Statens vegvesen
Norwegian Public Roads Administration

The Coastal Highway Route E39 in Norway

Børre Stensvold

Bridge Director

- Norwegian Public Roads Administration
- P.O. Box 8142 Dep N-0033 Oslo, NORWAY
- borre.stensvold@vegvesen.no

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Focus on: Extreme fjord crossings along the Route E39

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Norway in 10 second

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

The worlds longest…..

Lærdal tunnel (24,5 km)

Nordhordland bridge (1246 m end-anchored floating bridge)

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

The current Route E39

- E39 Kristiansand–Trondheim
  nearly 1100 km, including 7 ferry connections
- E39 ferry connection Kristiansand–Hirtshals
- Aalborg: The E39 joins the E45 which continues to Italy
- Varied road standard

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

An improved and ferry free E39

- Open road 24/7
  7 ferry connections removed
- Travel time reduced from 21 hours to 11 hours
- New solutions and new competence
  - Similar bridge solutions have never been built before
- National Transport Plan 2018 – 2029
  - Ambition confirmed
  - Estimated cost of 45 billion USD (340 billion NOK)

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

The National Transport Plan (NTP) 2018 – 2029

- Presented in April 2017
- The goal is maintained: The E39 is to become a continuous route without ferries
- June 2017: Adopted by the Parliament (Storting)
- Strong focus on cost cutting
  - Reductions possible as a result of technological development

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Challenging fjord crossings

Fiord	Length (km)	Depth (m)
Halsafjorden	2	5-600
Julsundet	1.6	5-600
Romsdalsfjorden	13	330
Sulafjorden	**3.8**	**500**
Vartdalsfjorden	2.1	600
Nordfjorden	1.4	500
Sognefjorden	**3.7**	**1250**
Bjørnafjorden	**5**	**550**
Langenuen	1.3	500
Boknafjorden	27	390

