

## The TEN-T core network and the Fehmarnbelt region

Guasco, Clement Nicolas

*Publication date:*  
2014

*Document Version*  
Publisher's PDF, also known as Version of record

*Citation for published version (APA):*  
Guasco, C. N. (2014). *The TEN-T core network and the Fehmarnbelt region*. Roskilde Universitet.

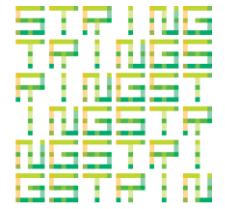
### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

### Take down policy

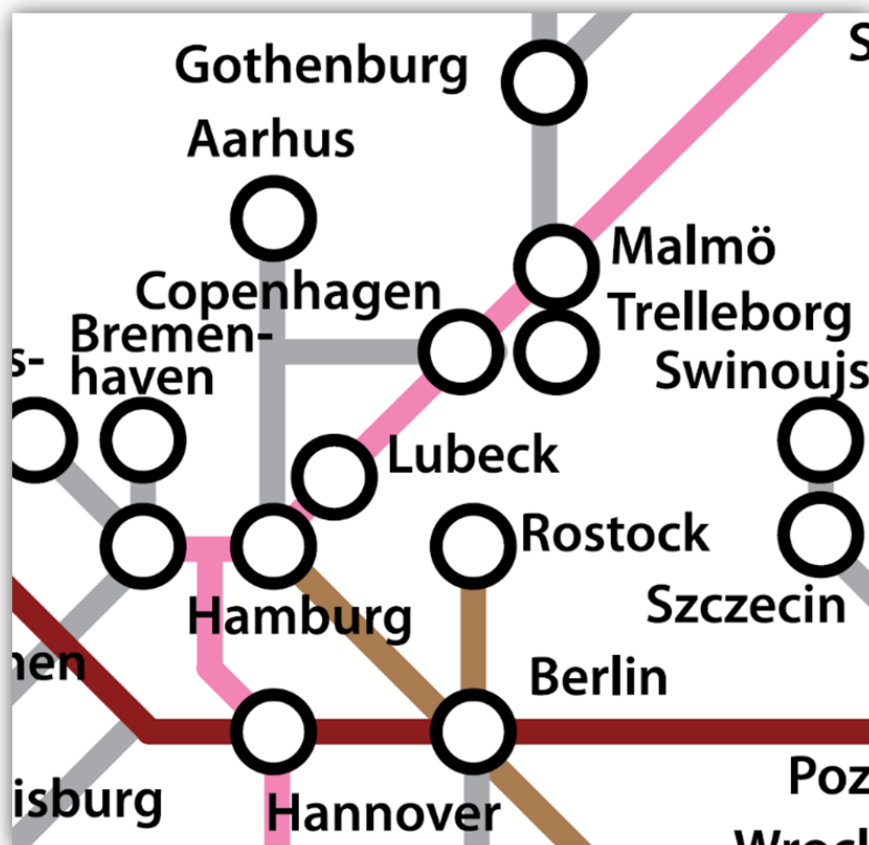
If you believe that this document breaches copyright please contact [rucforsk@ruc.dk](mailto:rucforsk@ruc.dk) providing details, and we will remove access to the work immediately and investigate your claim.



GREEN **STRING** CORRIDOR

# The TEN-T core network and the Fehmarnbelt region

Clement Guasco



**© The TEN-T core network and the Fehmarnbelt region**

Author: Clément Guasco

Print: Region Sjælland

1<sup>st</sup> edition 2014, Roskilde University, Institute for Environmental and Spatial Change

# Contents

- SUMMARY ..... 4**
- 1. THE TEN-T STRATEGY ..... 6**
- 2. SOURCES ..... 9**
- 3. EU LEGISLATION RELATED TO THE GREEN STRING CORRIDOR..... 9**
  - 3.1. REGULATION NO 1315/2013: NEW TEN-T STRATEGY ..... 10
  - 3.2. REGULATION (EU) NO 913/2010: RAIL FREIGHT CORRIDORS ..... 12
  - 3.3. COMMISSION DECISION (EU) NO (2012/88/EU): ERTMS DEPLOYMENT ..... 13
  - 3.4. REGULATION (EU) NO 1316/2013 AND 2013/801/EU: COORDINATION OF FINANCIAL INSTRUMENTS..... 14
- 4. CONCRETE CHALLENGES FOR A TRANSPORT CORRIDOR IN THE FEHMARNBELT REGION ..... 15**
  - 4.1. FREIGHT TRAIN IN THE CORRIDOR TODAY..... 15
  - 4.2. REGIONAL ACCESSIBILITY AND CONNECTION TO THE ECONOMIC FABRIC ..... 15
  - 4.3. GREEN TECHNOLOGIES ..... 16
  - 4.4. COORDINATION ACROSS NATIONAL SYSTEMS OF ADMINISTRATION ..... 16
- 5. NATIONAL INITIATIVES..... 17**
  - 5.1. RAIL FREIGHT CORRIDOR 3 AND ERMTS CORRIDOR..... 17
  - 5.2. THE GREEN CORRIDORS MODEL IN THE REGION..... 19
  - 5.3. THE FEHMARNBELT LINK ..... 20
- 6. CONCLUSION: PERSPECTIVE FOR THE REGIONS..... 21**
- REFERENCES ..... 23**

## SUMMARY

*This note is a snapshot picture, taken in early 2014, that places the Green STRING corridor project within the context of the TEN-T strategy and gives a summarized overview on the impact of this strategy in the region. Chapter 1 contains a summary of the TEN-T strategy today, chapter 2 presents the sources used for this note, chapter 3 presents all the relevant EU regulations with direct impact on the development of TEN-T corridors, chapter 4 gives practical examples of the challenges for the development of TEN-T corridors, chapter 5 presents the national initiatives related to the TEN-T corridor in Fehmarnbelt region and chapter 6 concludes on the opportunities for the regions related to this new policy.*

*The TEN-T strategy has now reached a new stage (end 2013), with the implementation of transnational transport corridors and the establishment of a core transport network for the EU listing transport hubs, production centres and urban nodes that must be connected together. This new strategy is already having an impact on European territories with the development of cross-border transport infrastructure, cross-border cooperation and national investments in specific corridors. The latest regulations set up models for the development of those corridors regarding the rail sector, but also draw the picture of a comprehensive transport network including alternative fuels, sustainable mobility, low CO2 emissions, inclusion of peripheral regions, and a centralized funding umbrella under the Connecting Europe Facility, to homogenize the process. There are numerous challenges to this policy because of the national segmentation of transportation planning in the EU. Those challenges are due to differences in standards, to the segmentation of planning between many national authorities, to the segmentation of national markets and to transnational coordination.*

