

**“United Nations International Meeting on the
Applications of GNSS**



Specialized GNSS applications for engineering professionals based on android tablets

Ivo Milev

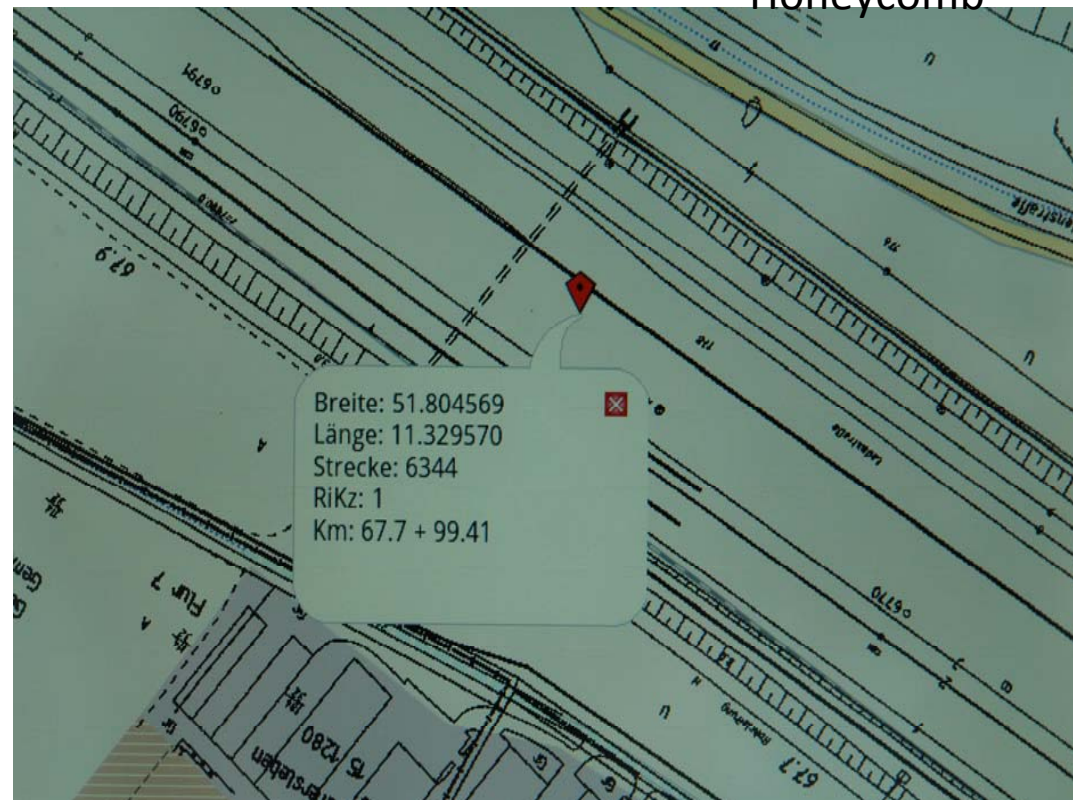
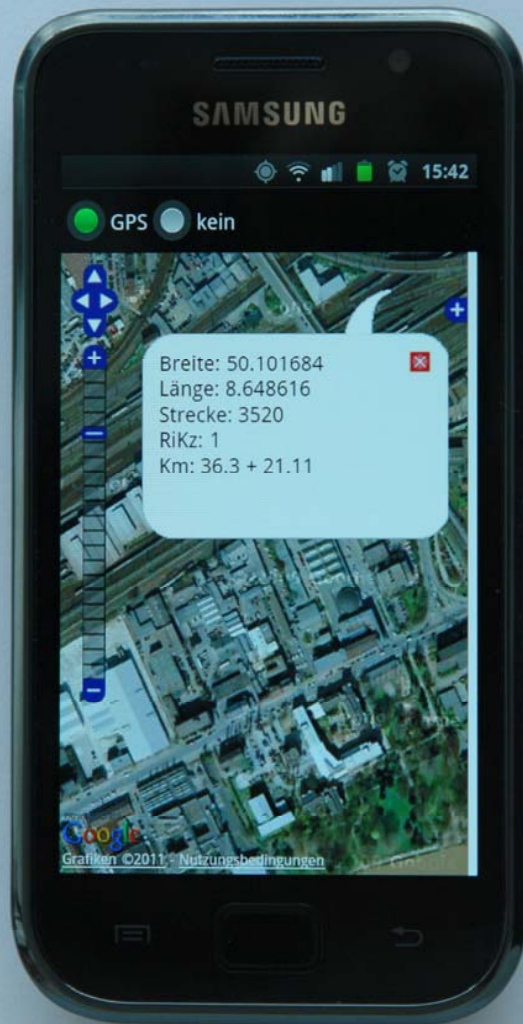
**12 - 16 December 2011
Vienna, Austria**

Aus Daten werden Lösungen.



~ 400 EUR

3.2
Honeycomb





Preconditions for low cost android based positioning related App's

Needed accuracy

~ 1m

Ground based augmentation systems

not obligatory

Bidirectional data exchange

not obligatory

DGNSS based service

not obligatory

SBAS Services

obligatory

Internal GNSS Chip

obligatory or

External L1 GNSS OEM Board

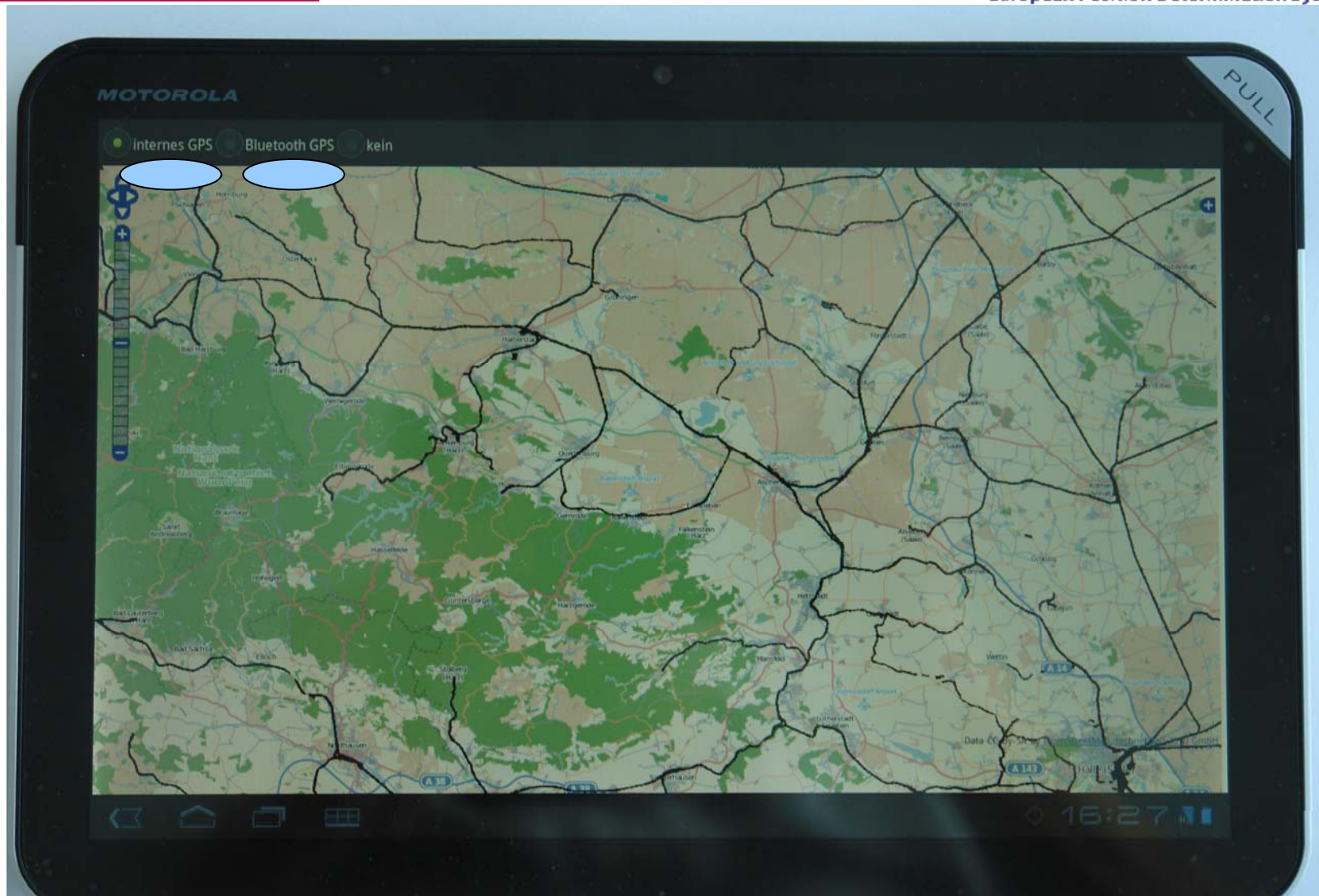
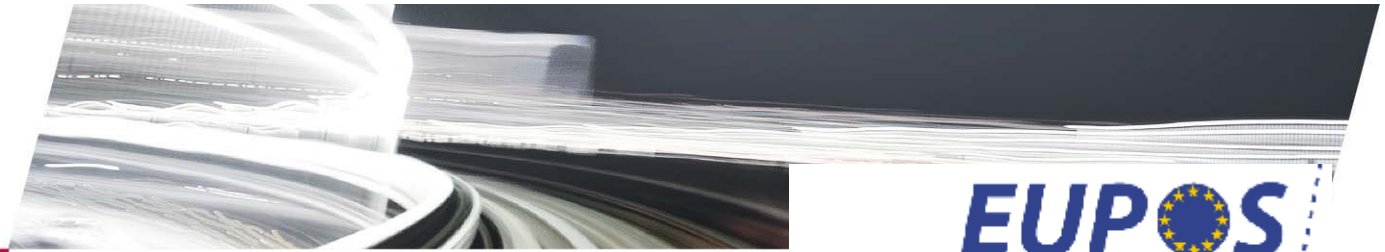
obligatory

