Transport infrastructure in the Jutland Corridor

The Danish-German Transport Commission

November 2015

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1. The Danish-German Transport Commission

The Danish-German Transport Commission was founded in July 2011. Its objective is to identify and analyse challenges and make recommendations with regard to the transport infrastructure in the Jutland Corridor. As such, the Commission focuses on analysing cross border traffic in the Jutland Corridor with the intention of providing concrete recommendations for improving the infrastructure in the Corridor.

The Commission has 12 permanent members, which are equally divided between Germany and Denmark cf. Table 1 below.

Table 1 | Members of the Commission

Representatives from
Danish Ministry of Transport and Building (TRM) (2 members)
Region of Southern Denmark
Danish Chamber of Commerce
Confederation of Danish Industry
Member appointed by the Danish Minister of Transport and Building
Ministry of Economic Affairs, Employment, Transport and Technology (MWAVT) (2 members)
Federal Ministry of Transport and Digital Infrastructure (BMVI)
Hamburg Chamber of Commerce
Chamber of Commerce and Industry Schleswig-Holstein
WiREG (Business Development Corporation Schleswig-Flensburg)

In addition to the permanent members, the Commission has invited experts to participate in the discussions about various subjects. It must be noted that the BMVI is not a de facto permanent member of the Commission. It only participates when issues of federal German or European level are addressed. When the BMVI is not participating, its seat is taken by the MWAVT in order to ensure parity between the Danish and the German members. To date the BMVI participated in two meetings.

The Commission is solely a consultative organ and is thus only capable of making recommendations, which are not politically nor legally binding for the German or Danish governments respectively. The recommendations and the other content of this report have been unanimously decided. As a result, it is the Transport Commission that puts forward the concrete projects and proposals in this report and each Commission member cannot as such be held individually accountable for ensuring the actual fulfilment of each project. With the report the Commission thus encourages the relevant decision makers to be inspired by the recommendations and projects in the report. Subsequently, the Commission will continue to push for a successful initiation and implementation of the infrastructure projects.

The projects described in this report vary by their stage of investigation and are thus not at the same analytical level. Furthermore, some projects focus on constructions while others focus on operations. For projects focusing on the operation of transport it will be necessary to take account of commercial perspectives. The decision making process for the concrete projects takes place outside of the authority of the Commission at the legislative level in Denmark and Germany.

The chair of the Commission alternates between Denmark and Germany every six month. The Commission initially decided to convene two times within every six month. However, it must be noted that in some periods the Commission has convened less than the agreed amount. The Commission has currently held 10 meetings. During the meetings a wide array of transport related topics have been discussed. Most of the discussions have fostered the development of concrete recommendations. The recommendations and challenges presented in this report do not represent all the topics that have been discussed in the Commission. The content of this report is therefore prioritised by the members of the Commission and is perceived to be representative of the most important infrastructure and transport projects in the Jutland Corridor.

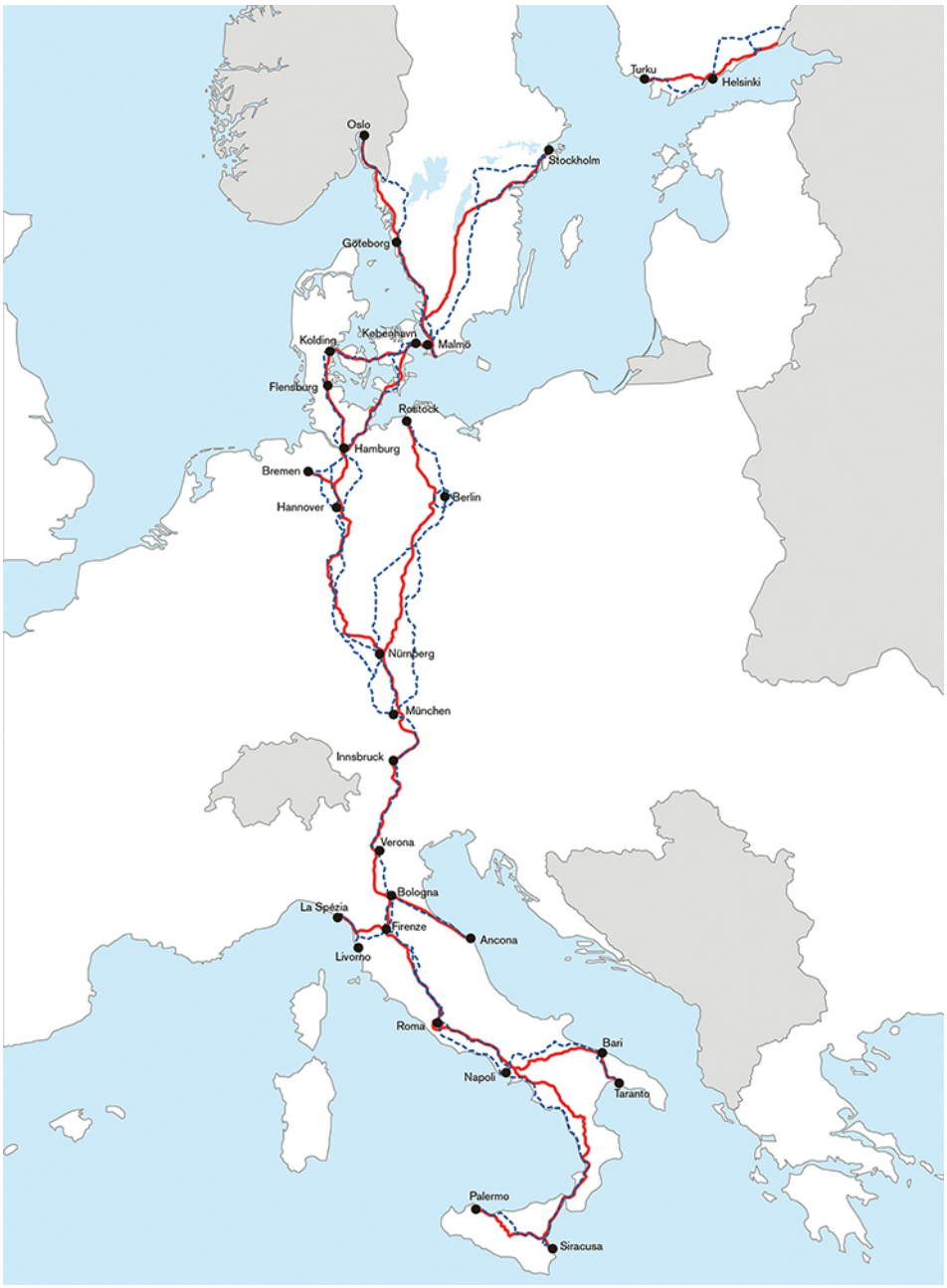
The Commission acknowledges that the establishment of the fixed link across Fehmarn Belt will influence the traffic development of the Jutland Corridor. However, the report will not consider the construction of Fehmarn Belt fixed link as this specific project is outside the scope of the Commission. In addition, the ferry services from Gedser to Rostock and Rødby to Puttgarden might also affect the traffic in the Jutland Corridor but these connections are not considered in the report for similar reasons. The report also contains specific proposals for cross border transport projects, which have been presented by various stakeholders from German and Danish local communities. The proposals from the stakeholders are incorporated in to the recommendations from the Commission.

The report is structured as follows. While chapter 2 describes the cross border transport infrastructure in the Jutland Corridor, chapter 3 analyses the traffic development. The current infrastructure projects are presented in chapter 4. On the basis of chapters 2-4, chapter 5 contains concrete infrastructure projects, which are presented as recommendations the Commission. Finally, chapter 6 provides an overview of the recommendations.

2. Cross border transport infrastructure

Denmark and Germany have a common border that divides Jutland and Schleswig-Holstein in an east-west direction. The countries are connected by a network of roads and railway lines running in a north-south direction through the so-called Jutland Corridor.

Map 1 | The Scandinavian-Mediterranean Core Network Corridor



The Jutland Corridor is highlighted by the European Union as one of the most important transport corridors in the EU. It is a part of the Scandinavian-Mediterranean Core Network Corridor, which runs across Europe from the Finnish/Russian border in the north, across Scandinavia to the Europe-

an mainland connecting Europe with the rest of the world through the large seaports. It continues through Germany and southward to Italy and Malta.

The transport infrastructure in the corridor is therefore not solely a Danish and German matter. It is important to several other European countries, particularly the Scandinavian countries. In fact the corridor is important in a global perspective because it is used as a key transport route for the large harbours in Germany where cargo is shipped to several global destinations. Norway and Sweden export a large amount of goods via the seaports in Northern Jutland. The goods are carried by cargo trains or trucks through the Jutland Corridor across the Danish-German border and onwards to several European and global destinations. Similarly, a large amount of European goods are transported through the Jutland Corridor to Scandinavian destinations.

The continuing development and improvement of the Jutland Corridor is thus strategically important for Europe, Scandinavia as well as Denmark and Germany. The report thus makes an important contribution to the on-going efforts to increase the transport mobility in Europe.

This chapter describes the existing transport infrastructure in the Jutland Corridor. The chapter contains a description of roads, railways, ports and shipping and air traffic.

Map 2 | Jutland Corridor in the Scan-Med Corridor

2.1. Roads

The trunk road network is the backbone of the key international transport corridors throughout Denmark and Germany and is thus an important venue for traffic flows between Scandinavia, Germany and the rest of Europe.

The Danish road network primarily consists of the so-called capital "H". The capital H describes the roads between Frederikshavn in North Jutland and the Danish-German border, between Køge in the east of Denmark and Esbjerg in the west and between Helsingør in North Zealand and Rødby in the south. The capital H thus provides gateways to Denmark's closest neighbours most notably Germany, Sweden, Norway (from the port in Frederikshavn) and the United Kingdom (from the port in Esbjerg).

Despite the fact that the trunk road network only makes up approximately 5 % of the total public road network in Denmark, nearly 45 % of all vehicle kilometres in Denmark are driven on the trunk road network.

Southern Jutland is part of the Region Southern Denmark. In this region there are located two motorways, which are part of the capital H, namely the

east-west Esbjergmotorvejen (E20) between Lillebælt and Esbjerg and the north-south Sønderjyske motorway (E45) between Kolding and Frøslev/Ellund, after which it continues as the German A7.

In the Jutland Corridor the most important road connection in the eastern part of the corridor is the E45/A7 motorway, which connects the Scandinavian countries with the rest of Europe. It runs in a north-south direction from Frederikshavn in the northern part of Denmark and crosses the border at Frøslev/Ellund after which it continues through Schleswig-Holstein and onwards in Germany.

In the western part of Jutland there is one trunk road (route 11) between Esbjergmotorvejen and the Danish-German border south of Tønder, which continues in Germany as B5. In addition there are a number of trunk roads across the region.

The E45/A7 absorbs a major share of the traffic running in north-south direction with considerable transit traffic to and from Denmark and Scandinavia. With the completion of the Store Bælt Link in 1997, the traffic has partially shifted from the so-called "Vogelflug line" (Copenhagen-Fehmarn-Hamburg) to the E45/A7.

In Germany, the A7 is especially important for the mobility of the population of Schleswig-Holstein. For many businesses in Schleswig-Holstein the A7 is the most important transport link to relevant markets, which are often far away. It is therefore important that the efficiency of the A7 is preserved by continual development.

In addition, the A7 is an important route for commuters travelling to and from Hamburg. As a consequence the traffic volume increases in proximity to Hamburg. The highest volume of traffic is close to the Elbe Tunnel with an average of 150,000 vehicles per day. Because of frequent traffic congestion, the Elbe Tunnel increasingly acts as a bottleneck.

On the A7 the need to build a substitute for the Rader Bridge by the year 2026 is a very important infrastructure project. Reconstruction work done on the bridge piers in July 2013 revealed unforeseen extensive damages to the bridge. As a result, traffic restrictions were imposed with short notice in order to avoid further damage to the load-bearing capacity of the bridge. The restrictions include:

- Closure of the bridge for vehicles over 7.5 t in both directions
- Narrowing of lanes in both directions to single-lane operation
- Permanent monitoring of the "trouble spot".

The traffic restrictions has had serious consequences, particularly for north- and southbound traffic and thus for destinations in the northern part of Schleswig-Holstein and in Denmark as well as for other European and Scandinavian countries.

The damaged bridge piers were repaired immediately so that Rader Bridge could be reopened for two-lane traffic in both directions in November 2013. For vehicles exceeding 7.5 t however there is a speed limit of 60 km/h including traffic control to decrease the speed and a ban on overtaking for

trucks. In addition, the closure of both hard shoulders and a maximum load of 84 t for heavy haulages are still effective.

Originally the Rader Bridge had an operating life expectancy of 80 to 100 years. A recalculation from mid-2014 revealed a remaining useful life of only 12 years.

In the western part of the corridor the main trunk road is the route 11/B5 between Esbjergmotorvejen and Heide after which the federal highway B5 continues as the A23 motorway towards Hamburg. The western part of the corridor is thus connected from E20 Esbjergmotorvejen to Hamburg by route 11, B5 and A23. The traffic volume towards Hamburg is increasing considerably on the B5 and A23.

Map 3 | Trunk roads in the Jutland Corridor

There are also a number of trunk roads across the region in both Denmark and Germany. For example, the state capital of Kiel is connected to the A7 by the A215 motorway at the three-way interchange at Bordesholm and by the A210 at the four-way interchange at Rendsburg. The A7 is connected with several federal highways which mainly run in an east-west direction and partly in a north-south direction. In the city of Hamburg, the three-way interchange at Hamburg-Nordwest connects the A7 and the A23 coming from Heide. In Denmark, the motorway from Kliplev to Sønderborg opened in 2011. The 25 km four lane motorway was the first Danish motorway to be carried out as a public-private partnership collaboration.

There are two trunk road border crossings between Denmark and Germany, namely the crossing at Sæd/Süderlügum and the crossing at Frøslev/Ellund. Table 2 shows the number of vehicles crossing the border stations on the trunk roads in 2014.

Table 2 | Vehicles crossing the Danish-German border daily (2014)

Border station	Number of vehicles
Sæd/Süderlügum	5,800
Frøslev/Ellund	17,200
Kruså/Kupfermühle*	13,400

* The border crossing at Kruså/Kupfermühle d is a municipal road.

In Germany, the A20 motorway is gradually being built from east to west in order to create a competitive east-west main thoroughfare from Poland to the Netherlands. The A20 will be connected with the A21 motorway near Bad Segeberg, with the A7 near Bad Bramstedt and with the A23 near Hohenfelde. A fixed link across the river Elbe is planned near Glückstadt and a

connection with the A26 and the A27 in Lower Saxony. This project including the fixed link across the river Elbe has been included as an 'urgent need' in the Federal Transport Infrastructure Plan (Bundesverkehrswegeplan - BVWP).

With the final extension of the A20 it will be possible to circuit and decongest the busy traffic hub of Hamburg and to improve the connection to the less developed west coast of Schleswig-Holstein. At that point in time, the A20 will also be an attractive transport route for the transit traffic running to and from Denmark.

There is an agreement in the coalition contract of the political parties forming the government of Schleswig-Holstein that the A20 will be extended up to the A7 in this legislative period (until 2017). The sections west of the A7 including the fixed link across the river Elbe will be planned nonetheless.

2.2. Railways

There are two railways crossing the Danish-German border: Niebüll-Tønder and Padborg-Fredericia – also called the Jutland-line. International passenger and cargo transport mainly uses the Jutland-line, which runs from Frederikshavn in North Jutland to Padborg where it crosses the border and continues towards Hamburg via Flensburg. This railway is double-tracked, electrified and constructed for a speed of 160 km/h. On the section between Tinglev and Padborg in Denmark there is a speed limit of 120 km/h due to the fact that this section is single-tracked. This section is the last single track section left to be upgraded on the Danish part of the Jutland-line. In the Agreement on a Modern Railway (Aftale om en Moderne Jernbane) from October 2009 it was agreed that the long term perspective is to construct double tracks on the section between Tinglev and Padborg.

Near Rendsburg the railway crosses the Kiel Canal on a high-level bridge from 1913. At present the bridge is undergoing thorough restoration and will be dimensioned for bigger weight charges. Until completion, which is planned for 2016, the bridge is a bottleneck because of speed and weight limitations. Once the bridge has been modernised, it can be crossed by two trains at the same time and is expected to have an additional operating period of at least 30 years.

The railway between Fredericia-Padborg-Flensburg-Hamburg is part of the Scandinavian Mediterranean Corridor. The section is an important part of the railway network in the Jutland Corridor linking the Scandinavian and Nordic countries with the rest of Europe. With the introduction of the Store Bælt Link in 1997, a vast majority of cargo transport by railways shifted to the Jutland-line. Consequently, this railway has nearly reached the limits of its capacity. However, it is expected that the establishment of the Fehmarnbelt Fixed Link will shift a large part of the transit activities from the Jutland-line back to the Vogelflug line and thus relieve the Jutland-line.

The railway between Niebüll and Tønder is single tracked with a speed limit of 100 km/h. It is a 17.7 km, single-tracked and non-electrified section between Niebüll and Tønder, which had been closed down in 1980 but it was reactivated in 1997. A few years ago, extensive reconstruction work was performed on the track with financial support from the State of Schleswig-

Holstein. In Niebüll it is possible to change to the German marsh-railway, which runs from the Island of Sylt to Hamburg. The marsh-railway is mainly double-tracked except for a few one-tracked sections, designed for a speed of 140 km/h and electrified from Hamburg to Itzehoe. In Niebüll the marsh-railway is connected with the Danish railway network via Tønder and Esbjerg.

The Jutland-line and the marsh-railway converge in Elmshorn and onwards to Hamburg. From Elmshorn and/or Pinneberg the route is complemented with regional railways and suburban traffic. The railway hub of Hamburg is a bottleneck, especially for the railway traffic running in southern directions. The report "Development and Assessment of a Concept for the Railway Hub Hamburg" conducted by the MWAVT in 2009 recommends that the railway connections to the south should be extended for the transport of containers and suburban passenger trains.

Map 4 | Railways in the Jutland Corridor

In Schleswig-Holstein the railway network has traditionally been oriented towards the railway hub of Hamburg with main lines running to Sylt (marsh-railway), Flensburg (Jutland-line), and Kiel, Lübeck and Fehmarn (Vogelflug-line). The railway network is supplemented by various cross country lines.

In 2012 it was decided to electrify the railway between Esbjerg and Lunderskov. It is now under construction and is expected to be operational at the end of 2016. This is the first step towards a complete electrification of the most important Danish railway lines. The electrification will provide a modern, cheaper, more stable and environmentally friendly railway network.