*National authorities and rail operators have already started to tackle those challenges, but their activity is limited to the rail sector and does not address local conditions. Regions have a strong interest in participating to the process if they do not want to be left aside to the benefit of strong international metropolitan centres that will surely benefit from such upgrades in the EU transport system. Regions do not have the authority nor the capacity to tackle infrastructure, regulatory and fiscal matters. If the aim is to develop transport corridors that do reduce transport emissions while promoting cohesion of the European territories, then regions should play a role regarding the local integration of those corridors to their territories and economic fabric. They can play an active role in promoting local initiatives and involving local stakeholders in this endeavour, so that they can also benefit from the coming infrastructure upgrade.*

*There are too many stakeholders in each corridors to coordinate use single corridor-wide cooperation platforms and smaller macro-regional clusters should be considered. EU legislation opens up for local actors and stakeholders to get funding for participating in reaching*

*the general goals of the TEN-T policy. This can help peripheral regions with lower access to economic and cultural capital to develop their own initiatives. In the case of the Fehmarnbelt region, the coming tunnel between Germany and Denmark is a great potential for the regions if they manage to realize it and macro-regional initiatives like the STRING network offer a good base for such a strategy.*

# 1. THE TEN-T STRATEGY

An efficient transnational transport network is vital for the development of the Single Market and the cohesion of the European Union. Without an integrated transport system, it would not make sense to talk about a single market with freedom of movement for people, goods and services. This goal, which appears in paragraphs 170 and 171 of the Consolidated Treaty on the functioning of the European Union

(2012), is fundamental and has led to the development of a comprehensive transport policy to connect the 28 national transport systems in the EU: the TEN-T strategy.

This policy was first shaped in the Maastricht treaty in 1992. The original aim was to establish guidelines on priority actions that would lead to a better integration of each national transport system across borders. This treaty also established a financial framework to support selected infrastructure.

In the following decade, this approach developed into a series of 30 priority projects (cf. figure 1). Those 30 priority projects formed the backbone of the TEN-T strategy. This approach focused greatly on closing the infrastructural gaps along borders of the member-states, based on the assumption that member-states needed specific help regarding key cross-border infrastructure projects with high European added value, but that lied outside of the traditional scope of national transport policies.

## ***From priority projects to integrated network***

In the last 4 years, the European Commission decided to intensify this development by introducing compulsory elements in the TEN-T strategy, (EU regulations and decisions<sup>1</sup>), and by increasing the financial support. This new approach marks a new era for the TEN-T policy, where the EU takes on a more important role in the coordination and implementation of a single coherent transport system in the EU. The last revision of the TEN-T strategy, in 2013,



Fig. 1. 30 Priority project of the TEN-T strategy

---

<sup>1</sup> Cf. §3 of this note for an overview of the legislation

saw a switch from priority projects to a core network approach composed of selected transport corridors linking major infrastructural nodes and cities together. Those corridors do not only close the missing connections between national transport systems, but also construct a single coherent transportation network beyond national frames of reference (cf. figure 2).

It clearly shows the evolution of the TEN-T strategy from a single priority projects approach to an integrated policy aiming at a coherent trans-European transport network. Figure 2 illustrates this new approach based on a transport network linking selected nodes as a metro system connects selected stations. For that purpose, the European Commission has drafted a comprehensive list of nodes that includes urban centres, airports, maritime ports, inland ports and rail/road terminals. Those nodes are classified in two categories; one forming the core network represented in figure 2 and the other one the comprehensive network. While the main efforts will focus on the core network in a first time, it is the goal that the final TEN-T network becomes a coherent system including peripheral elements.

It is also characterized by a new approach based on *transport corridors* linking important urban centres to harbours. Those corridors supports a coherent development of transport infrastructure and operation along main transport routes in the EU. This should allow for the effectivization of transport on selected axis and reduce financial and environmental costs for transporting people and goods from one end to the other. The TEN-T strategy uses corridors as a central tool to guide the planning, development and operation of transport infrastructure in the EU.

There are ten key corridors supporting the development of the core network. They should insure an adequate connection between major centres of production, major centre of consumption and major transport hubs in the EU. Those corridors combine rail, road and, when available, waterways. They have a strategic importance since they guide the implementation and financing process of the TEN-T for the coming 6 years. As shown in figure 3, a geographical representation of all ten selected corridors following the informal trilogue of the June 27<sup>th</sup> 2013, several trace are possible along each corridor, as for example in Spain, across the Alps or between Scandinavia and Germany. Which precise portion of rail, road and waterway should



Fig.2: Metro schematization of the new TEN-T strategy, Brochure on the Connecting Europe Facility, (European Commission 2013)



be selected to fulfil the corridor is thus left to the appreciation of the implementation authorities in each country, as long as the selected nodes of the network are connected<sup>2</sup>.

**Scandinavian-Mediterranean corridor**

The corridor that concerns Fehmarnbelt region is the former Helsinki-Valetta corridor, now referred to as the Scandinavian-Mediterranean corridor. It appears in pink on figures 2 and 3. This corridor is one of the longest and crosses seven member-states, which makes it a challenging corridor to coordinate in a coherent manner. The STRING corridor itself focuses on the northern portion from southern Scandinavia to Germany. This situation requires multi-lateral cooperation processes, which are even more challenging than traditional cross-border projects characteristic of the former priority project period. The region is also home to a major infrastructure project of the corridor: the coming Fehmarnbelt tunnel.

