TransBaltic

Towards an integrated transport system in the Baltic Sea Region

TransBaltic WP 5.1

Business plans to expand analysed dry ports towards full scale production use

TransBaltic partners in cooperation with LAKES - Lahti Regional Development Company

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REGION SKANE

Foreword

The overall objective of TransBaltic is to provide regional level incentives for the creation of an integrated multimodal transport system in the Baltic Sea Region (BSR). This is to be achieved by means of joint transport development measures and jointly implemented business concepts.

As underlined in the European Union Strategy for the Baltic Sea Region, appropriate public policy response is needed to increase the accessibility of territories and the quality of connections, and to master the increasing flows in and across the Region. TransBaltic is going to contribute to the implementation of the EU Baltic Sea Strategy by adding a sustainable regional growth dimension to the harmonisation actions, which are planned by the national transport ministries (Priority Area 11). Furthermore, the project aspires to develop and test specific transport and logistics solutions, which stem from needs of the Baltic Sea business community and may be introduced to relevant EU and national level policies.

One of the aims of TransBaltic is to formulate a BSR action plan. Several studies and analyses contribute in this process. This internal report high lights findings of the WP 5.1 Dry Port Development. The focus of the report on the business plans to expand analysed dry ports towards full scale production use. The report has main focus on Lahti Dry Port in Finland, but tries to cover main findings done by various Dry Port studies performed under TransBaltic WP 5.1. Please see individual Dry Port studies for detailed information concerning other WP 5.1 studies performed during the project.

The WP 5.1 task has been led by a TransBaltic partner LAKES - Lahti Regional Development Company (Petri Jalkanen) and Ramboll Finland (Jukka Siren). Following TransBaltic partners have actively participated to the WP 5.1 work: Region Skåne, Region Västerbotten, Västra Götaland Region, Region Sjælland, The Institute of Logistics and Warehousing, Self-government of the Warmisko-Mazurskie Voivodeship and Hamburg Port Authority. Associated partners representing logistics service providers, trade and industry have been very active. Professor Kaj Ringsberg has given very remarkable contribution to the WP 5.1 process, special thanks to Kaj!

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Guidelines for the WP 5.1 Work

Dry Port Concept

Many times the difference of a Dry Port and a normal hinterland terminal is not seen. The Dry Port Concept is defined although the definition is not very widely known.

A dry port is an inland intermodal terminal directly connected to seaport(s) by rail where customers can leave/pick up their units as if directly at a seaport. "As if directly at the seaport" is a very crucial part of the definition because it implies a certain level of integration with seaports as well as availability of services that may be found at a seaport, such as storage, maintenance of containers, customs clearance, etc. Therefore, dry ports are used much more consciously than conventional inland terminals, with the aim of improving the situation resulting from increased container flows, and a focus on security and control by the use of information and communication systems. Scheduled and reliable high-capacity transportation to and from the seaport is essential and determines the dry port's performance and its environmental role. Based on their function and their location, dry ports may be categorized as distant, midrange and close. (Dr Violeta Roso, Chalmers University of Technology, Department of Technology Management and Economics)

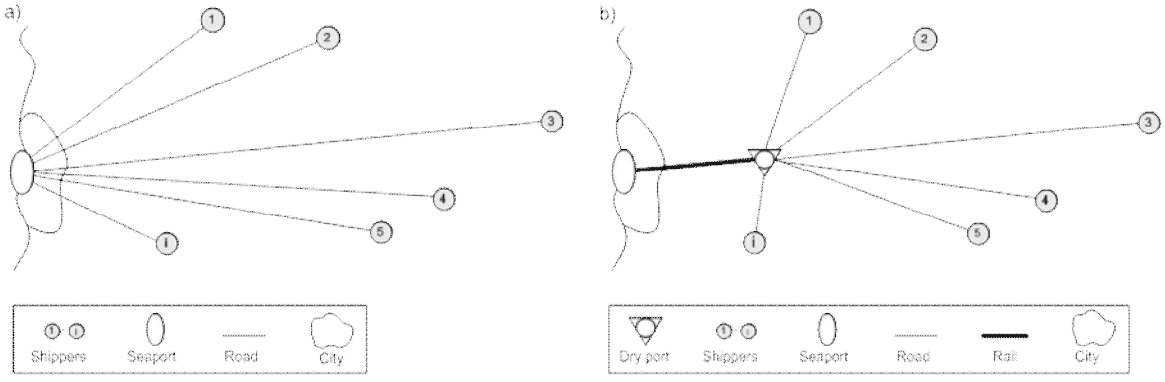


Figure 1. Description of freight flows without and with a dry port (Dr Violeta Roso.

