

National Transport Plan (Norway) – Freight Analysis

(October 2015)

English summary

Freight transport is central to national productivity and value creation

In an increasingly specialized and globalized world, the freight transport system is a strategically important link in the value chains. It makes it possible even for small countries to develop a highly specialized and highly productive industry by entering into international and worldwide production networks.

Industrial and economic development has resulted in high freight growth

The productivity gains and increase in wealth that has been enabled by this new international division of labor, has caused a growth in international trade – over longer distances – which by far exceeds the increase in both commodity production and value creation. This has also led to a significant growth in the volume of freight transport, which in turn is exceeded by the growth in transport work.

International coordination of taxes is essential for fair competition

A major share of the Norwegian freight transport work consists of large volumes of low-cost goods which are sent by ship over long distances and sold at prices set in a global market. There is no actual transport alternative for this trade. Changing the conditions for maritime transport in this segment will therefore have little effect on the modal split, but instead *it will affect the shippers and their possibilities to continue production in Norway*, and thereby have consequences for the national economy and employment situation. Hence, initiatives aiming to alter the modal split may also affect national economic growth and competitiveness.

The various transport modes mainly operate in different market segments, competitive interfaces are small

The adherence of different commodity groups to particular transport modes is relatively stable. In general, the different modes have adapted to market segments where they have a competitive advantage and hardly compete against each other, and where such competition would be hard to establish. More than 90 percent of the road freight volume is transported short-distance and is related to construction work and local distribution. International bulk transport constitutes nearly 80 percent of the volume of maritime transport, and ore/cast iron and other bulk goods also make up more than 80 percent of the rail freight volume. Efficient air freight opens up new markets, which otherwise are less accessible. In terms of freight transport work, the competition between transport modes increases, but even without including petroleum products, three quarters of the Norwegian transport work is produced at sea. The segment which seems to be most exposed to competition is the rail shuttle traffic of unitized freight, considered to be the main service of the rail sector, and for sea transport, European cargo and smaller quantities of domestic general cargo and bulk goods. In today's transport market, we find that the competition between ship and rail is virtually non-existent.

The modal split is a result of what and with whom we trade

The competition between and within each transport mode has hardened with increased access to inexpensive road transport. Alterations in modal split occurs primarily when there is a change in the composition of traded goods, i.e. there is a stable relationship between the kind of goods and the preferred mode of transport. The choice of transport mode may also change when there is a change in the geography of the trading pattern. More trade with fresh produce, with high-value produce and more trade with the countries in Eastern Europe have entailed more road transport. Many modal shift strategies have the goal of returning to the transport mode share of previous times, a so-called modal backshift. However, when the reason for the shift is the existence of new trading partners, new kinds of goods or larger freight volumes with special criteria for delivery and different trading routes, a strategy for returning to a historical situation will have limited chances to succeed. Nevertheless, we find that truck transport still manages to attract new market shares – with a relative growth of around eight percent each year during the 2000's in the export of fresh fish, the import of fruits and vegetables, the import from central storage facilities outside Norway and the import from Eastern European countries. Thus, the truck has strengthened its position. Air transport has grown significantly, especially in the market for export of fresh fish, but also for fast deliveries of special equipment and mechanical parts. Much of the growth in road and air transport seems to be transport of goods that demands urgent delivery, either because it is part of a just-in-time production process, or because its value diminishes during transport. In other words, mode choice considerations concern more than the cost of transport. External value creation may determine the transport mode choice.

Maritime and rail transport perform well in market segments with strong competition between modes of transport

Despite this trend, transport by ship and rail have grown relatively faster compared to road transport in market segments where competition between transport modes is strong. For example, *in both import and export services, transport by road has grown slower than transport of containerized goods by ship. Groupage freight transported over 500 kilometers inland has grown faster by rail than by road.*

There is a considerable potential for increased sea transport to and from the Baltic Sea region

Of the 500 million tons of freight carried each year, approximately 50 million tons belong to commodity groups and transport distances where different modes of transport may be suitable. More than half of this is currently transported by ship and rail. The greatest potential for increased sea transport seems to be in the *growing trade with the nine countries of the Baltic Sea, chiefly Poland, Germany and the Baltic states, and in these areas, there is an ongoing improvement of transport services.* Ships are highly competitive in the feeder transport of overseas goods, as long as the container is packed and ready for Norway and is not routed through European central depots. The services across the North Sea basin to Norway are competitive, although the transports with special requirements for shipment time seem to be a challenge, such as fresh and centrally stored goods.

