

**Proposal for environment  
sector initiatives in the  
transport area.**

**Copenhagen July, 1998**

Ministry of Transport  
Frederiksholms Kanal 27  
DK - 1220 Copenhagen K  
Denmark  
Homepage: [www.trm.dk](http://www.trm.dk)  
E-mail: [jfr@trm.dk](mailto:jfr@trm.dk)  
Phone: +(45) 33 92 33 55  
Fax: +(45) 33 12 38 93  
Project Coordinator: Mr. Jakob  
Franck



**Trafikministeriet**

## Table of contents.

<b>Page</b>	<b>Content</b>
2	1. Baltic Agenda 21.
3	1.1 Goal for sustainable transport.
3	1.2 Gaps and Obstacles
4	1.3 Actions in the transport sector.
4	2. Baltic Agenda 21 - Transport
4	2.1 What is Sustainable Transport.
6	2.2 Goods transport.
7	2.3 Indicators.
7	2.4 Trend unchanged.
8	2.5 What is needed for a sustainable transportdevelopment.
9	3. Goal for the transport sector programme.
9	4. Contents of transport sector programme for 1998.
9	5. Proposal of a transport sector programme for 1999.
10	5.1 Trade facilitation and multimodal transport.
11	5.2 External costs and AEI (Assessment of Environmental Impact, or VVM in Danish).
11	5.3 Other.
12	6. Environmental consequences of the implementation of the sector programme.
12	6.1 Activities.
13	6.2 Output.
13	6.3 Indicators for the transport sector programme.
14	6.3.1 Logistics Index - Introduction.
15	6.3.2 The Basis for the survey.
15	6.3.3 The Purpose of the Survey.
15	6.3.4 Definition of Terms.
15	6.3.5 Performance and Strategy.
15	6.3.6 The Baltic and North European Index.
18	6.4 Logistics index as indicator.

## Proposal

July 1, 1998

### **Environment sector initiatives in the transport area for 1999.**

In May 1997 the Danish Government presented a new strategy for support for Eastern Europe. The new strategy includes the setting up of a regional environmental effort integrated across sectors in the Baltic region, where the development of for instance the energy, industry, agricultural, forestry and transport sectors must take place on an environmentally sustainable basis.

The sector programme for the transport area springs from the Agenda 21 recommendations, and is part of the implementation of the Baltic Agenda 21 action plan for sustainable transport; the programme is also a continuation of the 1998 programme. Emphasis has been placed on ensuring a long-term effort through the programme.

#### **1. Baltic Agenda 21<sup>1</sup>.**

It is important to set up adequate goals and establish objectives to guide the transition towards sustainable development. Used in the Baltic Agenda 21 context, they indicate a direction rather than a state and should therefore be seen in a dynamic, not a static, context.

Keeping within environmental and natural resources limits is a long-term necessity for achieving sustainable development, and an over-riding goal that will influence also the development of the Baltic Sea Region.

The need to keep development within the limits of the ecosystems and the resource base is therefore recognised as the long-term overall strategy. The richness of natural resources and a healthy environment in the Baltic Sea Region must prevail as a fundamental basis also for the development aspirations of future generations.

The tools to make it possible to reach the objectives are, however, of an economic and social nature, requiring well-functioning societies in which new solutions (technological and other) are found that do not contradict sustainable development, and that non-sustainable systems and practices are abandoned.

The following **Overall Goal for Sustainable Development** has been adopted as the common basis for Baltic Agenda 21:

"The essential objective of Baltic Sea Region co-operation is the constant improvement of the living and working conditions of their peoples within the framework of sustainable development, sustainable management of natural resources, and protection of the environment." Sustainable development includes three mutually interdependent dimensions - economic, social and environmental.

---

<sup>1</sup> Part 1 is describing the content from "Agenda 21 for the Baltic Sea Region" June 1998.

This means for the region:

- ◆ a safe and healthy life for current and future generations
- ◆ a co-operative and prosperous economy and a society for all
- ◆ that local and regional co-operation is based on democracy, openness and participation
- ◆ that biological and ecosystem diversity and productivity are restored or maintained
- ◆ that pollution of the atmosphere, land and water does not exceed the capacity of nature to recover from its impact
  - that renewable resources are efficiently used and managed, within their regeneration capacity
  - that material flow of non-renewable resources are made efficient and cyclic, and that renewable substitutes are created and promoted
  - that awareness of the elements and processes leading to sustainability is high among various different actors and levels of society.

The sector goals for transport address different aspects of the overall goal, and indicate how the development of the transport sector should contribute to the objectives of the overall goal and to sustainable development in the Baltic Sea Region.

### **1.1 Goal for sustainable transport.**

The goal with regard to sustainable transport in the Baltic Sea region consists of two components:

- To minimise the negative environmental effects, the consumption of non-renewable resources and the use of land for transport purposes to protect human health and the environment, in particular the sensitive ecosystems of the region.
- To retain transport's ability to serve the economic and social development of the Baltic Sea region.

