

The Follo Line

Norwegian railway: building for the future



The Follo Line is currently the largest transport project in Norway. The new double track line between Oslo Central Station and the public transport centre of Ski, includes the country's longest railway tunnel (19.5 km).

The Follo Line is planned as a high-speed rail line through twin tunnels for maximum tunnel capacity, safety and availability for maintenance. The project also facilitates a potential high-speed line to the continent.



Jernbaneverket



Two single bore tunnels will give the new double track line Oslo-Ski both a significant degree of flexibility and modern level of rail safety.

Punctual service between cities

Four tracks to Oslo Central Station, as the hub of Norway's passenger rail network, represents a new era for traffic between cities south-east of Oslo. From a railway engineering perspective, to incorporate two new lines into this most densely trafficked area, is a complex challenge. Construction works is scheduled to commence 2014, but important preparations have already started. The project is due to be completed in 2019.

Swift and accurate construction

A project of such a large scale has the potential to adversely affect people and the natural environment during construction. Thorough planning is essential to keep progress, costs and environmental impact under control. Progress is determined by the need for a secure and watertight tunnel and will involve major material requirements as well as the transportation of tunnel spoil.

Challenges and requirements

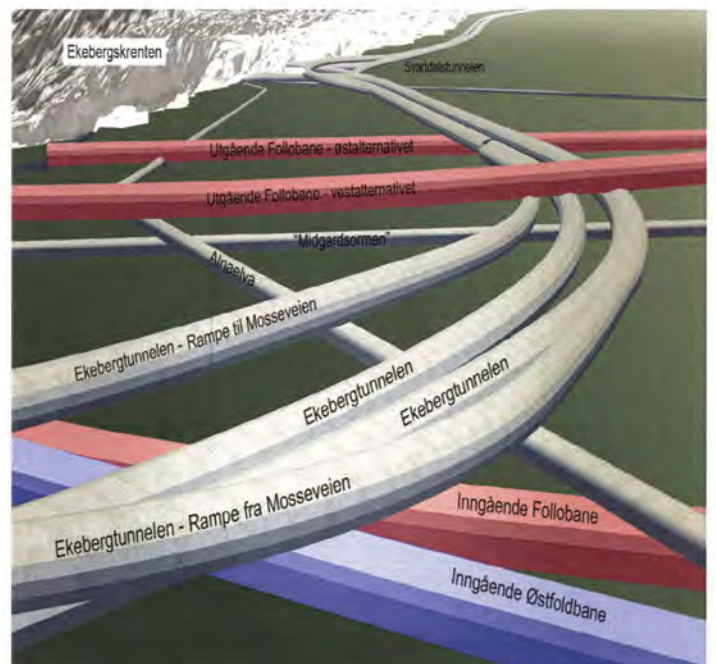
The Follo Line comprises four sub-projects:

Oslo Central Station: From the starting point at Oslo Central Station and before entering the long tunnel, the new line runs through busy areas, as well as the oldest part of the city, with ancient settlements of significant archaeological and historical interest. A major challenge is to integrate the new line with existing systems at Oslo Central Station, and to implement restrictions regarding the use of the historical area.

The surface section: The approach to the small city of Ski will require retaining walls and culverts, cut and cover solutions.

Ski station: The new Ski station will be rebuilt and expanded to include six tracks and three centre platforms. Accessibility and transfer within the station area will be improved to make the journey efficient, comfortable and easy for the passengers.

The tunnel: The long railway tunnel (19,5 km), is the first Norwegian rail tunnel to be built with two separate tubes. The Norwegian National Rail Administration is considering both blasting/drilling and tunnel boring machine. Both methods are prepared for. A combination of drill and blast and TBM is also an option.



Building the Follo Line (in red) through the already crowded Ekeberg hill will be an engineering challenge.

- ▶ Building for the future.
- ▶ The Follo Line must satisfy tomorrow's requirements for safety and reliability.
- ▶ Maintainability solutions must last for a lifetime.

Spoil management and opportunities

Suitable land fill-sites and environmentally-friendly use of tunnel spoil are also being considered. Regardless of the construction method, it will be necessary to dispose of around 11 million tons of spoil from the tunnel. This will take place over a period of around 3-3.5 years. The spoil extracted represents a potential resource.

A 'greener' construction

The Norwegian National Rail Administration is the first organisation in Norway to formulate a green budget governing the choice of materials and solutions in major transport projects. As a pilot project the Follo Line has an environmental budget to detail the potential environmental impact of construction, operation, maintenance and disposal of the Follo Line's infrastructure from a life cycle perspective.

