Lötschberg Base Tunnel

bls connects.

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Regional, national and for Europe

The Lötschberg base tunnel is a firm fixture in the Swiss transport landscape. More than 300,000 trains passed through the tunnel from the day it opened in 2007 until 2017. Whether commuters on their way from Valais to Berne, holidaymakers travelling from Germanspeaking Switzerland to the Valais mountains or business travellers making the journey to northern Italy, the tunnel reduces the journey time for them all.

Freight too, largely in containers, passes through the Lötschberg section of the Rotterdam–Genoa international corridor at all hours of the day and night. In tandem with the mountain route via Kandersteg and Goppenstein, the base tunnel forms a complete alpine transit system. A new record was set in 2017 when 35.7 million gross tonnes were transported on the Lötschberg axis, in other words on the basic section and the mountain line. The market share of the Lötschberg in Swiss transalpine freight transport is therefore 54 percent.

This masterpiece of technical and civil engineering is now traversed by around 50 passenger trains and up to 60 freight trains per day. Utilisation of the tunnel's capacity therefore averages over 80 % and on some days even 100 %, which means that trains have to rely on skilful traffic management to keep things running smoothly.

While the tunnel needs to be able to cope with the anticipated growth in traffic, the 21-km-long single-track section greatly restricts its ability to do so. To make rail freight an even more attractive option than road haulage, capacity of the former must be sufficient to meet demand. At the same time, there have been calls for quite a while now to introduce half-hourly passenger rail connections to the Valais. In order to meet both objectives, an expansion is unavoidable. It guarantees a second functioning transit axis through the Alps in addition to the Gotthard axis.

Only an extended base tunnel will create the flexibility required for timetable scheduling and thus ensure that the policy of shifting freight from road to rail can continue to be successfully implemented.

We are proud that we, the strongest independent private railway company in Switzerland, have been permitted to operate this tunnel and participate in the future of this interface of regional, national and international railway transport! The aim must be to ensure that rapid transit in both directions between the north and the south remains possible in the future.

Have a good trip!

Daniel Wyder
Member of the BLS Executive Board
Head of Infrastructure

The NRLA concept

The NRLA, the New Rail Link through the Alps, is a key element in the expansion and modernisation of Switzerland's rail infrastructure.

The NRLA mainly includes the three base tunnels at the Gotthard, at the Lötschberg and at the Monte Ceneri (scheduled to open in time for the 2020/2021 timetable change) with expansion of the access routes. The Federal Government's intention is that this epic feat of construction will make rail an attractive alternative to road transportation for both freight and passengers. New north–south rail connections, offering a substantial expansion of alternatives and capacity, will enable more trans-alpine traffic to be diverted away from the roads and therefore relieve the strain on the road system. As part of this diversionary strategy, the NRLA is financed by means of a special fund that is largely financed by the heavy-vehicle fee (HVF), VAT shares and tax revenue from mineral oil.

The Swiss electorate voted for the NRLA concept in 1992 and the funding model to bring it about in 1998 (FinöV) by decisive majorities.

Objectives of the NRLA

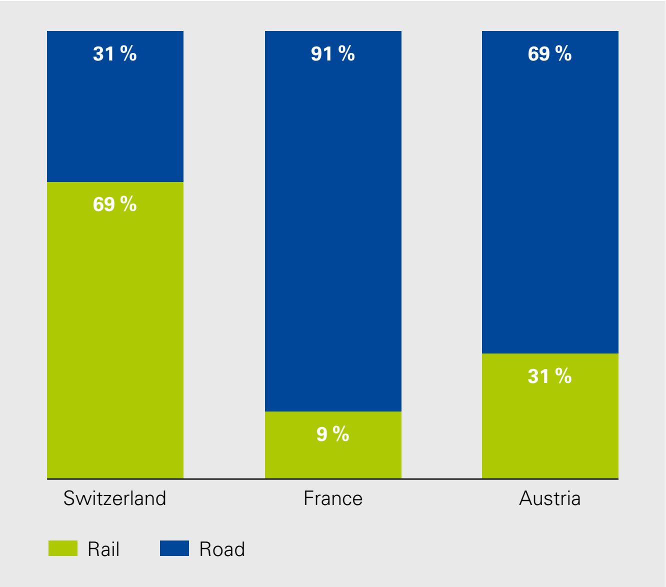
Passenger traffic
- Making Switzerland part of the European high-speed rail network
- Better links to Europe's major cities
- Improved connections for peripheral cantons such as Ticino and Valais
- Reduction in journey times by up to 30 %

Freight traffic
- Increase in trans-alpine freight transit capacities
- Improvements in efficiency through lower gradients and larger route profiles
- Increase in operational quality
- Reinforcing the competitive position of rail
- Implementation of the Alpine Protection Act

The NRLA in the European context

Its central location makes Switzerland an important hub for European rail transport. Italy's ports, the key economic regions of Lombardy and Piedmont and industries in Germany, Belgium and the Netherlands and as far as Scandinavia and the UK require efficient, reliable transport connections.