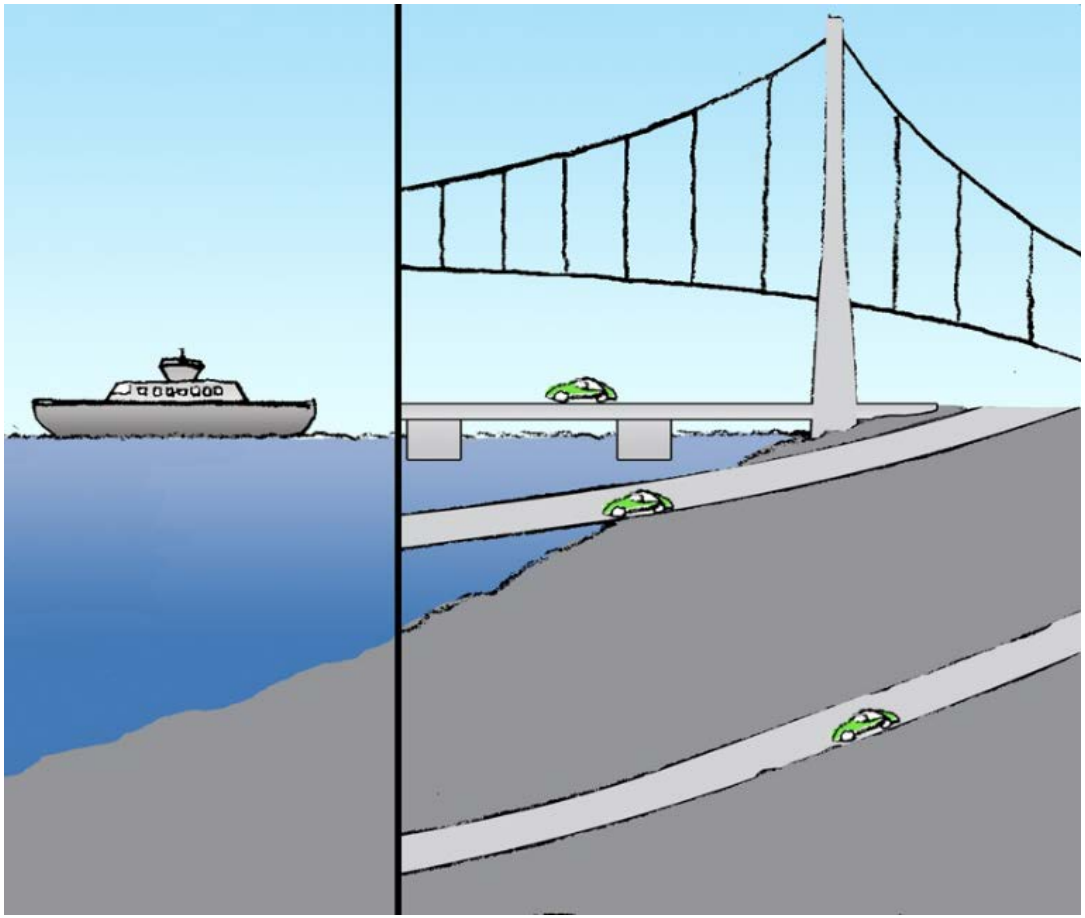
= subsea tunnel

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Alternative solutions for the large fjord crossings

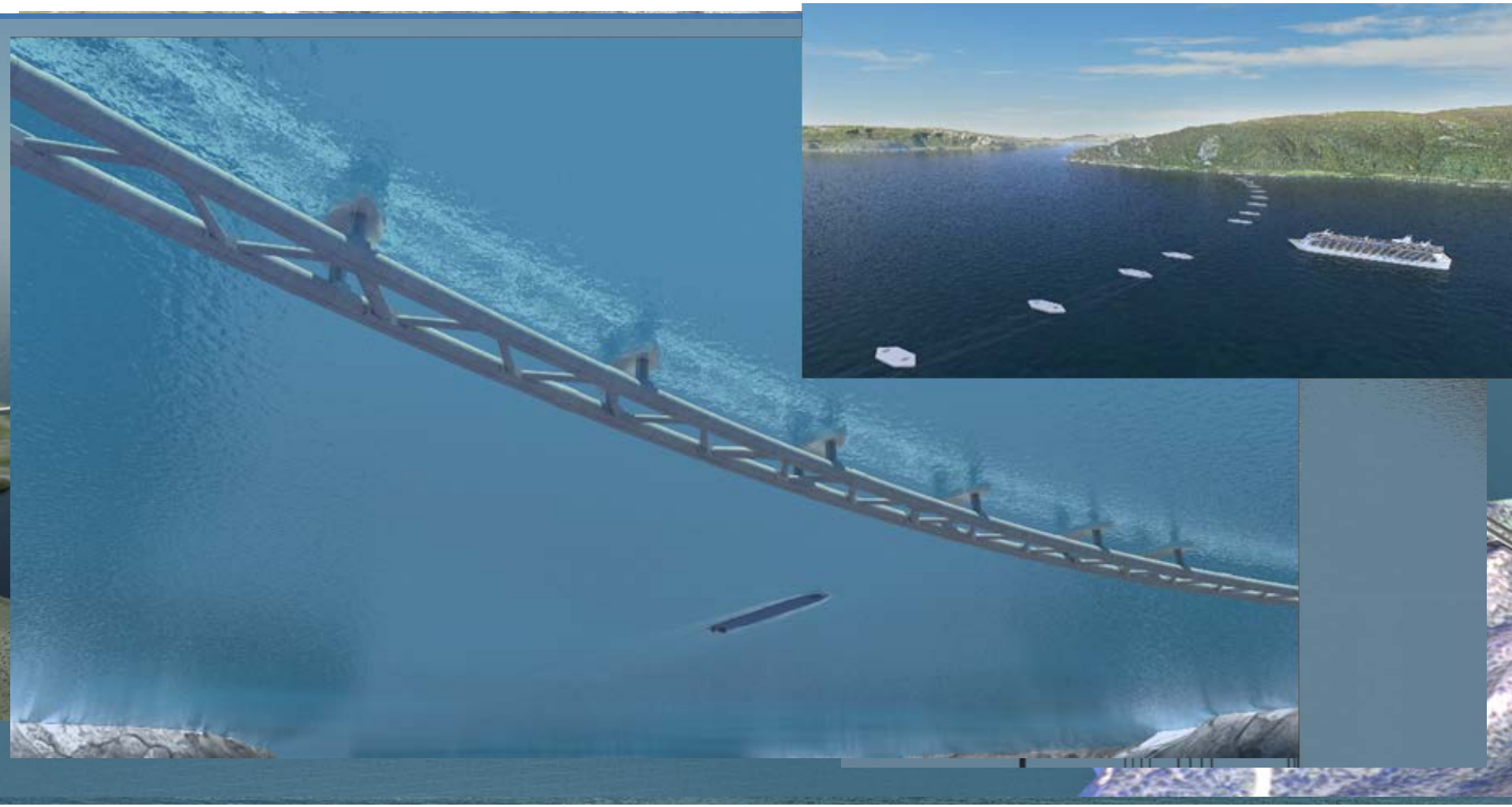
- Suspension bridge
- Floating bridge (combined with suspension/cable-stayed bridges)
- Submerged floating tube bridge (floating tunnel)
- Immersed tunnel/ subsea rock tunnel



