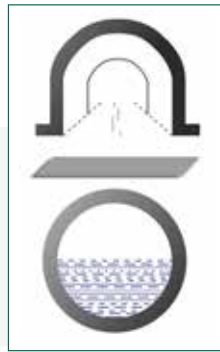


Greece

Name: Greek Tunnelling Society (GTS)

Type of Structure: non-profit association with membership

Number of Members: 250 members, 16 corporate members



ASSOCIATION ACTIVITIES DURING 2021 AND TO DATE

In 2021 the Greek Tunnelling Society (GTS), during the pandemic, continued working to promote the environmental, social, technical and economic advantages of the design, construction and operation of tunnels and underground space. The Council Board executed numerous meetings, most of them virtual, for running GTS activities.

Last year was an exceptional landmark for the Greek Tunnelling Society when on 12/2/2021 at the ITA General Assembly, the member nations voted to award the organization of the World Tunnel Congress 2023 and the 49th ITA General Assembly to GTS in Athens. The GTS Board and members have been working hard since then to accomplish the task in line with the ITA "WTC Planning Guide". We are in continuous contact with ITA and have already presented the WTC Backup Plan and 1st Progress Report. We have set up the Organizing Committee (OC), as well as various committees, each assigned to work on organizing WTC 2023. After long negotiations, GTS signed a contract with an experienced PCO company as our partner to deliver a successful WTC in Athens. Since then, GTS, OC and PCO are in close cooperation. The Congress will be hybrid and include the Scientific Sessions, the Technical Exhibition, the ITA General Assembly and other ITA activities (<https://wtc2023.gr/>).

Following elections on 1/7/2021, which were postponed in 2020 due to pandemic, our members elected a new GTS Council Board consisting of seven board members.

The Chairman of the WTC2023's OC participated in the virtual ITA ExCo meetings representing the host member nation.

GTS published regular issues of its electronic magazine for informing our members about our activities, recent news, new underground projects in Greece and globally, and interesting technical publications etc. The Young Members

Group emphasized its work on promoting webinars on interesting tunnelling issues, research results, work opportunities for young tunnellers etc via social networks (Facebook page).

Workshops/on-line webinars organized/co-organized by GTS:

- "Innovations and solutions in Tunnelling", Mr. A. Boscaro & Mr. S. Anzani, UTT MAPEI, 18/10/2021 joint organization GTS and GTSym
- "Safety of Road Tunnels based on data from ODOS Project", Prof. K. Kirittopoulos, NTUA -Mechanical Engineering Faculty, 9/12/2021, Joint Research Program of NTUA, NCSR Democritus, Ioannina University, TEKMON GEOMATICS

GTS was a sponsor of the "ITA Tunnelling Week", a virtual Congress held instead of WTC2021, and participated with a presentation about underground projects scheduled in Greece and an e-booth, 20-24/9/2021.

In collaboration with ITA-AITES and the Brazilian Tunnelling Society, in March 2021 GTS collected data for female Greek engineers active in underground works during the last 30 years.

CURRENT TUNNELLING ACTIVITIES ATTIKO METRO (Athens METRO)

Line 3 Extension to Piraeus

This year the "Line 3 Extension to Piraeus" project will become operational when it delivers the final three Stations (MANIATIKA - PIRAEUS - DIMOTIKO THEATRO) thereby concluding the whole 7.6km long section (6.5km of which was constructed by TBM). DIMOTIKO THEATRO Station will also become an open museum. The Metro Extension to Piraeus will serve approximately 132,000 passengers on a daily basis reducing private car traffic by 23,000 daily and CO2 emissions by 120 tons per day. PIRAEUS Station is to become a vital transport hub by connecting two Metro Lines (Line 1 and Line 3), the Port, the Suburban Railway

and a new Tram Line (5.4km long with 12 Stations) recently put into operation. Furthermore, the direct connection between the Port and the Athens International Airport "El. Venizelos" will promote the development of the economy of the Attica region and Greece as a whole.

New Line 4 - Section A "Alsos Veikoy - Goudi"

On 22-06-2021, the contract for the new Athens Metro Line 4, first section (from Alsos Veikou to Goudi) was signed between the responsible authority and the project contractor. The Design and Built contract has an estimated cost of €1.5bn and a delivery time of 96 months for the 13km long, fully automated Metro Line with 15 stations in Athens. The project includes tunnel boring using two TBMs, underground stations, station fit-out, ventilation shafts, mechanical and electrical systems, rail infrastructure and systems, underground train maintenance and washing plant, rolling stock light maintenance facilities and a new central control building.

It is the biggest public Project currently being executed in Greece. It is foreseen that the Section A of Line 4 will serve at least 341,000 passengers on a daily basis in 2030.

Preparatory works have started and include archaeological investigations, utilities diversions, traffic deviations, and worksites occupation etc.

Thessaloniki Metro

The first Metro Line for the second largest city in Greece, Thessaloniki, is under implementation. The project includes 18 underground stations, ~14.4km of tunnelling and a 50,000m² depot in the Pylea area. There will be 18 fully automatic driverless and air-conditioned trains, as well as automatic Platform Screen Doors in each Station for improved passenger service and safety. Excavation and final lining installation of the twin single-track tunnels has been completed using two EPBMs. Nearly all Stations are complete and equipped. According to the project owner ATTIKO METRO S.A. planning, the project is expected to be commissioned in 2023. The Metro line alignment was designed at significant depths to minimize the chances of archaeological finds, which were nevertheless encountered in the historical city centre. The Venizelos Station will now become an open museum that will display the ancient history of the city.