In January 2014 the former Danish government agreed with the Parliament on the so-called "Train Fund Denmark". The Train Fund DK consisted mainly of an electrification of the main railways as well as the "One Hour Model" vision – one our travel time between Copenhagen-Odense-Aarhus-Aalborg. In addition, a new railway to Billund Airport and Legoland/Billund City, faster trains on regional lines, and better conditions for freight-traffic on railways are parts of the Train Fund DK.

It was the former government's ambition that the Train Fund DK should include spending of almost €4 billion. The Train Fund DK is based on extra tax revenues from oil activities in the Danish part of the North Sea from 2014-2042. The financial outcome of the Train Fund DK is therefore dependent on expectations on future levels of the oil price and the level of oil activities in the North Sea. Since the establishment of the Train Fund DK the oil prices have decreased significantly.

Map 5| Ports and ferry routes in the Jutland Corridor

In June 2015 a general election was held in Denmark and the power of government shifted to the current liberal minority government. The current government intends to initiate a review of the financial fundament of the Train Fund DK in order to clarify the expectations of the Train Fund DK's financial capacity for future infrastructure projects. As a result, some of the infrastructure projects in the Train Fund DK might be revised.

2.3. Ports and shipping

Southern Denmark and Schleswig-Holstein have approximately 170 sea ports that function as important nodal points in the transport infrastructure connecting the region's transport economy to neighbouring markets.

Due to the central location between the Scandinavian countries and the Baltic Sea as well as the proximity to the region of Hamburg, the Schleswig-Holstein ports are very important from an economic and logistical point of view. With its well-developed ports Schleswig-Holstein is a transport hub for a large amount if freight traffic.

The biggest ports of Schleswig-Holstein are Lübeck, Kiel and Puttgarden at the Baltic coast. The most important ports for trade with Denmark are Puttgarden with its ferry link to Rødby and the port of List/Sylt with its connection to Havneby/Rømø. The other ports of Schleswig-Holstein have a significantly lower volume of freight with Danish ports.

In Southern Jutland ports facilitate a wide array of services ranging from frequent feeder services to German ports, short sea shipping of roll-on-roll-off units and transport of oil, gas and dry bulk. In recent years ports on the west coast of Denmark have furthermore carried out investment programmes to facilitate the growth in the wind energy sector and the off-shore wind farms in the Wadden Sea and North Sea specifically.

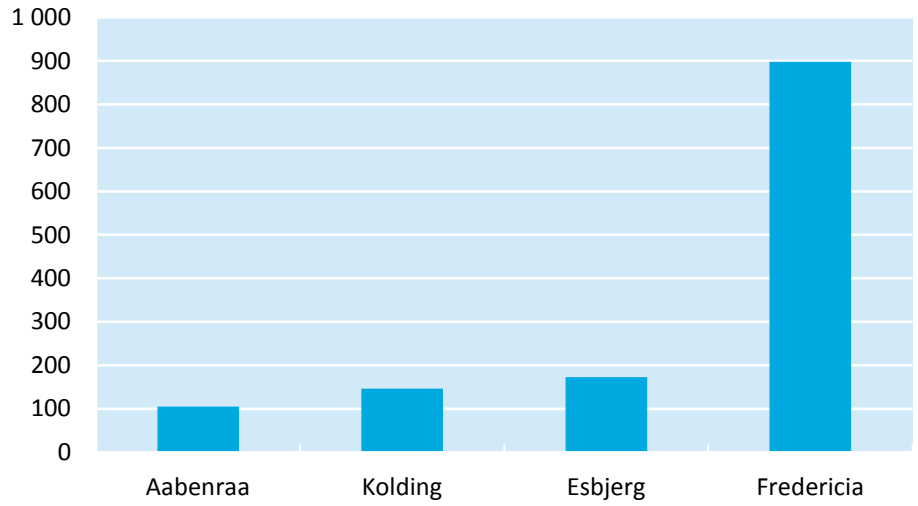
The most prominent port in Southern Jutland in terms of container freight to and from Germany is the port of Fredericia. As a feeder port to the port in Hamburg there are four weekly connections. The prominence of the port of Fredericia is visualised in figure 1 below. In 2014 almost 900,000 tons of goods were transported between Fredericia and German ports. The port of Esbjerg handled almost 200,000 tons of goods in 2014 and represents a major connecting point for Danish foreign trade. Even though the volume of freight between Esbjerg and German ports remains marginal, the port of Esbjerg offers an efficient supplement to the port of Hamburg in terms of short sea shipping access to destinations in the United Kingdom and on the European continent.

The ports of Rømø and Esbjerg have taken a proactive approach to accommodate the growing market for wind energy. While Esbjerg has focused on the shipping of wind turbines components from Danish production facilities and on supplying services to Danish off shore wind farms, the port of Rømø focusses on supplying services to German off shore wind farms. Both ports are distinguished by their ability to deliver adequate port depths in the otherwise shallow waters of the Wadden Sea.

A number of small and medium sized ports also contribute to the supply of easy and efficient access to waterborne transport in the borderland region. The ports of Kolding and Aabenraa offer modern reception facilities and are important to the region for the supply of building materials, foodstuff and other forms of dry bulk.

There are two regular ferry services between Germany and Denmark. On the one hand, there is the so-called Vogelflug line between the ports of Puttgarden and Rødby and on the other there is a ferry connection between the port of List on the island of Sylt and Havneby on the island of Rømø. As this report focuses exclusively on the Jutland Corridor only the line between List and Havneby will be discussed. For individual transport from the mainland this 16 km ferry connection, which opened in 1963, represents a popular alternative to the railway link via the Hindenburgdamm. The ferry service is operated by Syltfahre.de using a double-ended ferry called SyltExpress. The crossing takes 35-40 minutes.

Figure 1 | Freight volumes with German ports (1000t) 2014 p.a.



Source: Statistics Denmark

This report does not discuss the Kiel Canal. Whereas the Kiel Canal plays a pivotal role in the waterway transport of cargo to the entire Baltic Sea region, largely to and from Hamburg, it does not have a distinct function for the cross border transport of goods in the Jutland Corridor.

2.4. Air traffic

Civil aviation in the EU including domestic routes is based on an internal market with free access for all carriers in all EU/EEA member states. It is the decision of the companies to decide which routes they will serve.

Aviation is a flexible and important transportation venue for most of the southern region's larger companies. Domestic scheduled civil aviation in Denmark is concentrated to six routes from the larger Danish cities to and from Copenhagen Airport. The routes from Billund and Sønderborg are relevant for the transport infrastructure in Southern Jutland. Billund Airport is situated 130 km from the German border and Sønderborg Airport is located 50 km from the border.

From Billund Airport there are flights to a large number of airports, particularly in Europe. From both Billund Airport and Sønderborg Airport there are daily flights to Copenhagen Airport.

In 2014 approximately 146,000 passengers travelled between Copenhagen Airport and Billund Airport and approximately 56,000 passengers travelled between Sønderborg Airport and Copenhagen Airport.

There are at present three routes linking Southern Jutland with Germany: from Billund Airport to Frankfurt, Munich and Düsseldorf. The number of passengers from Billund to German destinations is shown in table 3 below. Esbjerg Airport (80 km from the border) solely has routes to Aberdeen and Stavanger. In addition, Esbjerg Airport is essential for the off-shore industry.

Table 3 | Number of passengers to German airports p.a. 2014

Route	Passengers
Billund – Frankfurt	240,000
Billund – Munich	11,500
Billund – Düsseldorf	7,400

Domestic flight routes between Danish and international airports can help to ensure a high level of regional accessibility and contribute to regional development, particularly for remote areas where the travel time to Copenhagen is considerably shorter by plane than by train or ferry. The airports are furthermore important for the companies in relation to commercial interaction and thereby a key element in the development and economic growth in the region.

The airfield Flensburg-Schäferhaus is the only airfield with a cross border function in the Schleswig-Holstein part of the Jutland Corridor. Due to its location near the border it is also used by Danish customers. The airfield has three runways altogether. One of them has a length of 1,580 m and a maximum weight-bearing capacity of 30 tons. For this reason, the airfield is well suited for business charter flights.

Air-charter enterprises offering commercial and private flights as well as sightseeing flights are located in the vicinity of the airfield. Moreover, Germany's largest seaplane enterprise has its seat in Flensburg. Flight schools offer lessons for flying airplanes, gliders, ultra-light planes and seaplanes as well as for parachuting. Aerial advertisement and hangar places are offered. In addition, an aviation-technical company offering servicing and repair of motorised aircraft is located on the airfield as well. The water aerodrome Flensburg-Sonwik on Flensburg fjord is also nearby.

Beyond the borders of Schleswig-Holstein, the airport at Hamburg-Fuhlsbüttel (Hamburg Airport) is interesting also for citizens and businesses in the region. It offers a vast number of German and European destinations as well as intercontinental connections.

Map 6 | Airports in the Jutland Corridor

3. Traffic development

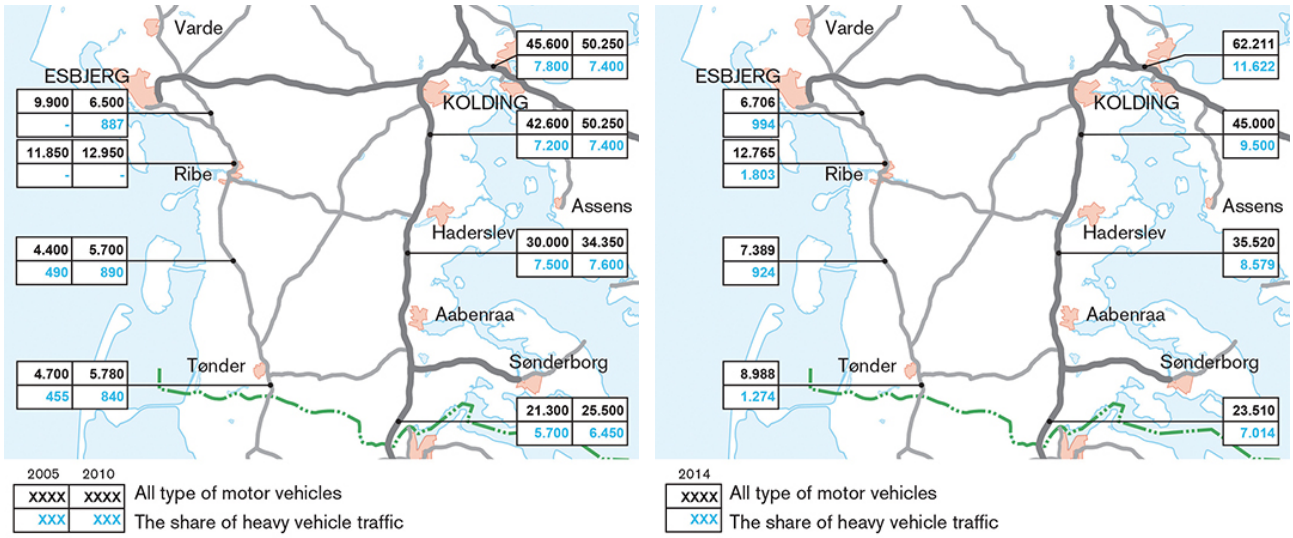
This chapter focuses on the development in traffic in the Jutland Corridor and contains four sections about roads, railways, ports and shipping, and air traffic respectively.

3.1. Roads

The development of traffic volume in the Jutland Corridor from 2000-2014 is shown on map 7 and map 8 below. The maps present the average traffic expressed in number of vehicles per day on selected locations on the B5, A23 and A7 as well as route 11 and E45. It must be noted that the newest figures from the German authorities are from 2010. It has not been possible to get newer figures.

As seen on map 7 the traffic volume has increased on the E45, particularly in the so-called 'triangular area' where congestion is a growing problem. The traffic volume is highest in the triangular area from the town of Fredericia to south of Kolding after which it decreases significantly towards to Danish-German border. A small decline from 2010 to 2014 in the traffic volume close to the border can be observed. After the E45 becomes the A7 an increase in the traffic volume can be observed all the way to Hamburg cf. map 8.

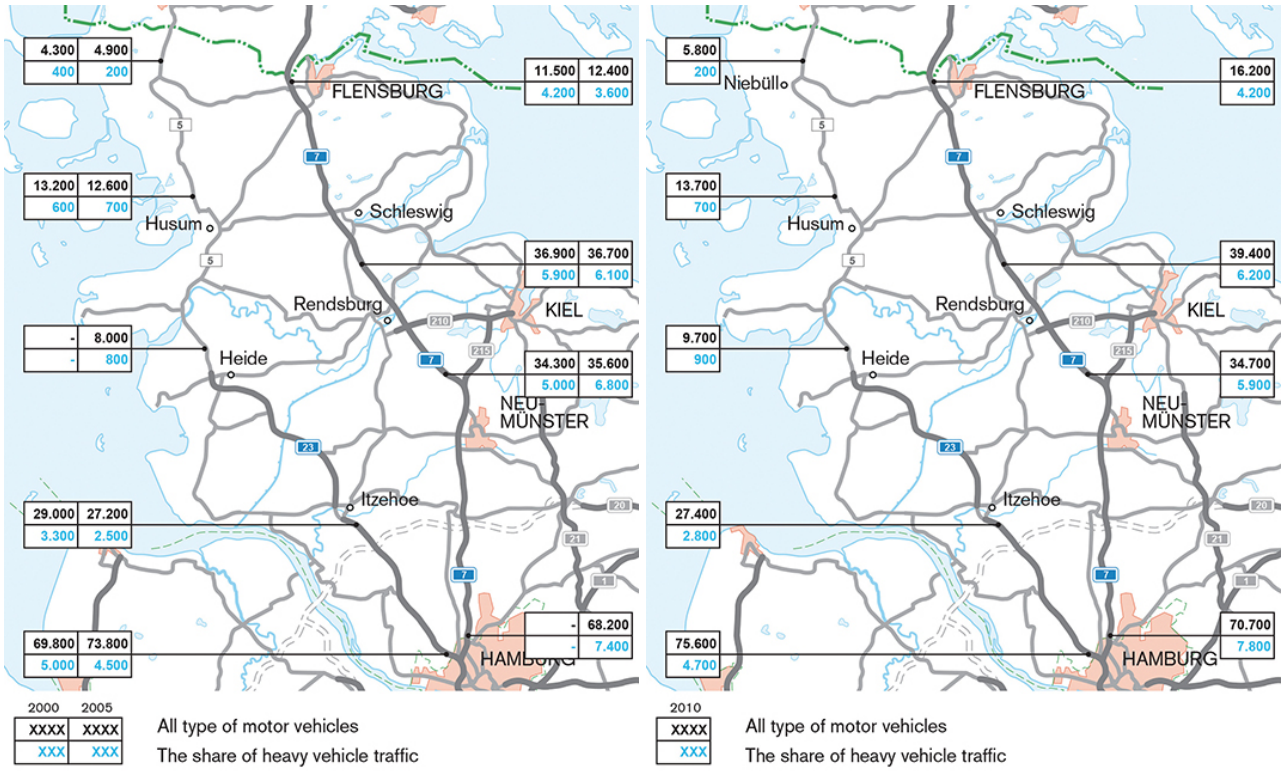
Map 7 | Traffic volume 2005, 2010 and 2014 on route 11 and E45



*The traffic volume at the most southern point on the E45 is counted south of the exit to Kruså, which means that the traffic exiting the motorway is not included in the count. As such, the count north of the exit is estimated to 28.662 in 2014.

The traffic development on route 11 has been slightly inconsistent with an increasing development on the central and southern sections simultaneously with a decreasing tendency between Esbjerg and Ribe as well as around Ribe. However, the traffic volume is still highest on the section around Ribe. Currently, an environmental impact assessment is being conducted with regard to the establishment of a by-pass around Ribe.

Map 8 | Traffic volume 2000, 2005 and 2010 on B5/A23 and A7



With regard to the A7 motorway, the traffic volume has risen in the period from 2000 to 2010. In the area of the A7 motorway border crossing at Ellund the daily average quantity of traffic have risen from app. 12,400 vehicles in 2005 to 16,200 in 2010. The share of trucks is app. 25 %. The rise in traffic volume is above average especially in the area close to the border, whereas it is more moderate to the south. However, this trend is no indication of the efficiency of this particular road section given that the absolute congestion rate is higher than in the north. Consequently, the capacity of the A7 motorway north of the interchange A7/A215 can be considered to be adequate. Some individual road sections like the area of the Rader Bridge are critical at certain times. South of the A7/A215 interchange traffic capacity levels are exceeded regularly, particularly in the area around Neumünster and in the metropolitan area of Hamburg.

A similar development can be noted on the motorway A23 and the federal highway B5. On the B5 the daily quantity of traffic has increased from 4,283 vehicles in 2000 to 5,771 vehicles in 2010 with the share of trucks being app. 4 %. Over-proportional increases can be observed in the area close to the border whereas towards the south the increase of traffic is more moderate

Congestion on the B5 is mainly caused by tourist and agricultural traffic in the summer months, particularly on the section between Tönning and Bredstedt. South of Heide the quantity of traffic reaches a volume that warrants the profile of a motorway. In general terms there has only been a moderate increase in heavy vehicle traffic in Schleswig-Holstein despite the fact that a disproportionate rise can be noted in the area close to the border.

According to the latest statistical releases of the Federal Motor Transport Authority (Kraftfahrtbundesamt) from 2012 the amount of freight from

cross border truck transports between Germany and Denmark was about 6 million tons in shipping (outgoing) and about 5.4 million tons ingoing (figures include the Vogelflug-line via Fehmarnbelt).

From 2003 to 2013 there has been an increase in the number of vehicles passing the two border trunk roads between Denmark and Germany. Figure 2 shows the trend in the number of vehicles crossing the border and figure 3 shows the development in truck traffic across the Danish-German border (northbound) from 2003 to 2014.

As seen on figure 2 the number of vehicles passing the Danish-German border at Sæd/Süderlügum and at Frøslev/Ellund is increasing steadily with a slight drop in 2013.