The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Conceptual design – across the Sognefjord



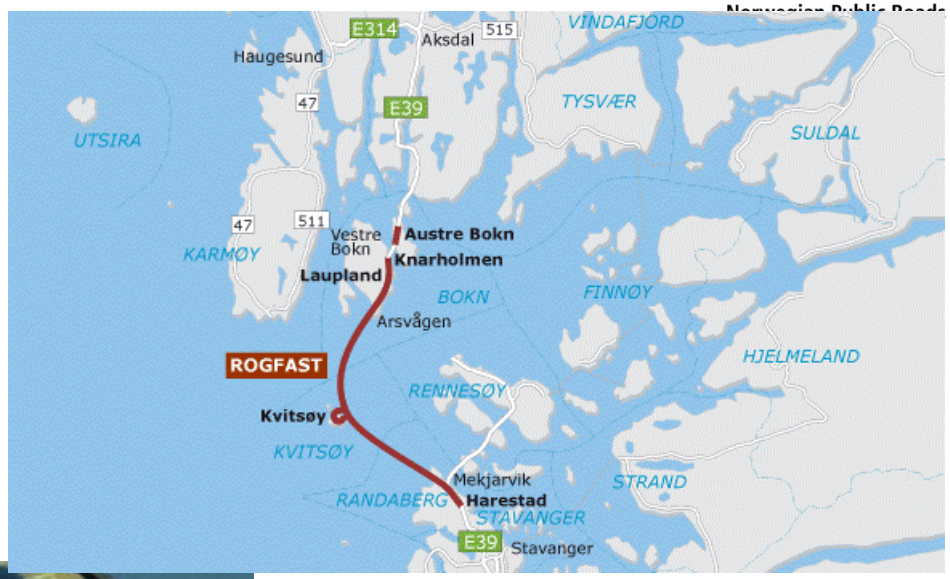
The Coastal Highway Route E39

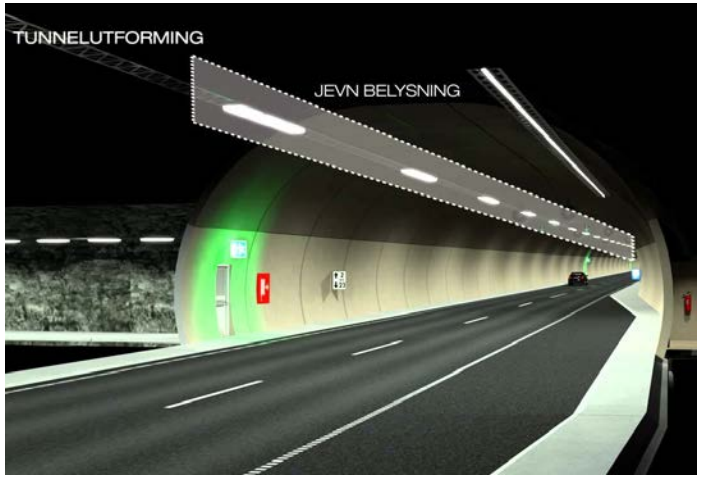
Statens vegvesen

Sub Sea Rock Tunnel

Prefered solution on the following crossings (known technology, but streched):

