways in freight transport market in Denmark was about 8-9%, in Germany - 21-22%, in Sweden – 36-37%, in Lithuania – 40-41% [11].

Negative effects have emerged in the management area after liberalization of the rail freight market according to a separate structural model. The increased number of new players with their own interests interfered with the coordination processes among terminal operators, railway carriers, the infrastructure manager and the railway traffic operator. Planning railway operations became even more complex. Liberalization does not bring an optimal allocation of resources, like train paths, terminals equipment [12]. It is necessary to use integrating governance methods to overcome these deficiencies. These issues were smaller when the liberalization model of integrated structure was used.

Rail transport is environmentally friendly. It is important to create favorable preconditions to increase the rail freight share. It must be assumed that the principles "user pays" or "right price" are more suitable for greening of transport corridors.

Even more problems arise with the choice of governance methods due to the fact that the corridor is covered by the EU and non EU countries. Railway companies in non EU countries of EWTC are vertical integrated monopolies with a strong political dependence. E.g., the company "Russian Railways" has established lower tariffs for freight carriage to Russian ports. In some cases, it is difficult to reach mutually beneficial agreements with the Russian Railway Company because of its political interests. But there are also new opportunities. Russian, Belarusian and Ukrainian railway companies in their strategic goals are willing to integrate the railway infrastructure into the European rail network. There is an opportunity to collaborate on establishment of Green EWTC and negotiate only with a single railway company or its subsidiary in non EU countries. E.g., the project of shuttle train "Viking" launched by Lithuanian, Belarusian and Ukrainian railway companies, Klaipeda and Odessa, Iljichevsk ports, Lithuanian, Belarusian and Ukrainian Customs Authorities demonstrate the possibility of good cooperation. There is no special governing structure. Possibilities of good control in Kena border station equipped according EU requirements, possibilities of IT systems on sharing data of cargo load to the Customs and Belarusian railway, simplification of Customs Procedures (checking documents of bill of lading with electronic data and recognizing it as customs declaration) shorten the border-crossing time to 30 minutes when homogeneous goods are transported. In spite of the fact that the "Viking" is a successful case of best practice, the transport ministries and the governments of the train route countries are involved in further development of the project.

The EWTC transport chain rail-sea-rail pollutes the environment less. Action Plans under the European Neighborhood Policy (ENP) as well as bilateral Partnership and Cooperation Agreements involve cooperation on transport policy, including adoption of substantial provisions of the EU transport legislation by the EU neighbor countries. The EU's transport relations with Eastern non-EU countries as well as with Belarus also include ambitious plans for extension of the TEN-T network.

The rail freight corridors are being implemented in the EU. It is planned for the entire freight corridor to establish a separate governance entity and to implement the European Rail Transport Management System (ERTMS). “Bravo” project is one of the examples in which the common corridor management system was implemented. “Brenner Rail Freight Action strategy aimed at achieving a sustainable increase of intermodal transport volume by enhancing quality, efficiency, and system technologies... The Brenner Corridor Management System has to be in line with the main goals of the European transport policy – relating to liberalization, interoperability, safety and the infrastructure development in sense of the European net-works – and has to provide for the promotion of cooperation between different actors” [13]. But for the EWTC there is no possibility to implement a governing structure based on the administrative management method. It is acceptable to choose governing methods based on coordination arrangements (table 1) due to huge geographical coverage of the EWTC and complexity factors affecting smooth movement of cargo through the railway of the corridor.

**Table 1. Coordination arrangements.**

<b>Coordination mechanism</b>	<b>Coordination arrangements</b>
Introduction of incentives	Differentiation tariffs, service level agreements among the participants of the logistics chain, etc.
Creation of an interfirm alliance	Agreements on cooperation for use resources, common use of wagons, launch dedicated shuttle trains, etc.
Change of the scope	Vertical or horizontal integration
Creating collective actions	Establishment of associations, intermodal transport platforms, implementation of pilot projects

Creating collective actions is the most common and most effective coordination mechanism in a complex institutional environment and when necessary to harmonize diversity of interests of the logistics chain stakeholders.

A number of business models that are prevalent in provision of rail freight services vary on shared responsibility and interaction between the actors. Distribution of responsibility in the rail freight business models is presented in Table 2. The listed models differ in the relationship with the customer and the goods provider’s function first of all. Agreements with the customer

are a sign in most cases of a third party logistics provider, but in case of the Agent and the Anchor model, the carrier contracts directly with the client. Responsibility for cargo operations depends on the amount of carriers and presence of a dominant carrier. The route and corridor models are important for the EWTC joint rail freight concept implementation.