### **1.2 Gaps and Obstacles**

In order to make a transition towards sustainable development, the most crucial issue to address is how to make the three aspects of sustainable development interact and support each other. The gap constitutes the insufficient efforts made to assure that economic activities are kept within the long-term carrying capacity of nature, at the same time as a favourable economic and business climate is achieved and the well being of people is assured.

At present, the efforts made to overcome the economic dependence on non-renewable energy and material resources in the countries of the Baltic Sea Region are insufficient, as are also the measures undertaken to reduce pollution and other impact on the environment.

Even though there are political agreements stating that the Polluter Pays Principle and the Precautionary Principle are to guide policies and decision making, in order to internalise environmental aspects and to deal with uncertainties, it has proven politically difficult to implement these principles fully.

The driving forces to achieve economic growth, as well as regional and national equity, are strong. This is so because the interests of the governments, the private sector and the general public coincide. Admittedly, in the short-term perspective it is important to provide a favourable business climate in the region, especially in the transition countries, where there are still many basic barriers remaining to a balanced economic development. Such barriers consist of i.a. incomplete legislation, weak law enforcement, custom and certification problems, illegal trade, deficiencies in the taxation system and excessive bureaucracy.

Economic growth and environmental investments will also improve the possibilities for solving social problems, such as for instance unemployment, health care issues and social security.

Also at the national level, the integration of economic, environmental and social concerns in public and private sector policies and decisions, applying a holistic and long-term perspective leaves room for improvement.

The co-operation between sectors to solve problems and to promote solutions across sectors to avoid problems is insufficient.

Further, there is a lack of responsibility devolved to and accepted by the sectors.

### **1.3 Actions in the transport sector.**

The transport sector action programme in Baltic Agenda 21 focuses on developing the necessary institutional and legal framework; on establishing a regular, long term co-operation process in the region with regard to sustainable transport; on avoiding duplication of the action programmes of other institutions and making use of existing co-operation bodies in the region. The programme emphasises implementation of instruments (assessment and auditing processes, public sector participation, indicator-based trend observation, education, training) rather than technical or infrastructure "hardware" projects.

One of the actions mentioned in the Baltic Agenda 21 is:

*"Establish and strengthen collaboration among the governments with regard to measures for more efficient goods transportation in particular by improving railway and ship connection.*

*National governments will establish regular collaboration towards sustainable transport in order to secure common goals, and to avoid unfair competition by subsidising non eco-efficient means of transport or unnecessary investment in infrastructure.*

*The current situation in the region is still characterised by large inefficiencies in freight transport.*

*Therefore a trade facilitation and multimodal transport programme in the region which systematises and rationalises procedures, information flows and documentation will be started.*

*There is a need to develop and support efficient operation of combined mode (multimodal) transport and reduce the physical barriers; while at the same time upgrading the customs systems will reduce lead time, detours, and the use of obsolete or highly polluting equipment in the total transport process*

*In this context pilot projects will be carried out to show the achievable improvements."*

## **2. Baltic Agenda 21 - Transport.<sup>2</sup>**

### **2.1 What is Sustainable Transport.**

Access to people, places, goods and services is important for the social and economic well-being of communities. Transport is a key means to ensuring access. It is particularly important for the development of strong co-operation within the Baltic Sea region.

In modern societies, which are characterised by highly specialised division of labour in industrial production chains, by open markets and by - compared to most countries of the world - high private household incomes, private passenger cars and lorries have become the most important transport modes.

The Baltic Sea is traditionally a shipping and trading route. Shipping lines can link the densely populated areas in the region. However, at the same time the Baltic Sea also poses

---

<sup>2</sup> Part 2 is describing the content from "Baltic 21 Transport Sector Report" February 1998.

specific challenges for transport. These include the naturally limited speed of waterborne transport and the fact that road transport tends to concentrate in a few corridors around the Baltic Sea. The development of efficient, safe and sustainable sea transport is an objective for all countries bordering the Baltic Sea.

The increasing movement of both people and goods have the potential to improve the quality of life, but could - if no appropriate measures are taken - on the other hand increase the number of accidents; emissions of air pollutants, greenhouse gases, and noise; the pollution of the Baltic sea; the fragmentation of nature and urban or rural landscapes, loss in biodiversity; and consumption of fossil fuels without sufficient development of renewable substitutes.

In order to ensure mobility with less negative impact on nature and societies, most countries promote transport modes with lower fuel consumption and emissions, and the transport of goods via rail, inland navigation and coastal shipping, respectively. Nevertheless, market conditions as well as individual preferences currently do not support the use of the modes with less specific negative impact.

Besides the growing overall demand for transport in the Baltic Sea region, there is a shift taking place towards private cars, road cargo transport, air transport and high speed ferries, modes that may increase the undesirable effects. However, rail transport, conventional water transport, and even public transport can also be a threat to the environment if they are based on outdated technology, poorly utilised organisation or use dirty fuels.

***The goal with regard to sustainable transport in the Baltic Sea Region consists of two components:***

- 1. to retain transport's ability to serve the economic and social development of the Baltic Sea region; and***
- 2. to protect human health and the environment, in particular the sensitive ecosystems of the region, including those of forests and lakes and of the Baltic Sea itself, and to minimise the consumption of non-renewable resources and the use of land for transport purposes.***

The shift to road transport is still going on in Europe, although here modern public transport systems and high-speed railways have been established in the transport market. On the other hand the shift - both in the passenger and the freight market - has reduced the share of other modes and has led in some areas to a reduction of services offered by public transport concerning coverage, frequency and quality.

