

## Facts about Fehmarn Belt

### Results from a fact-finding study regarding a possible fixed link between Denmark and Germany across Fehmarn Belt

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#### Dansk resume

Med vedtagelsen af anlægsloven for en fast forbindelse over Øresund blev signalet givet til igangsætning af planlægningsarbejdet for en eventuel fast forbindelse mellem Danmark og Tyskland over Femer Bælt. I artikel 21 i den dansk-svenske regeringsaftale om Øresundsforbindelsen fra den 23. marts 1991 hedder det således, at den danske regering erklærer sig rede til at arbejde for, at en fast forbindelse over Femer Bælt bliver gennemført under forudsætning af, at hensyn til miljø og økonomi kan tilgodeses. I Tyskland er der ikke tilsvarende taget en politisk beslutning om en fast Femerforbindelse; forbindelsen er ikke listet eksplicit i den tyske transportinvesteringsplan fra 1992.

Den danske og den tyske trafikminister har mundtligt aftalt at gennemføre undersøgelser af faste forbindelser over Femer Bælt. Såkaldte "Fase A" forundersøgelser er gennemført og dokumenteret i et samarbejde mellem de to landes trafikministerier 1992-93. Egentlige undersøgelser er planlagt påbegyndt i 1995 med følgende komponenter: (i) geotekniske og geologiske forhold; (ii) tekniske alternativer for kyst-til-kyst forbindelsen; (iii) marine miljøeffekter; og (iv) trafikprognoser.

I 1993 og 1994 oplyste den danske trafikminister, at undersøgelserne tillige ville omfatte (i) vurdering af alternative finansierings- og organisationsmodeller; (ii) sociale aspekter; og (iii) forbedrede færgeforbindelser som alternativ til faste forbindelser. Af disse er de to første komponenter ikke inkluderet i de undersøgelser, som planlægges påbegyndt i 1995.

I Danmark er beslutningen vedrørende en eventuel fast forbindelse over Femer Bælt forbundet med en beslutning om at elektrificere og forøge kapaciteten på jernbanestrækningen Odense-Hamburg. Det har hidtil været den danske regerings politik, at såvel Øresundsbeslutningen som Odense-Hamburg beslutningen skal gennemføres inden en eventuel Femerforbindelse.

Af regeringens trafikpolitiske redegørelse fra 1993, "Trafik 2005", fremgår, at det er den danske regerings holdning, at hensynet til banetrafikken er udgangspunktet for en eventuel beslutning om etablering af en fast forbindelse over Femer Bælt, herunder hensynet til opkobling af Danmark og Skandinavien på det europæiske net for højhastighedstog. Regeringen har derfor erklæret, at samtidig med undersøgelser af Femer Bælt forbindelsen bør der gennemføres undersøgelser af forskellige udbygningsalternativer for baneforbindelsen mellem København og Rødby, og at en beslutning om investeringer i de tilsluttende baneanlæg bør træffes sammen med en beslutning om en eventuel fast forbindelse via Femer Bælt.

I EU-Kommissionens arbejde med trans-europæiske transportnet optræder Femer Bælt forbindelsen på en liste over projekter, som vurderes at være af central betydning for etablering af de trans-europæiske net. Femerforbindelsen indgår i en gruppe af projekter, som kræver yderligere undersøgelser, og EU deltager i finansieringen af sådanne undersøgelser. På topmødet i Essen i december 1994 besluttede Europarådet, at arbejdet med transeuropæiske net skulle fortsættes, og det blev noteret, at den Europæiske Investeringsbank har oprettet en særlig konto til finansiering af sådanne net.

#### Eksisterende trafik

Hvad angår den eksisterende trafik over Femer Bælt (Rødby-Puttgarden, Gedser-Warnemünde, Gedser-Travemünde og Gedser-Rostock) og over Østersøen (vigtigste færgeruter mellem Skandinavien og kontinental-Europa på Østersøen fra Jyllands østkyst til Oder), kan følgende konstateres:

Vejtrafikken over Femer Bælt var i 1993 4.100 køretøjer pr. døgn. Det svarer til 75 procent af trafikken over Øresund og godt 50 procent af trafikken over Storebælt. 80 procent af vejtrafikken over Femer Bælt var personbiler, resten lastbiler og busser.

Passagertrafikken med tog over Femer Bælt var i 1993 2.190 passagerer pr. døgn. Det svarer til knap dobbelt så mange togpassagerer som over Øresund og cirka en fjerdedel af antallet over Storebælt.

Godstrafikken over Femer Bælt i 1993 er estimeret til 6,9 millioner tons, fordelt med cirka halvdelen på tog og halvdelen på lastbil.

Vejtrafikken over Femer Bælt er vokset betydeligt mere end vejtrafikken i Danmark og Tyskland i perioden 1980-91. Derimod er vejtrafikken over Femer Bælt faldet 1991-93, mens den fortsat er steget i Danmark og Tyskland. I 1993 var vejtrafikken over Femer Bælt således på samme niveau som i 1988, året før Berlin-muren faldt.

Femer Bælts andel af den samlede vejtrafik over Østersøen er faldet cirka en procent om året i gennemsnit 1983-89 og cirka to procent om året 1989-93.

På det maritime transportmarked på Østersøen er transport af køretøjer til og fra det tidligere Østtyskland et væsentligt marked i markant vækst. Vejtrafikken mellem Danmark-Sverige og Østtyskland udgjorde i 1989 seks procent af den samlede vejtrafik mellem Danmark-Sverige og de to tysklænder (excl. landegrænsen). I 1993 var denne andel steget til 21 procent. Den maritime transport af køretøjer til og fra det tidligere Vesttyskland var i samme periode faldende, såvel absolut som relativt.

#### Estimer af omkostninger og fremtidig trafik

På grundlag af erfaringerne fra Storebælt, har A/S Storebælt estimeret anlægsomkostninger på 24 milliarder kr (1988-priser) for en kombineret jernbane- og vejbro over Femer Bælt (to jernbanespor, fire-sporet motorvej). Dette er knap dobbelt så meget som den oprindelige pris for Storebæltsforbindelsen, således som den er oplyst i bemærkningerne til anlægsloven.

En bil-tog forbindelse i boret tunnel er estimeret til 21,6 milliarder kr (1988-priser). Endelig er anlægsomkostningerne for en kombineret forbindelse bestående af en boret jernbanetunnel og en motorvejsbro estimeret til 13,6 plus 15,4 milliarder kr, d.v.s. i alt 29 milliarder kr (1988-priser).

Foruden kyst-til-kyst forbindelsen kommer omkostninger til udvidelse fra et til to spor og øvrige forbedringer af tilsluttende jernbaner i Danmark og Tyskland samt bygning og udbygning af tilsluttende motorveje i de to lande, arbejder som samlet vil koste adskillige milliarder kroner.

Trafikken over en kombineret forbindelse over Femer Bælt er estimeret af A/S Storebælt til 8.000 køretøjer og 5.750 togpassagerer pr. døgn umiddelbart efter åbningen. Det svarer til 95 procent flere køretøjer og 160 procent flere togpassagerer end den faktiske trafik i 1993. Det svarer endvidere til cirka halvt så mange køretøjer og en femtedel så mange togpassagerer som estimeret for en fast Storebæltsforbindelse umiddelbart efter dennes åbning.

For vejdelen af en vej- og jernbaneforbindelse har A/S Storebælt estimeret en forrentning på 9,75 procent. For banedelen er forrentningen ikke estimeret.

Endelig kan det konstateres, at etablering af en kombineret Femerforbindelse vil have en betydelig og gunstig indflydelse på Øresundsforbindelsens økonomi og begrænset indflydelse på Storebæltsforbindelsens økonomi, ifølge beregninger udført af A/S Storebælt.

Andre studier har estimeret andre omkostninger og andre trafiktal for en fast Femerforbindelse. En vurdering af omkostninger udført af EU Kommissionen i 1994 gav et overslag på 4,5 milliarder ECU for en kombineret jernbane- og vejforbindelse. Ingen trafiktal og forrentning blev estimeret.

Et studie udført af Scandinavian Link i 1990 anslog at anlægsomkostningerne for en enkeltsporet jernbane i tunnel og en to-sporet vej ligeledes i tunnel ville være 12,8 milliarder kroner (1987-priser), incl. renter i anlægsperioden. Trafikken i år 2000 blev estimeret til 1,7 millioner togpassagerer, 4,3 millioner bilpassagerer og 16 millioner tons gods. Forrentningen af projektet blev anslået til 15 procent.

Endelig anslog et studie udført af Dansk Vejforening i 1991, at anlægsomkostningerne for en bro med enkeltsporet jernbane og fire-sporet motorvej ville være 16 milliarder kroner (1990-priser). Trafikken i år 2000 blev her estimeret til 1,8 millioner togpassagerer, 6,7 millioner bilpassagerer, 2,8 millioner buspassagerer og 17 millioner tons gods. Forrentningen blev anslået til 10-15 procent.

Alle estimater er forbundet med betydelig usikkerhed.

## Aktører og deres holdninger

Det organiserede Danmark - her forstået som regering, Folketing, politiske partier, arbejdsmarkedets organisationer og en række andre interesseorganisationer - samt væsentlige dele af den nationale presse, er helt overvejende for etablering af en fast forbindelse over Femer Bælt. De vigtigste beveggrunde er konkurrence- og beskæftigelseshensyn samt europæisk integration. Ligeså klart viser opinionsundersøgelser imidlertid, at der sandsynligvis ikke er noget flertal i den danske befolkning for en fast Femerforbindelse.

Danmark har tidligere oplevet tilsvarende markante forskelle mellem offentlig og organiseret opinion, f.eks. ved beslutningerne om faste forbindelser over Øresund og Storebælt og ved beslutningerne om omfanget af deltagelse i den Europæiske Union. Erfaringerne fra Øresund, Storebælt og EU-afstemningerne tyder på, at offentlighedens tillid til det politiske og administrative system står på spil i denne type situation. Kravene til informationsniveau, demokratisk proces og fair play bliver derfor særligt høje.

Det konkluderes på den baggrund, at procedurer bør udvikles for undersøgelser af og beslutninger om faste eller andre forbindelser over Femer Bælt, som indeholder den gennemskuelighed, de mekanismer til balancering af interesser og de incitamentter til ansvarlig ressourceanvendelse, som kan sikre en demokratisk beslutningsproces og en effektiv anvendelse af samfundets midler. En efterfølgende rapport fra Transportrådet vil redegøre for, hvordan sådanne procedurer kunne se ud.

## English Summary

### Political Decisions

The ratification in 1991 by the Danish Parliament of the law for construction of a fixed link across Øresund paved the way for studying the feasibility of a possible fixed link between Denmark and Germany across Fehmarn Belt. Article 21 of the agreement between Denmark and Sweden regarding the Øresund link commits the Danish Government to work for a fixed link across Fehmarn Belt, should such a link prove environmentally sound and economically feasible. In Germany, no explicit political decision has been made regarding a Fehmarn Belt link; the link is not listed in the current German investment plan for the transport sector.

The Danish and German ministers of transport have agreed informally to carry out studies of a possible Fehmarn Belt link. "Phase A" studies were carried out in 1992-93 in order to establish a study basis. Further studies will start in 1995 covering (i) geotechnical and geological conditions; (ii) technical alternatives for the coast-to-coast facility; (iii) environmental impacts on marine areas; and (iv) traffic forecasts. In 1993 and 1994, the Danish Minister of Transport stated that studies would also cover (i) assessment of alternative models for finance and organisation; (ii) social aspects of a possible link; and (iii) improved ferry operations as an alternative to possible fixed links. Of these, the two former components are not included in the studies which will be initiated in 1995.

In Denmark, the decision regarding a possible fixed link across Fehmarn Belt has been closely connected with a decision to electrify and increase the capacity of the railroad Odense-Hamburg. It has been the policy of the Danish Government to implement the Øresund fixed link and Odense-Hamburg project before a possible link across Fehmarn Belt.

In a policy statement in the Danish Parliament in December 1993, the Minister of Transport announced that the Government's regard to development of rail traffic, including the possibility of extending the European high-speed rail network to include Denmark and Southern Scandinavia, would be the point of departure for a possible decision about a fixed link across Fehmarn Belt.

In the EU Commission's work on trans-European networks, a Fehmarn Belt link is included in a list of projects that are seen as central to establishing the trans-European Networks. The Fehmarn Belt link is included in a group of projects which require further study. At the Essen summit meeting in December 1994, the European Council decided that work on trans-European networks would continue and noted that a special account had been established with the European Investment Bank for the financing of such networks.

## Existing Traffic

Existing traffic across Fehmarn Belt (Rødby-Puttgarden, Gedser-Warnemünde, Gedser-Travemünde and Gedser-Rostock) and across the Baltic Sea (most important ferry routes between Scandinavia and continental Europe on the Baltic Sea from Jutland's East Coast to the Oder) can be described as follows:

Road vehicle traffic across Fehmarn Belt 1993 amounted to 4,100 vehicles per day. This was equivalent to 75 percent of road vehicle traffic across Øresund and a good 50 percent of traffic across Great Belt. 80 percent of road vehicle traffic across Fehmarn Belt was passenger cars, the rest trucks and buses;

Passenger traffic by train across Fehmarn Belt 1993 was 2,190 passengers per day. This was equivalent to almost twice the amount of train passengers crossing Øresund and about a fourth of the train passengers crossing Great Belt;

Goods traffic across Fehmarn Belt in 1993 is estimated at 6.9 million ton, with approximately half on train and half on truck;

During 1980-91, road vehicle traffic across Fehmarn Belt grew faster than road vehicle traffic in Denmark and Germany. However, during 1991-93 road vehicle traffic across Fehmarn Belt fell while traffic continued to grow in Denmark and Germany. In 1993 road vehicle traffic across Fehmarn Belt was at the same level as in 1988, the year before the Berlin Wall fell;

The Fehmarn Belt share of total road vehicle traffic across the Baltic Sea fell on average by approximately one percent a year 1983-89, and on average by approximately two percent a year 1989-93;

Transport of road vehicles to and from the former East Germany across the Baltic Sea is growing rapidly. In 1989, road vehicle traffic between Denmark-Sweden and East Germany was six percent of total road vehicle traffic between Denmark-Sweden and the two Germanies (excluding traffic across the Danish-German land border). In 1993, this share had grown to 21 percent. Ferry transport of road vehicles between Denmark-Sweden and the former West Germany fell during the same period, in real as well as in relative terms.

## Estimates of Costs and Future Traffic

On the basis of experience from Great Belt, Great Belt, Ltd. has estimated construction costs for a combined rail and road bridge (two-track

rail, four-lane motorway) across Fehmarn Belt at dkr 24 billion (1988 prices). This is approximately twice the original budget for the Great Belt link (in the same prices).

A shuttle-train connection in a bored tunnel was estimated at dkr 21.6 billion (1988 prices). Finally, construction costs for a combined connection with a bored rail tunnel and a motorway bridge was estimated at dkr 29 billion (1988 prices), with dkr 13.6 billion for the rail tunnel and dkr 15.4 billion for the road bridge.

In addition to costs for the coast-to-coast link across Fehmarn Belt, costs would be incurred for expansion of the connecting rail links from one to two tracks in Denmark and Germany and for construction of connecting motorways in the two countries. Taken together, these works would cost several billion Danish kroner.

Traffic on a rail and road link across Fehmarn Belt has been estimated by Great Belt, Ltd. at 8,000 road vehicles and 5,750 rail passengers per day upon opening of the link. This is equivalent to 95 percent additional road vehicles and 160 percent additional train passengers than crossed the Belt in 1993. It is also equivalent to approximately half as many road vehicles and a fifth as many train passengers as are estimated for the fixed link across Great Belt upon its opening.

For the road part of the rail-and-road link across Fehmarn Belt, Great Belt, Ltd. calculated a financial internal rate of return of 9.75 percent. No rate of return was calculated for the rail link.

Finally, Great Belt, Ltd. found that establishing a fixed rail and road link across Fehmarn Belt would have a substantial and positive influence on the financial performance of the Øresund link but a limited influence on the financial performance of the Great Belt link.

Other studies have produced different costs and traffic volumes for a possible Fehmarn Belt link. An initial cost evaluation by the EU Commission in 1994 produced a cost of ECU 4.5 billion for a combined rail and road link. No figures for traffic and revenues were estimated.

A 1990 study by Scandinavian Link of a single-track rail tunnel and a two-lane road tunnel estimated costs at dkr 12.8 billion (1987 prices), including interest during construction. Traffic in year 2000 was estimated at 1.7 million rail passengers, 4.3 million car passengers and 16 million tons of goods. An internal rate of return of 15 percent was calculated.

A 1991 study by the Danish Road Association estimated construction costs for a bridge with a single-track railway and a four-lane motorway at dkr 16 billion (1990 prices). Traffic in the year 2000 was estimated at 1.8 million rail passengers, 9.5 million road vehicle passengers and 17 million tons of goods per year. The rate of return on the project was estimated at 10-15 percent.

All estimates mentioned are subject to substantial uncertainties.

## Public and Organised Opinion

What could be called "organised Denmark" - here understood as government, the Parliament, political parties, employer and labour organisations and other interest organisations - in addition to central parts of the national press, clearly supports the construction of a fixed link across Fehmarn Belt. The reasons most frequently cited for being pro-fixed link are that a link is believed to result in (i) an improved competitive situation for Danish business in relation to the rest of Europe; (ii) increased employment; and (iii) European integration. Notwithstanding this, opinion polls suggest that at present a majority of Danes are not for a fixed link across Fehmarn Belt.

Previously, Denmark has experienced similar marked differences between public and organised opinion, for instance in connection with the decisions on fixed links across Great Belt and Øresund and on the extent of Danish participation in the European Union. The experiences of Øresund, Great Belt and the EU-referenda indicate that public trust in the political and administrative system is at stake in such types of situations. Requirements on information, due democratic process and fair play are, therefore, particularly high.

Against this background it may be concluded that better procedures should be developed for carrying out feasibility studies and for deciding on fixed or other links across Fehmarn Belt. Such procedures should (i) be transparent; (ii) provide adequate mechanisms for balancing different interests against each other; (iii) contain incentives for making efficient use of scarce resources; and (iv) allow for effective mechanisms for enforcement of accountability. A later report from the Transport Council will outline such procedures.

## Deutsche Zusammenfassung

### Politische Entscheidungen

Mit der Ratifizierung des Gesetzes des Dänischen Parlaments über den Bau einer Landverbindung zwischen Dänemark und Schweden über den Öresund wurde der Weg bereitet, um die Möglichkeit einer Landverbindung zwischen Dänemark und Deutschland über den Fehmarnbelt zu untersuchen. Artikel 21 des Vertrages zwischen Dänemark und Schweden über die Öresund - Verbindung verpflichtet die dänische Regierung, auf eine Landverbindung über den Fehmarnbelt hinzuwirken, wenn eine solche Verbindung sich als wirtschaftlich und ökologisch verträglich erweisen sollte. In Deutschland ist keine politische Entscheidung bezüglich der Fehmarnbelt - Verbindung gefallen, das Projekt ist nicht explizit im Bundesverkehrswegeplan enthalten.

