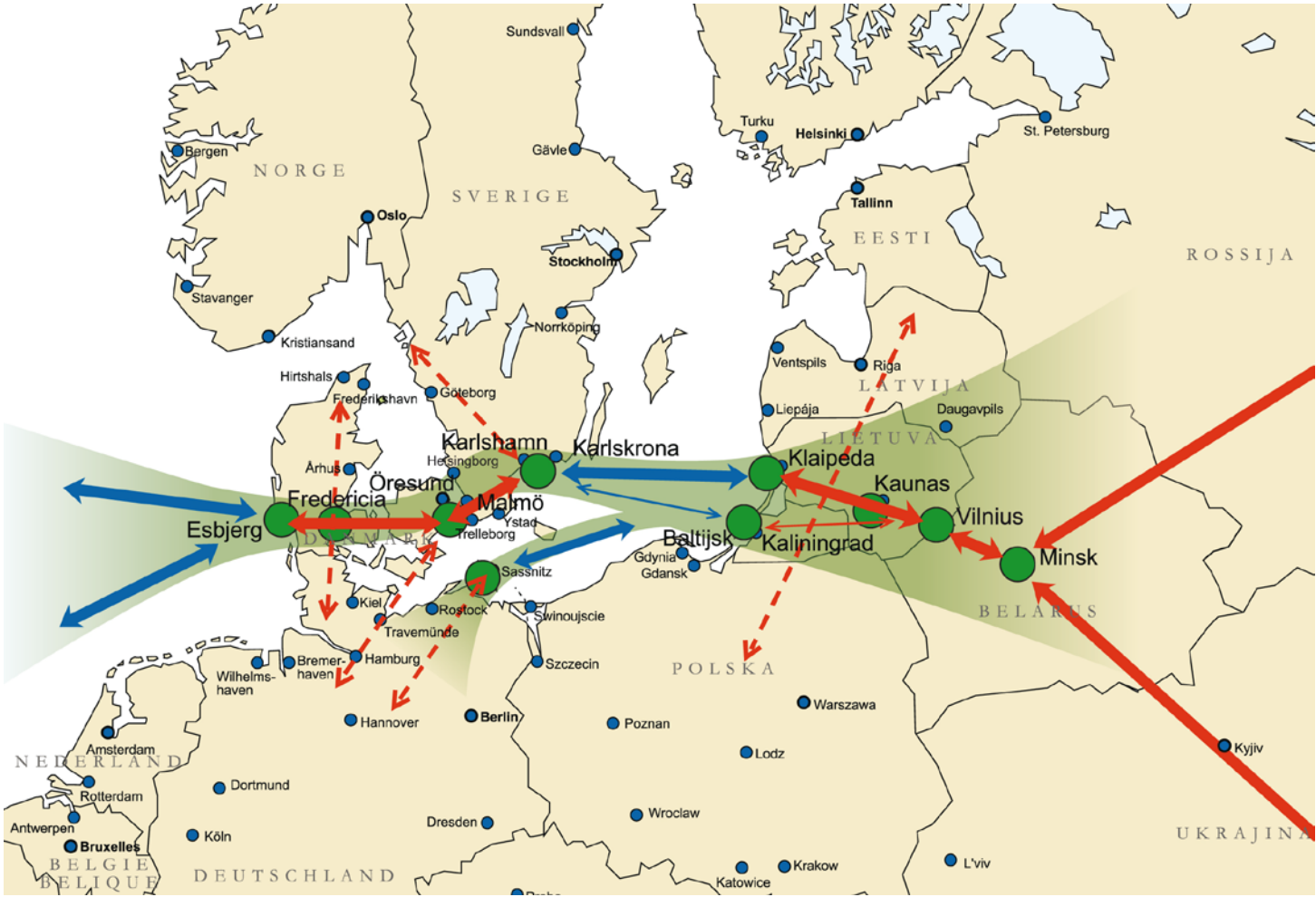




Draft Green Corridor Definition

EWTC II Green Corridor Manual



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– Draft definition**
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1 Introduction

This report aims at making a draft Definition of the Green Corridors Concept. The work is based on the EU-definition from the Communication from the Commission Freight Transport Logistics Action Plan (COM(2007) 607 final) where the following is said:

