

## Transport policy

Switzerland lies at the heart of one of Europe's most important freight transport axes. Every year around 26 million tonnes of freight is transported through the Swiss Alps by rail and 80 per cent of this is transit traffic. Studies have concluded that this volume will continue to increase.

Switzerland wants to promote forms of transport that are efficient, environmentally friendly and space-saving. The population has voted on several occasions to move transalpine traffic from road to rail. The Gotthard Base Tunnel is a core element of Swiss transport policy. By providing an efficient rail infrastructure, Switzerland aims to offer an alternative to road transport through the Alps for freight and passengers.



## Financing

The popular vote held in November 1998 secured the long-term funding for the New Rail Link through the Alps (NRLA) and three other major rail projects by establishing the fund for the financing of public transport projects (FinPTO fund). It is financed from three sources: the Heavy Goods Vehicle Charge (HGVC, 60 per cent of the funding), mineral oil tax (10 per cent) and VAT (30 per cent).

In addition to the NRLA, the FinPT fund is also financing the expansion of the rail infrastructure (Rail 2000 and ZEB), the connection to the European high-speed rail network and the project to reduce noise on the railways. From January 2016, the FinPT fund will be replaced by the Rail Infrastructure Fund (RIF), which will finance the entire rail infrastructure.

## Construction

During the construction of the Gotthard Base Tunnel, the tunnellers had to bore through a wide variety of different rock strata, from hard granite to crumbly sedimentary rock. Tunnel boring machines carried out 80 per cent of the work in the main tunnels and conventional blasting methods were used for the remaining 20 per cent. A total of 28.2 million tonnes of excavated material was removed from the tunnel.

In order to save time and money, the tunnellers worked on different sections of the tunnel at the same time. Workers, materials and machinery were transported to the construction sites in the mountain via access galleries and shafts. With rock cover up to 2,300 metres in depth, the Gotthard Base Tunnel is the deepest rail tunnel in the world. The temperature inside the mountain reached as high as 50 degrees Celsius.



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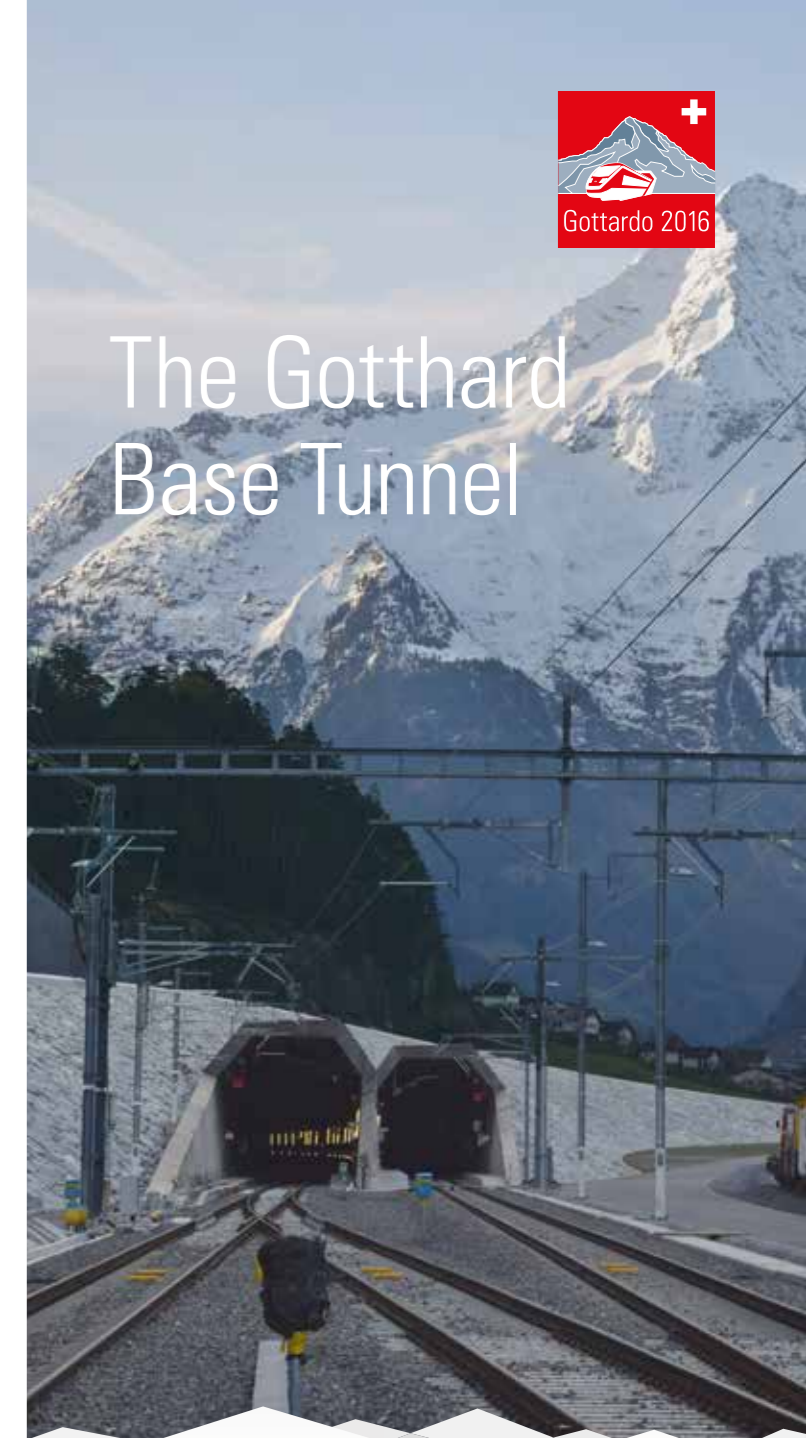
Tunnel construction company: AlpTransit Gotthard AG (ATG)

Tunnel operator: SBB AG

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# The Gotthard Base Tunnel



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## Freight traffic

The level rail route through the Gotthard brings major benefits for freight traffic. It allows for longer, heavier trains, fewer locomotives and shorter journey times. The efficiency and reliability of rail freight traffic will increase, making it more competitive. In addition, the transport capacity of the route will increase. As many as 260 freight trains will be able to pass through the Gotthard Base Tunnel every day. On the historic mountain route, the maximum number was 180.