Proximity between freight terminals and industry is important to strengthen the competitiveness of maritime and rail transport, also over shorter distances, but fragmented commodity flows constitute a challenge

Domestically, increasing volumes are carried by truck even if the consignor and the consignee are located in the immediate vicinity of a port terminal. The competitiveness of maritime transport increases significantly when the transport is carried out directly, without need for road transport in

either end. The land-use strategy followed by many ports already, with ample space for industry in the port area, seems to be important both for current and future maritime competitiveness. Even if road freight volumes between port areas are significant on the aggregate level, they are still fragmented in shipment sizes. An alternative form of transport by ship may require multiple port calls, which is expensive and time-consuming. Alternatively, direct transport by ship may give way for combined transport solutions where freight volumes are concentrated in fewer corridors, also using fewer ports. For the shorter transports, an intermodal solution consisting of two short truck trips and two ship terminal handlings will be more expensive than direct road transport. Direct maritime transport might be competitive for transports beyond 200 kilometers, whereas a combined transport chain seems to compete with road transport from around 500 kilometers and above.

Reduced delivery time and high frequency are important competition parameters

Land-carriage has a shorter transport time and because of the geography of Norway, in many cases it also has shorter transport distance than maritime transport. This is becoming more and more noticeable in the stretch between the Oslo Fjord and the coast north of Bergen. Domestic maritime transport services are often limited to weekly departures. The shippers demand reliable services, competitive prices and fast delivery/high frequency. Presumably, transports by ship and rail offer the best services for shippers who rely on these solutions today. For further shift away from road transport, the current ship and rail services seem to fail to meet shippers' demands. However, there are continuous improvements to the services and the container segment is expanding, also domestically.

Important decisions regarding infrastructure investments and market strategies must be taken in order to ensure the railway's competitiveness

A competitive rail service for long-distance domestic transport of unitized groupage goods depends on both terminals and railway networks that are reliable, efficient and have sufficient capacity. A primary task is to ensure that we maintain high-quality services in this market and that deviation situations are handled in mutually accepted manners. Rail transport already has such a high market share in particular segments that there is little left on the road network. From a socio-economic perspective, it is therefore difficult to expand the existing market enough to warrant large investments. On the other hand, it is likely that a large share of the current volume will shift to road transport if such investments are not made. In the corridors between Oslo and Stavanger and Trondheim, and to Europe, the railway has smaller market shares. This indicates that the railway must make the hardest efforts in order to compete in these corridors, and this is also where it has the most to gain.

The competitiveness of maritime and rail transport must be ensured also in existing market segments

Altering the future modal split along a more desirable path for society, implies not only shifting freight from road to ship and rail, but also to ascertain that cargo which is currently carried by ship and rail may continue to do so and that future freight growth is effectively distributed socio-economically. However, we can expect the competition from truck transport to remain strong also in the years to come.

A decentralized terminal structure leads to more goods transported by sea and rail - and less by road

Decentralized terminal structures provide a better market coverage and therefore more competitive ship and rail transport. The railway needs major investments in existing terminals and railway networks, which must be given priority. In Oslo, the central rail freight hub at Alnabru must be enabled to operate as efficiently as expected, and the role of the railway in the future freight transport system must be clarified. As new railway terminals are built, their localization must be assessed in relation to products, customers and markets. Our analysis suggests that a terminal in the Follo/Østfold area both will attract more foreign trade and provide a better rail service to local trade and industry. Terminals on the West side of Oslo will increase the rail freight volume both in the Drammen, Larvik and Grenland regions. North of Oslo, new terminals will have the same effect. With an increased number of terminals, we will see more rail transport, for both shorter and longer transports. Maintaining a decentralized port structure with local/regional ownership and corresponding financial strength will ensure that the ports continue to be local and regional drivers of development, and execute strong support for competitive maritime transport services.

Improving conditions for industrial development in and around the terminal areas will boost the competitiveness of ship and rail transport and reduce environmental impacts and security risks. The land-use strategies today seem to favor efficient road transport, with good access to attractive lots of land near the main road networks. However, industrial settlements in the vicinity of railway and port terminals, especially the urban ones, will encounter greater areal conflicts and limitations.

