Trimble

Leveraging Mobile Mapping Systems

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TS 9D – Machine Guidance and Integrated Measurement Systems

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What data types can be collected?

1. Asset Management
2. Pavement Management
3. Geospatial and Survey Data

To be defined in more detail…

Mobile Mapping – Why?

1. Improve efficiency by collecting the most possible data in a single pass
2. Fully synchronize and georeference the data
3. Extract intelligent data by automated means to the fullest extent possible
4. Collect data that is relevant for Asset, Pavement and Geospatial applications
5. Ensure the system is fully modular

1. Roadway Asset Management

- By Roadway Asset Management we refer to the process whereby all assets other than the pavement itself are inventoried, valued and managed by the road owner
- For Example:
  - *Signs*
  - *Guiderails*
  - *Security barriers*
  - *Stop lights*
  - *Pavement stripes*
  - *Bridges*
  - *Mileposts*
  - *Etc.*

2. Pavement Management

- By Pavement Management we refer to the process whereby maintenance works are planned and optimized through accurate collection and analysis of pavement condition data
- For Example:
  - *International Roughness Index (IRI)*
  - *Rutting*
  - *Cracking*
  - *Potholes*
  - *Other surface defects*
  - *Surface Macrotexture*
  - *Etc*

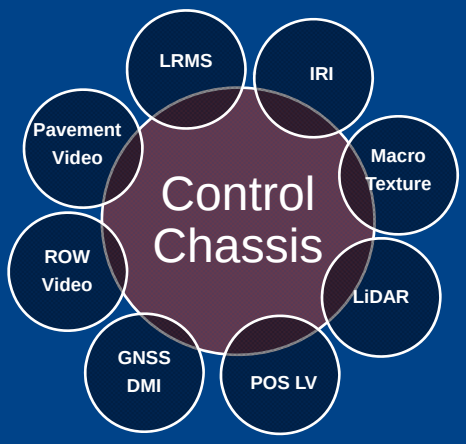
3. Geospatial Data

- By Geospatial data we refer to the process whereby georeferenced vehicle based LiDAR and Multispectral camera data is collected to allow for diverse applications.
- For Example:
  - *3D City Models*
  - *Utility Surveys*
  - *DTM*
  - *Road Geometry*
  - *Road Safety*
  - *Bridge Management*
  - *3D Point Cloud – As built Surveys*
  - *Vegetation/Landscape inventory*

Trimble Mobile Mapper

Trimble Mobile Mapper

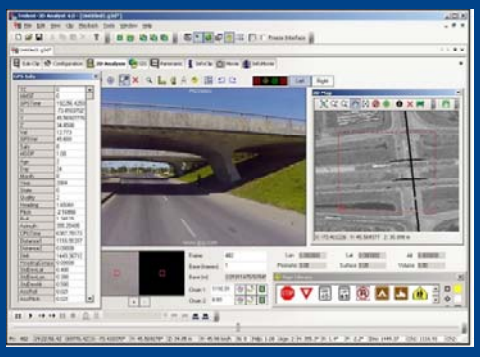
Technical Approach



Systems Integration

- Video – forward, side, 360 and pavement view
- LiDAR – forward, side and pavement view
- PMS Laser sensors for roughness, rutting, macrotexture
- Blended Georeferencing including POS LV, GNSS and DMI

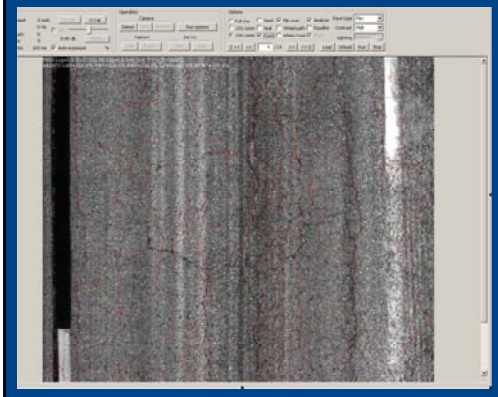
Technical Approach - Assets



Automate Processing

- ✓ Automatic sign detection
- ✓ Automatic pole detection
- ✓ Automatic road geometry measurements
- ✓ Automatic lane marking detection
- ✓ Automatic corridor clearances