Die dänischen und deutschen Verkehrsminister sind auf der informellen Ebene übereingekommen, Untersuchungen über die Realisierbarkeit einer Fehmarnbelt - Verbindung durchzuführen. Vorstudien wurden durchgeführt ("Phase A") und in den Jahren 1992-93 vorgelegt. Weitere Untersuchungen sind ab 1995 geplant, die umfassen: (i) geotechnische und geologische Bedingungen, (ii) technische Alternativen für eine Verbindung von Küste zu Küste, (iii) Umweltbeeinträchtigungen im Ostseegebiet und (iv) Verkehrsprognosen. In den Jahren 1993 und 1994 wurde vom dänischen Verkehrsministerium angekündigt, daß die Untersuchungen ebenfalls (i) die Bewertung von alternativen Finanzierungs- und Organisationsmodellen, (ii) soziale Aspekte des Vorhabens und (iii) verbesserte Fährschiffsbedingungen als Alternative zu möglichen Landverbindungen umfassen sollen. Die beiden letzten Elemente sind in der Beschreibung der Untersuchungen, die ab 1995 durchgeführt werden sollen, nicht enthalten.

In Dänemark wurde die Entscheidung zur Fehmarnbelt - Verbindung eng mit einer Entscheidung über die Elektrifizierung und Kapazitätssteigerung der Eisenbahnstrecke Odense - Hamburg verknüpft. Es war politischer Wille, daß die Öresund sowie Odense - Hamburg - Projekte vor einem möglichen Fehmarnbelt - Projekt begonnen werden sollten.

Der dänische Verkehrsminister hat im Dezember 1993 in seinem Bericht vor dem Parlament zur Verkehrspolitik der Regierung angekündigt, daß für die dänische Seite die Entwicklung des Eisenbahnverkehrs eine entscheidungsbestimmende Bedeutung hat, wobei die Möglichkeit einer Erweiterung des europäischen Hochgeschwindigkeitsnetzes der Eisenbahnen unter Einschluss von Dänemark und Süd - Skandinavien

eingeschlossen ist.

In der Zusammenstellung der EU - Kommission zu den transeuropäischen Netzen wird die Fehmarnbelt - Verbindung unter den Projekten, die als Kernelemente dieses Netzes gelten, aufgeführt. Die Fehmarnbelt - Verbindung ist in der Projektgruppe enthalten, für die zusätzliche Untersuchungen notwendig sind. Beim EU - Gipfel in Essen im Dezember 1994 hat der Europäische Rat entschieden, daß die Arbeiten zu den transeuropäischen Netzen fortgeführt werden sollen, wobei die Europäische Investitionsbank bei der Finanzierung mitwirken soll.

#### Heutige Verkehrssituation

Die heutige Situation des Verkehrs über den Fehmarnbelt (Rödby-Puttgarden, Gedser-Warnemünde, Gedser Travemünde und Gedser-Rostock) und die Ostsee (die wichtigsten Fährverbindungen zwischen Skandinavien und dem europäischen Festland von der Ostküste Jütlands bis zur Odermündung) kann wie folgt beschrieben werden:

1993 passierten durchschnittlich 4100 Stra?enfahrzeuge pro Tag den Fehmarnbelt. Dies entsprach 75 % des entsprechenden Verkehrs über den Öresund oder 50 % des entsprechenden Verkehrs über den Gro?en Belt. Der Pkw - Verkehr machte davon 80 % aus, der Rest setzte sich aus Lkw und Bussen zusammen.

Der Schienenpersonenverkehr über den Fehmarnbelt erreichte 1993 2190 Reisende pro Tag im Durchschnitt. Dies entsprach dem Doppelten des Schienenpersonenverkehrs über den Öresund und ein Viertel dessen über den Gro?en Belt.

Der Güterverkehr über den Fehmarnbelt wurde für 1993 mit 6,9 Mill. Tonnen geschätzt, wovon etwa jeweils die Hälfte mit der Bahn bzw. mit dem Lkw transportiert wurden.

In den Jahren 1980 bis 1991 wuchs der Stra?enfahrzeugverkehr über den Fehmarnbelt schneller als der gesamte Stra?enfahrzeugverkehr in Dänemark und in der Bundesrepublik (in den alten Grenzen). In den Jahren 1991 bis 1993 war der Stra?enfahrzeugverkehr über den Fehmarnbelt allerdings rückläufig, während er insgesamt in Dänemark und in der Bundesrepublik (in den alten Grenzen) weiter anstieg. Im Jahr 1993 hatte der Stra?enfahrzeugverkehr über den Fehmarnbelt wieder das Niveau von 1988, also dem Jahr vor dem Fall der Berliner Mauer, erreicht.

Der Anteil des Stra?enfahrzeugverkehrs über den Fehmarnbelt am Gesamtverkehr über die Ostsee fiel in den Jahren 1983 bis 1989 durchschnittlich um 1 % p.a., in den folgenden Jahren bis 1993 um 2% p.a.

Im Seeverkehr über die Ostsee ist der Transport von Stra?enfahrzeugen von und nach Ostdeutschland ein Wachstumsmarkt. 1989 betrug der Stra?enfahrzeugverkehr zwischen Dänemark/Schweden und Ostdeutschland gerade 6 % des entsprechenden Verkehrs zwischen Dänemark/Schweden und Gesamtdeutschland (ohne den Landverkehr über die dänisch-deutsche Grenze). Im Jahr 1993 ist dieser Anteil auf 21 % angewachsen. Dagegen fiel der Seetransport von Straenfahrzeugen zwischen Dänemark/Schweden und Westdeutschland im gleichen Zeitraum, sowohl absolut wie relativ.

## Schätzung der Baukosten und der Verkehrsentwicklung

Auf Basis der Erfahrungen mit dem Bau der Landverbindung über den Großen Belt hat die Great Belt, Ltd. die geschätzten Baukosten für eine kombinierte Straßen- und Eisenbahnbrücke (zwei Gleise, 4 Fahrstreifen) über den Fehmarnbelt mit 24 Mrd. dkr (Basis 1988) beziffert. Dies entspricht dem Doppelten der ursprünglich für das Großer Belt - Vorhaben geschätzten Baukosten.

Eine Shuttle - Zug - Verbindung durch einen Tunnel wurde bei 21,6 Mrd. dkr (Basis 1988) Baukosten geschätzt. Schließlich wurden die Baukosten für eine kombinierte Verbindung in Form eines Eisenbahntunnels und einer Straßenbrücke mit 29 Mrd. dkr (Basis 1988) beziffert, wobei auf den Eisenbahntunnel 13,6 und auf die Straßenbrücke 15,4 Mrd. dkr entfielen.

Zusätzlich zu den Kosten der Küste-Küste - Verbindung würden weitere Kosten für die Erweiterung von Eisenbahnstrecken und für den Bau von Straßenanbindungen in Dänemark und Deutschland anfallen. Auch diese Kosten dürften sich auf einige Mrd. dkr belaufen.

Der Verkehr für eine kombinierte Eisenbahn- und Straßenverbindung über den Fehmarnbelt ist von der Great Belt, Ltd. auf 8000 Straßenfahrzeuge und 5750 Eisenbahnreisende je Tag im Jahr der Eröffnung geschätzt worden. Dies entspricht einer Steigerung bei den Straßenfahrzeugen um 95 % und bei der Eisenbahnreisenden um 160 % gegenüber 1993. Im Vergleich zur Verkehrsprognose zum Großer Belt - Projekt liegt die Straßenfahrzeugprognose (zum Zeitpunkt der Inbetriebnahme) bei etwa der Hälfte und die Eisenbahnreisendenprognose bei einem Fünftel. Für den Straßenanteil des kombinierten Eisenbahn-/Straßenprojekts für den Fehmarnbelt errechnet die Great Belt, Ltd. eine interne Verzinsung des Kapitaleinsatzes von 9,75 %. Für den Eisenbahnteil gibt es keine solche Angabe.

Great Belt, Ltd. stellt abschließend fest, daß der Bau einer kombinierten Eisenbahn- und Straßenverbindung über den Fehmarnbelt einen positiven Einfluß auf das wirtschaftliche Ergebnis der Öresund- und einen schwachen Einfluß auf das der Große Belt - Verbindung haben würde.

Weitere Studien haben unterschiedliche Ergebnisse für die Kosten und die zu erwartenden Verkehrsmengen über den Fehmarnbelt ergeben. Eine erste Kostenabschätzung der EU - Kommission führte zu einem Kostenvolumen von 4,5 Mrd. ECU für eine kombinierte Straßen-/Eisenbahnverbindung. Über Verkehrsmengen und Erlöse wurden keine Angaben gemacht.

Im Jahr 1990 ermittelte die Scandinavian Link in einer Studie zu einem kombinierten Tunnel mit einem Eisenbahngleis und zwei Fahrstreifen Kosten in Höhe von 12,8 Mrd. dkr (Basis 1987), einschließlich der Zinsen während der Bauphase. Der Verkehr für das Jahr 2000 wurde mit 1,7 Mill. Bahnreisenden, 4,3 Mill. Pkw - Reisenden und 16 Mill. Tonnen Güteraufkommen angegeben. Die erwartete interne Verzinsung des Kapitals wird mit 15 % genannt.

Im Jahr 1991 erschien eine Studie der Danish Road Association, welche die Baukosten für eine Brücke mit einem Bahngleis für den Schienen- und vier Fahrstreifen für den Straßenverkehr auf 16 Mrd. dkr (Basis 1990) schätzte. Der Verkehr für das Jahr 2000 wurde mit 1,8 Mill. Bahnreisenden, 9,5 Mill. Pkw - Reisenden und 17 Mill. Tonnen Güteraufkommen prognostiziert, die interne Verzinsung mit 10 - 15 %.

Alle erwähnten Schätzungen unterliegen hohen Unsicherheitsmargen.

## Einstellung von Gruppen und Verbänden

Das politisch organisierte Dänemark, also Regierung, Parlament, politische Parteien, Wirtschaftsverbände, Gewerkschaften oder Interessengruppen, wie auch wesentliche Teile der Presse, unterstützen eine Landverbindung über den Fehmarnbelt. Als Gründe für die positive Einstellung zu diesem Vorhaben werden meist die verbesserte Wettbewerbssituation der dänischen Wirtschaft in Relation zum übrigen Europa, die Verbesserung der Beschäftigung und die europäische Integration genannt. Ebenso klar zeigen jedoch Umfragen, daß es gegenwärtig offenbar keine Mehrheit in der dänischen Bevölkerung für eine Landverbindung über den Fehmarnbelt gibt.

Es hat früher bereits ähnliche Differenzen zwischen der organisierten und der nicht organisierten Öffentlichkeit gegeben, so zum Beispiel bei den Entscheidungen über die Großer Belt- und Öresund - Projekte, sowie bei der Entscheidung über die dänische Mitgliedschaft in der Europäischen Union. Die Lehren, die aus diesen Beispielen gezogen werden können, zeigen, daß das öffentliche Vertrauen in das politische und administrative System bei solchen Entscheidungssituationen auf dem Spiel stehen kann. Die Anforderungen an die Information, den geeigneten demokratischen Prozeß und eine faire Behandlung aller Gruppen sind dementsprechend hoch.

Vor diesem Hintergrund ist zu folgern, daß die Verfahrensweisen zur Durchführung von Wirtschaftlichkeits-, Verträglichkeits- und anderen entscheidungsvorbereitenden Untersuchungen über die Art einer Verbindung über den Fehmarnbelt neu überdacht werden sollten. Zentral sind dabei die Anforderungen (i) ein hohes Maß an Transparenz zu gewährleisten, (ii) eine Balance verschiedener Interessen herbeizuführen, (iii) Anreize für eine effiziente Verwendung der Ressourcen zu vermitteln und (iv) wirksame Mechanismen für Kostenverantwortlichkeiten zu entwickeln. In dem folgenden Bericht des Verkehrsbeirats werden diese Anforderungen weiter präzisiert und mögliche Verfahrensweisen aufgezeigt.

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## Facts about Fehmarn Belt

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#### Forord

Denne rapport indeholder resultaterne af en undersøgelse af foreliggende fakta om en eventuel fast trafikforbindelse mellem Danmark og Tyskland over Femer Bælt. Undersøgelsen blev gennemført i løbet af 1994.

Rapporten udgør fase 1 af en undersøgelse af hvilket grundlag og hvilken proces, som bør etableres i forbindelse med en beslutning om en eventuel fast Femer Bælt forbindelse. I en efterfølgende rapport vil der blive gjort rede for erfaringerne fra andre store infrastrukturprojekter, ligesom der vil blive opstillet anbefalinger vedrørende beslutningsgrundlag og -proces for en beslutning om en eventuel fast forbindelse.

Rapporten er blevet udarbejdet for Transportrådet af et internationalt team af eksterne rådgivere:

Professor, dr.techn. Bent Flyvbjerg, Aalborg Universitet (projektleder)

Professor, dr. Werner Rothengatter, Karlsruhe Universitet

Docent, dr. Nils Bruzelius, Lund

Undersøgelsen er gennemført uafhængig af de egentlige forundersøgelser af forbindelsen. Disse forundersøgelser vil blive gennemført af det danske og det tyske trafikministerium i fællesskab.

Med denne rapport ønsker Transportrådet at give beslutningstagerne og offentligheden en samling af fakta, som kan danne grundlag for en indledende debat om en eventuel fast Femer Bælt forbindelse. Rapporten vil tillige danne udgangspunkt for efterfølgende anbefalinger fra teamet og Transportrådet.

Transportrådet

Februar 1995

## Preface

This report contains the results of a fact finding study on a possible fixed link between Denmark and Germany across Fehmarn Belt. The study was carried out during 1994.

The report makes up phase one of a study on requirements on feasibility studies and decision making processes regarding a Fehmarn Belt link. A succeeding report will contain lessons learned from other major infrastructure projects and recommendations on the design of feasibility studies and decision making processes on a possible fixed link across Fehmarn Belt.

The report has been prepared for the Danish Transport Council by an international team of external experts:

Professor Dr. Bent Flyvbjerg, Aalborg University, (team leader)

Professor Dr. Werner Rothengatter, University of Karlsruhe

Docent Dr. Nils Bruzelius, Lund

The study was carried out independently of the feasibility studies, which will be conducted jointly by the Ministries of Transport of Denmark and Germany.

By means of this report, it is the intention of the Transport Council to provide the decision makers and the general public with a set of basic facts on which an initial debate on a possible fixed link across Fehmarn Belt can be based. Moreover, the report shall serve as a basis for succeeding recommendations from the team and the Transport Council.

The Danish Transport Council

February, 1995

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#### 1. Introduction

A fixed link across Fehmarn Belt was considered as early as 1936-37 when a group of Danish contractors submitted a proposal to the Danish Government for developing transport infrastructure in Denmark by implementing a system of motorways and bridges.<sup>1</sup> The motorways formed what would later become known as the "Big H", i.e. two motorways from North to South, one in Jutland and one on Zealand and Lolland-Falster, and one motorway from East to West across Zealand, Funen and Jutland. The Eastern and Western parts of the motorway system were proposed to be connected with a bridge across Great Belt. The Danish motorways were to be linked with Sweden and Germany by bridges across Øresund and Fehmarn Belt.<sup>2</sup>

In June 1994, the Big H was completed, with only minor differences compared to the original proposal by the contractors. The Great Belt link is under construction and is expected to be completed by December 1997. Tendering for the construction of the Øresund link has begun. The Fehmarn link is in its early planning stages with feasibility studies expected to be carried out 1995-97.

The purpose of this report is to give an overview of existing information regarding a possible fixed link across Fehmarn Belt. The report is the result of a fact-finding study and it covers: (i) the political decisions behind a possible fixed link across Fehmarn Belt; (ii) existing traffic across Fehmarn Belt, across the Baltic Sea and between Scandinavia and continental Europe; (iii) earlier studies of proposed fixed links across Fehmarn Belt; and (iv) an overview of actors and their objectives regarding a possible fixed link across Fehmarn Belt.

A later report will review the implications of the information presented in this report on how best to organise the process for deciding whether a fixed link should be built across Fehmarn Belt or not, including what information will be needed in the process and how it may be produced, realising that such information will neither be the only nor, possibly, the most important basis for political decision making. The later report will also spell out lessons from other major transport investments, in Denmark and internationally, and their ramifications regarding how to reduce risk and ensure transparency and accountability in the decision making process for a possible fixed link across Fehmarn Belt.

## Facts about Fehmarn Belt

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#### 2. Political decisions regarding a possible fixed link across Fehmarn Belt

In this Chapter, political decisions of importance for a possible fixed link across Fehmarn Belt are described. Firstly, the formal political and legal basis for a possible link is delineated. Secondly, other political decisions with implications for a link are described. At this stage, the emphasis is on describing the legal and political decisions as such. The question of how far implementation of the decisions have come will not be dealt with in detail here.

##### 2.1 The Political and Legal Basis for a Possible Fixed Link Across Fehmarn Belt

No written agreement exists between Denmark and Germany regarding a fixed link across Fehmarn Belt. However, the Danish and German ministers of transport have verbally agreed to study the feasibility of a fixed link across the Belt. The studies are expected to be carried out 1995-97.

In Denmark, the decision regarding a possible fixed link across Fehmarn Belt has been closely connected with two other decisions regarding major transport infrastructure, namely the decision regarding a fixed link between Denmark and Sweden across Øresund and the decision to electrify and increase the capacity of the railroad Odense-Hamburg. It is the policy of the Danish Government that the latter two projects be implemented before the possible implementation of a fixed link across Fehmarn Belt.

For Denmark, the formal political and legal basis for work on a possible fixed link across Fehmarn Belt is "Law on Construction of a Fixed Link Across Øresund" of August 19 1991.<sup>[1](#)</sup> The law ratifies an agreement between the governments of Denmark and Sweden signed on March 23 1991 to build a combined road and rail link between Denmark and Sweden across Øresund.<sup>[2](#)</sup>

Article 21 of the agreement between Denmark and Sweden commits the Danish Government to work for a fixed link between Denmark and Germany across Fehmarn Belt, should such a link prove ecologically and economically feasible. In full, article 21 reads:

"The Government of Denmark declares itself ready to work for the implementation of a fixed link across Fehmarn Belt on the condition that regard for environment and economy can be observed."<sup>[3](#)</sup>

In paragraph 2 of the "Law on Construction of a Fixed Link Across Øresund" the Danish Minister of Transport is authorised to take the steps necessary to implement the agreement with Sweden.