Increased focus on industrial goods will provide more goods by rail, but rail will also face greater competition from maritime transport

More rail terminals will provide a larger *hinterland* for rail freight, and freight model estimates indicate that improved areal coverage will increase the railway's attractiveness to new customers and commodity segments, especially the ones aimed at the needs of production industries. However, this seems to create competition with maritime transport which is currently low. A decentralized rail terminal structure will also attract more foreign trade, which to a lesser extent uses the railway today. The EU is working on increasing the attractiveness and the speed of its rail network, and simplifying the process involved in border crossings. The infrastructure is improving, both on rail and road, for instance the new line across the Fehmarnbelt.

It will be challenging to develop combined transport by rail within " The Eight Million City"

The region between Oslo and Copenhagen, called the "Eight million city", is in rapid growth, and much of the foreign trade by road transport originates or passes through this area. The trade between Västra Götaland, Østfold, Akershus and Oslo is significant, though these transports are less consolidated. With 300 kilometers between Oslo and Gothenburg, these transports fall within the traditional domain of road transport.

There is a potential for increased rail transport of bulk and industrial goods between Norway and Sweden

Closures of Norwegian cellulose and paper industries have brought about changes in the transport of timber. The export of timber by rail has increased more than the export by road from 2013-2014. This indicates that rail can attract a larger share of these transports, also domestically. More than 80

percent of the freight volume on rail is bulk goods, and the railway is well suited for both longer and shorter transports of such concentrated commodity flows.

Many ports are investigating opportunities to develop sea/rail connections with low investment requirements

Many ports are developing specific plans for direct transfer between ship and rail via port tracks or other tracks nearby. The port of Drammen is as of today the only terminal where general cargo arrives by ship to be shipped directly onwards by rail, without intermediate road transport. The tracks at the Port of Oslo are used for aviation fuel, while tracks in the Port of Narvik are used both for iron ore, minerals and container trains. In Grenland and Borg/Rolvsøy, there are sporadic transports of goods that are transferred between ships and trains.

Higher taxes on road freight transport in cities can inhibit intermodality

There is a continuous improvement of the road transport efficiency. Transfer of goods therefore requires deliberate organizing for other modes of transport, in order for them to improve their services to an equal or greater extent. Combined transports require road transport in both ends. The ability to compete with direct transport is very sensitive to the amount of distribution costs and to efficient terminal handling. The challenge of road transport pricing seems to be that the pricing is too low on the long hauls, where road transport is competing with ship and rail, and too high on short distribution transport, where it is complementary to these. New estimates of the marginal external costs of road transport show that long-distance transport which mainly operates in sparsely populated areas and on motorways, has costs to society which correspond to the current taxation level (somewhat higher with unevenly distributed costs of accidents).

Transport in cities has costs to society which are much higher than the current taxation level. In our analyses, combined transports appear to be sensitive to increases in collection and distribution costs. An increase in road transport costs based on environmental concerns in cities where ports and rail terminals are located, will most likely challenge the competitiveness of intermodal transport.

More cost-efficient terminals will lead to more goods transported by sea and rail

Combined transport seems to compete with direct deliveries on distances ranging upwards from 500 kilometers, which includes transports between the major city areas of Southern Norway. A lowering of the competitive threshold of combined transport to 400 kilometers would make these services far more robust. Reducing the terminal handling costs by 20 percent would give this effect. We find there are substantial scale economies in transportation, whereas our data have not shown corresponding effects in terminals. Reduced terminal handling costs enable more sea freight and rail transport, while increased distribution costs give less. By closing down services in one port, there will be an increase in distribution costs due to an expansion of areas covered by neighboring ports, and these costs exceed any realistic cost reductions in terminal handling. Some ports have overlapping geographical markets and can probably replace each other's services. Here we find that industry itself deliberately maintains competing transport routes.

Transport buyers' requirements determine the terminal structure

Especially for the Oslo fjord region, the potential positive effects of having a fewer number of ports have previously been advocated. Our model-based simulations include calculations of the effects of

having larger vessels. Many lines serve industry on both the western and the eastern side of the outer Oslo fjord and they also deliver consumer goods to the inner Oslo fjord. Several liner ships use a milk-round kind of route, whereby the flow of goods has already been concentrated to and from the Oslo fjord. Other lines call at just one port, often towards the end of the inlet. Most vessels seem to adapt to the needs of the customers, and the development of the flow of goods is heading towards more dispersion, rather than concentration.

