

Swiss pioneering project heralds the dawn of a new travel era

Construction of the world's longest train tunnel in Switzerland took 17 years. Travel through it takes some 17 minutes. The new Gotthard Base Tunnel is a project of pioneering proportions – a once-in-a-century structure extending for 57 kilometres through the Alps. On Sunday 11 December 2016 the two-way tunnel enters into scheduled service, taking north-south-north travellers far quicker and more comfortably through the mighty mountain massif.

Every winter sees the introduction in Switzerland of a new nationwide timetable, coordinating all public transport services across the entire country. This year will also see something extra special – the dawn of an exciting new travel era. The entering into service of the Gotthard Base Tunnel on Sunday 11 December 2016 will reduce travel time on Europe's most important north-south-north rail route by up to 40 minutes. The once-in-a-century structure extends for 57 kilometres through the mighty mountain massif, down to depths of up to 2300 metres. The tunnel will not only bring northern and southern Switzerland and Europe closer together by some 40 track kilometres – it will also eliminate the 1400-metre difference in high-Alpine altitude. When Switzerland's Ceneri Base Tunnel opens in 2020 the flat track along the entire north-south axis will also become a remarkable reality.

Boring and blasting on five fronts

Starting point for the building of the Gotthard Base Tunnel was Sedrun (Canton Graubünden) in 1999, when two 800-metre shafts were bored deep into the Alpine interior. Two further access shafts followed at Faido (Canton Ticino) and Amsteg (Canton Uri). Together with the Gotthard north portal in Erstfeld and south portal in Bodio, they formed the five simultaneous starting points for construction of the longest train tunnel in the world. Excavation followed at all five sections, simultaneously and coordinated with pinpoint precision – which speeded up construction time and also reduced costs. Up to four tunnel boring machines each 450 metres in length were in operation at any one time, penetrating the strata of rugged rock. Together they accounted for some 80 percent of the nearly 152 kilometres of excavation work. Only 20 percent of the total tunnel and gallery system were achieved by blasting. The tunnel teams worked through a total of 13 layers of rock, excavating more than 28 tons of material out of the mountain.

In harmony with nature

No less than 99 percent of the excavated material found sustainable re-use. A large quantity of the spoil has been used to make concrete for the inner lining of the tunnel, for renaturation of construction site surroundings and for island regeneration of the shallow water zone on Lake Uri. The Gotthard Base Tunnel does not follow a perfectly straight line. It is curved due to geological factors and geographical criteria, such as the location of reservoirs and access routes to construction sites. With an altitude difference of only 148 metres between the north and south portals, the tunnel passes beneath the Alpine massif almost horizontally. Compared to train travel over the winding Gotthard mountain route with its 1400-metre altitude difference, the journey through the new Gotthard Base Tunnel saves not only time but also valuable energy resources.

Precision planning and punctuality

On 15 October 2010 Switzerland celebrated the main breakthrough at the first of the two parallel tunnel tubes. The second followed five months later. By summer 2016 the entire facilities and operational technology had been installed. On 1 June the Alp Transit Gotthard company handed over the completed tunnel to the Swiss Federal Railways (SBB) – on time and on budget. The ceremonial inauguration was attended by the heads of government of neighbouring Germany, France and Italy, highlighting the European importance of Switzerland's achievement. As the focal point of the wider-ranging New Rail Link through the Alps (NRLA), the Gotthard Base Tunnel will play an essential role in facilitating goods and passenger transport far into the future. The tunnel has been so conceived and constructed as to eliminate the need for major maintenance during its predicted life span of at least 100 years.

More trains – faster travel times

The Gotthard Base Tunnel enters into regular service on Sunday 11 December 2016. From the first day train travel on the north-south axis will be much faster and more frequent. The number of trains travelling between German-language Switzerland in the north and Italian-language Switzerland in the south will increase by a quarter. The new tunnel will also permit longer train compositions than those on the old mountain route with its 1400-metre difference in Alpine altitude. Passenger carrying capacity on the north-south axis will rise from the 9000 annual average today to a predicted 15,000 in 2021 – and up to double by the year 2025. This is attributable also to the additional opening in 2020 of the Ceneri Base Tunnel south of the Gotthard Base Tunnel. Passengers will then save a further 30 minutes in travel time. The journey from Lugano to Lucerne will take only 1 hour 47 minutes; and from Milan (Italy) to Zurich only 2 hours 58 minutes – more than an hour faster than today's travel time. Shorter travel times mean that passengers will in future have more opportunity to discover the many delights of their destinations north or south of the Gotthard.

Highest security in the world's deepest tunnel

In creating this once-in-a-century structure Switzerland has invested millions to ensure trouble-free operation and maximum safety over the next 100 years. The Gotthard Base Tunnel features the most modern security installations for the protection of passengers and personnel. The separate tunnel tube system eliminates any risk of head-on collision. The parallel tunnels are linked by cross-passages every 325 metres, allowing for fast access to a safe area. Train control and monitoring systems will ensure automatic and early detection of any irregularities. In such an event, multifunction stations located one and two thirds along the route (at Faido and Sedrun) will serve as emergency stopping points. Emergency lighting, handrails, signage and trained staff will assist passengers to find their way from one tunnel tube to another. At the tunnel's north and south portals, rescue services will be on stand-by and able to evacuate passengers to safety within five minutes. Four rescue exercises have already been carried out in advance of the entering into service of the Gotthard Base Tunnel. All met their target – the evacuation of all passengers from the tunnel within 90 minutes.

Source: ATG, https://www.alptransit.ch/fileadmin/dateien/media/publikationen/atg_broschuere_e_2012_lq.pdf

SBB, <https://www.sbb.ch/en/group/media/dossier-medienschaffende/gotthard-basistunnel.html>