Around 100 million tonnes of freight cross the Alps each year and the volume keeps rising. A third of this freight crosses Switzerland. The construction of the NRLA lays the foundations for transferring as much of this traffic as possible from road to rail. In 2015, as much as 69 percent of cross-alpine freight traffic in Switzerland was in fact processed by rail.



Propoportions of freight crossing the alps in Switzerland, France and Austria (2015). Source: FOT

It is a policy that is gaining ever wider acceptance in other European countries. Thus, the NRLA concept forms part of the 1999 Land Transport Agreement between Switzerland and the EU. The Lötschberg and Gotthard transit axes also constitute the most important part of the most significant European freight corridor, the **Rhine Alpine Corridor** between Rotterdam and Genoa.

Rotterdam–Genoa Corridor

NRLA partners at the Lötschberg

The following parties are involved in the operation of the Lötschberg base route:

BLS Ltd was appointed by the Swiss Federal Council as an infrastructure operator for the Lötschberg base route. The company is responsible for the following activities:

- Operational management and network access control for the rail companies using the route (in line with the specifications laid down by the Swiss Federal Government)
- Maintenance of the rail and tunnel infrastructure
- Emergency intervention and rescue operations

Swiss Federal Railways (SBB) was appointed system operator by the Federal Office of Transport, with responsibility for the fundamental structure of the electronic train control system (ETCS) and telecommunications (GSM-R).

The Lötschberg base route is used by several **rail companies**: SBB operates long-distance passenger services, while BLS Cargo Ltd is the market leader in freight services. However, the route is also used daily by SBB Cargo International, Crossrail, DB Schenker and other companies.

Key data for the Lötschberg axis

1906	Berne–Lötschberg–Simplon Railway Company (BLS) founded in Berne, with the aim of constructing a direct link between Berne, Valais and Italy
1913	The Lötschberg mountain section enters operation
1915	BLS opens the Grenchenberg section, thus realising the long-held desire for rail access from the Simplon to north-eastern France via Berne.
1960s	A base tunnel linking the cantons of Berne and Valais comes under discussion for the first time
1983	The Federal Council approves the construction of a new trans-alpine rail route, but considers it premature to reach a final decision on construction.
1986	Planning of the NRLA begins, involving the Federal Government, SBB and BLS. Five possible variants are considered: Lötschberg–Simplon, Gotthard base, Ypsilon (Gotthard), Splügen 1 and Splügen 2
6.12.1987	Referendum on Rail 2000: 57 % of votes in favour
4.10.1991	Federal decree on the construction of the Swiss trans-alpine route (Alpine Transit Decree)
8.5.1992	Completion of the expanded twin-track route on the Lötschberg mountain section
27.9.1992	Referendum on the Alpine Transit Decree: 63.5 % of votes in favour
16.12.1992	Parliament approves the Transit Agreement with the European Community (Decision on the Expansion of the Lötschberg Piggyback Corridor)
8.6.1993	BLS AlpTransit AG founded as a fully owned BLS subsidiary
20.2.1994	The approval given to the Alpine Initiative (52 % in favour) anchors the policy of diverting traffic from road to rail into the constitution
12.4.1994	Construction work commences at the Kandertal exploratory tunnel
24.4.1996	The Federal Council decides on simultaneous construction of the base tunnels at the Lötschberg and Gotthard (network variants) in a revised format

29.11.1998	Referendum on the construction and financing of the public transport infrastructure: 63.5 % of votes in favour
5.7.1999	Blasting operations begin at the base tunnel (Mitholz)
Sept. 2000	Excavation begins at Raron and Steg
1.5.2001	Excavation begins at the Ferden base
11.6.2001	Opening of the piggyback corridor (“rolling highway”) between Germany and Italy via the Lötschberg mountain section
Oct. 2001	Construction commences in Frutigen
6.12.2004	Installation of non-ballasted track begins in the western tube
28.4.2005	Breakthrough in the eastern tube
6.6.2006	First experimental journey powered by electricity in the southern tunnel section
24.7.2006	The rails join up in the middle and the last spike is nailed in place
from Dec. 2006	Electric-powered experimental through journeys at up to 280 km/h
15.6.2007	Official opening of the Lötschberg base route Tunnel handed over to BLS as operator
9.12.2007	Full scheduled operations begin
3.3.2011	100,000th train passes through the Lötschberg base tunnel
9.2.2014	62 % of the Swiss electorate who participated voted in favour of the project to fund and expand the rail infrastructure (FERI). The population thus also agreed to project planning for rail technology equipment in the Lötschberg base tunnel between Ferden and Mitholz (partial expansion)
5.6.2017	314,814 trains had passed through the Lötschberg base tunnel during the first ten years.