Rigid operation of terminals fail to meet the transport market's requirements for flexibility

The terminal handling charges are of great importance. Given a normal increase in transport volumes, maintaining a decentralized terminal structure is contingent on seeking cost-saving rationalizations by other means than scale economies. We see in the transport market a demand for simpler, cheaper and more flexible small-scale solutions for terminal handling when new transport services are developed. These solutions must have the flexibility to up-scale at a later stage.

The current port capital scheme supports a decentralized port structure and cheap port services

The handling of freight and ships at port terminals in itself quite often creates little surplus value for a municipality. The volume is rarely high enough to manage the costs or create a sufficient basis for reinvestment. Therefore, it is important to have logistical support and other beneficial services located in the neighboring areas. Earnings from real estate development is a valuable supplement to those coming directly from freight and traffic handling. Ports are likely to expand the range of their activities in order to make the business more robust. Some invest heavily in real estate to create synergies between local industry and sea transport, others actively enter into relations between shipping agents and shipping companies, in order to play an active part in the chain of logistics. Such approaches have positive effects on both the competitiveness of sea transport and for industrial development in the region. Hence, it is important to understand the ports and their role both as providers of customized services for local and regional trade and industry, and as a driver of development for this industry. The need for government support to make sea transport more competitive, and how such support can be designed, is often discussed. Using land-based business profits to strengthen sea transport services is such a support. Today these funds are protected and cannot be used for other purposes than ports. If this protection is lifted, it will require that the municipalities assume a greater and more conscious responsibility to maintain competitive and inexpensive port services. The trunk ports and their owners seem satisfied with the government's responsibility for infrastructure connection between land and sea and want more efforts to be made here, whereas government involvement in the port terminals themselves is less of an issue.

Even in a relatively deregulated transport market, the authorities may affect transport development by coordinating their measures

Over several decades, there has been a controlled deregulation of the freight transport markets. This has given us cheaper, more responsive and available transport services, but it has also reduced the government's direct influence on transport development. Despite this, society plays an important role as owner of infrastructure, transport companies, as a regulator and buyer of transport services. If today's trends continue, we will not be able to fulfill future climate obligations. Public administration alone acquired goods and services with a value of 350 billion NOK in the year 2013. In addition to this

comes 80 billion NOK in purchases from publically owned businesses. *By demanding the use of transport by ship and rail wherever it is possible, the balance in the transport mode share will change.* We may have to accept longer transport times and project execution times, and probably also higher costs, at least until new services have been established and adjusted to the new modal split.

The contradiction between continued transport growth and future environmental requirements makes it crucial to invest in - and implement - new technology

The effect of approved international obligations (2015) is expected to entail higher emissions in 2040 than today. Expected technological development will be a contributing factor, but deliberate action is needed to reach the goals. By developing, testing and exporting efficient, safe and eco-friendly technologies, Norway can make contributions that make a difference globally. New technology will probably reduce and perhaps even partly remove some of the negative effects of the different transport modes and at the same time reduce the environmental impact gap between them.

Reducing carbon emissions to below 2015 levels requires implementation of zero emission solutions, fully electric or hydrogen-based solutions. The government should play a central role to ensure faster implementation of low-emission and zero emission solutions by:

- Initiating and funding research, development and full-scale testing
- Adjusting taxation policies in order to benefit low and zero emission solutions and offer benefits that speed up the adoption of new technology.
- Requiring higher concentrations of biofuels in conventional fuels.
- Supporting the development of infrastructure for charging, distribution and sale of new types of fuel.

Predictable and long-term government incentives and taxation policies increase the players' willingness to invest in solutions that require more time or more extensive use to be profitable. The incentives should aim at zero emissions, but they should vary over time. Liquefied natural gas, LNG, blends of biodiesel and hybridization is today available, and the use of these alternative fuels should be encouraged in order to reach the goal of a zero emission fleet. At a later stage, the LNG infrastructure can be used for biogas, the concentration of biofuels can increase to reach 100 percent and hybridization is a step towards fully electric solutions. In many cases, development is aimed at the most profitable markets. Mergers that provide a better market potential can contribute to shift the focus, such as the initiative by the municipality of Oslo to speed up the development of public transport busses running on hydrogen.