As a consequence of article 21 in the Danish-Swedish agreement, studies will be initiated regarding a fixed link across Fehmarn Belt. Such studies will be carried out in collaboration between the Danish and German authorities.<sup>4</sup> The purpose of the studies is to establish information on the basis of which a decision regarding a possible fixed link across Fehmarn Belt can be taken.<sup>5</sup> According to the Danish Minister of Transport the studies will cover:

1. Technical and environmental assessment of alternative designs of a fixed link;
2. Traffic forecasts;
3. Assessment of alternative models for financing and organisation.<sup>6</sup>

In an account to the Danish Parliament in December 1993 regarding the Government's transport policy, the Minister of Transport announced that he expected the studies regarding a possible fixed link across Fehmarn Belt to be concluded by the end of 1996.<sup>7</sup> The current schedule is that the tendering process for the studies will be carried out Fall-Winter 1994-95 with contracts for the studies expected to be signed Spring-Summer 1995. Actual work on the studies will take up to two years. Thus, at the time of writing this report, 1997 seems to be a more likely time-frame for concluding the studies.<sup>8</sup>

Article 21 of the agreement between the governments of Denmark and Sweden is linked to a Danish political agreement from April 29 1991 between the Conservative Party, the Liberal Party (Venstre), the Social Democratic Party and the Centre Democrats (Centrumdemokraterne) that the railroad Odense-Hamburg will have its capacity increased and will be electrified before a possible fixed link across Fehmarn Belt is built.<sup>9</sup> On June 7 1991 the Danish and German Ministers of Transport concluded an agreement on electrification of the section of the railway system between Odense and Hamburg.<sup>10</sup>

In addition to the formal legal and political basis for work on a possible fixed link across Fehmarn Belt, a number of political decisions and statements have implications for this work. They are mentioned below in chronological order. Finally, a number of interest groups have made their objectives and attitudes regarding a fixed link known. These will be described in Chapter 5.

## 2.2 National Physical Planning, 1992

In his 1992 account on national physical planning, the Danish Minister of the Environment and the Danish Government proposed to develop transport infrastructure in Denmark in order to "avoid that the European main traffic corridors would bypass Denmark".<sup>11</sup> A decision regarding a possible fixed link across Fehmarn Belt was seen as central to this policy. The Ministry of the Environment was identified as a partner to the Ministry of Transport in carrying out the feasibility studies for a possible fixed link across Fehmarn Belt.<sup>12</sup>

Parallel to the Fehmarn Belt feasibility studies, studies would be carried out of high-speed rail Berlin/Hamburg-Copenhagen-Oslo/Stockholm in collaboration with the German and Swedish authorities.

## 2.3 Parliamentary Vote on Privately Financed Link Across Fehmarn Belt, June 1993

With 102 votes against and nine votes for, on June 18 1993 the Danish Parliament rejected a "Proposal for Decision by the Parliament Regarding a Privately Financed Link Across Fehmarn Belt" set forth by the Progress Party (Fremskridtspartiet).<sup>13</sup> The objectives of the proposal was to speed up implementation of a fixed link across Fehmarn Belt and to ensure that the link would be privately financed.

The Danish Minister of Transport, in his comments on the proposal, gave two main reasons for the Government's rejection of it: (1) Feasibility studies would have to be carried out before a decision could be made regarding a possible fixed link across Fehmarn Belt; as part of such studies alternative organisational models would be evaluated, and (2) The proposal comprised an "unfortunate mix" of interests, with construction companies and financial institutions operating together in the same consortium responsible for the link.<sup>14</sup>

#### 2.4 Danish Government Transport Policy, December 1993

In his December 1993 statement to the Danish Parliament regarding the Government's transport policy, the Danish Minister of Transport announced that for the Danish Government, concern for the development of rail traffic is the point of departure for a possible decision about a fixed link across Fehmarn Belt.<sup>15</sup> In the statement, the minister also stressed the importance of a link across Fehmarn Belt for enabling the extension of the European high-speed rail network to include Denmark and Southern Scandinavia.

In conjunction with the minister's statement to the parliament, the Danish Government published a national traffic plan called Trafik 2005. In the plan, the Government proposed that parallel to the feasibility studies of a possible Fehmarn Belt link, studies be initiated of alternative ways to improve the railway between Copenhagen and Rødby.<sup>16</sup> The improvements would be aimed at increasing capacity and accommodating high-speed rail.

In addition, the Government proposed that decisions on investments in connecting railway infrastructure should be taken together with the decision about a possible fixed link across Fehmarn Belt. If a fixed link is built, a new double rail track Orehoved-Rødby should be built to accommodate increased demand. This investment would cost dkr 2.6 billion, according to the plan. Also, dkr 1.5 billion would have to be invested in a third rail track Roskilde-Ringsted if a new railway Copenhagen-Ringsted would not be established. A new railway Copenhagen-Ringsted would cost an estimated dkr 6.3 billion and would solve capacity problems Copenhagen-Høje Taastrup. According to the plan these problems are expected to get worse after the opening of the fixed link across Great Belt.<sup>17</sup>

#### 2.5 White Paper from the Commission of the European Communities, December 1993

In December 1993, the Commission of the European Communities published the white paper Growth, Competitiveness, Employment.<sup>18</sup> The establishment of trans-European

networks is central to the white paper's recommendations on how to fight unemployment in the European economies and secure international competitiveness. The Commission showed that direct investment in transport infrastructure to be mobilised by 1999 could amount to ECU 220 billion. The white paper contains an indicative list of 26 major projects representing an overall investment of the order of ECU 82 billion. The Fehmarn Belt crossing is project number six on this list with an indicative total cost of ECU 4.5 billion for a tunnel/bridge with related construction works. On the basis of the indicative list, the Commission has initiated discussions with the authorities concerned and with what the Commission calls the relevant economic circles.

On the basis of the white paper, the European Council authorised further work on planning and implementation of trans-European networks to be carried out by a so-called Group of Personal Representatives of the Heads of State and Government chaired by the then Danish Vice-President for the Commission, Mr. Henning Christophersen.<sup>19</sup> The group, also known as the Christophersen-Group, was to present an interim report to the European Council at the Corfu-meeting in June 1994 and a final report at the Essen-meeting in December 1994. The overall objective for the work of the group was defined as the "speedy completion of the TENs [Trans-European Networks] with a view to the efficient operation of the single market; to reinforcing the Union's competitiveness, regional planning and the links with neighbouring countries; and to contributing to faster and safer means of communication for the citizen."<sup>20</sup> (See also Section 2.7).

## 2.6 Nordic Conference of Ministers of Transport, May 1994

In the resolution from the Second Nordic Conference of Ministers of Transport, May 1994, the ministers of transport of Denmark, Finland, Germany, Norway and Sweden and the ministers and senators of transport of the North German States of Schleswig-Holstein, Lower Saxony and Mecklenburg-Western Pomerania, and of the Hanseatic cities of Hamburg and Bremen stated that they consider the Fehmarn Belt transport corridor as an important regional element in the trans-European networks.<sup>21</sup>

The ministers underlined the necessity to include into the economic assessment of a fixed link across Fehmarn Belt the benefits which could be generated by improved fast ferry boats. It is unclear from the resolution whether improved fast ferry boats are to be considered an alternative that could substitute a fixed link in the assessments or whether it will be seen as an alternative that will co-exist and compete with such a link, or both.

The resolution specifies that the feasibility study for Fehmarn Belt will cover (i) traffic-related; (ii) ecological; (iii) technical; and (iv) social aspects of the project.

The ministers also underlined the importance of trans-European networks and emphasised the important position that the Nordic region holds within these networks, in particular as regards the North-South transport axis between Scandinavia and the European Continent as well as within the East-West transport axis in the Baltic Sea.

Finally, the ministers underlined that a political decision regarding Fehmarn Belt is "closely connected with efforts towards a strengthening of rail transport in the region".<sup>22</sup>

## 2.7 European Council at Corfu and Essen, June and December 1994

At the meeting of the European Council at Corfu, June 1994, an interim report on trans-European networks was presented to the European Council by the chairman of the so-called Christophersen-Group.<sup>23</sup> The interim report identifies 34 projects classified into three groups according to when the projects can be expected to start. The first group consists of projects for which work is already underway or could begin before the end of 1996. The second group consists of projects that could be made mature for start in 1997. The third group comprises projects which appear likely to take more time before work can begin or which require further study.

A fixed link between Denmark and Germany across Fehmarn Belt is one of 13 projects in the third group; a fixed link across Øresund is one of 11 projects in the first group; finally, high-speed rail in Denmark, with new and upgraded tracks South-West of Copenhagen (Copenhagen-

Ringsted) and in Eastern Jutland, is one of ten projects in group two.[24](#)

The Christophersen-Group recommended that the European Council acknowledge the priority status of the 34 projects identified by the group; that the European Council recommends to the Member States that they facilitate the implementation of these projects; and that the group would be allowed to complete its work according to a mandate suggested by the group, including finishing the assessment of the 34 projects and their priority status.[25](#)

On the basis of the interim report, the European Council decided to agree on a "first priority list" of 11 major transport projects identical to the first group on the Christophersen-Group's list of 34 projects. The Council emphasised the importance of rapid implementation of these projects and confirmed that measures would be taken to secure that priority projects would not run into financial obstacles which would jeopardise their implementation.[26](#) The Council also approved the mandate of the Christophersen-Group to complete its work with a final report to be presented to the Council in Essen in December 1994.

At the Essen meeting of the European Council in December 1994, the Council reconfirmed its support to implementation of the 11 priority projects identified at the Corfu meeting and three new projects were added to the priority list.[27](#) The Fehmarn Belt project remained on the list of projects that require further study.[28](#) In a technical paper from the EU Commission, the cost of a combined rail and road link across Fehmarn Belt was estimated at ECU 4.5 billion.[29](#)

At Essen, the European Council also decided that work on trans-European networks would continue and noted with satisfaction that a special account had been established with the European Investment Bank for the financing of such networks.

## 2.8 The German Political Situation with Respect to the Fehmarn Belt Project

In Germany, no decision has been taken regarding a fixed link across Fehmarn Belt.[30](#) The link is not listed in the Federal Transport Investment Plan of 1992. As North-South traffic in Germany, including transit, is not changing as dramatically as East-West traffic, a Fehmarn Belt fixed link is not considered an undertaking of highest priority.

The position of the Federal Ministry of Transport is neutral: If the project appraisal comes out with a positive result and the fixed link can be financed by private capital then chances are that the link will be built. There is no preference for a particular technical solution. The Ministry is open to discuss tunnel and bridge projects or the improvement of sea borne connections, depending on the economic and environmental viability documented in the project appraisal.

Note has been taken of the EU Commission's categorisation of the Fehmarn Belt link among the trans-European networks railway links. In Germany, this designation is viewed as inappropriate as there has not been any decision taken in favour of a railway link. However, in general it is regarded as helpful that the Fehmarn Belt link is one of the EU trans-European network projects as this improves the likelihood of financial support from the EU. A financial contribution from the German Federal Ministry of Transport to a possible Fehmarn Belt link is not viewed as likely.

The political situation in Schleswig-Holstein is similar. The arguments of protagonists for the project concentrate on its expected contribution to regional development and to European-wide interrelationships. But there are also critical views from the aspect of the protection of the environment.

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#### 3. Existing Traffic Across Fehmarn Belt and the Baltic Sea

This Chapter presents a description of existing traffic across Fehmarn Belt and the Baltic Sea.<sup>1</sup> The purpose is to establish an overview of the most important volumes and types of traffic that constitute or form part of the potential market for a possible fixed link across Fehmarn Belt or for continued ferry operations. Traffic across Fehmarn Belt will be compared with traffic across Øresund and Great Belt. Developments in traffic since 1980 will be described, and market changes after German unification will be assessed. Finally, issues of reliability of traffic data will be addressed.

The description of traffic is not meant to be exhaustive. A more complete description and analysis of traffic lies outside the scope of this report and would entail a more extensive collection of data and more work to establish the reliability of such data.

The traffic data used in this chapter are from the Danish Central Statistical Office, the Danish State Railways, the Danish Road Directorate, the Swedish National Road Administration, Great Belt, Ltd., Cruise (Car) Ferry Info and a number of other sources. In a more complete description of traffic across Fehmarn Belt and the Baltic Sea, data from these sources could not stand alone. In particular, existing data on goods traffic by truck are incomplete as are data on origins, destinations and purposes of trips made across Fehmarn Belt and the Baltic Sea. Such data would have to be collected for a more complete study.

##### 3.1 Traffic Across Fehmarn Belt 1993

Existing traffic between Denmark and Germany across Fehmarn Belt is carried by four ferry lines: Rødby-Puttgarden, Gedser-Warnemünde, Gedser-Travemünde and Gedser-Rostock. All four lines carry cars, trucks and buses. In addition the first two carry rail passengers and goods wagons. (See Figure 3.1).

The average number of road vehicles (passenger cars, trucks and buses) crossing Fehmarn Belt per day in 1993 was 4,100. Of these 80 percent were passenger cars and 20 percent trucks and buses. In comparison, the average number of road vehicles crossing Øresund 1993 was 5,450 vehicles per day and crossing Great Belt 7,570 vehicles per day. Thus, average daily traffic across Fehmarn Belt was 75 percent of that crossing Øresund and 54 percent of that crossing Great Belt in 1993. (See Table 3.1).

Goods traffic across Fehmarn Belt was 6.9 million ton per year in 1993. Rail carried 53 percent and trucks 47 percent of the tonnage. In comparison goods traffic across Øresund 1993 was 6.6 million ton per year,

**Table 3.1:** Traffic across Fehmarn Belt, Øresund and Great Belt 1993.

	Road Vehicle Traffic Average Daily Traffic				Goods Traffic Mill. Ton per Year			Passenger Trips Mill. Trips per Year			
	Passenger Cars	Trucks	Buses	Total	Rail	Truck	Total	Rail	Bus <sup>12</sup>	Walk-on-off + Vehicle Passengers <sup>13</sup>	Total <sup>14</sup>
Fehmarn Belt <sup>1</sup>	3296	667	139	4102	3.665 <sup>4</sup>	3.240 <sup>7</sup>	6.905	0.800 <sup>9</sup>	1.776	6.804	9.380
Øresund <sup>2</sup>	4524	735	193	5452	3.440 <sup>5</sup>	3.143	6.583	0.423 <sup>10</sup>	2.466	13.44	16.365
Great Belt <sup>3</sup>	6594	927	54	7575	2.453 <sup>6</sup>	- <sup>8</sup>	-	2.958 <sup>11</sup>	0.686	6.719	10.363

1 The routes across Fehmarn Belt are Rødby-Puttgarden, Gedser-Warnemünde, Gedser-Rostock and Gedser-Travemünde.

2 The routes across Øresund are Copenhagen-Malmö, Copenhagen-Helsingborg, Tuborghavn-Landskrona, Dragør-Lindhamn, Helsingør-Helsingborg.

3 The routes across Great Belt are Korsør-Nyborg (DSB), Korsør-Nyborg (Vognmandsruten), Halskov-Knudshoved.

4 Only the Rødby-Puttgarden and Gedser-Warnemünde routes carry trains. Figures from the Danish Central Statistical Office.

5 Only the Copenhagen-Helsingborg route carries trains. Figures from the Danish Central Statistical Office.

6 Only the Korsør-Nyborg route carry trains. Figures from the Danish Central Statistical Office.

7 Goods traffic on trucks is estimated for the routes Rødby-Puttgarden and Gedser-Warnemünde while calculated from the routes Gedser-Travemünde and Gedser-Rostock.

8 Not reported in 1992 nor in 1993.

9 Only the Rødby-Puttgarden and Gedser-Warnemünde routes carry trains. Figures from DSB.

10 Only the Helsingør-Helsingborg route carry trains. Figures from DSB.

11 Only the Korsør-Nyborg route carries trains. Figures from DSB.

12 Calculated on the assumption that each bus carries 35 passengers.

13 Calculated as the total minus rail and bus passenger trips.

14 Figures from the Danish Central Statistical Office.

Sources:

Danish Central Statistical Office, Samfærdsel & Turisme, 1994:9 (Copenhagen: Danish Central Statistical Office, 1994).

DSB, Letters of June 13 1994 and June 24 1994 (Copenhagen: Shipping Department, 1994).

with 52 percent on rail and 48 percent on trucks. It should be noted that figures for goods traffic on trucks across Fehmarn Belt have been estimated for Tables 3.1 to 3.3. The problem is that no figures for tonnage on trucks exist for the ferry routes Rødby-Puttgarden and Gedser-Warnemünde. Therefore, for each year 1980-93 the average tonnage per truck has been assumed to be the same on Rødby-Puttgarden as on Gedser-Travemünde, where the average tonnage is known. Gedser-Warnemünde is not included since no meaningful comparison can be made to other ferry routes. Gedser-Warnemünde carried 3-10 percent of all trucks on Fehmarn Belt 1980-93.

The total number of passenger trips across Fehmarn Belt was 9.38 million per year in 1993. Of these 27 percent were passenger trips by rail and bus; the rest was trips by walk-on-walk-off passengers and passengers in road vehicles. In comparison 16.37 million passenger trips were made across Øresund of which 18 percent were by rail and bus; on Great Belt the equivalent numbers were 10.36 million and 35 percent. The number of passenger trips across Fehmarn Belt is 57 percent of the number across Øresund and 91 percent of the number of passenger trips across Great Belt. Fehmarn Belt and Øresund both have substantially more bus than rail passengers whereas the opposite holds true for Great Belt. It should be noted that the number of bus passengers is not an observed number; it is calculated following a practice adopted by Great Belt, Ltd. assuming that a bus on average carries 35 passengers.

**Table 3.2:** Traffic across Fehmarn Belt 1980-93.

	Road Vehicle Traffic <sup>1</sup>				Goods Traffic <sup>1</sup>			Passenger Trips <sup>1</sup>			
	Average Daily Traffic				Mill. Ton per Year			Mill. Trips per Year			
	Cars	Trucks	Buses	Total	Rail <sup>2</sup>	Truck <sup>3</sup>	Total	Rail <sup>2,4</sup>	Bus <sup>5</sup>	Walk-on-off + vehicle passengers <sup>6</sup>	Total <sup>7</sup>
1980	2096	534	68	2698	2.155	2.972 <sup>8</sup>	5.127	1.057	0.869	3.961	5.887
1981	2259	552	72	2883	1.950	2.393 <sup>8</sup>	4.343	1.187	0.920	4.255	6.362
1982	2460	599	83	3142	2.177	3.560 <sup>8</sup>	5.737	1.140	1.060	4.614	6.814
1983	2442	473	91	3006	2.215	2.346 <sup>8</sup>	4.561	1.037	1.163	4.968	7.168
1984	2591	494	96	3181	2.225	3.096 <sup>8</sup>	5.321	1.042	1.226	5.298	7.566
1985	2783	541	100	3424	2.494	3.151 <sup>8</sup>	5.645	1.148	1.278	5.733	8.159
1986	2972	588	102	3662	2.493	2.743 <sup>8</sup>	5.236	1.154	1.303	5.845	8.302
1987	3021	588	98	3707	2.636	2.774 <sup>8</sup>	5.410	1.133	1.252	5.872	8.257

1988	3301	635	106	4042	2.823	3.003 <sup>8</sup>	5.826	1.139	1.354	6.477	8.970
1989	3673	647	115	4435	3.134	3.078 <sup>8</sup>	6.212	1.214	1.469	6.701	9.384
1990	3747	624	124	4495	3.322	- <sup>9</sup>	3.322	1.250	1.584	6.733	9.567
1991	3874	644	138	4656	3.443	- <sup>9</sup>	3.443	1.175	1.763	7.026	9.964
1992	3709	663	153	4525	3.637	- <sup>9</sup>	3.637	1.039	1.955	7.278	10.272
1993	3296	667	139	4102	3.665	3.240	6.905	0.800	1.776	6.804	9.380
Average Annual Change (%)	3.7	2.2	5.9	3.4	4.3	3.1 <sup>10</sup>	3.3 <sup>10</sup>	-1.7	5.8	4.3	3.8

1 The routes across Fehmarn Belt are Rødby-Puttgarden, Gedser-Warnemünde, Gedser-Rostock and Gedser-Travemünde.

2 Only the routes Rødby-Puttgarden and Gedser-Warnemünde carry trains.

3 Figures for goods on trucks are only available from the route Gedser-Travemünde from 1980-89. In 1990 no figures at all for goods on trucks are reported and from 1991 to 1993 figures are reported only from the new route Gedser-Rostock, which explains the greater part of the decrease. In 1993 figures for goods on trucks are reported from the routes Gedser-Rostock and Gedser-Travemünde.

