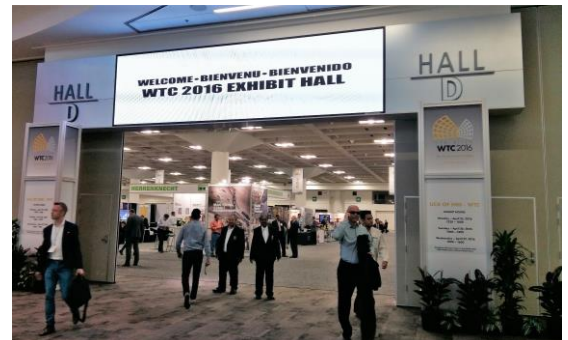
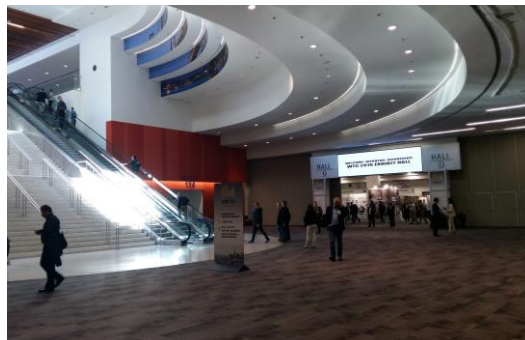


World Tunnel Congress 2016, 22nd-28th April 2016, A successful week in San Francisco: 2 319 attendees gathered around the latest technological and technical innovations in urban underground planning

From April 22nd to 28th in San Francisco, United States, the International Tunnelling and Underground Space Association (ITA) held its 42nd General Assembly along with the 2016 World Tunnel Congress (WTC), co-organised with the Underground Construction Association of SME. As states demonstrate strong needs in tunnels and underground spaces for public transports, interchange subway stations, hydroelectric infrastructures, etc, the WTC 2016 was a unique occasion to discover the latest state-of-the art innovations in urban planning and underground construction projects in the United States and worldwide. This international event, widely recognised among tunnelling professionals, civil engineers, and public authorities, is, indeed, the top attended annual "rendez-vous" that currently permits to have a clear vision of the latest projects of underground infrastructures over the planet.



This year, **2 319 participants gathered** around several strategic questions raised by countries: how are cities coping with climate change pressures, a few months after the COP21 negotiations in Paris? How could they improve their networks of mobility and, at the same time, develop green and pedestrian areas above ground? What will the urban planning of the future be? What is the future of material freight? In what way can high technologies in tunnels and underground spaces contribute to the development of smart cities? Convinced that the tunnelling industry have ingenious responses to address these challenges, the ITA, along with the UCA of SME, offered the attendees a large panel of several high profile conferences, up to 200 technical sessions, and oral and poster presentations to address these questions and thus favour good practice and innovation sharing.

In this regard, one can evocate **the ITA Tech Session dedicated to the very recent exploitation of the Internet of Things (IoT) by the tunnelling industry**. At that occasion, a representative of SIGMA Connectivity offered an interesting perspective of the future IoT developments, pointing out that two strategic shifts would greatly influence the tunnelling industry: the connexion of digital technologies with industrial products and logistics, from the one hand, and, above all, the development of easy-to-use IoT enablers, that will permit to drive higher volumes of data and to considerably reduce the costs of this revolutionary technology. **Pauli Arenram, Chair of the Committee on New Technologies within the ITA**, expressed his satisfaction regarding the value of the exchanges: *"New digital technologies have definitely reached the tunnelling industry. There is a growing need for safer and more reliable systems that communicate, deal with and report large data in actionable format to the stakeholders from the investigation phase of tunnelling projects, during the construction and the tunnel operation phase. This ITA Tech Session was a great opportunity to find precious answers to the questions and challenges of our industry"*.

Another interesting session was held by **the ITA Committee for Underground Space (ITACUS), who orientated the discussions on the international urban agenda**, in which the United Nations, through their Habitat Program, take a great part. **As other UN Consultative Members involved in urban development, the ITACUS, through the World Urban Campaign, is in charge of proposing new solutions to imagine sustainable cities**. Through this open session, the ITACUS developed new insights about the role that **underground freight networks** could take in this regards. The **Hyperloop technologies** were also evocated, as well as **CargoCheck Systems**, in order to help stakeholders in port areas become aware of the relevance of urban underground freight systems. *"During the session, we also heard a presentation on the possibilities of mixed-use tunnels and the implications this could have, Han Admiraal, Chair of ITACUS, explained. Rather than building a tunnel for just one use, the future could bring urban network providers creating underground spaces to be used by multiple parties. Urban system integrators would bring these parties together to ensure that the underground space is used in an efficient way. In the future, metro systems will not only move people, they will also be able to move cargo, and to carry cables that are essential to modern societies. Furthermore, they could be producing energy for the city beneath which they operate. The World Tunnel Congress is the occasion to share bright ideas that could be of high value for cities in the next few years"*.

