

**WTC 2016 Training session**  
**‘Underground Space Use’ - 22<sup>nd</sup> – 23<sup>rd</sup> April 2016**  
**Moscone Center – Marriot Marquis**  
**San Fransisco - USA**

**Seminar Objective:** Introduction for engineers, architects, planners and public administrators to the use of underground space to increase liveability and sustainability in urban areas and in other key public resource regions. The seminar will identify key issues that need to be considered when using underground space and will show how these key issues are dealt with on a worldwide basis.

**Background:** This course outline has been developed by the ITA Committee on Underground Space (ITACUS) in conjunction with the ITA Committee on Education and Training (ITA-CET).

**Friday 22 April 2016**

**Session 1: Introduction and Overview**

09.00-09.45: Welcome and Opening: ITA and concerned country representatives – H. Admiraal  
09.45-10.30: Solutions and missed opportunities – H. Admiraal  
10.30-11.00: Coffee Break  
11.00-11.45: A history of underground space use – R. Sterling  
11.45-12.30: Classification of Uses / Brief overview of construction methods – R. Sterling  
12.30-14.00: Lunch

**Session 2: Cost and Risks Issues / Advantages and Disadvantages**

14.00-14.45: Controlling costs in underground space development – H. Admiraal  
14.45-15.30: Human factors and risk – H. Admiraal  
15.30-16.00: Coffee Break  
16.00-17.30: Detailed exploration of potential advantages and disadvantages – A. Cornaro & R. Sterling  
17.30-18.00: Questions and Answers

**Saturday 23 April 2016**

**Session 3: Architectural, planning and cost-benefit issues for broad-scale underground space use**

09.00-09.45: Sustainability and resiliency issues – H. Admiraal  
09.45-10.30: Legal and compensation issues for underground space – H. Admiraal  
10.30-11.00: Coffee break  
11.00-12.30: Architecture of underground spaces – creating a connected urbanism – M. Labbé  
12.30-14.00: Lunch



#### **Session 4: Guidance for planning and design of underground spaces**

- 14.00-14.45: Planning for urban underground space use – A. Cornaro
- 14.45-15.30: Master planning for underground space use: Helsinki example – R. Sterling
- 15.30-16.00: Coffee Break
- 16.00-16.45: Master planning for underground space use: Selected examples – A. Cornaro
- 16.45-17.30: Current underground space research and development activities – R. Sterling
- 17.30-18.00: Closing Remarks – H. Admiraal and A. Cornaro

*Update(d): 21/04/2016*