Figure 2 | Vehicles (all types) passing the border daily 2000-2013

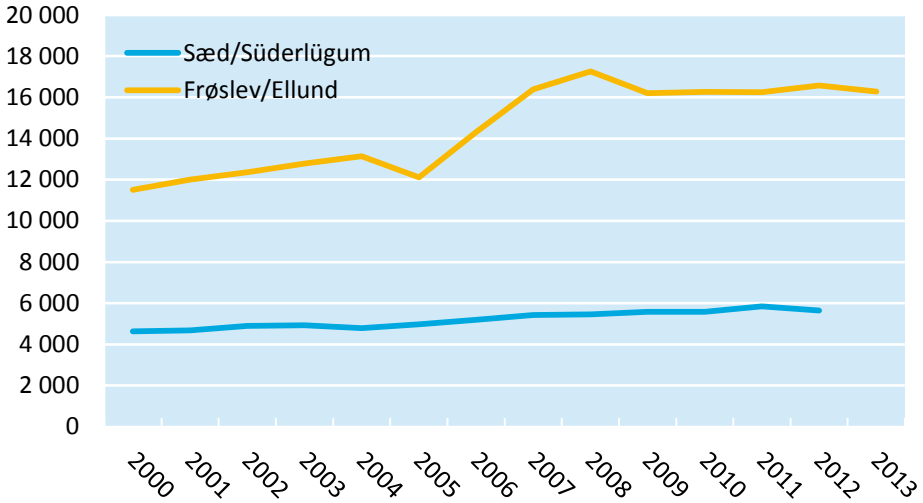
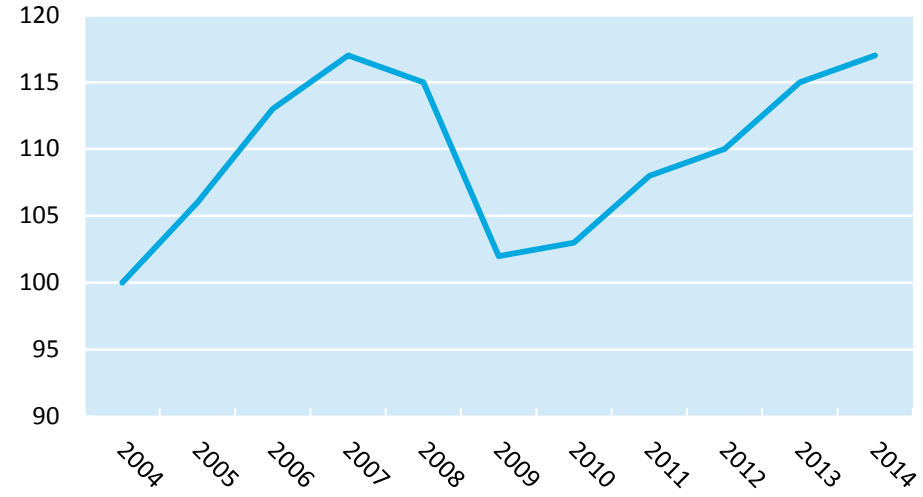


Figure 3 shows that after the drop in truck traffic across the Danish-German border in a northbound direction in 2008, the level in 2014 has increased to almost that of 2007.

Figure 3 | Cross border truck traffic 2003-2014 (2002= index 100)



3.2. Railways

There are two border crossings between Schleswig-Holstein and Denmark used by local passenger traffic, namely Flensburg-Padborg and Niebüll-Tønder. From the train stations in Denmark there are trains from Flensburg to Kolding, Odense and Copenhagen as well as from Niebüll to Esbjerg.

The border crossing at Niebüll-Tønder was reopened in the past few years for local passenger traffic and the transport options are being extended step by step. Currently, the railway company Arriva, a foreign subsidiary of the DB AG, operates ten trains crossing the border on workdays and seven on weekends. The number of passengers using this line is increasing steadily and demand is particularly high in the summertime due to the high frequency of tourists. It has been possible to increase demand substantially since 2006. On the Tønder-Niebüll railway, regional trains cross the border every two hours. In Niebüll there are good connections to regional trains to and from Hamburg.

From March 2015 there has been an additional connection between Niebüll via Tønder to Esbjerg from Friday to Sunday in the late evening. This is an interesting new connection particularly for commuters from Denmark. In the southbound direction there is also a new connection in the late evening. The state government expects that this offer will increase demand in cross border traffic. Initially, this service was provided from March to October 2015. If the service should be demanded by the passengers, the state government will consider continuing to offer this service in the summer 2016.

The table below shows the development of the average number of passengers per day in cross border passenger traffic.

Table 4 | Daily average number of cross border passengers

Railway line	2003	2006	2010	2011	2012	2013	2014
Tønder – Süderlügum	57	98	131	112	133	132	146
Padborg – Flensburg	267	252	262	420	420	391	398

Altogether, cross border passenger railway traffic which started from a low level is developing very successfully. In order to support this trend, there are plans to extend both railways to run on an hourly basis in the medium to long term.

The border crossing at Flensburg-Padborg is used by local passenger traffic as well as international long distance passenger and cargo traffic. Today the Danish national railway company DSB operates intercity trains between Copenhagen and Flensburg every second hour. From 2016 these trains will change route to Aalborg to Flensburg to improve the north-south connections in Jutland. Together with Deutsche Bahn (DB), DSB also operates two international trains daily in each direction across the border between Aarhus and Hamburg via Flensburg.

The State of Schleswig-Holstein offers a connection every two hours for local passenger traffic. The trains mostly run directly from Flensburg to Copenhagen. The Danish IC3 trains are primarily used for this line due to the fact that they have a standard, which is appropriate for long distance travel. A considerable increase in the number of passengers travelling daily was achieved since the DSB took over operations in 2011, with the volume rising from nearly 250 passengers per day to more than 400 passengers per day.

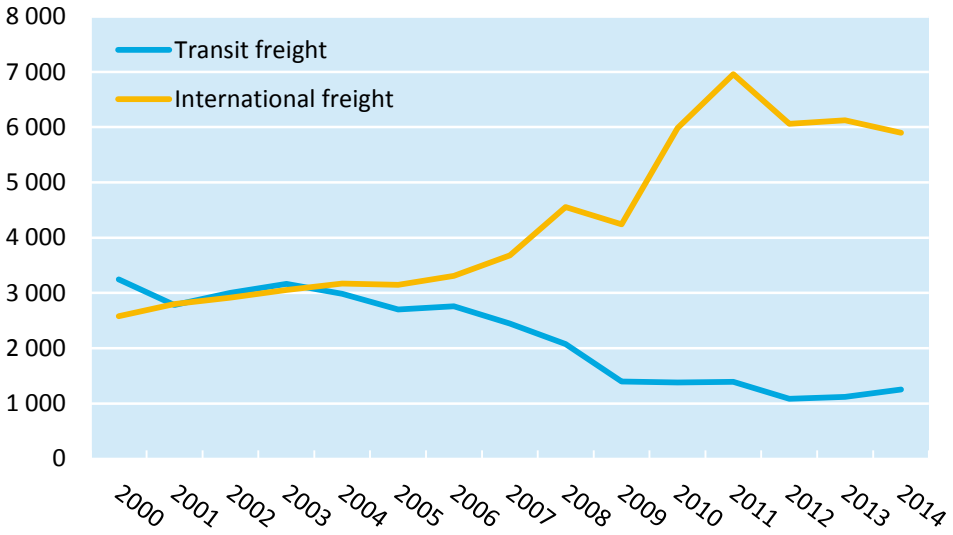
3.2.1. Freight transportation

In March 2015 a freight terminal was established in Esbjerg together with a railway to the port of Esbjerg linking railway freight to sea transport. The Danish windmill company Vestas uses the railway as their primary transport of windmill wings from Lauchhammer in Germany to the port of Esbjerg.

Figure 4 below illustrates the development in freight transport (tons of cargo) from 2000-2013. The railway freight transit has increased by 240 % since 2000. The railway freight transportation in and out of Denmark across the German border (measured in tons) has declined by 58 % in the same period.

According to the Danish Transport Authority the railway freight transit traffic will increase by 5.2 % per year until the opening of the Fehmarn Belt Fixed Link. Hereafter a substantial share of transit traffic will be directed from the route via Padborg to the route via Fehmarn. After this shift the freight traffic via Padborg is expected to grow again until full capacity is established in the German Hinterland of the Fehmarn Belt Fixed Link through the establishment of double tracks.

Figure 4 | Cross border railway goods traffic 2000-2014 p.a. (1000 t)



Source: Statistics Denmark
*"Transit freight" is trains running through Denmark between Germany and Sweden, while "International freight" is international trains with goods to and from Denmark.

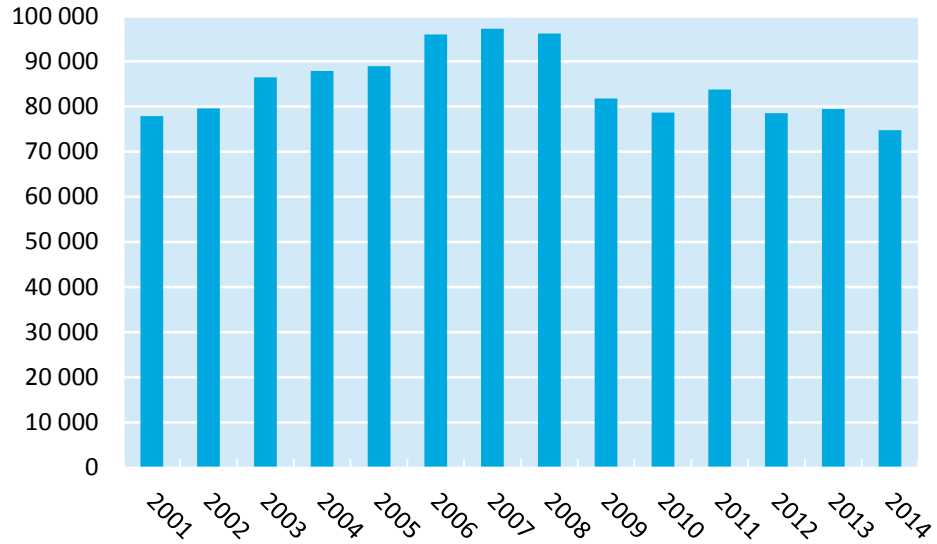
3.3. Ports and shipping

Traffic volumes in Southern Jutland ports can roughly be divided in to freight and passenger transport.

In general Danish ports felt the consequences of the global economic downturn. Activity in ports and the amount of freight volumes handled decreased from 2008-2010. After three consecutive years of reduced activity, the pattern appeared to be changing in 2011 as freight volumes grew. However, in 2012 volumes decreased slightly again but grew in 2013, albeit cautiously cf. figure 5, which shows the development in freight volumes in Danish ports from 2001-2014. Freight volumes dropped again in 2014, reaching the lowest level since 2001.

In terms of the transport of goods between Southern Jutland ports and Germany, the impact of the economic downturn is less apparent. Although 2008 did see a slight downwards trend in goods volumes, the development in the subsequent years appears to be less of a result of the general slow economy. According to figure 6 the transport of goods between Southern Jutland ports and Germany are more or less similar with the situation before the global economic downturn.

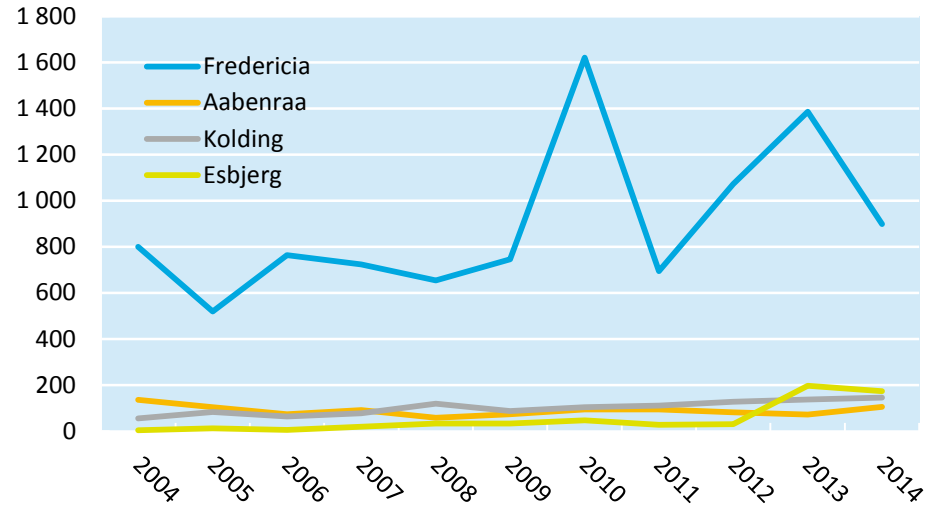
Figure 5 | Freight volumes in Danish ports (1000 t) 2001-2014 p.a.



Source: Statistics Denmark

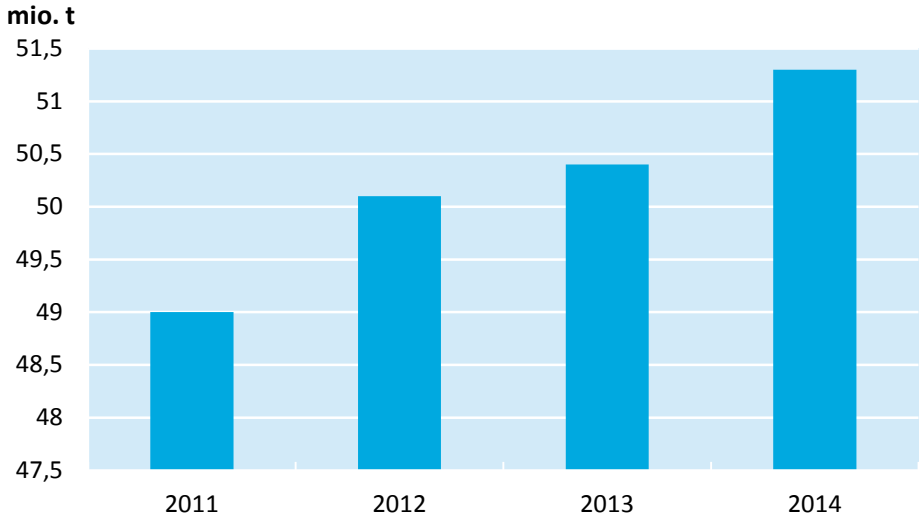
The port of Fredericia stands out as the port with the largest freight volumes with a growth exceeding that of 2008. After a significant increase in freight volumes in 2010, volumes dropped in 2011 but have since then increased in the two succeeding years and have almost reached the volume of 2010.

Figure 6 | Freight volumes between Danish ports and Germany (1000 t) 2004-2014 p.a.



Source: Statistics Denmark

Figure 7 | Freight volumes in Schleswig-Holstein ports p.a.



The development of freight volumes of the main ports in Schleswig-Holstein is presented above. From 2011 to 2014 there has been a continuing increase in the freight volumes from 49 mio. tonnes p.a. in 2010 to 51.3 mio. tonnes p.a. in 2014.

3.3.1. Passenger transportation

The ferry service from the port of Esbjerg to the island of Fanø is the second busiest domestic service in Denmark. In 2013 the ferry service handled almost 1.6 million passengers and more than 300,000 private cars.

Southern Jutland is also home to another domestic ferry link between the island of Als (Fynshav) and Funen (Bøjden). The Fynshav-Bøjden link represents an important alternative to the fixed link across the Little Belt and provides a shortcut to Funen for the border region.

Table 5 | Transport volumes p.a.

Transport	2014
Passengers	332,000
Cars	56,464
Busses	1,182
Lorries	9,502
Bicycles	8,457

Source: Statistics Denmark

In addition to the domestic Southern Jutland ferry lines, an international route operates between the island of Rømø (Havneby) and Sylt (List). The 2014 traffic volumes of the Rømø-Sylt link are listed in table 5. The considerable passenger transport and substantial accommodation of bicycles are indicative of the importance of the ferry link to local communities and tourism.

The ferry services between List-Sylt and Havneby-Rømø have seen an increase in transhipment while the number of passengers has decreased from 2000 to 2014 cf. table 5. In 2014 the connection List-Havneby had a transhipment of about 76.000 tonnes and 332.000 passengers.

Table 6 | Development in shipping p.a. List-Havneby

	2000	2010	2011	2012	2013	2014
Trans-shipment	53,654 t	59,994 t	92,634 t*	86,546 t	98,036 t	76,128 t
Passengers	415,467	421,072	389,563	295,411	323,672	331,781

*Increase in quantity because of some bigger building projects on the island of Sylt

3.4. Air traffic

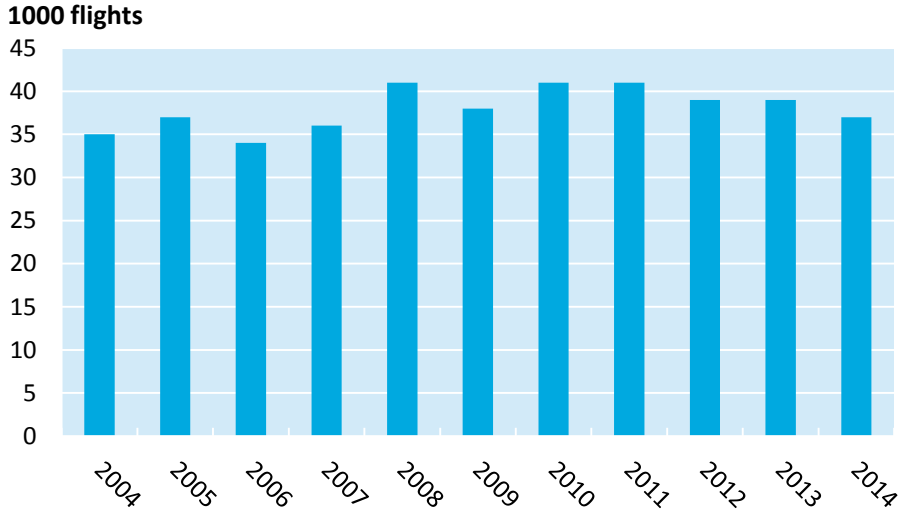
Sønderborg Airport is owned by Sønderborg Kommune (municipality). The airport was historically tied to the Danish airline Cimber (later Cimber Sterling) which had its headquarters at the airport and for 46 years served the route to and from Copenhagen until its bankruptcy in May 2012.

The route was immediately taken over by the Danish carrier Danish Air Transport (DAT). In 2013 Air Alsie started up on the route instead of DAT. In 2014 56,000 of the airports total number of passengers of 58,000 used the only scheduled route to and from Copenhagen.

As part of its development plans, in 2010 the airport hired a consultancy firm to report on the possibilities for changing the airport into a “binational” Danish-German airport or for other co-operative arrangements with the main purpose of attracting more passengers from the German side of the border to the existing route to Copenhagen and to new routes that might be created. Within a drive of app. 90 minutes the airport could serve a potential 1.6 million people. The analysis received support from the EU’s European Regional Development Fund.

Billund Airport is the largest airport in Southern Jutland. The airport offers several international flights to global destinations. The table below shows the development in numbers of flights from 2004 to 2014.