**Table 2**

Distribution of responsibility in the rail freight business models							
Rail business model	3PL model	3PL-RU model	Agent model	Anchor customer model	Corporation model	Route model	Corridor model
Responsibility domain							
Agreement with customer	3PL	3PL	RU agent	RU	3PL, RU of corporation	3PL	3PL
Goods provider	3PL	3PL-RU	RU agent	RU	3PL, RU of corporation	3PL or Main freight forwarder	Main freight forwarders of corridor
Freight operations	RU	RU	RU	RU	RU of corporation	Main RU of route	Main RUs of corridor
Infrastructure management	IM	IM	IM	IM	IM of corporation	IM of route	IMs of corridor
Rail business regulation	The Competition or other Authority	The Competition or other Authority	The Competition or other Authority	The Competition or other Authority	The Competition or other Authority	The Competition or other Authority	The Competition or other Authorities
Safety and security responsibility and control	RU&IM, Rail Agency or other Authority	RU&IM, Rail Agency or other Authority	RU&IM, Rail Agency or other Authority	RU&IM, Rail Agency or other Authority	RU&IM of corporation, Rail Agency or other Authority	RU&IM, Rail Agency or other Authority	RUs&IMs of corridor, Rail Agencies or other Authorities
Rail business development	The Transport Administration or Integrated rail business company; Government	The Transport Administration or Integrated rail business company; Government	The Transport Administration or Integrated rail business company; Government	The Transport Administration or Integrated rail business company; Government	Railway corporation; Government	Platform for strategic decisions, alliance, etc. and railway companies	Platform for strategic decisions, alliance, association, etc. and railway companies
RU – railway undertaking (rail freight company or it's division)							
IM - rail infrastructure manager							
3PL – third party logistics provider (e.g. forwarder)							

The rail freight business models in EWTC corridor countries are presented in Table 3. DB Schenker Company dominates in the freight rail business in the western part of the corridor and the freight carriers of the integrated railway companies dominate in the eastern part of the corridor. For example, DB Schenker Rail Deutschland AG, the leading management of the Central/ Western Europe from Sweden to Italy, is the main goods transporter in Germany. DB corporation widely applies Cooperation Arrangements in its activities, has established joint companies with ports, has merged with other logistics

companies applying the principles of the PPP. Also some other rail carriers (Ladungsverkehr, Stückgutverkehr, etc.) are operating in Germany.

**Table 3**

Distribution of responsibility in the rail freight business models of EWTC states					
Rail business model	Denmark	Germany	Sweden	Lithuania	Belarus
Responsibility domain					
<b>Agreement with customer</b>	3PL, DB Schenker, etc.	3PL, DB Schenker, etc.	3PL, DB Schenker, etc.	3PL, LG expedition	3PL, Belarussian railway company division for international freight - Belintertrans
<b>Goods provider</b>	DB Schenker, etc.	3PL, DB Schenker, etc.	3PL, DB Schenker, etc.	3PL, LG expedition	3PL, Belarussian railway company division for international freight - Belintertrans
<b>Freight operations</b>	DB Schenker, other RUs	DB Schenker, other RUs	SJ, DB Schenker, Green Cargo, Tagkompaniet, Malmtrafik, etc.	Freight transportation directorate of JSC Lithuanian railways, other RUs	Belarussian railway company or its division Belintertrans
<b>Infrastructure management</b>	IM - National Authority Trafikstyrelsen	IM Deutsche Bahn (DB)	IM - National Authority Trafikverket	Infrastructure management directorate of JSC Lithuanian railways	Belarussian railway company
<b>Rail infrastructure access regulation</b>	IM - National Authority Trafikstyrelsen	Federal Networks Agency (FNA)	IM - National Authority Trafikverket	The Competition Authority	Belarussian railway company
<b>Safety and security responsibility and control</b>	RU&IM, Rail Agency	RU&IM, Rail Agency	RU&IM, Rail Agency	RU&IM Rail Inspectorate Authority	Belarussian railway company, Rail Inspectorate Authority
<b>Rail business development</b>	State Transport Administration Trafikstyrelsen; Government	DB corporation; Government	State Transport Administration Trafikverket; Government	JSC Lithuanian railways; Government	Belarussian railway company; Government
<small>RU – railway undertaking (rail freight company or it's division)  IM - rail infrastructure manager  3PL – third party logistics provider (e.g. forwarder)</small>					

In Denmark, goods transport is mainly performed by DB Schenker Rail, although other operators take care of a significant portion of the non-transit traffic. In Sweden, goods transport is performed by DB Schenker Rail, SJ AB, Green Cargo, Tagkompaniet, Malmtrafik, etc. In Lithuania, goods transport is performed by Freight transportation directorate of JSC Lithuanian railways, although there are more certified carriers. In Belarus, all activity is centralized in the Belarussian Railway company.

