



Source: Drago Prvulovic/Øresundsbron

The Øresund Fixed Link



Location

Copenhagen, Denmark–Malmö, Sweden Northern Europe, Øresund Region

Sector

Transportation

Procuring authorities

Øresundsbro Konsortiet

Project company

Øresundsbro Konsortiet

Project Company obligations

design, build, finance, maintain, own and operate (DBFMOO)

Capital value

USD3.7 billion (DKK30.1 billion – 2000 value)

Start of operations

2000

Key facts

Government financed, 100% user funded

Project highlights

The Øresund Fixed Link is a combined bridge and tunnel link across the Øresund Sound between Denmark and Sweden. It comprises:

- The Øresund Tunnel between Amager at Kastrup, south of Copenhagen, and the artificial island Peberholm.
- The Øresund Bridge, a combined girder¹ and cable-stayed bridge between Peberholm and Lernacken – south of Malmö, in Skåne.

The Fixed Link is composed of a motorway and a dual rail track. The total length is 15.9 km.

The Fixed Link is owned and operated by Øresundsbro Konsortiet, which is jointly owned by state-owned enterprises A/S Øresund and Svensk-danska Broförbindelsen (SVEDAB) AB. The latter is owned by the Swedish Government, while A/S Øresund is 100% owned by Sund & Bælt, which is owned by the Danish state (see also Figure 3).

The total cost of the Fixed Link, including the motorway and rail connection on land, was calculated at DKK30.1 billion in 2000 (circa USD3.7 billion, 2000 prices). The project received financial support of DKK780 million (USD96.6 million) from the Trans-European Transport Network (TEN-T). It is estimated that the entire Fixed Link, including the land works, will have paid for itself by 2050.²

The completion and opening of the the Fixed Link in 2000 marked an upturn in mobility at an international, national, regional and local level for one of the busiest and most important traffic routes between the Scandinavian peninsula and the European continent. The fast link to the centre of Copenhagen has also had a significant impact on the potential of Copenhagen's Kastrup Airport to attract more international flights. Further, it triggered the formation of a common labour and housing market, which lies at the heart of the political vision of the Øresund Region.

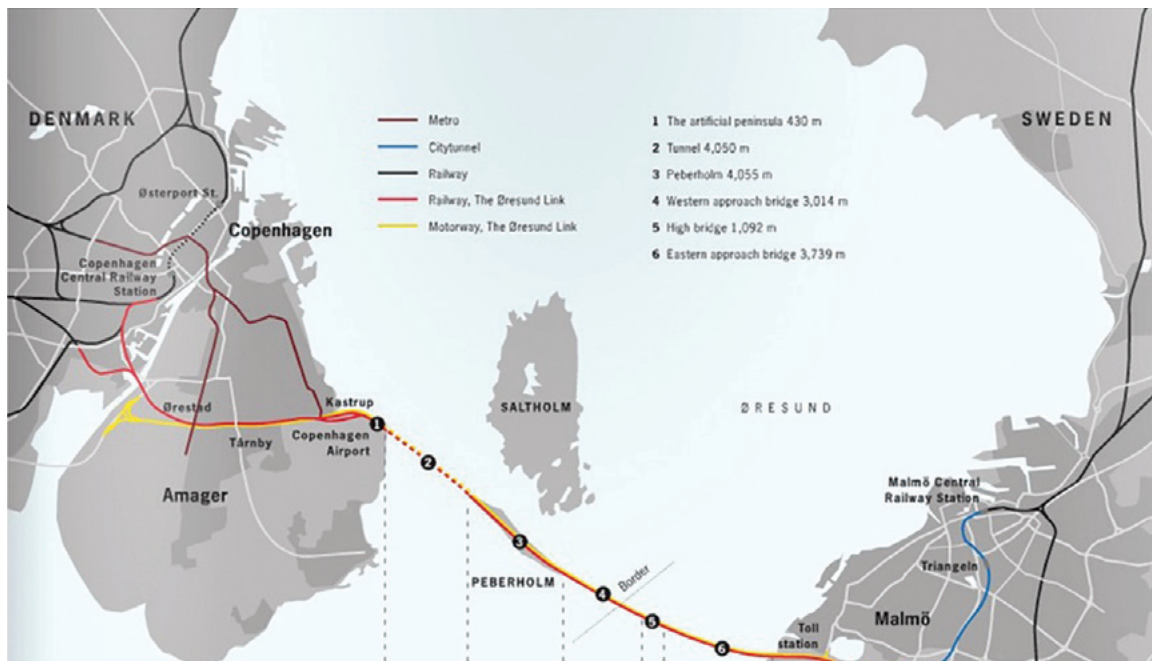


Figure 1: The Øresund Fixed Link (Source: Øresundsbro Konsortiet)

¹ Most common bridge structures. The beams (girders) support the deck.