The common problems of the transport sector in all industrialised and wealthy countries, increasing demand for mineral oil fuels, severe air pollution and an increasing noise level due to transport activities, are a threat to and partly a destruction of nature. Furthermore, congestion, especially in large cities and conurbation, fatalities and injuries due to road accidents are adverse effects of this development.

The transport system demands large investments and leads to: High per-capita transport activities in terms of passenger kilometres and ton kilometres, carried out mainly by passenger cars and trucks, not only indicate economic progress and welfare, but also cause environmental problems.

The situations of the South-east<sup>3</sup> (S-E) and North-west<sup>4</sup> (N-W) Baltic Sea region are different. In the countries of the south east, economic development is associated with rapidly growing traffic volumes for which transport infrastructure must be developed. Progress towards sustainable transport must accommodate traffic growth and infrastructure development while mitigating their negative effects on the environment.

The policies selected for implementation must be those that target the driving forces behind the current trends and take into account the lessons learned in North-west Europe during the recent decades.

The policies will be based on the following strategies:

- Develop the necessary institutional and legal framework to integrate transport and land-use planning (spatial planning, physical planning) so as to reduce or mitigate transport demand in the medium and long term.
- Ensure that sustainable transport supports attainment of sustainable development in other sectors by being efficient and timely.
- Give priority to modes of transport that meet needs in the most ecologically efficient manner in every specific case, which may include a general shift from road transport to sea and rail transport, if appropriate.
- Raise public awareness about the environmental, social, economic, and safety-related consequences of excessive motorised transport; provide information and promote public discussion of sustainable transport.
- Apply the polluter-pays principle by internalising external costs so that each transport mode bears its current and future social and environmental costs.
- Promote the use of cleaner and more fuel-efficient transport technologies by use of fiscal instruments and legal standards.
- Improve the overall operational efficiency of transport systems.

## **2.2 Goods transport.**

In order to increase the efficiency and reliability of transport operations, different technology systems are already in use and still under preparation. Information technology in the freight transport sector handles a wide range of freight management functions or systems. Main objective is the effective planning (of the logistic chain) and monitoring of the vehicle fleet and the freight. Information technology can support a shift from long-distance road to combined mode transport by making rail and shipping more competitive, e.g. by reducing time losses.

The development of goods transport and trade in S-E countries is characterised all in all by a lack of systems, of expertise, modern equipment and strategies paying heed to the requirements and wishes of the international enterprises, to economic efficiency and especially to the environment. The way in which the systems work today in the transport field cause both great delays of the transport and delays in connection with documentation, customs clearance and other procedures.

This causes very poor utilisation of the existing transport equipment while at the same time not enough money is earned to replace what is often obsolete and highly polluting equipment. For lorry transport, the system delays have meant that the transport capacity has had to be increased.

The development is illustrated quite well by the fact that many companies have been forced to increase the transport distance, and thereby increase the environmental impact of the transport, due to the very poor facilitation of border crossing. At the same time there is a

---

<sup>3</sup> Southeast is used for Russia, Estonia, Latvia, Lithuania and Poland

<sup>4</sup> Northwest is used for Germany, Denmark, Sweden, Norway and Finland.

tendency to use ports where the subsequent surface transport is much longer than needed.

This development takes place at the same time as lack of efficiency and competitiveness on the part of the railways "force" more and more cargoes to be switched to lorries, because the railways are unable, as the situation is, to provide the flexible customer service required in today's competitive environment.

### **2.3 Indicators.**

Within the complex structural situation of the various Baltic Sea countries sketched above, all decisions made by public and private parties influence the chances for future transport development. In order to support a sustainable transport future, the question arises how sustainability can be measured, and what kind of indicators could be applied to guide the decisions. Indicators are to be used both to help guessing the current situation and to assess the consequences of the various options.

At the moment it will be necessary to develop indicators which can measure the effects of the actions but there is a lack of defined goals in some sectors - e.g. transport - that can be monitored and evaluated and that can help to identify conflicting interests within and between sectors.

Following this, at present, it is difficult to procure information that is based on common classification systems and data collection methods.

### **2.4 Trend unchanged.**

The S-E countries will experience more changes and larger increases especially in private mobility. In the following considerations we concentrate on land transport; for international air and sea transport the developments might be similar to the N-W countries. Motor vehicle ownership and use is expected to grow at a rate of up to 10 % over the coming years, or even more. The S-E countries' goods transport sector also will undergo rapid change towards road haulage because the economy demands flexible transport services, which private truck operators are able to offer, rather than the slow and inflexible services state-run railway companies offer. This can already be observed in this part of the region. Spatial changes in the locations of production and logistical centres support the demand trend towards the truck.