The Lötschberg base tunnel

Basic concept and key figures

The Lötschberg base tunnel is one of the most modern, secure and technically complex rail tunnels in the world and is extremely reliable. It was designed with twin single-track tubes to ensure optimum reliability, but for financial reasons, only one of the tubes was fully equipped, while the second was left largely as a shell. The two tubes are connected by transverse tunnels at 333-metre intervals, meaning that each main tunnel serves as the evacuation tunnel of the other. All systems are duplicated in the tunnel. This "twin installation" means that operations can continue in the event of any technical problems.

Key figures on the construction

Length of the base tunnel	34.6 km
Total length of tubes and connecting tunnels	88.1 km (with connecting tunnels 91.8 km)
Axis distance between base tunnel tubes	40 m
Number of connecting tunnels between the tunnel tubes	108
Threshold height north portal of Frutigen	776.5 m above sea level
Threshold height at vertex	828.2 m above sea level
Threshold height south portal of Raron	654.2 m above sea level
Min. gradient	3 ‰
Max. gradient	13 ‰
Total material excavated	16.6 m tonnes (= approx. 830,000 trucks)
Investment volume	CHF 4.3 billion
Cost of operations and maintenance	approx. CHF 22 million p.a.
Max. speed	250 km/h

Necessary expansion

The Lötschberg base tunnel is currently stretched to the limit. The reason for this is rapid growth of passenger and freight traffic on the one hand and the limited capacity due to the long single-track section on the other hand. The 21-kilometre long single-track route makes it impossible to expand passenger and freight traffic, greatly restricts leeway when it comes to timetable scheduling and results in high operating costs. A double-track expansion is therefore absolutely essential.

Advantages of an expansion:

- It will facilitate a half-hourly passenger service between Bern and Valais.
- It will strengthen the competitiveness of railway freight transport: more trains will run through the base tunnel instead of over the mountain line, which is shorter and more economical for companies.
- In the event of an interruption to the service on the Gotthard axis, it will improve the option of a diversion through the Alps.
- It will simplify modernisation and intervention in the event of incidents.
- It will relieve the mountain line of heavy goods trains and improve the attraction of the region to tourists.

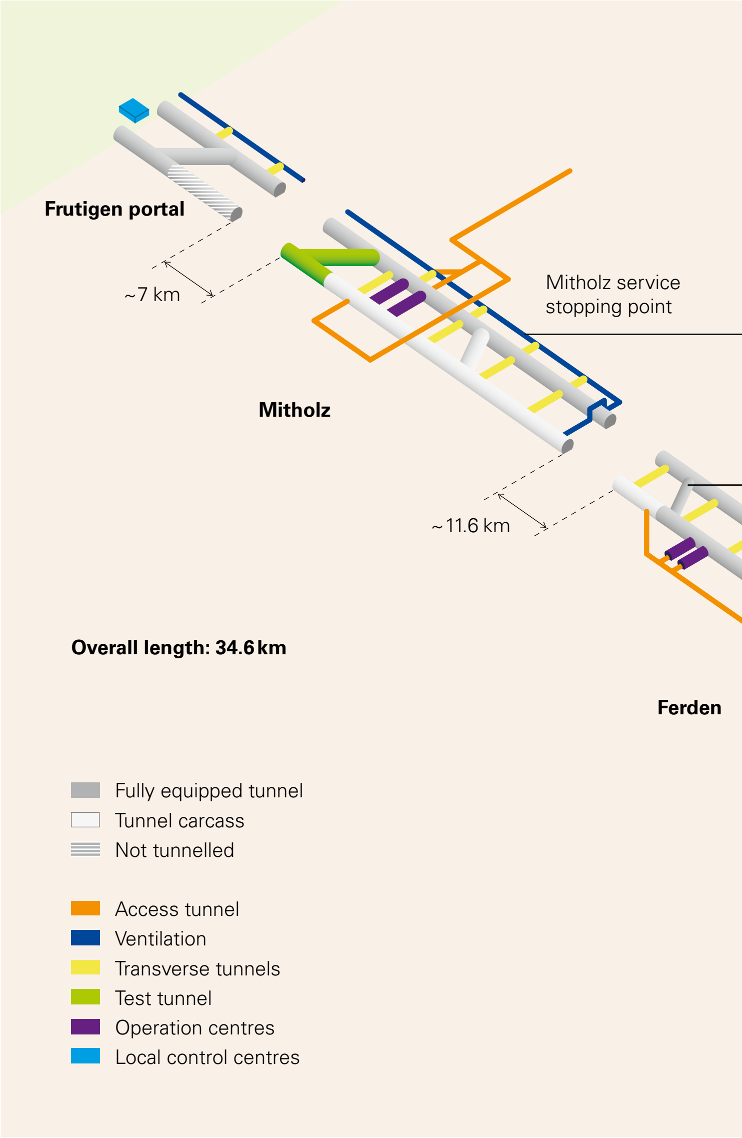
What does expansion mean?
As part of an expansion project, the existing tunnel carcasses would be equipped with the required rail infrastructure. The expansion is also often referred to as a partial expansion because there would then still be a 7-kilometre-long single-track section between Frutigen and Mitholz. A second tunnel tube would first have to be dug on this seven-kilometre section.

