



## Proposal for a Submerged Floating Tube Bridge as part of the Bømlafjord crossing

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### Abstract

A proposal for a Submerged Floating Tube Bridge as part of a scheme for a new and improved fixed link along the E39 route, across the Bømlafjord in Norway, is presented. The existing crossing is not able to satisfy the provisions of the increase in traffic and the new rules on the road alignment and gradient. The new requirements, including the need of a carriageway with two lanes for each direction, imply a complete replacement of the existing tunnel with a longer one. The possibility to substitute the new bridge, necessary for the northern part of the crossing, with a SFTB (Submerged Floating Tube Bridge) allow to reduce the parts of the tunnel in the southern part that have to be substituted. The advantages of the proposed scheme for the crossing are evaluated and discussed. A comparison, in terms of costs, of the different solutions for the design is presented.

**Keywords:** Bridges; Offshore Structures; Tunnels

### 1 Introduction

The E39 is an existing road connecting Kristiansand with Trondheim, on the west coast of Norway.

The project commissioned to the Norwegian Public Road Administration (NPRA) is related to the replacement of the ferry lanes along the E39 with fixed bridge crossings. To fulfill the

requirements of the new rules, in terms of road geometry, alignment, gradient, safety and the traffic provisions, the project implies an adjustment of many road sections along the 1100 km European road.

Bømlafjorden, located south of Bergen, is one of the existing crossing along the E39 which will require an adjustment intervention. A more traditional solution of building another bridge by