THE LYON-TURIN PROJECT AND THE CROSS-BORDER SECTION

The Lyon-Turin line is a **new freight and passenger new railway line** that covers 270 km, 70% of which in France and 30% in Italy. It is the central link of the **Mediterranean Corridor**, one of the 9 axes of the European TEN-T transport network to connect the Continent from East to West.

The Lyon-Turin project:

- aims to shift about 1 million lorries per year from road to rail over the Alpine arc between France and Italy;
- aims to guarantee a connection for freight and passenger in the heart of the Alps to promote economic exchanges and strengthen the competitiveness of the Mediterranean European countries, connecting also the most important sea and river ports, major cities and airports.

The line is divided into three sections:

- the common cross-border section between Italy and France, established by four international agreements (1996, 2001, 2012 and 2015, supplemented by the Additional Protocol of 2016). It is 65 km long and stretches from Susa (Piedmont) to Saint-Jean-de-Maurienne (Savoie). It is under the responsibility of TELT, whose main project is the 57.5-km-long Mont Cenis **base tunnel**, currently under construction;
- the about 50-km-long Italian part, from Turin to Bussoleno (Susa Valley), under the responsibility of RFI;
- the about 160-km-long French part, from Saint-Jean-de-Maurienne to Lyon, under the responsibility of the SNCF.

The construction of the cross-border section is entrusted to TELT, the bi-national public promoter owned 50% by the Italian State, through Ferrovie dello Stato Italiane (FS), and 50% by the French State.

Key figures in December 2023

- **35 km of the 162 km of tunnels planned for the project** have already been excavated (12.5 km of which for the base tunnel). It Is a complex system consisting of two parallel tunnels, four slopes and 204 safety by-passes
- **113 km of exploratory surveys** and core borings were carried out in Italy and France
- **Eleven operational construction sites** for the above ground and underground works **including 4 construction sites for the excavation of the base tunnel,** 3 in France and 1 in Italy
- **More than 2,500 workers** that will become **4,000 at the peak of the activities**
- **5 TBMs ordered**
- **Costs: € 8.6 billion** (2012 value)

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OPERATIONAL CONSTRUCTION SITES

France

Saint-Julien-de-Maurienne: RAILWAY INTERCONNECTION

After the opening of the temporary multimodal hub (station) in June 2022, the works for the railway interconnection with the historic line in the Saint-Jean-de-Maurienne area continue.

- **Agreement with SNCF Réseau**

Saint-Julien-de-Montdenis: BASE TUNNEL EXCAVATION - SAINT-JULIEN-MONTDENIS/SAINT-MARTIN-LA-PORTE

The works for the excavation of the base tunnel access, started in December 2022, continue in the 2.8 km section between the French entrance portal in Saint-Julien-Montdenis and towards Saint-Martin-la-Porte. The operations are taking place on the Villard-Clément platform that previously hosted the work for the cut-and-cover tunnel. Excavation in this section will be carried out using the conventional method, that is, with a hydraulic breaker and/or explosives.
The excavation work will be followed by the completion of the site, entailing the construction of the portal part for the entrance into the mountain that completes the cut-and-cover tunnel already built and the restoration of the site to its original state.

- **Group of companies**: IMPLENIA Suisse (group head) / IMPLENIA France / NGE / ITINERA / RIZZANI de ECCHER

Saint-Martin-La-Porte and La Praz: BASE TUNNEL - SAINT-MARTIN-LA-PORTE/LA PRAZ-MODANE

This construction site for the excavation of the 23.1 km of the base tunnel between Saint-Martin-la-Porte and Modane proceeds on two work platforms in Saint-Martin-la Porte and La Praz.
In these areas, work is in progress to build some logistical tunnels to connect the branches of the existing slope with the outside yard and the technical caverns for the TBM assembly. Between July and November 2023, the three tunnel boring machines, which will complete the excavation of the two tubes of the base tunnel between Saint-Martin-la-Porte, La Praz and Modane, were delivered to the Herrenknecht factory in Schwanau.
On this area, the La Praz safety site, linkage branches every 333 metres between the tunnels, technical rooms, niches and tunnels for operation and safety will also be built.
In total, 43.5 km of tunnels will be excavated, starting from the 17.5-km-long grid of tunnels excavated between 2003 and 2022. The territories of the municipalities of Saint-Martin-la-Porte, Saint-Michel-de-Maurienne, Orelle, Saint André, Villargondran and Saint-Julien-Mont-Denis are affected by the works for this part of the tunnel.