Tunnel areas

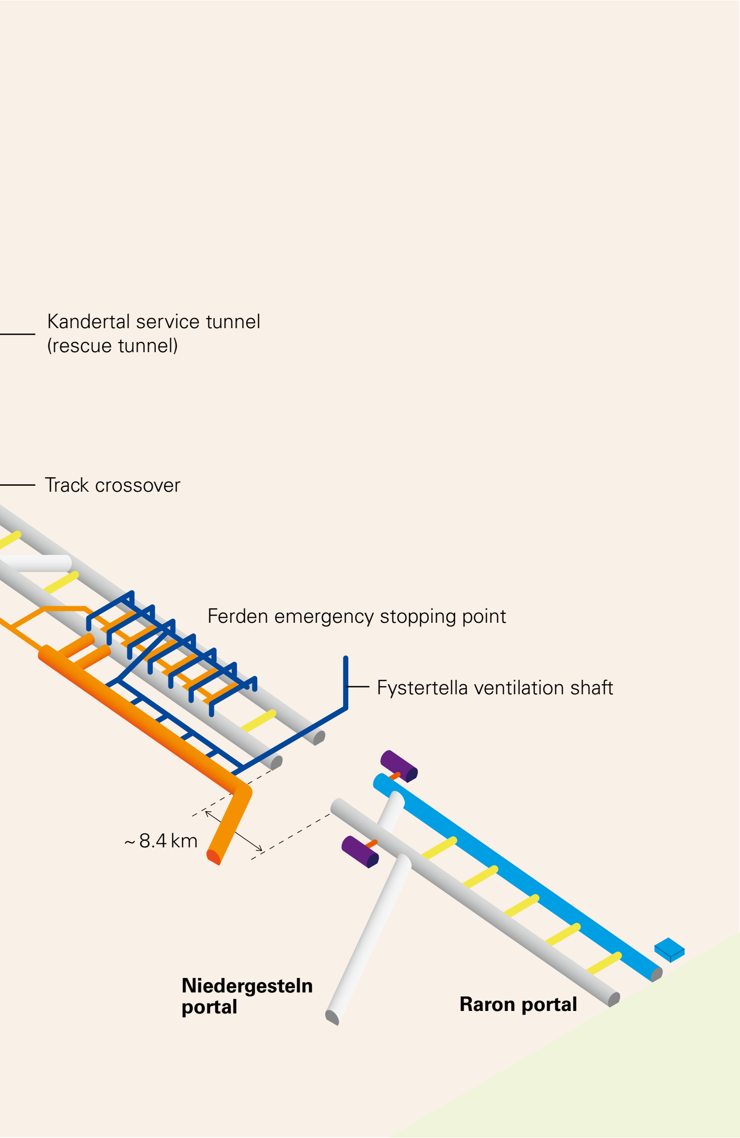
The Lötschberg base tunnel today
In operation since 2007

Expansion
In addition to the existing tunnel:
Outfit the existing non-equipped tube

Completion
In addition to the existing tunnel and the expansion:
extension of tube for through double track

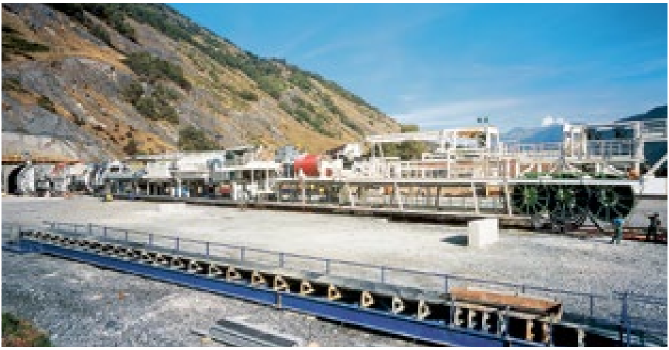


Frutigen portal
~7 km
Mitholz service
stopping point
Mitholz
~11.6 km
Overall length: 34.6 km
Ferden
Fully equipped tunnel
Tunnel carcass
Not tunnelled
Access tunnel
Ventilation
Transverse tunnels
Test tunnel
Operation centres
Local control centres


Kandertal service tunnel
(rescue tunnel)
Track crossover
Ferden emergency stopping point
Fystertella ventilation shaft
~ 8.4 km
Niedergesteln
portal
Raron portal

The rail tunnel

Tunnelling
Some 20 % of the Lötschberg base tunnel was excavated by tunnel boring machines and the remaining 80 % by means of conventional blasting techniques. In Raron (eastern tube) and Steg, two tunnel boring machines were employed. Blasting was used in the other zones due to varying geological conditions or structurally difficult rock varieties.