During the WTC, specific workshops were also organized, like the Building Infrastructure Modelling (BIM) workshop. As governments worldwide tend to mandate and recommend BIM process, thus recognizing its value for helping to deliver projects successfully, the workshop aimed at identifying in what way tunnelling fundamentally differs from civil surface construction, and to making sure that BIM standards and processes reflect these major differences. Also, it focused on current trends in the application of BIM technology to tunnelling, to allow teams to reduce direct costs, improve efficiency and reduce risk. Presentations being delivered by design, construction and project professionals and are not aligned with particular software. According to Jurij Karlovšek, chair of the BIM open session, *"there is a need to act fast and develop live online documents and procedures for consultants, contractors, owners, and operators, describing the value, data sources, best practice and possible further actions for a project using BIM process for tunnels,*

What does the BIM Technology aim at?

The BIM models are now much more than 3D animation. They are intelligent constructs with embedded information that can be shared between stakeholders throughout an organization, with the possibility to provide significant benefit in each phase of a tunnel project lifecycle.



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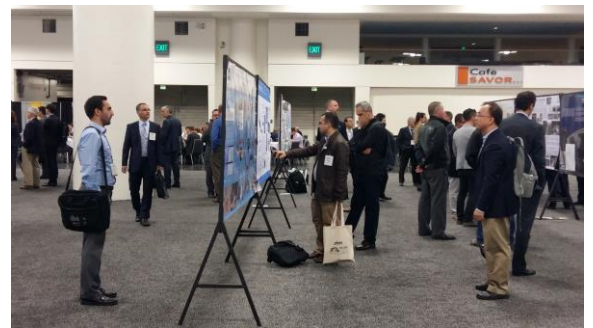
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because this technology is crucial for our industry. Therefore, it is of paramount importance to share, within the ITA, these experiences and come to dedicated global standards and guidelines that so far are only driven by the building industry. The ITA should be a leader in the discussion and be proactive in integrating with the civil-end legislation, rather than waiting for tunnel owners/project proponents to dictate something else”.

Innovation-oriented, the World Tunnel Congress was also an **international business-to-business meeting**. In total, **285 booths** were deployed in the Moscone Center, displaying the latest technical devices launched by the most important champions of the tunnelling industry. The participants had also the opportunity to look through more than **180 posters that gave concrete answers to various topics directly concerning civil engineers: innovative procurement processes, cost and risk management, contractual methods, BIM technologies, and even examples of innovative underground infrastructures built worldwide** (water conveyance, sewage, and storage, cross rail tunnels, Washington DC or Los Angeles Metro projects ...).



The week ended with the **42nd General Assembly of the ITA**, during which the new President of the Association, Tarcisio Celestino, a civil engineer from Brazil, was elected. The latter presented his roadmap for his three-year mandate: *“The world population will nearly double in the next three to four decades. This will bring a significant*



*increase to the need for underground facilities which will have to be designed and constructed, in addition to the current backlog. It is the role of ITA to indicate to government, decisions makers and the population, that underground urban infrastructure is the correct way to go. **Looking at the past, we find out that effort and resources have been spent in fixing mistakes like elevated transportation routes which were later on put underground. If we start it right, we will spend less to have better results than did the past generations.** ITA also has to enhance its consistent contribution of the Working Groups and Committees for the improvement of design and construction techniques. By doing so and developing the idea that underground construction is safe and reliable, we can also expect, as a consequence, to throw some light upon their licensing processes. This has become a bottleneck in many countries, almost eliminating the advantages for faster and more efficient construction techniques”.*



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To see the video related to Tarcisio Celestino's interview, please click on the link: <https://youtu.be/9iS9AY7AZmo>

To know more about the major tunnelling works in progress worldwide, as well as some future projects, please click on the link: <http://urlz.fr/3iel>

About the International Tunnelling and Underground Space Association:

The International Tunnelling and Underground Space Association (ITA) is a non-profit and non-governmental international organization, which aims at promoting the use of underground space as a solution to sustainable development. Founded in 1974 and operating out of Lausanne, Switzerland, ITA currently associates 73 Member Nations, 300 affiliated members, 17 Prime Sponsors and 60 supporters.

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