"Green" transport corridors for freight

The concept of transport corridors is marked by a concentration of freight traffic between major hubs and by relatively long distances of transport. Along these corridors industry will be encouraged to rely on co-modality and on advanced technology in order to accommodate rising traffic volumes while promoting environmental sustainability and energy efficiency. Green transport corridors will reflect an integrated transport concept where short sea shipping, rail, inland waterways and road complement each other to enable the choice of environmentally friendly transport. They will be equipped with adequate transshipment facilities at strategic locations (such as seaports, inland ports, marshalling yards and other relevant logistics terminals and installations) and with supply points initially for biofuels and, later, for other forms of green propulsion. Green corridors could be used to experiment with environmentally-friendly, innovative transport units, and with advanced ITS applications. A number of initiatives are coming together to promote this objective, including the freight-oriented railway network, motorways of the sea and NAIADES. Account should be taken of the opportunities offered by the TEN-T guidelines on the development and the integration of multimodal transport chains.

Fair and non-discriminatory access to corridors and transshipment facilities is a requirement for co-modality and needs to be addressed. Restrictions of access to the market for terminal operations, inter alia, in ports and marshalling yards, can have repercussions to the customers of these facilities. Open and non-discriminatory access for operators and customers of these facilities should be ensured in accordance with the rules of the Treaty."

Further to the above the draft definition is also based on the definition created by the Swedish Logistics Forum:

"Green Corridors aim at reducing environmental and climate impact while increasing safety and efficiency.

Green Corridors aim at reducing environmental and climate impact while increasing safety and efficiency. Characteristics of a green corridor include:

- *Sustainable logistics solutions with documented reductions of environmental and climate impact, high safety, high quality and strong efficiency,*
- *Integrated logistics concepts with optimal utilisation of all transport modes, so called co-modality,*
- *Harmonised regulations with openness for all actors,*

- *A concentration of national and international freight traffic on relatively long transport routes,*
- *Efficient and strategically placed trans-shipment points, as well as an adapted, supportive infrastructure, and*
- *A platform for development and demonstration of innovative logistics solutions, including information systems, collaborative models and technology.”*

Methodology

For the purpose of finding a viable draft Definition of the Green Corridors Concept, an email survey was conducted, whereas 20 replied to the survey. The group consisted of EWTC II Task 3B-partners as well as experts and other Green Corridors projects. Further to this all in all 8 personal and telephone interviews with some of the above mentioned experts and project members were carried out. A list of the contact persons can be found in Annex 1 and the email survey with the 6 open questions that were asked can be found in Annex 2.

Based on the above methodology, the characteristics of the Green Corridors Concept are described in the following.

Definition in short

Green transport corridors promote the development of a ‘greener-oriented’ transport system. They endorse the EU vision towards an integrated and sustainable transport system. Green Corridors provide the most environmentally-friendly, sustainable, efficient and safest connections for freight transport in Europe.

Green corridors deliver transport solutions that are more economically, ecologically & socially viable than other (non-green) corridors. The transports within the corridors are efficient, and when possible the optimum transport mode is used. Hence a large proportion of the goods transported within the corridors often are international or other long distance transport, through intermodal transports, with use of freight trains, inland waterways, modular road trains, trucks using alternative fuels, trucks with the best Euronorm, or other efficient and more environmentally-friendly transport modes between the trans-shipment points. At the trans-shipment points, the goods will be shifted to local trucks in an efficient manner in regard to time and costs, to be distributed to the receivers.

Each Green Corridor is defined by a basis of measurable indicators, KPIs, whereby the corridor can be compared with the rest of the transport sector in Europe and over time, also compared with other Green Corridors and itself. A Green Corridor is only green if the indicators relating to the specific corridor are better than the European average and that there is a continuous improvement of these indicators over time. Indicators should be linked to the cargo volumes, environment, efficiency, economy etc. It is also important that only a limited number of measurable KPIs are chosen for each corridor, in order not to lose out on the comparability.

2 Green Corridors Concept in general

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. This implies that the corridors are more or less dedicated to excellent climate-adapted logistics solutions that are focussing on reduction of emissions, while keeping a win-win situation for society and actors in the Green Corridors. This also means that the Green Corridors are solutions customised towards the specific development conditions of the areas they cross.

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. The multimodal nodes (terminals, hubs, ports etc.) in the system play a vital part, as they are corridor entry and exit points.

By concentrating the transport flows into corridors, investments and measures can be channelized towards the corridor to ensure the high quality transport performance at all levels throughout the corridor. The green corridors should build on existing dominant transport corridors in Europe, with major trade flows and the potential for mass transportation with consolidated transports are the largest and hereby giving possibilities for economy of scale.

