INSTYTUT BADAWCZY
DRÓG I MOSTÓW

ROAD AND BRIDGE
RESEARCH INSTITUTE

EXPERIENCES FROM POLAND AND GERMANY

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SELECTED PROJECTS

the Bavaria project (2019)

→ about 530 roads, 14000 km measured in one direction

→ deflections every 10m

→ GPR raw data, front camera pictures

projects in poland (2018-2022)

→ about 200 roads, 4600 km measured in one direction

→ deflections every 10m

→ GPR data&interpretation, front camera pictures

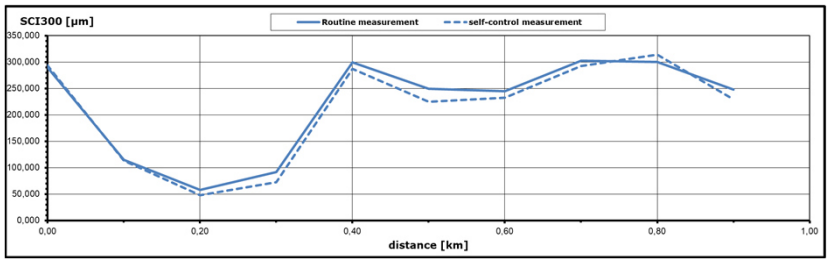
GENERAL REQUIREMENTS

- → intermediate deadline for results - 50% range
- → final deadline for results - 100% range
- → schedule supplied before campaign, updated every 14 days or each time before planned change
- → information on the progress of works every day, and each 7 days in case of Bavaria
- → self-inspections in Poland: every 5 measurement days on a 1 km long section
- → self-inspections in Bavaria: every 3 measurement days on a 5 km long section
- → additional comparative measurements with MESAS from BASt (only in Bavaria)

GENERAL REQUIREMENTS

self-inspections

- → second measurement taken not earlier than 6 hours and not later than 60 hours after the routine measurement
- → control section 1 km length (5 km in case of Bavaria project)
- → data given every 100 m
- → criteria:
  - → r - average of differences < 10
  - → σr - standard deviation of differences < 70



GENERAL REQUIREMENTS

Bavaria - permissible temperature range 5-35°C@5cm depth

Poland - permissible temperature range 5-25°C@12,5cm depth

(in all cases temperature calculated using BELLS equations)

correction of deflections

→ temperature factor = $1+0,02(20-t_{BELLS})$

t_{BELLS} - *temperature at the moment of measurement (calculated from the surface temperature and the average daily air temperature of the day before the measurement*

→ load factor = reference load/measured load

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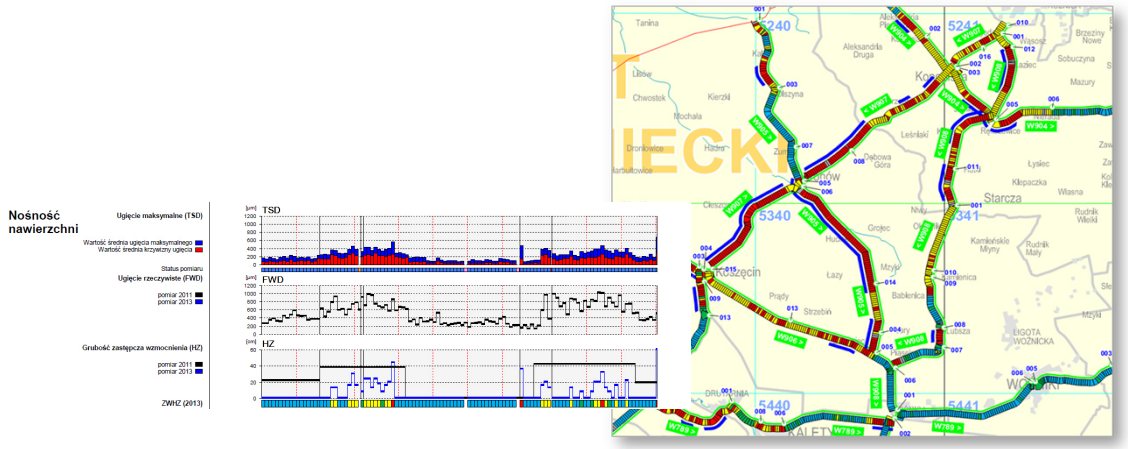
GENERAL REQUIREMENTS

data formats:

→ **.xls* so-called „machine data” containing basic measurement data

→ **.csv* with geolocation data (including deflection, evenness, air and surface temperature and load)

→ **.xml* data related to the network model (information on deflection, evenness, air and surface temperature, load, front camera pictures)



SOME EXPERIENCES AND TIPS

→ cooperation with the client

- meetings before and during the project facilitate the control of work progress, but also make the client often involved in solving problems arising during the project

- digital platforms allow for ongoing exchange of data, reports, etc. and facilitate communication and maintenance of order for both parties ...as long as there is wifi coverage

- large scale projects require ongoing data integrity checks as it is easy to lose section or road

cooperation sometimes also means a day for the press..

SOME EXPERIENCES AND TIPS

→ planning and conducting measurements

- information on sections temporarily out of service (maintenance, height and tonnage restrictions) is crucial for maintaining high performance. In Bavaria, about 10% of the network fell off due to sections that could not be passed.

- weather prediction is a branch of science that we could do a PhD in….

- the TSD has demonstrated extremely high reliability, but as with anything, failures do happen and often cannot be fixed quickly

SOME EXPERIENCES AND TIPS

→ planning and conducting measurements

- narrow roads, tight turns, steep climbs and descents in mountainous areas and on lower category roads cause a significant reduction in daily efficiency

- beware of dust on the road, which can damage equipment. This is a rare problem, but we have encountered it particularly in the Scandinavian countries and on roads located in mountainous areas.

- temperatures that are too low or too high significantly reduce the day's work. This is perhaps the most significant factor, especially since deflections in this regard are significantly sensitive.

A FEW TSD'S TIDBITS

- → over 50 000 km of completed measurements (2011-2022)
- → projects in 11 European countries including Poland, Greece, Norway, Finland and Germany
- → the highest located road section at an altitude of 1102 m above sea level
- → the longest section measured in 16 hours, both sides, total distance 932 km

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