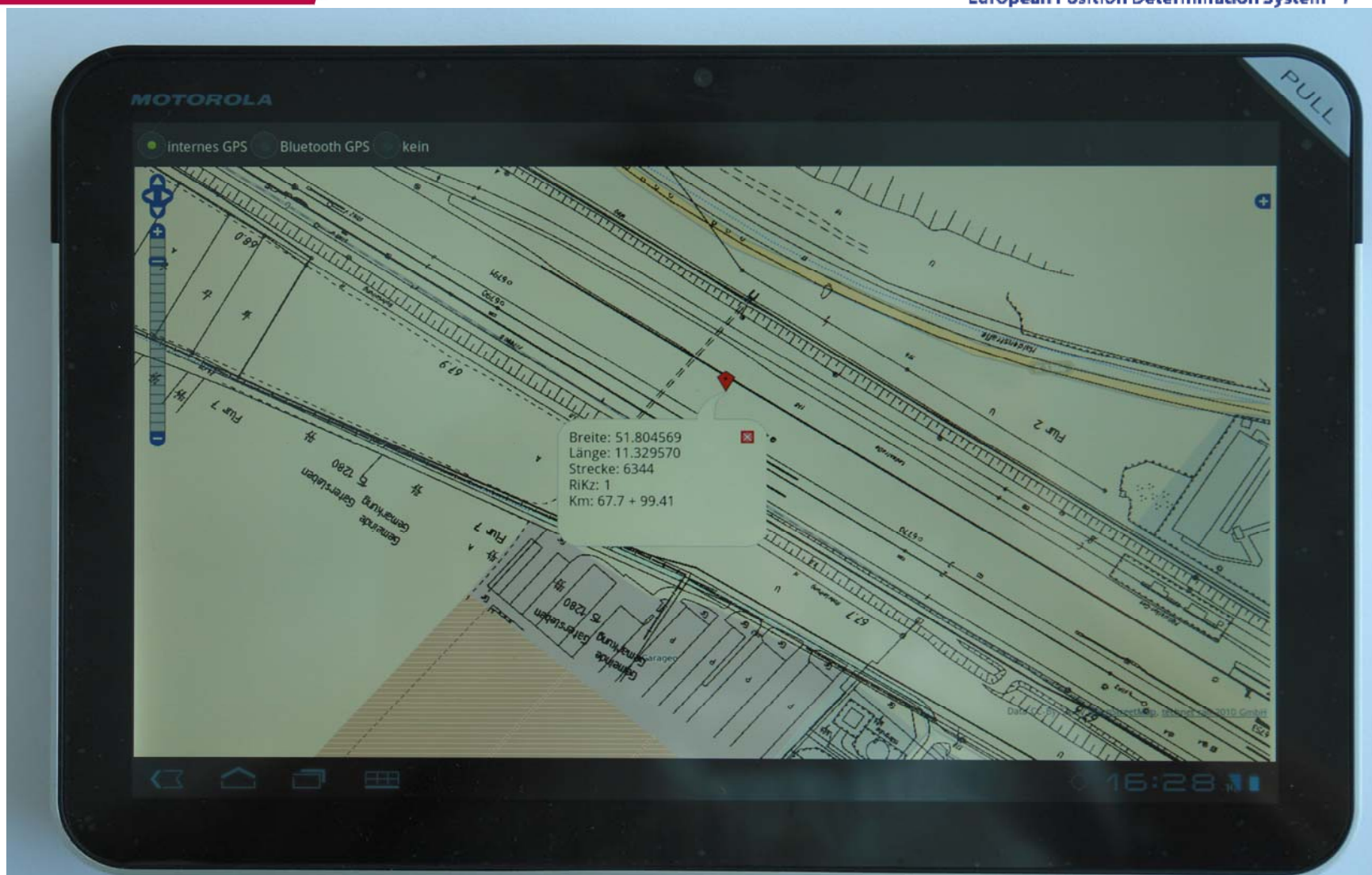
Data processing options

Low computer power

•Android TAB

dual core







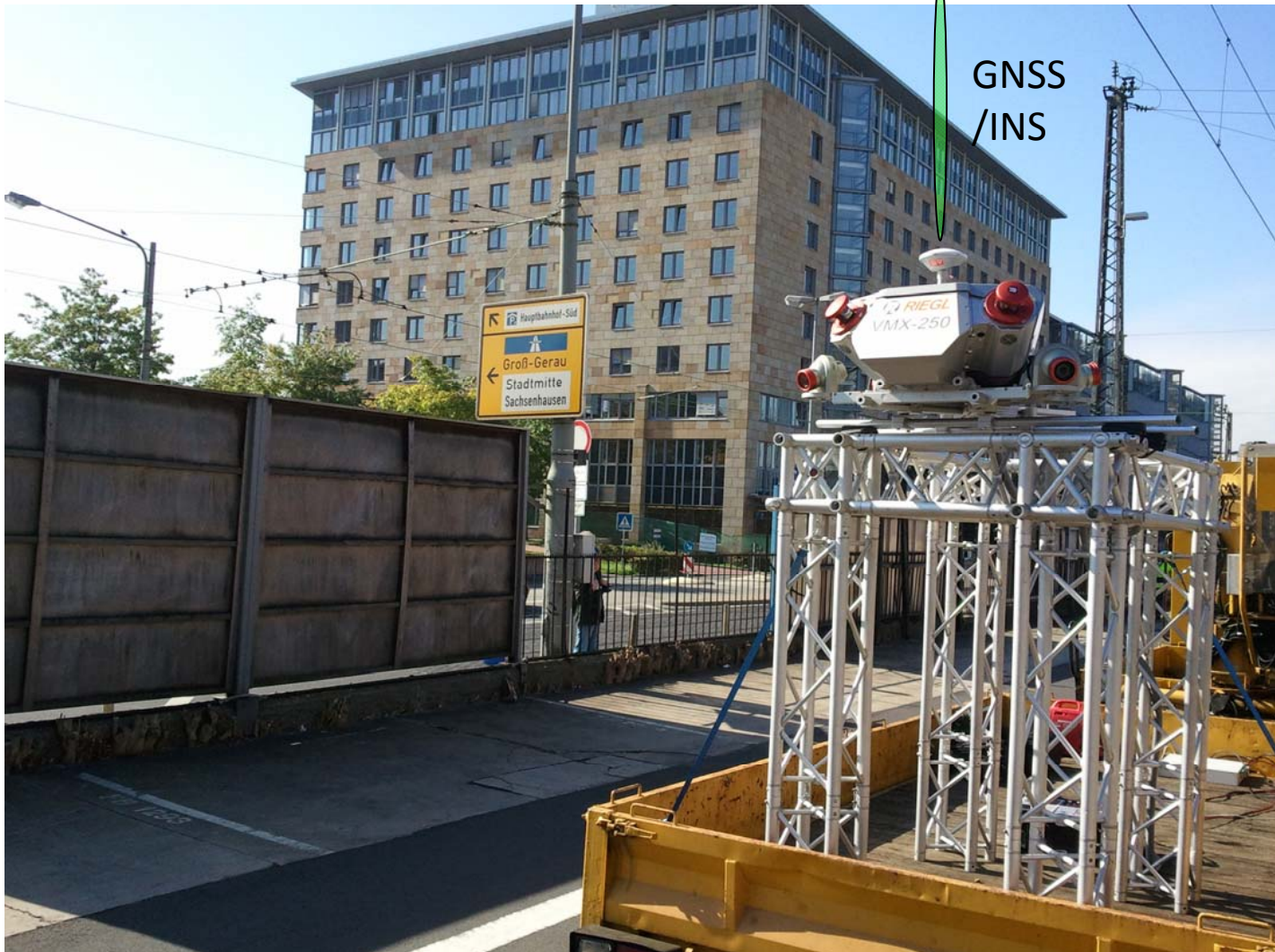
Preconditions for high end GNSS based applications