Responsibility

The new double track line from Oslo Central Station to the public transport centre of Ski, the Follo Line, will be constructed by the Norwegian National Rail Administration. The Rail Administration is responsible for the management of the national railway network, on behalf of the Ministry of Transport and Communication.

Tunnel geology

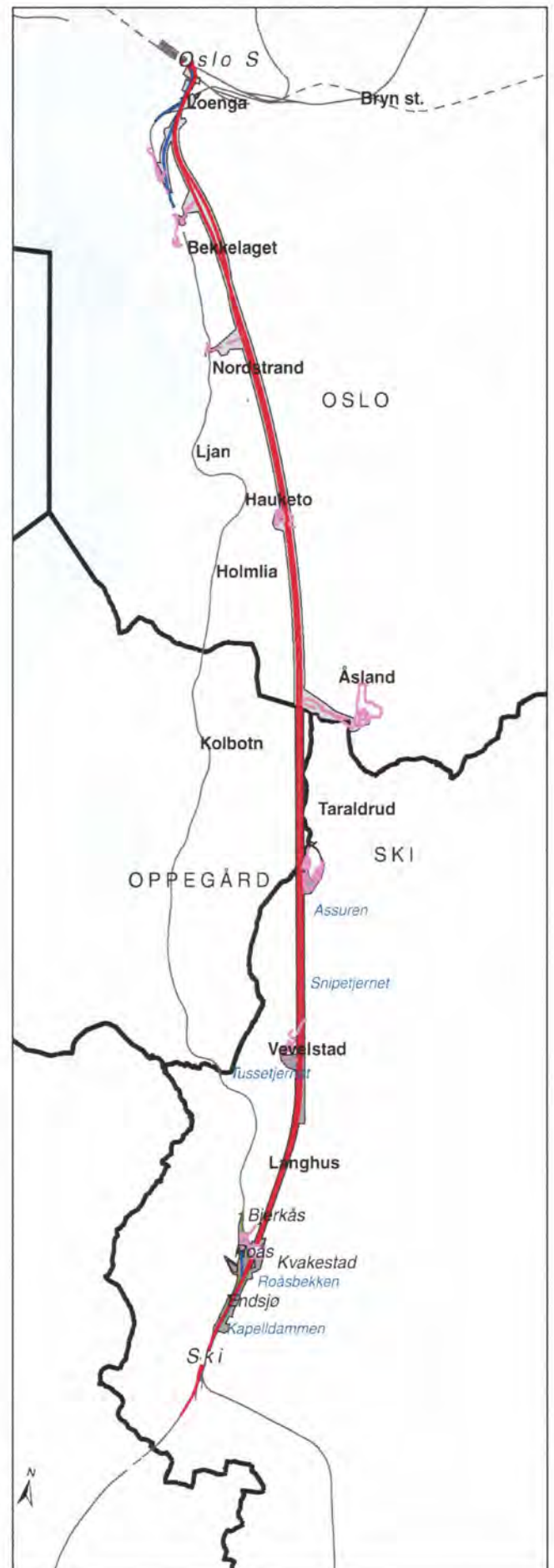
- ▶ Gneiss with fractured zones and intrusions
- ▶ Borability, DRI: 27 - 52 and CLI: 4 - 14
- ▶ Degree of fracturing: 1- 2
- ▶ Good stability of the rock mass

Main planning - The Follo Line

- ▶ 2011: Impact assessment - Approved
- ▶ 2012: Area development plan for public scrutiny - Detail planning
- ▶ 2013: Permission from the Ministry of Transportation and Communications to start the civil works
- ▶ 2014: Start of main civil works - according to current plan
- ▶ 2019: Finalised project - according to current plan

"Our aim is to offer more frequent and faster trains to the ever-increasing population."

Anne Kathrine Kalager - Project Director



About the Follo Line

- 22 km of new double track line between Norway's capital Oslo, and Ski
- Construction phase scheduled to commence in 2014
- Designed for 200 km/h/250 km/h
- 19.5 km tunnel
- Two separate twin bore tunnels with cross-passages every 500 metres
- Both TBM and drill and blast are being considered
- The project facilitates a potential high-speed line to the continent
- 1.1 million residents in the Oslo region
- 150,000 passengers daily
- 30 % increase in population and jobs anticipated by 2025
- Great potential for increased freight traffic

Norwegian National Rail Administration
Mailbox 4350
2308 Hamar, Norway
Telephone (+47) 05280
follobanen@jbv.no