- Boknafjorden (opening for traffic in 2025 or 2026)
- Romsdalsfjorden





The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Single-span Suspension bridge

Prefered solution on the following crossings (proven technology):

- Julsundet
- Nordfjord
- Langenuen

Considered a viable option on the following crossings (new technology):

- Halsafjord
- Vartdalsfjord
- Sulafjord*
- Sognefjord*

*span of approx. 3 km or wider

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Multi-span Suspension bridge with fixed towers

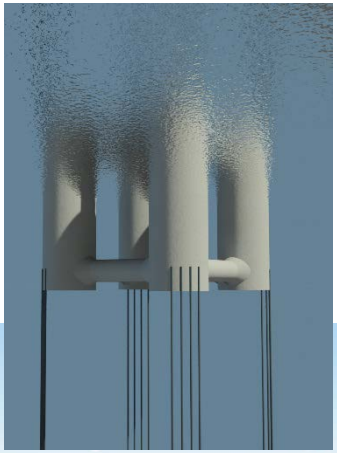
Considered a viable option on the following crossing:

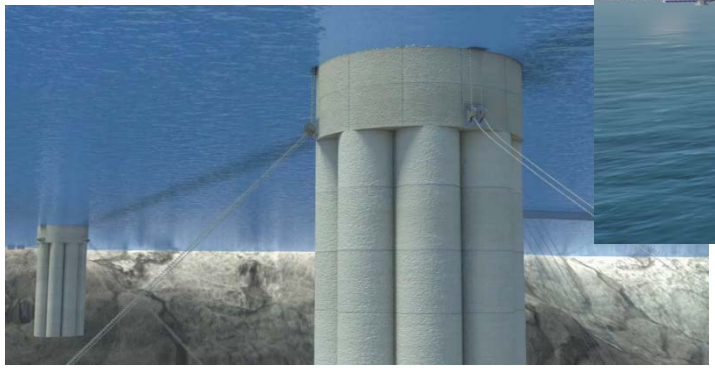
- Sulafjorden

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Multi-span Suspension bridge with floating towers





Considered a viable option on the following crossings:

- Halsafjord
- Vartdalsfjord
- Sulafjord

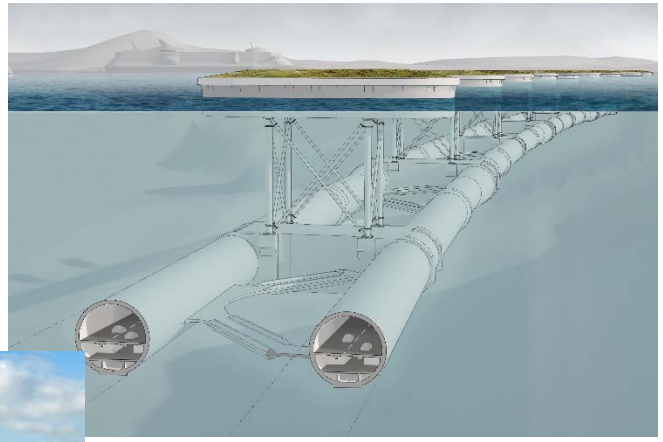
The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Submerged Floating Tube Bridge

Considered a viable option on the following crossings:

- Sulafjorden
- Sognefjorden



The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

End Anchored Floating Bridge

Considered a viable option
on the following crossings:

- Halsafjorden
- Bjørnafjorden

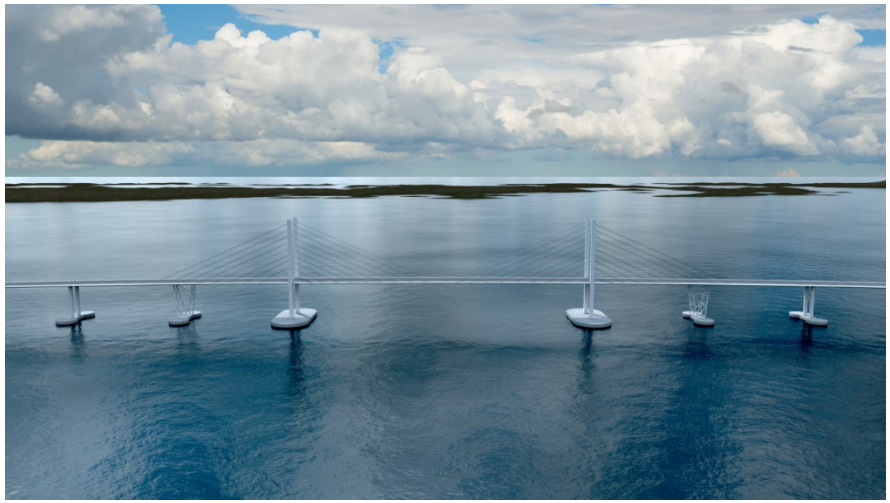
The Coastal Highway Route E39

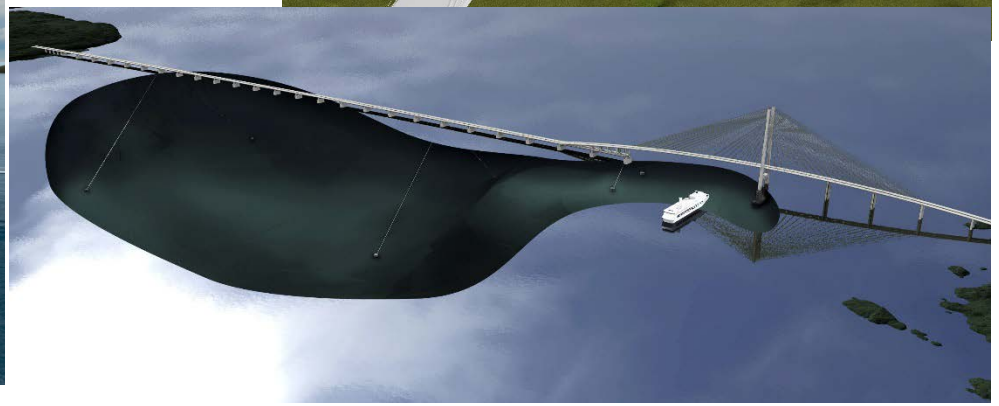
Statens vegvesen
Norwegian Public Roads Administration

Side Anchored Floating bridge

Considered a viable option on the following crossings:

- Halsafjorden
- Bjørnafjorden

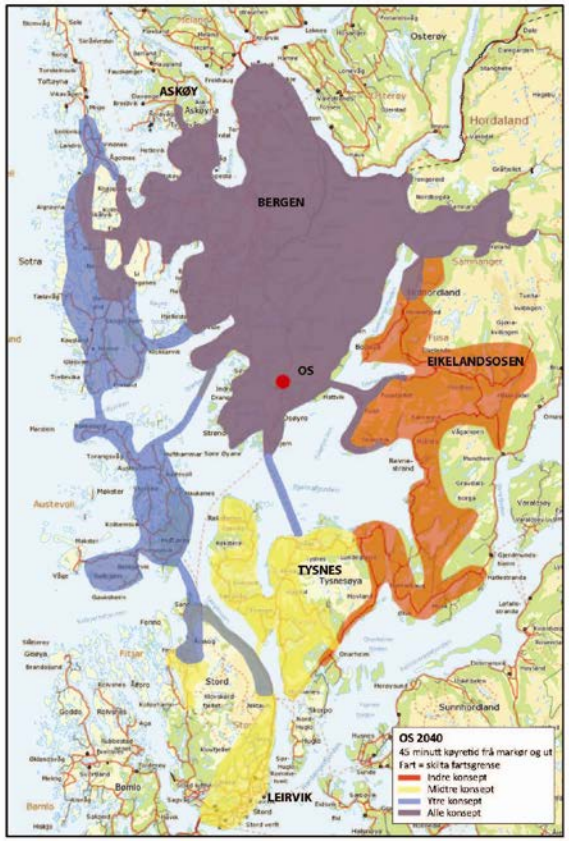




Statens vegvesen
Norwegian Public Roads Administration

Impact on Society

- Large positiv Socio-Ecomonic impact
- Big influencer of Regional Development
- Redefining housing and labour markets along the Route through increased mobility for users
- Will be a “Gamechanger”

