



**POLITECNICO DI TORINO**  
Dipartimento di Georisorse e Territorio



GEORESOURCES AND ENVIRONMENT ASSOCIATION



ITALIAN TUNNELLING ASSOCIATION

## INTERNATIONAL CONGRESS

# MECHANIZED TUNNELLING: CHALLENGING CASE HISTORIES

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## **SMART PROJECT (Stormwater Management and Road Tunnel) (Kuala Lumpur, Malaysia)**

### Abstract

The topic of logistics, which stands for the efficient and effective design and management of material flows, gains more and more importance. This applies particularly for the construction industry. Construction projects have to be realized with smaller funds and within shorter periods. Thus, a well-organized and thought-out logistic concept is vital to support and guarantee an efficient and therewith cost saving construction process. On tunneling sites, the scheduling and coordination of the material flows is essential to ensure smooth operations. If the required materials are not on schedule and accurate in quantity and quality and if the disposal of the excavated materials is not sufficient, the two main tunneling processes of advance and ring building cannot run continuously.

The logistic of the S.M.A.R.T-Project has to be designed for the supply of e.g. 9300 tons of bentonite for the bentonite slurry, more than 28000 segments for the concrete lining and 131000 tons of grout. This research reveals that the tunneling process of the S.M.A.R.T.-Project is heavily dependent of the separation plant and that the most worrying bottleneck is the disposal of the arising excavated material of in total 740000 m<sup>3</sup>. This bottleneck is caused by the large excavation area of 140 m<sup>2</sup>, the alignment in limestone and driving restrictions for trucks within Kuala Lumpur that are limiting the disposal process to 15.5 h/day. With an average production rate of 6 rings/day, 300 trucks/day or, in consideration of the driving restrictions 20 trucks/h, are required, to dispose the excavated materials within the same day.

After the design of an overall logistic concept, potential solutions for detected bottlenecks within the logistic concept, including disposal of the excavated materials as well as supply and production of the pre-cast concrete segments, can be developed.