² Øresundsbro Konsortiet (2019), Annual report 2019.

Project timeline³

- **1930 and 1950's First proposals** for an alignment across the Isle of Saltholm
- **1973 Signature of an agreement** between Sweden and Denmark for the construction of a fixed link
- **1978 Agreement rejected** when Denmark decides against relocating Copenhagen airport to the Isle of Saltholm
- **1984 Øresund delegation (OD) appointed,** reviews studies from 1960s and 1970s to develop a new project
- **1985 Øresundsförbindelser report** presented by the OD, and agreement that the project must be financed outside the state budgets and be profitable on business economic terms
- **1986 Danish Parliament decides to build a fixed link across the Great Belt**
This removes a Danish policy lock regarding an agreement on a fixed link across the Sound
- **1987 The Fasta Öresundsförbindelser (SOU 1987:41)** presents three alternatives
- **1989 The Fasta Øresundsförbindelser (SOU 1989:4)** narrows down the alternatives to either a combined road and railway link between Copenhagen and Malmö or a railway tunnel. The structure of the link should not affect the water flow
- **April-May 1990 Swedish Government votes** in favour of the combined road and railway link between Copenhagen and Malmö
- **23 March 1991 Signature of the Danish-Swedish Government agreement to build a fixed link across Øresund**
- **1992 Creation of the Øresundsbro Konsortiet** and application for permission to build and operate the link
- **August 1995 Beginning of construction** with the dredging of Øresund
- **1 July 2000 Opening of the Øresund Bridge**

³ Own production, based on OMEGA centre Sweden, UCL London (n.d.) The Øresund link-project profile; Øresundsbro Konsortiet (2008), *Facts worth knowing about the Øresund bridge*.

Development

THE POLICY AND PLANNING SETTING

Denmark and the southern region of Sweden have been closely related through history. The Øresund Region, built around the metropolitan areas of Copenhagen (Denmark), Malmö and Lund (Sweden), is now one of the most well-known examples of European cross-border collaboration.

Both sides share similar profiles of development (knowledge-based economies). In the two years preceding the opening of the Øresund Fixed Link, a major share of direct investments from both countries were directed to the Øresund Region.

For the development and operation of the Øresund Fixed Link, Denmark and Sweden are bound by the governmental agreement signed on 23 March 1991, which fixed fundamental design and construction principles, and regulated cooperation between the two countries.

CHALLENGES AND NEEDS ADDRESSED

The Fixed Link aimed at acting as a catalyst for the whole Øresund Region by strengthening commercial ties and by promoting commuting and cultural exchange between Copenhagen and Malmö.

At the end of the 20th century, unemployment was affecting the region: "the decline of traditional industries and the closure of shipyards as well as car and textile factories had visible effects on unemployment figures on both sides of the Sound."⁴ With the Fixed Link, Sweden saw an opportunity to address industrial unemployment in Malmö through access to Copenhagen's labour market. For Copenhagen, the construction of a fixed link was an opportunity to expand its production system, universities and services catchment area.

Strategically, the Fixed Link aimed at increasing the attractiveness and competitiveness of the whole region, by enlarging its educational offering and encouraging the development of new infrastructure – like the European Spallation Source⁵ (ESS) facilities in Lund – to attract high-skilled labour and businesses. For Sweden, it was a major opportunity to improve connection with the European continent and the world – by road but also by air, thanks to the proximity of Copenhagen's Kastrup Airport, located at the Danish end of the Fixed Link. A few years after the bridge

⁴ Nauwelaers, C., K. Maguire and G. Ajmone Marsan (2013), "The case of Oresund (Denmark-Sweden) – Regions and Innovation: Collaborating Across Borders", *OECD Regional Development Working Papers*, 2013/21, OECD Publishing.

⁵ Multi-disciplinary research facility based on the world's most powerful neutron source.

opened, more than half of the exports from Sweden were directed to mainland EU countries while two-thirds of imports originated from within the EU.⁶

Easier and faster communication contributes increased commercial exchange, but also tourism. The bridge aimed to have an impact on the region's image and to create new opportunities for the development of leisure and tourism businesses.

