

# **Tunnels and Underground Spaces – sustainable solutions for infrastructure development**

Dr. Chungsik Yoo  
Professor, Sungkyunkwan University, Korea  
Executive Council Member, ITA

Due to the limited surface space available, tunnelling has become an attractive alternative in creating spaces for the transportation networks. An ever-increasing awareness of the environment has also given a favor to tunnelling over other construction alternatives. In response to such an increasing demand for tunnels and underground spaces, a significant length of tunnels for subway lines in major cities, high speed railway, and highway road has already been constructed and being operated. More tunnels and large underground spaces for a variety of use are scheduled for construction in the years to come.

The term “sustainability” has become a key word in our daily life. Natural resources are limited as

consumption outpaces supply. International reports regarding global warming, water shortages, and extreme weather events urge global action to reverse existing trends.

Despite the increased popularity of the use of the term "sustainability", the possibility that human societies will achieve environmental sustainability has been, and continues to be, questioned—in light of environmental degradation, climate change, overconsumption, population growth and societies' pursuit of unlimited economic growth in a closed system.

Tunnelling and related technology are now being recognized as fundamental to sustainable infrastructures development. Related technologies will further provide innovative solutions for the generations to come. This is because tunnels and underground spaces can satisfy sustainable development goals, such as economic development, social development and environmental

protection. I have no doubt that the tunnelling and underground space construction technology will enhance our quality of life for current and future generations while conserving resources and energy.

More collaboration between urban planners and tunnel engineers is needed to raise awareness of subsurface development and to further discuss on how underground space construction technology can bring sustainability into the infrastructure development for the next generations. I believe that the workshop to be held in the upcoming WTC 2019 in Naples will provide a good opportunity for interdisciplinary exchange on urban and subsurface development.