4 1980-1989 the source is Great Belt, Ltd., letter of May 2 1990. 1990-1993 the source is DSB, letter of June 13 1994.

5 Calculated on the assumption that each bus carries 35 passengers.

6 Calculated as the total minus rail and bus passenger trips.

7 Figures from the Danish Central Statistical Office.

8 The route Gedser-Warnemünde is not included. No basis for estimation exists.

9 Incomplete figures for goods on trucks, especially from 1990-92. Estimates are made only for the routes Gedser-Warnemünde and Gedser-Rostock. Gedser-Travemünde was closed down from January 1991 to February 1993.

10 Average annual change from 1980-89.

Sources:

Great Belt, Ltd., letter of May 2 1990.

Danish Central Statistical Office, Danmarks Skibe og skibsfart, 1983 and 1987 (Copenhagen: 1984 and 1988).

Danish Central Statistical Office, Samfærdsel & Turisme, 1990:7, 1991:9, 1992:15, 1993:9, 1994:9, (Copenhagen: 1990-94).

DSB, Letter of June 13 1994 (Copenhagen: Shipping Department).

Development of traffic across Fehmarn Belt 1980-93 is shown in Table 3.2. The average annual increase in traffic during this period was 3.4 percent for road vehicle traffic and 3.3 percent for goods traffic 1980-89. Figures for goods on trucks cannot be provided for 1990-92. The average annual increase in total passenger transport was 3.8 percent for the period

1980-93. For rail passenger trips, the average annual change has been a decrease of 1.7 percent.

**Table 3.3:** Index for traffic across Fehmarn Belt and for traffic in Denmark, Germany and Sweden 1980-93. Index 1980=100.

	Road Vehicle Traffic				Goods Traffic			
	Fehmarn <sup>1</sup>	Denmark <sup>2</sup>	Germany <sup>3</sup>	Sweden <sup>4</sup>	Fehmarn <sup>5</sup>	Denmark <sup>8</sup>	Germany <sup>10</sup>	Sweden <sup>11</sup>
1980	100	100	100	100	100	100	100	100
1981	107	97	95	99	85	91	98	98
1982	116	98	99	99	112	90	95	99
1983	111	102	102	102	89	95	97	99
1984	118	107	106	106	104	99	102	108
1985	127	112	105	107	110	106	107	99
1986	136	119	113	112	102	112	108	107
1987	137	125	120	116	106	111	110	106
1988	150	132	127	120	114	114	115	112
1989	164	135	130	125	121	116	121	112
1990	167	138	135	122	116	119	126	124
1991	173	142	136	124	116	116	137	112
1992	168	145	138	125	116	120	136	112
1993	152	147	143	122	135	119	125	121
Average Annual Change (%)	3.4	3.0	2.8	1.6	3.3 <sup>7</sup>	1.6	1.8	1.3

1 Index of carried vehicles. Calculated from the Danish Central Statistical Office, *Danmarks skibe og skibsfart 1980-1987* and *Samferdsel & Turisme 1988-1993*.

2 Vejdirektoratet Sektorplanafdelingen, *Tal om Vejtrafik*, (Copenhagen 1994). Index calculated from road vehicle kilometers.

3 Figures from Bundesminister für Verkehr, *Verkehr in Zahlen 1994*. Index calculated from road vehicle kilometers in former West Germany. For former East Germany comparable figures exist only from 1991.

4 Swedish Road and Transport Research Institute, Letter of November 8 1994. Estimation of road vehicle kilometers made by Hans Thulin.

5 Index of rail goods. Figures for goods on trucks are incomplete, see Table 2.2 note 3. Calculated from Danmarks Statistik, *Danmarks skibe og skibsfart 1980-1987* and *Samferdsel & Turisme 1988-1993*.

6 The decrease is due to no reported figures from 1990 for goods traffic on trucks on all routes and from 1991 to 1993 no reported figures for goods traffic on trucks on the routes Rødby-Puttgarden and Gedser-Warnemünde.

7 Average annual change 1980-89.

8 Vejdirektoratet, *Tal om Vejtrafik*. Index calculated from ton-kilometers on rail and on trucks over 2 ton.

9 No figures for 1993 reported for goods on rail.

10 Figures from Bundesminister für Verkehr, *Verkehr in Zahlen 1994*. Index calculated from Billion ton-kilometers carried on rail and trucks for long distance haulage in former West Germany. For former East Germany comparable figures have only been produced since 1991.

11 Statistiska Centralbyrån, *Statistiska meddelanden*, T 30 SM 9403, Table 5. Index calculated on the basis of ton-kilometers.

12 No figure reported.

13 No meaningful calculation can be made.

Table 3.3 shows that for Denmark the average annual increase in total road vehicle traffic 1980-93 was 3.0 percent; for goods traffic the average annual increase was 1.6 percent. For former West Germany the equivalent numbers were 2.8 percent for road vehicle traffic and 1.8 percent for goods traffic. For Sweden the estimated average annual increase in road vehicle traffic was 1.6 percent; for goods traffic no calculation can be made. From Table 3.3 it is seen that from 1980 to 1991 road vehicle traffic across Fehmarn Belt increased more than road vehicle traffic in the two nations on either side of the belt and more than in Sweden. After 1991 this situation was reversed for Denmark and Germany with national road vehicle traffic increasing while traffic across Fehmarn Belt was decreasing.

As a comment on Table 3.3, it should be noted that international goods transports via ferries on the Baltic Sea has a composition different from that of national goods transports. The latter is dominated by many heavy shipments with inexpensive materials, for instance gravel, sand, stone, grains, fertilisers and oil products. International goods transports on ferries, on the other hand, are dominated by shipments of higher value-added export goods, for instance processed food and industrial products.

### 3.3 Traffic Between Scandinavia and Continental Europe

Table 3.4 shows road vehicle traffic on the most important ferry routes 1993 between Scandinavia and the Continent. In addition, road vehicle traffic across the Danish-German land border is included in Table 3.4 because a competitive situation will exist for a possible Fehmarn Belt link in relation to a small part of this traffic, for instance that part of road vehicle traffic between Sweden-Norway and continental Europe that currently travels via Jutland but in the future may choose the route Øresund-Fehmarn Belt if fixed links are established across these waters. Road vehicle traffic across Great Belt and air traffic between Scandinavian and North German airports are also included in Table 3.4 to complete the picture.

**Table 3.4:** Road vehicle traffic between Scandinavia and Continental Europe. Average number of road vehicles per day 1993. Air traffic between Scandinavian and Northern German airports; average number of passenger trips per day in 1980 and 1992.

Ferry Route <sup>1</sup>	Cars Average Daily Traffic	Trucks Average Daily Traffic	Buses Average Daily Traffic	Total Average Daily Traffic
Great Belt <sup>6</sup>	6594	927	54	7575 <sup>2</sup>
Bagenkop-Kiel <sup>6</sup>	245	3	4	252
Danish-German land border <sup>8</sup>	31260	3219	575	35054
Fåborg-Gelting <sup>6</sup>	245	2	8	255
Gedser-Rostock <sup>6</sup>	361	61	21	443
Gedser-Travemünde <sup>6</sup>	7	40	1	48 <sup>3</sup>
Gedser-Warnemünde <sup>6</sup>	285	42	15	342
Halskov-Kiel <sup>6</sup>	10	0	0	10 <sup>4</sup>
Rødby-Puttgarden <sup>6</sup>	2644	524	102	3270
Copenhagen-Oslo <sup>6</sup>	87	39	3	129
Frederikshavn-Larvik <sup>6</sup>	329	97	22	448

Table 3.4 continued next page

Continued from previous page

Ferry Route <sup>1</sup>	Cars Average Daily Traffic	Trucks Average Daily Traffic	Buses Average Daily Traffic	Total Average Daily Traffic
Frederikshavn-Moss <sup>6</sup>	118	44	3	165
Frederikshavn-Oslo <sup>6</sup>	130	35	5	170
Hanstholm-Bergen <sup>6</sup>	44	0	1	45
Hirtshals-Kristianssand <sup>6</sup>	452	75	16	543
Hirtshals-Oslo <sup>6</sup>	60	35	3	98
Copenhagen-Swinoujscie <sup>6</sup>	21	19	1	41
Dragør-Lindhamn <sup>6</sup>	683	113	63	859

Frederikshavn-Gothenburg <sup>6</sup>	1176	298	25	1499
Grenå-Halmstad <sup>6</sup>	183	50	4	237
Grenå-Varberg <sup>6</sup>	213	50	5	268
Helsingør-Helsingborg <sup>6</sup>	3542	546	127	4215
Tuborg Havn-Landskrona <sup>6</sup>	299	76	4	379
Oslo-Kiel <sup>7</sup>	168	105	6	279
Gothenburg-Kiel <sup>7</sup>	238	79	21	338
Gothenburg-Travemünde <sup>7</sup>	-	163	-	163 <sup>5</sup>
Malmö-Lübeck <sup>7</sup>	102	1	4	107
Malmö-Travemünde <sup>7</sup>	12	298	0	310
Trelleborg-Rostock <sup>7</sup>	165	93	3	261
Trelleborg-Sassnitz <sup>7</sup>	355	53	9	417
Trelleborg-Travemünde <sup>7</sup>	293	347	7	647
Ystad-Swinoujscie <sup>7</sup>	216	143	5	364
Airtraffic between Scandinavian and Northern German Airports 1980 and 1992 <sup>9</sup>	Average Daily Passenger Trips		Average Daily Passenger Trips	
	1980		1992	
From Northern Germany to Scandinavia <sup>10</sup>	383		698	
From Scandinavia to Northern Germany <sup>10</sup>	11		820	

1 All existing routes between Scandinavia and the Continent, across Great Belt and across the Danish-German land border; exclusive ferry routes from/to Bornholm and the ferry route Havneby-List.

2 Includes three ferry routes, two between Korsør-Nyborg and one between Halskov-Knudshoved.

3 Re-opened in February 1993.

4 Re-opened June 1993.

5 Only figures for vans and trucks are reported.

6 Figures from the Danish Central Statistical Office.

7 Figures from Cruise Ferry Info.

8 Figures from the Danish Road Directorate.

9 The airports are Helsinki, Stockholm, Malmö, Göteborg, Oslo, Bergen, Copenhagen, Rønne, Berlin, Bremen, Hamburg and Hannover.

10 Figures from Statistical Bureau in Germany.

11 No figures available.

Sources:

Danish Central Statistical Office, *Samfærdsel & Turisme*, 1994:4 (Copenhagen: 1994).

Marine Trading AB, *Cruise Ferry Info*, No. 3 (Halmstad: Marine Trading, 1994).

Danish Road Directorate, Letter of October 26 1994 (Copenhagen: 1994).

Statistical Bureau in Germany, *Special Series on Air Traffic*, (Germany: Statistical Bureau, 1993).

**Table 3.5:** Estimated vehicle goods traffic in 1000 ton on ferries between Scandinavia and Continent of Europe 1988 and 1993.

Ferry route	Vehicle Goods Traffic 1988	Vehicle Goods Traffic 1993
Helsinki-Gdansk	74	60
Finland-Travemünde/Lübeck	480	No Information
Ystad-Swinoujscie	465	699
Trelleborg-Sassnitz	617	297
Trelleborg-Rostock	-	523
Trelleborg-Travemünde	1870	2050
Malmö-Travemünde	1716	1765
Göteborg-Travemünde/Kiel	1184	1432
Oslo-Kiel	321	620
Copenhagen-Swinoujscie	55	196
Gedser-Warnemünde/Gedser-Rostock	157	575
Rødby-Puttgarden incl. Gedser-Travemünde	2431	2928

Source:

Hoff & Overgaard, estimation made by Morten Steen Petersen.

Figure 3.1 gives a geographical presentation of traffic on the most important ferry routes shown in Table 3.4. Within the limits of this review, it has not been possible to obtain figures for total goods traffic on all ferry routes between Scandinavia and continental Europe. However, figures have been estimated for the most important routes. These are shown for 1988 and 1993 in Table 3.5.

Total goods traffic increased by 25 percent from 1988 to 1993. The Fehmarn Belt share of goods traffic on these routes increased from 29 percent in 1988 to 31 percent in 1993.

As a comment on Table 3.4 and Figure 3.1 it should be noted that a large proportion of the trips across the Danish-German land border are very short trips.

Figure 3.1: Road vehicle traffic between Scandinavia and Continental Europe. Average number of road vehicles (passenger cars, trucks, buses) per day 1993. For actual figures see Table 3.4.

### 3.4 Fehmarn Belt Market Share

Road vehicle traffic 1980-93 between Denmark and Germany as well as between Sweden and Germany are shown in Table 3.6 together with road vehicle traffic across Fehmarn Belt.

On the basis of Table 3.6, the Fehmarn Belt market share has been calculated in relation to total road vehicle traffic across the Baltic Sea and in relation to total road vehicle traffic between Denmark-Sweden and Germany. The results are shown in Table 3.7.

The Fehmarn Belt share of total road vehicle traffic across the Baltic Sea has been falling throughout the period 1983-93, with an average annual decrease of 0.9 percent during 1983-89 and an accelerated average annual decrease of 1.9 percent during 1989-93.

Measured in relation to total road vehicle traffic between Denmark-Sweden and Germany (including the Danish-German land border), the Fehmarn share fell by an annual average of 1.9 percent 1983-89, and increased by an annual average of 3.2 percent 1989-93. However, the latter increase in the Fehmarn share of total road vehicle traffic between Denmark-Sweden and Germany 1989-93 is explained not by increased traffic across Fehmarn Belt but by a marked drop in road vehicle traffic across the Danish-German land border during this period.

With the data available for this review, it has not been possible to estimate the Fehmarn Belt market share for goods traffic.

**Table 3.6:** Road vehicle traffic from/to Denmark and Sweden to/from Germany 1980-93; road vehicle traffic across Fehmarn Belt 1980-93.

	Road Vehicle Traffic Average Daily Traffic			
	Denmark-Germany <sup>1</sup>	Denmark-Germany excl. Land border <sup>2</sup>	Sweden-Germany <sup>3</sup>	Fehmarn <sup>4</sup>
1980	31022	2882	-	2698
1981	29005	3095	-	2883
1982	28723	3383	-	3142
1983	29458	3248	1208	3006

1984		31422	3452	1336	3181
1985		35007	3687	1377	3424
1986		40881	3971	1573	3662
1987		43965	4025	1787	3707
1988		45115	4455	1905	4042
1989		49354	4954	1900	4435
1990		44909	5009	2158	4495
1991		43249	5149	2230	4656
1992		42236	5036	2274	4525
1993		39623	4568	2250	4102
Average Annual Change (%)	80-89	5.5	6.3	8.0 <sup>5</sup>	5.8
	89-93	-5.3	-1.9	4.5	-1.8

1 Rødby-Puttgarden, Gedser-Travemünde, Gedser-Warnemünde, Gedser-Rostock, Bagenkop-Kiel, Fåborg-Gelting, Halskov-Kiel and the land border between Denmark and Germany. Figures from the Danish Central Statistical Office, Automobile Importers' Society and the Danish Road Directorate.

2 Rødby-Puttgarden, Gedser-Travemünde, Gedser-Warnemünde, Gedser-Rostock, Bagenkop-Kiel, Fåborg-Gelting, Halskov-Kiel. Figures from the Danish Central Statistical Office.

3 Gothenburg-Kiel, Gothenburg-Travemünde, Trelleborg-Travemünde, Trelleborg-Rostock, Malmö-Travemünde, Malmö-Lübeck, Trelleborg-Sassnitz. Figures from Cruise Ferry Info. collected by Great Belt, Ltd.

4 Rødby-Puttgarden, Gedser-Warnemünde, Gedser-Rostock and Gedser-Travemünde. Figures from the Danish Central Statistical Office.

5 Calculated from 1983 to 1989.

#### Sources:

Great Belt, Ltd., Copenhagen. Collected data from Cruise-(Car)-Ferry Info. and data from Great Belt, Ltd.'s own database. Letters of April 12 1994, April 28 1994 and May 11 1994.

Automobile Importers' Society, *Vejtransporten i tal og tekst*, 1989 and 1993 (Copenhagen: Automobile Importers' Society, 1990 and 1994).

Danish Central Statistical Office, *Danmarks Skibe og skibsfart*, 1983 and 1987 (Copenhagen: 1984 and 1988).

Danish Central Statistical Office, *Samferdsel & Turisme*, 1990:7, 1991:9, 1992:15, 1993:9, 1994:9 (Copenhagen: 1990-94).

Marine Trading AB, *Cruise Ferry Info*. No. 3 (Halmstad: Marine Trading, 1994).

Danish Road Directorate, Letter of October 26 1994 (Copenhagen: Department of Traffic Statistics, 1994).

**Table 3.7:** Fehmarn Belt market share of total road vehicle traffic from/to Denmark and Sweden to/from Germany, Fehmarn Belt market share of total

road vehicle traffic across the Baltic Sea 1983-93.

		Road Vehicle Traffic				
		Average Daily Traffic				
		From/to Denmark and Sweden to/from Germany <sup>1</sup>	Total Traffic across the Baltic Sea <sup>2,3</sup>	Fehmarn <sup>4</sup>	Fehmarn Share of Traffic from/to Denmark and Sweden to/from Germany %	Fehmarn Share of Total Traffic across Baltic Sea %
1983		30666	4819	3006	9.8	62.4
1984		32757	5185	3181	9.7	61.4
1985		36384	5425	3424	9.4	63.1
1986		42454	5949	3662	8.6	61.6
1987		45752	6110	3707	8.1	60.7
1988		47020	6827	4042	8.6	59.2
1989		51254	7498	4435	8.7	59.2
1990		46967	7845	4495	9.6	57.3
1991		45479	8097	4656	10.2	57.5
1992		44510	7988	4525	10.2	56.7
1993		41873	7501	4102	9.8	54.7
Average	83-89 <sup>5</sup>	9.0	7.7	6.7	-1.9	-0.9
Annual Change (%)						
	89-93	-4.9	0.1	-1.8	3.2	-1.9

1 Rødby-Puttgarden, Gedser-Travemünde, Gedser-Warnemünde, Gedser-Rostock, Bagenkop-Kiel, Fåborg-Gelting, Halskov-Kiel and the land border between Denmark and Germany, Gothenburg-Kiel, Gothenburg-Travemünde, Trelleborg-Travemünde, Trelleborg-Rostock, Malmö-Travemünde, Malmö-Lübeck, Trelleborg-Sassnitz. Figures from Danish Central Statistical Office, Automobile Importers' Society, the Danish Road Directorate and from Cruise Ferry Info. collected by Great Belt, Ltd.