The notion of "a fixed link to the continent" was of major importance when developing the project, but in the late 1980s, the ideas of regional development and building cross-border regions gained in importance.⁷ The growing objective, which still stands high on the political agenda, was to forge the Øresund identity in a "culturally and linguistically similar but still diversified population" by fostering cultural exchanges.⁸

ENVIRONMENTAL ISSUES

Environmental issues have been central throughout the project. In 1986, the OD started discussing the effects a fixed link would have on the water flows from the North Sea to the Baltic Sea. This issue became central in the development of the project and led to major environmental protests which culminated in the resignation of Sweden's Environment Minister Olof Johansson in 1994. To address the environmental issues, 3–6 m³ of seafloor sediment were dredged to maintain water inflows.⁹ Specific care was taken to avoid permanent damage and serious impact on seafloor fauna and flora during the dredging. In total, 14% of the cost of the Fixed Link was related to environmental measures and optimization.¹⁰

LONG-TERM BENEFITS

After the bridge opening, labour market integration, measured by commuting, rose considerably – mainly from Sweden to Denmark. In 2018, 90% of Øresund commuters lived in Sweden and worked in Denmark.¹¹ Commuting by car reached a peak in 2008, with 20,000 vehicles passing the Sound daily compared with 3,000 in 1999.¹² Differences in salaries and housing prices (both higher in Denmark) and unemployment rates (higher in the Skåne region)

drove this pattern. In 2018, an average of 70,000 people were crossing the bridge daily; 55% by car and 45% by train.¹³

The type of trips changed over time. For vehicle traffic, commuting was the largest customer segment in the initial years of operation, but leisure travel gradually took over (in 2017, commuters and leisure travellers each accounted for one third of the car trips each).¹⁴ Favourable fare policies implemented over the years, and the weakening of the Swedish currency, supported that pattern, with Danes shopping on the other side of the Sound, for instance. The remaining traffic – business, freight and coaches – kept increasing as the bridge offered a faster and better-located (customer wise) alternative to the Helsingborg-Elsinore ferry service, located north of the Fixed Link in the same functional region.¹⁵

The opening of the Fixed Link was accompanied by major infrastructure development on both sides.

New districts are continuing to be developed in the suburbs of Hyllie and Ørestad in Malmö at the Swedish end of the Fixed Link, with housing, shops and offices. The Fixed Link has also integrated the Malmö property market with Copenhagen's.

At the turn of 2012–2013, the price per square metre for a family home in the Malmö area was almost at the same level as in the Capital Region that encompasses Copenhagen and its surrounds. This reflects the demographic characteristics of prospective buyers and the economic connection the Fixed Link has made between the two regions.

The proximity to Kastrup Airport has helped companies and major research facilities to establish themselves in the region. Major logistics centres have been established near the E6 road around Malmö. Direct business collaboration between both countries emerged – like the merger of Copenhagen and Malmö ports. Finally, millions have been invested in improving adjacent transport infrastructure like Copenhagen metro or the city tunnel in Malmö.¹⁶

6 Øresundsbro Konsortiet (2020, February 25), personal interview

7 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*

8 Nauwelaers, C., K. Maguire and G. Ajmone Marsan (2013), "The case of Oresund (Denmark-Sweden) – Regions and Innovation: Collaborating Across Borders", *OECD Regional Development Working Papers*, 2013/21, OECD Publishing

9 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*

10 Øresundsbro Konsortiet (2020, February 25th), interview

11 Øresundsbro Konsortiet (2018), *The Øresund Bridge and its Region: 18 years*

12 Ibid

13 Ibid

14 Øresundsbro Konsortiet (2018), *The Øresund Bridge and its Region: 18 years*

15 Øresundsbro Konsortiet (2018), *The Øresund Bridge and its Region: 18 years*

16 OECD (2003), *OECD Territorial Reviews: Oresund, Denmark/Sweden 2003*, OECD Territorial Reviews, OECD Publishing, Paris

According to the Organisation for Economic Co-operation and Development (OECD),¹⁷ the better cross-border mobility helped decrease cultural and communication barriers, since most Swedes and Danes living in the core of the cross-border area, even if not commuting themselves, get to know nationals that have worked on the other side of the Sound.

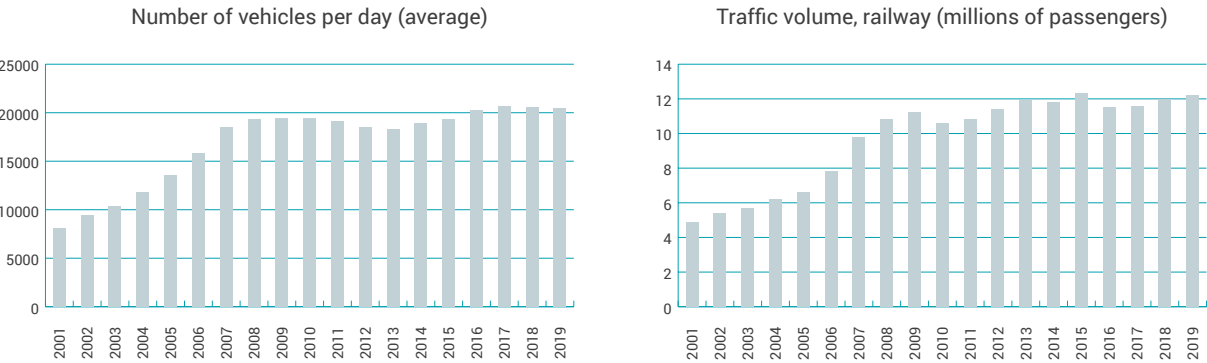


Figure 2: Traffic over the Sound (Source: Øresundsbro Konsortiet)