Technical Approach - Pavement

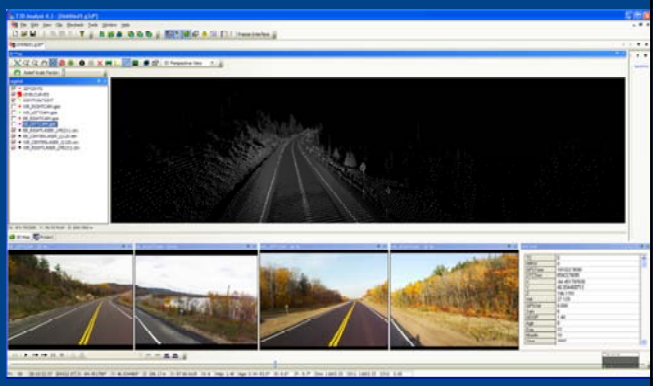


Automate Processing

- ✓ Automatic crack detection
- ✓ Crack maps
- ✓ IRI reporting
- ✓ Rutting
- ✓ Texture

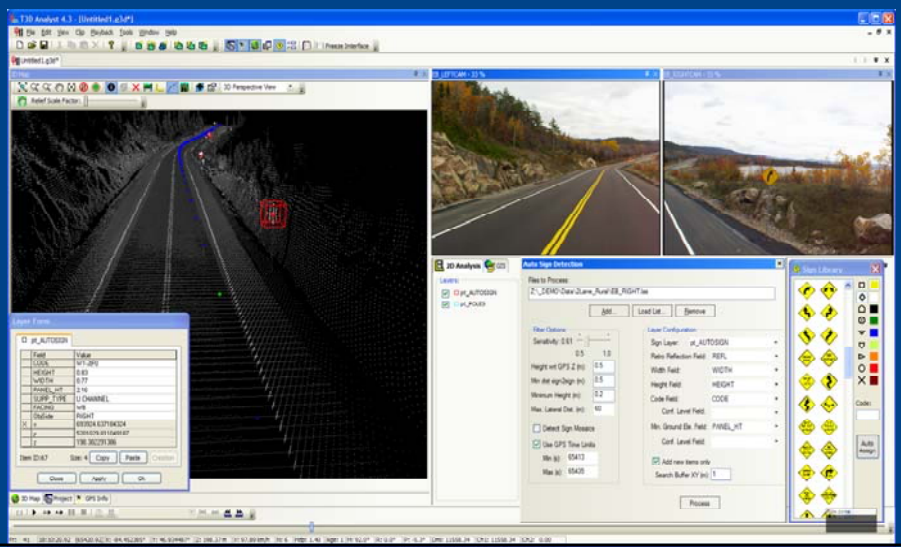
Technical Approach - GeoSpatial

Extract Intelligent Information

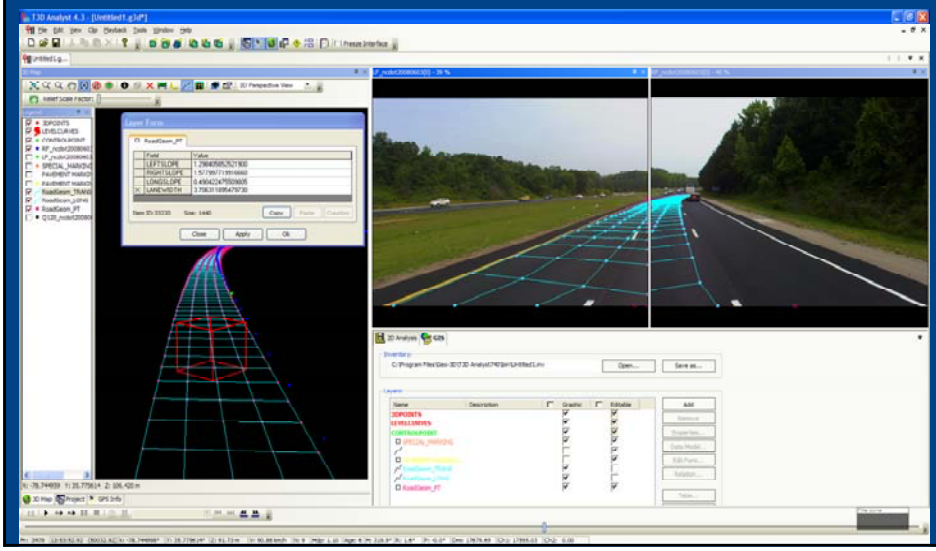


- ✓ 3D Models
- ✓ Utilities
- ✓ Bridges
- ✓ Road Safety
- ✓ Road Geometry
- ✓ 3D Point Cloud
- ✓ DTM
- ✓ Use of control points
- ✓ Obtain 2 cm accuracy (x,y,z)
- ✓ 1 cm accuracy for relative measurements

