



### DAY 1

## MARA NORD PROJECT- TRAINING 2010

### LESSON 6: OTHER INSTRUMENTS NEEDED IN GPR DATA COLLECTION PROCESS,



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In addition to GPR system, survey van should be also equipped with:

- Good quality GPS unit designed especially for data collection from a moving vehicle
- Other positioning systems (trip meters, etc)
- 1-3 Digital Video Cameras (or still photo cameras)

and in the future also:

- Laser scanners



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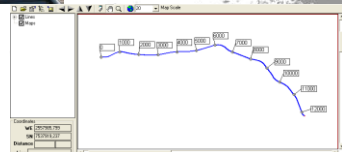
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### GPS Positioning



- separate antenna on the roof recommended  
- "dead reckoning" not recommended



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### GPS positioning

- + standalone system accuracy good enough for most GPR road surveys
  - separate roof antenna strongly recommended
- + easy to use and assemble
- + cheap, available everywhere
- + low power consumption, portable
- + reliable in most environments
  
- problems in tunnels, forest canopies, mountains
- occasional GPS "blackouts" – rarely these days
- occasional interferences

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### GPS positioning

- reliability and repeatability are fundamental – even more than high precision



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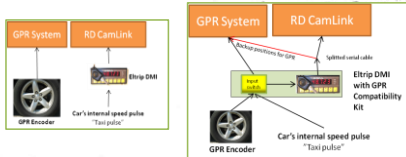
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### GPS positioning - extended

GPS problems in tunnels and other problematic areas with lowered visibility to satellites can be avoided using inertial system as a support

Other option is to use tripmeter/encoder information to support GPS in blind spots (Eltrip compatibility kit)



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### GPS positioning - differential

More accurate positioning is needed for example in bridge surveys

GPS accuracy can be drastically improved with the use of a base station – this is called differential GPS  
+ accuracy can be up to ± 1 cm, also in z-direction  
- limited area for one station (range 5-10-km)

Also Virtual Base station systems improve the accuracy. More complicated (and expensive) systems are required.

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### Positioning - alternatives

- for local, high accuracy positioning purposes, tachymeter's are useful
- if no other positioning system is available, markers and video together with road registry information (coordinates, distances) can be used

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### VIDEO collection systems



- high (shutter) speed cameras with good aperture are recommended
- good quality compression to produce acceptable file sizes, yet compatible for most playback softwares

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### Multiple camera system advantages

#### Triple camera view from a road



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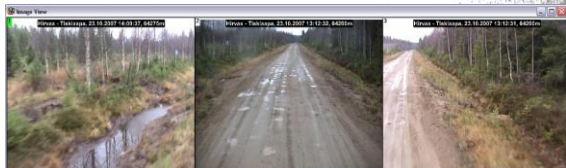
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### Multiple camera system advantages

#### Triple camera view from a narrow road



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### Audio Commentary

Supporting the video, audio commentary is recommended - especially useful for pre rehab surveys

Headset found to be easiest (though on/off button is useful)



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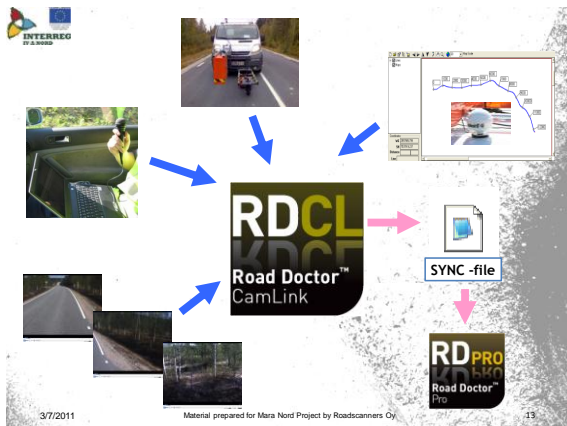
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### LASER SCANNER

- Relatively cheap and easy way to collect supportive information of a road section
- Big help when information of embankments, road cuts or sidesloping ground is needed

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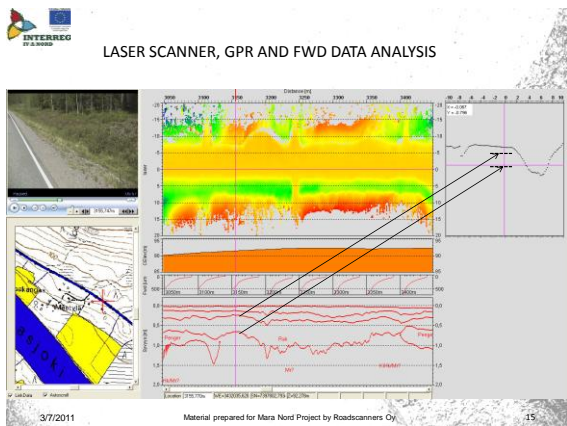
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