The Dry Port Concept could be needed by

EU:

- Dry Port Concept supports the cohesion and co-modality objectives of the EU transport and regional policies
- Dry Port Concept offers possibilities to sift cargo from road to rail and reduce CO2 emissions
- Dry Port Concept could be component of the future TEN-T network

Ports and areas around the ports:

- Dry Ports offer expansion areas for seaports with limited space
- Dry Ports can partly solve problems caused by increasing truck traffic close to the seaports

Hinterland regions:

- Dry Ports can generate jobs
- Dry Ports can increase hinterland region logistics competitiveness

Transport and logistics companies:

- Dry Ports can offer new business model and open new markets
- Dry Ports can reduce cost
- Dry Ports can offer possibilities to achieve environmental objectives

Table 1. Impacts generated by dry ports for the actors of the transport system (Dr Violeta Roso)

	Distant	Midrange	Close
Seaports	• Less congestion • Expanded hinterland • Interface with hinterland	• Less congestion • Dedicated trains • Depot • Interface with hinterland	• Less congestion • Increased capacity • Depot • Direct loading ship-train
Seaport cities	• Less road congestion • Land use opportunities	• Less road congestion • Land use opportunities	• Less road congestion • Land use opportunities
Rail operators	• Economies of scale • Gain market share	• Day trains • Gain market share	• Less time in congested road terminals • Avoiding environmental zones
Road operators	• Less time in congested roads and terminals	• Less time in congested roads and terminals	• Less time in congested road terminals • Avoiding environmental zones
Shippers	• Improved seaport access • "Environment marketing"	• Improved seaport access • "Environment marketing"	• Improved seaport access
Society	• Lower environmental access • Job opportunities • Regional development	• Lower environmental access • Job opportunities • Regional development	• Lower environmental impact • Job opportunities

Dry Port implementation

The situation of Dry Port development is very different than the situation of seaport development. The seaport development has quite established practices and it could almost be said that all stakeholders know their role and are usually eager to fulfill it:

- EU has policies and instruments: TEN, Motorways of the Seas, interest to develop ports as a part of the transport network, financial support for the investments
- States are in many cases financing/participating to the development of the port infrastructure or at least developing the transport infrastructure (road, rail, sea fairways) to the port
- Municipalities are usually acting as land lords and many times very eager to develop the ports in their area, finance the infrastructure expansions. Municipalities are aware of the positive economic impact and jobs generated by the sea ports. In some cases municipalities or region around the port even owns at least partly the terminal operator of the port.
- Companies running the terminal operators invest in superstructure and actively operate, market and develop the port terminal.
- Customs has clear role, legislation and custom codex developed for the port operations.
- Transport operators (road and rail as well as shipping lines) have established practices and interest to develop the operations.

The Dry Port implementation process is not defined and the implementation path is not generally known. There are no established roles how different stakeholders (EU, State, Region, Municipality, terminal operator, transport operators, customs) should share the risk of Dry Port Implementation. Many times a Dry Port is seen as a normal hinterland terminal/warehouse business, where the terminal operator should take the risk – often including needed infrastructure investments like railway link to the main railway line.

We can find examples where the Dry Port implementation has lead into operational cost savings, opened new markets, improved economic activities and reduced CO2 emissions. However, still stakeholders seem to fear that in their specific case and circumstances the Dry Port might

- rather increase than decrease the cost of the transport chain
- decrease service level and throughput time of the logistics chain
- not reach critical transport volumes to be viable – at the same time there is no clear answer how big the volume (e.g. TEUs/year) should be to be viable

In theory many logistics stakeholders seem to agree of the potential benefits of Dry Ports. At the same time in practice they are not convinced that they should be active concerning the Dry Port implementation. Stakeholders are not convinced that it would be profitable for themselves to be active towards Dry Port concept – one of the main reasons is that it is unclear how the investment, risk and profit should be shared between stakeholders involved.