2 Rødby-Puttgarden, Gedser-Travemünde, Gedser-Warnemünde, Gedser-Rostock, Bagenkop-Kiel, Fåborg-Gelting, Halskov-Kiel, Copenhagen-Swinoujscie, Gothenburg-Kiel, Gothenburg-Travemünde, Trelleborg-Travemünde, Trelleborg-Rostock, Malmö-Travemünde, Malmö-Lübeck, Trelleborg-Sassnitz, Ystad-Swinoujscie and Oslo-Kiel. Figures from the Danish Central Statistical Office, Automobile Importers' Society, the Danish Road Directorate and from Cruise Ferry Info. collected by Great Belt, Ltd.

3 Only vans and trucks are reported from the route Gothenburg-Travemünde.

4 Rødby-Puttgarden, Gedser-Warnemünde, Gedser-Rostock and Gedser-Travemünde. Figures from the Danish Central Statistical Office.

5 No road vehicle traffic figures reported from/to Sweden from/to Germany 1980-82.

Sources:

Great Belt, Ltd., Copenhagen. Collected data from Cruise-(Car)-Ferry Info. and data from Great Belt, Ltd.'s own database. Letters of April 12 1994, April 28 1994 and May 11 1994.

Automobile Importers' Society, *Vejtransporten i tal og tekst* 1989 and 1993 (Copenhagen: Automobile Importers' Society, 1990 and 1994).

Danish Central Statistical Office, *Danmarks Skibe og skibsfart* 1983 and 1987 (Copenhagen: 1984 and 1988).

Danish Central Statistical Office, *Samferdsel & Turisme*, 1990:7, 1991:9, 1992:15, 1993:9, 1994:9 (Copenhagen: 1990-94).

Marine Trading AB, *Cruise Ferry Info*. No. 3 (Halmstad: Marine Trading, 1994).

In Table 3.8 road vehicle traffic from/to Denmark and Sweden to/from Western and Eastern Germany is shown. In addition, the Table shows the average annual change in road vehicle traffic for the period 1980/83-89 and 1989-93, i.e. the periods before and after the Wall came down in Germany. It should be noted that Table 3.8 says nothing about first origin or final destination of trips; e.g. a trip that lands in an Eastern German port may have its final destination in Western Germany, or vice versa.

Table 3.8 shows that until 1989 the average annual increase in road vehicle traffic was higher for traffic to and from Western Germany than for traffic to and from Eastern Germany. This picture was reversed from 1989 when traffic to Western Germany started to decrease while traffic to Eastern Germany started to increase. Thus, the fall of the Wall and related changes in Europe seem to have had a profound effect on traffic patterns on the Baltic Sea and Fehmarn Belt.

Despite the increase in traffic between Eastern German ports and Denmark-Sweden the magnitude of this traffic is still relatively small when compared to total traffic between Germany and Denmark-Sweden. Thus in 1993 road vehicle traffic between Eastern Germany and Denmark-Sweden was only 3.5 percent of total road vehicle traffic between all of Germany and Denmark-Sweden, up from 1 percent in 1983 when Eastern road vehicle traffic was at its lowest.

However, if road vehicle traffic across the Danish-German land-border is subtracted from total road vehicle traffic between Denmark-Sweden and Germany, the share of road vehicle traffic to Eastern Germany is 21 percent in 1993, up from 7 percent in 1983. Thus, in the maritime transport market on the Baltic Sea and Fehmarn Belt, the transport of road vehicles to and from Eastern Germany is a substantial and markedly growing market segment. In comparison, maritime transport of road vehicles to and from Western Germany is a market in decline in both absolute and relative terms during the period 1989-93.

**Table 3.8:** Traffic from/to Denmark and Sweden to/from Western Germany and Eastern Germany 1980/83-93.

		Average Daily Road Vehicle Traffic							
		From/to Denmark <sup>1</sup>		From/to Sweden <sup>4</sup>		From/to Denmark and Sweden <sup>1,4</sup>			
		From/to Western Germany <sup>2</sup>	From/to Eastern Germany <sup>3</sup>	From/to Western Germany <sup>5</sup>	From/to Eastern Germany <sup>6</sup>	From/to Western Germany <sup>2,5</sup>	From/to Eastern Germany <sup>3,6</sup>	From/to Germany Total	East-Traffic as Percentage of Total Traffic
1980		30923	99	-	-	-	-	-	-

1981	28901	104	-	-	-	-	-	-	
1982	28616	107	-	-	-	-	-	-	
1983	29365	93	996	212	30361	305	30666	1.0	
1984	31322	99	1107	229	32429	328	32757	1.0	
1985	34912	95	1142	235	36054	330	36384	0.9	
1986	40791	90	1325	248	42116	338	42454	0.8	
1987	43877	88	1497	290	45374	378	45752	0.8	
1988	45024	91	1579	326	46603	417	47020	0.9	
1989	49251	103	1582	318	50833	421	51254	0.8	
1990	44202	707	1551	507	45753	1214	46967	2.6	
1991	42582	667	1723	507	44305	1174	45479	2.6	
1992	41491	745	1616	658	43107	1403	44510	3.2	
1993	38838	785	1581	669	40419	1454	41873	3.5	
Average	80-89	5.5	0.7	8.2 <sup>7</sup>	7.2 <sup>7</sup>	9.1 <sup>7</sup>	5.6 <sup>7</sup>	9.0 <sup>7</sup>	-3.3 <sup>7</sup>
Annual Change(%)									
	89-93	-5.7	174.5	0.1	22.7	-5.5	77.1	-4.9	89.4

1 Rødby-Puttgarden, Gedser-Travemünde, Gedser-Warnemünde, Gedser-Rostock, Bagenkop-Kiel, Fåborg-Gelting and the land border between Denmark and Germany. Figures from the Danish Central Statistical Office, Automobile Importers' Society and The Danish Road Directorate.

2 Rødby-Puttgarden, Gedser-Travemünde, Bagenkop-Kiel, Fåborg-Gelting and the land border between Denmark and Germany.

3 Gedser-Warnemünde, Gedser-Rostock.

4 Gothenburg-Kiel, Gothenburg-Travemünde, Trelleborg-Travemünde, Trelleborg-Rostock, Malmö-Travemünde, Malmö-Lübeck, Trelleborg-Sassnitz. Figures from the Danish Central Statistical Office.

5 Gothenburg-Kiel, Gothenburg-Travemünde, Trelleborg-Travemünde, Malmö-Travemünde, Malmö-Lübeck.

6 Trelleborg-Rostock, Trelleborg-Sassnitz.

7 Calculated from 1983 to 1989.

Sources:

Great Belt, Ltd., Copenhagen. Data from Cruise-(Car)-Ferry Info. and data from Great Belt, Ltd.'s own database. Letters of April 12 1994, April 28 1994 and May 11 1994.

Automobile Importers' Society, *Vejtransporten i tal og tekst* 1989 and 1993 (Copenhagen: Automobile Importers' Society, 1990 and 1994).

Danish Central Statistical Office, *Danmarks Skibe og skibsfart* 1983 and 1987 (Copenhagen: 1984 and 1988).

Danish Central Statistical Office, *Samferdsel & Turisme*, 1990:7, 1991:9, 1992:15, 1993:9, 1994:9 (Copenhagen: 1990-94).

Marine Trading AB, *Cruise Ferry Info*. No. 3 (Halmstad: Marine Trading, 1994).

Danish Road Directorate, Letter of October 26 1994 (Copenhagen: Department of Statistics, 1994).

### 3.5 Goods Traffic Between Scandinavia and the Continent

A study sponsored by the Swedish Communications Research Board and a number of companies and institutions found that in 1988/89, of a total of 13.6 million ton of goods traffic with origin/destination in Scandinavia and destination/origin in Germany, 33 percent was carried on rail and 67 percent on road.<sup>2</sup> (See Table 3.9). Of goods transport on rail, 74 percent was to and from Sweden, 18 percent to and from Denmark, and the remaining 8 percent to and from Norway and Finland. Of goods transport on road, 58 percent was to and from Denmark, 29 percent was to and from Sweden, and the remaining 14 percent to and from Norway and Finland.<sup>3</sup>

Goods transport on rail and road with origin/destination in Scandinavia and destination/origin in Western and Eastern Europe, not including Germany amounted to 21.7 million ton in 1988/89. Of these 44 percent was goods on rail and 56 percent was goods on road.<sup>4</sup> Of goods transport on rail, 64 percent was to and from Finland, more than nine-tenths of which was to and from Eastern Europe. Finland's goods transport on rail to and from Eastern Europe is the only example of transports between Scandinavia and Europe where the volumes to Eastern Europe are larger than volumes to Western Europe. 27 percent of goods transport on rail was to and from Sweden, the remaining 9 percent being to and from Denmark and Norway. For goods transport on road to and from Europe, excl. Germany, 42 percent was to and from Sweden, 36 percent was to and from Denmark, 13 percent was to and from Finland, and 9 percent was to and from Norway.

In the same study, it was found that in 1988 of a total of 13.6 million ton of road and rail goods traffic with origin/destination in Scandinavia and destination/origin in Germany, 93 percent had origin or destination in the Western part of Germany and 7 percent in the Eastern part of Germany. Of the goods traffic to and from Western Germany, 46 percent originated or had its destination in Denmark, 41 percent in Sweden, the remaining 12 percent in Finland and Norway. Of the goods traffic to and from Eastern Germany 67 percent originated or had its destination in Sweden, 28 percent in Denmark, and the remaining 5 percent in Norway and Finland.<sup>5</sup>

Finally, it was found that goods transports between Scandinavia and Germany in 1988 constituted 5 percent of all goods transports to and from Germany with an almost even split between road and rail.<sup>6</sup> Transit traffic through Germany between, on the one hand Scandinavia, and on the other France, Italy, Spain, Portugal, Greece, Switzerland and Austria, constituted 20 percent of all transit traffic in Germany in 1988.

A large proportion of the traffic between Scandinavia and the continent, including the traffic across Fehmarn Belt, passes through the Hamburg area. Capacity problems exist in this area for both road and rail traffic.<sup>7</sup>

**Table 3.9:** Goods traffic between continental Europe and Denmark, Sweden, Norway and Finland 1988/89 in 1000 ton.

			Rail		
To and from:	Denmark	Sweden	Norway	Finland	Total
Germany-West	725	2697	78	279	3779
Germany-East	83	565	12	0	659

Europe-West	609	2219	137	344	3309
Europe-East	55	407	61	5753	6277
Total	1473	5887	288	6376	14024
			Road		
To and from:	Denmark	Sweden	Norway	Finland	Total
Germany-West	5113	2522	645	564	8843
Germany-East	205	116	15	21	357
Europe-West	4132	4748	1025	793	10698
Europe-East	234	367	42	790	1433
Total	9683	7753	1727	2168	21332

Source:

Peter W. Cardebring, Lars Källström and Morten Steen Petersen, *Transport Routes Scandinavia-The Continent: Forecast and Corridor Evaluation*, KFB-rapport 1993:22 (Stockholm: Kommunikationsforskningsberedningen, 1993), p. 14.

One study of the Hamburg bottleneck concludes: "A coming fixed link across Fehmarn Belt in connection with the planned Øresund link will lead the main part of road goods traffic into the bottleneck [at Hamburg] with the consequences this imply".<sup>8</sup> According to Danish newspapers, Volvo is planning a direct freight-line by ship from the main factory in Gothenburg to Zeebrugge and Volvo's factories in Holland and Belgium because "the traffic jams in Northern Germany are a constant threat to delivery on time".<sup>9</sup>

### 3.6 Reliability of Traffic Data

It is the impression of the review panel that the reliability of data on traffic across Fehmarn Belt and the Baltic Sea varies considerably between types of traffic. In addition, reliability seems to vary with how data is compiled and who does the compilation.

At a minimum, three levels of compilation exist, the first being the actual and original registration of traffic done by ferry operators, the second the compilation of (some of) these data by the Danish Central Statistical Office and other official statistical agencies, and the third the compilation of data from the statistical agencies and, possibly, data directly from ferry operators done by users of traffic data. At each of the three levels reliability of data may be affected. Finally, reliability seems to vary over time, for instance with changes in the way data are collected and compiled.

For goods traffic, the reporting of tonnage has been erratic for some ferry operators, and the methods for registering tonnage have changed over time. Both of these factors seem to have influenced the reliability of data on goods traffic.

Problems of reliability of data on goods traffic are also documented in a comparative study of two sources of actual and forecast goods traffic between Sweden and the Continent.<sup>10</sup> According to a study by Great Belt, Ltd., the potential for transferring goods traffic from ferry routes to a fixed link across Fehmarn Belt is big whereas the potential for transferring passenger traffic is small.<sup>11</sup> If this is the case then it is all the more important that figures for observed goods traffic be reliable and valid.

For passenger traffic, the Danish Central Statistical Office records the total number of passengers on ferry routes. However, numbers for individual passenger groups like train passengers, bus passengers, car passengers and walk-on-walk-off passengers are not recorded with the Statistical Office. Thus, when bus passengers are listed in Table 3.1 this is not an observed number but a calculated number based on the assumption that a bus on a ferry on average carries 30-35 passengers, depending on the ferry route. This assumption is also used by Great Belt, Ltd. in its estimations of traffic across Danish belts. Great Belt, Ltd. further assumes that a passenger car on average carries around 2.25 passengers, again depending on the ferry route. Thus, based on data from the Danish Central Statistical Office on the total number of passengers on a ferry route, and from the Danish State Railways on the number of train passengers, and by calculating the numbers of bus and car passengers, Great Belt, Ltd. can determine the number of walk-on-walk-off passengers, and arrive at figures for all passenger groups. In the equivalent calculations in this report (Tables 3.1 and 3.2) walk-on-walk-off passengers and car passengers are calculated as one group in order to keep assumptions made at a minimum. It should be kept in mind, however, that of all the figures for passenger traffic mentioned only rail passengers and the total number of passengers are actually observed figures and that, accordingly, the reliability of the other figures are dependent on the assumptions that go into the computation of the numbers.

It should be stressed that the uncertainties in question at this stage are not simply the uncertainties related to forecasting but, instead, the uncertainties of figures for observed traffic. These uncertainties may in turn affect the results of forecasting. However, the estimations of uncertainties for observed traffic, and related sensitivity and risk analyses of forecasts, should be seen and treated as separate from estimations of uncertainties and sensitivity analyses related to forecasting proper. The key question is whether uncertainties regarding figures for observed traffic are of a magnitude that may make forecasts based on such figures unreliable. Today this question is unanswered. It will have to be answered to estimate the reliability of forecasts and feasibility studies for a possible Fehmarn Belt link, i.e. it will have to be answered to provide useful and reliable information for the decision makers and the general public.

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## Facts about Fehmarn Belt

### Results from a fact-finding study regarding a possible fixed link between Denmark and Germany across Fehmarn Belt

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#### 4. Earlier Studies of a Possible Fixed Link Across Fehmarn Belt

This Chapter gives a brief description of a number of earlier studies of proposed fixed links across Fehmarn Belt. The studies have typically been produced by parties with interests in building a fixed link across Fehmarn Belt, e.g. contractors, financial institutions, industry and the road lobby. Most of these studies are of a preliminary nature, generally containing only traffic forecasts and cost estimates. A majority also assesses the financial viability of the proposed fixed links. None include full-scale economic or financial evaluations. Finally, the studies have typically been conducted in ways that make comparison of results difficult. None of the studies are of sufficient scope and depth for a decision regarding a fixed link across Fehmarn Belt to be based on them.

The studies covered below do not include a study sponsored by the Danish and German ministries of transport 1992-93 as part of the official feasibility study procedure. This study was carried out in a joint venture by the consulting companies Cowiconsult and Lahmeyer International for the two ministries. It covered technical, environmental and cost aspects of a fixed link.<sup>1</sup> This study and the formal feasibility study procedure will be covered in a later report. In addition, the review panel has found references that indicate that a 1963 study by a group called Fehmarn-Lolland EV may exist.<sup>2</sup> However, it has not been possible for the review panel to locate this study and it is not included below.

All proposals for a fixed link between Denmark and Germany connect the two countries at the shortest distance across Fehmarn Belt, i.e. the 18.6 kilometres (app. eleven miles) between Rødbyhavn in Denmark and Puttgarden Ferry Harbour in Germany. On the Danish side, the Storstrøm County Regional Plan 1994-2005, ratified by the Storstrøm County Council on June 22 1994, states that "East of Rødbyhavn the municipal plan must secure possibilities for a possible future landing of a fixed link across the Baltic Sea."<sup>3</sup> The plan goes on to identify two alternative right-of-ways for the landing, both East of Rødbyhavn. These right-of-ways are reserved for a possible fixed link "until a final decision has been taken."<sup>4</sup>

##### 4.1 Christiani & Nielsen, Højgaard & Schultz, Kampmann, Kierulff & Saxild, 1936-37

As mentioned in the introduction, in 1936 and 1937 a group of contractors consisting of Christiani & Nielsen, Højgaard & Schultz, Ltd., Kampmann, Kierulff & Saxild, Ltd. submitted proposals to the Danish Government for developing Danish transport infrastructure with a system of motorways and bridges.<sup>5</sup> The proposals included bridges across Øresund and Great Belt.

A bridge across Fehmarn Belt - apparently for both rail and road - was also considered as part of the proposals.<sup>6</sup> The bridge was seen as technically feasible with costs estimated at dkr 400-500 million.<sup>7</sup> Denmark was expected to pay half of this sum. The cost was seen by the contractors as "very high" and the project was considered non-feasible in economic and financial terms.<sup>8</sup> Therefore, the proposal to build a bridge was dropped and replaced by a proposal to establish a ferry route between Rødby and the island of Fehmarn. This proposal was later implemented. The ferry proposal was considered "temporarily satisfactory", indicating that a fixed link might be reconsidered at a later date.<sup>9</sup>

##### 4.2 Danish State Railways, DSB, 1940

In 1940 the Danish State Railways, DSB, developed plans for a fixed link across Fehmarn Belt.<sup>10</sup> The following alternatives were considered: (i) a rail and road bridge; (ii) a road bridge; and (iii) a road bridge prepared for rail. The rail link across the Belt would be one-track and the road would have two lanes with shoulders; a bicycle-path in each direction was included in the plans.

The costs for the three proposals coast-to-coast were estimated at dkr 670, 470 and 630 million, respectively. At 1994 price-levels this would be equivalent to dkr 10.3, 7.2 and 9.9 billion.<sup>11</sup> Presumably, the DSB-plans were dropped on account of the war.

#### 4.3 European Roundtable of Industrialists, 1984

In December 1984 the European Roundtable of Industrialists published the report Missing Links with proposals on how to improve transport infrastructure in Europe.<sup>12</sup>

A bridge or tunnel across Fehmarn Belt was identified as central to the development of the so-called Scandinavian Link between Hamburg and Oslo. The link proposed for Fehmarn Belt would have two rail tracks and four road lanes. The rail tracks would be for high-speed or ordinary rail.<sup>13</sup>

The European Roundtable of Industrialists estimated the cost of their proposal at \$1.5 billion, including accumulated interest costs during construction.<sup>14</sup> The cost estimate was based on information about the construction costs for the Great Belt Bridge which was considered similar to a possible Fehmarn Belt bridge.

