Real world projects: highway survey

- Korinthos – Tripoli (80 km, ILRIS, 2006-2007)
- Elefsina – Korinthos (60 km, LYNX, 2008)
Real world projects: highway survey

- Existing highways: dual carriageway, 2-3 lanes & shoulder

- Detail "as built" survey of all highway features (pavement, structures, slopes, signage, poles, etc.)
- Efficient archiving of "as built" situation for future reference
- Positional accuracy: 2-3 cm
- Elevation accuracy: 1-2 cm
- 3D model (TIN) for highway reconstruction design
- Background survey maps (scale 1:500)
- No significant traffic closure or delay
- Efficient safety plan
- Permits from local traffic authorities
Real world projects: highway survey

**Static laser scanning**
- Optech ILRIS mounted on vehicle moving or positioned in shoulder lane
- Scanning from both sides of highway
- Distance between scanning positions 50-80m
  - 1100 total scanning stations, 120 working days for 80 km of highway

**Mobile laser scanning (SINECO)**
- Optech Lynx Mobile Mapper mounted on vehicle travelling 50 km/h on shoulder and left lane
- 2 passes for each carriageway for better data quality
- 240 km total scanning distance, 1 working day for 60 km of highway
Real world projects: highway survey

Lynx Process

- Mission Planning
- Data Collection
- Data Processing
- Downstream Processing

Real world projects: highway survey

- Base GPS station support (7 base stations on known points)
- Measurement of positional Ground Control Points (natural targets identifiable in point cloud)
Real world projects: highway survey

- SBET creation and GPS base station correction

<table>
<thead>
<tr>
<th>Base Station</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2</td>
<td>716397,438</td>
<td>4211970,201</td>
<td>82,493</td>
</tr>
<tr>
<td>T5</td>
<td>706381,286</td>
<td>420705,081</td>
<td>20,377</td>
</tr>
<tr>
<td>T7</td>
<td>698999,794</td>
<td>4205883,704</td>
<td>74,133</td>
</tr>
<tr>
<td>T9</td>
<td>693061,432</td>
<td>4204125,31</td>
<td>27,595</td>
</tr>
<tr>
<td>T10</td>
<td>689981,482</td>
<td>4202372,422</td>
<td>26,116</td>
</tr>
<tr>
<td>T13</td>
<td>680101,384</td>
<td>4199350,249</td>
<td>11,519</td>
</tr>
<tr>
<td>T16</td>
<td>670916,888</td>
<td>4199036,617</td>
<td>60,122</td>
</tr>
</tbody>
</table>
Real world projects: highway survey

- Output
Original Pointcloud

Segmentation in 1.5 km sections

Real world projects: highway survey
Real world projects: highway survey

Point Cloud / 3D Features (Lynx Mobile Mapper survey)

Real world projects: highway survey

Background Survey Map (scale 1:500)
Summary

- GPS is a critical factor in mobile terrestrial mapping
- Proper set-up and monitoring of GPS improves data quality
- Careful route planning is important—import background images, check all equipment, check weather
- Use best driving practices to minimize GPS signal outage
- Always be aware of GPS signal status—monitor POS LV
- Safe, fast and efficient data collection compared to static methods

Thank You
Daina Morgan
Lynx Product Manager
www.optech.ca