- **Group of companies:** VINCI Construction Grands Projets (group head) / Dodin Campenon Bernard / VINCI Construction France TP Lyon / WeBuild

Villarodin-Bourget / Modane and Avrieux: UNDERGROUND WORKS AND VENTILATION SHAFTS OF THE BASE TUNNEL

The construction of the ventilation shafts for the base tunnel is under way. These are four parallel vertical tunnels to be built at an altitude of 1,300 metres. They are very important because they must reach the underground station of Modane (at the foot of the Villarodin/Bourget-Modane slope), 500 metres below, where they will contribute to ventilation and safety. The four parallel shafts with a diameter of 5.2 metres are excavated using Raise Boring Machines, a technology developed in the mining industry specifically for the mechanised excavation of vertical shafts of small diameter.
Pilot holes are excavated into the underground caverns at a depth of 500 metres. Bars are then inserted into the holes, at the ends of the bars the reamers (the heads of the vertical cutters) are mounted, which then go back up and dig the shaft vertically. The excavated material, which falls by gravity, is taken out through the existing slope. The safety site tunnels and several technical caverns, measuring up to 22 metres in height and 23 metres in width, are also being built underground. They will be used to assemble the TBMs that will then excavate towards Italy.

- **Group of companies**: VINCI Construction Grands Projets, Dodin Campenon Bernard, VINCI Construction France, Webuild and Bergteamet.

Modane: BYPASS
The Modane bypass will lead around the Modane and Fourneaux town centres and be used to supply the Villarodin Bourget/Modane base tunnel construction site and connect to the A43 motorway, thereby also facilitating the removal of excavated material.
Work on the first section was completed in April 2022. Work is under way to complete the bypass (with a 198-m-long road tunnel) that will connect to the A43 motorway.

- **Group of companies**: Spie Batignolles – Cogeis

On 7 November 2023, the new bridge over the Saint Antoine stream, built by the Eiffage Génie Civil / Forezienne / Soletanche group of companies, was opened to traffic. It will allow the new bypass to cross the river. The project was co-financed by TELT and the Savoie Department.

Italy

Chiomonte: BASE TUNNEL CONSTRUCTION SITE
In Chiomonte there is the largest Italian construction site for the Lyon-Turin railway line. Since 2012, it has been a site of strategic national interest and is the Italian access route to the base tunnel.
After the completion in November 2023 of the excavation of the niches to facilitate the passage of construction vehicles in the Maddalena 1 tunnel, completed in 2017, in December 2023 the new group of companies for the excavation of the base tunnel entered the construction site.
The companies will complete the two tubes of the tunnel up to the Susa entrance. In this area, the use of two dual-mode TBMs is planned; these are capable of changing their advancement

mode according to the type of terrain they have to face. When fully operational, this construction site will employ about 700 workers.

- **Group of companies**: Itinera, Ghella, Spie Batignolles

Chiomonte: NEW MOTORWAY JUNCTION ON THE TORINO-BARDONECCHIA MOTORWAY
In Chiomonte, the construction site for the new junction of the A32 motorway, which will allow the transit of construction vehicles without interfering with the local road traffic, is also operational. The construction of the new junction is managed by SITAF, a motorway company, on the basis of an agreement with TELT.

- **Agreement with SITAF** (Società Italiana per il Traforo Autostradale del Frejus SpA)

San Didero: RELOCATION OF THE SUSA CAR AND TRUCK TERMINAL
The new car and truck terminal between San Didero and Bruzolo is part of the final project for the Lyon-Turin railway line and will replace the one that is currently in Susa, where the facilities for the new international station are planned. The relocation is managed by SITAF on the basis of an agreement with TELT.
The car and truck terminal will be built on an area of **approximately 68,000 square metres, between the A32 motorway and the "Moncenisio" state road 25**. The project has been **approved by all the competent bodies** and has been developed from a **green perspective** in terms of materials, processes and technologies. Moreover, it also minimises the use of forest areas in the territory: the interference of the new work constitutes 0.5% of the woods in the municipalities of San Didero and Bruzolo and 0.08% of the total wooded area in the valley bottom, around the Dora Riparia river. When work for the terminal is completed, a restoration is planned of all the areas not concerned by the new infrastructure.