Table 7 | Flights from Billund to national and international destinations



* The numbers are based on charter flights and regular scheduled airliners.

In 2000 some 16,600 flight movements were counted on the airfield Flensburg-Schäferhaus (take offs and landings by airplanes). The number amounted to 13,200 in the year 2005 and 12,900 in 2011.

At the airport of Hamburg-Fuhlsbüttel app. 165,000 flight movements and some 10 million passengers were counted in 2000. In 2005, the number of flight movements dropped to about 156,000 with 10.7 million passengers and in the year 2014 there were 153,876 aircraft movements with 14.8 million passengers.

A survey done at Hamburg Airport in 2013 revealed that app. 220,000 Danish passengers used the airport (journey from Denmark and flight to and from Hamburg, without transit passengers from Copenhagen). Thus, the share of Danish passengers was about 1.6 %.

4. Current infrastructure projects

This chapter presents the concrete plans for expansion measures and cross-border infrastructure projects in the Jutland Corridor.

Before the infrastructure programmes are presented, it is necessary to explain in detail the decision-making process in Germany because it is different from the Danish. In principle federal transport routes in Germany are planned and financed by the Federal State. The BVWP containing all transport modes classified into 'urgent need' (Vordringlicher Bedarf plus, Vordringlicher Bedarf) and 'additional need' (Weiterer Bedarf, Weiterer Bedarf mit Planungsrecht) is the main strategic infrastructure plan. However, it is not a finance plan, which means that the projects are not automatically financed.

It is decided by the Federal Government but only has the nature of a recommendation. However, the plan was taken up by German Parliament for the federal railways and the major federal roads in the so-called 'needs plan' (Bedarfsplan), which is an annex to both the Federal Railway Extension Act (Bundesschienenwegeausbaugesetz) and the Federal Trunk Road Extension Act (Fernstraßenausbaugesetz). These two laws provide that 5-year plans be drawn up for the concrete realisation of the needs plan. For this purpose, the BMVI compiles 'investment framework plans' (IRP) for a period of 5 years. The current IRP is valid from 2011 to 2015.

At present the BMVI is working on an update of the BVWP which shall be applicable from 2015-2019. The current status of the procedure is:

- The BMVI presented its basic concept in the spring of 2014
- A new traffic forecast for the period up to the year 2030 has been available since the summer of 2014
- The period for submission of projects is over. The projects will be reviewed by the BMVI on the basis of defined criteria (cost-benefit criteria)
- The BMVI intends to draft an overall plan from these separate projects and to discuss this draft in the federal cabinet.

The federal transport budget has been structurally underfunded for several years. As a result, the BMVI accords priority to the maintenance of existing infrastructure. In terms of upgrading and expansion, priority must be accorded to the removal of traffic bottlenecks and the freight traffic corridors.

State roads are financed by the state budget and municipal roads by the municipalities and counties. For municipal building projects the federal state and the state of Schleswig-Holstein grant subsidies under certain conditions according to the German Community Transport Financing Act.

In the sections below, the most important infrastructure projects are presented.

4.1. Roads

In the Danish road system the Jutland Corridor is represented mainly by the E45 motorway in Eastern Jutland, which provides a high level of mobility and economic development in the region. However, the growth in traffic causes increasing congestion on parts of E45, which will be one of the key issues for the future infrastructure projects to cope with.

Within the last few years several initiatives have been carried out on E45. In 2013 the most trafficked section at Vejle was expanded and in 2014 the capacity at Kolding was enlarged by inclusion of the emergency lanes. With the political transport agreement "Traffic Agreement 2014: Implementing available means of the Infrastructure Fund" (Trafikaftale 2014: Udmøntning af disponible midler i Infrastrukturfonden) of June 2014 it was decided to allocate DKK 38.9 million to the construction of a third southbound lane south of the Limfjord Tunnel in Aalborg, where the accessibility is currently challenged. Furthermore, approx. DKK 100 million was allocated as grants to four new interchanges at Skanderborg, Kolding, Aarhus and Horsens.

In addition, several road projects in the Jutland Corridor are ready to be initiated, when the funding is provided. This is the case for an extension of the motorway between Fredericia and Kolding and a third Limfjord Fixed Link at Aalborg, which have both been analysed at the EIA level.

The E45 crosses the border at Frøslev/Ellund and becomes the A7 in Germany. Due to the growing traffic volume the A7 motorway will be expanded between the interchange at Bordesholm and the Elbtunnel in Hamburg from four to six or eight lanes, respectively. In Schleswig-Holstein the expansion is planned on a section of 65 km. This expansion project costing about € 372 million is included in the "urgent need" category of the BVWP as well as in the IRP 2011-2015.

It will be carried out as a public-private partnership as a so-called availability model (Verfügbarkeitsmodell), meaning that besides the expansion the private company also takes over maintenance and operation services for a period of 30 years. A monthly remuneration is paid for these services. The project also contains a basic renewal of the existing lanes. To avoid delays as far as possible, 2 lanes per direction can be used by vehicles during the construction period. Therefore, the expansion work will be done on one side only, while the traffic runs on the other side.

Legally binding plan approval notices have been granted for all construction sections in Schleswig-Holstein. A construction consortium was awarded the contract after completion of the tendering procedure. Construction work began in November 2014 and is expected to end in 2018.

In Hamburg there are three sections planned for the expansion to six or eight lanes, partly with coverings. Construction in Hamburg-Schnelsen began in the middle of 2014 and the last section in Hamburg-Othmarschen will be finished in 2025.

To provide relief for the Hamburg Elbtunnel along the A7 motorway, a northwest bypass of Hamburg including a new link across the river Elbe will be realised by the A20 motorway, which will be built in different sections.

The A20 coming from Mecklenburg-Vorpommern is already used by traffic east of Bad Segeberg. All sections of the A20 motorway are a part of the IRP 2011-2015 albeit in different realisation categories.

The plan approval decision for the adjoining sections between Weede and Wittenborn was ruled to be unlawful and unenforceable by the Federal Administrative Court in Leipzig. The Court has decided in favour of the claims filed by several conservation groups and one community. According to the ruling the errors found are not of such a nature that the plans as a whole must be called into question a priori. The State of Schleswig-Holstein is conducting more extensive fauna studies and is assessing more environmentally friendly routings. The rulings may affect other sections and the fixed link across the Elbe. The MVWAT predicts that there will be a delay of almost 2 years because of the reworking of the project.

Map 9 | Road projects

The plan approval decision for the section with the fixed link across the river Elbe (tunnel) was issued on 30th December 2014. Various lawsuits against the decision are pending.

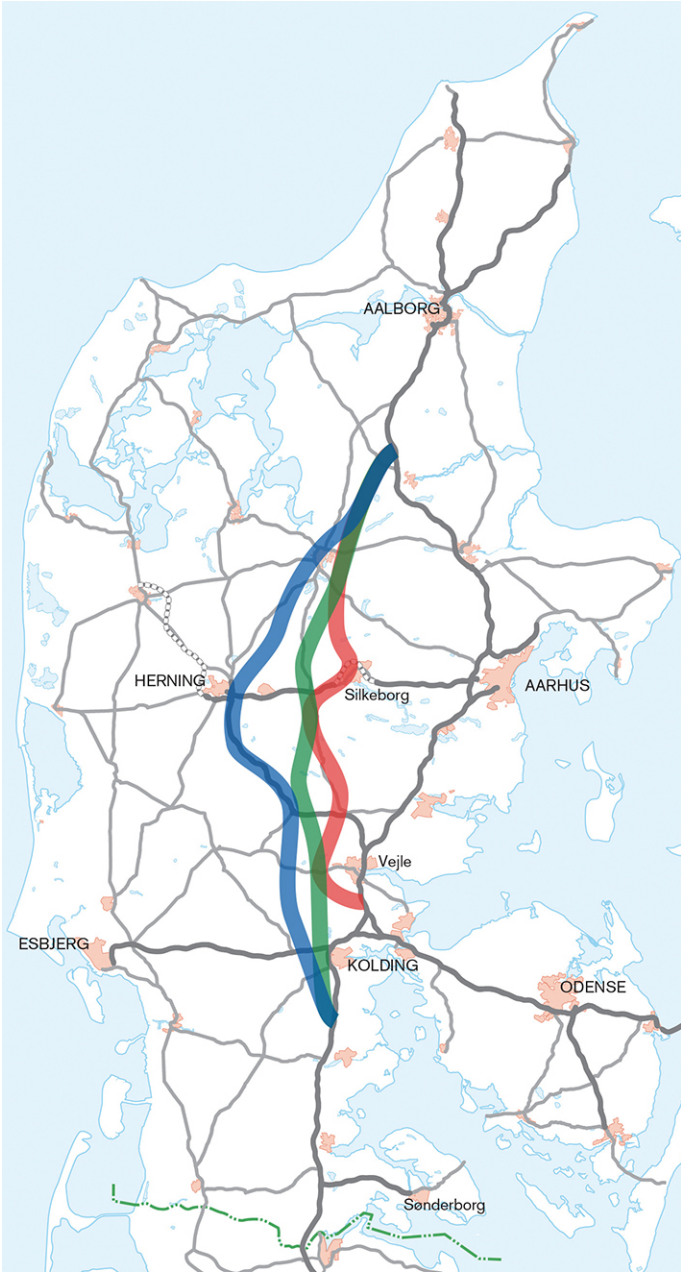
In the western part of the Jutland Corridor, a bypass road around Ribe on route 11 is currently being analysed at EIA level. Several extension projects are planned on the German side for A23 and B5. The new bridge across the river Stör was completed in June 2010. Demolition work on the old bridge has been carried out since October 2011.. Completion of the entire section and a new second bridge across the river Stör is scheduled for 2016.

The section of the B5 between Itzehoe and Wilster-West is being upgraded to three lanes. The first construction stage was completed in April 2014. The plan approval procedure is currently under way for the second construction phase. An upgrade of the highway between Wilster-West and Brunsbüttel is the long term aim when the two above-mentioned sections are completed.

In the area of the B5 between Tönning and Husum planning for a three-lane-traffic management system has begun. The objective is to enhance road safety and to manage peaks in seasonal traffic. The plan approval procedure has been initiated for the first section. The construction plans for sections two to four are currently being drawn up.

As a competitive advancement the BVWP-project “B5 bypass Hattstedt-Bredstedt” will be realised. The plan approval notice was granted in March 2012 but is pending at court. At present, a plan revision procedure is being carried out and the project is included in the IRP.

Map 10 | 'Midtjyske motorway' and E45



According to the state government the current and future traffic volume do not warrant a four-lane motorway expansion of the B5 north of Heide up to the Danish border, which has been suggested by the region.

With regard to the long term development strategies, the Jutland Corridor has been part of a broader planning effort in Denmark, which has identified large scale infrastructure demands in the years after 2020 and major strategic options for further infrastructure investments beyond 2020. This work was initiated by a broad political agreement in 2009 and finalised in the spring 2014 with a summary report.

The strategic analyses have identified two main long term development strategies for the north- and southbound road capacity in Jutland:

- Further development of the motorway capacity in the E45 corridor
- Different models for establishment of a new motorway corridor in Central Jutland.

The analyses show that the cheapest and most effective way to deal with the growing congestion problems in East Jutland in 2030 will be a gradual expansion of the E45 corridor. Environmentally it will be relatively little intrusive to expand the highway in the existing corridor but in terms of traffic it will be disturbing for road users during construction. It must be noted that the compared prices between establishing the new motorway and expanding the E45 solely includes the construction price. The additional costs incurred by the chosen solution are thus not included in the comparison.

Another strategy is to establish a new motorway corridor through Central Jutland - the so-called “Midtjyske motorway”. A new motorway corridor through Central Jutland can both absorb some of the traffic from the E45 and connect some towns in Jutland that are not currently connected to the motorway network. However, the project is very extensive and costly with an estimated construction budget of DKK 15-20 billion. The full relief impact in relation to E45 requires that the new motorway is fully established, which is estimated to take at least 15 years. However, even with a fully established motorway in Central Jutland, congestion will occur in sections of the E45.

In the Government Platform the current government has suggested an assessment of a shorter and more western bound stretch of the western corridor between Lunderskov-Billund-Give.

This solution will relieve the southern part of E45 of traffic and both avoid affecting the nature around the area of Vejle Ådal as well as serve as a road corridor for the international airport in Billund.

Overall, the report concludes that irrespective of the chosen long-term development strategy, it will be necessary to expand the congested sections of E45.

4.2. Railways

In recent years there has been invested heavily in upgrading the existing railway infrastructure in Denmark. The political perception has been that the train must be a viable alternative to the car and most of the traffic growth in the future must be absorbed by public transportation.

Investments have also been made in the European Rail Traffic Management System (ERTMS), which will harmonise the European signal systems and make Danish railway transport more efficient. Installation will begin on early deployment railways in 2016 for testing in commercial service before the main roll-out of the new signaling system. The new signaling system will be implemented in 2021 with an overlap between railways, prioritised according to the traffic level with roll-out taking place first on the heavily used railways.

It was decided to upgrade the single track section between Vamdrup and Vojens of 20 km to double tracks. The upgrade was finalised in September 2015 and has thus eliminated the bottleneck between Vamdrup and Vojens.

It has also been decided to electrify the railway between Esbjerg and Lunderskov. This is the first step towards electrification of the most important Danish railways. The electrification provides a modern, cheaper, more stable and environment friendly railway.

Map 11 | Railways

Furthermore, investments will be made in a program focusing on repairing and replacing railways and bridges in order to improve the reliability.

In January 2014 the previous Danish government agreed with the parliament on the "Train Fund Denmark". The intention of the Train Fund DK is to modernise the Danish railway system by electrifying the main railways, establishing double tracks and increasing speed limits. However, the current government has proposed a review of the financial fundament of the Train Fund DK in order to clarify the expectations of its financial capacity for future infrastructure projects. As a result, some of the infrastructure projects in the Train Fund DK might be revised. The projects are planned to be finalised in the middle of the 2020s if the agreement is realised under the current conditions.

In Germany the following expansion projects are planned for the Jutland Corridor:

- Upgrading and modernisation of the railway station in Elmshorn with the construction of a fourth platform line.
- Improvement of the suburban railway connection from Hamburg to Elmshorn including an expansion to three tracks between Elmshorn and Pinneberg.

The BVWP of 2003 includes a three-tracked extension of the railway between Elmshorn and Pinneberg as an urgent need. However, a re-evaluation of the project shows that the extension is no longer necessary because of the relief provided by the Fehmarnbelt Fixed Link. As an alternative to a conventional three-tracked extension, the State of Schleswig-Holstein has suggested an improvement of the suburban connections in this section, which would also free up capacity on the main track. This project was submitted for the BVWP of 2015. Financing has not been secured or allocated yet.
The private-owned company NEG plans the construction of a combined cargo terminal in Neumünster. The Eisenbahnbun-desamt has granted financial support for the expansion. The MWAVT advocates the project, because a partial shift of freight from road to railway could be achieved, particularly from the highly frequented motorway A7. The approval procedure for the intermodal terminal is being processed.

Work on the design and permit planning for a continuous double-track upgrade and electrification of the A1 line between Hamburg-Eidelstedt and Kaltenkirchen is currently in progress. The new line 'S 21' will enable rapid transit from Kaltenkirchen to Hamburg Central Station.

With regard to marsh-railway, the State of Schleswig-Holstein wishes to achieve a complete double-track extension and electrification of the railway between Itzehoe and Westerland. For this purpose, the project has been submitted to the BMVI for inclusion in the BVWP.

It has been considered to increase the speed on the railway line Niebüll-Tønder to 120 km per hour. However, it cannot be assessed if it would be feasible under the current technical conditions or economically prudent in relation to general cost-benefit aspects.

5. Transport and infrastructure projects

In the previous chapters the transport infrastructure in the Jutland Corridor has been analysed and presented. On the basis on the preceding chapters, this chapter presents 20 transport and infrastructure projects. The concrete content of each project has been agreed on by the Transport Commission.

The projects are grouped in to five categories.

Categories
Western Corridor Roads
Western Corridor Railways
Mid-Eastern Corridor Roads
Mid-Eastern Corridor Railways
Additional Projects

Insofar as it has been possible, cross border projects have been merged in order to underline the cross border nature of the Jutland Corridor. However, some projects focus solely on either the Danish or German side.

The Western Corridor primarily consists of the Danish route 11 and the German B5 and A23, which connects the summerhouse area on the west coast of Denmark with northern Germany. The rail line from Bramming to Niebüll via Tønder is also of great importance for local traffic as well as for tourists visiting the west coast during holidays.

The E45/A7 is the main international connection for passenger and freight transportation from Scandinavia to the rest of Europe. The E45/A7 produces a high level of mobility and economic development in the region. The motorway serves several types of traffic, which are all growing in volume.

The railway running from Hirtshals – Aalborg – Aarhus –Hamburg is of great importance to both passenger and freight transport.

The projects are summarised below.

	Western Corridor	Mid-Eastern Corridor
Roads	- Upgrade of route 11 from Esbjerg to the Danish-German border and route 24 - Expansion of B5 federal highway	- Motorway through Central Jutland - Expansion of A7 from Hamburg to the Danish border - Construction of a bridge to replace Rader Bridge - Extension of A20 with a fixed link across the river Elbe - Construction of a bypass in Handewitt - East-west connections in Schleswig-Holstein - Harmonisation of weight limits and regulations for road trains

	Western Corridor	Mid-Eastern Corridor
Railway	- Speed upgrade between Bramming-Tønder-Niebüll and standardisation of signaling systems - Railway service between Esbjerg and Hamburg via Tønder - Expansion of the marsh-railway	- Railway improvements between Hirtshals and Hamburg and double tracks between Tinglev and Padborg - Upgrade of Jutland railway - Expansion of the intermodal terminal in Padborg and increased cooperation with Neumünster - Danish-German railway station - Speed upgrade between Sønderborg and Tinglev
Air traffic, ports and electromobility	- Passenger shipping on Flensburg fjord - Intensified cross border utilisation of airports - Electromobility	

Western Corridor Roads

This section presents transport and infrastructure projects relating to the western part of the Jutland Corridor. The main roads in this corridor are the Danish route 11 from Esbjerg to Tønder and the German B5, which is a continuation of route 11 in Germany. The B5 becomes the A23 motorway around the city of Heide and continues as a motorway towards Hamburg. The B5 also continues as a federal highway to the city of Brunsbüttel and further on to Hamburg.