Financing

INFRASTRUCTURE FUNDING AND FINANCIAL OPERATIONS MODEL

The governmental agreement from 1991 explicitly stated that funding from the state budgets of the two signatory countries was not an option to deliver the Øresund Fixed Link.

The coast-to-coast section – which includes the tunnel, the artificial island, the bridge as well as the dredging and other environmental and safety measures – has been financed by loans taken on the international credit market. Øresundsbro Konsortiet is responsible for these loans. The cost of the coast-to-coast section of the link was calculated at DKK19.6 billion in 2000 (approximately USD2.4 billion, 2000 prices). The two states act as guarantors for the loans taken by Øresundsbro Konsortiet and pledged to share responsibilities towards creditors.¹⁸ This section also received financial support from the EU's TEN-T funding programme. By the completion of the bridge, it was estimated that this support amounted to approximately DKK780 million (approximately USD96.6 million, 2000 prices).¹⁹

NET DEBT IN 2000
COAST-TO-COAST INFRASTRUCTURE
DKK 19.6 billion (approximately USD2.4 billion)

LAND WORK
DKK 10.5 billion (approximately USD1.3 billion)

In 2013, HH Ferries et al. (now ForSea), which operate ferries between Helsingborg and Elsinore, lodged a complaint with the EU Commission claiming that the Danish and Swedish state guarantees for Øresundsbro Konsortiet's loans are illegal according to the EU's state aid rules. After several years of procedure, this matter is still under investigation. A decision was expected in the second half of 2019 but was still pending in February 2020.²⁰

The construction of the connecting land infrastructure on both sides of the Sound has also been financed by loans, taken by SVEDAB on the Swedish side (DKK2.6 billion in 2000, approximately USD300 million – not including the cost of the outer ring road, which was funded by the Swedish National Road Administration via state budget grants), and by A/S Øresundsförbindelsen on the Danish side (DKK7.9 billion in 2000, approximately USD1 billion).²¹

Toll revenues from road traffic and railway fees are the sole sources from which the debts of Øresundsbro Konsortiet and the two parent companies will be repaid. The loans taken by SVEDAB and A/S Øresundsförbindelsen for the connecting land infrastructure will be repaid thanks to dividends received from Øresundsbro Konsortiet. Initially, dividends were to be paid after the loans for the coast-to-coast section itself had been repaid. The initial payment was expected 25 years after the opening of

17 Nauwelaers, C., K. Maguire and G. Ajmone Marsan (2013), "The case of Oresund (Denmark-Sweden) – Regions and Innovation: Collaborating Across Borders", *OECD Regional Development Working Papers*, 2013/21, OECD Publishing

18 Ibid

19 Ibid

20 Øresundsbro Konsortiet (2020, February 25), personal interview

21 Ibid

the Fixed Link,²² and Øresundsbro Konsortiet's debt was expected to be repaid approximately in 2035.²³ However, in 2018, the two owners decided on a new dividend policy whereby the primary focus will be on maximum debt reduction in the owner companies.

The first dividend from Øresundsbro Konsortiet to its owners was paid in the spring of 2018 for the financial year 2017.²⁴ In the latest estimations, the entire Fixed Link and the land works are expected to be repaid in 2050.

Table 1: Tolls for private customers as of March 2020, in DKK

Single trip price (DKK)	Online ticket	Full price	Smut Tur	BroPass
Car (max 6 m)	355	390	105	170
Car with trailer/ caravan 15m Camper 6–10m Van 6–9m	710	780	210	340
Car with trailer/caravan over 15m Camper over 10m Camper over 6m with trailer Van over 9m	1350	1470	-	645
Motorcycle	195	210	52	80

The terms of the governmental agreement signed in 1991 included the prevention of unnecessary distortion of the region's traffic balance resulting from the new infrastructure. Existing transportation measures which will continue to operate – such as the ferry between Helsingborg and Elsinore operated by ForSea – are protected from competition with other transport means. Hence, the pricing mechanism for road fees, which are fixed by Øresundsbro Konsortiet, is based on the ferry taxes.²⁵ The price paid by users must cover all construction and operating costs, including maintenance and new investments. Value-added tax (VAT) is paid to the two governments.²⁶ In 2019, revenues from road traffic amounted to DKK1.5 billion (approximately USD200 million, 2019 prices), which was a 3% rise compared to 2018.