There is a large potential in optimisation of the logistics chain and the green corridors should be a platform to enhance development of new thinking within all parts of the chain, through for example seamless or at least compatible communication. The platform should, through demonstration projects and tests, lead the way to introduction of innovative logistics solutions. Examples hereof could be longer freight trains, EMS road vehicles on certain international test routes, new transshipment technologies etc.

Interestingly enough, there seemed to be an overall agreement amongst the respondents of this study that the Swedish Definition, with its 6 bullet points seems to found a mutual basis of understanding of the Green Corridors Concept.

Therefore, we have chosen to further describe the Definition of the Green Corridors Concept based on the Swedish Definition, which is found in the following chapters.

3 Sustainable logistics solutions with documented reductions of environmental and climate impact, high safety, high quality and strong efficiency

Sustainable logistics solutions are economically, ecologically & socially viable transport solutions. Sustainable solutions ensure the applicability of the most economical and environmentally-friendly means of transport respectively logistic systems that are available at present, also incorporating the social dimension. Continuous improvements of services and efficiency in all parts of the transport chain are strived for in the Green Corridors, while keeping the economic efficiency in mind.

The possibility to document the reductions of environmental and climate nuisance is very important, as this is how the specific “greening” of a transport service is measured. The emissions concerned are Greenhouse Gasses (GHGs), pollutants and noise. Further, the protection of environmentally sensitive areas should be addressed.

The emissions need to be quantified and measured. The measurability, through setting up Key Performance Indicators (KPIs) is the manner to prove that it is a green concept. Not all services will start at the same level of emissions and it is therefore necessary to set a threshold that fits with the level of emissions for current business standards of logistic chains – the Business As Usual level (BAU). From the BAU level the work will then be concentrated on continuously reducing the environmental and climate impact and hereby the green corridor logistics services can be measured as regards to their level of reduction compared to the BAU-level. Here the levels may deviate through Europe as the current business standard today also deviate from each other in different parts of Europe.

High safety reflects the importance of continuously working with traffic safety in the corridor.

The quality issue needs to be seen from the perspective of the customers of the logistics system. The customers have a set of conditions that should be fulfilled in the logistic chain and these are described in detail in agreements with the service providers. High quality in the transport chain means expectations on:

- **Efficiency** in the logistics chain, whereby large effort is put on maximising the utilisation of vehicles and infrastructure.
- **Punctuality** as regards to the agreed time of departure and delivery.
- **Security** in the transport chain is an important issue in order to receive the goods without damages at arrival point. There are also other issues, as for example theft from the transport vehicles and safety of the concerned drivers that should be included in all parts of the corridor.

Efficiency also relates to the fast handling of all kinds of cargo throughout the whole transport chain in the Green Corridor. All parts of the corridor should be as efficient as possible and strive for continuous improvements. This includes the infrastructure and the nodes, and all the different parts of the transport chain, where different modes and actors are included. This also implies a strong management of the corridor.

Information systems are needed, in order to follow and monitor the high quality of the transport services offered in the green corridors.

The green corridors also need to be robust and through redundancy plans be prepared for deviations in the transport chains due to different causes. There is a need for different capacity options should there be a delay or disruption somewhere in the chain, in order to maintain to the high quality and reliability.

4 Integrated logistics concepts with optimal utilisation of all transport modes, so called co-modality

Integrated logistics concepts include a long row of different services. Transport chains are not very often singular mode transports from A to B, and this has to be considered in the description of the concepts. A Green Corridor does not consist of only one mode, for example railway, as there is almost always the last mile delivery, usually made by trucks.

All transport modes are included in the Green Corridors Concept, and the different modes are used where they have the best performance in the logistic chain. Most logistics chains are door-to-door and not terminal to terminal, and the last mile delivery is also an important part of the logistics chain. Further, the territorial specificity of the corridor has to be considered and reflected in the modal choice, ie. the Alps, the Baltic Sea, whereby different modal solutions can be found.

Comodality means the optimum utilisation of each mode where they are suitable and efficient, in all parts of the transport chains and this means that all modes are important and all modes should be utilised at their best performance level.

The road transport mode is not always considered a very environmentally-adapted mode, but there is almost no transport chain without a part being on truck. Trucks have a very large market share in the European freight logistics, where the road transport mode in 2008 accounted for 72,5% market share for inland modes in EU-27¹. The road transport mode is also working on greening, with new technical solutions, eco-driving, adapting to the latest rules and having the newest fleet of vehicles, preferably according to the Euro 4 and Euro 5 norms.