The logistical development with increased focus on just-in-time delivery (to reduce stocks and inventories) means that the size of goods units will decrease (to avoid stocks at both supplier and recipient), and that the frequency of transports will therefore increase. This development will, if the emphasis is laid in the policies on improving trade facilitation and multimodal transport, mean that there will be:

- more vehicles on the roads;
- less use of rail transport;
- lower utilisation of existing transport equipment;
- less money for new transport equipment;
- longer delays at border points and harbours, and thereby a need for more transport units to handle the same amount of cargo;
- increased need for capital investment;
- more empty transports (empty legs) than today, etc.

These factors will cause significant increases of environmental impact.

Under the conditions caused by this trend, local air quality in cities and conurbation is expected to suffer significantly due to traffic increases. Also some other social and environmental indicators will worsen. Road fatalities and injuries will invariably rise. Although costly road network extensions will be constructed, congestion will increase, and the nuisance caused by noise for the people living near roads is going to be higher as well.



The current situation and the trend development in the S-E countries mean insufficient attention for the following problems:

- road and highway infrastructure projects with heavy investments are under construction or already planned;
- deterioration of the rail network at the same time;
- lack of financial support for the public transport system;
- the shift from rail to lorries for freight transport;
- high specific emissions because of an out obsolete vehicle fleet;
- assuming a development in air transport for passengers and freight at least similar to that of the N-W countries, an annual growth rate of between 6 and 7 % until 2030 can be expected. This growth will exceed the gains achieved through technical improvement, which means an increase of CO<sub>2</sub> emissions;
- for Estonia, Latvia and Lithuania the EU assumes a growth rate of 75 % for sea transport. Regarding the sulphur content in marine fuels and the trend towards high-speed ships, an increasing contribution by sea transport to environmental and health damage could become severe.

## **2.5 What is needed for a sustainable transport development.**

In the countries in transition, the high increase in transport energy consumption, noise level due to transport, destruction of nature and landscape, and the increase in exhaust emission caused by trend conditions can only be avoided if sustainable transport measures are implemented.

For transport of goods, the sustainable transport scenario comprises advantages in the long term in a well-kept rail system and a short sea shipping system which especially makes the goods transit from Baltic Sea harbours more profitable. The use of fiscal and economic instruments will reduce the number of high-speed ferries in the region and support the adoption of best available technology for reducing the emission of NO<sub>x</sub> and SO<sub>2</sub> of existing and new ships. Fuel quality has to be strictly regulated and controlled.

For goods transport, the focus on development of trade facilitation and multimodal transport which will systematise and rationalise procedures, information flows and documentation relating to trade and transport will reduce lead times - besides making transport systems more efficient. It will develop and support efficient operation of multimodal transport and reduce the physical barriers, while at the same time an upgrading of the customs systems will reduce lead time, detours, the use of obsolete equipment and highly polluting equipment in the total transport process.

Higher cost for lorry transport of course would increase cost of long-distance products but local manufacturers will become more competitive, which will in turn stabilise the local labour market. Sustainable transport is built by adjusting transport costs to improve conditions for local and regional production and distribution networks, while disincentives are imposed on non-sustainable structures. The S-E countries basically have advantages compared to the N-W countries because the spatial structures are relatively concentrated, not widely dispersed. The sustainable transport scenario assumes that these advantages are preserved.

## **3. Goal for the transport sector programme.**

**The overall goal for the transport sector programme is to support the development of sustainable transport in the framework of Baltic Agenda 21. The programme is part of the implementation of the action programme for sustainable transport.**

**As a parallel goal the programme will support the co-operation between the Ministries of Transport and the Ministries of Environment. Today, this co-operation is at best weak and often non-existent.**

#### **4. Contents of transport sector programme for 1998.**

The proposal for environmental sector initiatives for 1998 in the transport area emphasises supporting sea and railway transport. The focus will be on combined mode transport, including especially the factors which cause both sea and railway transport to lose ground. The intention is primarily to make procedures and document handling more flexible and efficient.

The programme conforms to the Baltic Agenda 21 - section on transport, in which the programme is one of the explicitly stated initiatives on the transport area. Further, the sector programme is an integrated part of a World Bank programme in Estonia.

It must be added that the sector programme has been drawn up for areas in which the beneficiary countries have recognised the necessity for help, and where the Ministry has already good and close contacts.

The Ministry is carrying out an environmental sector programme in the transport area, starting in 1998 but stretching over several years. The programme amounts to DKK 13 million to technical assistance and comprises Russia (Saint Petersburg) and Estonia in the following areas:

- A.** development of multimodal transport (make possible and simplify the use of different transport modes for the same consignment),
- B.** development of trade facilitation (rationalise paperwork, simplify customs clearance, remove trade barriers etc.),
- C.** assess the environmental impact of the various transport modes, and assess the external costs in connection with the various transport modes and
- D.** AEI (Assessment of Environmental Impact, or VVM in Danish) of a developed transport concept (Gateway Saint Petersburg).

It is expected that approximately DKK 3 million of the DKK 13 million will be spent in Estonia, and DKK 9 to 10 million will be spent in the Saint Petersburg area. The programme has a budget of DKK 5 million for 1998 and DKK 8 million for 1999.

#### **5. Proposal of a transport sector programme for 1999.**

The programme originates from the Agenda 21 recommendations and is a continuation of the 1998 programme. It emphasises ensuring a long-term programme initiative.