Ground based augmentation systems

- Bidirectional data exchange
- DGNSS based service - corrections
- Data processing options – high up to high end computers



Scanning complex





Preliminary Work

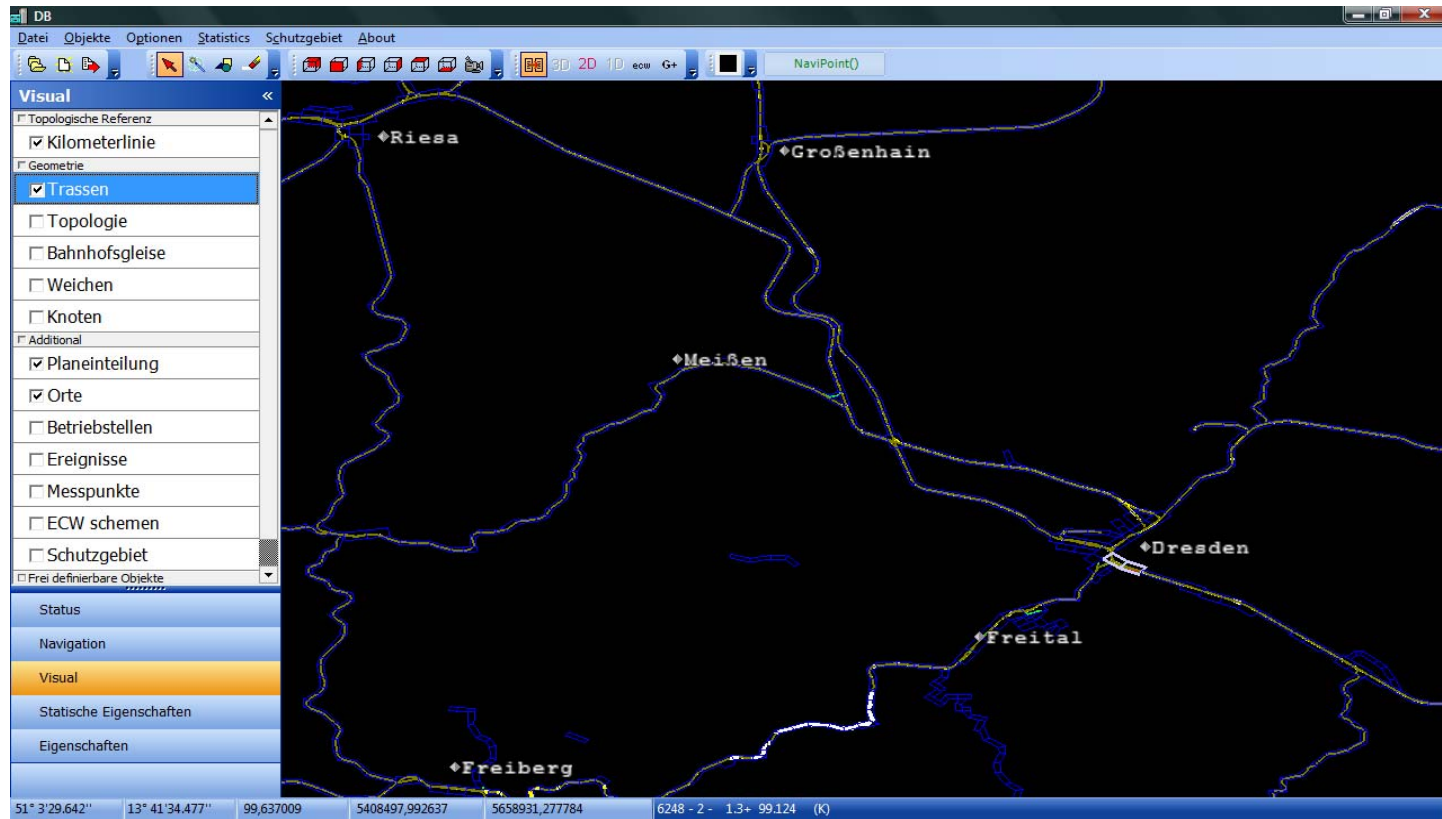
Development of an **navigation conformal** GIS data set

Extend this to an ERIN - Environmental Resources Information Network – Transportation , Energy... scalable

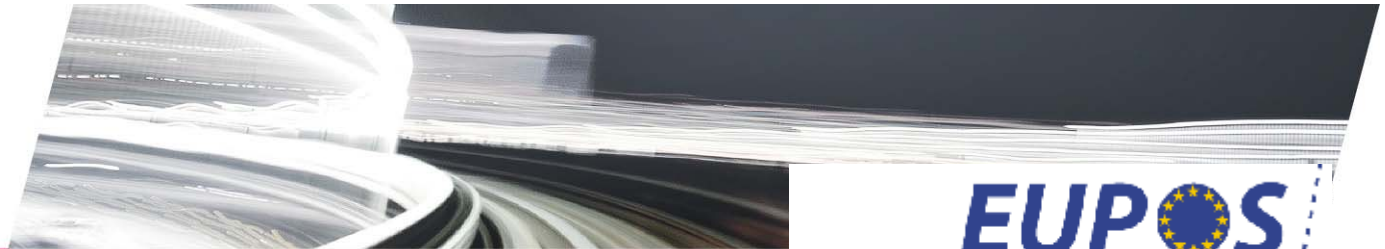
Prepare the android device for data synchronization and upload the data of interest on board

Patch based technology for solving the data amount problem on board

Integrity of the railway navigation database ambiguity free reference system definition for navigation propose ref. fr.



51° 3' 29.642" 13° 41' 34.477" 99,637009 5408497,992637 5658931,277784 6248 - 2 - 1.3+ 99.124 (K)