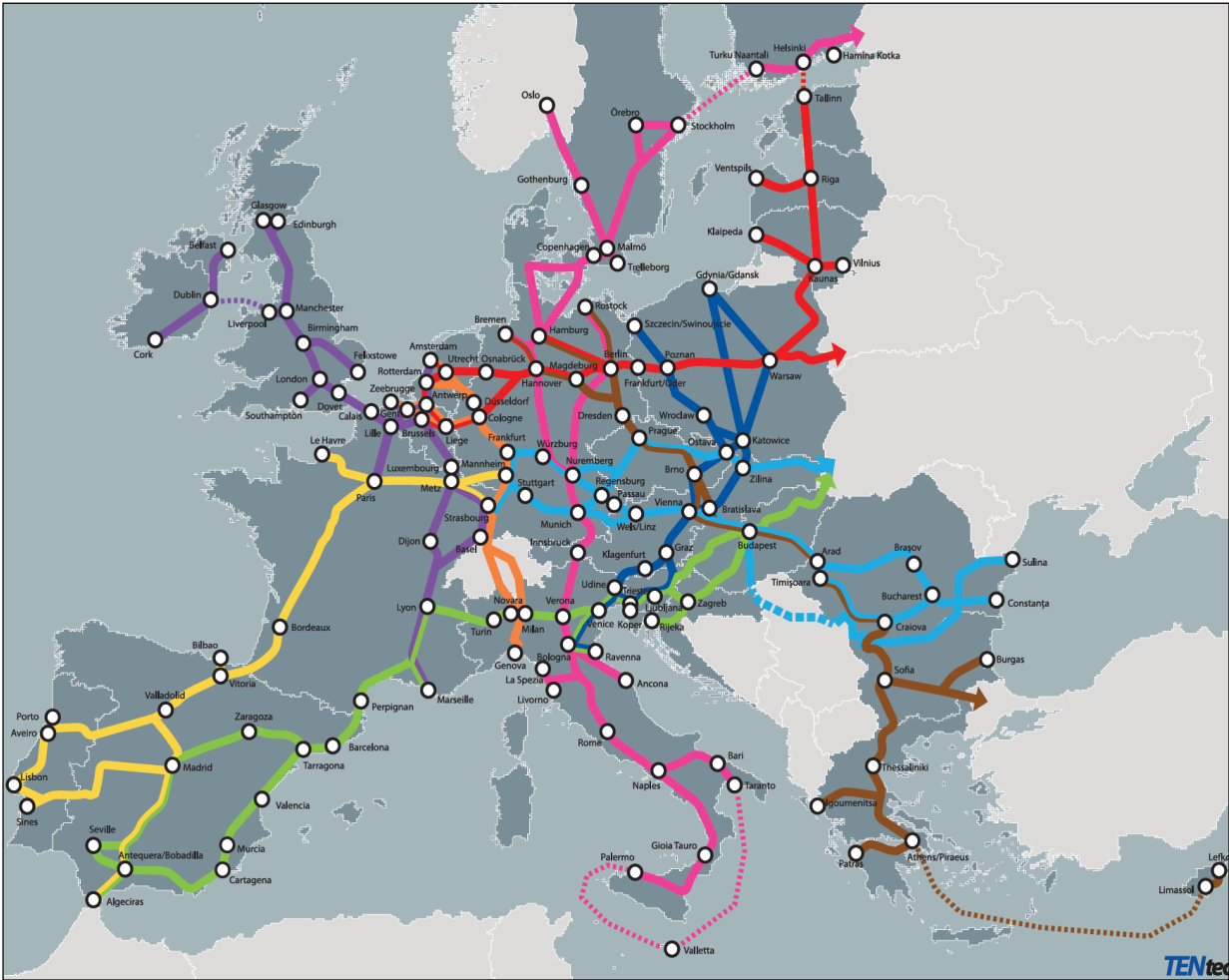


Fig. 3. Schematic map of the Core Network Corridors as required by Article 44(2) of the TEN-T Regulation.

<sup>2</sup> A full list of all selected nodes and infrastructure is available in Regulation (EU) No 1315/2013

Aside from the infrastructural coherence of the transport system, long-distance transport in the EU also has a significant impact on the environment and on the EU's consumption of fossil fuels. It is expected that a better integration of the system will allow for more efficient transport forms and ultimately a reduction of CO<sub>2</sub> intensity of the EU transport system. Without being an original goal for the TEN-T strategy, the reduction of the environmental impact of transport is integrated to this strategy. The recent white paper on *the Way to a Single Transport Area* (European Commission, 2011) states a goal of 60% reduction of CO<sub>2</sub> emissions by 2050 and a massive switch from road to rail and water transport. According to this paper, 30% of freight transport in the EU should be done by train in 2030 and 50% in 2050. The roadmap also mentions the need for the EU to grow out of oil in order to insure a security of energy supply. However, it points out the challenges posed by the lack of coordination across the member-states, which might result in diverging strategies from neighbouring member-states, and advocates strongly for developing a strategy that will remedy to this problem.

## 2. SOURCES

This Note is based on a review of relevant EU legislation from EurLex, as well as publication and communications from the European Commission. An emphasis has been put on binding legislation that overrules national legislation to give a picture of the extent of coordination of the policy at the supranational level. Information in chapter 4 related to challenges for the implementation of the TEN-T strategy has been collected through interviews of experts with experience of those challenges and through prior reports of the Green STRING corridor project. Information in chapter 5 on national activities related to TEN-T has been collected through interviews with civil servants and experts working with the implementation of a transport corridor in the Fehmarnbelt region. The selected actors are public/semi-public authorities in charge of infrastructure planning, construction and operation in the corridor, plus some relevant public authorities for the Fehmarnbelt region. Additional information comes from publication and websites from the same institutions collected in January/February 2014.

## 3. EU LEGISLATION RELATED TO THE GREEN STRING CORRIDOR

The development of the TEN-T strategies is directed by a series of EU legislations. This chapter gives a summary of the binding legislations, like regulations and decisions, which directly affect the development of the Scandinavian-Mediterranean corridor. They override national legislations in all Member-States and understanding them can shed light on the ongoing plans.

### 3.1. REGULATION NO 1315/2013: NEW TEN-T STRATEGY

This regulation, entitled *Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU*, passed the 11th December 2013 and published in the Official Journal of the European Union on the 20<sup>th</sup> of December 2013, is the latest version of the TEN-T strategy and the foundation for the development of an integrated TEN-T network and the use of the corridor tool. It states that the goal of the TEN-T network is to strengthen the social, economic and territorial cohesion of the EU by supporting a single European transport area that is efficient, sustainable and supports inclusive growth. The emphasis is thus put on the TEN-T strategy as more than an infrastructure policy.

#### Regulation (EU) No 1315/2013:

- Entry into force: 21 December 2013
- Work plan delivery by December 2014
- 1 priority *core network* with 9 *core corridors*
- 9 EU corridor coordinators + corridor forums and working groups
- 1 integrated comprehensive network
- Focus: corridor integration, Interoperability, co-modality and cross-border sections.

It gives a precise description of the TEN-T core network to be established by 2030, including all the transport nodes and infrastructures that must be connected by rail, road, waterways and air. It also describes the comprehensive network that will complement the core network by adding a long series of secondary transport nodes as well as focus on socially and environmentally sustainable projects.

This regulation summarizes general priorities of the TEN-T: the enhancement of *accessibility* for all regions, *inter-modality* and *interoperability*, the focus on *bottlenecks* and *missing links* in cross-border sections, an *efficient* and *sustainable* use of the infrastructure, the deployment of *IT solutions*, a focus on the promotion of *energy efficiency* and *zero carbon energy*, mitigating the exposure of urban areas to *negative effects of transiting transport* and removal of *administrative barriers* between countries. In addition to the aforementioned priorities, the core network includes extra focus on *electrification of railroad*, minimum requirements for *freight lines*, full *ERTMS* and the availability of *clean fuel* for road, air and waterways transport on the entire network. The regulation sets a long and precise series of priorities for the development of each transport mode. Finally, it stresses the importance of the European Added value<sup>3</sup> in the appraisal of projects, which focuses on *cross-border sections*, *missing links*, *multimodal connecting points* and *major bottlenecks serving the objective*, set

---

<sup>3</sup> For more information on European added value, see article 4 of Regulation No 1315/2013.

out in the White Paper, of reducing greenhouse gas emissions from transport by 60 % below 1990 levels by 2050.

### **Corridors as a tool**

This regulation introduces corridors as a central tool for implementing the TEN-T strategy (cf. figure 3). It selects nine corridors, which embrace all transport modes in a holistic approach, and emphasize the need to develop interoperability in the corridors. Each corridor is assigned a European coordinator in charge of supervising the implementation process on behalf of the European commission.

A work plan must be developed by the coordinators for each of the 9 corridors and submitted to the Member States by the 22<sup>nd</sup> of December 2014. The corridor coordinator is assisted in this task by a secretariat and a consultative corridor forum consisting of appointees from concerned Member States.