- **Agreement with SITAF** (Società Italiana per il Traforo Autostradale del Frejus SpA)

Salbertrand: REUSE SITE
The abandoned material removal activities continue to prepare the area for **the sorting and reuse of the excavated materials** from the base tunnel construction site, in Italy. Between 2021 and 2022 the first phase of removal of the piles of materials abandoned over the years by various subjects was completed and the cleaning of another portion of the site is under way. TELT is carrying out this operation on the instructions of the Prescription No. 9 of CIPE Resolution No. 39 of 26 April 2018 updated by CIPESS Resolution No. 3/2022. The environmental monitoring plan is operational in the area to control the different environmental components with a special focus on soil. All the results about the investigation are shared with Arpa Piemonte and reported to the relevant territorial stakeholders.

Work completed:

- In Saint-Julien-de-Montdenis, the cut-and-cover tunnel, an artificial tunnel that will be the French entrance to the base tunnel, was completed in the autumn 2021.
- In Saint-Jean-de-Maurienne a new temporary multimodal hub (station) has been in operation since mid-June 2022. The new station (the construction of which started in 2019) was built by SNFC Réseau in agreement with TELT to support travellers and maintain the bus and train stations operational during the construction of the new lines. It will then be replaced by the new final international station.
- In Saint-Martin-la-Porte 9 km of the base tunnel excavated using the Federica TBM were completed in 2019. In the same area, 1.5 km were completed in 2021 using the conventional method.
- In Villargondran, consolidation works were carried out on the embankments of the Arc river to protect the Saint-Jean-de-Maurienne basin from floods, as well as to prepare the platform where the others railway and technical structures of the Lyon-Turin cross-border section will be located. Work was completed in October 2021. At the same time, work was completed along the Arc river, at the Resses d'en Bas logistics site to adapt it to house part of the construction site that will manage the base tunnel excavation material.
- In France, the slopes required to start the construction sites inside the mountain were completed: Villarodin-Bourget/Modane (4,000 m, completed in 2007), La Praz (2,480 m, completed in 2009) and Saint-Martin-la-Porte (2,400 m completed in 2010 and 1,800 m completed in 2016).
- In Italy, the Chiomonte exploratory tunnel (Susa Valley, 7,020 m) was completed in 2017.
- The interchange niches inside the Maddalena 1 tunnel were completed In Chiomonte in November 2023.

TIMING AND COSTS

The completion of the main works of the project is scheduled for 2030, followed by a couple of years for testing and pre-commissioning, scheduled until 2032, before opening.

The cross-border section cost amounts to € **8.6 billion** (2012 value), certified by an international group.

The European contribution is effected through the Grant Agreement, i.e. the agreement drawn up between the EU, Italy and France within the framework of the **Connecting Europe Facility (CEF)**.

In Italy, the funding is provided by "construction lots" which include various activities and works according to the executive phases. To date, four out of five construction lots have been financed.

France, instead, has an annual financing mechanism: each year it commits the sums for which it is responsible through specific agreements signed between the Agence de financement des

infrastructures de France (Afitf) and TELT, on the basis of the budget provided by the public promoter.

The reasons why

The new tunnel transforms the current mountain line into **a plain railway**, with positive environmental, economic and transport effects. The old Fréjus tunnel, which was inaugurated in 1871 and reaches an altitude of 1,300 meters, is smaller than that required by current international standards, and has a single-tube which does not meet current safety standards.

Based on this objective, **7 base tunnels** have been planned in Europe to facilitate the crossing of the Alps: Mont Cenis (57.5 km), Gotthard (57 km), Brenner (56 km), Koralm (32 km), Semmering (27 km), Ceneri (15.4), Lötschberg (34.6 km).

Environment

When the Lyon-Turin line will be operational, about 1 million lorries used for international road transport will no longer be present on alpine roads, thus reducing CO_2 emissions by 1 million tons.

Trains that travel on plain level allow energy savings and higher speeds. The historic line has a 40% higher energy cost than a line that doesn't climbs a mountain.

Transport and economy

It is necessary to make the railways competitive for the transport of freights and passengers, and to increase **connectivity between Italy and the European railway networks.**
Moreover, the Mediterranean Corridor, to which the Lyon-Turin section belongs, concerns 18% of the European population in regions representing 17% of the EU GDP. To **support the economic development** of these territories, an efficient and green infrastructure is essential.

Italy-France interchange

In general, cross-border projects are those that give the greatest benefit to the European economy, **with a multiplier 3 times higher** than the average of the 9 TEN-T corridors.
France and Italy are the second and third economies of the European Union and the second commercial partner of one another.