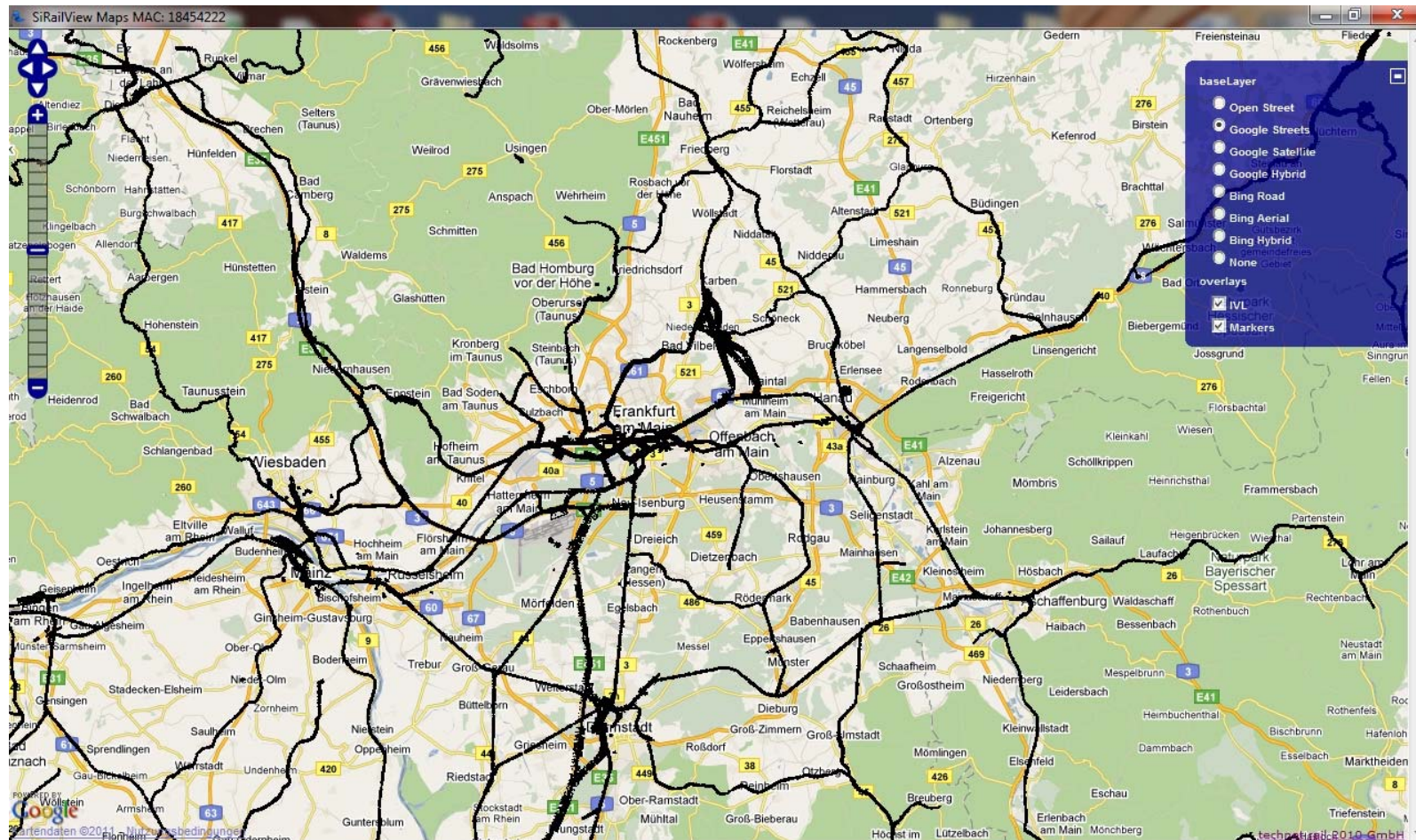


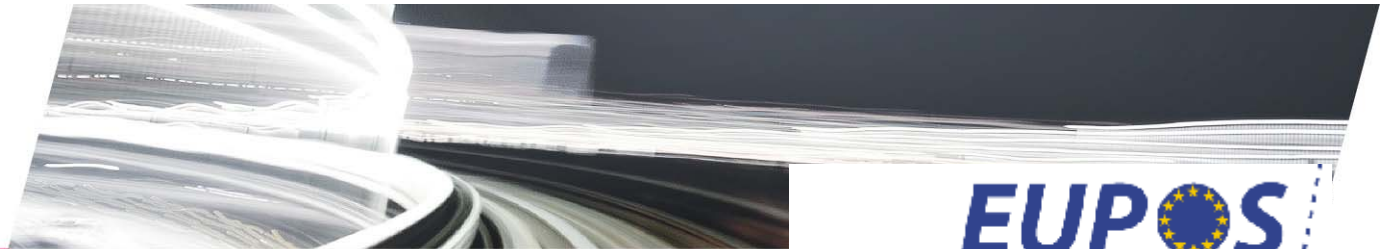
German railway network and attributive Oracle database