The work on trade facilitation (rationalise paperwork, simplify customs clearance, remove trade barriers etc.), and multimodal transport (facilitate and simplify the deployment of different transport modes for the same shipment) will continue. It will aim to strengthen the position and competitiveness of railway and sea transport (including transport by inland waterways) relative to road transport, in accordance with action TR 2 (action 9.3.40) in the Baltic Agenda 21.

The programme is expected to include the Saint Petersburg area and the Baltic countries, with budgets of DKK 3 million for 1999, DKK 6 million for 2000 and DKK 6 million for 2001.

##### **5.1 Trade facilitation and multimodal transport.**

One of the reasons why the environmentally superior transport modes lose market share to road haulage is that the change from one transport mode to another normally means acquiring and drafting an entirely new set of transport documents.

**Multimodal transport** means that transport by different transport modes may be carried out using **one** transport document. This fact alone means a major simplification of the use of railways for freight transport.

Another fact which causes no end of complications to using environmentally expedient transport modes is the tendency of each transport mode to live its own separate existence, create its own routines, etc., something which causes delays wherever a switch from one mode of transport to another is involved.

It is not only in Western Europe that there is ever increasing demand and pressure for expanding the road network. This is also the case in Eastern Europe, where road haulage is on a constant rise at the expense of the environmentally friendly transport modes, such as railway, ships at sea and ships on inland waterways. The pressure in Eastern Europe to expand the road network is very strong indeed. At the same time, the growing transport of goods by road in cities like Saint Petersburg, Tallinn, Riga and others exacts a toll of ever increasing impact on the local environment.

It is therefore important to endeavour to make the environmentally friendly transport modes more competitive. The first interim objective is to shorten the transport time by making procedures and document handling more flexible, and by introducing random sample inspection of shipments (**trade facilitation**). The prevailing current conditions require Russian customs officials to carry out inspections on all shipments, which means that shipments of goods accumulate and the transport time grows to unacceptable length. At the same time the problem of theft also escalates.

These problems obviously grow *pari passu* with the size of the shipments (for sea and rail transport), and are influenced by the spread of liberalisation and privatisation, which means that customs clearance has often to take place in localities not designed for this purpose (insufficiently secured and much too small). At the same time the rolling transport equipment is under-utilised because it cannot be deployed for long periods of time due to waiting time.

Based on the preparatory project already carried out in Saint Petersburg it is the assessment that it will be possible to improve matters significantly without making new investments in infrastructure etc. It is furthermore the assessment that that a rationalisation of the customs clearance may be achieved at very modest costs.

It should also be noted that a not insignificant by-product of the **trade facilitation** endeavour will be, as implied in the term, a streamlining of the trade in goods and services, and hence also simplify business for Danish export companies.

In the **Saint Petersburg area** it is expected that implementation of the registration of companies must continue with special close links to the Russian customs committee. Beyond this, the work on trade facilitation must be followed up before any positive effect may be seen in connection with the introduction of more flexible systems, in the harbours as well as with the customs authorities.

With a view to ensuring significantly better utilisation of the capacity of the transport equipment, that is, reduce the rate of empty return trips (empty legs) and increase the volume of freight generally, the intention is to emphasise logistics to create more viable national and international distribution for Russian carriers.

In **Estonia** it is expected that the current work with trade facilitation is to continue in close co-operation with the World Bank, with special focus on training and implementation, and there are considerations on setting up a companies register. Furthermore, it is the intention to focus on the concept of multimodal transport and the introduction of EDI (Electronic Data Interchange).

In **Latvia and Lithuania** the work currently aims to widen the co-operation with the World Bank on the formulation of a strategy for trade supporting infrastructure and services. The intention of these studies is to establish an overall picture of the deficiencies and weak points in relation to transport and trade of the country in question. The strategy is to clarify the need for infrastructure investments, but is at the same time to discover weaknesses of document handling, procedure, customs clearance, insurance and payment guarantees, etc. The strategy studies are expected to be carried out in 1999.

It is also the intention to initiate trade facilitation projects proper in the countries corresponding to the contents of the 1998 Estonia programme. These are not expected to commence until 2000.

## **5.2 External costs and AEI (Assessment of Environmental Impact, or VVM in Danish).**

There is tradition for including estimates of environmental impact in connection with construction and expansion of infrastructure works, and there is no tradition for co-operation between environmental and transport authorities.

Hence it is the intention to create a "model" or "instrument" to make possible a calculation of the external costs. The model should among other things include the following factors.

- maintenance of the infrastructure plant in question
- accidents
- hospital costs
- rehabilitation
- disablement
- pollution (human health, acid rain, deterioration of buildings, pollution of lakes, rivers, fields, forests, etc.)
- noise (reduced hearing, stress, etc.)

At the same time there will be determined some benchmark figures for the environmental impact of the individual transport modes (with especial focus on freight transport), for the purpose of being able to compare the environmental impact of the transport modes.

Thus the purpose is to make explicit and visible the added costs at local, regional and national level that are not currently imposed upon the individual transport mode.