In future, freight trains travelling through the Swiss Alps will no longer require an additional bank engine, which eliminates the need for time-consuming shunting. This means that the tunnel will be able to absorb the expected increase in the volume of goods being transported on the north-south route.



## The tunnel

On 11 December 2016, the Gotthard Base Tunnel will come into scheduled operation. At 57 kilometres in length, it is the longest rail tunnel in the world. It has virtually no gradients and its highest point is 550 metres above sea level. It will allow passenger trains to travel more quickly through the Alps and reduce the number of locomotives needed by freight trains. The Gotthard Base Tunnel will also shorten the travelling distance between Aldorf (UR) and Bellinzona (TI) by 30 kilometres.

During peak periods, around 2,400 people were working on the tunnel construction around the clock in 3 shifts. For the 2 main tunnels and the safety, ventilation and cross cuts, a total of 152 kilometres of tunnel has been bored. Excluding the exploratory work, the construction project has taken 17 years.

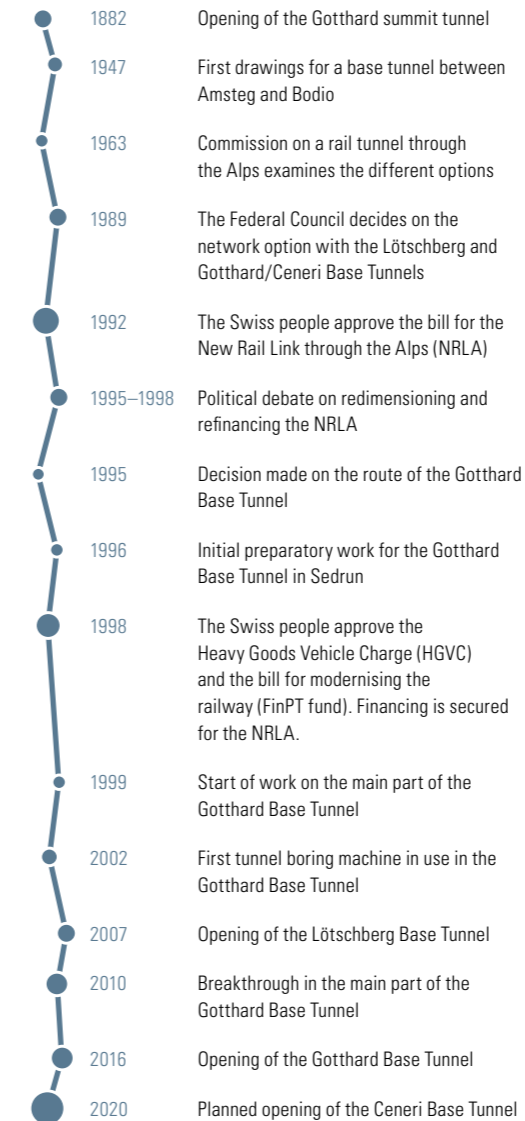


## Passenger traffic

More than 20 million people in the catchment area between southern Germany and northern Italy will benefit from the Gotthard Base Tunnel. Thanks to the level route, train connections will be faster, more reliable and more punctual. Passenger trains will travel every half hour on the north-south axis.

Passenger trains generally travel through the tunnel at a speed of up to 200 km/h. In future, top speeds of up to 250 km/h are possible. The reduction in journey times will gradually become noticeable from 2016 onwards. Once work on the entire length of the Gotthard axis (incl. Ceneri Base Tunnel) has been completed, the journey between Zurich and Lugano will be around 45 minutes shorter.

## The Gotthard history



## Facts and figures

- Length: 57 km (the longest rail tunnel in the world)
- Duration of tunnel journey: a little under 20 minutes
- Two single-track tubes, connected by cross cuts every 325 m
- Total length of all the tunnels: 152 km
- Northern portal in Erstfeld (UR), southern portal in Bodio (TI)
- Highest point of the tunnel: 550 m above sea level
- Maximum rock cover: 2,300 m
- Construction time (excluding exploratory work): 17 years
- Main tunnels drilled with tunnel boring machines (80 %) and blasted (20 %)
- Excavated material: 28.2 million tonnes
- Cost of the Gotthard Base Tunnel: CHF 9.7 billion (cost dating from 1998, excluding increase in VAT and construction interest; effective total cost: CHF 12.2 billion)
- Cost of the entire NRLA, including the Lötschberg, Gotthard and Ceneri Base Tunnels: CHF 18.2 billion (cost dating from 1998, excluding increase in VAT and construction interest; effective total cost: approx. CHF 23 billion)
- Tunnel capacity: up to 260 freight trains and 65 passenger trains per day
- Timetabled speed: freight trains 100 km/h; passenger trains up to 200 km/h
- Maximum speed: freight trains 160 km/h; passenger trains 250 km/h
- Train protection system with cab signalling (ETCS Level 2)
- Reduction in journey time from Zurich to Lugano after completion of the axis (from 2020): around 45 minutes
- Official opening of the Gotthard Base Tunnel: 11 December 2016