1. Upgrade of route 11 from Esbjerg to the Danish-German border and route 24

Background information

The length of route 11 between E20 (Esbjergmotorvejen) and Tønder is about 74 km. It is a two lane conventional road with accesses to farms, fields and houses. Around Bramming and Tønder route 11 is expanded to a two lane expressway. The section around Bramming is about 12 km and the section around Tønder is about 5 km. The main section of route 24 (about 11.5 km) is an expressway.

The speed limit is 80 km/h on the conventional road section and 90 km/h on the expressway. There are a number of local speed limits.

Route 11 is a regional connection and an international road connection to Germany. It primarily serves local and regional commute and recreational traffic. Route 11 is the main connection between the northern part of Germany and the vacation homes on the west coast of Jutland.

The traffic load on route 11 varies between 3,800 and 13,000 vehicles per day. The highest traffic volume is in the town of Ribe and north of Ribe followed by the sections south of Gredstedbro and north of Tønder. There is some congestion around Ribe but on the main section of route 11 there are only few accessibility problems.

Project description

In the Danish political agreement on traffic "Better Mobility" (Bedre mobilitet) from 26th November 2010 it was agreed to implement a feasibility study to examine the needs and possibilities of improving route 11 between Esbjerg and the Danish-German border.

In the feasibility study it was suggested to build a new expressway from E20 to Tønder and three new bypass roads around Skærbæk, Abild and Ribe. Two different solutions (A and B) are suggested for a bypass road around Ribe. In addition, five concrete initiatives were presented for route 24, all of which would enhance traffic safety.

Status

In the political agreement on traffic "A new Storstrømsbro, Holstebromotorvejen etc." (En ny Storstrømsbro, Holstebromotorvejen mv) from 21st March 2013 it was agreed to allocate DKK 8 million to prepare an Environmental Impact Assessment (EIA) for a bypass road around Ribe.

With the political agreement "Traffic Agreement 2014: Implementing available means of the Infrastructure Fund" (Trafikaftale 2014: Udmøntning af disponible midler i Infrastrukturfonden) from 24th of June 2014, it was decided to allocate DKK 372.4 million to the construction of Ribe Bypass (solution A). The parties will discuss the specific design of the bypass when the EIA is finalised in 2015.

2. Expansion of B5 federal highway

Project description

- Develop the B5 into a west coast transport axis by expanding the entire section between Heide and the border to Denmark into a multi-lane highway. From the junction in Heide, the B5 should be connected with the new fixed link across the river Elbe to the west of Hamburg
- Expand the section between Heide and Tönning into a four-lane highway
- Realise the Bredstedt-Hattstedt bypass
- Expand the federal highway according to the regional study by Rambøll.

Background information

The A23 motorway between Hamburg and Heide which was completed in 1990 ends west of Heide at the B203 federal highway. Since the B5 continues on through the northern part of the District of Dithmarschen and the District of Nordfriesland up to the Danish border, the regional road functions as the main connection for the west coast of Schleswig-Holstein.

Status

The B5 and the A23 are to be expanded section by section depending on the demand from the traffic volume as follows.

Closure of the gap near Itzehoe
Expand a seven km section of the B5 between the existing motorway junctions of Itzehoe-Süd and Itzehoe-Nord to four lanes and thus make it part of the A23. After completion of a replacement bridge across the river Stör in 2010, the old bridge built in 1967 could be demolished. A new bridge (second bridge across the river Stör) will be built at the original site. Both bridges are approx. 1.2 km. The road sections north and south of the bridges will also be expanded to four lanes as part of the A23. In the northern section between the Itzehoe-Nord and Itzehoe-Mitte junctions some 1.7 km of the Heide lanes were opened to traffic at the end of 2011. Completion of the entire project costing approx. € 140 million is scheduled for 2016.

Expansion to three lanes between Itzehoe and Wilster-west
The objective behind expanding the B5 between Itzehoe and Wilster to three lanes is to create improved access to the economic zone of Brunsbüttel. Construction is to be done in two phase. The first phase in which the section from Itzehoe to Heiligenstedten (connection of the K36 to the B5) is to be built was started at the end of 2011 and completed in April 2014. A plan approval procedure for the next phase of construction of the highway between Heiligenstedten and Wilster-West was initiated in 2013. It is conceivable that the section between Wilster-West and Brunsbüttel will be expanded in a third step. The state and federal levels have agreed that this stage will not be discussed before completion of the second construction phase.

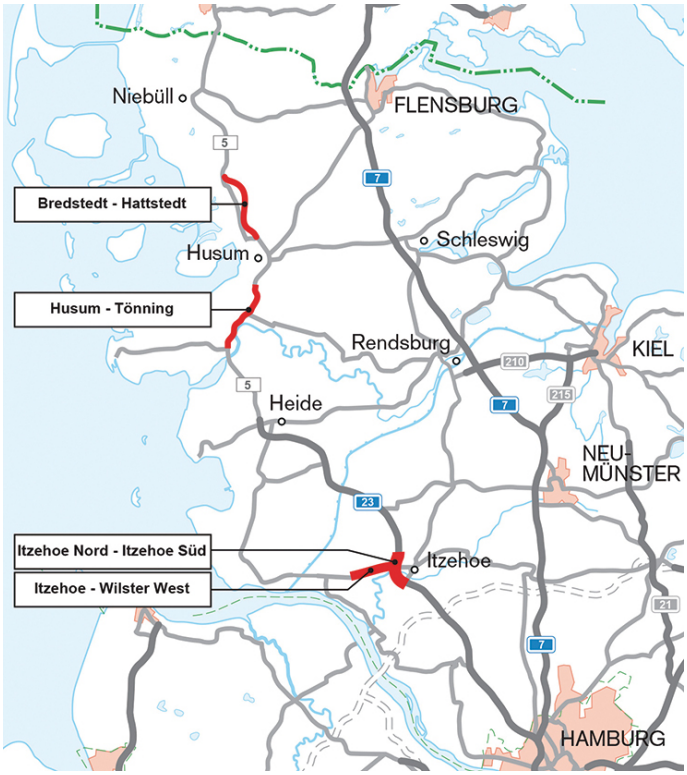
Three-lane traffic management system from Tönning to Husum
The areas of the B5 between Heide and Tönning as well as the Husum bypass have already been upgraded over the past years to include grade-separated junctions. The section between Tönning and Husum is to be constructed to allow 2 + 1 traffic management. The plan approval procedure for the first segment from Tönning to Rothenspieker was initiated in September

2013. The start of construction depends on the further planning procedures for the individual sections as well as on the provision of federal funds. The overall cost involved will amount to some € 110 million. Work on the construction drafts for sections two to four is in progress and funding has not been appropriated.

Bypass construction between Hattstedt and Bredstedt

The plan to reroute the adjoining northern part of the B5 between Hattstedt and Bredstedt, which will coast approx. € 54 million, has been included as an urgent need in the needs plan for Federal Trunk Roads. The plan approval procedure was instituted on 27th August 2009. The plan approval notice was granted on 30th March 2012 but is pending at court. A plan revision procedure aims to remove existing planning faults, which would then lead to a legally binding decision. The start of construction depends on the date when the plan approval notice becomes effective and on the appropriation of the requisite funding by the federal level as the commissioner of the B5.

The project description includes an expansion of the B5 as proposed in the study "Infrastructure and Economic Development along the West Coast" by Rambøll Management Consulting of March 2012. The study examined three development scenarios for the B5/route 11 between Heide and Esbjerg.

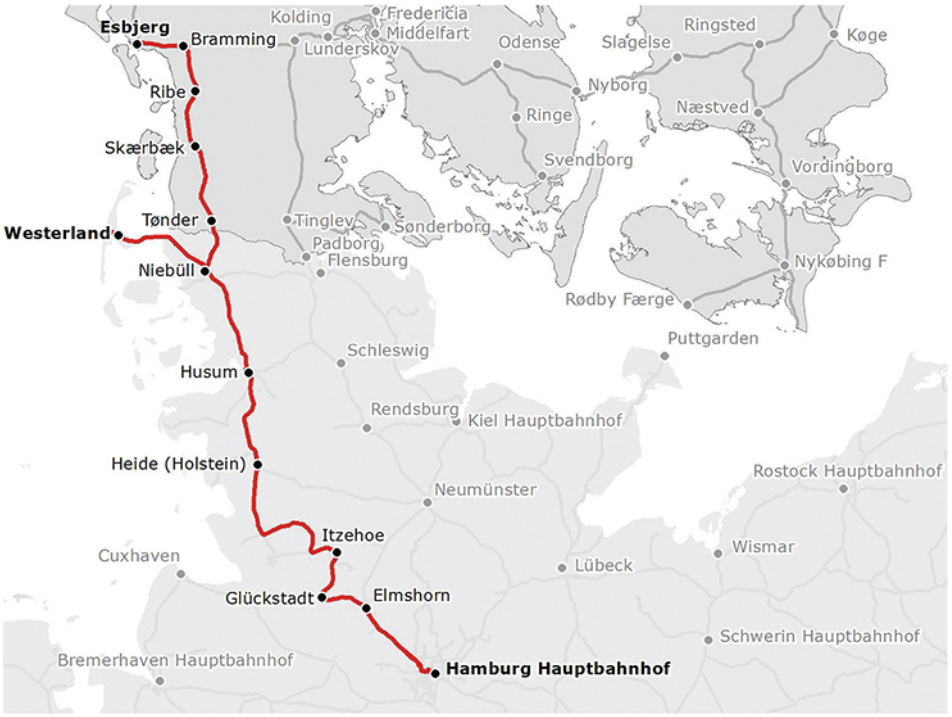


- Alternative 1: construction of grade-separated junctions instead of intersections and roundabouts and combined with bypass sections around the cities
- Alternative 2: Adding a lane (three-lane) with changing sections for overtaking and upgrading to a motorway
- Alternative 3: Construction of a four-lane dual carriageway, including a central crash barrier and hard shoulders (like a federal highway).

According to the assessment of the MWAVT the proposed expansion of the B5 into a four-lane federal highway (or motorway) from Heide up to the Danish border is in view of the current traffic volume considered to be an unrealistic option. The potential expansion is a long term proposal but the Transport Commission acknowledges the proposal and has also put forward a proposal to initiate a strategic analysis of the future traffic flows and needs in the Jutland Corridor cf. project 6.

Western Corridor Railways

This section contains railway transport and infrastructure projects in the western corridor. The main railway in the western corridor runs from Esbjerg over Tønder to Niebüll. From Niebüll the railway continues south to Hamburg where passengers can connect to several pan-European trains. In addition, the marsh-railway from the island of Sylt and onwards to Hamburg is also an important railway for tourists visiting Sylt.



3. Speed upgrade between Bramming-Tønder-Niebüll and standardisation of signaling systems

Background information

In the Train Fund DK it was amongst other things decided to upgrade the speed limit on the railway between Bramming and Tønder. Furthermore, it was decided to install a new signaling system – the so-called ERTMS level 2, which is the newest European common signaling standard.

Today the maximum speed limit is 100 km/hour. The railway is characterized by a relatively high density of stations. When the signaling program has been established, the required technique to increase the speed on the line will be available.

The railway between Bramming-Tønder-Niebüll is currently using lineside signals and the Danish ATC-train control system - also on the German part of the line. Until the new signaling system is fully implemented on the Danish side, it will be necessary to use the Specific Transmission Module (STM) for Danish ATC, which allows the trains to communicate with both ATC and ERTMS trackside systems for the Danish trains. German trains can continue to operate on lineside signals according to existing dispensations without ATC. After the implementation of the ERTMS between Esbjerg and Tønder around 2020/2021, the German trains running from Esbjerg-Tønder-Niebüll will have to install ERTMS in order to continue to operate on the Danish railways.

Status

Speed upgrade

The speed will be upgraded to 120 km/hour. A requisite for this is the construction of a crossing level at Rejsby. In comparison to today it will be possible to save up to 14 minutes on a journey from Bramming to Tønder. The speed upgrade will generate traffic corresponding to 12,300 journeys a year.

With 14 minutes travel time savings a commuter travelling between Bramming and Tønder each day will save 28 minutes. In a week it will be possible to save 2 hours and 20 minutes by train compared with today.

Standardisation of signaling systems

When Denmark is replacing the Danish ATC with ERTMS the support for ATC will in praxis disappear and the usage of ATC on the NEG line will no longer be feasible. The German Safety Authority requires the use of train protection systems for the current speed on the line so unless the obsolete ATC solution is being replaced with ERTMS, the line speed will have to be reduced.

The Danish trains will according to plans remove the Danish STM after 2021 because no Danish railway will have ATC anymore and service contracts will be terminated. Until the Danish STM is removed from the trains they will be able to run on the ATC system on the German section.

Banedanmark is assisting the German infrastructure owner NEG in investigating possible solutions for replacing the obsolete ATC installations on the

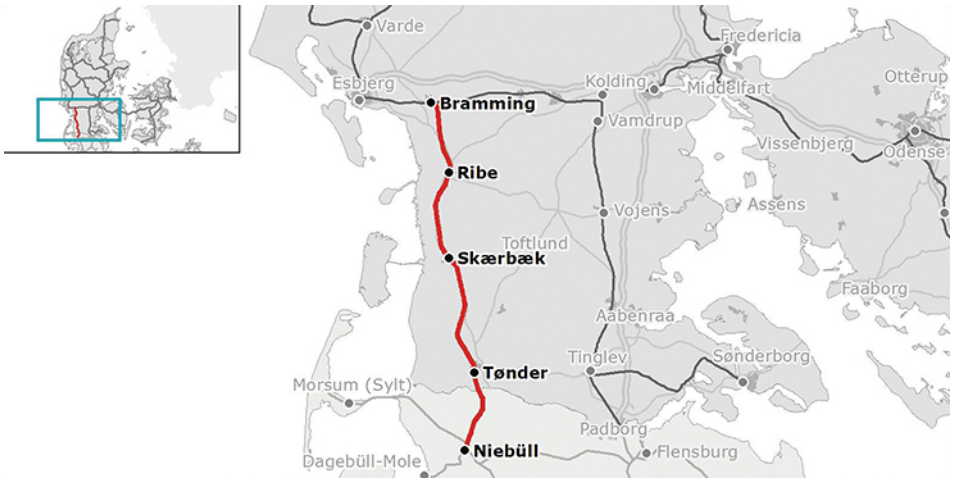
German part of the line. It is expected that the existing ATC system will be replaced with ERTMS, Level 2, Baseline 3. The solution is expected to incur limited costs as the railway is not complex.

As a sub-element of the ERTMS, the European Train Control System (ETCS) will be introduced European-wide in the long term. ETCS is a common EU standard for train safety and has been developed for application throughout Europe. The aim is to achieve a uniform standard which will enable the EU-objective of unrestricted interoperability. In the future it will be possible to operate trains without the need to change traction at the national borders because of different standards. In this way it will be possible to offer non-stop rail services across Europe. ETCS is to be introduced for high-speed trains in the medium term and for all European railway traffic in the long term. As a principle, the EU subsidises railway infrastructure measures only if they apply the ETCS.

Economy

The total investment for the speed upgrade to 120 km/hour is estimated to DKK 85 million (2014) including a 50 % reserve.

There are no available estimated construction costs for the installation of a new signaling system.



4. Railway service from Esbjerg to Hamburg via Tønder

Project description

A long distance railway service from Esbjerg via Tønder to Hamburg and onwards should be established. This additional service should be integrated in to the planned regular interval timetable called “Deutschland-Takt”.

Status

It is important to note that cross border long-distance railway services for passengers are normally run commercially, i.e. enterprises operating these railway services do not receive any financial support. It is therefore the decision of the railway companies whether to improve the service or not. Improvement of the services can indirectly be supported by the state through improvement of the infrastructure.

As a first step, potential options for establishing a long distance railway service from Esbjerg via Tønder to Hamburg should be explored in coordination with the DB AG and the DSB.

5. Expansion of the marsh-railway

Project description

The marsh-railway should be expanded to an uninterrupted double tracked and electrified railway.

Background information

The marsh-railway is mainly double tracked except for a few single tracked sections. In addition, the marsh-railway is electrified from Hamburg to Itzehoe. The single track sections between Klanxbüll and Niebüll and on the island of Sylt are currently acting as bottlenecks in light of the traffic volume. Therefore, the proposal concerns the sections of the railway, which are not electrified and single tracked.

The extensions with two tracks on the whole railway and the electrification from Itzehoe to Westerland are aims of the state government. With this project connections to the west coast could be improved and an efficient bypass for the very busy Jutland railway could be established.

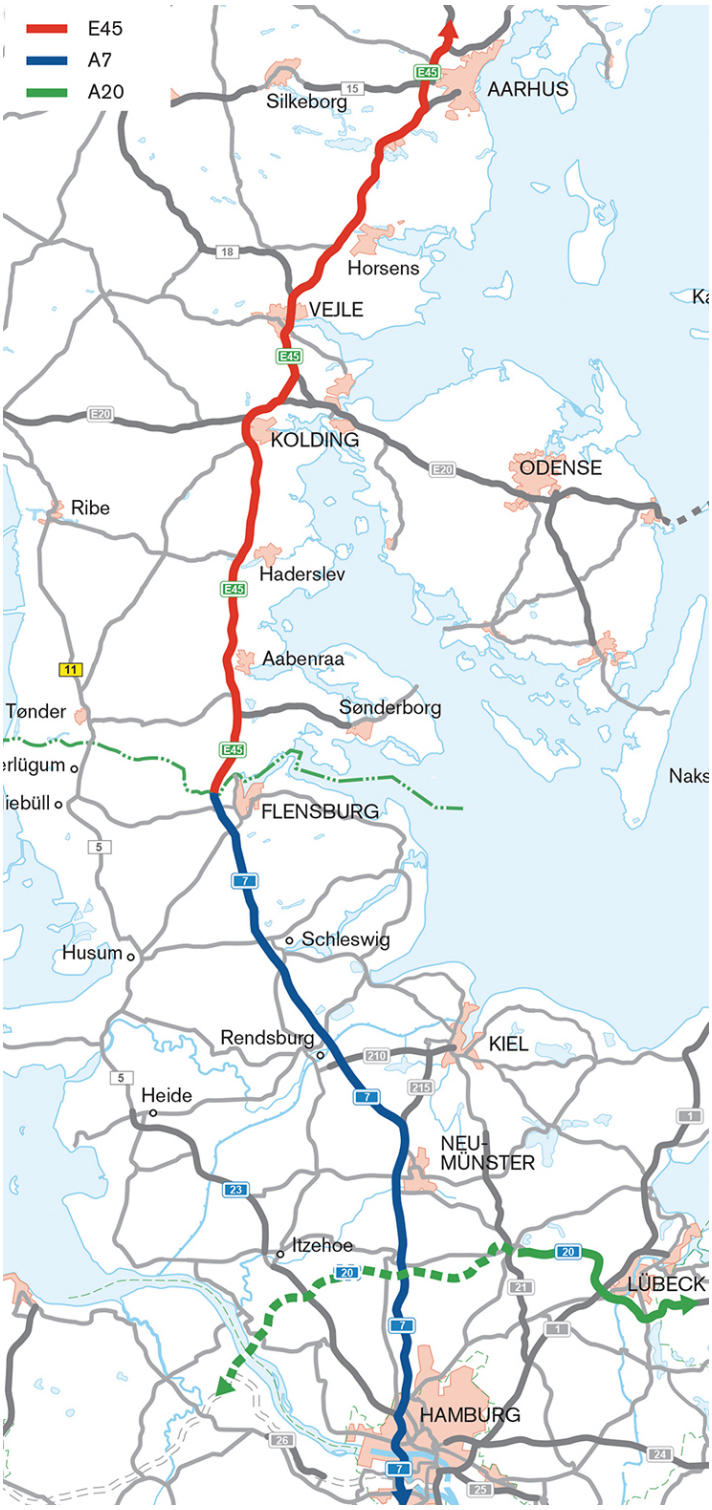
In Elmshorn the marsh-railway and the Jutland railway come together. Thus the capacity of the section to Pinneberg is high frequented. For this reason the addition with a conventional third track between Elmshorn and Pinneberg was included in the first priority needs of the 2003 BVWP. Since then the planning has been modified with the aim to achieve an increase in capacity in the heavily trafficked section from Hamburg to Elmshorn parallel to the project 'S4 east'.