The rail fee is a fixed fee which was agreed upon in the 1991 Agreement and is paid equally by the two countries' national railway agencies. The railway administrations, in turn, charge the train operators for using the Fixed Link. The amount is based on a fee of DKK300 million in 1991 (approximately USD47 million, 1991 prices) and is index-linked.²⁷ In 2019, revenues from the railway amounted DKK512 million (approximately USD76 million, 2019 prices).²⁸

The agreement with the guarantors stipulates that the currency of the loans can only be Danish Krone (DKK), Swedish Krona (SEK) and Euros (EUR). At the end of 2007, most of the loans were in EUR, with a small proportion in DKK and about 1% in SEK.²⁹ The toll for crossing the bridge is initially settled in DKK. Railway revenue is settled in DKK.

FINANCIAL RISKS

Due to the pricing mechanism, Øresundsbro Konsortiet's revenues are closely associated with the development of the financing costs – mainly interest rates. They also directly depend on road traffic volumes. The road traffic expectations were not met in the first few years of operation, and income from car traffic was lower than expected. Indeed, the ferry connection between Helsingborg and Elsinore was still frequently used to cross the Sound.³⁰ Train traffic over the Fixed Link fared better than car traffic. However, given the financial structure of the project, the success of the train did not bring additional revenues to Øresundsbro Konsortiet, which receives fixed fees irrespective of ridership numbers. Because of that, the date of repayment of the loans was pushed several years into the future.

22 Øresundsbro Konsortiet (2002), *Annual report 2002*

23 Ibid

24 Øresundsbro Konsortiet (2019), *Annual report 2019*

25 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*

26 Øresundsbro Konsortiet (2008), *Facts worth knowing about the Øresund bridge*

27 Øresundsbro Konsortiet (2008), *Facts worth knowing about the Øresund bridge*

28 Øresundsbro Konsortiet (2019), *Annual report 2019*

29 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*

30 Øresundsbro Konsortiet (2020, February 25), personal interview

Traffic volumes kept fluctuating over time, bringing uncertainties in cash flows. After the 2008 crisis, fluctuations in currency exchange rates, as well as the resulting relative price differentials, slightly changed commuter behaviour. While traffic increased by 10–17% a year between 2001 and 2007, it increased by just under 5% in 2008.³¹

Other factors can and have impeded cross-border mobility and led to a reduction of traffic – and hence of revenues – for the Fixed Link:

- Covid-19³² (see box opposite)
- Free movement of people: In 2015, border controls reintroduced by the Swedish authorities to manage the flows of refugees constrained train traffic,³³ which led to a decrease in patronage. For the same reasons as stated earlier, this did not have a direct negative impact on Øresundsbro Konsortiet's economic situation. On the contrary, road revenues increased as commuters shifted from train to cars for their trips.³⁴
- According to the OECD, discrepancies in tax, social insurance and pension regulations can also impact movements over the Sound: "The fiscal systems in both countries exhibit some differences that can distort location decisions and the free movement of labour and capital across the border."³⁵
- Partial recognition of education and grades achieved between the two countries can dissuade students from studying in the neighbouring country.
- The fees for crossing the bridge by car are a frequently raised concern and have most likely caused some unexpected diversion of traffic.³⁶
- Other infrastructure projects currently being developed in Europe might directly impact the traffic flows through the Link. The construction of the Fixed Link across the Fehmarnbelt between Germany and Denmark – expected to open mid-2029 – will most likely benefit the Øresund Fixed Link, with faster car and train journeys to the European continent. Scandinavia is Germany's seventh largest trading partner. Øresundsbro Konsortiet expects the Fehmarnbelt link to

increase road traffic on the Øresund Fixed Link by 1,000 vehicles per day.³⁷ On the other hand, the possibility of a tunnel between Helsingborg and Elsinore (Sweden to Denmark) could lead to traffic reduction, especially when it comes to freight traffic (see also the section on long-term benefits). The impact of such a project on the Øresund Fixed Link's traffic has not been assessed yet.³⁸

Partial closure of borders due to the spread of COVID-19

In 2020, the spread of the coronavirus compelled the Danish Government to close its borders with neighbouring countries such as Sweden. The Fixed Link remained open for freight traffic and trips from Denmark to Sweden. However, strict entry rules applied for trips from Sweden to Denmark – travellers could only enter the country if they had a valid reason, such as living or working in Denmark. Between 14 March 2020 – when the regulations entered into force – and 12 April 2020, car traffic was about 71% lower than during the same period in 2019. Train traffic was also severely reduced, with only one to two trains crossing the link per hour instead of six in regular times. However, positively, freight traffic has only seen a minor dip.