There are several efficiency racing measures for road transport, also between terminals, such as EMS, trucks using alternative fuels (liquefied biogas, hydrogen etc) with lower emissions or trucks that have a higher capacity utilisation than the average etc. Here the co-modality originates to be the more environmentally and efficient solutions between the terminals.

¹ Energy and Transport in Figures 2010

5 Harmonised regulations with openness for all actors

There are many different sets of regulations that will apply for green corridors and these need to be harmonised throughout the corridor. The regulations apply for both the infrastructure and the operation in different modes of transport, for example different standards for infrastructure, different regulation for how cargo should be secured, depending on transport mode, liability issues, driving and rest time for drivers to mention a few.

The rules and regulations differ from country to country and from mode to mode and this is a hindrance in optimising the logistic chains. It is necessary to create a level-playing field by harmonising regulations across both country and modal borders for fair and equal treatment.

The different regulations need to be harmonised throughout Europe and this also accounts for the follow-up of regulations. The present situation is that there are for examples different penalties for traffic violations depending on the specific Member State. Further to the penalties, the way these rules are applied is also an important issue, as there is a difference depending on Member State, which violations are seen as more critical.

There has to be a common regulative framework that applies to all users of the Green Corridors Concept that fulfil the demands. The basis is fair, open and non-discriminatory access to the green corridor and its services.

In the green corridors there should also be room for testing new and innovative concepts, whereas present regulations may be set a side for such tests or demonstration projects.

ERTMS: Example of technical harmonization of a green corridor:

The 3600 km long railway line between Stockholm and Naples, Corridor B, is one of six lines at EU level are identified as strategically important corridor for rail freight traffic.

On the lines, there is special attention to improving infrastructure, eliminating bottlenecks, streamlining procedures for running the trains and not the least to promote technical cohesiveness of deployment of the Single European train control and communication systems ERTMS.

Based on a report on Corridor B from 2005 it is expected that the number of trains on the corridor B will increase by approx. 50% in the period 2005 – 2015. For example, the expected average daily number of trains crossing the Øresund is expected to increase from 32 in 2005 to 66 in 2015. During the same period the transported volume of goods transported (measured in tons) could rise by up to 60%, among others as the trains are getting longer.

Example of border-crossing trials with EMS

Modular haulage is one way to improve the performance of road based transports by reducing the number of traffic km, when at the same time increasing the number of tonnes-km. This is done by a combination of larger trucks with more capacity in combination with high capacity utilization. It is difficult to calculate the exact reduction in vehicle-km for services carried out by modular units compared with similar services based on semitrailer combinations. But it is possible to reduce the numbers of km with up to 20% and at the same time reduce the energy consumption and emissions with 10-15%.

Denmark is an advocate for border-crossing trials with modular road trains on the route between Sweden and Benelux. Several reports, including the report "Effects of adapting The Rules on weights and dimensions of heavy commercial vehicles as established within Directive 96/53/EC" from 2009 suggest significant environmental and operational economic gains by driving modular road trains.

6 A concentration of national and international freight traffic on relatively long transport routes

The green corridors are concentrating large transport flows along a specific freight corridor in order to concentrate the efforts into the corridor. The transport flows may be long, border-crossing and international, but there will also be room for shorter transport flows, that will fit into the corridor, by using the nodes for entrance and exit.

By concentrating the transport flows into corridors, investments and measures can be channelized towards the corridor to ensure the continuous high efficiency at all levels throughout the corridor.

The green corridors should build on existing dominant transport corridors in Europe, where trade flows are largest and the potential for mass transportation with consolidated transports are the largest and thereby leading to economy of scale.

7 Efficient and strategically placed transshipment points, as well as an adapted, supportive infrastructure

The nodes in the green corridors are vital points for the swift change between different modes of transport. These nodes – or transshipment points - need to be very efficient, both in terms of time and costs. The nodes should be strategically placed along the corridor and have sufficient capacities to enter or exit the corridor and hereby enhance the efficient shift towards more environmentally-adapted modes of transport.

Openness for all actors is a vital part of the Green Corridors Concept and the nodes have open and non-discriminatory access for all potential users and this means.

The transshipment points are intermodal, they include at least 2 transport modes – road/rail as in the inland terminals for combined transports, or road/rail/sea as in the ferry ports or dryports and facilitate the fast and efficient shift from one transport mode to another.