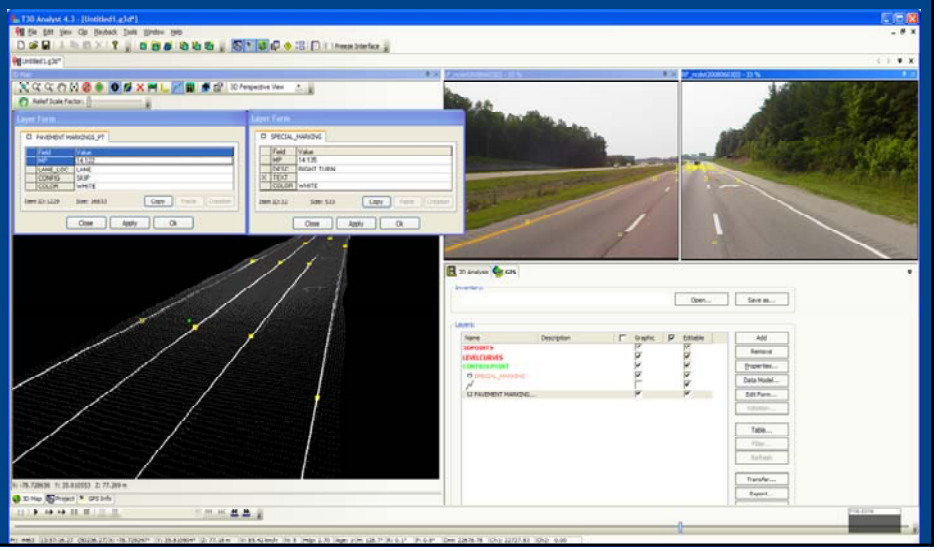
Applications *Automatic Sign Detection*



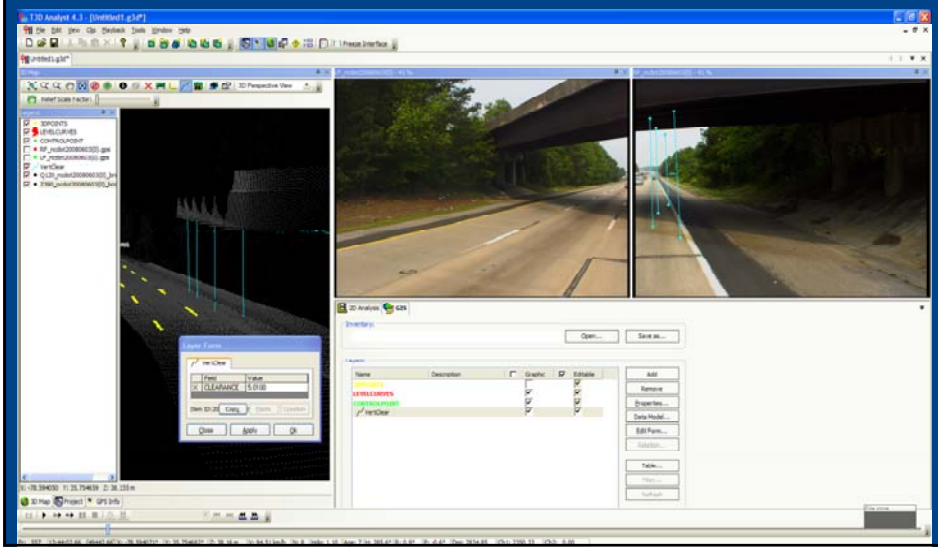
Applications *Automatic Road Geometry*



Applications *Automatic Lane Marking*