In its 2020 half yearly report, Øresund Konsortiet reported a 40% drop in traffic over the Jan–Jun period compared to 2019, with an equivalent drop in operating profit.

Travel restrictions began to ease in late June 2020 for people entering Denmark, depending on the level of infection in their country of residence.

PRIVATE SECTOR AND PROCUREMENT

Øresundsbro Konsortiet is responsible for negotiations with contractors. Contracts are awarded following EU procurement procedures and national legislation – usually Danish legislation.³⁹ In the construction stage, negotiations were held from July to November 1995, and deals were signed with three consortia.⁴⁰

31 Ibid

32 <https://www.globenewswire.com/news-release/2020/08/13/2077641/0/en/Half-year-report.html>

33 "Rail passengers crossing the Øresund Bridge had to change platforms and go through an ID check at Copenhagen Airport at Kastrup as well as a border check at the station in Hyllie [Sweden]" (ibid.)

34 Ibid

35 OECD (2003), *OECD Territorial Reviews: Øresund, Denmark/Sweden 2003*, OECD Territorial Reviews, OECD Publishing, Paris

36 Ibid

37 Øresundsbro Konsortiet (2018), *The Øresund Bridge and its Region: 18 years*

38 Øresundsbro Konsortiet (2020, February 25), personal interview

39 According to our interviewee, the Consortium chooses which country's legislation will be applied

40 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*

- The construction of the immersed tunnel section was awarded to the Øresund Tunnel Contractors, a consortium consisting of NCC AB (SE), Dumez-GTM SA (F), John Laing Construction Ltd (UK), E. Pihl & Søn (DK), and Boskalis Westminster (NL). The value of the contract was DKK3.8 billion (USD700 million, 1995 prices).
- The contract for constructing the artificial island and dredging was awarded to the Øresund Marine Joint Venture, a consortium of Per Aarsleff A/S (DK), Ballast Nedam Dredging b.v. (NL) and Great Lakes Dredge & Dock Co (USA). The value of the contract was DKK1.4 billion (USD0.3 billion, 1995 prices).
- A third contract was signed with Sundlink Contractors, a consortium of Skanska AB (SE), Højgaard & Schultz (DK), Monberg & Thorsen (DK), and Hochtief AG (Germany), for the

construction of the high bridge and the two 2-level approach bridges (with the motorway on the upper level and the railway on the lower level). The value of the contract was DKK6.3 billion (USD1.1 billion, 1995 prices).

Øresundsbro Konsortiet describes the procurement procedure for the construction as quite innovative. Responsibilities were clearly defined among the owner and building companies, which was described as not common at the time. As a result, the construction process went smoothly and efficiently. There has not been any overrun from the budget initially allocated for the construction of the Fixed Link until its completion.⁴¹

The procurement of cross-border train services is under the responsibility of regional transport authorities from the two countries – Skånetrafiken in Sweden and Trafikstyrelsen in Denmark.

