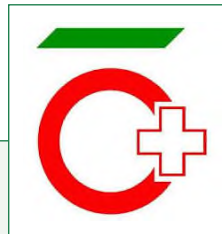


# Switzerland



**Name:** Swiss Tunnelling Society (STS)

**Type of Structure:** Non profit, open association

**Number of Members:** 513 members, 97 corporate members

## ASSOCIATION ACTIVITIES DURING 2018 AND TO DATE

**May** - General Assembly in Winterthur, Switzerland

**June** - Swiss Tunnel Congress (STC) in Lucerne, Switzerland

**September** - DACH Meeting in Reichenau an der Rax, Austria

**November** - STS field trip to third Gubrist tunnel tube construction site

**November** - BEFIPS Meeting in Brussels, Belgium

Additionally, the STS young members (STSym) hosted the following five events:

**March** - Field trip to Nant de Drance pump storage power plant construction site

**June** - Reception as part of STC 2018 in Lucerne

**August** - Field trip to Herrenknecht, producer of tunnel driving machines

**October** - Autumn workshop at ETH Zurich

**November** - Regional event to Brenner base tunnel construction site

## CURRENT TUNNELLING ACTIVITIES

### Galgenbuck Tunnel:

The Galgenbuck Tunnel runs over a total length of 1,138m (motorway A4, two lanes, bidirectional), and consists of two short cut-and-cover sections in the portal areas and a 1,061m long mined section. It contributes to relieve the transit traffic in the Schaffhausen area. The excavation method was both drill-and-blast and machine-supported. The start of construction was in July 2013, the main construction works are now completed and the opening is scheduled for the end of 2019.

### New-build project Albula Tunnel II:

breakthrough for the Albula Tunnel II was on 2 October 2018. After three years of tunnelling, teams advancing from Spinas towards Preda cleared the final rock at the 2,653m mark. The tunnellers had worked to a very high standard of precision: the bores from Preda and from Spinas were misaligned by just 1 mm vertically and 5 mm laterally.

That represents virtually the ultimate in engineering accuracy! This breakthrough is a crucial milestone in the construction of the 5,860m long tunnel, which can now progress to the next phase – lining and railway-installations. The tunnel is due to be inaugurated in 2022.

### CERN:

The Large Hadron Collider (LHC) is the most recent and powerful accelerator constructed on the CERN site. The LHC consists of a 27km circular tunnel, about 100m underground, with eight sites positioned around the tunnel's circumference. High-Luminosity LHC (HL-LHC) is a new project aiming to upgrade the LHC, at Point 1 (ATLAS in Switzerland) & Point 5 (CMS in France), in order to maintain scientific progress and exploit its full capacity with new underground and surface structures and consists for each point in an additional shaft and cavern, approximately 500m of tunnels connected to the LHC tunnel, and additional technical buildings at the surface. The execution of the underground works started in April 2018 and is scheduled to be finished by the end of 2021.

### Parking Schlossberg Thun:

On Friday, November 9, 2018, the official inauguration of the new underground "Parking "Schlossberg Thun" took place. The parking has 300 parking spaces located in two main caverns (width 15m, height 17m, length 78m) connected by means of three transverse caverns. The realization of the parking – which is beneath the historic old town of the Thun Castle – required about 3 years of construction works at a cost of about 45'000'000 CHF. The excavation occurred by means of a road header. The primary support consists of rock bolts and reinforced shotcrete. The definitive lining (reinforced concrete) was cast in-situ.

### Achievement of the civil work of the 900 MW pumped storage power plant Nant de Drance:

The civil engineering work that began in 2008 has now been completed. 17km of tunnels and 9 big caverns have been excavated for this project. The machine cavern that is 52m high, 32m wide and 194m long is now fully concreted and the installation of the 6 pump-turbines is well advanced. The two-parallel headrace tunnels and two 400m high vertical shafts will be completed in 2019.



Parking Schlossberg Thun



Albula tunnel



Silvaplana

During peak time 650 workers were employed on site. No fatal accidents have been reported in 10.5 years of civil construction despite a hostile alpine environment, overburden of over 800m and high water pressures.