Public authorities must be a driving force in implementing new technologies

The technological shifts in shipping are slow. Commercial considerations alone do not call for quick technological shifts. On account of the environment and efficiency, one should prepare for faster adoption of new technologies. *A system of payment for scrapping vessels, which requires reinvestments in more efficient and less polluting ships, stands as an important measure for more eco-friendly sea transport.* This will contribute to a rationalization, and possibly also a restructuring of an ageing and fragmented coastal shipping fleet. *The domestic network of ferries and passenger boats, fishing boats and offshore and supply ships, which together are responsible for 55 percent of emissions in Norwegian waters, should be included in the efforts to ensure a more eco-friendly maritime transport.*

Wherever the government is able to initiate technological changes, *it is important to ensure that county administrations and municipalities with a great responsibility for transport, road networks, ports, urban logistics, public transport and land use provide good, integrated solutions.*

Many measures have little effect on the modal split. In addition, they generally yield limited socio-economic benefits

Many of the initiatives we have analyzed have only marginal effects on achieving the transport political goals or on altering the modal split. Some of the measures that contribute to a better environment and safety and less expensive transport systems, presumably require investments of such a scale that the socio-economic benefits may be negative, for example the construction of a rail terminal structure with greater area coverage. Other steps may have a negative effect on the environment or safety, and yet improves the transport system to such an extent that the socio-economic benefits are positive, for example full cabotage on domestic road transport or the introduction of modular concept trucks. Some steps are presumably cheap and may be taken quickly, such as higher priority for freight trains outside of rush hours for passenger trains, or subsidies for transport of containers by ship and rail. Others are necessary, but expected to have a long execution time, such as reinvesting in existing rail freight terminals. Increased taxation of long-distance road transport has the most restraining effect on the growth in this transport mode and gives the highest transfer to sea and rail. As for tax increases, the disadvantages for trade and industry are greater than the sum of the utility in the form of fewer accidents and a better environment. However, 20 percent of the utility is released by a shift from indirect to a direct financing (for example by a transition from tax to a user charge /fuel tax/ toll or the like). For some of the taxation measures this form of utility is the greatest and ensures socio-economic benefit. The opposite effect is estimated when the taxation level is reduced and replaced by tax funding. In many cases, the utility for businesses and limited modal shift effects combined will be less than the disadvantage of 20 percent, by a shift from direct to indirect financing – tax reduction measures will hence be unprofitable (this is not the case with productivity increases in services).

A level of taxation which equals the costs that the activity imposes on society, will affect the demand in such a way that the extent of use is balanced out. A change in taxation aimed at a particular transport mode will affect all transport both with and without alternative services. Transport without alternative services are in majority. *This means that taxes are more suited for a general adjustment of all use of a particular mode of transport than they are likely to affect the limited competition between the different modes. On the other hand, estimates indicate that user charges aimed at road transport has the strongest effect on the modal split. From a market perspective, however, the prices of transport with different competing modes seem to follow each other, and the road transport prices set the precedent. Higher road transport prices are likely to yield higher transport prices in all modes that compete against each other.* Concerning an eventual incentive initiative for unitized sea and rail transports, it is of vital importance to design a scheme where it is ensured that the shippers, not the transport companies, benefit from the scheme. Furthermore, road transport is very dynamic, and has historically managed to adjust to the price competition in the market, although in many cases with great social challenges. A risk posed by high road transport prices is a corresponding increase in the prices of combined transport. We expect that subsidies will have the same effect as taxation, and it may lead to the postponement of readjustments that are necessary for future competitive ability.

Using maritime and rail transport often involves more complex logistical solutions and organizations than using road only

With a partial modal shift to sea transport, businesses that still to some degree rely on road transport will need more complex logistics systems. Cost differentials between the various transport modes do not give us a complete picture of the costs that a modal shift has for businesses. By establishing new services or increasing capacity, profitability will improve by yielding the highest possible volume in an early phase. This indicates that an incentive scheme may be feasible. Also, measures to reduce costs related to terminal handling, collection and distribution, or generally lower costs for combined transport of containers, will be key to succeed in affecting the modal shift. The actors themselves have the most important job. If there is to be a modal shift of freight transport, the transport services by rail and by sea need to improve and become more appealing than truck transport.

None of the analyzed measures will reduce road transport below current levels

Without corrective measures, calculations indicate that the growth in transport towards 2040 will be significantly higher than any measures outlined here may compensate for. *The measures seem to either slow down the foreseen development, or actually accelerate it. None of the measures we have analyzed will reduce the amount of road transport to below the current level.*

Measures that facilitate more efficient road transport yields the highest socio-economic benefits

Seeking to combine the expected growth in freight transport in the future with a fulfilment of future climate obligations will therefore only modestly succeed by means of shifting freight between modes. The goals can only be reached by *making all freight transport safer, more efficient and environmentally friendly, irrespective of the modal split.* In some cases, the estimated socio-economic benefit is greater when you improve the conditions for truck transport.