It seems that existing Dry Ports are developing gradually – the situation in which "shippers can leave and/or collect their goods in intermodal loading units as if directly at the seaport" cannot be reach immediately. According to the Swedish experiences the development bath can be following:

1. Create normal hinterland terminal operation including container handling
   - Minimum volume maybe 6 000 – 8 000 units / year
2. Expand services of the hinterland terminal
   - Stuffing and stripping
   - Minimum volume maybe 10 000 – 12 000 units / year
3. Introduce customs activities (Dry Port stage 1)
   - Minimum volume maybe 20 000 units / year
4. Connect with Port terminal production process (Dry Port Stage 2)
   - IT– integration between Port Terminal and Dry Port
   - Minimum volume over 20 000 units / year

Dry Ports should try to have annual volume of 15 – 20 000 container. If the volumes are staying for example on level of 10 000, the Dry Port might have problems with viability.

TransBaltic WP 5.1 Work flow and contribution to Dry Port Concept

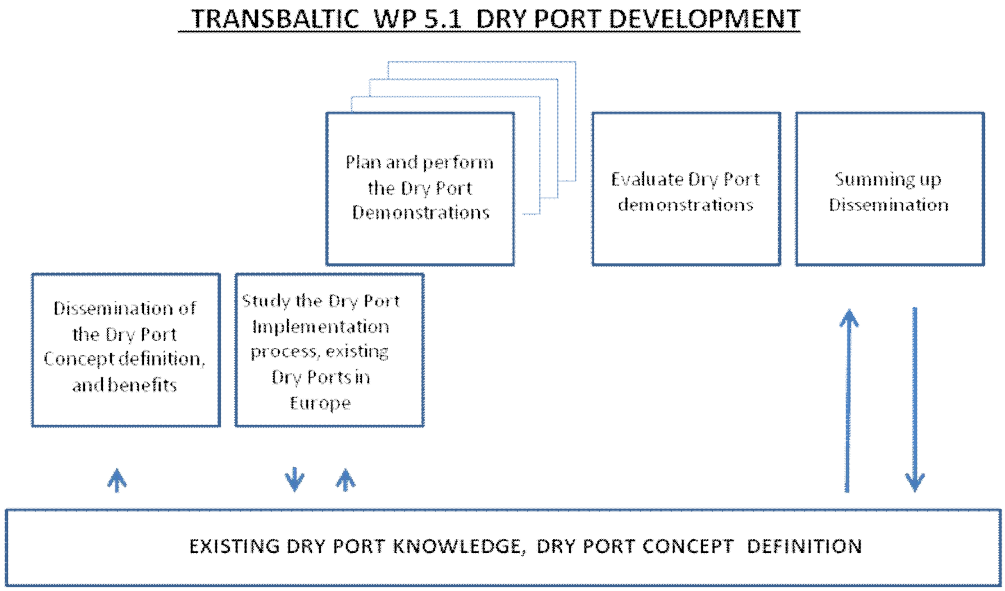


Figure 2. TransBaltic WP 5.1 Dry Port Development process.

TransBaltic WP5.1 tries to contribute to the Dry Port issues in following ways.

1. Make the Dry Port definition widely known.

The Dry Port Concept definition is important – not because of science but because it is important to understand the difference between a normal intermodal hinterland terminal and a Dry Port. A Dry Port can provide with larger added value - "shippers can leave and/or collect their goods in intermodal loading units as if directly at the seaport". Dry Ports offer benefits to larger number of actors than a normal intermodal hinterland terminal. Dry Ports should be part of EU transport policy.

2. Study the Dry Port Implementation Process

The implementation and establishment phase of a Dry Port is not widely known. There is a clear need to study the success stories of Dry Port implementation and share the information even though many of the questions may not have single and simple answers:

- what are the benefits per actor (consignor/consignee, shipping line, port, port terminal, forwarder, road and rail operator, municipality) and how soon the benefits can be reach after the implementation (economical, operational, other impacts)
- what are the needed actions of involved stakeholders during the implementation
- who should lead the establishment
- what kind of total budget is needed for the establishment, how big is the economic risk, how the risk should be shared
- what is the minimum annual volume
- what kind of facilities and resources are needed (yard area, handling equipment, personnel, ITC)
- what kind of train operations are needed, how to ensure that train operations are economically competitive, should the train operations be planned for several Dry Ports in order to reach high enough utilization rate for the wagons

3. Implement feasibility studies and demonstrations

WP 5.1 has several partners – sites - from different parts of the BSR. The sites are very different in many ways – it is not possible to give detailed, strict and common guidelines for all of them. The sites have the right – and also the obligation - to define their own detailed feasibility studies and demonstration actions in following frame:

- The demonstration actions are fulfilling the obligations of the TransBaltic-project application.

- The sites are committed to the Dry Port Concept definition - "The Dry Port concept is based on a seaport directly connected by rail to inland intermodal terminals, shippers can leave and/or collect their goods in intermodal loading units as if directly at the seaport" – and keep this definition as a long term objective of their Dry Port activities.