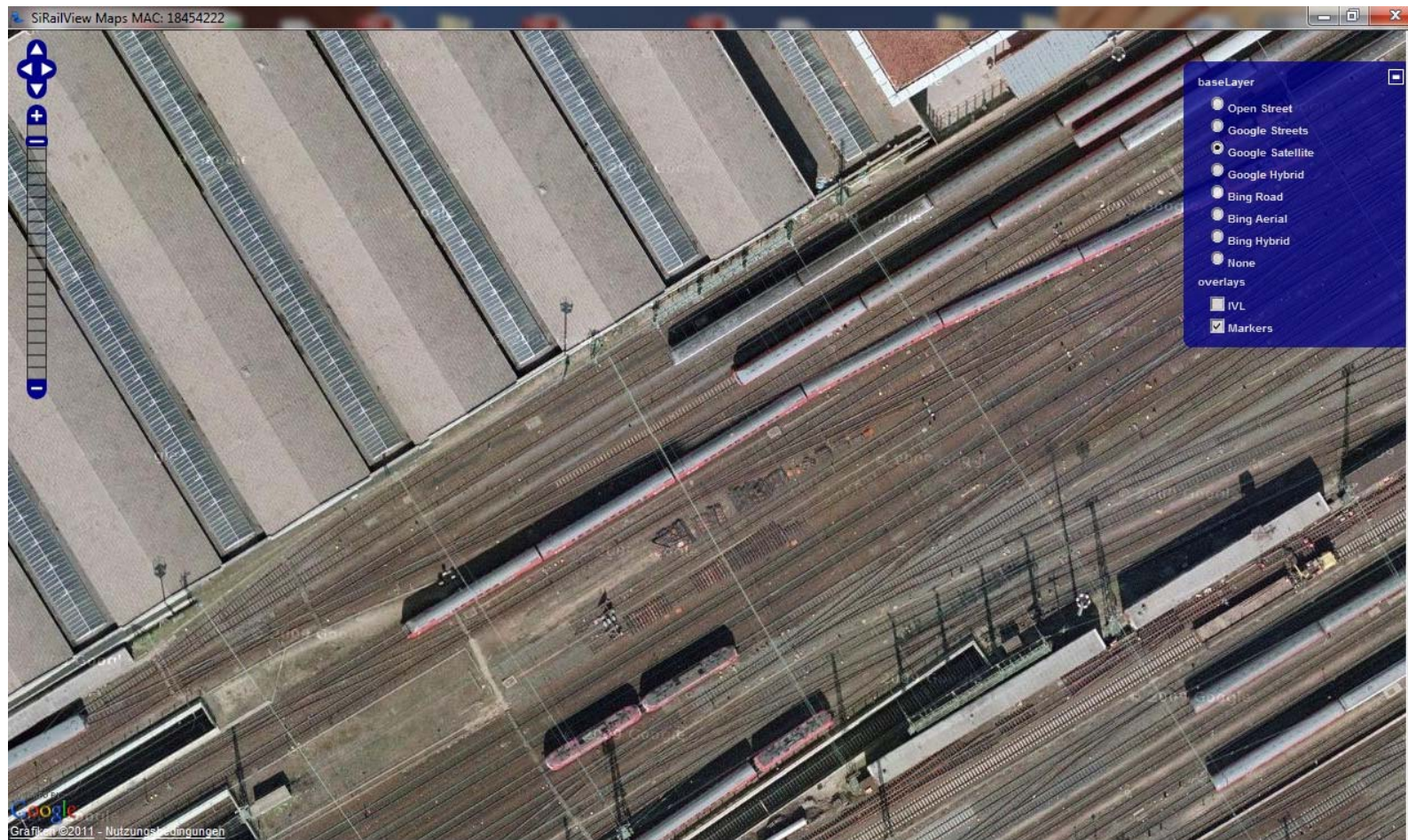


Corridors with high precision positioning



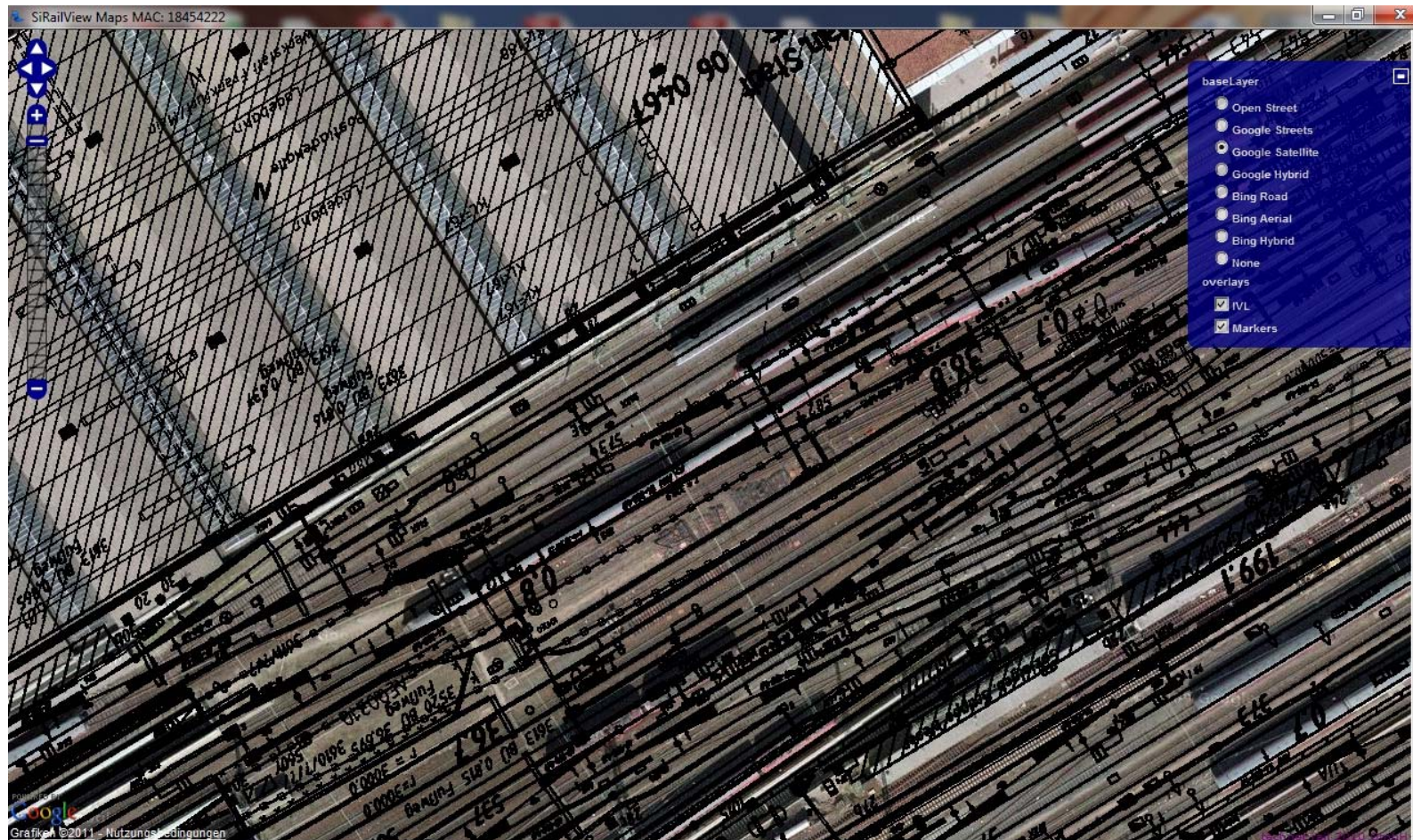


Web Application using Geo-images



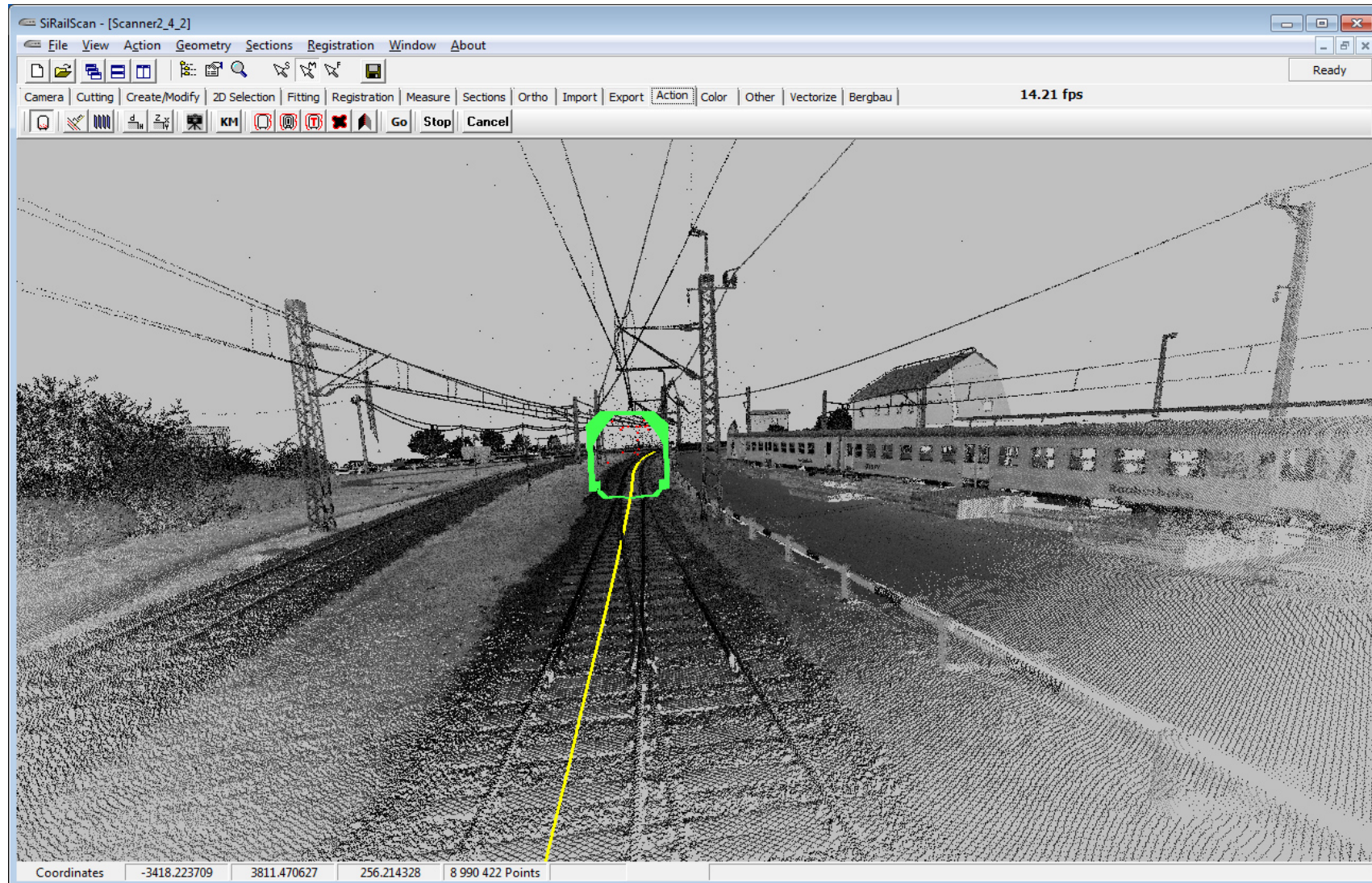


Web Application using harmonized Geo-images





3 Data acquisition



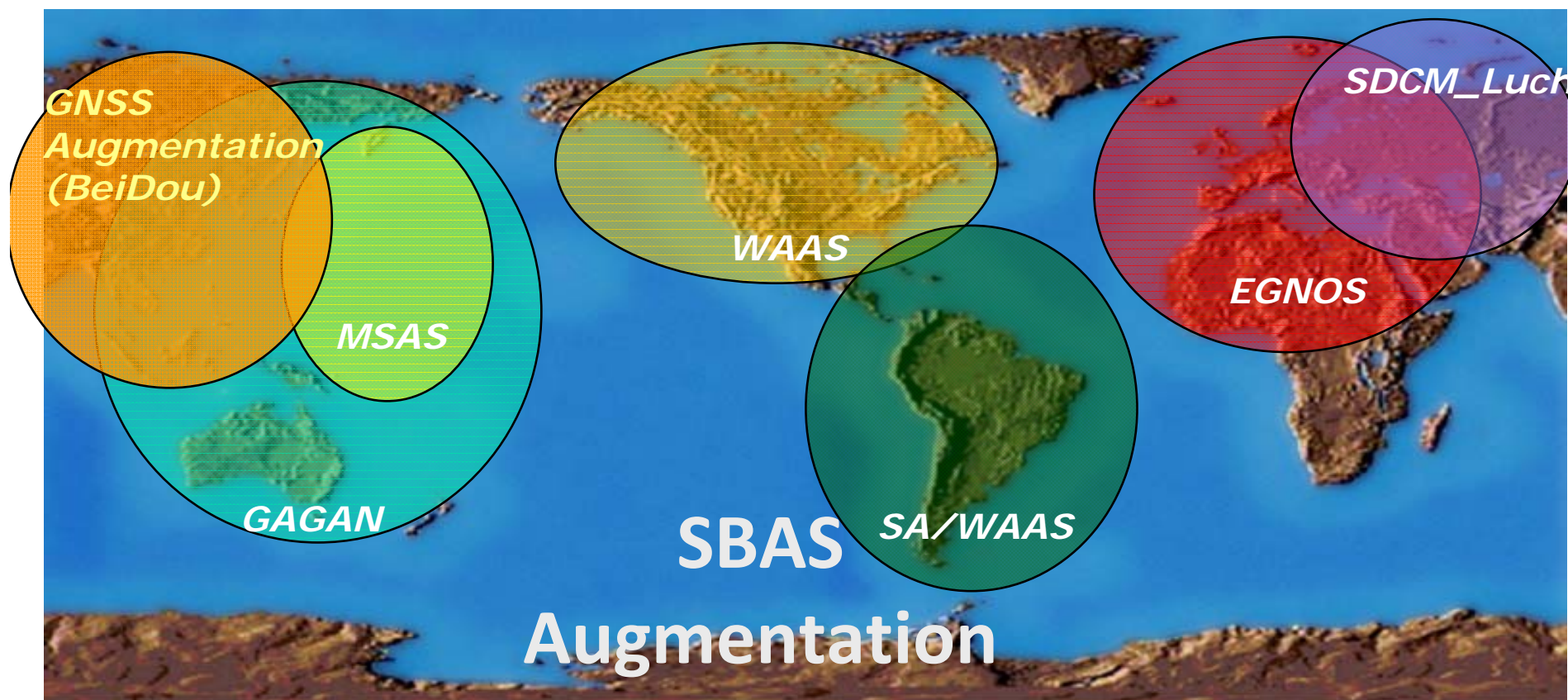
***Off line „bad conditions“ - we are in the Gobi region
Mongolia – most active grooving mining exploration
area in the World***

No bidirectional connection -> loosing the transportation layer for
RTCM → no corrections!