The annual operating costs were estimated at \$3.0-3.5 million a year, and the gross revenues at \$205 million, leaving an operating surplus at about \$202 million per year. Bridge tolls were assumed to be equivalent in real terms to current ferry charges. Using a project lifetime of 30 years and assuming traffic estimates as described in Table 4.1, a financial internal rate of return was calculated at 13.1 percent in real terms.<sup>15</sup>

**Table 4.1:** Traffic estimates year 2000 for Fehmarn Belt bridge with two-track railway and four-lane motorway proposed by European Roundtable of Industrialists in 1984.

	Rail freight	Road freight	Road vehicles	Passengers excl. drivers		
	(Mill. ton per year)	(Mill. ton per year)	(Average Daily Traffic)	(Mill. trips per year)		
				Rail	Bus	Car
Fehmarn Belt Bridge	7.6	5.3	6767	6.0	1.8	4.06

Source:

European Roundtable of Industrialists: Missing Links: Upgrading Europe's Transborder Ground Transport Infrastructure (Paris: Roundtable Secretariat Paris Office, December 1984), p. 26.

While the study stated that its findings were not sufficiently robust to form the basis of a firm recommendation, the figures were seen as an indication of the desirability of testing the financial viability of the project "as soon as possible".<sup>16</sup> Based on the figures presented, the proposed project would have a strong cash flow, even in the early years of operation. The project could therefore be financed largely with loan capital, as long as there was no need for major repayment during the first few years, according to the Roundtable.

#### 4.4 Hochtief & Philipp Holzmann and Deutsche Bank, 1988

In 1988, the German contractors Hochtief & Philipp Holzmann and the Deutsche Bank proposed a privately financed tunnel across Fehmarn Belt.<sup>17</sup> The tunnel would comprise a two-lane road tunnel and a single-track railway tunnel. The rail tunnel would be designed for high-speed rail at 250 kilometres per hour. The total length of the tunnel would be 23.6 kilometres.<sup>18</sup>

The estimated cost of the proposal was DM 3.0 billion, including interest during construction.<sup>19</sup> The construction period was estimated at 5.5 years. No internal rate of return was reported.



Fehmarn Belt Link	3.929	4.940	1.702	3.009	7.211	8.256	5.565	6.351
Øresund + Fehmarn Belt Link	4.308	5.396	1.702	3.009	7.806	9.133	8.214	13.374

Source:

Scandinavian Link, Appraisal of Fixed Link across Fehmarn Belt, prepared by Hoff & Overgaard A/S for Scandinavian Link (Copenhagen: Scandinavian Link, January 1990), table 5.1, p. 84, table 5.2, p. 85, table 5.3 and 5.4, p. 86.

The study concludes that the capacity of the Hochtief-Holzmann concept is relatively low, taking into consideration the expected traffic loads in 2020 and their future development. Particularly the road tunnel can be expected to become congested in the summer period. Capacity problems are also foreseen for rail on both sides of Fehmarn Belt where upgrading from one-track to two-track high-speed rail should be considered, according to the study.[26](#)

#### 4.6 Great Belt, Ltd., 1990

In 1990 Great Belt, Ltd. published a study of a fixed link across Fehmarn Belt.[27](#) The study considers the following four concepts for a fixed link:

1. *Immersed railway tunnel.* A double-track railway link in a coast-to-coast immersed tunnel. One tube for each rail track. Length 17.6 kilometres.[28](#)
2. *Bored railway tunnel.* A double-track railway link in coast-to-coast bored tunnel. One tube for each rail track. Length 19.2 kilometres.[29](#)
3. *Road bridge.* Four-lane motorway. Length 17.7 kilometres with three kilometre suspension bridge over the fairway. Alternatively, a multi-section suspension bridge with seven one-kilometre sections.[30](#)
4. *Combined rail and road bridge.* Two-story construction with motorway on top of railway. 2.7 kilometre suspension bridge over the fairway.[31](#)

Great Belt, Ltd. points out in the study that on the Danish side optimal use of a fixed link across Fehmarn Belt will require expansion from one to two tracks of the railway on Lolland, the Guldborgsund Bridge, Falster and on the Storstrøm Bridge to Vordingborg. It is also proposed that the two-lane motor traffic way from Saksøbing to Nørre Alslev be expanded to a four-lane motorway. On the German side, it is proposed that the railway will have to be expanded from one to two lanes on Fehmarn Island, across Fehmarn Sound and South to Lübeck. In addition, fourteen kilometres of motorway are proposed on Fehmarn Island as well as a fixed link across Fehmarn Sound and ten kilometres of motorway on the mainland.

The study is based on the following assumptions:[32](#)

- Simultaneous construction of links across Øresund and Fehmarn Belt;
- A seven year construction period with operations starting in year 2000;
- Operations and maintenance costs as for the Great Belt Link;
- Financing by loans with a five percent interest rate in real terms;
- Tolls equivalent to current ferry tariffs with deductions of rebates and vehicle operating costs;
- Fifty-fifty division of construction costs on rail and road.

The four proposals considered for technical feasibility by Great Belt, Ltd. were reduced to the following three for evaluating financial feasibility. All prices are 1988 level. Great Belt, Ltd. notes that costs have been estimated with "considerable uncertainty".<sup>33</sup> Traffic estimates for the three proposals are shown in Table 4.4.

1. *Combined rail and road bridge*. Double-track rail, four-lane motorway. Costs dkr 24.0 billion, i.e. nearly twice the original budget for the Great Belt Link (in the same prices). The financial internal rate of return was estimated at 9.75 percent for the road link and no rate of return was calculated for the rail link. Pay back period for the road link was estimated at 13 years;

2. *Shuttle train link in a tunnel*. Double-track rail. Costs for immersed tunnel dkr 17.3 billion, bored tunnel dkr 13.6 billion. Additional cost for shuttle link dkr 8.0 billion plus dkr 300 million annual operating costs. Internal rate of return was estimated at 6.25 percent. Pay back period was estimated at 24 years;

3. *Phased solution*. The Fehmarn rail link is established five years later, and the Fehmarn road link ten years later than the Øresund link. Internal rate of return for the Fehmarn Belt road link was estimated at 8.25 percent; payback period was estimated at 16 years.

In addition to these three proposals, the costs for a road bridge with a four-lane motorway were estimated at dkr 15.4 billion. No internal rate of return, etc. was calculated for this proposal.

**Table 4.4:** Great Belt, Ltd. traffic estimates for three proposals made in 1990.

	Cars (Average Daily Traffic)	Passengers (Mill. trips per year)		Goods (Mill. ton per year)	
		Rail	Bus	Rail	Truck
Combined Link 2000	8000	2.1	3.4	8.5	11.5
Shuttle Link 2000	6400	3.2	3.0	8.5	9.5
Phased Link 2010	8000	2.0	3.4	8.5	10.7

Source:

A/S Storebælt, Foreløbig teknisk-økonomisk vurdering af en fast forbindelse over Femern Bælt, (Copenhagen: Great Belt, Ltd., November 1990), pp. 44, 47 and 48.

The study observed that the financial situation of the Øresund road link would be "highly dependent" on whether a Fehmarn road link is established or not.<sup>34</sup> If no Fehmarn road link is established, the Øresund link would have a weaker financial performance. The internal rate of return for the Øresund road link drops from 9.25 to 7.0 percent and the pay back period increases from fourteen to twenty years if no Fehmarn road link is established. A Fehmarn rail link would only marginally influence the financial situation of an Øresund road link. A Fehmarn railway shuttle link would moderately strengthen the financial situation of an Øresund road link.

#### 4.7 Danish Road Association, 1991

In 1991 the Danish Road Association published a short study of three proposals for a fixed link across Fehmarn Belt based on the work of Great Belt, Ltd., Hochtief & Philipp Holzmann and Scandinavian Link described above.<sup>35</sup> The study includes revised traffic estimates, calculations of economic viability and an assessment of environmental effects.

The study by the Danish Road Association views the forecasts developed by Great Belt, Ltd. as optimistic and the forecasts from Hoff & Overgaard as pessimistic. On this basis, the study produces an average forecast based on the assumptions that (i) the Fehmarn Belt Link opens in year 2000 and (ii) a fixed link across Øresund opens before the Fehmarn Link.<sup>36</sup> The traffic estimates based on these assumptions are shown in Table 4.5.

The following was estimated for each of the three proposals:<sup>37</sup>

1. Road bridge with four-lane motorway. Total construction costs were estimated at dkr 11 billion (1990 prices). Pay-back period was estimated at 14 years;
2. Combined rail and road bridge with one-track railway and four-lane motorway. Total construction costs were estimated at dkr 16 billion

**Table 4.5:** Traffic estimates in the year 2000 for rail and road bridge proposed by the Danish Road Association in 1991.

	Passengers (Mill. trips per year)				Goods (Mill. ton per year)		
	Car	Bus	Rail	Total	Truck	Rail	Total
Fehmarn Belt Link	6.7	2.8	1.8	11.3	8.5	8.5	17.0

Source:

Dansk Vejforening, Femern Bælt forbindelsen, (Copenhagen: Dansk Vejforening, February 1991), p. 9.

(1990 prices).<sup>38</sup> The rate of return on the investment was estimated at 10-15 percent in real terms.<sup>39</sup> The pay-back period for the road part was estimated at 11 years;

3. *Bored double tunnel* with a two-lane road and single-track rail. Total construction costs were estimated at dkr 13 billion (1990 prices). A four-lane road would increase total construction costs to dkr 18 billion (1990 prices), according to the study.<sup>40</sup>

The study contains estimates of some of the environmental impacts of a fixed link across Fehmarn Belt. Energy consumption of road traffic on a fixed link is estimated at 33 percent lower than energy consumption assuming continued ferry operations. Emissions from road traffic with a fixed link is estimated at 21-65 percent lower than emissions with continued ferry operations, depending on type of emission.<sup>41</sup> Regarding environmental impacts, the Danish Road Association concludes: "Thus, the construction of a fixed link across Fehmarn Belt is entirely in the spirit of the Brundtland-report."<sup>42</sup>

#### 4.8 Fehmarn Belt Consortium, 1992

The Fehmarn Belt Consortium consists of the contractors Bilfinger & Berger, Ltd., Strabag Bau, Ltd., KKS Entreprise, Ltd., Campenon Bernard SGE and Bouygues, and of the financial institutions Dresdner Bank, BNP and Bikuben. In 1992, the consortium proposed a privately financed fixed link across Fehmarn Belt implemented according to the so-called BOT model (build, operate, transfer).<sup>43</sup> The consortium decided to consider only combined rail and road concepts, to consider only one-track rail, not to consider a bored tunnel and not to consider a railway shuttle link. The consortium proposed the following three concepts for study:<sup>44</sup>

1. *Bridge-island-immersed tunnel*. Four-lane motorway, one-track rail. Bridge-length app. seven kilometres, tunnel length app. ten kilometres, road length on island 1.2 kilometres;

**Table 4.6:** Traffic estimates for a rail and road link across Fehmarn Belt proposed by the Fehmarn Belt Consortium in 1992.

	Passengers in year 2010 (Mill. trips per year)					Goods in year 2000 (Mill. ton per year)		
	Rail	Bus	Car	Walk on-of	Total	Rail	Truck	Total
Fehmarn Belt Link	3.4	3.2	6.6	2.8	16.0	8.3	11.7	20.0

Source:

Femern Belt Consortium, *Forundersøgelse: Femern Bælt forbindelsen over Østersøen*, (Hvidovre: KKS Enterprise, 1992), p. 5.

2. *Bridge*. Four-lane motorway, one-track rail placed in the middle of the bridge. Bridge-length app. nineteen kilometres. Suspension bridge over fairway;

3. *Immersed tunnel*. Four-lane motorway, one-track rail. Length app. 18 kilometres. The concept has two sub-concepts, one with lengthwise ventilation of the tunnel, another with crosswise ventilation.

The Fehmarn Belt Consortium has not published any viability analyses of its proposals; only traffic forecasts have been presented (see Table 4.6).[45](#)

#### 4.9 Danish State Railways, DSB, 1992

The study estimates an internal rate of return for the proposal of 11.7 percent and a pay-back period of 13 years. The assumptions behind these calculations are an interest rate of 5 percent, an inflation rate of 4 The concept proposed in a study by the Danish State Railways is a railway shuttle link in a tunnel, bored or immersed, with two tracks and a service tunnel.[46](#)

A basic assumption of the proposal is that a railway tunnel for conventional rail transport is established and that costs for the shuttle link will solely be additional costs incurred by developing the conventional rail link into a shuttle link.[47](#) On the basis of this assumption, the study estimates total additional costs for a shuttle link in a bored tunnel at dkr 5 billion (1992-level, not including value added tax) with rolling stock accounting for 45 percent of total additional costs.[48](#) In accordance with the basic assumption, total additional costs do not include costs for construction of the tunnel system, only costs for the development and establishment of installations used by the shuttle trains and an enlargement of the tunnel diameter from 7.7 meter to 8.5 meter.[49](#) Operating costs are estimated at dkr 206 million per year (1992-level, including value added tax).[50](#)

percent, revenues from user tolls at 1991 ferry price levels, a flat fee for DSB of dkr 300 million per year for using the tunnel, an increase in operating costs of 0.25 percent a year, and, finally, a traffic growth of 4 percent per year until 2010, and 1 percent per year after this.[51](#)

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## Facts about Fehmarn Belt

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#### 5. Actors and their Objectives Regarding a

#### Possible Fixed Link Across Fehmarn Belt

##### 5.1 Introduction

This Chapter presents an overview of actors who have publicly stated their objectives and attitudes regarding a possible fixed link across Fehmarn Belt. The following points should be noted:

The main emphasis is on Danish actors and their objectives.

Only actors who have explicitly stated their objectives and/or attitudes regarding a possible fixed link across Fehmarn Belt are included.

Actors, objectives and attitudes have been identified mainly through document analysis. The documents used as sources are reports, memoranda, letters, brochures, newspapers and Gallop Polls. In a number of instances actors have been contacted directly in order to clarify and verify views.

Research and experience indicate that for major projects like a possible Fehmarn link, hidden or not-so-visible actors and unstated objectives and attitudes may play a significant role in influencing project decision making and outcome.<sup>1</sup> However, identifying such actors, objectives and attitudes lies outside the scope of the present report. Thus, to repeat, only actors who have stated their objectives on the record are included.

Objectives and attitudes have been recorded at particular points in time, as recently as possible for each actor. However, it should be kept in mind when reading the overview that viewpoints may change over time. In fact, a few actors appear to have recently changed their views of the Fehmarn project, or they may currently be changing them. Rødby Municipality, for instance, stated in 1990 that they were undecided regarding support for a fixed Fehmarn link.<sup>2</sup> However, in 1991 the Municipality officially expressed its support for a fixed link in a letter to the Danish Prime Minister.<sup>3</sup> Today, the Municipality is, once again, undecided about the Fehmarn project and misgivings about the project seem to be on the rise in the local community.<sup>4</sup>

Other actors in the local area appear to be going through similar changes. The objectives for these actors appear to be stable over time: local development and increased local employment. There is no consensus, however, regarding whether a fixed link will contribute to or detract from these objectives. In fact, a recent study of employment effects of a fixed link across Fehmarn Belt predicts significant job losses in the local area and seems to have contributed to eroding local support for a link.<sup>5</sup>

A number of actors who have played a part in the Øresund and Great Belt projects have not, at the time of writing this report, been publicly active regarding the Fehmarn project. This is the case for, for instance, the Danish Fishery Association, the Danish Ornithological Society/Birdlife Denmark, the Ecological Council, Greenpeace, the Danish Confederation of Trade Unions (LO), the Special Worker's Union in Denmark (SID), Scanlink No Thanks, and a number of government offices. These and other actors could become active in relation to the Fehmarn project at a later stage.

Given the above qualifiers, actors and their objectives and attitudes can be listed as shown below. The left column lists actors while the right column lists the corresponding main objectives and attitudes. Objectives and attitudes are presented as direct quotes from the actors in question, where possible.

## 5.2 Government

<p>Danish Government, 1991-94</p>	<p>"The Government of Denmark declares itself ready to work for the implementation of a fixed link across Fehmarn Belt on the condition that regard for environment and economy can be observed".<a href="#">6</a></p> <p>The objective is to "avoid that the European main traffic corridors would bypass Denmark".<a href="#">7</a></p> <p>"It is the position of the government that regard to development of rail transport [including high-speed rail] is the point of departure for a possible decision regarding construction of a fixed link across Fehmarn Belt".<a href="#">8</a></p>
<p>European Union, 1994</p>	<p>"[S]peedy completion of the Trans-European Networks with a view to the efficient operation of the single market; to reinforcing the Union's competitiveness, regional planning and the links with neighbouring countries; and to contributing to faster and safer means of communication for the citizen."<a href="#">9</a></p> <p>A fixed Fehmarn link is on a list of European projects currently given priority by the EU.<a href="#">10</a></p>
<p>Nordic Countries &amp; North German Federal States, 1994</p>	<p>"[T]he development of environmentally sound, safe, efficient and integrated transport system".</p> <p>To maintain and further develop "the important position that the Nordic region holds within the trans-European networks".</p> <p>"[T]he Fehmarn Belt transport corridor [is considered] as an important regional element in the trans-European networks".</p> <p>"[A] political decision on the future transport across the Fehmarn Belt based on environmental, social and economic assessments is closely connected with efforts towards a strengthening of rail transport in the region".<a href="#">11</a></p>

<p>Swedish Government,  1991</p>	<p>Establishment of link with continental Europe across Øresund and Fehmarn Belt.<a href="#">12</a></p>
<p>National Railways, DK,  D, S, 1992</p>	<p>"[T]he environmentally friendly, safe and energy-saving railways should gain a larger share of total traffic ... [A] connection across Fehmarn Belt is an important element still missing ... A fixed connection across Fehmarn Belt could be finished by 2005".<a href="#">13</a></p>
<p>Storstrøm County,  1989-1994</p>	<p>"[A] fixed Baltic Sea link will again give Storstrøm County, and especially Lolland-Falster, a geographically central position that will give new opportunities for business development ... Storstrøm County therefore strongly urges [the Danish Government] to now take the necessary steps to prepare a fixed link between Lolland and Fehmarn".<a href="#">14</a></p> <p>"Growth in economy and employment in the region ... [T]he best possible traffic connections" ... Local access to high-speed rail in connection with fixed link across Fehmarn Belt.<a href="#">15</a></p>
<p>Nykøbing F.  Municipality, 1990.  Holeby, Højreby,  Maribo, Nakskov,  Nysted, Ravnsborg,  Rudbjerg, Rødby and  Sakskøbing  Municipalities, 1991</p>	<p>1990-91: "All city council members agree that it is absolutely necessary for the region that the necessary steps are taken to prepare a fixed link".<a href="#">16</a></p> <p>"We ... urgently request that the Government and Parliament decide to build a fixed link across the Baltic Sea".<a href="#">17</a></p> <p>1994: Political consensus eroding: A fixed link "will have disastrous consequences for the populations on the islands of Fehmarn and Lolland, if the European society does not massively support and develop alternatives".<a href="#">18</a></p> <p>See introductory note on change in attitudes.</p>
<p>Confederation of  Municipalities in  Storstrøm County, 1992</p>	<p>"Long-range solutions to specific problems like the elimination of border control, elimination of tax-free sales, the fixed link [across Fehmarn Belt], etc. demand initiatives now if the solutions are to have an effect ... [T]here is also a need for larger political initiatives in relation to business ... With an initiative regarding articulating a Baltic region, Storstrøm County will cease to be on the periphery. In a Baltic region Storstrøm will be a centre region and will, therefore, get new possibilities regarding political initiatives to support business".<a href="#">19</a></p>