- The sites familiarize themselves with the Dry Port Concept and Dry Port Implementation information made available during the project.

- The sites plan and perform Dry Port Demonstration actions, which are needed in their site to develop Dry Port activities towards the long term aspiration level "The Dry Port concept is based on a seaport directly connected by rail to inland intermodal terminals, shippers can leave and/or collect their goods in intermodal loading units as if directly at the seaport". It is known that Dry Ports are developed gradually – the situation in which "shippers can leave and/or collect their goods in intermodal loading units as if directly at the seaport" cannot be reach immediately. The demonstration actions should lead towards to the long term aspiration level.

The sites should report the WP 5.1 Leader about the results and thus the demonstrations and their findings will contribute to the general knowledge of Dry Port Implementation.

Main results: Dry Port implementation and expansion

TransBaltic WP 5.1 Dry Port Development –task has many partners around the Baltic Sea Region. The regions made feasibility studies concerning their own Dry Port cases. The findings of each region are a bit different having different emphasis areas. However, following findings can be seen as the main results.

Commercial demand

Commercial demand seems to be a key factor to successful Dry Port implementation and expansion towards full scale production use. Logistics service providers and/or major shippers representing trade or industry should be involved to the implementation as early stage as possible. This may sound very obvious, but reaching really true commitment from the industry side is an issue which should have really strong focus from the very beginning and this must be emphasized. Many issues related to the Dry Port implementation and expansion process are much easier when the end customers are strongly involved into the process. It may lead to wrong investment decisions, if a planning process and investment decisions are done by public bodies without in-depth cooperation with the Dry Port end users. One success story related to the Port of Gothenburg is well described by WP 5.1 case study made by the Region Västerbotten.

The development of dry ports and associated rail shuttles in Scandinavia has been remarkable during the last decade. Most of the rail shuttles have Port of Gothenburg as their destination. Currently, Port of Gothenburg has 27 hinterland rail shuttles to 23 different destinations and dry ports in Scandinavia connected to the port. The system is termed The Scandinavian Railport System. More than ten different rail operators exist in the system (Port of Gothenburg 2011b), an impressive number given that the rail sector in Sweden started its deregulation as late as 1988. Each shuttle has a frequency of at least three departures per week in each direction. The most frequent one operates about 14 times a week in each direction.

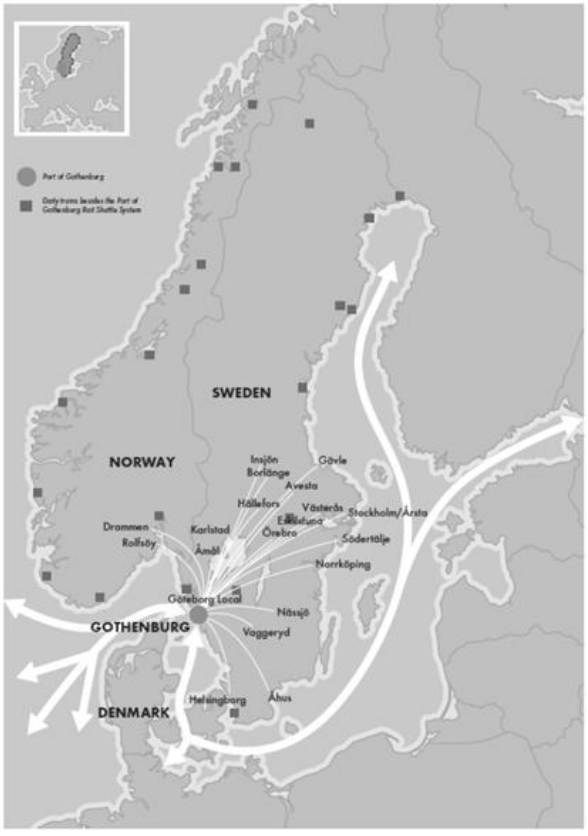


Figure 3 . The Port of Gothenburg rail shuttle system as of September 2011.

Location, macro analysis

The location of a Dry Port should be studied both from the EU / Baltic Sea Region macro scale and local perspective. Lahti, Finland is a good example of outstanding macro scale location.