It is furthermore the intention to carry out pilot projects of Environmental Impact Assessment (AEI) in the countries included in the programme for a chosen transport corridor in accordance with the contents of the EU directive with a view to transferring knowledge on why and how such assessments are made. There will also be attention to the question of how citizens may be involved, through public hearings, etc. It should be noted in this connection that environmental aspects are a relatively novel concern, and that there is currently no tradition for inviting citizens to participate in the decision making process.

It is the intention to carry out projects on external costs calculation for infrastructure investments in **Latvia and Lithuania**, and further development of the work on environmental assessment of infrastructure plans in **Estonia and the Saint Petersburg area** may also be considered. It is also the intention to select some "pilot" transport companies in each of the countries included in the programme for the purpose of developing "green" accounts.

## **5.3 Other.**

It is the intention to carry out a project on public transport in Tallinn, for which focus on privatisation of public transport on reasonable terms may be a relevant area. The aim is both to focus on tenders based on clear and transparent rules and criteria, and privatisation should be carried out with a starting point on the Danish model, under which contractors are assigned both some good and some less desirable routes. In any case, the emphasis will be on introducing the EU rules on public tenders.

If it turns out to be relevant it is the intention to look into collection of waste oil from ships in the harbours. There has already been a pre-study of this for Muuga Port in Estonia, but it must be investigated why this project has made no progress.

Finally, it will be considered whether the time is ripe for developing "green taxes" for private cars. It is, however, a requirement that there is a computer-based motor vehicle register.

## **6. Environmental consequences of the implementation of the sector programme**

The development of transport and trade in the S-E countries is characterised by lack of systems, expertise, modern equipment and strategies which pay sufficient attention to the

requirements and wishes of the surrounding countries, in this connection not least as regards the environment.

The way in which the systems work today in the transport field cause *both* great delays of the transport *and* delays in connection with customs clearance, documents and other procedures. This causes very poor utilisation of the existing transport equipment while at the same time not enough money is earned to replace what is often obsolete and *highly polluting* equipment. For lorry transport, the system delays have meant that the transport capacity has had to be increased by approximately 30 % compared to 1996 merely to be able to supply the same volume of transport service.

The development is illustrated quite well by the fact that many companies have found it necessary to double the transport distance, and thereby double the environmental impact, due to the very poor facilitation for border crossing.

The need for more equipment, as well as restrictions from the Russian side, also means that obsolete equipment is used to a higher extent. This development takes place at the same time as lack of efficiency and competitiveness on the part of the railways "force" more and more cargoes to be switched to lorries, because the railways are unable, as the situation is, to provide the flexible customer service required in today's competitive environment.

It is therefore of great importance to initiate a process which, besides making systems more efficient, will reduce lead times, introduce flexible combined-mode solutions to ensure that the development takes due consideration of the environment. There is a need to introduce a transport strategy which incorporates an assessment of the environmental impact of various transport modes, while at the same time it promotes increased use of combined mode transport, creates a broader general understanding amongst the transport industry circles of the negative environmental impact that may be caused by a wrong transport development, and at the same time there is generated broad interest in supporting the environmentally friendly transport development without increasing the general transport costs.

The logistical development with increased focus on *just-in-time* delivery (to reduce stocks and inventories) means that the size of shipments will decrease (to avoid stocks at both supplier and recipient), and that the frequency of transports will therefore increase.

## **6.1 Activities**

A trade facilitation programme will systematise and rationalise procedures, information flows and documentation relating to trade and transport. It will develop and support efficient operation of multimodal transport and reduce the physical barriers, while at the same time an upgrading of the customs systems will reduce lead time, detours, the use of obsolete equipment and highly polluting equipment in the total transport process.

There will be focus upon:

- strategy components in the planning and execution of transport which have a positive influence on securing the environment in connection with transport;
- harmonisation of unification of components and criteria pertaining to international transport and trade, as well as local distribution;
- increasing the efficiency and utilisation of the transport capacity in connection with international transport and transport related transactions;
- introducing best practices experience and logistical index benchmarking;
- establishing *performance indicators* for the individual areas, including the environmental area;
- supporting efforts across borders within trade and transport so that there may be established a tight strategy for the parties involved, and
- introducing more cost efficient activities, better utilisation of the transport capacity, and minimising the need for further capital investment in connection with transport.

## **6.2 Output**

The sector programme will not only support an environmentally viable transport development, but will also lead to tangible results. The sector programme will provide the basis for a reduction of the number of lorries through optimisation of the activities surrounding the actual execution of the transport, and a de facto improvement of the efforts in the transport companies.

The sector programme will contribute towards reducing the external costs and support the development of combined road and rail transport. The sector programme will support and contribute towards increasing the number of multimodal transport operators, and thereby support the development of non-stop transport, with a focus on employing the most environmentally friendly transport modes.

This will help reduce the number of empty transports/ empty capacity. The sector programme will promote the development of multimodal transport, with the emphasis on ship/ railway, and help reduce the tonne per kilometre development through opening of more direct transport routes in the region.

As mentioned, tangible performance indicators will be introduced within the individual areas. In the subsequent phases these will serve as a checklist for the sector programme and the authorities involved, as well as for private companies. Thereby the sector programme will also constitute a basis, or pilot project, for establishing *performance indicators* which may be employed by local actors, and thereby secure the environmental dimension in the transport policy context.