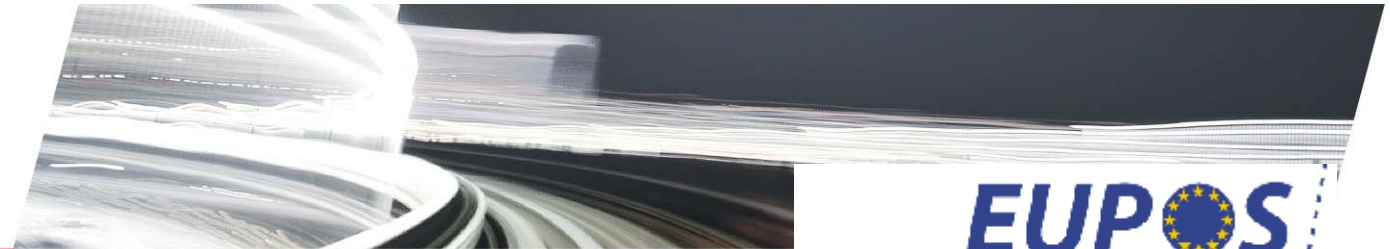
No GSM/GPRS – no web application → empty PAD screen



Wide range differential services(Satellite Based Augmentation System:

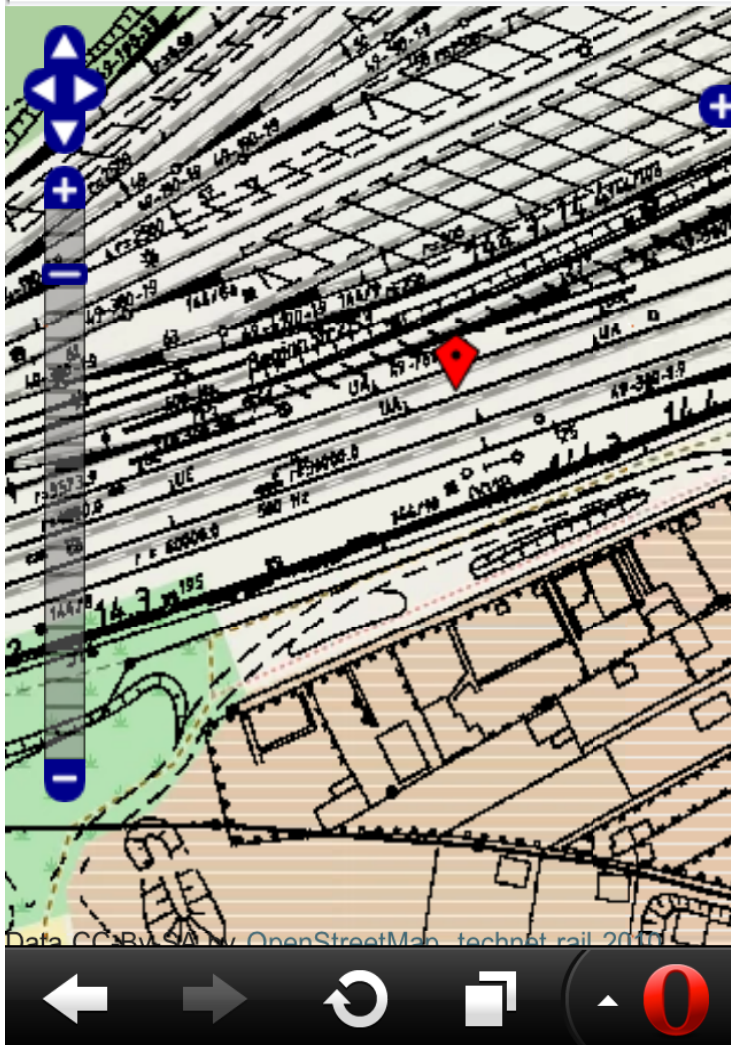


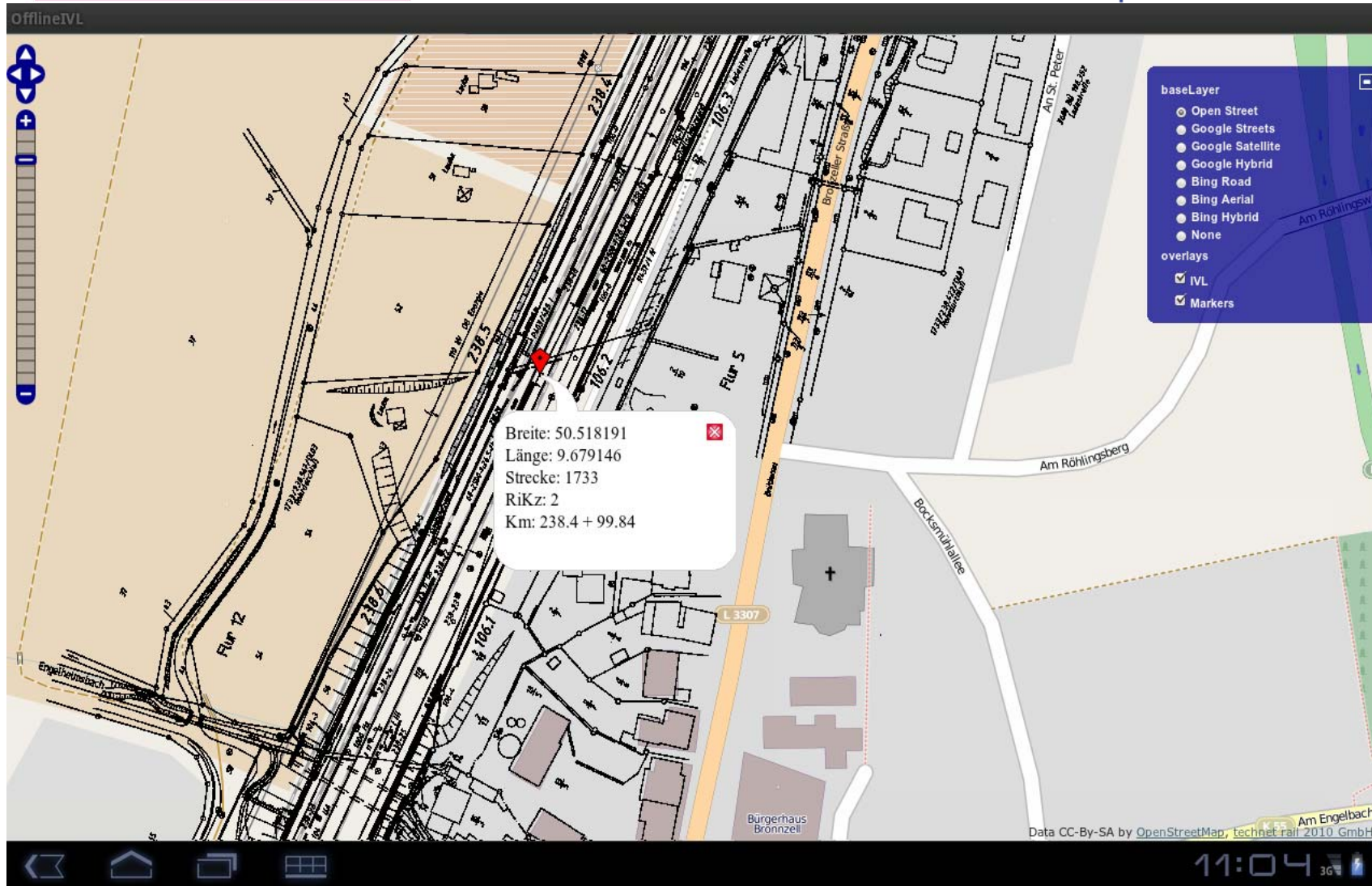
СДКМ система дифференциальной коррекции и мониторинга