The Lahti region is located at the intersection of Finland's main north-to-south and east-to-west links – at an ideal distance from Southern Finland's major cities and business centres. Lahti could be described as one of the best locations in Finland for logistics:

- *less than an hour from the Vuosaari port in Helsinki*
- *excellent fast road and rail links to the Helsinki area*
- *fast train connection to St. Petersburg (app 2.5 hours)*
- *qualified workforce readily available, Lahti is a city of 100,000 people and Lahti Region has a population of 200,000*

The central location of Lahti offers a cost-effective environment near the growing markets of Southern Finland and Russia. Business property rental prices in the Lahti region are an average of 40% lower than in the Helsinki area, and the general price level is highly competitive when compared with other growth centers in Southern Finland.

Figure 4. Lahti Region, Finland is a good example of outstanding macro scale location.

Location, regional analysis

The location should also be analyzed from regional point of view. Studies made by the Region Skåne and Helsingborg Business Region are offering a good example.

Site alternative analysis including

- *locations*
- *road and rail connections*
- *geotechnical issues*
- *regional land use plan*

Figure 5. Helsingborg Region, The map above shows not only both areas of investigation but also where Helsingborg, Bjuv, Åstorp and Ängelholm are situated. Existing railways and larger roads are also shown.

Design of a Dry Port, new sites & utilization of existing infrastructure

Swedish Transport Administration has outlined following principles for Design of a Dry Port.

Design of dry port, according to Trafikverket (Swedish Transport Administration) a functional unit "Terminal" is made up of two main parts, the terminal and the transfer yard.

The terminal consists of the following:

- *Loading areas*
- *Loading equipment, cranes, forklifts etc.*
- *Connecting roads*
- *Loading tracks, side tracks, locomotive storage tracks*
- *Facilities*
- *Lighting*
- *Perimeter i.e. fence or enclosure*

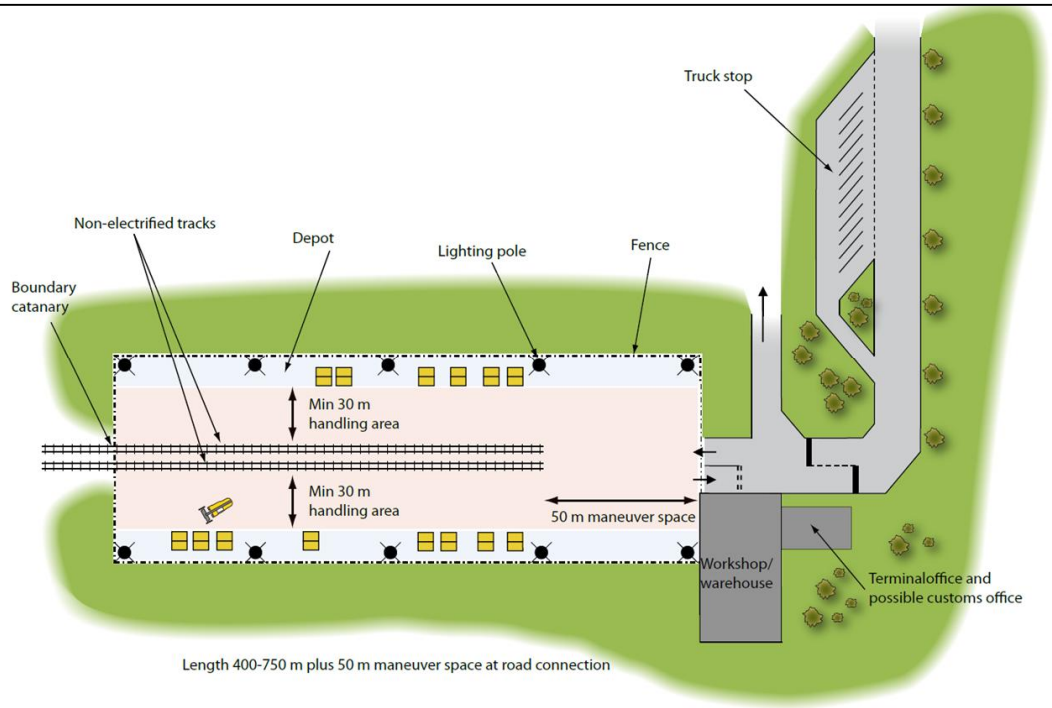


Figure 6. Schematic illustration of the terminal part (based on Trafikverket's principles for efficient terminals).

The guidelines presented by Swedish Transport Administration are most likely very relevant for Dry Port design also in the other BSR countries – especially when planning totally new infrastructure. However, a Dry Port implementation starts normally with limited volumes. It seems that existing Dry Ports are developing gradually – the situation in which "shippers can leave and/or collect their goods in intermodal loading units as if directly at the seaport" is seldom reached immediately. Especially in the areas with relatively low population, a starting Dry Port may expect annual volumes of 15 – 20 000 containers.