Assessment of the methodological presumptions, of the complexity of the corridor and of the experience of implementation of shuttle trains projects shows that the most appropriate form of governance of EWTC would be an associated structure. An association of stakeholders is suitable for coordination activity in the EWTC because of bringing business, science institutions and authorities to remove obstacles and bottlenecks, innovating and improving the quality of services.

The EWTC Association was established on 29th of June 2010 in Vilnius. EWTC II project partners are responsible for revision of the corridor strategy. Implementation of the strategy will be the responsibility of the Association. Implementation of the strategy and action plans will require close collaboration and different types of cooperation between the association members and stakeholders of the EWTC. It includes activities in the following areas:

- (i) Global conventions (EU and non EU countries);
- (ii) Intergovernmental agreements/ organizations addressing regional cooperation;
- (iii) Intergovernmental agreements/ organizations addressing sub-regional cooperation;
- (iv) Programs addressing regional or sub-regional cooperation;
- (v) Frameworks for agreements;
- (vi) Guidelines for legislation;
- (vii) Business-to-business agreements.

Problematic issues between transport companies or actors of logistics process can be dealt with through other mechanisms of coordination: change of the scope, creation of an interfirm alliance and introduction of incentives. The choice of specific coordination arrangements depends on the trade off of the institutional environment parameters with the interests of stakeholders of the logistics process. It is absolutely possible that coordination mechanisms can be used in different parts of the EWTC as it is done in the railway hinterland chain to Rotterdam port [12] or like the governance system of Brenner Rail Freight Corridor [6]. But these mechanisms are not suitable for coordination activity in the whole space of the EU and non-EU countries covered by EWTC.

## 6. Conclusions

The institutional environment determines the choice of governance mechanisms of green transport corridors. Its configuration parameters affect the choice of governance mode and structure.

Rail market liberalization in the EU countries was carried out by separate, integrated and mixed models of the structure. The rail infrastructure is separated into a fully independent entity in case of a separate liberalization model. Activities accounting is separated but the company remains unresolved in case of an integrated liberalization model.

Liberalization of the railway market in Denmark and Sweden was carried out by a separate structural model, while in Lithuania – according to an integrated model of the structure. A German railway company Deutsche Bahn became a holding structure which is more consistent with the integrated model. The reform led to emergence of new rail carriers in all these countries, but major carriers have remained.

Negative effects have emerged in the management area after liberalization of the rail freight market according to a separate structural model. The increased number of new players with their own interests interfered with the coordination processes among terminal operators, railway carriers, the infrastructure manager and the railway traffic operator. Planning railway operations became even more complex. Liberalization does not bring an optimal allocation of resources, like train paths, terminals equipment. It is necessary to use integrating governance methods to overcome these deficiencies. These issues were smaller when the liberalization model of integrated structure was used.

Rail transport is environmentally friendly. It is important to create favorable preconditions to increase the rail freight share. It must be assumed that the principles "user pays" or "right price" are more suitable for greening of transport corridors.

Even more problems arise with the choice of governance methods due to the fact that the corridor is covered by the EU and non EU countries. Railway companies in non EU countries of EWTC are vertical integrated monopolies with a strong political dependence. In some cases, it is difficult to reach mutually beneficial agreements with the Russian Railway Company because its political interests. But there are also new opportunities. Russian, Belarusian and Ukrainian railway companies in their strategic goals are willing to integrate railway infrastructure into the European rail network. There is an opportunity to collaborate on establishment of Green EWTC and negotiate only with a single railway company or its subsidiary in non EU countries. E.g., the project of shuttle train "Viking" launched by Lithuanian, Belarusian and Ukrainian railway companies, Klaipeda and Odessa, Iljichevsk ports, Lithuanian, Belarusian and Ukrainian Customs Authorities demonstrate the possibility



of good cooperation. There is no special governing structure. Possibilities of good control in Kena border station equipped according to the EU requirements, possibilities of IT systems to share data about cargo load with the Customs and Belarusian railway, simplification of Customs Procedures (checking documents of bill of lading with electronic data and recognizing it as customs declaration) shorten the border-crossing time to 30 minutes when homogeneous goods are transported. In spite of the fact that the "Viking" is a successful case of best practice, the transport ministries and the governments of the train route countries are involved in further development of the project.