Additionally, the implementation of the TEN-T network must be done in synergy with the implementation of rail freight corridors provided for by Regulation (EU) No 913/2010.

Timeline for the implementation of Regulation No 1315/2013:

First quarter 2014	Nomination of the European Coordinators
Apr. - Jun. - Oct. - Nov. 2014	Meetings of the Corridor Forum to Elaborate on the work plan
April 2014	Creation and meetings of the working groups
December 2014	Approval of the work plan by Member States
22 Dec. 2014	Corridor coordinators deliver the work plan to Member States
Jan. 2015	Possible implementing act by the Commission
As of 2015	Regular meetings of the Corridor Forum and working groups

### **Stakeholders**

Regional and local authorities, managers and users of infrastructure, industry and civil society are listed as stakeholder and are invited to use funds such as the CEF, the Cohesion Fund, European Territorial Cooperation, Research & Innovation and Environment & Climate Action, to support any of the TEN-T targets and especially: regional mobility, integration of regions and urban nodes to the network, sustainable transport solutions and sustainable mobility, promotion of cross-border projects and enhancement of cooperation between stakeholders.

### 3.2. REGULATION (EU) NO 913/2010: RAIL FREIGHT CORRIDORS

This regulation passed by the European Parliament and of the Council the 22<sup>nd</sup> of September 2010 lays down rules for the establishment of international rail freight corridors with the aim of developing the European rail network for competitive freight. It clearly define rules regarding the organization and management of those freight corridors. This regulation also uses the corridor approach as a central tool to coordinate actions across multiple national systems of government. It defines 9 corridors, which matches the corridors from the TEN-T core network. The relevant rail freight corridor for Fehmarnbelt Region is *corridor 3: North – South corridor* from Stockholm to Palermo. This regulation states that *Coordination should be ensured between Member States and infrastructure managers in order to guarantee the most efficient functioning of freight corridors. To allow this, operational measures should be taken in parallel with investments in infrastructure and in technical equipment such as ERTMS that should aim at increasing rail freight capacity and efficiency.*

The rail corridors can be modified by a joint proposal of all concerned Member States to the constitution after consultation of the infrastructure managers and applicants. In case of disagreement between Member States, a Commission committee will provide a conciliatory opinion to help reach mutual consent.

The governance of the freight corridors is insured by two coordination bodies: an executive board composed of representatives of the national authorities and taking its decision by mutual consent, and a management board composed of representatives from infrastructure managers and allocation bodies, that may take the form of an EEIG<sup>4</sup>. The management board is in charge of coordinating the implementation of IT applications and must set up an advisory group composed of managers and owners of terminals and an advisory group composed of railway undertakings interested in rail freight. It must also draw up an implementation plan and an investment plan, and establish a one-stop shop joint body for application for infrastructure capacity in the entire corridor.

#### Regulation (EU) No 913/2010 – Key aspects:

- 9 International freight corridors matching with the 9 TEN-T corridors
- Over 3 Member States or over 500km and two Member States
- Consistent with ERTMS and TEN-T corridors
- Co-modal integration with other transport modes in the TEN-T
- Executive board (National authorities)
- Management board (Infrastructure managers)

---

<sup>4</sup> European economic interest group as defined by Council Regulation (EEC) No 2137/85.

### 3.3. COMMISSION DECISION (EU) No (2012/88/EU): ERTMS DEPLOYMENT

The implementation of the ERTMS signalisation standard throughout the EU railway system is regulated by numerous Commission decisions that describe in details the standards and procedures to apply. It also makes use of the corridor tool in order to coordinate the implementation on long sections of railway. The ERTMS implementation plan establishes 6 main corridors, which follow the same routes than TEN-T and rail freight corridors. Those corridors are named with letters from A to F. According to DG move, the main target of this series of legislations is to reduce the costs and increase the security of international train operation. It gives the example of the high-speed Thalys train between Paris and Brussels where *it has been necessary to install seven signalling systems, thereby generating additional costs and accentuating the risks of breakdowns*<sup>5</sup>.

Annex 3 §7.3.4 of the Commission Decision (EU) No (2012/88/EU), review the precise trace of each of the 6 ERTMS corridors introduced by the Commission decision of 22 of July 2009 (this decision also introduced the requirement for Member States to develop national implementation plans<sup>6</sup>). The relevant ERTMS corridor for FehmarnBelt region is corridor B. This decision also states that *without prejudice of the legislation applicable to the trans-European high-speed network, links can be provided through stretches of high-speed lines, provided paths are allocated to freight trains. At least one ERTMS-equipped link will be provided by 2020 between Denmark and Germany (Flensburg-Hamburg or Rødby-Puttgarden) but not necessarily two*.

EU legislation on the matter is also strengthened by a memorandum of understanding between the European Commission, the European Railway Agency and the European Rail sector Associations (CER - UIC - UNIFE - EIM - GSM-R Industry Group - ERFA). This memorandum, signed the 16<sup>th</sup> of April 2012, concerns the strengthening of cooperation for the management of ERTMS and stipulates that the main standard for interoperability should be the baseline SRS 2.3.0 or 2.3.0d and that all partner should strive to speed-up the implementation of the ERTMS.

#### ERTMS deployment

- 6 implementation corridors
- Relevant corridor for Fehmarnbelt region is *corridor B* from Stockholm to Napoli.
- ERTMS standard is Baseline 2 – 2.3.0d
- A memorandum of understanding strengthen the cooperation of the rail sector with the Commission

<sup>5</sup> ERTMS in 10 Questions, DG Move, 2013

<sup>6</sup> All national implementation plans are available on the website of DGmove at [http://ec.europa.eu/transport/modes/rail/interoperability/ertms/edp\\_map\\_en.htm](http://ec.europa.eu/transport/modes/rail/interoperability/ertms/edp_map_en.htm)

### 3.4. REGULATION (EU) NO 1316/2013 AND 2013/801/EU: COORDINATION OF FINANCIAL INSTRUMENTS

The regulation (EU) No 1316/2013 provides for the establishment of the Connecting Europe Facility, in charge of EU financial support for the implementation of the TEN-T strategy in the period 2014-2020. The CEF determines the conditions, methods and procedures for EU financial support for the development of the trans-European networks in transport, energy and telecommunication sectors and to promote a synergy between them. In the transport sector, the CEF shall support projects of common interest as defined in the regulation No 1315/2013 above. It shall focus on missing links in the transport sector, clearly provide a European added-value and significant societal benefits which do not receive adequate financing from the market, and also support public/private partnership. Specific goals for supported projects in the transport sector are railway and waterways, cross-border connections, bottlenecks and capacity, supply points for alternative fuels on the TEN-T core network, multi-modal platforms connected to rail and reduction of casualties on the road network.