The limited transport volumes and the high investment costs of new Dry Port infrastructure can lead to challenging situation where the Dry Port investment is not bankable. The cost of a new Dry Port infrastructure including the rail infrastructure can be tens of million euros. Logistics services are under heavy competition and thus the investment cost can be hard to include even to very long agreements.

TransBaltic WP 5.1 task proposes, that existing infrastructure should be taken account when establishing a new Dry Port. Many regions may have existing infrastructure (for example old industrial areas) where first phase Dry Port activities could be started by utilising existing infrastructure.

Even if the layout of the existing facilities may not be optimal or it may need some maintenance, existing infrastructure might offer a cost efficient way to introduce first phase Dry Port services. Investments to the Dry Port expansion should be made when the volumes grow.

Figure 7. Example from Lahti: *old industrial areas may offer facilities needed by first phase Dry Port. An essential issue is to find long enough rail and sufficient yard for the operations. Infrastructure must be very robust: weight of a reach stacker able to lift loaded containers is about 100 tons.*

Rail and road between the Dry Port and seaport can supplement each other

A Dry Port implementation may also be challenging from the transport network point of view. Rail infrastructure between the seaport and the planned Dry Port may have its limits. It might be that the railway network capacity is not available for cargo trains during the peak hours of daytime and container trains between the seaport and the Dry Port can run only during nights. It is also quite obvious, that if rail traffic is having some difficulties for example due to winter conditions, passenger trains are normally prioritised before cargo trains. Trade and industry – the end customers of the logistics services – may not be satisfied with a service, which is not available during daytimes or which is not secure enough in all conditions. Instead of making remarkable rail infrastructure capacity investments which are needed only during few peak hours, it might be more cost efficient and environmental friendly to let different transport modes supplement each other.

Swedish Transport Administration has lately introduced *High Capacity Transport* –theme. One of the key elements of *High Capacity Transport* is to utilise existing infrastructure. One of the pilots performed under *High Capacity Transport* umbrella is so called DuoTrailer pilot between Malmö and Gothenburg. In brief the idea is that DuoTrailer is allowed to operate between defined terminals using high standard road, in this case four-lane highway. The DuoTrailer concept reduces transport cost and CO2 emissions. It could be that

- the most environmental friendly, cost efficient and reliable transport solution between a Dry Port and seaport can be achieved by letting the rail and road transport modes supplement each other.

- if the service level of the Dry Port – seaport transport link is based on only one transport mode the total cost and environmental influence will be heavier when both the infrastructure construction and operational effects are taken account.

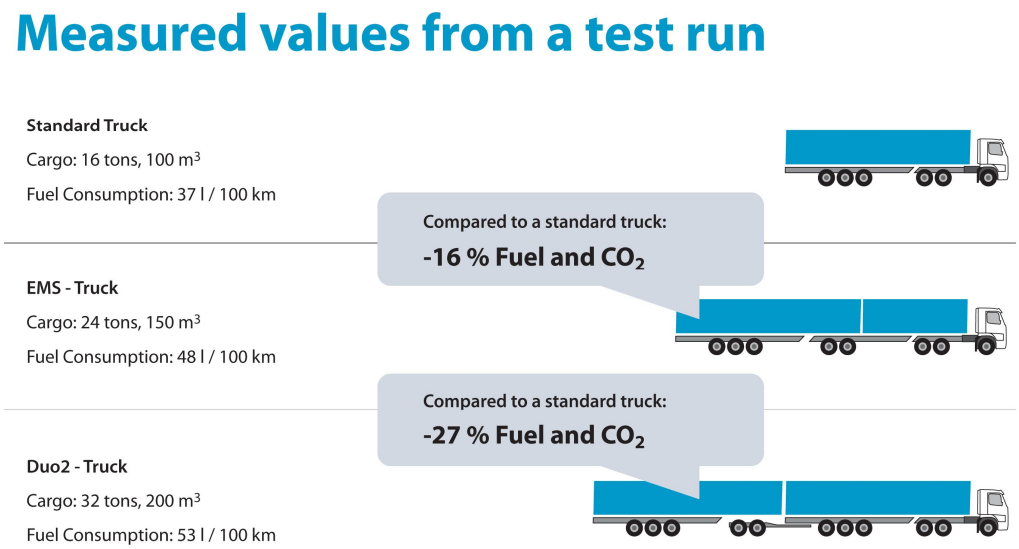


Figure 8. Duo Trailer reduces fuel consumption and CO2 emission 27 % compared to a standard truck (Source: www.duo2.nu)

TransBaltic WP 5.1 task proposes, that High Capacity Transport / Duo Trailer concept should be utilised:

1. Transports between Sea Port and Dry Port

   - even if the Sea port - dry port would have one train up and down per day there will always be customers who are not able to work with the closing times of the train. DuoTrailer can serve these customers and offer needed transports between the sea port and dry port when the train is not an option.