EWTC transport chain rail-sea-rail pollutes the environment less. Action Plans under the European Neighborhood Policy (ENP) as well as bilateral Partnership and Cooperation Agreements involve cooperation on transport policy, including adoption of substantial provisions of the EU transport legislation by the EU neighbor countries. The EU's transport relations with Eastern non-EU countries as well as Belarus also include ambitious plans for extension of the TEN-T network.

The rail freight corridors are being implemented in the EU. It is planned to establish a separate governance entity for the entire freight corridor and to implement the European Rail Transport Management System (ERTMS). "Bravo" project is one of the examples in which the common corridor management system was implemented. "Brenner Rail Freight Action strategy aimed at achieving a sustainable increase of intermodal transport volume by enhancing quality, efficiency, and system technologies...– and has to provide for the promotion of cooperation between different actors" [13]. But there is no possibility for the EWTC to implement a governing structure based on the administrative management method. It is acceptable to choose governing methods based on coordination arrangements due to a huge geographical coverage of the EWTC and complexity factors affecting smooth movement of cargo through the railway of the corridor.

The complexity of the institutional environment of the EWTC, diversity of interests of the logistics process stakeholders requires usage based on coordination governing methods. Four groups of co-ordination mechanisms have been named:

1. Introduction of incentives;
2. Creation of an interfirm alliance;
3. Change of the scope;
4. Creating collective actions

Creating collective actions is the most common and most effective coordination mechanism in a complex institutional environment and when necessary to harmonize diversity of interests of logistics chain stakeholders.

A number of business models that are prevalent in provision of rail freight services vary in shared responsibility and interaction between actors. Distribution of responsibility in the rail freight business models (3PL, 3PL-RU, Agent, Anchor Customer, Corporation, Route, Corridor) is presented. The listed models differ in the relationship with the customer and the



goods provider's function first of all. Agreements with the customer are a sign in most cases of a third party logistics provider, but in case of the Agent and the Anchor model, the carrier contracts directly with the client. Responsibility for cargo operations depends on the amount of carriers and presence of a dominant carrier. The route and corridor models are important for implementation of the EWTC Joint Rail Freight Concept.

The rail freight business models and responsibilities in rail freight domains are presented in EWTC corridor countries: Denmark, Germany, Sweden, Lithuania and Belarus. Goods transport is mainly performed by DB Schenker Rail in Denmark, although other operators take care of a significant portion of the non-transit traffic. Goods transport is performed by DB Schenker Rail, SJ AB, Green Cargo, Tagkompaniet, Malmtrafik, etc. in Sweden. Goods transport is performed by Freight transportation directorate of JSC Lithuanian railways in Lithuania, although there are more certified carriers. All rail freight activity is centralized by the Belorussian Railway company in Belarus.

DB Schenker Rail Deutschland AG, the leading management of the Central/ Western Europe from Sweden to Italy, is the main goods transporter in Germany. DB corporation widely applies Cooperation Arrangements in its activities, has established joint companies with ports, has merged with other logistics companies applying the principles of the PPP. Some other rail carriers (Ladungsverkehr, Stückgutverkehr, etc.) are also operating in Germany.

Assessment of the methodological presumptions and of the experience of implementation of shuttle trains projects shows that the most appropriate form of governance of the EWTC would be an associated structure. An association of stakeholders is suitable for coordination of activity in the global and complex EWTC. The EWTC Association was established on 29<sup>th</sup> of June 2010 in Vilnius.

EWTC II project partners are responsible for revision of the corridor strategy. Implementation of the strategy will be the responsibility of the Association. Implementation of the strategy and action plans will require close collaboration and different types of cooperation between association members and stakeholders of the EWTC. It includes activities in the following areas:

- (i) Global conventions (EU and non EU countries);
- (ii) Intergovernmental agreements/ organizations addressing regional cooperation;
- (iii) Intergovernmental agreements/ organizations addressing sub-regional cooperation;
- (iv) Programs addressing regional or sub-regional cooperation;
- (v) Frameworks for agreements;
- (vi) Guidelines for legislation;
- (vii) Business-to-business agreements.

Coordination mechanisms of all modes of the rail freight corridor management system can be put in place in separate parts of the EWTC in the EU countries based on administrative governing methods.

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