Last, the sector programme will contribute towards initiating a dialogue or co-operation between the environment and transport authorities of Russia and Estonia.

## **6.3 Indicators for the transport sector programme.**

To attempt to measure the effect of the effort we have established the following indicators for the sector programme.

First are provided a number of indicators describing the present level of the individual countries. As concerns Germany and Russia, it should be noted that the figures represent the whole country. The statistical information comes from Baltic Agenda 21, the Transport Sector Report 1998. As it is stated it has not been possible to obtain comparable data of more recent date.

	<b>Density inh./km<sup>2</sup> 1995/96</b>	<b>GDP/capita 1995</b>	<b>Air emissions transport sector share - 1993/94</b>	<b>Transport CO<sub>2</sub>- emissions/capita 1993/94</b>
Denmark	122	21502 USD	22%	2561 kg
Germany	234	20370 USD	21%	2234 kg
Sweden	20	18201 USD	37%	2464 kg
Estonia	35	4035 USD	6%	712 kg
Latvia	39	3261 USD	22%	904 kg
Lithuania	56	4014 USD	16%	654 kg
Russia	9	4401 USD	4%	431 kg

Source: Baltic Agenda 21, Transport Sector Report, 1998

	<b>Car-density/ 1000 inh.</b>	<b>Road transport t-km per capita 1995</b>	<b>Rail transport t-km per capita 1995</b>
Denmark	323	2.104	251
Germany	493	4.267	849
Sweden	416	3.285	2.132
Estonia	251	n.a.	2.500
Latvia	127	743	3.950
Lithuania	191	1.419	2.105
Russia	91	n.a.	n.a.

Source: Baltic Agenda 21, Transport Sector report, 1998

For the S-E countries it is expected that the GDP per capita will grow at a higher rate than in the N-W countries.

Therefore it is expected that in the S-E countries increase in motor vehicle use also will lead to a significant increase in fuel consumption. The exhaust emission will therefore increase over the coming years because fleet growth.

Emission control technology of the vehicle fleet is less advanced than in the N-W countries. Rapidly growing traffic and poor technical as well as maintenance levels will increase fuel the emission. Although today's figures for absolute emissions as well as per-capita emissions in traffic are well below those of the N-W countries, a worsening emission situation is expected to aggravate the environmental and health problems.

Most S-E countries are currently implementing emission and fuel quality regulations that in the long run, following fleet renewal, will lead to similar vehicle fleets as in the N-W countries; but this is likely to take a long time. Current fleet and kilometre increases as well as the expected figures will lead to increasing total traffic emissions, especially of NOx, at least over the coming decade.

### **6.3.1 Logistics Index - Introduction.**

As one of the basic indicators the Logistics Index will be applied. Logistics Index is a benchmarking tool, which is used to compare the logistics efficiency – and thereby environmental efficiency – in companies and countries. The index comprises indicators like lead-time, costs and inventory.

The first Logistics Index was carried out on behalf of the Danish Ministry of Business and Industry in 1996 and comprised Denmark, Sweden, Germany, Holland, Belgium, England, Ireland and France.

This study was followed up in 1997 by the Estonian Ministry of Economy and the UNDP, which initiated a Logistics Index study comprising Estonia, Finland, Russia, Latvia, Lithuania, Sweden, Denmark, Holland and Germany.

### **6.3.2 The Basis for the survey.**

The survey was instigated as a consequence of the increasing focus on logistics and distribution in Europe.

The survey covered the strengths of logistics with specific emphasis on warehousing and distribution logistics, and was conducted as an in-depth analysis of a limited segment of market leading companies in three industries – Electronics, Pharmaceuticals and Foodstuffs.

### **6.3.3 The Purpose of the Survey.**

The primary objective was to make an unbiased and factual evaluation of logistics within these three different industries, and to benchmark the competitiveness. The survey also sets out to shed light on how leading edge companies prioritise efficiency within the individual elements of logistics – with emphasis on distribution and replenishment

strategies, lead-time, transport logistics, safety stock levels, customer service and logistics costs in general.

The survey has no statistical foundation, but should be viewed as a benchmark between companies on equal status. The concept of benchmarking is not only recognised by commercial companies; it also has a high level of interest for public authorities.

#### **6.3.4 Definition of Terms.**

In the survey, the term "logistics" defines "out-bound logistics", i.e. the activities in the chain of logistics activities spanning from the finished goods arriving at the warehouse through to their delivery at the customer site, and including replenishment, order processing, warehousing and distribution.

#### **6.3.5 Performance and Strategy.**

Logistics performance is an expression of a company's ability to fulfil customer requirements and expectations in the most optimal way in terms of both service and costs, while keeping the customer in central focus.

Logistics performance includes the following elements:

That customer orders are received and dispatched quickly and efficiently;

- that all orders are delivered as agreed, with the correct delivery notes and invoices;
- that orders are picked and packed correctly and delivered undamaged;
- that the supply and forecasting systems function so that the warehouse always has the optimal stock composition, thereby ensuring a high delivery service; and
- that the internal customers are treated with equal importance to the external customers, so that a cost-effective supply chain is ensured.

