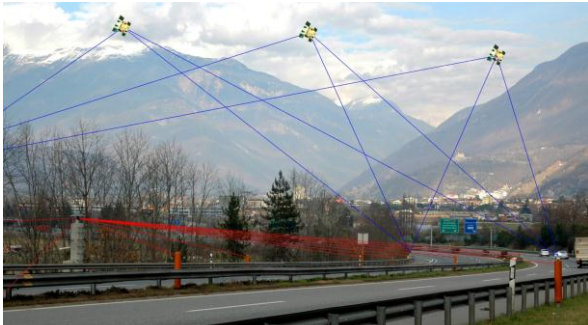


## Ceneri Base Tunnel, North Portal

Bellinzona, Switzerland (2006-2013)



Data from different measurement systems are linked

## Geotechnical Measurements

### Object

Ceneri Base Tunnel, North Portal and undercrossing of highway A2. Los 704

### Project Description

Complex monitoring of highway A2 for detection of settlements due to the tight undercrossing of the road. Permanent data analysis and control of threshold value overstepping, linked to an online alarm system.

### Instruments

Total Stations: 2 Leica TCA 1800 that measure 45 glass prisms  
Monitoring System: DC3 System that controls the total stations, manages the data and generates alarms  
Connected to: 6 GPS, 10 Temperature sensors  
Fixed installation: 10 water pressure sensors in drills  
75 Inclinometers in 6 vertical drills  
68 Inclinometers in 4 horizontal drills  
6 axial extensometers in 2 drills  
Communication: RS485 bus system, WLAN, UMTS, Ethernet (LAN)

### Data Analysis

On-site automatical data collection and analysis for threshold value overstepping. Generation of alarms at different levels. Graphics are supplied to the customer through the Amberg internet platform "GEOvis".

### Client

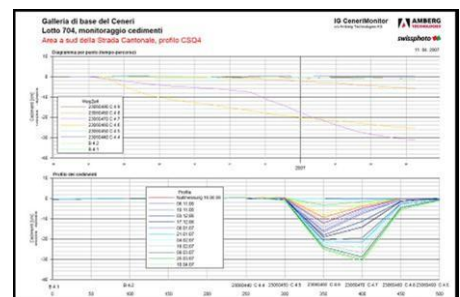
Alp Transit Gotthard AG, Lucerne  
Contact: A.Ryf

### Realization

IG CeneriMonitor  
Amberg Technologies AG, Regensdorf (lead)  
BSF Swissphoto, Regensdorf



Pillar with total station



Analysis of the subsidence cavity

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