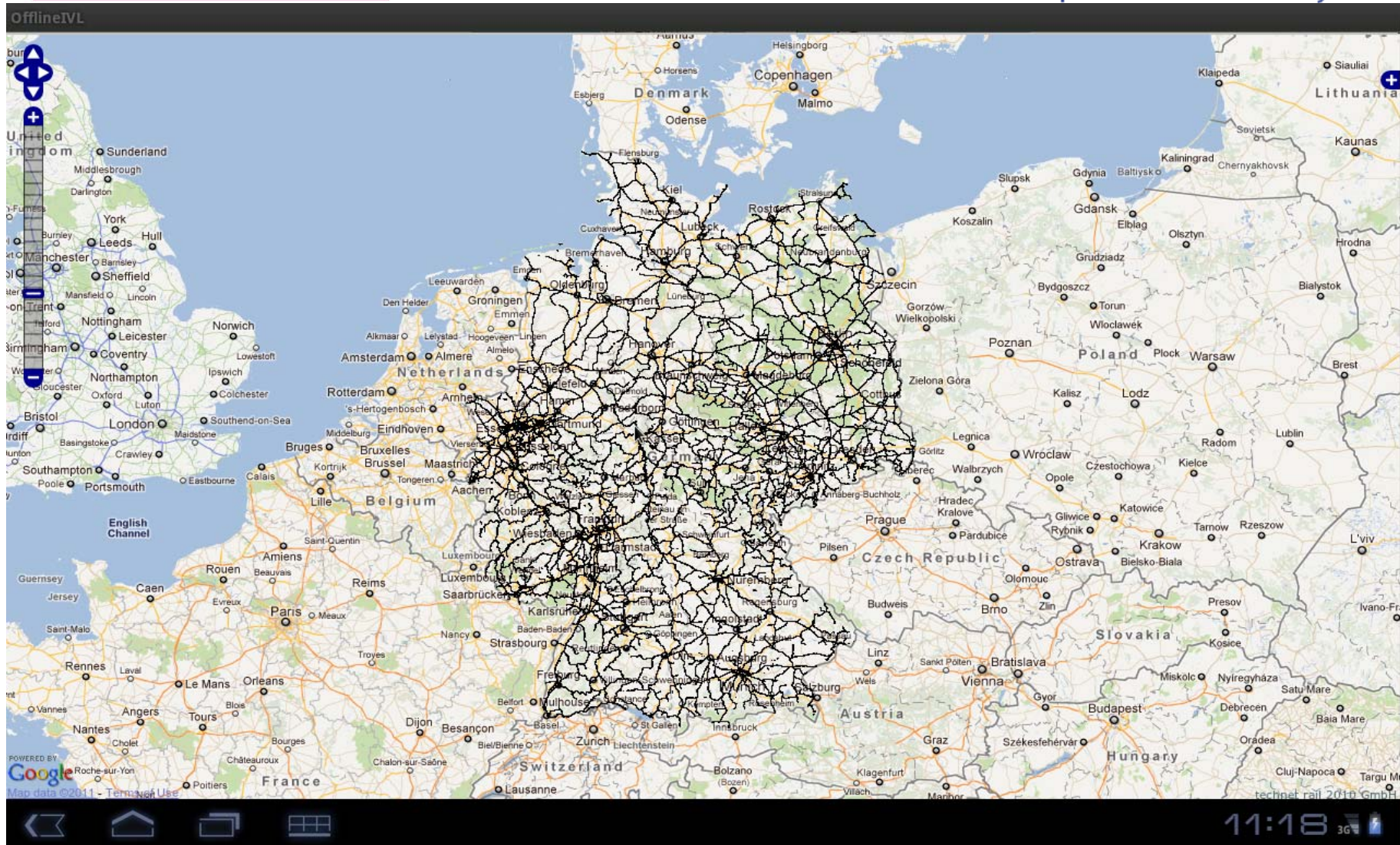


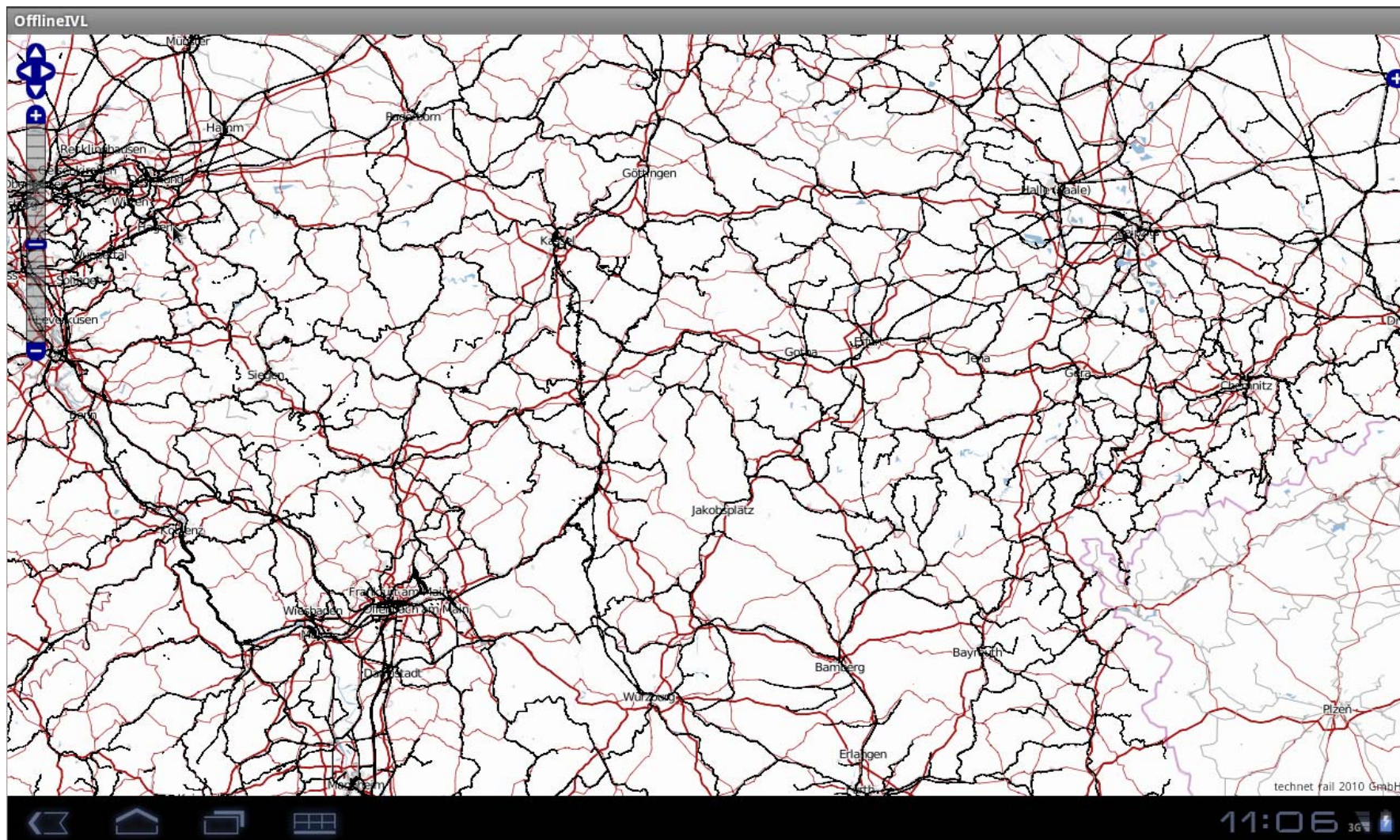
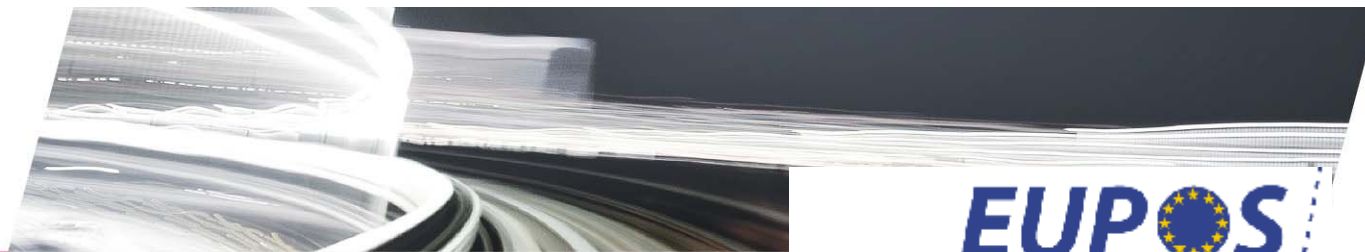
Telekom.de 12:50