Advantages for freight transport

- **Greater interchange**: with the creation of a tangible alternative to road transport, it will be possible to intercept the increase in the circulation of goods, as seen through the other Alpine passes
- **Greater capacity**: the extended compliance with the European standard will allow the passage of trains with capacities of up to 1,500 tons, compared to the 600-700 tons seen today
- **Ecology**: a train eliminates 60 heavy goods vehicles travelling on the road networks

- **Savings**: rail transport costs decrease over time; road costs increase.

Advantages for passengers

- **More trains**: the project foresees **22 long-distance trains a day**, compared to the 6 TGVs travelling today on the historic line between Turin and Lyon (Source: Volume 11 of the LY-TO Observatory)
- **Less travel time between European cities**
- **More connections**: the departures-destinations will multiply for passengers on different European routes, encouraging new passengers to travel by train, using the corridors and their connections.

THE COMMITMENTS OF THE SINGLE LYON-TURIN CONSTRUCTION SITE

TELT takes part in **the United Nations Global Compact** to sustain its goals and promote its values among its stakeholders:

Environment

TELT adopts a shared environmental policy between Italy and France that binds all external companies that work on the Lyon-Turin project to provide the same environmental protection criteria. This commitment is based on the Integrated Environmental Control System (SCAI), which makes use of two tools: the Environmental Monitoring Plan, which monitors the areas around the construction sites; the Environmental Management Plan, which monitors the internal construction site. Coordination between external and internal site monitoring is ensured by the Environmental Coordinator.
The monitoring is carried out using internal and external control units with tests conducted on different environmental parameters (water, dust, asbestos, radon etc.), carried out under the supervision of national control bodies.

Workplace safety

TELT is committed to ensuring **high safety standards** at construction sites by involving companies and workers in all steps of the construction of the Lyon-Turin base tunnel through an ambitious programme called **Mission S** (Safety). The aim is to work towards minimum accidents and zero mortality. The starting point is that safety is a shared responsibility of all those involved and that the return on experience from the smallest accident is crucial for the prevention of subsequent accidents, in a virtuous circle that tends continuously towards zero.

Legal aspects

The Lyon-Turin cross-border section represents the **first case in Europe of application of the anti-mafia legislation at a transnational level** regardless of the nationality of the construction sites.

The French and Italian Prefects work in parallel, sharing information, with the support of the respective police forces that carry out joint checks and inspections in the construction site areas. The checks are carried out not only on the contractors, but also on the entire subcontracting chain (also for contracts worth € 1).
The companies that have everything in order are included in a transnational Whitelist, a sort of register of entities who can work on the construction sites.

Excavation materials

For the first time in Europe, thanks to an agreement drawn up within the Intergovernmental Committee and validated by France and Italy, it will be possible to re-use the excavated material extracted on the Lyon-Turin construction sites across national borders for the construction of the work between the Susa and the Maurienne Valleys.

THE PUBLIC PROMOTER: TELT

Company profile

TELT (Tunnel Euralpin Lyon Turin) is the Public Promoter in charge of the construction and management of the Lyon-Turin cross-border section. A company founded under French law on 23 February 2015 according to **international agreements** that define the realization of the line itself. The above agreements were signed by the two **founding partners: the French government and Ferrovie dello Stato italiane (Italian State Railways).** TELT succeeds Lyon Turin Ferroviaire (LTF SAS), former Public Promoter involving SNCF (France) and RFI (Italy), and, since 2001, has been in charge of the studies, investigations and preliminary works for the shared Italian-French part.

Corporate setup and management

TELT is an SAS (Società per Azioni Semplificata). The corporate set-up is as follows:

- 50% Ferrovie dello Stato SpA (FS) for Italy;
- 50% French State, through the Ministry of Transport.

The Board of Directors has 10 members with voting rights appointed by both countries, plus one representative of the European Commission, without voting rights and two representatives of the Auvergne-Rhône-Alpes Region (France) and the Piedmont Region (Italy) without voting rights.

The French State appoints the President and the Italian State appoints the General Director choosing among the Board members.

The President of TELT is Daniel Bursaux.
The General Director is Maurizio Bufalini.

Team

200 people from both Italy and France currently work for TELT, with an average age of 45 and with an equal distribution between genders.
The team consists of 70% engineers who have worked on infrastructure projects worldwide, participating in **the design and engineering of a total of 1,150 km of railways and 454 km of tunnels.**

Supervisory Bodies

The Company has established two control bodies (the **Contract Committee and the Permanent Monitoring Service**), which respectively monitor the contract awarding procedures for compliance with EU law and the correct use of funds.

They are both chaired by French representatives and are composed of 12 members, 6 appointed by each government, for a renewable term of 5 years.