#### Expansion of the Mont Terri rock laboratory:

The Mont Terri rock laboratory is located near St-Ursanne in the Canton of Jura and it is accessed via the safety gallery of the Mont Terri motorway tunnel. It is owned by the Canton of Jura and operated by swisstopo. The first experiment gallery was built in 1998 and expanded in 2004 and 2008. Currently, in order to create more space for upcoming research projects, the rock laboratory is again expanded by additional 600m of about 5.4m wide tunnels and niches. Excavation started on March 12, 2018 and up to the end of the year about 50% of the tunnels and niches have been excavated by roadheader mostly in the sandy facies of the Opalinus clay. Excavation works are planned to be completed in 2019.

#### By-pass road Silvaplana

The Silvaplana road tunnel is located in the mountain region of Engadin (Canton of Grisons, Switzerland). It connects the Julier pass to the heart of the valley. The goal of the tunnel is to relieve the village of Silvaplana from the heavy traffic through the majority of the year. The project consists of the realization of a multi-lane road tunnel, a safety gallery tunnel and 2 escape tunnels. The total length of the main tunnel amounts to 750m. The tunnel has been excavated by means of drill and blast. The excavation works were started on April 2015 and have been completed on August 2016. The tunnel has been opened to traffic at the end of June 2018.

#### FUTURE TUNNELLING ACTIVITIES

##### Rail Tunnels:

RBS Bern Station Expansion (RBS, 1,200m)

##### Road Tunnels:

Second Gotthard Tunnel Tube (ASTRA, 16,918m), Leissigentunnel (ASTRA, 2,200m), Gallery Schwamendingen

und Schöneichtunnel (ASTRA, 1,680m), Tunnel Cholfirst (ASTRA, 1,250m), Safety Gallery Kerenzerberg (ASTRA, 5,504m), Morschacher / Sisikoner Tunnel (Kt. SZ/UR, 7,680m), Vingeltztunnel (Kt. BE, 2,300m), City Tunnel (Kt. BE, 900m), Porttunnel (Kt. BE, 1,700m), Tunnel Weidteile (Kt. BE, 1,300m), Tunnel Fäsenstaub (ASTRA, 1,460m),

#### STATISTICS

##### 1. Length or volume excavated - % mechanized/% conventional during 2018

8'000m / 35% TBM.

##### 2. Amount (USD or EUR) of tunnelling/ underground space facilities awarded in 2018

€500M.

##### 3. List of tunnels completed

Tunnel Silvaplana (Kt. GR, 750m), Safety Gallery Tunnel Viamala (ASTRA, 700m), Schlossberg Thun Carpark

##### 4. List of tunnels under construction

###### Rail Tunnels:

Ceneri-Basistunnel (ATG AG, 15,400m), 5 Tunnel der CEVA (SBB/ Kt. GE, 8,200m), Bözberg II Tunnel (SBB, 2,500m), Ruckhaldetunnel (AB, 725m), Eppenbergtunnel (SBB, 3,114m), Albulatunnel (RhB, 5,860m), Coldrerio (SBB, 96m), Dragonato (SBB, 30m)

###### Road Tunnels:

Tunnel Eyholz Haupttunnel (Kt. VS, 4,200m), Tunnel Ligerz (ASTRA, 2,483m), Safety Gallery Tunnel Sachseln (ASTRA, 5,084m), Galgenbuck (ASTRA, 1,138m), Tunnel Visp 2. Röhre (Kt. VS, 2,600m), Safety Gallery Tunnel Bärenburg (ASTRA, 1,028m), Sanierungstunnel Belchen (ASTRA, 3,200m), Gubrist 3. Röhre (ASTRA, 3,230m), Safety Gallery Tunnel Crapteig (ASTRA, 2,171m), Tunnel Riedberg (Kt. VS, S: 555m, N: 483m), Südumfahrung Küsnacht (Kt. SZ, 500m), Safety Gallery Tunnel Rofla (ASTRA, 1,017m), Tunnel de déviation des Evouettes (Kt. VS, 770m)

###### Other Projects:

Nant de Drance Pumped Storage Power Plant, CERN HILUMI LHC Project