The budget of the CEF for 2014-2020 dedicated to transport projects is of €26 billion of which €11 billion are transferred from the Cohesion funds to be spent in eligible Member States (Baltic countries, East European countries + Greece and Portugal). For non-eligible countries, 'studies' can be supported up to 50% and 'works' can be supported up to 20% with exception of 30% for bottlenecks on railways, 40% for inland waterways bottlenecks and 40% for cross-border rail and waterways sections. Funding related to former motorways of the seas and Marco Polo projects are now under the CEF.

The regulation (EU) No 2013/801/EU: Commission Implementing Decision of 23 December 2013 establishing the Innovation and Networks Executive Agency (*INEA*) and repealing Decision 2007/60/EC provides for the establishment of a new agency to replace the former TEN-T executive agency. The INEA will gather both the CEF and € 7 billion from the Horizon 2020 that fall under the 'societal challenges' section (i.e. smart green and integrated transport and secure, clean and efficient energy), in order to ease the coordination of both programs. It will also insure the legacy of former TEN-T and Marco Polo 2007-2013 programs. The agency is active per 1<sup>st</sup> January 2014.

#### Financial instruments

- Transport dedicated funds:  
CEF €26 billion and H2020 € 7 billion
- EU share is up to 50% for studies and 20% for works
- Priority to:  
Missing links and cross-border sections, EU added-value, railways and waterways, and alternative fuels supply in TEN-T core network

## 4. Concrete challenges for a transport corridor in the Fehmarnbelt region

### 4.1. FREIGHT TRAIN IN THE CORRIDOR TODAY

When it comes to setting up a freight train from Stockholm to Hamburg, there are a series of difficulties linked to the fact that such activity will have to cross three different systems regulated by three independent administrations in three different markets. The result is that planning and application procedures do not happen in one central organism, but in three separate ones. It requires having rolling stocks compatible with all the railway systems crossed. This complicates planning, increase costs, and extends the time to profitability.

The actors involved in each of the three markets are transportation authority of national governments, national competition authorities, national rail regulators, railway undertakings, infrastructure managers, railway workers unions and terminal/transfer-point managers. This high number of actors is coupled to the fact that each national system has its own set of customary procedures on top of the formal ones.

Capacity allocation must be coordinated across borders so that a train is not suddenly stopped for lack of capacity allocation on the other side. Related infrastructure charges and scheduling is also managed independently, so that the procedure can be very different in each national system. Moreover, the operator of such a train also needs to comply with three different sets of rules for safety certifications.

In terms of rolling stocks, it is necessary to have rolling stocks that can operate with each signalisation and electrification systems (or lack thereof). For example, the Thalys locomotive has 7 different signalisation systems on-board. It must also comply with the smallest maximal size and weight regulations. On the corridor from Oslo to Hamburg, the maximum meter load varies from 6 to 8.3 t/m, max. loading gauge variation up to 50%, and maximum train length is of max. 835 m in Germany, mainly max. 630 m in Sweden and max. 580 m in Norway. A central coordination of those systems would greatly reduce the costs and complexity of such an endeavour.

### 4.2. REGIONAL ACCESSIBILITY AND CONNECTION TO THE ECONOMIC FABRIC

Another challenge lies in the fact that the TEN-T core network and the Fehmarnbelt tunnel will bring a significant upgrade to transport infrastructure in the region, but it is unsure whether it will benefit the regional economy. The creation of intercity corridors of transnational transport networks in the European Union may increase the economic, social and cul-



tural differences between centre and periphery and hence the dysfunctionality of the single market of the European Union in terms of socio-economic cohesion in the Union . This view is shared by the Ministry of Housing, Urban and Rural Affairs, which focuses on how to make sure that the Fehmarnbelt tunnel will benefit the Danish regions . As Bruno Fontalirand explained when referring to the experience of the department Pas-de-Calais regarding the Channel Tunnel , Pas-de-Calais did not benefit of the new connection as much as it could have because it started by being opposed to this international project and did not really look at potential benefice for the region before the tunnel stood there finished. As a result, the region did not develop proactive plans to make use of this new infrastructure and did not benefit of this project as much as it could have.

### 4.3. GREEN TECHNOLOGIES

Another aspect of green transport that is named in the TEN-T policy, but whose implementation is not tackled is the coordination of alternative fuels. Some of them do require specific infrastructure and services all along the corridor, whose implementation is not coordinated by any corridor approach.

For example, In Sweden, locally produced biogas is already used for road transport by truck. In Denmark, there is a market for both natural gas and biogas, but not in the transport sector. In Germany, natural gas is used in the transport sector, but mainly for passenger cars. This lack of coordinated efforts means that, even though natural and biogas are available, they cannot be used for transnational transport from Stockholm to Hamburg today. Another example is electrical vehicles. They must recharge often and do so on a market that is not developed for transportation use, but for static use. There is already coordination among producers in the EU regarding technological charging standards, but without coordination, it is unknown how the owner of an electrical vehicle with a subscription in Denmark would do to buy electricity once in Germany if he does not meet free electricity outlets on his way. Finally, if one member-state, for domestic reasons, opted to exclusively support electric vehicles and another biogas, it would destroy the concept of transport corridor in the region.

### 4.4. COORDINATION ACROSS NATIONAL SYSTEMS OF ADMINISTRATION

The examples above clearly shows that many of the problems encountered are historically bound to the development of disconnected national systems of administration. As of today, the EU possesses a well-developed transport infrastructure, but it is still very fragmented both geographically and between transport modes. Many of the disruptions in the network occur at cross-border points because most transport networks were developed in a national perspective. This lack of integration between transport systems is not limited to infrastructure. The entire transport regulation system is also fragmented by national systems. It requires coordinating numerous national systems of governance in order to remove bottle-

necks at the borders, connect national transport systems and switch to green and energy efficient transportation systems. Where transport network within national boundaries are developed by one cohesive governance structure, the cross-border sections of those corridors remains a problematic question.

## 5. NATIONAL INITIATIVES

The following chapter presents national activities related to the aforementioned policies. It is clear that the most of the national authorities' activities are focusing in railways. However, the coming Fehmarnbelt tunnel has also triggered some actions among national authorities.

### 5.1. RAIL FREIGHT CORRIDOR 3 AND ERMTS CORRIDOR

The major activity, from national authorities, related to the TEN-T corridors focus on rail freight and ERTMS corridors as described in Regulation (EU) No 913/2010 and Commission Decision (EU) No (2012/88/EU). Rail freight corridor 3 goes from Stockholm to Palermo following the Scandinavian-Mediterranean corridor, and crosses Sweden, Denmark, Germany, Austria and Italia (a branch from Oslo has been added to the corridor in autumn 2013). The implementation of rail freight corridor 3 will be supervised by an Executive board led by the