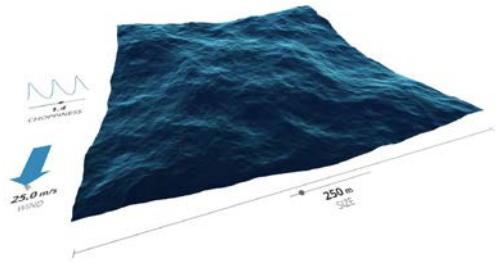


The Coastal Highway Route E39

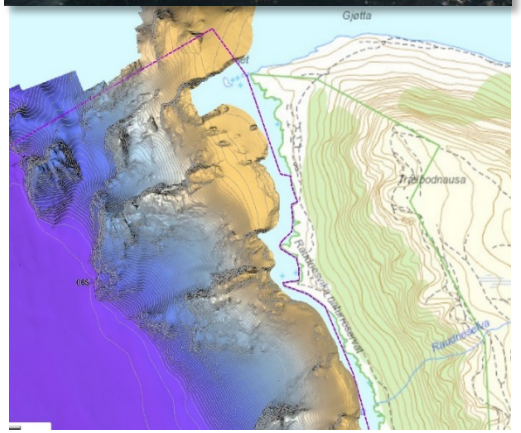
Statens vegvesen
Norwegian Public Roads Administration