The term "strategy" defines the growth and adaptation of market activities that companies must undertake in order to maintain and develop their market position. The company must primarily ensure that the customer is provided with the agreed, relevant service while continuously finding ways to improve efficiency and reduce costs.

#### **6.3.6 The Baltic and North European Index.**

The analysis includes 108 companies in nine countries, and in order to be able to make comparisons between the individual countries and industries a Baltic and North European Logistics Index has been created. The main elements in the index are:

- Lead-time
- Total Warehousing and distribution costs
- Capital costs on inventory
- Safety stock levels

In this area lead-time includes the total time elapsed from the time the company receives the order to the time it is actually delivered to the customer. "Lead-time" is therefore an expression of the efficiency of the supply chain from the finished goods warehouse to delivery at the customer site.

The Total warehousing and distribution costs include all direct costs on finished goods warehousing as well as distribution to customers.

Capital costs are included as interest on the capital investment in inventory. The interest rate used represents 12 % including costs on credit, and the same rate is used for all the companies, industries and countries. The participating companies have divulged their average stock value, and the capital costs include interest payments on the safety stock.

Safety stock levels are defined according to the number of months the individual companies consider necessary to comply with their own service level. The safety stock levels also indicate the internal efficiency supporting the supply chain.

The four main elements are chosen by the participating companies on the basis of their importance in the overall costs and service patterns.



Over recent years lead-time has become increasingly important to the overall impression of service, and this was definitely confirmed by the companies that were interviewed.

There was a clear connection between a strong focus on lead-time and an efficient logistic process, and lead-time is highly weighted in the collective index (higher than costs).

On the basis of the interviews that were conducted, the following weighted average has been used on the individual main elements in the Baltic and North European Index.

- Lead-time – 50 %
- Total costs in connection with warehousing, distribution and capital investments – 40 %
- Safety stock levels – 10 %

The Baltic and North European Logistics Index for the three industries is presented below.

### **Baltic and North European FOOD Logistics Index**

**Table 1.**

	Lead-time	Costs	Safety stock	Logistics Index
Estonia	107	140	104	120
Latvia	134	117	115	126
Lithuania	118	63	130	97
Finland	116	99	104	108
Russia	223	293	417	271
Sweden	55	46	99	47
Denmark	46	48	77	43
Holland	36	46	66	37
Germany	64	48	88	52

*Comparison of the efficiency of three logistics parameters.* Index is calculated on the average for the industry – the lower the figure, the better score. Weighting of cumulative logistics index – cost 40 % - lead-time 50 % safety-stock 10 %.

### **Baltic and North European PHARMA Logistics Index**

**Table 2.**

	Lead-time	Costs	Safety stock	Logistics Index
Estonia	123	94	94	109
Latvia	133	138	171	139
Lithuania	137	117	120	128
Finland	150	95	68	120
Russia	225	242	411	271
Sweden	41	45	7	40
Denmark	33	40	14	55
Holland	26	38	9	29
Germany	33	43	12	56

*Comparison of the efficiency of the three logistics parameters. Index is calculated on the average for the industry – the lower the figure, the better score. Weighting of cumulative logistics index – cost 40 % - lead-time 50 % safety-stock 10 %.*

### **Baltic and North European HI-TECH Logistics Index**

**Table 3.**

	Lead-time	Costs	Safety stock	Logistics Index
Estonia	116	99	85	107
Latvia	253	153	96	241
Lithuania	105	46	101	82
Finland	95	96	115	126
Russia	190	356	459	283
Sweden	26	33	9	27
Denmark	21	34	13	26
Holland	49	43	17	43
Germany	45	39	16	40

*Comparison of the efficiency of the three logistics parameters. Index is calculated on the average for the industry – the lower the figure, the better score. Weighting of cumulative logistics index – cost 40 % - lead-time 50 % safety-stock 10 %.*

The collective Baltic and North European Logistics Index for the three industries is presented below, where the "ranking" method has been employed.

The ranking is first calculated within the three industries and then collated to produce a total ranking spread over the individual countries instead of the individual industries.

### **Baltic and North European Index**

**Table 4.**

	Food	Pharma	Hi-tech	Ranking
Estonia	120	109	107	6
Latvia	126	139	241	8
Lithuania	97	128	82	5
Finland	108	120	126	7
Russia	271	271	283	9
Sweden	47	40	27	3
Denmark	43	55	26	1
Holland	37	29	43	1
Germany	52	56	40	4

*Logistics index for each industry. Ranking based on "country" position in all three Industries. Index is calculated on the average for the industry – the lower the figure, the better score. Weighting of cumulative logistics index – cost 40 % - lead-time 50 % safety-stock 10 %.*

Holland and Denmark hold the position of the leading edge European Logistics performers. Sweden has improved since the 1996 European Logistics Index, and is coming up close to the two others. Germany is still behind the three leaders.

#### **6.4 Logistics index as indicator.**

The effect of the sector programme will be measured by making new logistics index for the countries which are participation in the sector programme. The first time will be in spring 1999. Next time in spring 2000.