### 5.3 Political Parties, Denmark

<p>Centre Democrats  (CD), 1990</p>	<p>"Fixed links create activity of any kind: employment, trade, culturally, socially, etc. It is our clear view that one should build any fixed link that is technically feasible and has a sound economy. Failure to do this will delay and make more expensive transport of persons as well as goods and will reduce communication between nations and population groups".<a href="#">20</a></p>
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<p>Conservative Party (C), 1990-94</p>	<p>"In the Conservative Party we are supporters of two fixed links between Scandinavia and Europe ... [Great Belt and] the connection Germany-Rødby-Copenhagen-Malmö ... A fixed link to Germany will, no doubt be a shot in the arm for all of Lolland-Falster, but in addition a strong commercial expansion will take place along the whole traffic corridor through Denmark ... It is true that traffic through Denmark will increase substantially with the new infrastructure; that is the purpose, too".<sup>21</sup></p>
<p>Liberal Party (V), 1990</p>	<p>"Implementation of the two [fixed links] to Sweden and West Germany is important to Denmark's position in the new Europe ... Now Denmark, and with it the Nordic countries, must get seriously integrated in the European traffic network".<sup>22</sup></p>
<p>Progress Party (Z), 1993</p>	<p>"[The Progress Party proposes] that the Parliament instructs the Government to make a tender for the Fehmarn Belt link in a private principal contract with complete private financing".<sup>23</sup></p> <p>"[C]onstruction of the fixed link across the Baltic Sea ... is necessary ... both considering business, which is dependent on good traffic connections, but also considering the travel time of private individuals".<sup>24</sup></p>
<p>Social Democratic Party (S), 1990, 1992</p>	<p>"With the knowledge existing behind the scenes, a yes to the Øresund Bridge automatically will pull with it the fixed Fehmarn link. Anything else is absurd in that there is no reason to accommodate the Swedish demand regarding an Øresund bridge if one does not at the same time continue the line down over Fehmarn. Otherwise the Swedes will be sailing anyway".<sup>25</sup></p> <p>"The condition for a fixed link to Fehmarn is that there is a basis, traffically, environmentally and economically, for establishing such a link".<sup>26</sup></p>
<p>Social Liberal Party (B), 1990</p>	<p>"If there is to be a fixed link across Fehmarn Belt it must be a bored connection and nothing else. Environmentally speaking, goods transport is decisive and this will have to happen by rail".<sup>27</sup></p>
<p>Socialist People's Party (SF), 1993</p>	<p>"It is important for all of Scandinavia to be linked on to European development. Therefore we must get a railway tunnel under Fehmarn Belt ... but there are still large disagreements regarding the attitude to the project, both in the party's parliamentary group and in the party hinterland".<sup>28</sup></p> <p>"The Socialist People's Party will never support a road connection."<sup>29</sup></p>

<p>Economic Council of the Labour Movement (Arbejderbevægelsens Erhvervsråd), 1994</p>	<p>"The Economic Council of the Labour movement is pro-fixed links ... The Fehmarn link must include a railway, but apart from this the Council has not taken a stand regarding Fehmarn Belt"<a href="#">30</a></p>
<p>Danish Employers Confederation, 1990</p>	<p>"[W]e shall express our sympathy for a closer connection between Denmark and the other parts of the EC [European Community]. Continued expansion of the infrastructure is, in our view, necessary for dynamic business development. It is particularly gratifying if, at the same time, this leads to closer connections with the coming [European Community] single market, where we, as well known, want complete membership."<a href="#">31</a></p>
<p>Confederation of Danish Industries (Dansk Industri, Industrirådet), 1990-94</p>	<p>"[T]he fixed link [across Fehmarn Belt] must be built as quickly as possible ... it is necessary that the road link is built at the same time as the rail link".</p> <p>"A fixed link across the Baltic Sea will result in substantial benefits for the Danish society and for the Danish business community ... Therefore it is important as quickly as possible to decide on establishing fixed links to Sweden and Germany".<a href="#">32</a></p>
<p>Danish Confederation of Contractors (Entreprenørforeningen), 1994</p>	<p>"When the contracts are made on the Øresund connection one must immediately sit down and find out when the right time is to start on Fehmarn Belt".<a href="#">33</a></p>
<p>Danish Metal Worker's Union, 1990-94</p>	<p>"The next step in developing the infrastructure must be establishing a basis for building a fixed connection between Denmark and Germany ... why? ... So Denmark can survive. Infrastructure is a decisive prerequisite for securing good competitive conditions for our industries".<a href="#">34</a></p>

#### 5.5 Financial Institutions

<p>Bikuben Bank, BNP, Dresdner Bank, 1992</p>	<p>"The Fehmarn Belt Consortium ... proposes a fixed link across Fehmarn Belt in the Baltic Sea ... that will take the environment into account and that will be privately financed (B. O.T.-model ...)".<a href="#">35</a></p>
<p>Deutsche Bank, 1990</p>	<p>"[The Fehmarn Belt] project is becoming increasingly urgent because this is the only direct land route between Scandinavia and continental Europe - and this means Eastern Europe as well".<a href="#">36</a></p> <p>For-profit BOT-participant.<a href="#">37</a></p>

#### 5.6 Contractors

<p>Bilfinger &amp; Berger, Ltd.,</p> <p>Strabag Bau, Ltd., KKS</p> <p>Entreprise, Ltd.,</p> <p>Campeon Bernard SGE</p> <p>and Bouygues, 1992</p>	<p>See Bikuben Bank and Dresdner Bank.</p> <p>For-profit BOT-participants.<a href="#">38</a></p>
<p>Hochtief and Philipp</p> <p>Holzmann, 1989</p>	<p>See Deutsche Bank.</p> <p>For-profit BOT-participants.<a href="#">39</a></p>
<p>Monberg &amp; Thorsen,</p> <p>Højgaard &amp; Schultz,</p> <p>1992</p>	<p>For-profit BOT-participants.<a href="#">40</a></p>

5.7 Other Organisations and Private Companies

<p>European Roundtable of</p> <p>Industrialists (Fiat,</p> <p>Nestlé, Olivetti, Philips,</p> <p>Renault, Siemens,</p> <p>Thyssen, Asea, Volvo</p> <p>and other major</p> <p>European companies),</p> <p>1984</p>	<p>"The philosophy behind Scanlink is straightforward ... As transport links, especially roads, between other European countries have improved, the Nordic states have slipped into a position of disadvantage ... In identifying the two fixed link projects [Øresund and Fehmarn Belt] Scanlink greatly strengthens the economic case for each individual link".<a href="#">41</a></p>
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<p>Gyllenhammer Group, Scandinavian Link  (Volvo, Asea, United Breweries, Norsk Hydro, Danish Metal Worker's Union and other major Scandinavian companies), 1985-90</p>	<p>Basic philosophy identical to European Roundtable of Industrialists. (See above). "Progress of the Scandinavian Link project by and large rests on construction as soon as possible of the fixed links across Great Belt, Øresund and Fehmarn Belt".<a href="#">42</a></p>
<p>ASEED Europe, European Federation for Transport and Environment, 1994</p>	<p>"Dear Mr. Santer, Under the presidency of Jacques Delors, an increasing gap developed between the official European Union aim of sustainable development and concrete policy measures. The worst example is the trans-European networks scheme ... I consider these plans to be a serious threat to nature and environment in Europe ... In order to promote sustainable development and to improve democracy within the European Union, I appeal to you to put an end to the large influence that the European Roundtable of Industrialists has been allowed to exert during the presidency of Mr. Jacques Delors".<a href="#">43</a></p>
<p>Great Belt, Ltd., 1994</p>	<p>"Great Belt, Ltd. [has] an interest in and are capable of consulting for a feasibility study regarding a fixed link across Fehmarn Belt and for a possible future client [bygherreselskab] for this project ... Sale of knowledge and products of this type already takes place to the Øresund companies."<a href="#">44</a></p>
<p>Danish Society for the Conservation of Nature,  1991-94</p>	<p>"The connection that will benefit the environment is a bored railway tunnel with room for shuttle trains ... Denmark made the wrong choice with the fixed links across Great Belt and Øresund. Shall we repeat the mistakes with Germany on Fehmarn?"<a href="#">45</a></p> <p>"The Øresund link and a possible link across Fehmarn Belt are more critical with respect to [the saline balance and the environment in the Baltic Sea] than Great Belt because they are located exactly on the threshold to the Baltic Sea."<a href="#">46</a></p>
<p>Danish Road Association, 1991</p>	<p>"[T]here are many good reasons to establish a fixed link between Rødby and Puttgarden as quickly as possible .... economics ... growth ... environment ... employment ..."<a href="#">47</a></p>

<p>Automobilimportørenes Sammenslutning, Danmarks Automobilfor- handler Forening, Danske Grus- og Sten- industrier, Danske Vognmænd, Forenede Danske Motorejere, Foreningen af Danske Langtursvognmænd, Turistvognmændenes Landsforening, 1991</p>	<p>Pro-fixed road link.<a href="#">48</a></p>
<p>Junior Chamber, Lolland Falster, 1990-91</p>	<p>"[T]he advantages of a fixed link [across Fehmarn Belt] outweighs the disadvantages".<a href="#">49</a></p>
<p>C.G. Jensen, Det Danske Stålvalseværk, Phønix Vej, Topdanmark, Trafikprodukter A/S, Unicon Beton, Villadsen's Icopal, 4K-Beton, 1991</p>	<p>Pro-fixed road link.<a href="#">50</a></p>
<p>Aktionsbündis gegen eine feste Beltquerung, Femern, 1994</p>	<p>Anti-fixed link because of negative effects on local development in services and employment and on the environment.<a href="#">51</a></p>

<p>Berlingske Tidende,</p> <p>1990-94"Possibly, [a link across the Baltic] may not be a tunnel but an immersed tunnel. Possibly, the fixed link across the Baltic may be operated by a private consortium, but the possibility of a government-owned operation also exists. None of these questions are decisive. What is decisive is that we get a fixed link across the Baltic as a natural part of the network of fixed traffic connections between Denmark and Sweden and across Great Belt".<a href="#">52</a></p>	
<p>Børsen, 1990-94</p>	<p>"There is disagreement about many things in the policy for industry and trade. But there must be agreement about giving Denmark a modern infrastructure with a motorway-H, Great Belt Bridge, Øresund and Fehmarn link as quickly as at all possible".<a href="#">53</a></p>
<p>Ingeniøren, 1994</p>	<p>"The debate regarding a fixed link across Fehmarn Belt has to start now, if it is to start at all. Here and now".<a href="#">54</a></p>
<p>Jyllands-Posten, 1994</p>	<p>"With the building of the Øresund link work on a fixed link across Fehmarn Belt must proceed faster ... If a decision on a fixed link across the Baltic between Lolland and Fehmarn is not made soon, enterprising shipping companies will run fast ferries between Southern Sweden and Germany before long. That would not be in the interest of Denmark".<a href="#">55</a></p>

#### 5.9 The General Public

<p>Gallop Poll, 1991<a href="#">56</a></p>	<p>1,864 people in representative sample were asked, "Are you personally for or against the construction of a bridge from Lolland across the Baltic Sea to Fehmarn in Germany." 25% were for a bridge, 42% against and 33% did not know. The main reasons to be for a bridge were "easier, quicker" (35%), "don't have to sail" (25%), "will connect Denmark with Europe and the Nordic Countries" (25%) and "good for business, the economy" (22%). The main reasons quoted against a bridge were "no need" (36%), "environmental problems" (24%) and "waste of resources" (24%). No respondents were against a bridge because they wanted a tunnel.</p>
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#### 5.10 Summary and Conclusions

In sum, this description of objectives and attitudes shows that what one could call "organised Denmark" - government, political parties, business organisations, labour organisations, etc. - is distinctly for a fixed link across Fehmarn Belt, as are central parts of the national press. The same is true for important actors on the Nordic and European scenes, for instance the EU Commission. The reasons most frequently cited for being pro-fixed link are an improved competitive situation for Danish business in relation to the rest of Europe, increased employment and European integration.

Just as distinctly, however, the Gallop poll quoted above shows that most likely there is no majority in the Danish general public in favour of a fixed Fehmarn link at this stage. The latter situation is similar to the situation for the Øresund and Great Belt links when they were in the planning stages.[57](#)

Denmark has experienced similar divisions between public and organised opinion in other decisions of national import, for instance as reflected in the decisions regarding the Øresund and Great Belt links and, perhaps most notably, the decisions regarding the level of Danish participation in the European

Union (the Maastricht elections). In fact, European integration is seen by most organised proponents of a fixed link across Fehmarn Belt as a major objective that such a link will substantially advance.

Thus, the Fehmarn Belt link raises a double set of issues that are manifestly sensitive with large parts of the general public in Denmark. Firstly, it raises the issues involved in investing in another multi-billion kroner project when the track-records for planning the Øresund and Great Belt projects are perceived as poor by many. Secondly, it raises the issues of European integration.

The lessons from Øresund and Great Belt and from the Maastricht referenda suggest that public trust in the political system may be at stake in this kind of situation. It is the view of the review panel that this makes it all the more important that transparent procedures are developed for feasibility studies and decisions regarding a possible Fehmarn Belt link that will result in information and in a process that can be trusted by all involved parties and by the general public. Such procedures must contain sufficient checks and balances to ensure that there is a credible system for enforcing accountability, which will allow democratic decisions and efficient use of resources to be made regarding a possible Fehmarn Belt link. In a later report, the review panel will outline what such procedures might look like.

[Startside](#) [Forrige kap.](#) [Næste kap.](#)

## Facts about Fehmarn Belt

### Results from a fact-finding study regarding a possible fixed link between Denmark and Germany across Fehmarn Belt

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#### Notes to Chapter 1

[1.](#) Christiani & Nielsen, Højgaard & Schultz, Ltd., Kampmann, Kierulff & Saxild Ltd., *Motorveje med broer over Storebælt og Øresund*, (Copenhagen, March 9 1936); Christiani & Nielsen, Højgaard & Schultz, Ltd., Kampmann, Kierulff & Saxild Ltd., *Motorveje med broer over Storebælt og Øresund: Supplerende bemærkninger til forslag af 9. marts 1936*, (Copenhagen, June 17 1937).

[2.](#) For more detail, see Chapter 4.

#### Notes to Chapter 2

[1.](#) Folketinget, "Lov om anlæg af fast forbindelse over Øresund", August 19 1991, No. 590, Lovtidende A, 1991, Hæfte 106.

[2.](#) Folketinget, "Aftale mellem Danmarks regering og Sveriges regering om en fast forbindelse over Øresund", signed March 23 1991, article 21; Annex to Folke-tinget, "Forslag til Lov om anlæg af fast forbindelse over Øresund," Lovforslag nr. L 178, proposed May 2 1991.

[3.](#) "Aftale mellem Danmarks regering og Sveriges regering om en fast forbindelse over Øresund", article 21. Connecting the decision regarding Fehmarn Belt to the decision regarding Øresund, parallels the way Øresund had earlier been connected to the decision to build a fixed rail and road link across Great Belt. The political agreement regarding Great Belt explicitly states that "negotiations with the Swedish Government regarding building fixed links across Øresund will be initiated in the second half of 1986"; "Politisk aftale om Store Bælt" June 12 1986, Annex to Folketinget, "Forslag til Lov om anlæg af fast forbindelse over Storebælt", Lovforslag nr. L 177, proposed January 21 1987, paragraph 11.

[4.](#) Folketinget: "Bemærkninger til Forslag til Lov om anlæg af fast forbindelse over Øresund", Lovforslag nr. L 178 with comments, proposed May 2 1991, comments on paragraphs 1 and 2, p. 13.

[5.](#) Letter from the Danish Minister of Transport to the Parliament Traffic Committee, March 25 1993, p. 2.

[6.](#) Ibid., p. 2.

[7.](#) Folketinget, "Redegørelse om trafikpolitikken til år 2005", Redegørelse nr. R 9, December 14 1993, Folketingets forhandlinger nr. 10 1993-94, 3944.

[8.](#) Personal communication with officials at the Danish Ministry of Transport.

[9.](#) Folketinget, "Politisk aftale om en fast forbindelse over Øresund", April 29 1991, Annex to Folketinget: "Forslag til Lov om anlæg af fast forbindelse over Øresund," Lovforslag nr. L 178, proposed May 2 1991, paragraph 12.

[10.](#) Ministry of Transport, *Traffic Investments in Denmark* (Copenhagen: Ministry of Transport, undated), p. 14.

[11.](#) Miljøministeriet, *Danmark på vej mod år 2018: Resumé og handling*, Landsplanredegørelse fra miljøministeren (Copenhagen: Miljøministeriet, 1992), p. 32.

[12.](#) Ibid., pp. 32-33.

[13.](#) Folketinget, "Forslag til folketingsbeslutning om en privatfinansieret Femer Bælt-forbindelse," Beslutningsforslag nr. B 53, proposed January 12 1993, vote June 18 1993; Folketinget, *Fortryk af Folketingets forhandlinger*, June 18 1993, 11153.

[14.](#) Folketinget, *Fortryk af Folketingets forhandlinger*, February 10 1993, 5293-5294.

[15.](#) Folketinget, "Redegørelse om trafikpolitikken til år 2005", Redegørelse nr. R 9, December 14 1993, Folketingets forhandlinger nr. 10 1993-94, 3944; Trafikministeriet, *Trafik 2005: Problemstillinger, mål og strategier*, (Copenhagen: Trafikministeriet, 1993), p. 45.

[16.](#) Ibid., pp. 39, 99-101.

[17.](#) Ibid., p. 100.

[18.](#) Commission of the European Communities, *Growth, Competitiveness, Employment: the Challenges and Ways Forward Into the 21st Century*, White Paper, (Luxembourg: Office for Official Publications of the European Communities, 1993).

[19.](#) The Group of Personal Representatives of the Heads of State and Government, *Trans-European Networks: Interim Report of the Chairman to the Corfu European Council*, undated, presented to the European Council June 24-25 1994 at Corfu., p. 3.

[20.](#) Ibid., p. 5.

[21.](#) "Resolution from the Second Nordic Conference of Ministers of Transport in Nyborg May 19-20 1994", p.2.

[22.](#) Ibid., p. 3.

[23.](#) The Group of Personal Representatives of the Heads of State and Government, *Trans-European Networks: Interim Report of the Chairman to the Corfu European Council*, undated, presented to the European Council June 24-25 1994 at Corfu.