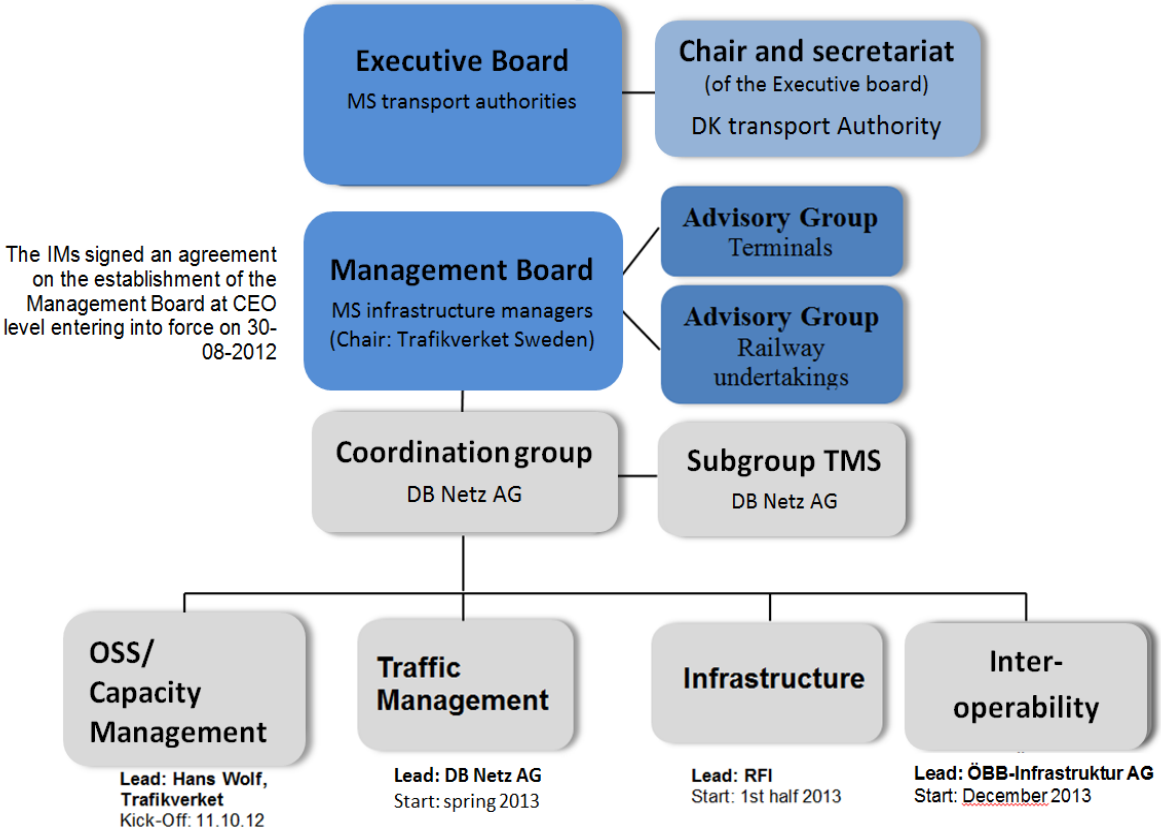


Fig. 4. Organizational diagram of corridor 3, Danish transport authority (2013)

Danish transport authority (Trafikstyrelsen). The organizational structure of corridor 3 (cf. figure 4) mirror the instructions from the EU rail freight regulation. The coordination of the related ERTMS corridor B has been merged with the rail freight corridor 3 since mid-2013. Besides Trafikstyrelsen, the executive board is composed of national authorities from each member state along the corridor (Norway, Sweden, Denmark, Germany, Austria and Italy). The role of the executive board is to coordinate the implementation of the corridor between all the member states, and inform national ministries if national legislation hinders the proper implementation of the corridor. It is in charge of defining and supervising the general objectives of Corridor 3, approving the designated lines, approving plans and capacity allocation. Along the executive board is a management boards gathering all the infrastructure managers in the corridor, led by Trafikverket (Swedish transport administration). Those infrastructure managers are Banedanmark (Denmark), DB Netze (Germany), Jernbaneverket (Norge), ÖBB infrastruktur (Austria), RFI (Italy), Trafikverket (Sweden), plus Öresundsbro Konsortiet (Öresund bridge) and Femern AS (Fehmarnbelt tunnel). The management board tasks are to establish a One- Stop-Shop, evaluate needed capacity, coordinate priority rules for capacity, coordinate traffic management, adopt targets for punctuality, produce plans and reports, and cooperate with the RNE. It is supported by two advisory groups, one gathering representative of terminals on the corridor and the other one representatives of railway undertakers. A Danish task group has been set up to develop market analysis, implementation plan, targets, capacity allocation plan and reporting to the European Commission. The purpose of this set-up is to support seamless and efficient services

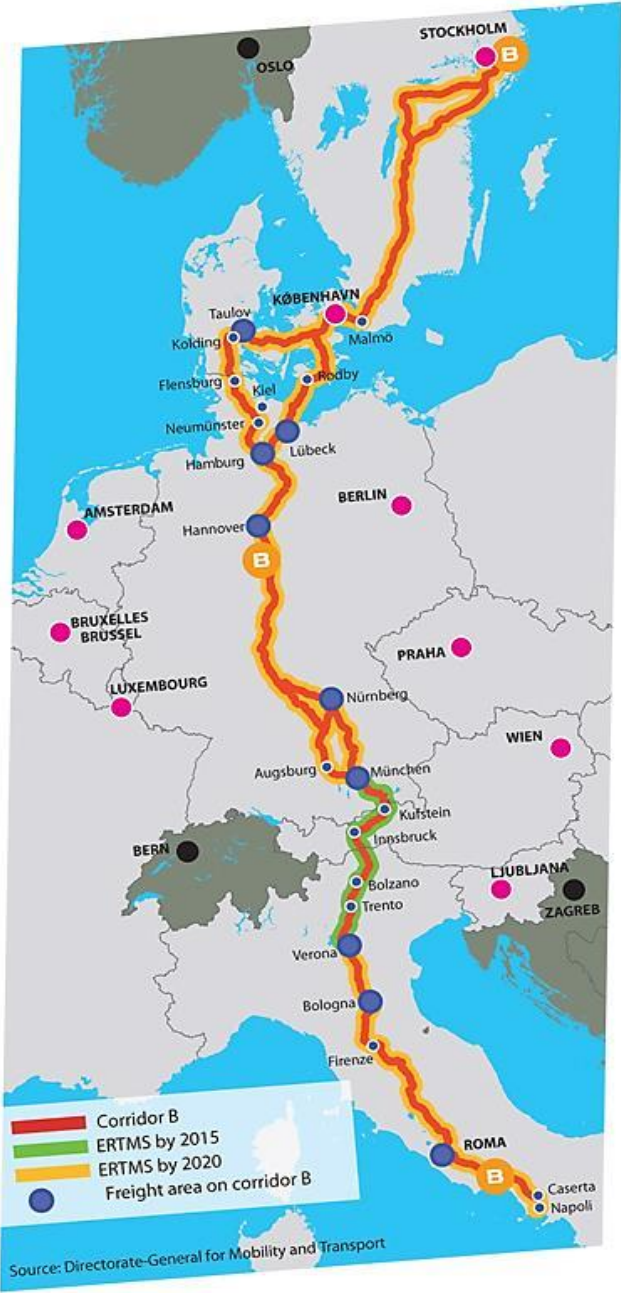


Fig. 5. ERTMS implementation plan in corridor B

to applicants and operators across borders along the entire corridor.