   - if the train connection is not possible (no rail infra or not economically viable rail service available) the dry port can be based on duo trailer based transport instead of rail.

2. Transports between Dry Port and major customers (e.g. mills, other terminals)

It is obvious, that a proposal to utilize road transports may lead to discussion concerning environmental issues and emissions. In order to contribute to this discussion, TransBaltic WP 5.1 utilized LIPASTO - a calculation system for traffic exhaust emissions and energy consumption in Finland. The system is developed by VTT Technical Research Centre of Finland. (http://lipasto.vtt.fi/indexe.htm). LIPASTO database provides average emissions concerning for example electric trailer trains (figure 9), average emissions of railway traffic in Finland per tonne-kilometer (figure 10) and semitrailer highway transport (figure 11). Even if these statistics do not give direct answers on Dry Port specific issues, the LIPASTO data is interesting also from Dry Port point of view.

Average emissions of trailer train in Finland in 2007

	Unit emissions of trailer trains[1]										
	CO	HC	NO_X	PM	CH_4	N_2O	SO_2	CO_2	CO_2eq.	Electricity cons. [kWh][2]	Primary energy cons. [MJ][3]
Electric trailer train [g/train-km]	2.7	0.27	6.4	0.75	0.14	0.12	4.6	4 080	4 120	17	121
Electric trailer train [g/trailer-km][4]	0.11	0.011	0.27	0.031	0.0057	0.0050	0.19	170	172	0.71	5.0
Electric trailer train [g/tonne-km][5]	0.010	0.0011	0.025	0.0029	0.00053	0.00046	0.018	16	16	0.066	0.47

Figure 9. Average emissions of electric trailer train in Finland (source: LIPASTO)

Average CO2 emission of electric trailer train is 16 g/tonne-km. Normally train transport between a Sea Port and a Dry Port includes shunting operations at both ends, emissions generated by shunting are most likely not included in the figures above. It also might be, that the train is powered by diesel instead of electricity. Figure 10 (average emissions of railway traffic in Finland per tonne-kilometer) reflects emissions related to diesel trains and shunting operations.

Average emissions of railway traffic in Finland per tonne kilometre in 2007

	Unit emissions of freight trains [g/tkm][1]									Electricity cons. [kWh/tkm][2]	Fuel consumption [g/tkm]	Primary energy cons. [MJ/tkm][3]
	CO	HC	NO_X	PM	CH_4	N_2O	SO_2	CO_2	CO_2eq.			
Electric train, excluding shunting[4]	0.0047	0.00048	0.011	0.0013	0.00024	0.00021	0.0082	7.2	7.3	0.03		0.21
Electric train, including shunting	0.011	0.0036	0.055	0.0026	0.00035	0.00026	0.0082	9.2	9.3	0.03	0.63	0.24
Diesel train, excluding shunting	0.074	0.034	0.60	0.011	0.0013	0.00065	0.00015	24	24.2		7.6	0.33
Diesel train, including shunting	0.081	0.037	0.64	0.012	0.0014	0.00070	0.00017	26	26.2		8.26	0.36

Figure 10. Average emissions of railway traffic in Finland per tonne kilometer (source: LIPASTO)

Diesel train average CO2 emissions are 24 g/tonne-km while electric train average CO2 emissions are 7,2 g/tonne-km, the difference is 24 – 7,2 = 16,8 g/tonne-km. Shunting seems to increase emissions 2 g/tonne-km. If the relation between diesel and electric emission would be the same in case of trailer train, it would be:

- electric trailer train, excluding shunting 16 g/tonne-km
- electric trailer train, including shunting 18 g/tonne-km
- diesel trailer train, excluding shunting 32,8 g/tonne-km
- diesel trailer train, including shunting 34,8 g/tonne-km

Average emissions of semitrailer combination are shown in figure 11. Average CO2 emission of semitrailer combination is 44 g/tonne-km. According to the tests between Malmö and Gothenburg, the DuoTrailer combination consumption is 27 % less than normal semitrailer combination.