Management

OPERATIONAL COORDINATION

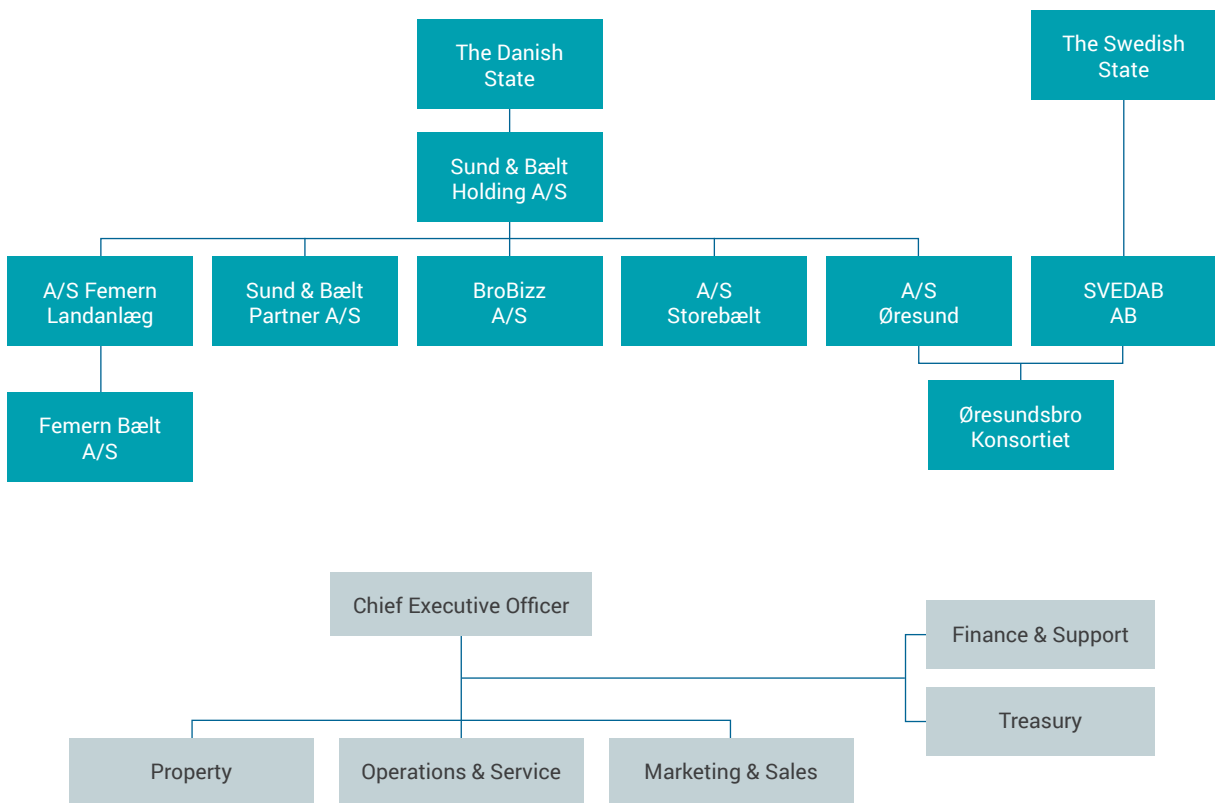


Figure 3: Øresundsbro Konsortiet ownership and management board (Source: Øresundsbro Konsortiet)⁴²

41 Øresundsbro Konsortiet (2020, February 25), personal interview.

42 Øresundsbro Konsortiet (2020), *Organisation*, <https://www.oresundsbron.com/en/info/organisation>

The Øresund Fixed Link is owned and operated by Øresundsbro Konsortiet, a Danish-Swedish company established based on the agreement of 23 March 1991 between the Governments of Denmark and Sweden. Øresundsbro Konsortiet is jointly owned by A/S Øresund and Svensk-Danska Broförbindelsen (SVEDAB), two state-owned companies.⁴³ A/S Øresund and SVEDAB are responsible for the delivery and operation of the land works on their respective sides of the Fixed Link.

As defined in the governmental agreement, Øresundsbro Konsortiet's two owners each appoint four members to the Board of Directors and nominate its Chairman and Vice-Chairman every other year. The board of directors is responsible for managing Øresundsbro Konsortiet and deciding on major strategic and economic issues. None of its members serve on the company's daily management. Day-to-day management is delegated to Øresundsbro Konsortiet's CEO, appointed by the board, and to the five department directors of the management board in charge of operations and maintenance tasks including financial administration, marketing and sales, customer and payment services, road and rail operations, maintenance, development and administrative duties.⁴⁴ The consortium manages the rail infrastructure, but rail operators are responsible for traffic on the line.⁴⁵ The consortium is also responsible for environmental compliance. Øresundsbro Konsortiet reviews the Fixed Link's environmental impact and publishes an environmental report. In the design stage, the consortium was responsible for performing the environmental impact assessment (EIA). In 2020, about 170 people work for the Consortium.⁴⁶

Traffic control and power management, as well as maintenance and railway safety coordination, are under the responsibility of Øresundsbro Konsortiet but performed by external parties.⁴⁷

The Swedish road and rail administrations are responsible for maintaining and operating the connecting infrastructure on the Swedish side and the Danish counterparts are responsible for the Danish side.⁴⁸

POLITICAL COORDINATION

In the early project stages, the Swedish Department of Communications (DOC) and the Danish Ministry of Traffic (MOT) were responsible for background investigations and reports as well as negotiations below the minister level. Representatives and officials from the Swedish Road Administration, the Swedish Rail Administration, the Swedish State Railways and their Danish counterparts were also involved in the investigations and negotiations.⁴⁹

In the design and construction stages, one of the main differences between the two countries' planning regimes concerned the formal procedures for environmental enquiries. In Denmark, the environmental assessment, through the report *Miljö Öresund 1991*, consisting of some 1,500 pages, was made public in March 1991, only a few weeks before the signing of the governmental agreement. In Sweden, the formal procedure required that the project had to be tested against different legal frameworks in several local jurisdictions before approval, which was a long and complicated process. This led to a controversial situation, in which construction on the Danish side began before the Swedish environmental enquiry was fully completed. As the environmental inquiry could influence the shape and design of the Fixed Link, but not the actual building of it, this issue did not become critical.