The efficiency in the transshipment point will also be measured, as there is a large potential for better efficiency in the transshipment between different modes of transports. This also concerns the economic aspects especially as regards transit times, where there is economy of scale in efficient transshipment points, strategically placed along the Green Corridor.

It is of great importance, that a co-modal concept is competitive not only on price but also with respect to other important parameters, as quality and transit time. Therefore in most instances, a co-modal solution is competitive when able to compete with a road based solution, with the use of efficient transshipment points.

The transshipment points will have adapted supportive infrastructure as for example ITS solutions in order to enhance the efficiency and the information flow in the logistics chain.

Elimination of existing bottlenecks of different character is a pre-requisite for the efficient operation in the Green Corridors.

8 A platform for development and demonstration of innovative logistics solutions, including information systems, collaborative models and technology

In regards to the large potential in optimisation of the transport chains and the green corridors should be a platform to enhance development of new thinking within all parts of the chain. The platform should promote demonstration projects and tests that lead the way to implementation of innovative logistics solutions.

New technologies, innovative thinking and models of collaboration could lead to a large increase in the present utilisation of the infrastructure and transport services.

Green corridors should be testbeds for:

- Innovative technologies (smarter engines, better fuels, innovative handling equipment, efficient vehicle combinations...)
- Processes (for handling, modal change, business processes, information exchange, safety and security, tracking and tracing...)
- Tools for planning, measuring and evaluating
- Service development
- Good governance and strategic management (e.g. green logistics solutions)

9 Summary

The following forms a summary of the definition.

Amongst the respondents in this investigation, there is an approval of the Swedish definition of green corridors:

“Green Corridors aim at reducing environmental and climate impact while increasing safety and efficiency. Characteristics of a green corridor include:

- 1. Sustainable logistics solutions with documented reductions of environmental and climate impact, high safety, high quality and strong efficiency,*
- 2. Integrated logistics concepts with optimal utilisation of all transport modes, so called co-modality,*
- 3. Harmonised regulations with openness for all actors,*
- 4. A concentration of national and international freight traffic on relatively long transport routes,*
- 5. Efficient and strategically placed trans-shipment points, as well as an adapted, supportive infrastructure, and*
- 6. A platform for development and demonstration of innovative logistics solutions, including information systems, collaborative models and technology.”*

Green corridors deliver transport solutions that are more economically, ecologically & socially viable than other (non-green) corridors. The transports within the corridors are efficient, and when possible the optimum transport mode is used. Hence a large proportion of the goods transported within the corridors often are international or other long distance transport, through intermodal transports, with use of freight trains, inland waterways, modular road trains, trucks using alternative fuels, trucks with the best Euronorm, or other efficient and more environmentally-friendly transport modes between the trans-shipment points. At the trans-shipment points, the goods will be shifted to local trucks in an efficient manner in regard to time and costs, to be distributed to the receivers.

Each Green Corridor is defined by a basis of measurable indicators, KPIs, whereby the corridor can be compared with the rest of the transport sector in Europe and over time, also compared with other Green Corridors and itself. A Green Corridor is only green if the indicators relating to the specific corridor are better than the European average and that there is a continuous improvement of these indicators over time. Indicators should be linked to the cargo volumes, environment, efficiency, economy etc. It is also important that only a limited number of measurable KPIs are chosen for each corridor, in order not to lose out on the comparability.

Annex 1 – List of contacted persons

Experts and other Green Corridors projects

DK - Scandria		Per Homann Jespersen
PL - TransBaltic	Maritime Institute in Gdansk	Urszula Kowalczyk
Brenner Corridor Platform		Simon Lochmann
Corridor A (Rotterdam-Genoa)		Stefan Wendel
DE	Hamburg-Harburg Technical University	Professor Heike Flämig
DE	Ministry of transport in Mecklenburg-Vorpommern	Karl Schmude
DK	DTU	Seniorforsker Ole Kveiborg
DK	Region Sjælland	Leif Gjesing
EcoMobility		Jesper König
EcoMobility		Sten Wandel
LT	Suggestions through Competence Center for Intermodal Transport and Logistics (CCITL) in Vilnius	Professor Ramunas Palsaitis
SuperGreen	Laboratory for Maritime Transport, National Technical University of Athens	Prof. Harilaos N. Psaraftis
SuperGreen	Laboratory for Maritime Transport, National Technical University of Athens	George Panagakos
TransBaltic	Project Manager	Wiktor Szydarowski
DK - Scandria		Sandrina Lohse
SE	Näringsdepartementet	Jerker Sjögren
SE	Trafikverket (GC Secretariat)	Kontorchef Kenneth Wåhlberg
SE	Trafikverket (GC Secretariat)	Annelie Nylander
SE	Trafikverket (GC Secretariat)	Rikard Engström
SE	Vinnova	Inger Gustafsson
SE	Vinnova(GC Secretariat)	Eva Schelin
SE	Port of Gothenburg	Arvid Guthed
SE	Conlogic	Magnus Swahn
SE	TransportGruppen (Logistikforum)	Stefan Back
European Commission	Former Policy Officer Green Corridors	Rein Jüriado
European Commission	Head of Unit, Logistics	Pawel Stelmaszczyk