On-going investigations

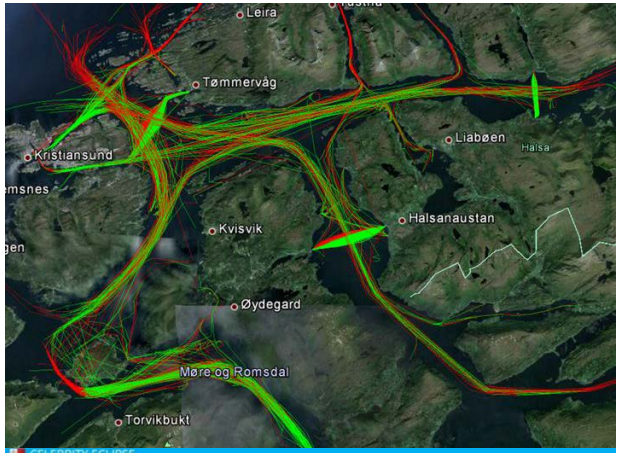
Environmental data

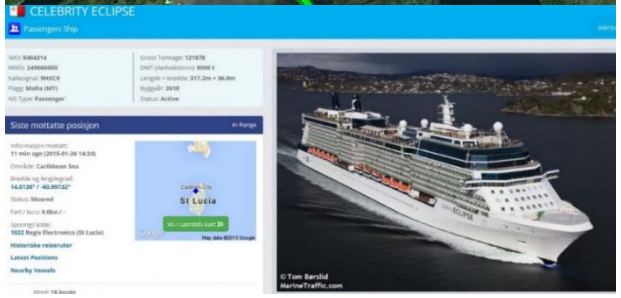


Ground assessment



Risk of ship collision





The Coastal Highway Route E39

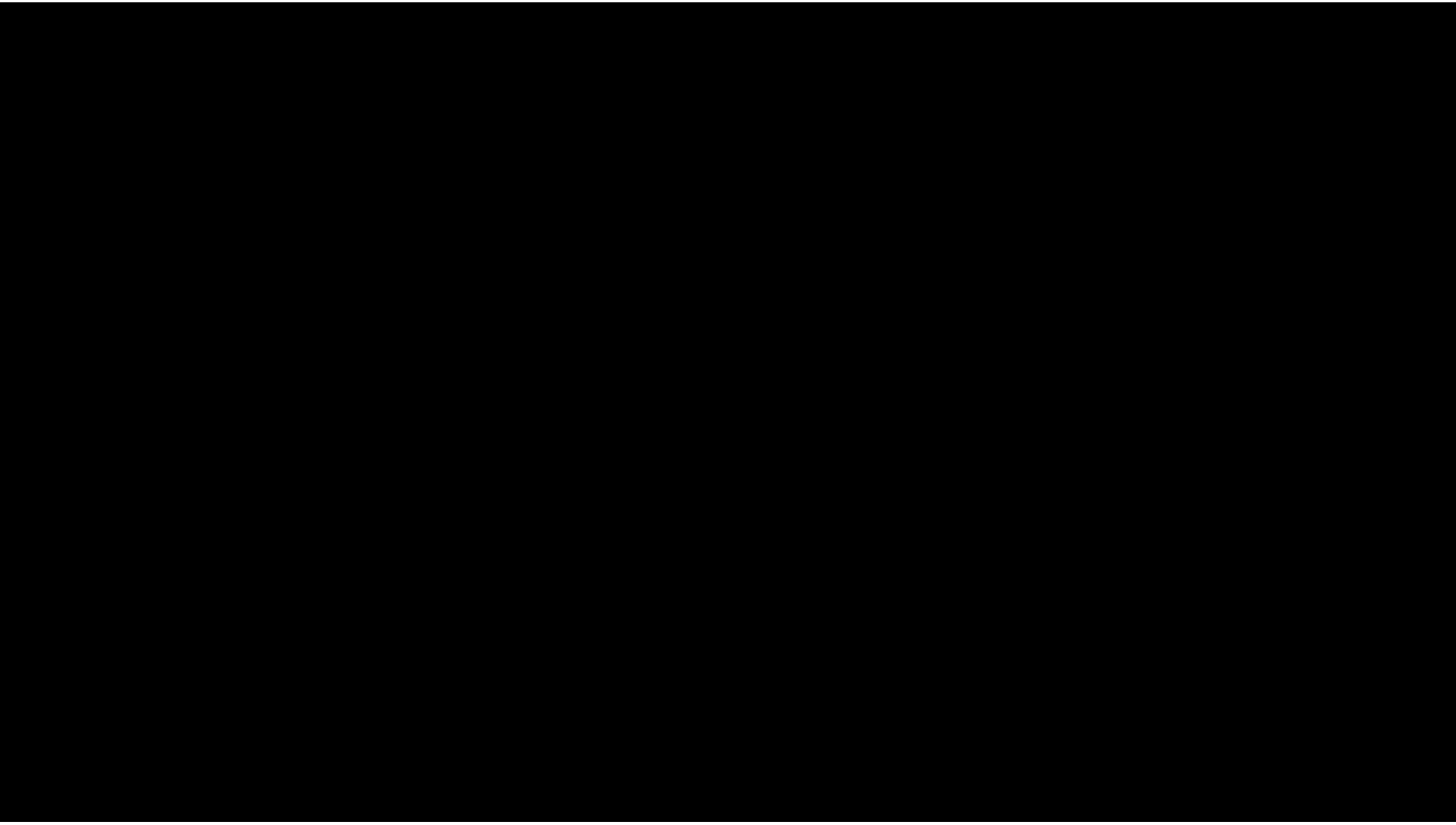
Statens vegvesen
Norwegian Public Roads Administration

Environment

- Major construction-related impact in a vulnerable coastal landscape
- Emissions of greenhouse gases are to be cut
  - Emissions over a 40-year period will be almost the same as for today's E39 – despite strong increase in traffic volumes
- Underlying parameters are constantly changing; new energy sources exploited
  - Electricity, biofuels and hydrogen
  - Calculations are based on today's vehicles, ferries etc.

