

GREECE

Name of Association: Greek Tunnelling Society (GTS)

Type of Structure: Non-profit association with membership

Number of Members: 250 members, 18 corporate members



ASSOCIATION ACTIVITIES DURING 2023 AND TO DATE

The Council Board executed numerous meetings – physically and virtually - for running GTS activities.

The most significant event for GTS was the organization of the WORLD TUNNEL CONGRESS 2023 and the 49th ITA GENERAL ASSEMBLY in Athens, 12th -18th May 2023 - the biggest technical congress ever held in Greece. The Congress theme was “Expanding Underground - Knowledge and Passion to Make a Positive Impact on the World” held at the Megaron Int'l Conference Centre.

During the Opening Ceremony, the work of the late Prof. P. Marinos was celebrated, Dr. M. Panet gave the Muir-Wood lecture entitled “The Tunnel behavior at the face of excavation” while the keynote lecture “Seismic design and risk assessment of tunnels and underground structures” was presented by Prof. K. Pitilakis. Prof. Lord R. Mair coordinated the round-table discussion “Underground Space for Mobility: Frontier/Emerging Technologies.”

The number of attendees was 2,100 from 66 countries, 20% of whom were students and ITA young members. We welcomed the Pakistan Tunnelling & Trenchless Society as a new ITA member. The scientific program included 412

papers from 44 countries, 153 oral and 259 e-posters, while authors numbered 1,221. The Congress proceedings were published by CRC Press, Balkema-Taylor Francis group, and are open-access for the first time in WTC history.

There were special sessions “Women in Tunnelling – Picture an underground expert: paving the road to diversity” organized by the women’s group and “Holistic view of road tunnel safety and risks: composing all factors and perspectives for sustainable projects in difficult times” organised by COSUF. A special off-site event was organized at Lavrion concerning ancient mining and tunnelling works.

The Technical Exhibition with 120 companies’ booths manned by 400 personnel covered almost all the entire Megaron Conference Centre as demand was high.

On the last day (18th May) the Technical Visits program took some 250 attendees to five interesting underground work sites, mining and operations activities, specifically Athens Metro Line 4, the Greek Railway underground corridor, the mined exploitation of Pentelikon marble, and the Hellinikon Project underground coastal road and Metro Operations Control Centre. Two athletics events completed the WTC2023 program; the

Symbolic Marathon; and the Cricket Competition in honour of the latest ITA member Pakistan.

Sponsors totaled 40 companies, both international and local.

During the 49th ITA Gen. Assembly, among the regular issues discussed, was the voting for the 2026 WTC host city where Montreal, Canada was elected. The G.T.S. was honored to have its B.o.D. member and WTC2023 Organizing Committee Chairman Mr. I. Fikiris elected as ITA Vice-President.

The ITA Working Groups, 14 in total with over 100 members, met in person, discussing various important subjects and presented the new technical reports from WGs 11, 17, 20 and ITAtech Group Excavation.

Before the Congress opening, a 2-day seminar on ‘Risk Management in Tunnelling and Sustainable Underground Solutions’ was organized by the ITACET foundation from 12th – 13th May emphasizing young engineers’ education.

In Sept. 2023, GTS published a special issue of its magazine (this year in a physical edition too) focussing on WTC2023 along with the regular recent news, new underground projects in Greece and globally, and other interesting technical publications etc.

On Saint Barbara’s Day (4-12-2024), we organized a worksite visit to the TBM Start Shaft “Veikou” on the Athens Metro Line 4 Project. Numerous GTS members and friends employed in the tunneling field took part and were enlightened on the design and construction of the project.

GTS took part in the 9th Greek Geotechnical Conference held from 4-6/10/2023 at the West Attica University Conf. Centre as a Gold Sponsor with an exhibition booth.



CURRENT TUNNELLING ACTIVITIES

Athens Metro - New Line 4 - Section A "Alsos Veikoy – Goudi"

Works for the new Athens Metro Line 4, first section, are continuing. The €15bn, 96 month Design & Built Contract for the 13km long, fully automated Metro Line with 15 stations within the city of Athens was signed in 2021. The Project includes tunnelling works by 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 executed in Greece. It is foreseen this Metro section will serve 341,000 passengers on a daily basis in 2030.

Preparatory works are in progress at certain worksites including archaeological investigation, utilities diversions, etc.

Construction of retaining structures and excavation works have started at a number of Stations and Ventilation Shafts. Regarding the two TBMs, the first one completed the initial tunnel section while the second is about to start boring from its start shaft.

Thessaloniki METRO

The first Metro Line for the second largest city in Greece, Thessaloniki, is almost ready to commence operation during the 2nd semester of 2024. The project includes 18 underground stations, some 14.4km of tunnelling and a 50,000m² depot 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. Civil, trackwork and E/M works on the twin single-track tunnels are complete. All but one of the stations are also complete and equipped. Only at Venizelou Station which was delayed due to archaeological findings, are the architectural and E/M works under way. Trains are currently running along the line and all systems are under test operation.

It is expected that the daily ridership will rise to 313,000 passengers. As a result, street traffic will be reduced by 57,000 vehicles/day and CO₂ emissions by 212 tons/day. Venizelos Station will become an open museum that will display the ancient history of the city.

The operation and maintenance of the



Thessaloniki Metro System will be on a public-private-partnership (PPP) basis. The contract was awarded in October 2023 for a period of 12 years with total cost €292M.