Introducing a high mileage road tax is the measure that will have the greatest positive effect on maritime transport, and the effect is estimated to be highest for ships that are not carrying containers. 20 percent reduced terminal handling charges and an environmental subsidy of 500 NOK per container handling of ships or trains will have a third of the effect of high usage charge on roads for sea transport work. A road usage charge of 0.78 NOK per km and an increased fuel tax of 4 NOK per liter will both lead to a modal shift to ship and rail transport and are socially and economically beneficial. Removing the pilot dues and safety charges will only have a marginal effect. The sum of having a high user charge on roads, more efficient port terminals, subsidies of 500 NOK on container handling and a removal of the fees of the Norwegian Coastal Administration will, according to our calculations, increase the estimated growth path of maritime transport with about 20 percent.

Opening the rail network for 1000 meter long trains, introducing a high mileage tax on roads and extensive development of new terminals in a decentralized spatial structure are the measures with the greatest effect on rail freight, which may triple the growth of rail transport. Whether or not the rail measures are socio-economically beneficial will depend on the level of the investments required. Considering the current level of investment costs, laying the grounds for longer freight trains and giving higher priority to freight trains outside the rush hours of passenger trains as well as better conditions for foreign trade by rail, will presumably return a higher benefit than investing in terminals.

Incentive schemes for container transport, road charges and a decentralized terminal structure will lead to more goods on rail and sea

The measures with the greatest effect on modal shift are: High subsidies of containers by ship and rail, high road user charge of 4 NOK/km for heavy trucks and 2 NOK/km for light trucks, and a decentralized rail terminal structure. According to the estimates, these measures will entail a transfer of 19 million tons, mainly to rail as a decentralized rail structures are estimated to transfer cargo from ships. The costs for trade and industry will increase and the measures are thus expected to have a negative socio-economic benefit. Toll-funded road development, modular concept trucks, road user fees of 0.78 NOK/km are the measures that are estimated to have the greatest socio-economic benefit (calculated without the EU's opening for free cabotage), even though both safety challenges and the environmental impact will increase. The model calculations indicate a transfer from sea and rail to road of 3 million tons. The measures that encourage road transport the most are the opening for international competition in domestic road transport, road development without tolls and modular concept trucks. In this case there is an estimated transfer of 13 million tons to road transport, mostly from ships but also from rail. The measures are expected to further increase the forecasted increase in road transport of about 30 percent and are estimated to be socio-economically beneficial, as the costs of trade and industry are reduced by more than the society's increased costs related to environment and safety. The introduction of a high mileage charge is expected to lower the forecasted growth by 25 percent and by 11 percent with the introduction of a 2000 NOK subsidy for container shipment by rail or sea. These measures are considered to be socio-economically unprofitable. 20 percent cheaper terminals and the development of decentralized rail structure is estimated to lower the increase of road transport by around 10 percent.

Five to seven million tons can be transferred from road to sea and rail. This will nearly meet the target set by the EU for freight transfer, but the measures needed to achieve this target yield low socio-economic benefits

Each year, approximately 270 million tons of cargo is transported by road in Norway. Out of this, approximately 20 million tons could be suitable for transport by other modes. Using strong incentives, it seems possible to shift 5-7 million tons from road to ship and rail. From a socio-economic profitability point of view, the shift potential seems more limited. In transport corridors with competition between transport modes, ship and rail seem to have had a relatively faster development than road transport. Current ship and rail transport services will in many cases not be able to meet the goods owners' demands for further modal shift. Nevertheless, the services seem to be developing in response to changes in the demands. Since 2009 the freight volume handled in Norwegian ports has increased by 8 million tons.

Global environmental commitments and national growth goals can only be reconciled by making all freight transport safer, more environmentally friendly and efficient - regardless of the means of transport; strategies for freight transport must include - but must not be limited to - the transfer from road to sea and rail

Seeking to combine the expected growth in transport in the future with a fulfilment of future climate obligations will therefore only modestly succeed by means of shifting freight between the transport modes. The goals can only be reached by *making all freight transport safer, more efficient and environmentally friendly, irrespective of each transport mode's share of the freight market.*