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration



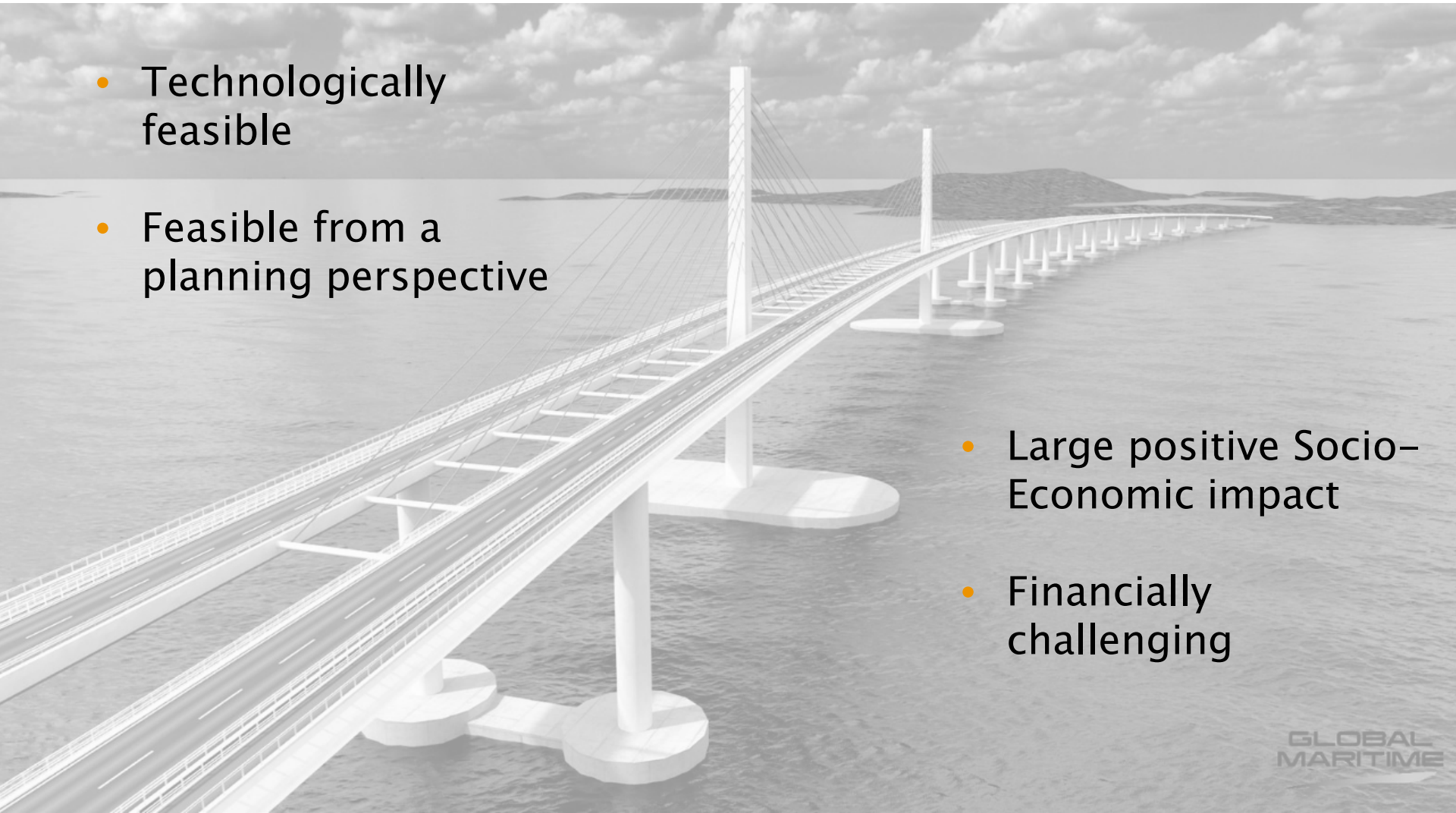
The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

YouTube

Statens vegvesen
Norwegian Public Roads Administration

Summary



- Technologically feasible
- Feasible from a planning perspective
- Large positive Socio-Economic impact
- Financially challenging

GLOBAL MARITIME

The Coastal Highway Route E39

Statens vegvesen
Norwegian Public Roads Administration

Thanks for your kind attention!