Status

The MWAVT has submitted the project to the BMVI for inclusion in the 2015 BVWP.

Mid-Eastern Corridor Roads

This section contains transport and infrastructure projects in the mid-eastern corridor with regards to roads. The mid-eastern corridor has one of the most important road connections between Denmark and Germany, namely the E45/A7, which functions as a connection between Scandinavia and continental Europe. In Denmark the E45 runs from Frederikshavn in the northern part of Jutland to Padborg after which it enters Germany and becomes the A7.



6. Motorway through Central Jutland

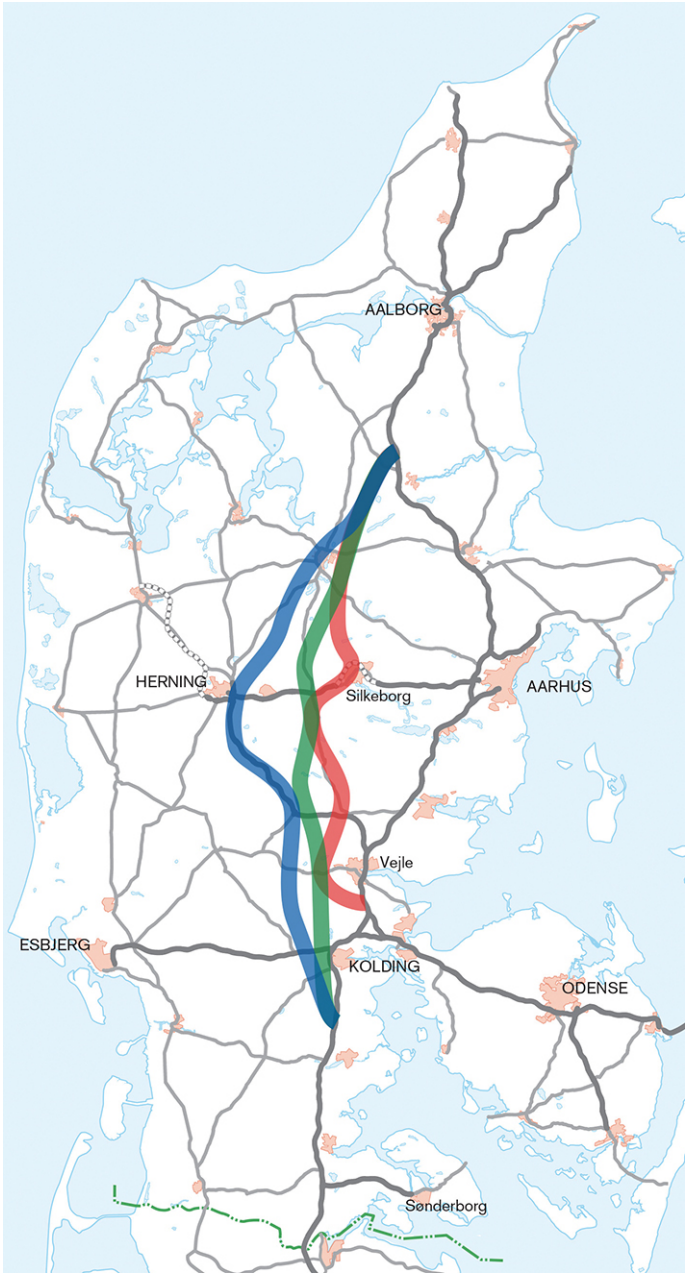
Background information

As a part of the "Strategic Analyses" the Danish Road Directorate has analysed a new motorway corridor through Central Jutland. The screening consists of three different routes.

A western route (corridor A, blue), which creates new mobility in the mid-western part of Jutland and partially reuses stretches from the existing motorway between Vejle and Herning.

A central route (corridor B, green), "Hærvejsmotorvejen", which forms the shortest route between North and South Jutland and basically follow the main road between Vejle and Viborg (Road nr. 13).

An eastern route (corridor C, red), which is the shortest of the three routes and reuses an existing motorway section at Silkeborg.



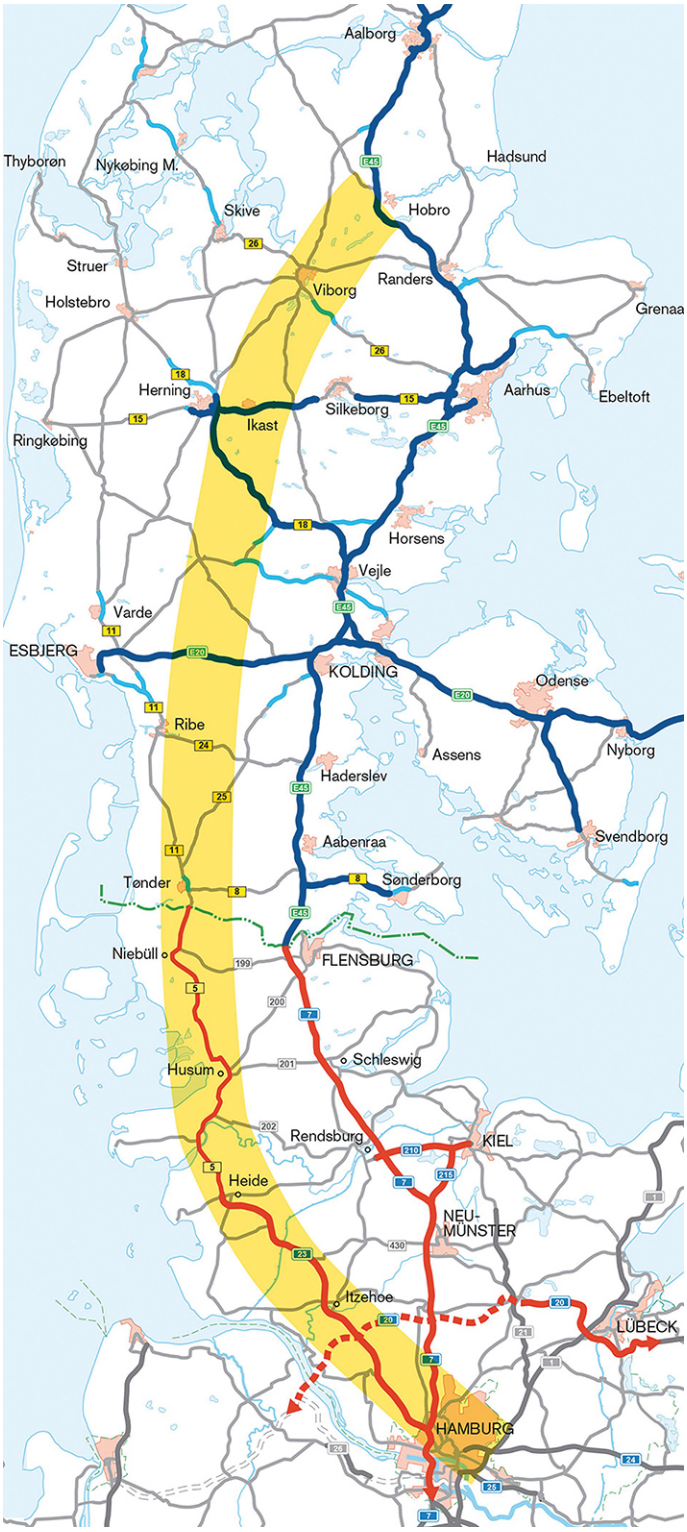
Status

A new motorway corridor through Central Jutland can both absorb some of the traffic from the E45 and connect some Jutland towns to the motorway network. However, the project is very extensive with a construction budget of DKK 15-20 billion. The full relief impact in relation to E45 requires that the new motorway is fully established, which is estimated to take at least 15 years. Even with a fully established motorway in Central Jutland, congestion will still occur in some sections of E45.

The table below presents the estimated construction prices for the various solutions. The variations in the socioeconomic rate of return are caused by a low and high traffic growth scenario.

Table 8 | Construction estimates

Route	Km new motorway	Price (bill. DKK, 2013-prices)	Traffic in 2030 (vehicles pr. Day)	Socio-economic rate of return*
Western corridor (A)	146	15.4	15-36,000	6.4-7.4 %
Central corridor (B)	167	20.0	14-29,000	5.9-7.0 %
Eastern corridor (C)	135	17.6	6-27,000	4.2-5.3 %



In the Government platform the current government has suggested an assessment of a shorter and more western bound section of the western corridor (solution A) between Lunderskov-Billund-Give.

The more western bound solution will relieve the southern part of E45 of traffic and in addition both avoid affecting the nature in Vejle Ådal and serve as a road corridor for the international airport in Billund. In addition, a motorway in Central Jutland will also benefit the tourist industry in Central Jutland and also in the northern and southern parts of Jutland as it will be easier and faster to travel through Jutland.

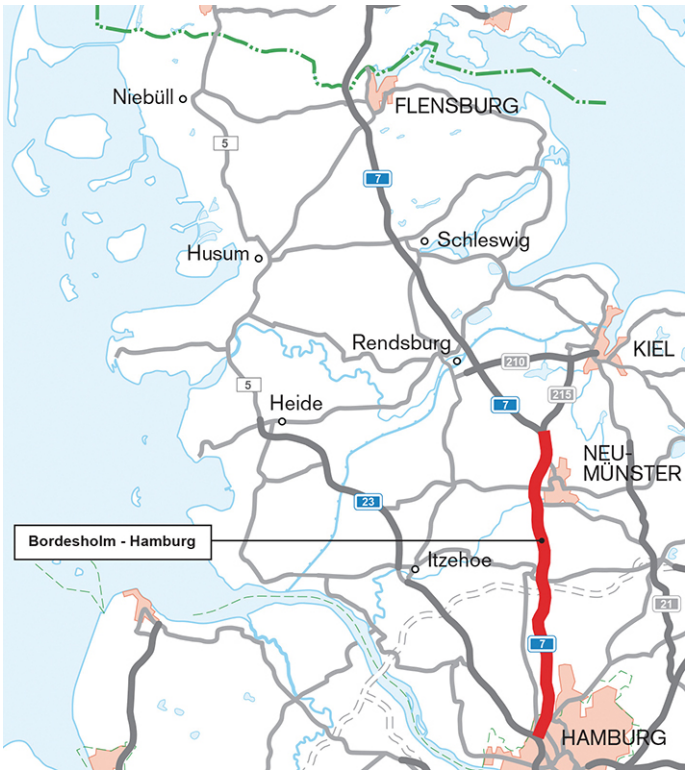
The Transport Commission acknowledges that there is a strong interest from several actors in Southern Jutland and Schleswig-Holstein in analysing the traffic needs for building a western road structure in the Jutland Corridor. Therefore, the Commission proposes to initiate a strategic analysis of the cross border traffic development and the future traffic needs in the Jutland Corridor. The analysis should also investigate the current traffic volumes and the long term need for expansions of the eastern and western road corridors.

The yellow corridors on the map show these transport corridors.

7. Expansion of A7 from Hamburg to the Danish border

Project description

The A7 federal motorway is the longest motorway in Germany and one of the main north to south connections between Scandinavia and Central Europe. For this reason the motorway has to be maintained and expanded as an efficient and attractive transport route.



By expanding the A7 between the interchange Bordesholm and the Elbtunnel in Hamburg from four to six and six to eight lanes respectively, the motorway is being adapted to the rising traffic volume in Schleswig-Holstein and Hamburg.

Status

The expansion of an approx. 65 km section of the A7 extending from the three-way interchange at Bordesholm to the area south of the three-way interchange at Hamburg-Nordwest is one of the projects included in the urgent need category of the 2003 BVWP. The project is being realized as a public-private partnership as part of a so-called availability-based model (construction contract including provisions on availability-dependent payment).

The project company has divided the project into eight parts altogether. The construction on two sections located in Schleswig-Holstein started in November 2014. The construction period will last from 2014 to the end of 2018.

The expansion of the motorway to six or eight lanes within Hamburg city limits is to be completed by 2024. Three so-called noise lids, i.e. noise-protection tunnels are to be built in Hamburg.

In view of the current traffic volume, the proposed expansion of the A7 to six lanes north of the three-way interchange at Bordesholm up to the Danish border does not seem necessary. Depending on the traffic development, however, such a measure could be included in the next BVWP (for the post-2030 implementation period). In any way, the expansion is considered to be a very long term project.

If the future traffic volume in the section north of Bordesholm to the Danish border increases more substantially than anticipated, it can be considered to open up the hard shoulders for traffic. This would require certain conditions to be fulfilled and would be limited to certain periods.

Opening the hard shoulders is solely relevant for the motorway sections experiencing permanent traffic jams or severe disruptions (for example frequent rear-end collisions). Furthermore, it is also necessary that the motorway section is an extension project, which is categorized as urgent need in the BVWP. To be included in this category the traffic volume must warrant a six-lane profile (above 65,000 vehicles per day). In addition, the planning, construction and legal conditions have to be created; for example the roadway profile width and -structure, emergency stopping bays every 1000 m and potential land acquisition and noise protection.

Economy

The investment outlays for construction and purchase of real estate for the Schleswig-Holstein section of the project are estimated at € 372 million. Total expenditures for the PPP-project amount to roughly € 1.6 billion (construction, operation, maintenance, financing).

Background information

A mobility management system for steering traffic guidance measures while the expansion work is in progress on the A7 has been established. Schleswig-Holstein and Hamburg jointly aim to minimise disturbances to commercial and private traffic caused by the expansion of the A7 by installing a well-functioning road work management system and a good coordination with other projects. The overriding goal is to continue to guide traffic efficiently and safely through the respective construction zones on the A7. For this purpose, the two federal states and DEGES Company are developing a traffic management and information system which shall comprise the following elements:

- Safe and efficient traffic routing in the area of the road works
- Large and small scale traffic management in the A7 corridor
- Transfer of traffic to alternate modes
- Supply of comprehensive and up-to-date information
- Appointment of a traffic coordinator, former State Councillor Gerhard Fuchs.

8. Construction of a bridge to replace Rader Bridge

Background information

Because of the damages to the pier caps discovered in July 2013 and the subsequent closure of the Rader Bridge, extensive tests and calculations were done to assess the load bearing capacity and fatigue resistance of the bridge. The results showed that the remaining useful life of the bridge was 12 years. In view of the load bearing capacity and durability of the bridge it was deemed necessary to impose compensation measures such as specific provisions and restrictions for vehicles including a speed limit of 60 km/h for trucks over 7.5 tons, a ban on overtaking for trucks and a minimum distance of 25 m (also in traffic jams) for trucks over 7.5 tons, closure of both hard shoulders, and a maximum load of 84 tons for heavy haulages.

Currently, the Rader Bridge is a bottleneck for several Danish, German and Scandinavian heavy industry manufacturers such as windmill transportations because they cannot cross the bridge due to the weight restrictions. They have to find alternative routes, which is very costly and time consuming. It is therefore of great importance that a replacement bridge will be built in the near future. To illustrate, the windmill manufacturer Siemens estimates that they incur additional costs due to the condition of the Rader Bridge. Their transports have to choose alternative routings entering smaller roads, which cause disturbances to the normal traffic as well as additional costs for the industry. Ultimately, Siemens can for example be forced to ship their products to avoid the Rader Bridge.

Project description

Due to current condition of the bridge, a timely replacement, i.e. a new structure across Kiel Canal must be accorded highest priority. The State of Schleswig-Holstein has proposed a combined solution including the Jutland railway to the federal level - a combined road-railway structure across Kiel Canal which would replace the 100 year old high level railway bridge at Rendsburg in the long term as well. This solution would also reduce travel time on the Jutland railway.

Status

The federal level has rejected a combined structure because the remaining useful life of the Rendsburg railway bridge is 50 years. Thorough restoration of the roughly 100 year old high level railway bridge at Rendsburg is to be completed in 2016. At that point, it will also be dimensioned for bigger weight charges.

DEGES was officially commissioned in February 2015 with the planning and execution of construction for the replacement building of the bridge. The aim is that in 2026 a new structure will be established. Until then it is important to observe and "protect" the existing bridge. The speed limits for trucks were not respected by all, so at present the establishment of speed monitoring system has been active since September 2015 for all vehicles. It is furthermore under consideration to install a system to measure the weights of the trucks.

DEGES is working on a technical feasibility study, which describes and compares various crossing options; for example a drilled and immersed tunnel, bridge-solutions made of steel, pre-stressed concrete or composite materials and constructed as deck-, arch- or cable-stayed bridge as well as different passage widths. On the basis of a thorough evaluation, a shortlist of preferred variants for the pre-planning process will be drafted.

The feasibility study also includes statements on various profile widths. The provisional determination of the bridge cross-section is based on the BMVI's traffic forecast for 2030 and data from traffic counts. The forecast figures indicate that a six-lane cross-section seems to be oversized. This solution will not be supported by the BMVI. The MWAVT thus proposed to provide a hard shoulder which is 0.75 m wider, which would allow an opening of the hard shoulder for traffic under certain conditions. Furthermore, it would be easier to carry out underfloor bridge inspections without the costly safe-guarding of the building site. This extra width will cause additional costs for the federal level of app. 4 million €. The BMVI´s decision on this special proposal is still pending.