Corridor 3 also collaborates with the European Rail Agency, where a series of working groups develop technical guidelines regarding safety and interoperability in the form of technical specifications of interoperability (TSI). Trafikstyrelsen/DK participates to those groups in order to ensure consistency between national developments and EU rules.

Corridor 3 will enter into function in November 2015. At that date, the following documents should be finalized and published by the coordination body: outline of corridor, Transport market study, corridor objectives and Investment plan. The Transport Market Study, which will describe the precise route of the corridor and every single connections and nodes (terminals, harbors, etc...), will be conducted by the management board and is planned for publication in august 2014.

*Corridor B – ERTMS:* it covers a smaller portion of the Scandinavian-Mediterranean corridor from Stockholm to Napoli. The ERTMS corridor is planned to be fully completed in 2020-2021 with the portion between Munich and Verona to be completed as early as 2015. Following the European Commission Decision, each relevant national authority has developed an implementation plan in order to equip the selected railways with ERTMS.

In Sweden, Trafikverket's plan targets ERTMS level 3 on the Stockholm-Malmö corridor in a first phase, then in the entire country later on. Equipment of the Stockholm-Malmö track is expected to start in 2016-17 and to be finished by 2020. The implementation of ERTMS is, however, not without challenges since Trafikverket points out the high costs to equip railways and rolling stocks, which could slow the process down. It also notes that those costs could eventually have a significant impact on the operators market itself. In Denmark, Trafikstyrelsen has planned to complete the installation of ERTMS on all core corridor railways by 2019 and extend it to regional railways by 2021. Finally, the German implementation plan sets ERTMS level 2 as the standard to implement and establishes the baseline 3.0.0 as a standard target for future German plans. The plan states that until 2020, Germany can only implement ERTMS in 2 corridors, corridor B being the first one, with 2015 as the targeted deadline.

## 5.2 THE GREEN CORRIDORS MODEL IN THE REGION

In Sweden, Trafikverket works actively with the implementation of efficient and environmentally friendly transport through the green corridor concept. This concept has been built upon the corridor tools that can be also found in EU legislation and shares most of the routes and targets with the last TEN-T policy, plus one additional parameter linked to regional coupling. It is the only national authority in the Fehmarnbelt geography that uses this concept actively. It is at the moment involved in three green corridor projects, GRECOR (leader), Green STRING corridor and Swiftly Green. It has also a long history of involvement with this concept through earlier projects like the Bothnian Green Logistic Corridor, Scandria,

EWTC II and Coinco North. Additionally, Trafikverket has also developed freight councils to connect businesses with public authorities and support efficient and environmentally friendly freight transport in several Swedish regions, like the Skåne/Blekinge freight council since 2002. Even though the Danish state does not focus on green corridors to the same extent, it also participates in some green corridor projects like EWTC II and Swiftly Green. On the German side, it does not appear that federal and relevant lander authorities (Hamburg state and Schleswig-Holstein) participate to such activities, but this concept is in use in neighboring landers, such as Mecklenburg-Vorpommern and Berlin & Brandenburg. Beside rail freight, that approach also includes alternative green transport technologies and is used by several public authorities on the Scandinavian-Mediterranean corridor.

### 5.3 THE FEHMARNBELT LINK

One major work on the Scandinavian-Mediterranean corridor is the coming Fehmarnbelt tunnel that will connect Denmark to Germany and should cost € 5.45 billion in 2008 prices. This infrastructure will significantly upgrade the TEN-T corridor in the region. In 2007 the German and Danish governments have signed a treaty for the construction of this infrastructure with specific plans and timelines for its implementation. The Danish state is in charge of the entire construction of the bridge down to its contact with German soil, and has clearly more advanced plans regarding this coming link than its German counterpart. The Danish state has established the company Femern A/S under the umbrella of Sund & Bælt Holding A/S that gather state owned companies managing other major bridges in the area like the Storebælt and the Øresund bridges. The Fehmarnbelt tunnel itself is financed through loans on the international market guaranteed by the Danish state with support from EU funds. The CEF EU regulation sets a limit of EU financing to 40% of total costs for cross-border railway sections and 10% for cross-border road sections, however Femern A/S has set-up a conservative budget targeting 10% EU support in total. On October 18, 2013, Femern A/S delivered, together with Landesbetrieb Straßenbau und Verkehr (LBV) in Lübeck, the application for the German building permit. This application will be processed by LBV Kiel and is expected to last 18 month. At the moment, the construction is thus planned to start in mid-2015.

The hinterland connection on the Danish side is expected to cost € 1.2 billion and comprise the electrification and 200km/h upgrade of the Ringsted-Fehmarn line, a twin-tracked upgrade from Vordingborg to Masnedø and from Orehoved to Rødbyhavn and a four lanes upgrade of the motorway down to Rødby (completed in 2007). Banedanmark is currently planning a new combined rail/road bridge over the Storstrøm sound for € 0.5 billion whose financing is expected to be approved by mid-2014. On the German side, the cost for hinterland connection is also estimated at € 1.2 billion financed by the Federal state, and consists of an upgrade of the E 47 between Heiligenhafen and Puttgarden to a fourlane highway, Expansion of A 1 from Oldenburg to Heiligenhafen Ost (completed in 2012), electrification

and upgrade to 160km/h of the Lübeck–Puttgarden rail line, and finally a two-lane road and single-track railway on the Fehmarnsund bridge. However, a twin track upgrade of the Bad Schwartau-Puttgarden line is planned within 7 years after the opening of the bridge. The state of Schleswig-Holstein has also decided to classify the Fehmarnsund Bridge as an urgent need in the next Federal Transport Infrastructure Plan (FTIP) for 2015.

Besides infrastructure planning, one national initiative looks at how to make use of this new infrastructure for regional development. A working group of The Danish ministry for Housing, Urban and Rural Affairs is in charge to look at how to use the Fehmarnbelt tunnel for the development of Region Sjælland. Such initiatives can also be found on the German side at a local level with the Entwicklungsachse A1 project in Schleswig Holstein. Nevertheless, it is not necessarily national authorities that would best achieve the connectivity between infrastructure and industry in the regions crossed.

## 6. CONCLUSION: PERSPECTIVE FOR THE REGIONS

Coordinated transnational activities are mostly related to the rail sector. It is also the only sector that is structured by clear and detailed EU regulations and decision, which directly apply in every single Member States. Rail is also a focus of several green corridor projects throughout Scandinavia and Germany. Moreover, both the Danish and German states are working on improving rail and road infrastructure on the corridor to prepare for the Fehmarnbelt tunnel.

How does the current situation plays together with the Green STRING corridor targets? Green STRING also focuses on rail as a way to increase the sustainability of both internal and crossing traffic and on how this new transport corridor can benefit the region. However, another important part of the equation lies in the fact that transport is produced by and used for economic activities. This new infrastructure must thus be connected to the existing socio-economic fabric in order to achieve the expected impact. So while national authorities have made plans to upgrade the infrastructure, they have much fewer tools at their disposal to ensure that it gets used in the intended manner at the local level.