B: 51.4702 L: 7.2025 S: 2160(1) 14.3 + 67.03

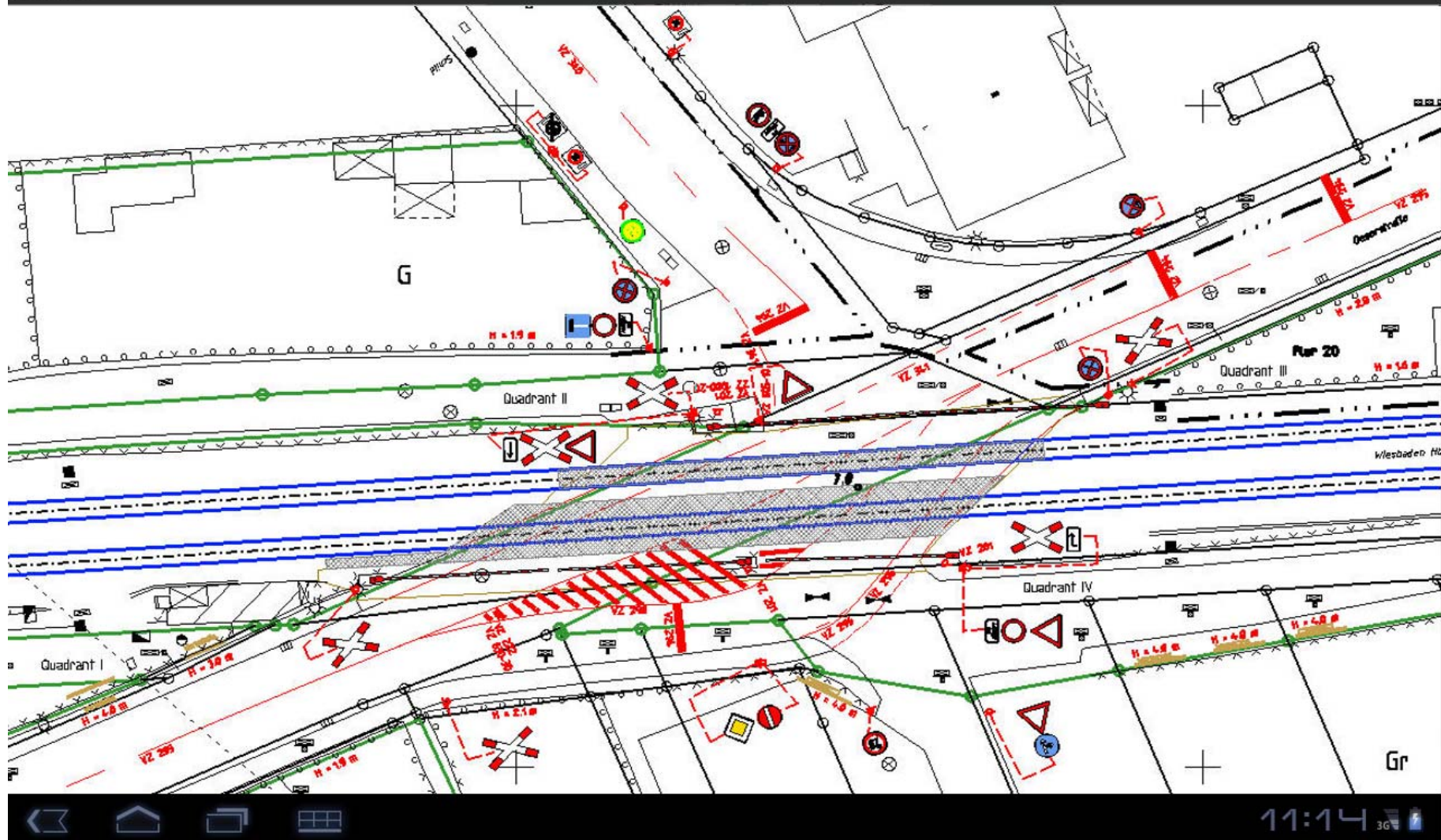








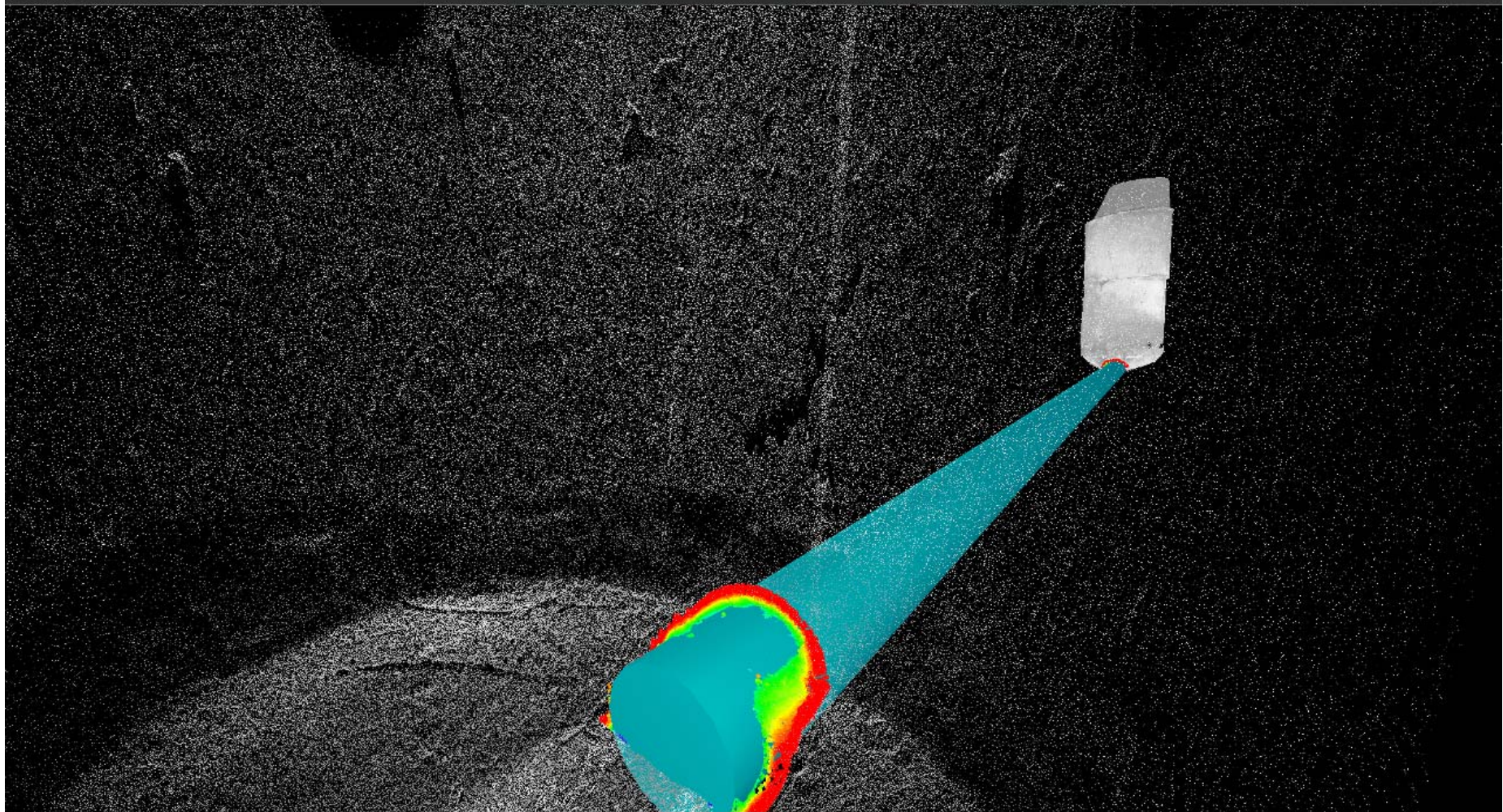
OfflineIVL





Thematic patch

OfflineIVL



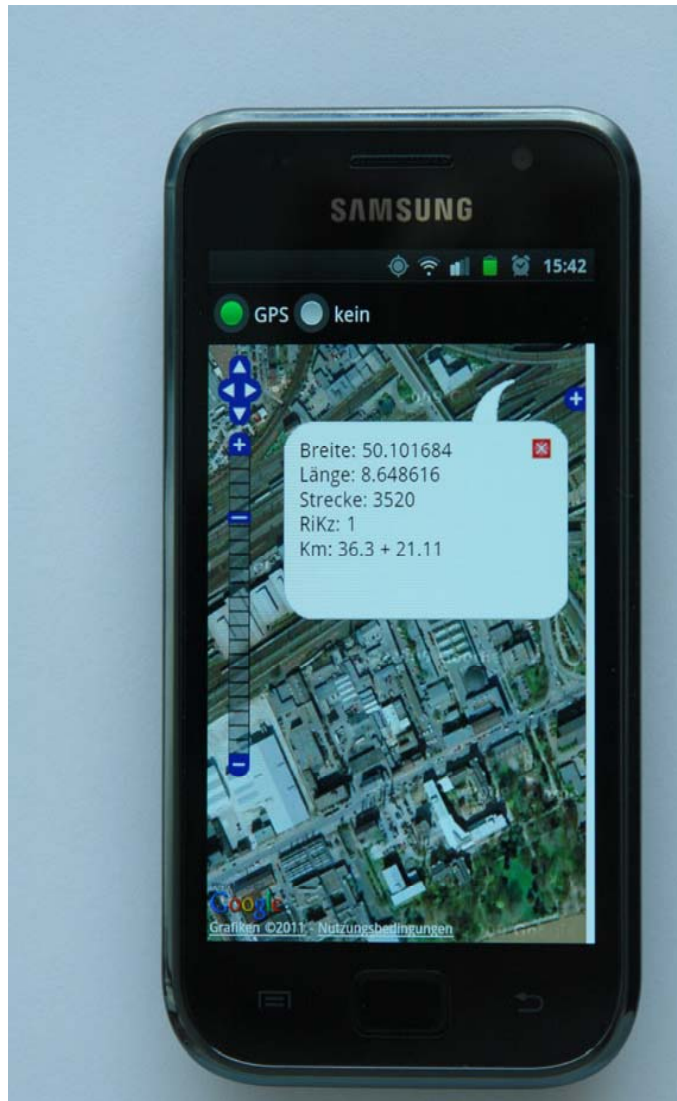
Two Scenarios

L1 GPS+GLONASS ~ min 8 Satellites+EGNOS



~1m in position

Intern GPS chip set AGPS ~ 2,5 m position



Conclusions

- Android based mass market applications but still for engineers
- Export of captured values = products and update this in the GIS