Following an initiative of the MWAVT the German Parliament has put the replacement building of the Rader Bridge on the list of those infrastructure projects for which a shorter legal process in the courts is scheduled. The shorter legal process is expected to accelerate the planning procedure.

Economy

A cost estimate for replacing the bridge without railway is € 220 million.

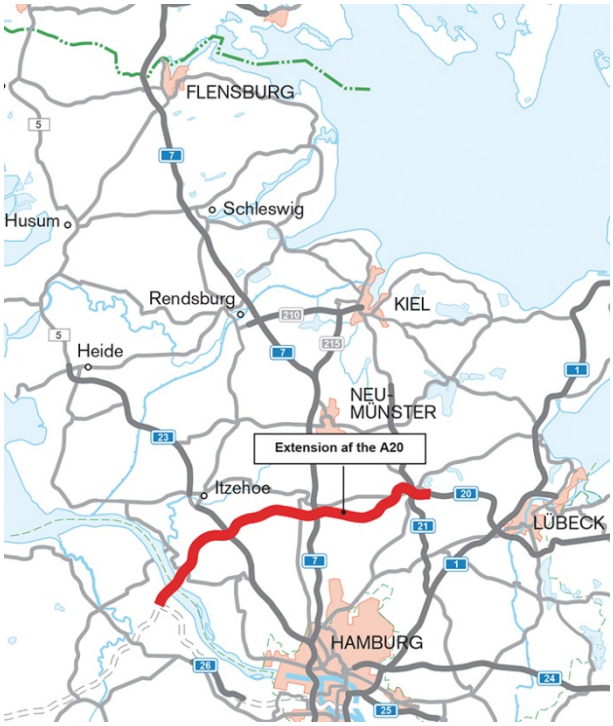
9. Extension of A20 with a fixed link across the river Elbe

Background information

The A20 motorway represents an efficient east-west thoroughfare from Poland to the Netherlands. An extension of the A20 will make it possible to bypass and thus decongest the busy traffic hub of Hamburg. Moreover, it will improve the road link to the west coast of Schleswig-Holstein.

Status

The federal level has made a financing commitment of approx. € 150 million for the section between Weede and Wittenborn. A construction period of more than five years has been projected.



In November 2013 the Federal Administrative Court in Leipzig ruled that the plan approval notice of the Schleswig-Holstein State Agency for Road Construction and Transport (LBV SH) from April 2012 was unlawful and unenforceable. The Court thereby decided in favour of the claims filed by several conservation groups and the community of Klein-Gladebrügge whereas it dismissed actions by other plaintiffs. The errors from the rulings are not of such a nature that the plans as a whole must be called into question. In the future, the LBV SH proposes to initiate a more extensive approach in studying the issue of bats, evaluation of alternate environmentally routings, and more fauna studies.

The LBV SH assumes that this reworking of the project will take about two years. The routing of the adjoining sections also depends on these results, because the original plans can either be kept or must be revised as well. The plan approval decision for the section with the fixed link was issued on 30th December 2014. There are currently seven lawsuits pending. The decision has been appealed by nature conservation groups. In September 2015 the Federal Level announced to schedule 600 mio. € to the fixed link in the road construction plan of 2016 for the period from 2017 onwards.

As for the fixed link across the river Elbe the BMVI is analysing a public-private partnership model (one of the 10 PPP-Projects of the “new generation”). Minister Meyer has proposed a financing model similar to the ones used for the Oresund and Fehmarnbelt fixed links, where a state-run planning company plans and implements the project and the loans for the investment are guaranteed by the state. This enables low-interest terms and lower project costs, because the return on equity does not apply and the financing model can be adapted more flexibly to the actual revenue from tolls in its duration. This model would require a change in the law (German Act on Private Financing for Transport Infrastructure).

10. Construction of a bypass in Handewitt

Background information

The construction of a bypass around the town of Handewitt will improve the capacity of the B199 federal highway as it functions as a link between the west coast and the A7. Work on the detailed construction plans for the by-pass was resumed now that the community supports the project again.

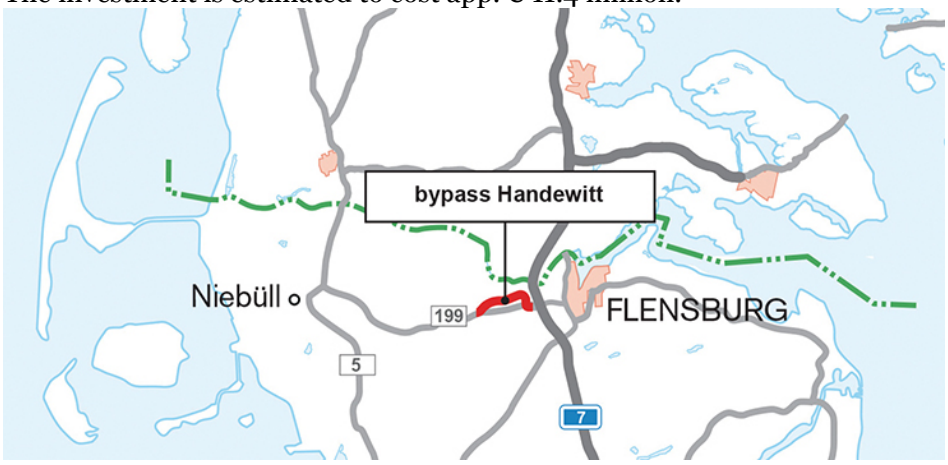
Status

The construction plan was approved by the BMVI on 30th June 2014. The documents for the plan approval procedure need to be compiled in the next step. The procedure itself needs to be executed and the federal level needs to allocate the requisite funds.

The MWAVT has submitted the project for inclusion in the 2015 BVWP.

Economy

The investment is estimated to cost app. € 11.4 million.



11. East-west connections in Schleswig-Holstein

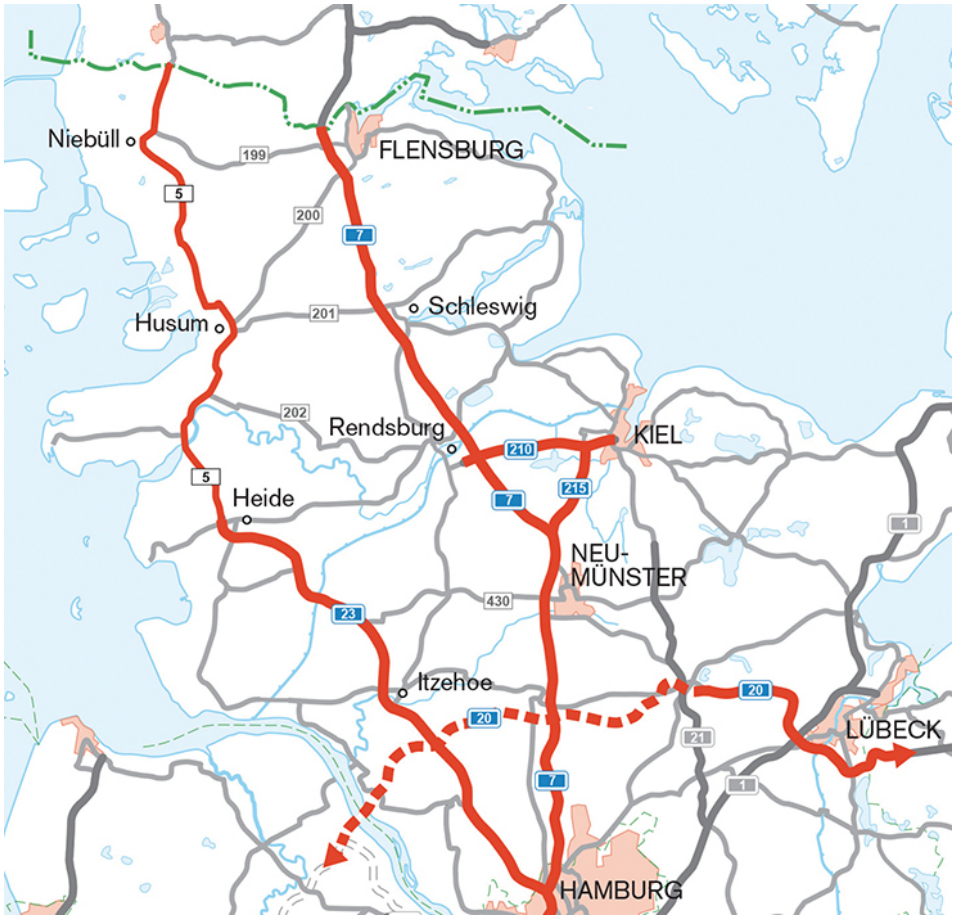
Project description

Outline the development and optimisation potential for traffic from the north towards Lübeck.

Status

By extending the A20 a main thoroughfare is built in east-west direction. Since the A20 will be linked with the existing motorways, i.e. A71, A7, A21 and A23 traffic coming from Denmark and the north of Schleswig-Holstein can reach any destination in eastern and western Schleswig-Holstein (i.e. Lübeck).

There does not seem to be any need to expand the federal highways running (largely) in an east-west direction (B199, B201, B202, B203, B430, B76) in general with the exception of some selective optimisations. In terms of funding, an expansion of these highways would mean that they would be competing with other concrete project plans such as the expansion of the B5 between Tönning and Husum for the limited federal funds. Based on this assessment, the MWAVT advocates not to pursue the proposal because other transport infrastructure projects are more important and due to the current traffic prognoses for the roads.



12. Harmonisation of weight limits and regulations for road trains

Project description

Improve the conditions for cross border freight traffic by harmonising the weight limits for trucks in cross border transport and by allowing road trains to operate in Schleswig-Holstein on equal conditions as in Denmark.

Background information

The problem is the different weight restrictions in Denmark and Germany. While a maximum of 54 tons may be transported by truck in Denmark, the limit in Germany is 40 tons and 44 tons in the combined transport. However, the infrastructure on the German side (especially bridges) is not designed for higher weight loads.

A process of harmonisation of the Danish and German weight limits is attractive and it would unquestionably have a positive effect on the logistics industry on both sides of the border. However, it would require massive investments in particularly German infrastructure and raising the weight limits would lead to higher wear and increase the maintenance costs. It is therefore the assessment that it is an unrealistic achievement in the foreseeable future. Nevertheless, the Commission presents the project in this report to create political awareness about the potential challenges that the different weight limits might create.

Denmark initiated a test period in November 2008 for the so-called road trains. The period was originally limited to three years but the test period has been extended to 2030. 75 mio. DKK has been allocated to prepare the public road net for the large road trains.

A road train is basically two trailers linked together allowing them to be up to 25 meters long with a maximum weight of 60 tons. The test period has been very popular among Danish hauliers. However, the hauliers experience a barrier when crossing the German border with a road train because Germany does not have similar regulations and permissions for road trains. As a consequence it becomes very expensive to use road trains in Germany.

The BMVI in Germany has also started a nationwide pilot project for road trains from January 2012 to December 2016 on certain routes. The aim of the project is to investigate the opportunities and risks of the use of road trains in terms of environmental effects, increased efficiency in transportation, traffic safety and infrastructure impacts.

Vehicles up to a length of 25.25 meters can use certain routes - the so-called positive network. However, the weight limit of 40 tons (or 44 tons in combined transport) is still valid.

The pilot project is disputed among the German states. The proponents consider the use of road trains as a useful development for road transportation both in terms of economy and the environment. There are also opponents of the pilot project, who are concerned about the potential shift of transport volume from railways to road and the potential difficulties for car traffic in terms of congestion and traffic safety.

The previous state government of Schleswig-Holstein participated in the pilot project and reported a number of routes for the positive network. The current state government is critical towards the use of road trains. Therefore, no further routes for the positive network were declared, but previously declared routes were maintained.

In total 39 companies with 80 road trains are taking part in the pilot project; 3 of these companies with 6 vehicles are from Schleswig-Holstein. The pilot project is monitored scientifically by the Bundesanstalt für Straßenwesen (BAST). In September 2014, the BAST presented an interim report stating that there were no serious problems and the number of critical issues was low. One problem is, however, that there is a lack of parking spaces at rest areas for a larger numbers of road trains which cannot be made available in the short term. The BAST will do a final evaluation when the pilot project is finished.

In cross border freight traffic trucks are the main transportation mode. Almost 70 % of all goods in the Jutland Corridor are transported by truck. The prognoses predict a further increase in the traffic volume, particularly with regard to freight transportation by trucks.

Mid-Eastern Corridor Railways

This section presents transport and infrastructure projects in the mid-eastern corridor in relation to the railways. The railway running from the northern part of Denmark and crossing the Danish-German border is one of the most important railways in the region. It runs from Hirtshals and southwards through Jutland via the cities of Frederikshavn, Aalborg, Aarhus, Fredericia and Padborg. In Germany it continues south via Flensburg, Neumünster and Hamburg.

As regards the political agreement Train Fund DK between the previous Danish government (S, RV and SF) and Enhedslisten and Dansk Folkeparti, it is important to consider that the current government has proposed an initiative to review the financing of the entire agreement. As a consequence, the financing and ultimately the implementation of the proposals are likely to be adjusted depending on the results of the review.

It is therefore important that the projects of the Train Fund DK and thus some parts of the content in the following section are interpreted with consideration to the review of the Train Fund DK.

13. Railway improvements between Hirtshals and Hamburg and double tracks between Tinglev and Padborg

Background information

A new intermodal terminal will be established in the port of Hirtshals in 2015. This terminal will handle trailers from vessel routes to Norway. Around 150,000 trailers are transported on the vessels every year. More than half of this traffic has destinations south of the Danish-German border and is therefore highly relevant for the Scandinavian rail freight corridor between Hirtshals and Hamburg. Therefore, the capacity of the railway section between Hirtshals and Aalborg is planned to be increased as a part of the Train Fund DK. If the Train Fund DK is realised in its full capacity cf. the above-mentioned reservations, the entire section between Aalborg and Fredericia will be electrified in 2023 and the section between Frederikshavn and Aalborg will be electrified in 2025. The electrification programme also has an option for electrification of the section between Hjørring and Hirtshals. The new sections and the capacity upgrades to double tracks will increase both capacity and punctuality in general and thereby benefit multiple intermodal terminals for example Taulov due to double tracks between Lunderskov and Tinglev. At the end of 2015 the entire track between Lunderskov and Tinglev will be upgraded to double track and a speed of 160 km/h. However, between Tinglev and Padborg there is only a single track and the maximum speed is 120 km/h.

Project description

It is necessary to upgrade to double tracks between Tinglev and Padborg as well as a speed upgrade to 200 km/h between Lunderskov and Padborg. Most parts of this railway run in straight lines. Therefore, a speed upgrade to 200 km/h is assumed to be feasible on most of the track.

The upgrade to double tracks will increase both capacity and punctuality and will furthermore prevent any accidents on the railway from closing the entire transport route because it will be possible to redirect traffic to the other railway tracks. The double tracks will thus provide a higher degree of supply security for the transport route. Furthermore, the speed upgrade is estimated to yield travel time savings of roughly five minutes. In addition, the intensified use of intermodal transportation will also experience benefits from the expansion to double tracks because it can be possible to operate with higher frequency without interruptions. Finally, double tracks will also increase the supply security. In case of a train accident somewhere between Tinglev and Padborg the entire train traffic from North Jutland to Germany and the rest of Europe will be affected because there will not be an extra railway to use. All train traffic will thus have to be redirected to other routes.

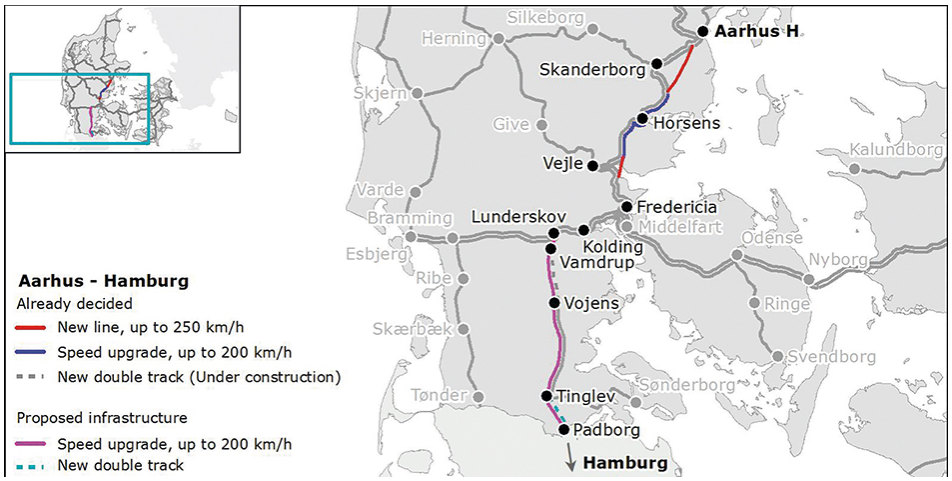
Status

In the 'Agreement on a Modern Railway' from October 2009 it was decided that an update of the basis of the decision for the establishment of double tracks between Tinglev and Padborg should be performed during the contract period (2009-2020).

If the political agreement on the Train Fund DK is realised in the middle of the 2020s, the speed on most of the section between Lunderskov and Aarhus will be upgraded to 200-250 km/h. Exceptions are the sections between Lunderskov and Brejning, the section through Horsens and the section near Aarhus, where an upgrade has been found uneconomical due to a curved track geometry. On these sections the speed will vary between 120 and 160 km/h.

Economy

The upgrade to double tracks between Tinglev and Padborg is estimated to cost around DKK 0.7 billion. The entire project including the upgrade to double tracks and the speed upgrade to 200 km/h is estimated to cost around DKK 1.9 billion.



14. Upgrading of the Jutland railway

Project description

Reduce the travel time from Hamburg to Aarhus and vice versa by implementing the following measures:

- Higher speed on the line
- Replacement of the high level railway bridge in Rendsburg by a new structure
- Use of newer rolling stock and optimisation of the train schedule
- Establish a second daily ICE-connection between Denmark and Germany via Flensburg.

Status

The Jutland railway is entirely double tracked and electrified in Schleswig-Holstein. There is a need for expansion measures at the rail bottleneck of Hamburg. However, upgrading the tracks in Schleswig-Holstein to accommodate speeds above 160 km/h would be very costly. For this reason such a project is considered to be unfeasible.

Thorough restoration of the roughly 100 year old high level railway bridge at Rendsburg is estimated to be completed in 2016. It will then be dimensioned for bigger weight charges. The MWAVT has proposed a combined solution including both the Jutland railway and the A7 across Kiel Canal to the federal level. This solution would also reduce travel time on the Jutland railway. However, the BMVI has rejected such a solution because the railway bridge has a useful life of some 30 to 40 years once it has been restored.