Material management
About 16 million tonnes of excavated material was accumulated in the construction of the Lötschberg base tunnel, an amount that would require 320,000 freight cars and a train 4,100 km long. Some 40 % of the excavated material was able to be recycled, as a result of which the majority of the additives in the concrete used in the interior of the tunnels came from this recycled material. The materials were procured and prepared in Mitholz and Raron.

Track
The Lötschberg base tunnel is equipped with non-ballasted track, with the sleepers resting on shock-absorbing rubber footings, rather than directly on the concrete base. The advantages of a ballast-free track are that it has a longer lifespan, costs less to maintain, entails less danger of derailment and is more comfortable for passengers. 57 km of track was laid and three points were installed in the Lötschberg base tunnel. The biggest set of points is more than 160 metres long and can be operated in a deflective position with trains travelling at a speed of 180 km/h.

Overhead traction system
The trains draw their traction current from the overhead traction system. It is important that the current collection quality at the interface between the train and the power cable is high. The overhead traction system in the Lötschberg base tunnel is designed to allow a maximum speed of 250km/h and has power switching at intervals of approx. six kilometres. It needs to be able to conduct 2,000 amperes of power into each of the two tubes. This high-current load-carrying capacity is necessary in order to provide sufficient power for six locomotives and for freight trains up to 1.5 km in length.

Clearance gauge
The clearance gauge is the diameter required for the train to pass in a tunnel. The Lötschberg base tunnel is designed to allow sufficient clearance for the "Lötschberg Shuttle", which has a contact wire height of 5.85 m. This means that all trains operating in Europe can make use of the tunnel.

Technical facilities

Technical centres and local control centres
There are a total of 12 technical centres housing technical installations along the base route between Frutigen and Raron. All technical centres are constructed in pairs for security reasons, with one each in the eastern and western tunnels, so that each tube is capable of being operated independently. The technical centres in the tunnels equipped with cranes have all the equipment necessary to supply current to the trains and infrastructure as well as wireless communications transmitters, signal towers and air conditioning in a total of 136 containers. They are unmanned and are monitored and controlled from the operations centre in Spiez (BZS) via the two local control centres (VOLS) in Frutigen and Raron.

Connecting tunnels
The 108 connecting tunnels that connect the two tunnel tubes serve as escape routes and also house a total of 1,450 cabinets. These contain installations for electricity supply, maintenance and emergency lighting, data transmission, door control, and safety and wireless communications installations.

Ferden emergency stop
There is an emergency stop in each of the tunnel tubes in Ferden. They are connected by a ventilated emergency escape tunnel. The emergency stop is the escape and evacuation location for passengers in the event of an emergency. It is equipped with a fresh air supply, smoke extraction, communication systems, video surveillance and more powerful lighting.

Mitholz service stop
There is a service stop seven kilometres south of the north portal which can also be used as an additional emergency stop in case of a serious incident to supplement Ferden.

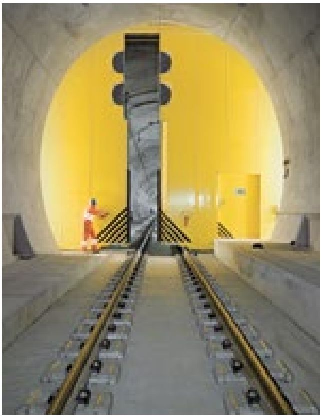
Systems and functions

Ventilation
The tunnel as a whole is equipped with three ventilation control centres: two air supply centres and one air extraction centre, as well as eight jet ventilators at each of the tunnel's entrances. This allows a total of 17 different ventilation scenarios to be employed, each geared towards the respective operating situation. The two air supply centres in Mitholz (150m³/s) and Ferden (200m³/s) regulate the supply of fresh air. This is of particular importance when maintenance is being performed or in the event of an emergency. In normal operations, the passage of the trains through the tunnel ensures sufficient ventilation. The air extraction system is employed only in emergency situations and removes polluted air, such as smoke, via the Fystertella ventilation shaft.

Air conditioning systems
The climatic conditions in the base tunnel are hot and very humid. A stable climatic environment and smooth functioning of the electronic equipment is ensured by means of 44 refrigeration units and 396 air circulation cooling units.

Climate in the Lötschberg base tunnel

Maximum temperature during the construction phase	Approx. 45 °C
Current maximum tunnel temperature	Approx. 31 °C
Maximum relative humidity	Approx. 80 %



Water management
Water management includes the tunnel's water supply, drainage and the environmentally friendly treatment of the waste water. Tunnel drainage is carried out via a separated system that runs through the entire rail tunnel system and distinguishes between mountain water and waste water. The clean mountain water has a temperature of around 18 °C, is collected throughout the tunnel and is employed in the cooling systems in the operations centres. Outside of the tunnel, external companies such as the "Tropenhaus" in Frutigen also make use of this mountain water. The polluted tunnel waste water is channelled into containment tanks, where it is checked for contaminants and, in the case of an incident, retained.