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Region Skåne	Mats Petersson
Trafikverket	Karin Nilsson
Trafikverket	Leif Ringhagen
Netport	Gunnar Fastén
VGTV	Vladas Sturys
KSRC	Vytautas Paulauskas
KSSA	Kristina Gontier
LitRail	Sasys Zurba
LitRoad	Gintaras Cilcius
Port Sassnitz	Patrick Schwabe
Wismar Uni	Gunnar Prause
Ministry, M-V	Karl Schmude
IT-Initiative M-V	Andreas Müller
Mun. Fredericia	Troels Lemonius
Port Fredericia	Jens Peter Peters
Vejdirektoratet	Jens Pedersen,
Danish Technical University	Jens Clausen
Trafikstyrelsen	Mikkel Krogsgaard Niss
Glubokoe Council of Deputies	Alexander Kolbasich
Region Blekinge	Bengt Gustafsson

Annex 2 – Email survey

Dear Green Corridor expert,

Tetraplan, with Incentive Partners as subcontractor, has received the assignment to create a draft definition and vision for the Green Corridor concept for the Interreg-project East West Transport Corridor, through its partner Trafikstyrelsen (Danish Transport Authority). This is a part of the work to create a Green Corridor Manual and the Deliverables should be finalised already by the beginning of March.

In this respect, we would very much appreciate your help in giving your input. We have prepared a small number of questions, to which we hope that you will respond freely. Please be as free of mind as possible.

The basis for our work will be the Swedish definition of Green Corridors, as this seems to be the closest to an existing definition that we have found. You will find it in the enclosed document, where we have also listed the questions that we would like you to answer.

We will need your answers already by 16 February, in order for us to collect the answers for the following work of compiling into a draft definition and vision. We are looking at the EU-level, as well as specifically for the EWTC.

We very much appreciate your efforts in this work and rely on your timely answers by 16/2.

Please also note that we will make follow-ups of these email queries via telephone interviews within the coming weeks, in order to get closer to a draft definition and vision.

Please don't hesitate to contact us, should you have any queries.

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Best regards,

Preben Thisgaard

On behalf of the Project Team

Questions for a Definition and Vision for Green Corridors Concept

There are many views to what Green Corridors are. There is no clear and more detailed

definition, and that is what we now are working towards. Basis for our work is the Swedish definition:

Green Corridors aim at reducing environmental and climate impact while increasing safety and efficiency. Characteristics of a green corridor include:

- *Sustainable logistics solutions with documented reductions of environmental and climate impact, high safety, high quality and strong efficiency,*
- *Integrated logistics concepts with optimal utilisation of all transport modes, so called co-modality,*
- *Harmonised regulations with openness for all actors,*
- *A concentration of national and international freight traffic on relatively long transport routes,*
- *Efficient and strategically placed trans-shipment points, as well as an adapted, supportive infrastructure, and*
- *A platform for development and demonstration of innovative logistics solutions, including information systems, collaborative models and technology.*

For inspiration and further information about the Green Corridors work in Sweden, please have a look through this link:

http://www.trafikverket.se/PageFiles/42690/green_corridors_54b68536.pdf

Based on the above 6 points, we would like you to give us your ideas on the definition. Therefore, we would very much appreciate your input as regards the following issues.

1. What would be sustainable solutions and how would you define sustainable?
2. What should a Green Corridor include? (Infrastructure, service, rules etc.)
3. What would define a Green Corridor compared to other Corridors? How can Corridors be compared?
4. What kind of innovative ideas would you like to see in Green Corridors? Within which areas?
5. Any other specific issues that you would like to point out for the Definition?
6. What is your Vision for Green Corridors towards 2020 and 2030?



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