A positive approach is taken in principle to other measures such as optimising the train schedules and using newer rolling stock. However, it is ultimately the specific railway companies' decision if they want to invest in new rolling stock or optimise the train schedule.

Currently DB AG and DSB are planning to cancel the existing ICE connection between Hamburg and Aarhus from 2016 and onwards. DB AG and DSB are currently discussing the circumstances for a potential replacement on the connection between Aarhus and Hamburg. It must be noted that today there are two daily connections between Aarhus and Hamburg but one of the connections is carried out by a shorter IC3 train with lower capacity.

Background information

A model test using extra-long freight trains is in progress on the Jutland railway between Padborg and Maschen. Freight trains measuring 835 m in length are already operating in Denmark whereas the maximum permissible length for trains on the Padborg-Maschen section is 620 m. The German railway company DB AG has therefore tested the feasibility of extending these trains by 215 meters. According to the evidence this would be possible in technical and economic terms and, given a constant transport volume, might even reduce the number of train runs. The DB AG has adapted the infrastructure to accommodate such 835 m long trains for some € 10 million. Since the timetable change on December 2010, trains of 740 m length have

already been operating on the Maschen-Padborg railway and the 835 m trains since November 2012 after approval by the Federal Railway Authority.

The study entitled “A Rail Strategy for West Denmark and North Germany” commissioned by the Region of Southern Denmark was presented by the region to the Danish-German Transport Commission in January 2013. The study proposes extensive work on the Jutland railway including new construction and expansion of existing structures in order to reduce travel time. The study for example proposes to establish a high speed railway with speeds over 200 km/h between Odense and Hamburg, to construct a new railway from Schleswig to Kiel in order to bypass the bottleneck at the high level railway bridge in Rendsburg, and to build new train stations in Flensburg West and Kiel North (Kiel-Suchsdorf).

These proposals do not seem to be financially viable in the long term nor does upgrading the railway for high speed trains seem warranted from a transportation point of view since there is only very little potential in terms of passengers in Jutland. Moreover, the Transport Commission notices that one needs to bear in mind that railway freight traffic to Copenhagen and Sweden is expected to move back to the Vogelflug-railway as soon as the Fehmarnbelt fixed link has been opened.

15. Expansion of the intermodal terminal in Padborg and increased cooperation with Neumünster

Background information

The intermodal terminal in Padborg has in the last years experienced an increased growth and new types of customers. A market research made by COWI and Trafikstyrelsen showed that freight volumes would exceed the present capacity of the terminal within a few years.

Project description

In order to avoid a situation in which capacity would be a constraining factor for the development of Padborg, it is necessary to expand the terminal. Furthermore, it is proposed that the intermodal terminal in Padborg and Neumünster begin to cooperate more closely.

Status

The 21st March 2013 the political agreement of 'En Grøn Transportpolitik' decided to allocate DKK 10.5 million to expand the capacity of the intermodal terminal in Padborg. The upgrade, which included a new depot and an establishment of safeguards, helped to increase the capacity of the terminal and optimised the operational conditions. By doing this, the terminal at Padborg was able to reach the same level as other terminals in Denmark and ensured capacity for the expected growth in railway freight. The project was finalised in 2015.

The 12th June 2014 the political agreement of "Bedre og Billigere Kollektiv Trafik" decided to allocate yet another DKK 8 million to an additional extension of the terminal. The political agreement wants to assist the development of Padborg but finds it necessary to clarify a number of issues such as the contractual rent and consequences. The amount of funds that has been allocated can be reserved for the execution of the project but only if it is possible to find an appropriate solution. At this moment, the project has not yet started.

Reflections on the establishment of a combined transport terminal in the centre of Neumünster have been on-going for many years. At present, NEG is cooperating with the Business Development and Technology Transfer Company Schleswig-Holstein, the City of Neumünster and local actors with the aim of installing an intermodal operation using reach stackers. The German Railway Authority reacted positively to a preliminary funding request. In view of the expansion of the A7 to six lanes, NEG expects to see an increased interest in such an intermodal offer. An application required by the General Railway Act (AEG) was submitted in June 2014.

The aim of establishing a combined transport terminal in Neumünster is to create an attractive offer for the relocation of truck transports from the A7 to railway. The overburdened and congested motorway could be relieved particularly around the bottleneck in Hamburg. This would create an alternative offer for road haulage for the currently initiated expansion of the A7 between the interchange of Bordesholm and Hamburg. In particular, transit traffic to and from Denmark and Scandinavia is to be addressed. Collaboration between the terminal in Neumünster and the intermodal terminal in Padborg is therefore desirable. The various departures and target destinations could be better merchandised and more potential users could be reached.

16. Danish-German railway station

Project description

It is proposed to establish a new Danish-German passenger and freight railway station to the west of the city of Flensburg (Flensburg-Weiche). The purpose of this station is to serve long distance international trains and thus replace the two existing stations in Padborg and Flensburg.

The initiative will decrease the total travel time. The decrease in travel time is partly due to the fact that two stops are being merged into one and partly that the loop through Flensburg can be avoided. It is estimated that the initiative can save up to ten minutes of concrete travel time because the trains do not have to drive to the centre of Flensburg but can continue along the Jutland railway. High class local public transport and park-and-ride parking spaces will secure accessibility to the trains on the new station.

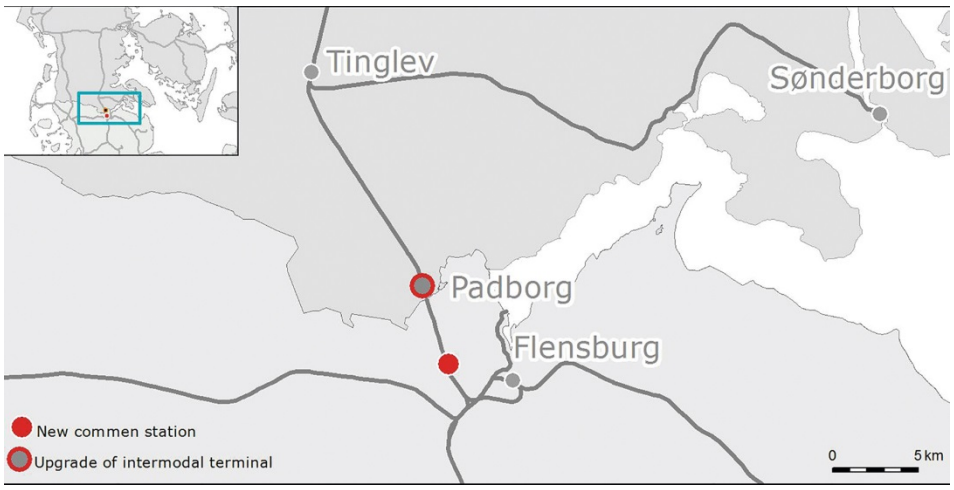
While a Danish-German passenger station will benefit the travel time, it will also mean that the station will be removed from the city centre. The station will thus be further away from the passengers in the cities and create extra travel time in order for the passengers to get to and from the station.

Status

Currently, a final plan for the station has not been decided in Schleswig-Holstein. However, it is noted that the City of Flensburg, NAH.SH, Aabenraa Municipality and the Region of Southern Denmark has initiated a preliminary analysis of a common railway station. Initial results from the analysis show that the accumulated time savings will be between 40-70 minutes on a journey from Hamburg to Aarhus. The Commission thus suggests to continue the work with the concrete location of the station, but at the same time the train services on the railway must also be discussed. It does not seem be purposeful to discuss the location of the station without addressing the number and frequency of trains passing through the station.

Economy

At this point in time there is no construction cost estimates available.



17. Speed upgrade between Sønderborg and Tinglev

Project description

With the Train Fund DK it was decided to upgrade the railway between Sønderborg and Tinglev.

When the signaling program has been established, the required technique to increase the speed on the railway will be available. The maximum speed limit today is 100 km/hour.

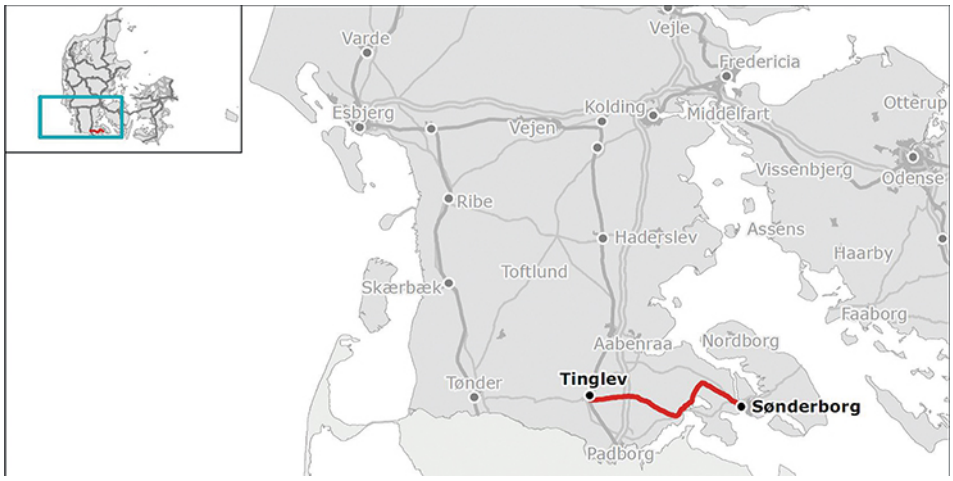
The speed is upgraded to 120 km/hour.

In comparison to today's travel time it will be possible to save up to 1.2 minutes on a journey from Sønderborg to Tinglev.

The speed upgrade will generate a traffic corresponding to 1,700 journeys a year between Sønderborg and Tinglev.

Economy

The total investment for the speed upgrade to 120 km/hour is estimated to DKK 15 million (2014) including a 50 % reserve.



Projects relating to air traffic, ports and electromobility

This section contains transport and infrastructure projects related to air traffic, ports or electromobility in the Jutland Corridor. The projects are cross border in nature and must therefore be addressed in this report.

18. Passenger shipping on Flensburg fjord

Background information

The Danish safety regulations for shipping do not distinguish between inland and maritime shipping. In Germany inland shipping or shipping between two EU-countries requires a lower safety level compared to the Danish regulations requiring that all ships must apply the international safety standards for passenger ships (EU Directive on the Safety of Passenger Ships; SOLAS, MARPPOL etc.). It is therefore not allowed for a German inland ship to call at a Danish port due to the different safety requirements.

While there is no legal difference between inland and maritime shipping, in terms of geography there is a difference between the sheltered inner fjord of Flensburg and the outer fjord. It should therefore be investigated if a special zone could be created for the inner fjord, where the safety standards of inland shipping would be applicable both in German and Denmark. This part of the fjord would thus be equivalent to an inland waterway. Without the need for costly equipment as specified for ocean going vessels, it will be easier to exploit the potential for passenger shipping on the inner fjord.

Project description

It is therefore proposed to expand passenger shipping across Flensburg fjord. If it is necessary, a special zone where inland shipping standards apply can be established.

Status

The BMVI and the Danish Ministry of Economic Affairs (MEA) are the responsible authorities to agree on a solution for inland shipping between the two countries. The MEA has declared that they are positive towards the proposal. The Danish Maritime Authority (DMA) has engaged in a dialogue with the German authorities in order to seek an agreement about mutual approval of inland shipping. The agreement ensures that the necessary approvals only have to be registered in one country – for example with the DMA. In addition, the DMA will offer advice and guidance about the Danish regulations and provide help to achieve a solution if they are presented for a concrete project. The Transport Commission therefore encourages any private actor to contact the MEA with a contrete project description for inland shipping.

19. Intensified cross border utilisation of airports

Project description

It is suggested to utilise the airports in Sønderborg and Billund by potential customers from Schleswig-Holstein, as well as the airports Flensburg-Schäferhaus, Sylt and Lübeck-Blankensee by potential customers from Denmark.

Status

The airports at Sønderborg and Billund could be made more attractive for potential customers from Schleswig-Holstein. These airports might appeal to passengers from northern Schleswig-Holstein as an alternative to German airports, particularly while expansion works on the A7 are in progress. Measures could also be taken to make the airports of Flensburg-Schäferhaus, Sylt and Lübeck-Blankensee more attractive to passengers coming from Denmark.

One way to accomplish this might be through better transport connections (e.g. express bus lines). Marketing activities might prove useful as well.

An enlargement of the area served by the airports or an expansion of the target group and improved travel options for passengers in Schleswig-Holstein and Denmark might result from these activities.

Development of services and marketing activities are tasks of the airports. Provision of bus services is the responsibility of the districts and administrative independent cities. Rapid transit connections could, moreover, be provided by tour operators and coach tour operators.

20. Electromobility

Project description

- Continue further development of electromobility including the creation of additional electric charging stations.
- Development of project “Green Transportation” to operate electric vehicles on the route between Sønderborg and the university campus in Flensburg.
- Implement model projects of cross border cooperation when introducing alternative, environmentally friendly drive systems for short distance public transport including the requisite electric charging stations.

Background information

In terms of technical development, electromobility is still in its infancy and has a very low market share up to now. Given the current state of technology electric vehicles still have disadvantages compared to vehicles using conventional drive systems. For example, electric vehicles have a lower range which decreases substantially as soon as additional features are activated (heating, air conditioning etc.). The charging period is still relatively long and the acquisition costs are high. Therefore, important technical advances especially in battery and charging technology are still needed in order to make electric vehicles competitive vis-à-vis conventional units on the market.

In light of this situation, pilot projects seem to be most useful in metropolitan areas because of the relatively short distances of commutes, the concentration of noise and exhaust emissions, and the option to recharge the batteries during working hours or at night. In rural regions on the other hand, commuters tend to travel longer distances so that conventional vehicles still are the most efficient option for most users.

In August 2009 the federal government adopted the National Electromobility Development Plan with the aim to bring the development and market introduction of electric vehicles ahead. In the meantime an integrated roaming system was developed. With this technology it is possible for users to load an electric vehicle on each charging station. This means that it is possible to take pure electrically trips over long distances.

With its project ‘GREAT’ (Green Region with Alternative Fuels for Transport), which was formerly known as ‘Eco-Friendly Highway” the STRING network aims to support and boost the use of eco-friendly vehicles and the development of green technologies in the STRING region. In a first step, the project will focus on rapid charging stations along the main roads from Hamburg to Scandinavia (A1 and A7). A conceivable second step might be an expansion to issues such as liquefied natural gas, natural gas, hydrogen and biogas. It is desired to get support for this project by the EU.

6. Recommendations

The Danish-German Transport Commission acknowledges that not all of the proposed projects can be achieved within a short period of time. The recommendations are therefore categorised in to short-medium term and long term achievements. The categorisation does not mean that the short-medium term projects are more important than the long term projects. It is simply a recognition from the Commission that some of the projects can only be achieved in the long term. The Commission recommends that all of the projects below be considered equally important.

The recommendations from the Danish-German Transport Commission are listed below.

Short-medium term
• Expansion of B5 federal highway • Speed upgrade between Bramming-Tønder-Niebüll • Railway service from Esbjerg to Hamburg via Tønder • Motorway through Central Jutland • Expansion of A7 from Hamburg to Bordesholm • Extension of A20 with a fixed link across the river Elbe • Construction of a bridge to replace Rader Bridge • Construction of bypass in Handewitt • Railway improvements between Hirtshals and Hamburg and double tracks between Tinglev and Padborg • Upgrading of the Jutland railway • Expansion of the intermodal terminal in Padborg and increased cooperation with Neumünster • Common Danish-German railway station • Speed upgrade between Sønderborg and Tinglev • Passenger shipping on Flensburg fjord • Intensified cross border utilisation of airports • Electromobility
Long term
• Upgrade of route 11 from Esbjerg to the Danish-German border and route 24 • Expansion of B5 to four lane high way up to the Danish Border • Standardisation of signaling systems • Expansion of the marsh-railway • Expansion of A7 from Bordesholm to the Danish border • East-west connections in Schleswig-Holstein • Replacement of the high level railway bridge in Rendsburg • Harmonisation of weight limits and regulations for road trains

The time dimension varies internally in some of the projects. In these cases, the various sub-elements of the project have been categorised in accordance with their expected time dimension.

Since the Transport Commission was established in July 2011 it has discussed multiple projects, initiatives and topics. Therefore, some of the recommendations that are listed above have already been politically agreed up-

on and funds have been allocated. The reiteration of these projects in this report can thus be perceived as an approval and a sign of support by the Danish-German Transport Commission.

The report presents a range of projects, which will contribute to the improvement and development of the transport infrastructure in the Jutland Corridor. In continuation, it is relevant to consider the traffic and economic consequences, which the Jutland Corridor will experience if none of the proposed projects in the report are realised.

It is beyond any doubt that the traffic volumes will increase in the future and the pressure on roads, railways and ports will increase as well. Some areas are today identified as critical in terms of traffic volumes. If the decision-makers do not invest in the expansion and development of the infrastructure, these areas can potentially constitute barriers to efficient traffic flows, which can ultimately affect the economic growth of the Corridor and thus have a direct impact for citizens and businesses.

The Rader Bridge is an example of a growing impediment for heavy transportation such as windmills. The current traffic restrictions on the bridge constitute a logistic and economic burden for both Danish and German hauliers. Another example is the expansion of the A7. If the motorway is not expanded, the capacity will not be sufficient compared to the traffic development. As a result, bottlenecks and congestion will occur on several parts of the motorway.

Both examples above illustrate that an insufficient infrastructure is not solely a problem and challenge for hauliers and other businesses. It poses a challenge for the entire society. It is a presumption for economic growth, employment and welfare that the infrastructure can absorb the current traffic volume. Therefore, it is also a presumption that the infrastructure is developed and improved in congruence with the traffic development. It is therefore the perception of the Commission that it will have economic and logistic consequences for the Jutland Corridor if the relevant decision-makers do not realise the proposed transport infrastructure projects.

The projects in the report depict the most important areas for improvement. The recommendations can be interpreted as a concrete list of projects which should be initiated to improve the infrastructure in the Jutland Corridor. However, the Commission recognises its consultative mandate, which solely allows the Commission to put forward non-binding recommendations. It is, however, the intention of the Commission that the relevant decision-makers continue to focus on the optimisation and improvement of the transport and infrastructure in the Jutland Corridor. With this report the Danish-German Transport Commission provides concrete projects, which can be achieved within various time dimensions and it is therefore up to the German and Danish governments to prioritise the Jutland Corridor in the future.

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