Gates
The western and eastern tunnels are each equipped with a rail tunnel gate that enables the rail tunnel to be completely sealed to help ensure an even climate when repair and maintenance works are conducted in the tunnel.

The entrances to the cross passages, connecting tunnels, emergency exits and emergency escape tunnels are equipped with a total of 173 motorised sliding gates that can be remotely controlled via the tunnel control system and are monitored by the security installations. When these gates are open, trains can travel at a maximum speed of 40 km/h.

Monitoring and detection

More than 100 cameras monitor events in the tunnel. All technical facilities, the cross passages, access and service tunnels and the drainage system are equipped with fire, gas and flooding sensors, depending on their location. This allows rapid, targeted intervention in emergency situations.

Communication systems

The base tunnel's communication systems contain data lines, a telephone system connected to the public telephone network (via tunnel operating) and GSM-R wireless communications for train data and voice communication. Every connecting tunnel and tube is equipped with emergency telephones. The GSM-R wireless communications system functions throughout the entire tunnel.

Power supply
There are two different power supplies in the Lötschberg base tunnel: traction current supply (16.7 Hz) and infrastructure current supply (50 Hz). The traction current is supplied via two substations in Mitholz and Gampel, while general power is obtained via some 21 transformer stations. The two input systems are independent, as the infrastructure equipment must remain functional for security reasons even if the traction current fails. The average annual power consumption of the tunnel infrastructure is about 8 million kWh, which is approximately the same as the amount needed to power a small local authority. Some 1,600 km of cable were laid to ensure the tunnel's power supply.

In addition, there is a high-voltage transmission line (132 kV) connecting the Valais with the Bernese Oberland.

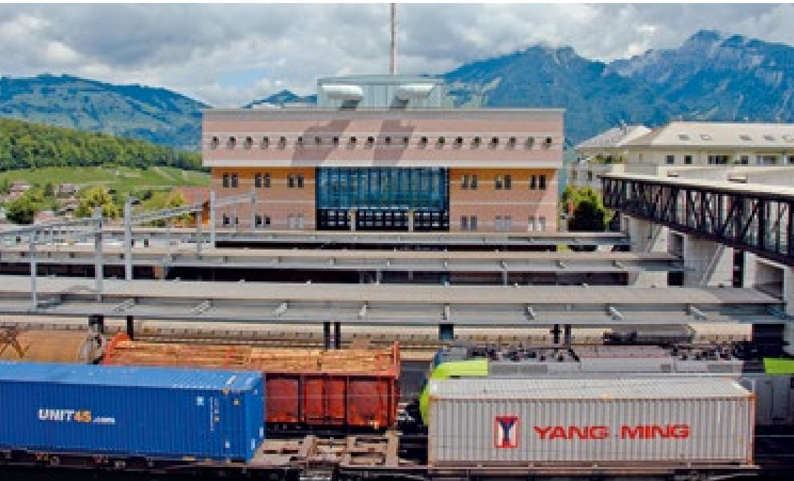
Operating the Lötschberg base route

Operation management

Functions and tasks
BLS is responsible for the entire Lötschberg–Simplon axis between Gümligen (exclusively) and Sierre (exclusively) to Domodossola (exclusively).

The main operational responsibilities relate to ensuring that the passage of trains and shunting activities are conducted safely and punctually. It is performed centrally from the BLS operations centre in Spiez for the entire rail network, including the Lötschberg base tunnel, where different experts control and monitor the traffic on the Lötschberg axis:

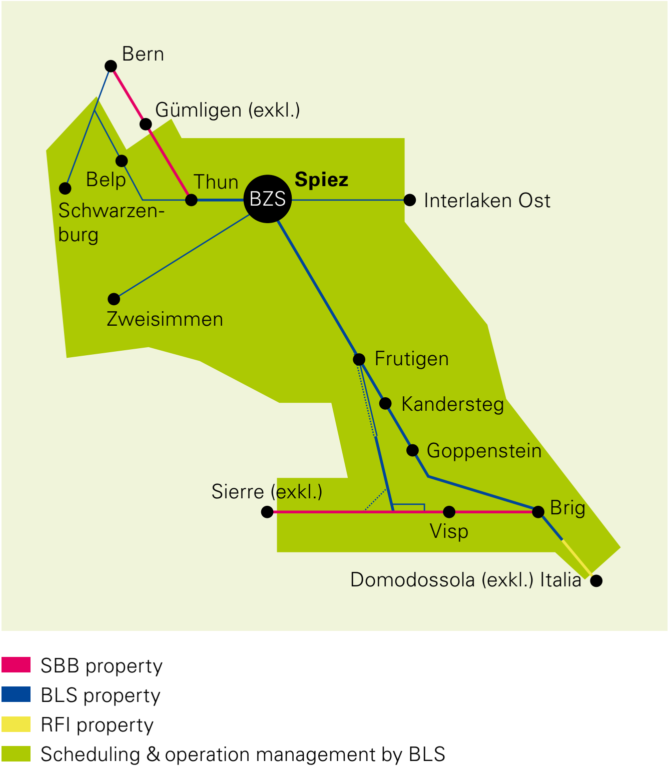
- Control operators monitor the current operational position, analyse any deviations from the timetable and devise measures to correct them.
- Rail traffic controllers operate the security facilities, and monitor and direct the points on the train and shunting routes.
- Technical operators monitor and control the technology in the tunnel (lighting, doors and gates, ventilation, video surveillance, etc.) as well as providing traction power to the 15 kV grid.
- Customer information assistants keep travellers at railway stations informed of the current operational position.