[24.](#) Ibid., pp. 9, 25-26; Økonomiministeriet, "Faktuelt notat til Folketingets Markedsudvalg vedr. interimsrapport fra gruppen vedrørende transport- og energiinfrastruktur (Christophersen-gruppen)," (Copenhagen: Det Økonomiske Sekretariat, June 8 1994), eksp. nr. 10450; Økonomiministeriet, "Danske transport- og energiprojekter i tilknytning til transeuropæiske net," (Copenhagen: Det Økonomiske Sekretariat, April 20 1994), eksp. nr. 9148.

[25.](#) The Group of Personal Representatives of the Heads of State and Government, *Trans-European Networks*, p. 4.

[26.](#) European Council, *European Council at Corfu, 24-25 June 1994, Presidency Conclusions*, SN 150/94, pp. 4, 9-10.

[27.](#) European Council, *European Council at Essen, 9-10 December 1994, Presidency Conclusions*, SN 300/94, pp. 7-8.

[28.](#) The Group of Personal Representatives of the Heads of State and Government, *Rapport til det Europæiske Råds møde i Essen*, undated, presented to the European Council December 9-10 1994 at Essen, p. 24.

[29.](#) The Group of Personal Representatives of the Heads of State and Government, *Trans-European Networks: Technical Papers*, Provisional Edition, November 29 1994, p. 159.

[30.](#) This section is based on interviews with German government officials.

### Notes to Chapter 3

[1.](#) The Chapter has benefitted from input from Morten Steen Petersen, Hoff & Overgaard.

[2.](#) Peter W. Cardebring, Lars Källström and Morten Steen Petersen, *Transport Routes Scandinavia-The Continent: Forecast and Corridor Evaluation*, KFB-report 1993:22 (Stockholm: Kommunikationsforskningsberedningen, 1993), p. 14.

[3.](#) Ibid., p. 14.

[4.](#) Ibid.

[5.](#) Ibid., p. vi.

[6.](#) Ibid., p. 19. The rail tonnage quoted in this part of the study by Cardebring et al. is based on German sources and it is twice as high as the rail tonnage quoted from the same study above regarding the modal split between road and rail which is based on Scandinavian sources (ibid., p. 14). According to Morten Steen Petersen, one of the authors of the study, a possible explanation of the difference between the Scandinavian and the German figures is that transports of iron ore from Kiruna to the continent are excluded in the Scandinavian but included in the German figures, and that the weight of packing of goods is excluded in the Scandinavian but included in the German figures. Similar discrepancies between Scandinavian and German figures exist for other transport statistics as well. (Personal communication, November 16 1994). Thus results and conclusions, for instance the conclusions mentioned in the main text above regarding modal split and the relative magnitude of Scandinavian transports in relation to German transports are dependent on which sources are used.

[7.](#) Ibid., pp. 11 ff.; Finland is considered part of Scandinavia in this study. Jacob Kjær, "Godsstrømmene mellem Norden og EF, med tilknyttede konsekvenser for infrastrukturen", in Nordrefo, *Norden utfordres: Internasjonaliseringens mange regionale ansikter* (Stockholm: Nordrefo, 1994), pp. 213 ff.

[8.](#) Ibid., p. 222.

[9.](#) Director of Public Relations with Volvo Transport, Johan Hallenborg, as quoted in *Berlingske Tidende* and *Jyllands-Posten* March 2 1994.

[10.](#) Hoff & Overgaard, "Comparison Between the Nordkont and the Gothenburg University Forecasts" (Copenhagen, undated), pp. 4.1 ff.

[11.](#) A/S Storebælt, Foreløbig teknisk-økonomisk vurdering af en fast forbindelse over Femern Bælt (Copenhagen: Great Belt, Ltd., November 1990), pp. 35-36.

#### Notes to Chapter 4

[1.](#) To the knowledge of the review panel, nine reports were printed from the Cowi-Lahmeyer study; the reports remain unpublished: Trafikministeriet and Bundesministerium für Verkehr, Femer Belt Crossing: Technical and Environmental Feasibility Study, Phase A, Doc. No. A1-1 Technical Solutions, Doc. No. A2-1 Environmental Site Conditions, Doc. No. A2-2 Technical Site Conditions, Doc. No. A4-1 Preliminary Design Basis, Doc. No. A5-1 Preliminary Costing Basis, Doc. No. A6-1 Planning of Further Environmental Studies, Doc. No. A6-2 Planning of Additional Technical Site Investigations, Doc. No. A6-3 Planning of Development of Technical Concepts, Doc. No. A7-1 Summary Report (Copenhagen and Bonn, March 1993).

[2.](#) "En bro til 2,5 milliard kroner Lolland-Fehmarn", *Lolland-Falster Folketidende* June 27 1963; "Tredive mennesker arbejder på at bygge broen over Østersøen", *Berlingske Tidende* July 7 1963.

[3.](#) Storstrøms amt, Regionplan 1994-2005, redegørelse, retningslinjer (Storstrøms amt, June 1994), p. 66.

[4.](#) Ibid., pp. 65-66.

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[7.](#) Ibid.

[8.](#) Christiani & Nielsen m.fl., Motorveje med broer, 1936, p. 9.

[9.](#) Ibid., p. 9.

[10.](#) A/S Storebælt, Nyt fra Storebælt, (Copenhagen: Great Belt, Ltd., September 1994), pp. 8-10.

[11.](#) Ibid.

[12.](#) European Roundtable of Industrialists, Missing Links: Upgrading Europe's Transborder Ground Transport Infrastructure, (Paris: Roundtable Secretariat Paris Office, December 1984).

[13.](#) Ibid., pp. 23-25.

[14.](#) Ibid., pp. 25-26.

[15.](#) Ibid., p. 26.

[16.](#) Ibid., p. 26.

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[19.](#) Ibid., p. 17.

[20.](#) Ibid., p. 3.

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[22.](#) Scandinavian Link, Appraisal of Fixed Link across Fehmarn Belt, pp. 80-81.

[23.](#) Ibid., p. 107.

[24.](#) Ibid., pp. 80-81.

[25.](#) Ibid., pp. 107 ff.

[26.](#) Ibid., 97.

[27.](#) A/S Storebælt, Foreløbig teknisk-økonomisk vurdering af en fast forbindelse over Femern Bælt (Copenhagen: Great Belt, Ltd., November 1990).

[28.](#) Ibid., pp. 17-18.

[29.](#) Ibid., pp. 18-19.

[30.](#) Ibid., pp. 20-21.

[31.](#) Ibid., pp. 21-22.

[32.](#) Ibid., pp. 48-49 and 51.

[33.](#) Ibid., p. 29.

[34.](#) Ibid., pp. 51-52.

[35.](#) Dansk Vejforening, Femern Bælt forbindelsen, (Holte: Dansk Vejforening, February 1991).

[36.](#) Ibid., p. 9

[37.](#) Ibid., pp. 4-7.

[38.](#) Ibid., p. 5.

[39.](#) Ibid., pp. 12-13.

[40.](#) Ibid., p. 6.

[41.](#) Ibid., pp. 16-17.

[42.](#) Ibid., p. 17.

[43.](#) Fehmarn Belt Consortium, *Forundersøgelse: Femern Bælt forbindelsen over Østersøen*, (Hvidovre: KKS Entreprise, undated, most likely published in 1992).

[44.](#) Ibid., pp. 8-10.

[45.](#) Ibid., p. 5

[46.](#) DSB, *Shuttletogsforbindelse under Femerbælt* (Copenhagen: DSB Projektjenesten, June 1992), pp. 1, 34 and 36.

[47.](#) Ibid., p. 1.

[48.](#) Ibid., p. 43.

[49.](#) Ibid., pp. 3, 43.

[50.](#) Ibid., Appendix B, p. 1.

[51.](#) Ibid., pp. 45-46.

## Notes to Chapter 5

[1.](#) See, for instance, Gunnar Falkemark, *Öresundsbron: Hur de avgörande besluten togs*, second edition (Gothenburg: Naturskyddsföreningen, 1993) and Claus Hedegaard Sørensen, *Slår bro fra kyst til kyst: En analyse af Socialdemokratiet og Öresundsforbindelsen* (Hovedland, 1993).

[2.](#) Letter from the mayor of Rødby Municipality to Junior Chamber, Nykøbing F, June 19 1990, p. 2., in Junior Chamber, eds., *Fast forbindelse over Østersøen* (Nykøbing Falster: Junior Chamber, undated), unpaginated.

- [3.](#) Letter from the nine municipalities on Lolland to the Danish Prime Minister, August 5 1991, p. 2, in Rødby Municipality, eds., *Fast forbindelse over Femern Bælt* (Rødby: Rødby Municipality, April 1994).
- [4.](#) Gert Mortensen, "Fast Femern-forbindelse eller ej," *Danske Kommuner* No. 33, October 1993, pp. 30-31; personal communication with the mayor of Rødby Municipality, April 21 1994; Thomas Müller, "Bro-valg i Rødby", *Danske Kommuner* No. 32, October 1993, pp. 16-17.
- [5.](#) AKF, *Socio-økonomisk analyse af Storstrøms amt og Kreis Ostholstein* (Copenhagen: AKF-Forlaget, 1994).
- [6.](#) Folketinget, "Aftale mellem Danmarks regering og Sveriges regering om en fast forbindelse over Øresund", signed March 23 1991, article 21; Annex to Folketinget, "Forslag til Lov om anlæg af fast forbindelse over Øresund," Lovforslag nr. L 178, proposed May 2 1991.
- [7.](#) Miljøministeriet, *Danmark på vej mod år 2018: Resumé og handling*, Landsplanredegørelse fra miljøministeren (Copenhagen: Miljøministeriet, 1992), p. 32.
- [8.](#) Folketinget, "Redegørelse om trafikpolitikken til år 2005", Redegørelse nr. R 9, December 14 1993, Folketingets forhandlinger nr. 10 1993-94, 3944.
- [9.](#) The Group of Personal Representatives of the Heads of State and Government, *Trans-European Networks: Interim Report of the Chairman to the Corfu European Council*, undated, presented to the European Council June 24-25 1994 at Corfu, p. 3; European Council, *European Council at Essen 9-10 December 1994*, Presidency Conclusions, SN 300/94.
- [10.](#) Ibid., Corfu, pp. 9, 25-26.
- [11.](#) "Resolution from the Second Nordic Conference of Ministers of Transport in Nyborg May 19-20 1994", pp. 2-3.
- [12.](#) Folketinget, "Aftale mellem Danmarks regering og Sveriges regering om en fast forbindelse over Øresund", signed March 23 1991, article 21; Annex to Folketinget, "Forslag til Lov om anlæg af fast forbindelse over Øresund," Lovforslag nr. L 178, proposed May 2 1991.
- [13.](#) DB, DR, DSB and SJ, *Banetrafikken Skandinavien-Kontinentet: Strategier og planer*, (Copenhagen, undated, most likely published in

1992), p. 2; SJ, *SJ:s Tågfärjeutredning: Sammanfattning, förslag och konsekvenser* (Stockholm: SJ, 1989); *SJ Information*, June 28 1989.

[14.](#) Letter from Storstrøm County to the Danish Prime Minister, Minister of Transport, the Parliament Committee on Public Works and MPs from Storstrøm County, April 26 1989; letter from Storstrøm County to Junior Chamber, Nykøbing Falster, July 27 1990; both in Junior Chamber, eds., *Fast Forbindelse over Østersøen*, unpaginated.

[15.](#) Storstrøms amt, *Regionplan 1994-2005, redegørelse, retningslinjer* (Storstrøms amt, June 1994), pp. 7, 64, 77.

[16.](#) Letter from the mayor of Nykøbing F. Municipality to Junior Chamber, Nykøbing Falster, July 26 1990, in Junior Chamber, eds., *Fast Forbindelse over Østersøen*, unpaginated; see also statement by the Mayor of Nykøbing F. Municipality in Dansk Vejforening, *Femern Bælt forbindelsen* (Copenhagen: Dansk Vejforening, February 1991), p. 18.

[17.](#) Letter from the nine municipalities on Lolland to the Danish Prime Minister, August 5 1991, p. 2, in Rødby Municipality, eds., *Fast forbindelse over Femern Bælt* (Rødby: Rødby Municipality, April 1994).

[18.](#) Gert Mortensen, "Fast Femern-forbindelse eller ej," *Danske Kommuner* No. 33, October 1993, p. 30.

[19.](#) Letter from the Confederation of Municipalities in Storstrøm County (Kommuneforeningen i Storstrøms amt) to Rødby Municipality, December 8 1992.

[20.](#) Letter from the Centre Democrats in the Danish Parliament to Junior Chamber, Nykøbing Falster, June 7 1990, in Junior Chamber, eds., *Fast Forbindelse over Østersøen*, unpaginated.

[21.](#) Letter from the spokesman on transport policy, the Conservative Party to Junior Chamber, Nykøbing Falster, July 3 1990, in Junior Chamber, eds., *Fast Forbindelse over Østersøen*, unpaginated.

[22.](#) Venstres Pressetjeneste, "Brovedtagelser må ikke gøre Jylland til en 'blindtarm'", May 30 1990.

[23.](#) Folketinget, "Forslag til folketingsbeslutning om en privatfinansieret Femer Bælt-forbindelse," Beslutningsforslag nr. B 53, law proposed January 12 1993, vote June 18 1993; Folketinget, *Fortryk af Folketingets forhandlinger*, June 18 1993, 11153.

- [24.](#) Ibid., "Bemærkninger til forslaget", p. 2.
- [25.](#) Svend Auken, then chairman of the Social Democratic Party, as quoted in Ulrik Dahlin et al., "Broen til Sverige", *Press No. 66*, May 1991, p. 70.
- [26.](#) Social Democratic Party, *På Menneskets vilkår: Socialdemokratiets arbejdsprogram 1992-96*, (Copenhagen: Social Democratic Party, September 1992), p. 35.
- [27.](#) Marianne Jelved as quoted in *Information*, September 17 1990.
- [28.](#) Tommy Dinesen, Socialist People's Party spokesperson on traffic policy as quoted in *Berlingske Tidende*, August 26 1993.
- [29.](#) Personal communication with Steen Gade, Socialist People's Party spokesperson for environmental policy, October 27 1994.
- [30.](#) Personal communication with Fridjof Hagen, spokesperson for traffic, Economic Council of the Labour Movement, October 28 1994.
- [31.](#) Letter from Danish Employers Confederation to Junior Chamber, Nykøbing Falster, June 27 1990, in Junior Chamber, eds., *Fast Forbindelse over Østersøen*, unpaginated.
- [32.](#) Confederation of Danish Industries, memorandum regarding the Fehmarn Belt link, July 8 1993; the memorandum covers the attitudes of both the Confederation of Danish Industries and its German counterpart, the Bundesverband der Deutsches Industrien. See also Confederation of Danish Industries and Bundesverband der Deutsches Industrien, "Øget samhandel og transport kræver fast Østersøforbindelse", memorandum, April 1993; Industrirådet, "Fast forbindelse over Østersøen", memorandum, July 27 1990, p. 1; *Berlingske Tidende*, January 9 1990.
- [33.](#) Erik Ross Pedersen, Chief Executive Officer for the Danish Confederation of Contractors, as quoted in *Berlingske Tidende* June 18 1994.
- [34.](#) Georg Poulsen, "Fagbevægelsens syn på fremtidens vej- og transportpolitik i Danmark", *Asfalt* No. 119, 1991, p. 10; see also *Berlingske Tidende* January 9 1990.

- [35.](#) Fehmarn Belt Consortium, *Forundersøgelse: Femern Bælt forbindelsen over Østersøen*, (Hvidovre: KKS Entreprise, undated, most likely published in 1992), pp. 2-3.
- [36.](#) Dr. Eckart van Hooven, *The 'Mare Balticum' - a New Region for Europe*, (Deutsche Bank, undated), p. 8.
- [37.](#) Hochtief & Philipp Holzmann, *Die Fehmarnbelt-tunnelverbindung* (no publisher, undated, most likely publishing year is 1988 or 1989).
- [38.](#) Fehmarn Belt Consortium, *Forundersøgelse: Femern Bælt forbindelsen over Østersøen*, (Hvidovre: KKS Entreprise, undated, most likely published in 1992), pp. 2-3.
- [39.](#) Hochtief & Philipp Holzmann, *Die Fehmarnbelt-tunnelverbindung*.
- [40.](#) *Berlingske Tidende* May 27 1992.
- [41.](#) European Roundtable of Industrialists, *Missing Links: Upgrading Europe's Transborder Ground Transport Infrastructure*, (Paris: Roundtable Secretariat Paris Office, December 1984), pp. 21-22.
- [42.](#) Arbetsgruppen för utvidgat ekonomiskt samarbete i Norden, *Norden Finns: Slutrapport*, undated, p. 30; Henrik Baasch, *Effektive transporter til EF's indre marked: Hvad forventer nordisk industri?*, (Copenhagen: Scandinavian Link, 1989).
- [43.](#) Petition initiated by ASEED Europe (undated) and distributed by European Federation for Transport and Environment September 1994.
- [44.](#) Letter from Great Belt, Ltd. to the review panel, November 4 1994.
- [45.](#) David Rehling, "Connection that will benefit the environment", the Director General, the Danish Society for the Conservation of Nature, undated.

[46.](#) Annex to "Tillægsbetænkning over Forslag til lov om anlæg af fast forbindelse over Øresund", made by the Danish Parliament Committee on Traffic, August 9 1991, p. 36.

[47.](#) Dansk Vejforening, *Femern Bælt forbindelsen* (Copenhagen: Dansk Vejforening, February 1991), p. 18.

[48.](#) Ibid., pp. 1 ff.

[49.](#) Junior Chamber, eds., *Fast Forbindelse over Østersøen*, p. 1.

[50.](#) Dansk Vejforening, *Femern Bælt forbindelsen*, pp. 1 ff.

[51.](#) *Det Fri Aktuelt* July 6 1994.

[52.](#) Editorial, *Berlingske Tidende*, May 28 1992; see also editorials January 10 1990, February 4 1990 and May 11 1990.

[53.](#) Editorial, *Børsen*, March 9 1993; see also editorials September 6 1994 and February 13 1991.

[54.](#) Editorial, *Ingeniøren*, June 10 1994.

[55.](#) Editorial, *Morgenavisen Jyllands-Posten*, June 17 1994.

[56.](#) Gallop Poll March 7-14 1991 quoted in *Berlingske Tidende* March 17 1991.

[57.](#) When 475 people were asked in 1994 whether they were for or against the Øresund Link, 30 percent answered they were for, 54 percent that they were against and 15 percent did not know. When asked to agree or disagree with the statement, "The wisest thing would be for the

politicians to take a break [tænkepause, implying that the project would be halted for the period of the break] because everything about the project is so unclear", 59 percent were in complete agreement, 23 percent were in partial agreement and 13 percent were in complete or partial disagreement. (AIM Research for Danish National Radio, 1994). When 764 voters were asked in April 1988 whether they were for or against the Great Belt Link, 31 percent said they were for the link, 50 percent that they were against it and 19 percent that they did not know. (Vilstrup Research for Politiken, April 25 1988).

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