An initiative like Green STRING corridor addresses targets that current national initiatives dealing with TEN-T corridors do not, in that it focuses on the contextual adaptation of a green transport corridor. Among those targets are the availability of clean fuel for road, air and waterways transport, energy efficient and zero carbon transport technology in a corridor perspective, regional mobility, integration of regions and urban nodes to the network, sustainable transport solutions, promotion of cross-border projects and enhancement of cooperation between stakeholders. Additionally, such a project can be useful to promote the coordination of efforts regarding alternative fuels like biogas and electricity at the local level,

so that a switch to rail does not remain the sole solution to CO2 emissions and energy consumption in the transport system of the region. At the moment, the TEN-T policy focuses on the efficiency of long distance transport, which does not serve territorial cohesion at the regional level. A regional anchoring allows for the adaptation of such a general EU policy to the local context so that adequate solutions for the region can be developed.

As stated in the last TEN-T regulation, the aim of the trans-European transport network goes beyond infrastructure upgrade and long distance freight transport. The aim of this policy is to strengthen the social, economic and territorial cohesion of the EU through the development of a single European transport area that is efficient, sustainable and inclusive. This target is more challenging than merely coordinated the development and operation of long-distance transport at the supranational level. As of today, national and supranational coordination focus principally on rail infrastructure and operation. The backbone on which to develop a sustainable and inclusive transport system is thus already underway, and there is no doubt that it will increase the efficiency of the European transport system on the long run. However, there is no sign that the coming TEN-T corridors won't simply act as pipelines between major metropolitan centres, which would benefit the European economy as a whole, but not necessarily support the cohesion goal of the TEN-T regulation. Moreover, if supranational coordination can tackle broad technological and operational matters, the contextual adaptation requires at the local level is a different venture, which requires the participation of a myriad of stakeholders that can hardly be efficiently coordinated in such a top-down perspective.

Generally, subnational authorities cannot face the costs of the required infrastructures and have little say regarding regulatory frameworks and tax policies of transport systems, but they can play an active role in how this new transport system will be received and integrated into their economy. This is a key strategy if they want to avoid getting the inconveniences of a crossing transport corridor without the benefits.

Local actors are also in a better situation to look at the adaptation of this policy in the context of their own territory, in order to find which initiatives will be more relevant in practice. Transport flows work in corridors, so such initiatives should be designed in a corridor perspective. But the focus should be on local issues so that regional initiatives complete rather than compete with national ones.

The supranational corridor coordinators have received the task to develop work plans for their respective corridor, which should be endorsed by the member states in December 2014. The importance of regional integration, and the role of regional and local authorities to achieve it, should be included in that work plan.

Additionally, Regulation 1315/2013 invites stakeholders to make use of several European funds for that purpose (cf. page 7). Those funds cover a broad range of topics from research

and development, to local initiatives and cross-border cooperation. It is a great opportunity for regional and local actors to involve their respective stakeholders into projects that would support green transport technologies, sustainable urban mobility, green logistics and a better accessibility between remote regions to centres of capital. Those funds can help peripheral regions that have more difficulties to attract the pre-required economic and cultural capital necessary for such endeavours. It is thus important for those regions to develop their capacity to tap in those funds.

Eventually, a successful regional green corridor strategy should achieve a good integration of small urban centres, rural territories and transport hubs to the overall supranational corridor, support the local economy to make use of infrastructure upgrades and greener transport solution and develop research and production of the related green technologies within the region. A cross-border platform in the STRING model is the perfect level to support regions along TEN-T corridors in tackling the aforementioned challenges and insuring that they do benefit the cohesion of the EU as a whole.

## REFERENCES

BMVI (Bundesminister für Verkehr und digitale Infrastruktur), *Feste Fehmarnbeltquerung*, retrieved in January/February 2014 from [http://www.bmvi.de/DE/VerkehrUndMobilitaet/Verkehrspolitik/EuropaeischeVerkehrspolitik/Fehmarnbeltquerung/fehmarbeltquerung\\_node.html](http://www.bmvi.de/DE/VerkehrUndMobilitaet/Verkehrspolitik/EuropaeischeVerkehrspolitik/Fehmarnbeltquerung/fehmarbeltquerung_node.html) COMMISSION IMPLEMENTING DECISION 2013/801/EU of establishing the Innovation and Networks Executive Agency and repealing Decision 2007/60/EC as amended by Decision 2008/593/EC. (n.d.). OJ L 352/65.

COMMISSION IMPLEMENTING DECISION 2013/801/EU establishing the Innovation and Networks Executive Agency and repealing Decision 2007/60/EC as amended by Decision 2008/593/EC," OJ L 352/65, 65-67

DG move (2014), *ERTMS in 10 questions*, European Commission [http://ec.europa.eu/transport/modes/rail/interoperability/ertms/edp\\_map\\_en.htm](http://ec.europa.eu/transport/modes/rail/interoperability/ertms/edp_map_en.htm) (accessed in February 2014)

European Commission. (2011). *WHITE PAPER: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system*. COM (2011) 144 final.

European Union. (2012). CONSOLIDATED VERSION OF THE TREATY ON THE FUNCTIONING OF THE EUROPEAN UNION. OJ C 326, 47–390.

Femern A/S webpages, retrieved in January/February 2014 from <http://www.femern.com/>



Grindheim, J. E., & Manga, A. (2011). 'Intercity Corridors Restructuring Europe'. In T. Herrschel, & P. Tallberg (Eds.), *The Role of the Regions? Networks, Scale, Territory* (pp. 223-254). Kristianstads Boktryckeri

Ministerium für Wirtschaft, Arbeit, Verkehr und Technologiedes LandesSchleswig-Holstein, *Feste Fehmarnbeltquerung*, retrieved in January/february 2014 from [http://www.schleswig-holstein.de/FehmarnBelt/DE/FehmarnBelt\\_node.html](http://www.schleswig-holstein.de/FehmarnBelt/DE/FehmarnBelt_node.html)

Palludan, A. U. (2013). *Lys & mørke over femern bælt: Scenarier for den nære Femern Bælt region 2030*, Ministeriet for By, Bolig og Landdistrikter

REGULATION (EU) No 1315/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU. *OJ L 348/1*

REGULATION (EU) No 1316/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010. *OJ L 348/129*.

REGULATION (EU) No 913/2010 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 September 2010 concerning a European rail network for competitive freight. (2010) *OJ L 276/22*.

Trafikstyrelsen DK, *Rail Freight Corridor 3*, retrieved in January/February 2014 from <http://www.trafikstyrelsen.dk/DA/Jernbane/Nationale-og-internationale-fora/Internationalt-arbejde/Kommissionen/Rail-Freight-Corridor-3.aspx>

Walker, Baarse, Van Velzen and Järvi (2009). *Assessing the Variation in Rail Interoperability in 11 European Countries, and Barriers to its Improvement*, *EJTIR* 9(1), March 2009, pp. 4-30