The Lötschberg base tunnel's long single-track section without any passing loops poses a special challenge. In order to maximise the capacity of this 21-kilometre-long bottleneck, wherever possible, several trains are directed through the single-track section in the same direction, one after another. Furthermore, a kind of slot system is in operation for traffic on the Lötschberg base section, similar to that employed in air traffic control: every train entering the single-track section is assigned a scheduled time slot. If a train is delayed and misses its slot, it either has to be diverted via the mountain route or await the next free slot. It is only by employing such an operating concept that the Lötschberg base route can operate an unusually high 80 % of capacity on average and, on certain particularly busy days, even 100 %.

Timetable and route management
BLS operational management schedules the timetable of the Lötschberg axis in collaboration with SBB and plans the use of the track and the marshalling of trains at the railway stations. It also ensures that sales of access rights are available on a non-discriminatory basis to all qualifying rail operators. In order to achieve a high level of timetable stability, maintenance work is coordinated with the operators of adjacent networks, RFI and SBB.

Security in the base tunnel
In the two approaches to the base tunnel, various state-of-the-art wayside train monitoring systems have been installed which identify any technical problems on trains before an incident occurs. A profile and antenna positioning system can, for example, detect objects on trains which could touch the overhead lines. There is also a fire and chemical detection system, a wheel load checkpoint as well as several hot box and break detection systems which, among other things, monitor the temperature of the axle bearings and thus prevent derailments.



ETCS
The new ETCS Level 2 train control system is employed because it can cope with the high speeds necessary for implementation of the planned timetable (up to 250 km/h) and high train frequencies. The ETCS system, which is the standard across Europe, sends driving commands directly onto a screen display in the driver’s cab via the GSM-R digital mobile network, rather than using exterior optical signalling, as was formerly the case.

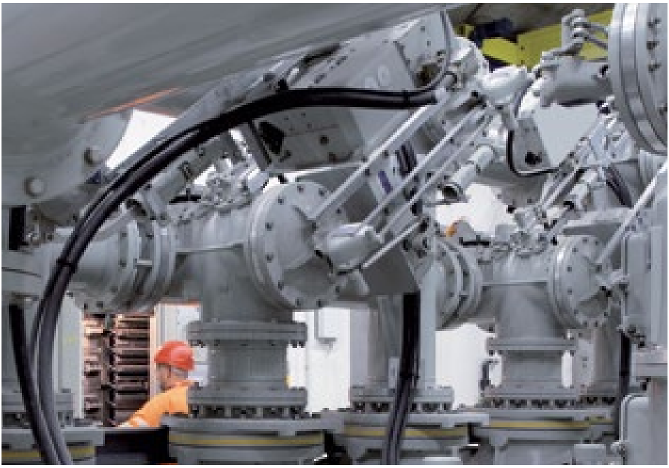
Maximum speeds with ETCS

Wengi-Ey entrance	120 km/h
In the tunnel	250 km/h
Rhone valley entrance	160 km/h

Technology employed in the tunnel

Activities
Over 30 BLS employees work around the clock to maintain the technical systems on the Lötschberg base route to ensure the smooth functioning of the tunnel’s operations:

– Maintenance coordinators plan and coordinate the maintenance of the route in collaboration with management.
– Engineers and electricians operate and maintain the tunnel’s technical installations.
– A hydraulic engineer is responsible for the supply of water and the environmentally friendly disposal of water in the tunnel. A functioning supply of fresh water is vital to regulate the temperature in the tunnel and therefore for the overall operation of the technical systems.



Technical control and monitoring
Technical control centre operators monitor and control the technical systems from the operations centre in Spiez. A distinction is made here between traction power and railway technology-related duties. State-of-the-art systems (technical control system and traction power control system) support them with the following duties:

- Tunnel security – security plan for access control, ventilation, alarm functions and management of staff in the case of emergencies.
- System availability – system monitoring, mobilisation and coordination. Goal: high availability and minimum cost.
- Emergency intervention – alarm functions and supporting the rescue teams. Goal: ensuring internal rescue services and supporting external rescue services.