- thus the consumption of DuoTrailer combination is 32 g/tonne-km

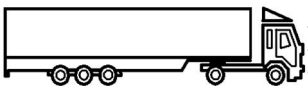
		Payload 25 t, Emissions per tonne kilometre [g/tkm]					
		CO	HC	NO_X	PM	CH_4	N_2O
	--> 1993	0,036	0,0098	0,77	0,013	0,00089	0,0015
	EURO 1 (1994 - 1996)	0,016	0,0069	0,54	0,0087	0,00062	0,0015
	EURO 2 (1997 - 2000)	0,0089	0,0049	0,46	0,0039	0,00044	0,0015
	EURO 3 (2001 - 2006)	0,0071	0,0039	0,31	0,0026	0,00035	0,0015
Semi trailer combination	EURO 4 (2007 - 2008)	0,0052	0,00068	0,16	0,0014	0,000062	0,0015
Gross vehicle mass 40t, pay load capacity 25t	EURO 5 (2009 -->)	0,0052	0,00068	0,11	0,0012	0,000062	0,0015
Highway driving	Average v. 2010	0,0088	0,0040	0,35	0,0035	0,00036	0,0015
		NH_3	SO_2	CO_2	ekv CO_2	Fuel Consumption [l/100km]	Energy consumption [MJ/tkm]
	--> 1993	0,00020	0,00027	42	43	39,6	0,58
	EURO 1 (1994 - 1996)	0,00020	0,00027	43	43	40,2	0,58
	EURO 2 (1997 - 2000)	0,00020	0,00028	44	44	40,9	0,59
	EURO 3 (2001 - 2006)	0,00020	0,00028	45	45	42,0	0,61
	EURO 4 (2007 - 2008)	0,00020	0,00028	44	44	40,9	0,59
	EURO 5 (2009 -->)	0,00020	0,00028	44	44	40,9	0,59
	Average v. 2010	0,00020	0,00028	44	44	41,3	0,60

Figure 11. Average emissions of Semi trailer combination (source: LIPASTO)

One very interesting conclusion, which can be made from the table above, is that the development of truck engines has not really affected to the fuel consumption. It seems that the fuel consumption of EURO 1-EURO 5 engines (semitrailer combination, gross vehicle mass 40 t, pay load capacity 25 t, highway driving) is about 40 litres/100 km. Now DuoTrailer offers possibilities to cut consumption minus 27 percent!

Conclusions and contribution to the Dry Port Concept

A Dry Port with a container depot might reduce transport of empty containers between a Sea Port and a hinterland region in question approximately 30 percent. This offers potential not only for CO2 savings but also for reduction of transport costs. Due to these findings - and other Dry Port benefits mentioned e.g. by Dr Violeta Roso – Dry Port implementation can be seen very interesting opportunity.

The most efficient and environmental friendly Dry Port operation is based on direct electric block train operation between a Sea Port and a Dry Port, which can be performed without shunting operations so that the same electric locomotive takes care of the transport from the origin to the destination. Shunting operations are weakening the environmental issues a bit, but main problem of shunting is the huge impact to the operational costs of the train transport. Direct electric block train operation between a Sea Port and a Dry Port requires high standard infrastructure at the sea port as well as in Dry Port. This might require huge infrastructure investments (tens of millions euros), which are not in any relation to the volume of the first phase Dry Port operations (10 – 20 000 TEU/year).

The next possibility is to establish Dry Port operations based on diesel locomotive and/or shunting operations. This reduces the requirements related to infrastructure and may offer possibilities to utilize existing infrastructure, like old industrial areas. The needed investments are most likely much lower. However, the transport cost related to diesel and/or shunting based train operation might be too high in order to compete with direct road transport.

TransBaltic WP 5.1 - especially Case Lahti, Finland – would like to open discussion concerning DuoTrailer based Dry Ports: transport between a Sea Port and a Dry Port would be operated by DuoTrailer combination (tractor – trailer – dolly – trailer –combination). Preliminary analyses done during TransBaltic project indicate, that average CO2 emissions of DuoTrailer combination are rather equal to average CO2 emissions of trailer trains operated by diesel locomotive. TransBaltic WP 5.1 - especially Case Lahti, Finland – estimates, that utilization of DuoTrailer based Dry Ports might enable Dry Port implementations in regions which can't have train based Dry Ports.