The planning regimes in Denmark and Sweden are, in many ways, different. In Sweden, the planning system grants extensive power to the municipal level, often referred to as the municipal planning monopoly. However, given the size and profile of the project, many of the relevant planning and decisionmaking processes were carried out at a higher political level.⁵⁰

43 Øresundsbro Konsortiet, multiple sources.

44 Øresundsbro Konsortiet (2018), *Annual report 2018*.

45 Øresundsbro Konsortiet (2008), *Facts worth knowing about the Øresund bridge*.

46 Øresundsbro Konsortiet (2020, February 25), personal interview.

47 Øresundsbro Konsortiet (2018), *Railway operations - Network Statement 2020*.

48 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*.

49 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*.

50 OMEGA centre Sweden, UCL London (n.d.) *The Øresund link - project profile*.

HARMONISATION RULES, PROCEDURES AND TECHNICAL STANDARDS

Øresundsbro Konsortiet established a specific safety procedure. The procedure is supported by statistical analysis (operational risk analysis) and is regularly updated based on experience gained from the Fixed Link's ongoing operation.⁵¹

Rail operations are regulated by the Network Statement, in agreement with Banedanmark and Trafikverket, which are both members of the Rail Net Europe (RNE), a collaboration among 40 different European infrastructure managers with the aim of facilitating cross-border rail traffic. RNE works to ensure that infrastructure managers' network statements follow a common document structure.⁵² Technical standards for the railway on the Fixed Link are defined in the Network Statement. Other technical requirements, such as alignments, environmental constraints and main civil engineering principles, are defined in the 1991 governmental agreement.⁵³

In collaboration with the relevant authorities in Denmark and Sweden, Øresundsbro Konsortiet maintains a comprehensive contingency plan, including an internal crisis response to handle accidents on the Fixed Link. The plan is tested regularly through exercises that meet requirements of the authorities and the EU.⁵⁴

COMMUNICATION AND DISSEMINATION

Øresundsbro Konsortiet includes a Marketing and Sales team, whose role it is to promote the Fixed Link and the region.⁵⁵ The Øresundsbro website contains information about Øresundsbro Konsortiet and the Fixed Link itself. The library gathers all documents published by the consortium, such as financial reports. But the website also provides operational information, such as real time traffic information for road transit in the bridge, weather conditions, fare policies and customer services (road traffic). Frequent travellers can subscribe to discount programs (such as bropass or bropass business) and access their user account.

Conclusions

- **Governance structure:** One of the major success stories of the Øresund Fixed Link lies in its independence from the political system. Politicians initially defined the project's framework and strategy, but later, Øresundsbro Konsortiet was relatively self-reliant. The two owners appoint the members of the board of directors but are not involved in day-to-day operations. Moreover, the Fixed Link is partially independent from the government budgets and thus does not answer to a national budget objective.
- **Financial risks:** Øresundsbro Konsortiet revenues are directly dependent on user traffic and can be strongly impacted by external factors such as the closure of borders or competition from other modes. In the meantime, existing transport modes between Denmark and Sweden (such as the Helsingborg–Elsinore ferry) are protected by the governmental agreement signed in 1991. This included the prevention of unnecessary distortion of the region's traffic balance resulting from the new infrastructure. Hence, road fees are capped and calculated based on the ferry taxes.
- **Procurement:** The construction of the Fixed Link went smoothly and efficiently thanks to clearly defined responsibilities among the owner and building companies. There has not been any overrun from the budget initially allocated for the construction of the Fixed Link until its completion.
- **Cross-border collaboration:** The project could have led to national competition between Sweden and Denmark, but it did not. Instead, the two countries decided to collaborate and work together on the Øresund Region, for which the Fixed Link acts as a catalyst.
- **COVID-19 management:** Borders were temporarily closed in March 2020 on the Danish side, with the management of the COVID-19 crisis very different from one country to the other. This affected the border control measures. The crisis has resulted in a significant drop in traffic and therefore revenue, however Øresund Konsortiet is still operating at a profit.

51 Øresundsbro Konsortiet (2018), *Annual report 2018*.

52 Øresundsbro Konsortiet (2018), *Railway operations-Network Statement 2020*; Øresundsbro Konsortiet (2019), *Railway operations-Network Statement 2021*.

53 Vincentsen, L. and K. Smedegaard Andersen (2018), *Risk Allocation in Mega-Projects in Denmark*, Working Group Paper, OECD Publishing, Paris.

54 Øresundsbro Konsortiet (2018), *Annual report 2018*.

55 Øresundsbro Konsortiet (2020, February 25), personal interview.