In order to be able to perform these duties, the operators monitor the mobile communications system (GSM-R), CCTV and fire alarms and carry out various switching operations on the power supply units. They operate door and gate systems, ventilation and air-conditioning systems as well as controlling lighting and water supplies. They coordinate the most varied of on-call organisations providing specialist BLS services and of third-party organisations and in case of a serious incident they notify the emergency and intervention services.

Track maintenance in the base tunnel

Track maintenance in the Lötschberg base tunnel is carried out by BLS. The aim is to be able to maintain the facilities at the lowest-possible cost and without any significant impairment of availability. To this end, the entire tunnel is closed each

Sunday night, with the southern section also often being closed in one direction only on Monday nights. Additional maintenance periods are scheduled during a four-week period each summer.

These restricted maintenance periods and the long journeys to the worksites make high demands on employees, equipment and logistics. BLS therefore has a dedicated maintenance fleet for use in tunnel maintenance, which is stationed in the new Frutigen maintenance and intervention centre. It includes diesel locomotives, self-propelled breakdown intervention vehicles and self-propelled

maintenance vehicles with modular super-structures and transportation vessels (crew containers and mobile workshops).

Intervention and rescue

In the event of an unforeseen emergency on the Lötschberg base section (e.g. in the event of fire), the train affected must attempt to reach the emergency stop or the intervention points outside of the tunnel. If this is not possible, the passengers and train personnel can access a safe area in the parallel tube via one of the transverse tunnels and wait there for assistance. On the south side between St. German and Ferden, an evacuation can be performed via the second rail tunnel, while on the north side, passengers can be ferried through the tunnel carcass between Frutigen and Ferden by means of buses.

The emergency services need to be able to reach the location of the incident within 45 minutes in order to initiate the rescue and emergency measures. The first port of call in such a scenario are the BLS and SBB firefighting and rescue trains, which have a fire-fighting carriage, an equipment carriage and rescue vehicles to evacuate passengers and train staff and are stationed in Frutigen and Brig. The intervention team is made up of the fire services of the two rail operators BLS and SBB, with the support of the local fire brigades. A total of 140 fire-fighters and around 20 each of police officers, ambulance personnel and other managers in the cantons of Berne and Valais are trained to be able to operate in the Lötschberg base tunnel. In addition, some 90 bus drivers from the bus company Postauto AG Schweiz can be called on to evacuate passengers from the tunnel.

Transport services

Overall system at the Lötschberg axis

The NRLA Lötschberg forms a complete system consisting of the new base tunnel and the hitherto high-elevation tunnel. The following types of train operate on this system:

Long-distance passenger traffic
SBB Intercity trains from Basel/Zurich to Brig (stopping at Thun, Spiez and Visp) operate in both directions at intervals of no more than one hour. In addition, there are six Eurocity connections each way between Basel and Milan.

Regional traffic
Regional access to the mountain route between Berne, Spiez, Brig and Domodossola is provided by RegioExpress trains (Lötschberger) operated by BLS.

Journey times (examples)

Route	Before opening of tunnel	Since opening of tunnel	Time saving
Berne–Visp	1:57	0:55	1:02
Berne–Brig	1:38	1:04	0:34
Lucerne–Visp	3:11	2:06	1:05
Zurich–Sion	3:19	2:32	0:47
Zurich–Zermatt	4:24	3:19	1:05
Basel–Milano	4:35	4:00	0:35

Freight traffic
Freight is envisaged to account for no more than 110 crossings per day. About two thirds of these are directed through the base tunnel, with around one third travelling instead over the mountain route (mainly south to north). Three main types of freight trains use the Lötschberg axis:
- Conventional wagonload traffic
- Trains providing unaccompanied combined transportation (containers, semi-trailers)
- Accompanied combined traffic trains (rolling highway between Freiburg im Breisgau and Novara)

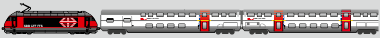
The heaviest trains currently using the Lötschberg base route transport clay from Germany to Italy. These have a trailer load of 3,250 tonnes and a length of 750 metres.

Car transport
BLS car transport operates on the mountain route between Kandersteg and Goppenstein. Scheduling is in accordance with demand: trains operate in each direction at intervals of no more than 30 minutes and at peak times, they operate every 7.5 minutes. The maximum capacity of the route is 180 trains per day. BLS also operates the Car transport through the Simplon tunnel between Brig and Iselle.

Mountain line

No. trains/ day	Speed	
36	125 km/h	
max. 180	110 km/h	
max. 50	100 km/h	

Base route

No. trains/ day	Speed	
max. 60*	100 km/h	
44	200 km/h	
6	200 km/h	

* Full capacity of 60 trains is already reached on busy days.

Scarton Stingelin AG, Liebefeld Bern

Contact with the public:

Guided tours for experts and the general public have been on offer since the Lötschberg base tunnel opened. The visits always commence at Frutigen Visitor Centre.

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