Underground Section of Coastal Road at Hellinikon area, Athens

The project budget is approx. €80M for the under-grounding of the existing coastal road (Poseidonos Street) over a length of 3km in cut & cover tunnel that will host two traffic directions of three lanes each. This is part of the "The Ellinikon", near the former Athens airport, which is Europe's greatest urban regeneration project. Construction works are almost half-way with completion scheduled for 2025.

Central Greece Motorway (E65) – Othris Tunnel at Lamia – Xyniada Section

The construction of the Othris Tunnel is part of the south section of the Central Greece Motorway (E65) project, between Lamia and Xyniada. It includes a twin tunnel of approx. 3km. Civil and E/M works for the tunnel are 99.5% complete. Boring of the tunnel was challenging, within geologically adverse ground and lasted for more than two years.

Underground Section of The National Railway Line, Athens

The Greek Public Railway Construction Company (ERGOSE) assigned the construction of a 4-track rail corridor in 2018. At 2.36km long, approx. with 1.9km fully underground, the project starts at the Athens Central Railway Station. This section will connect to the new four-track rail corridor recently completed and opened to traffic. The rail corridor runs mostly within the occupation zone of the surface train tracks. Half of the corridor will serve suburban trains, whereas the rest will be used mainly for intercity services.

Project constrains include maintaining the surface train operations, safe construction close to adjacent buildings, and a close overpassing of a Metro running tunnel and a Water Authority culvert. Therefore, modern instrumented monitoring is implemented. Works are in full progress and the whole project is expected to be delivered in 2026.

Klissoura Tunnel in the Provincial Road Kastoria - Ptolemaida, Macedonia

The contract for the "Construction of Provincial Road Kastoria - Ptolemaida" project, in Macedonia, Northern Greece, was signed in 2022. Construction of the new 10.4km road includes the Klissoura Tunnel. The tunnel will be 1,365m long and host traffic in both directions and will include an emergency gallery 1,383m long. The tunnel runs through mountainous terrain and drilling has started using controlled explosions that open about 1.5m length per round. The project schedule is 3 years with a total cost approx. €70M. EGNATIA ODOS is the owner.

FUTURE TUNNELLING ACTIVITIES

New Athens Metro Line 2 Extension to Ilion

The first phase of the Tender process (Call for Interest) was released in 2023 and four bidders submitted their financial and legal documents. The 2nd phase of the Tender is expected by the end of 2024. This extension of the existing Line 2, from Anthoupoli Station to the Ilion district is being designed in-house by the Metro Project authority ELLINIKO METRO S.A. The double-track tunnel will be approx. 4km long with three underground stations, six shafts and will include both civil and electromechanical works. The estimated cost is €550M and the construction time five years.

Kimis Road Extension to Athens – Thessaloniki National Highway

ITA MEMBER NATION ACTIVITY REPORTS 2023

The project includes the 1.26km long double tube urban tunnel and a 1.16km long cut & cover tunnel that will connect Attiki Odos (highway) with Athens - Thessaloniki National Highway. The cost will be approx. €350M and the estimated construction period four years.

Underwater road link Salamina - Perama in Attica region

Three consortia have filed bids for this project that concerns the design, construction, financing, operation, maintenance of an approx. 15km long highway which includes a 1.2km long immersed tunnel and two tunnels 1.7km long and 600m respectively. The Environmental Impact Assessment study is at the approval phase and following that the tendering process is expected to be finalized. The cost will be approx. €500M and the estimated construction period four years.

Northern Road Axis of Crete island

A concession project concerning the design, construction, financing, operation, maintenance of an approx. 200km long motorway which includes a significant number of tunnels (i.e. i) Souda - Kalyves section: a 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 3.19km, v) Hersonissos – Malia: a 375m long tunnel, vi) Malia – Neapoli:

two tunnels of 4km total long).

The project is split in 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 €360M for the PPP project.

Urban tunnels in the Metropolitan area of Athens

The implementation of the Athens Metropolitan Area Master Plan requires some new road tunnels, which include: i) the 3km long Ilioupolis urban tunnel with three traffic lanes per direction which is presently at the design phase, and ii) the 2km long motorway tunnel that will connect Attiki Odos (highway) and Rafina port.

Underwater road link to connect Lefkada island to the mainland

To connect Lefkada island to the mainland national highways, an underwater tunnel crossing the existing sea strait has been planned. In 2023, the Ministry of Infrastructure & Transport decided to run a tender for the selection of a Technical Advisor who will support the preparation of a PPP Tender for the 'Design, Construction, Funding, Operation and Maintenance' of an underwater connection of Lefkada island to the mainland.

Thessaloniki METRO line extension

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

Bralos-Amfissa Road Tunnel

This tunnel will be part of a new 24km long road on the Lamia-Itea axis. The project was awarded in Feb. 2023 with a budget of €290M approx.

STATISTICS

1. Length or volume excavated - % mechanized / % conventional during 2023: 1500m - 5% / 95%
2. Amount (USD or EUR) of tunnelling / underground space facilities awarded in 2023: €500M
3. List of tunnels completed: Thessaloniki METRO, Central Greece Motorway (E65) Orthris Tunnel, totalling approximately 3km.
4. List of tunnels under construction: Athens METRO Line 4, underground railway corridor in the Athens area, underground section of Coastal Road at Hellinikon area, Athens.

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/>)