It is expected that upon completion of the Project, the daily ridership will rise

to 313,000 passengers. As a result of the project's operation, the number of circulating private vehicles will be reduced by 57,000 vehicles/day and the respecting CO2 emissions will be reduced by 212 tons per day.

CURRENT TUNNELLING ACTIVITIES

Underground railway corridor between "Central Athens Station" and "Three Bridges" area

The €66M project involves the construction of a 2.36km long four-track rail corridor, 60% of which will be in a fully underground alignment. It is expected to become fully operational in 2023.

Central Greece Motorway (E65) – Lamia – Xyniada Section

The project concerns the construction of the south section of the Central Greece Motorway. It includes a 3km long twin tunnel. Excavation of the first tunnel was completed in 2021. Boring was difficult through geologically adverse ground conditions and took two years.

Halkidiki mining project

The northeastern side of Halkidiki, in northern Greece, has a long history of mining activity. Currently three exploitation areas exist namely Olympiada, Skouries and Stratonii areas. The overall development of Kassandra mines is considered as a mega-project with numerous challenging civil works (surface and underground) and earthworks. In underground infrastructure, the most notable works completed or currently under construction include Kokkinolakkas stream diversion tunnel, 1,140m long, Olympias main access tunnel, ~9km long, Skouries spiral decline, ~5.5km long and the Skouries access shaft, ~700m deep.

FUTURE TUNNELLING ACTIVITIES

New Athens Metro Line 2 extension to Ilion

An extension of the existing Line 2 from Anthoupoli Station to the district of Ilion is being designed by ATTIKO METRO S.A. The double-track tunnel will be approx. 4km long, constructed by the conventional method, with three underground stations, six shafts and will include both civil and electromechanical works.

New Athens Metro Line 2 extension to Glyfada

A 4.5km long Extension of Line 2 from Elliniko Station to the district of Glyfada including three stations has been planned.

Underwater road link connecting Salamina - Perama in the Attica region ~ €400M.

A competitive dialogue process is underway between the preferred three interested parties. The project concerns the design, construction, financing, operation, maintenance and exploitation of an approximately 15km long highway which includes a 1.2km long immersed tunnel and two tunnels, 1.7km l and 600m long respectively. The Environmental Impact Assessment study of the project is at the approval phase and following that the tendering process will be finalized.

Road extension of the Kimis Highway to Athens-Thessaloniki Highway

The Project's tendering phase has started and includes 1.26km long double-tube Kimis Urban tunnel and a 1.16km long cut & cover tunnel that will connect Attiki Odos (highway) with Athens-Thessaloniki Highway. The budget is €434M and the estimated construction period is 4 years.

Underground section of coastal road at the Hellinikon area, Athens

The Project is at tender phase with a budget of approx. €80M. The existing coastal road (Poseidonos Street) will be taken underground in a 3km cut & cover tunnel with two traffic directions of three lanes each. This project is part of the "The Ellinikon", near the former Athens airport, and is Europe's greatest urban regeneration project.

Northern road axis for Crete Island (NRAC)

A concession project concerning the design, construction, financing, operation, maintenance and exploitation of an approximately 200km long motorway which includes a significant number of tunnels i.e. i) Souda-Kalyves section: an 1.22km long tunnel, ii) Kalyves – Agioi Pantes: an 230m long tunnel, iii) Vrises-Petres-Atsipopoulos: five tunnels of 4.59km total length, iv) Exantis-Fodele-Linoperamata: Five tunnels of a total length of 3.19 km, v) Hersonissos – Malia: a 375m long tunnel, vi) Malia – Neapoli: two tunnels of 4km long. The project is split into two separate tenders: i) a concession agreement for the section between Chania and Hersonissos, and ii) a PPP project for the Hersonissos-Neapolis section. The cost has been estimated at around €1.1bn for the concession project and €359.6M for the PPP project. The tendering process involves a competitive dialogue. Currently the contracting authority (Ministry of

Infrastructure and Transport) is examining the technical skills of the interested parties.

Urban tunnels in the Metropolitan area of Athens

The implementation of the Athens Metropolitan Area Master Plan requires new road tunnels, which include: i) the 3km long Ilioupolis urban tunnel, and ii) a 2km long motorway tunnel that will connect Attiki Odos (highway) and Rafina port.

Klissouras road tunnel

A new road tunnel (Klissouras) 1.36km long on the highway connecting the towns of Castoria and Ptolemais in northern Greece is ready for the project tender to begin. The budget is €74M with EU funding, and a construction period estimated at 36 months.

Thessaloniki Metro line extension

The Thessaloniki Metro line extension to the north-west of the city will serve six municipalities including nine new underground stations and is currently in the first design phase.

STATISTICS

1. Length or volume excavated - % mechanized/% conventional during 2021 ~ 1000m - 0%/100%

Amount (USD or EUR) of tunnelling / underground space facilities awarded in 2021 = €1.50bn

3. List of tunnels completed: Central Greece Motorway (E65) – Lamia-Xyniada Section, first of the twin tunnels with a total length of approximately 3km.

4. List of tunnels under construction: Athens Metro Line 4, Thessaloniki Metro, Othris mountain twin tunnels (E65 motorway), tunnels along the Rododafni-Patra new railway section, underground railway corridor in Athens area.

EDUCATION ON TUNNELLING IN THE COUNTRY

National Technical University of Athens
Postgraduate Course
Design and Construction of Underground Works
Schools: Mining and Metallurgical Engineering/Civil Engineering (more info: <http://tunnelling.ntua.gr/>)