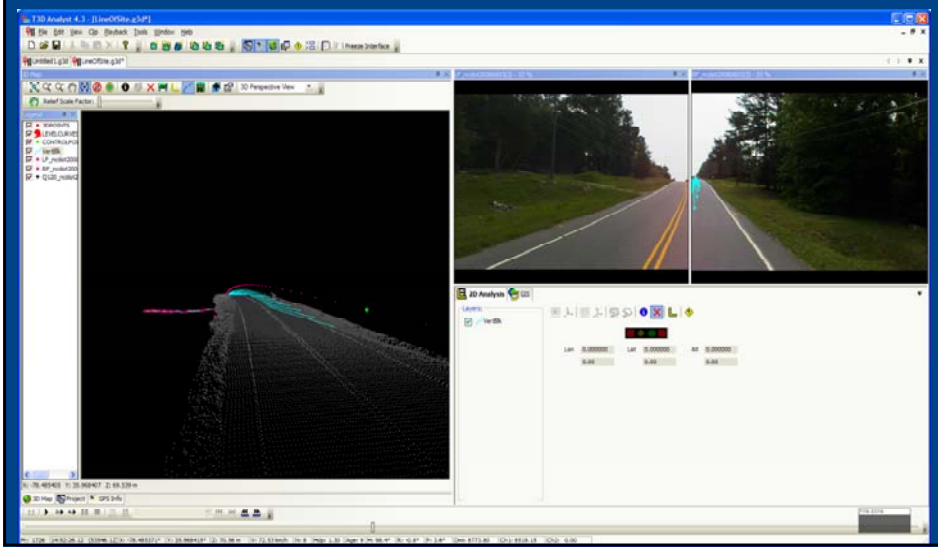


Applications *Automatic Vertical Clearance*



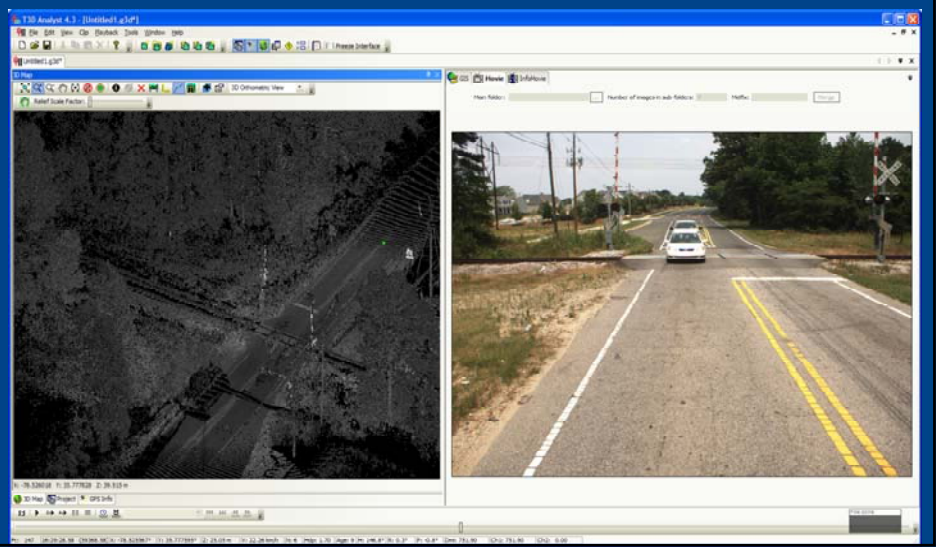
Applications

Automatic Sight Distance

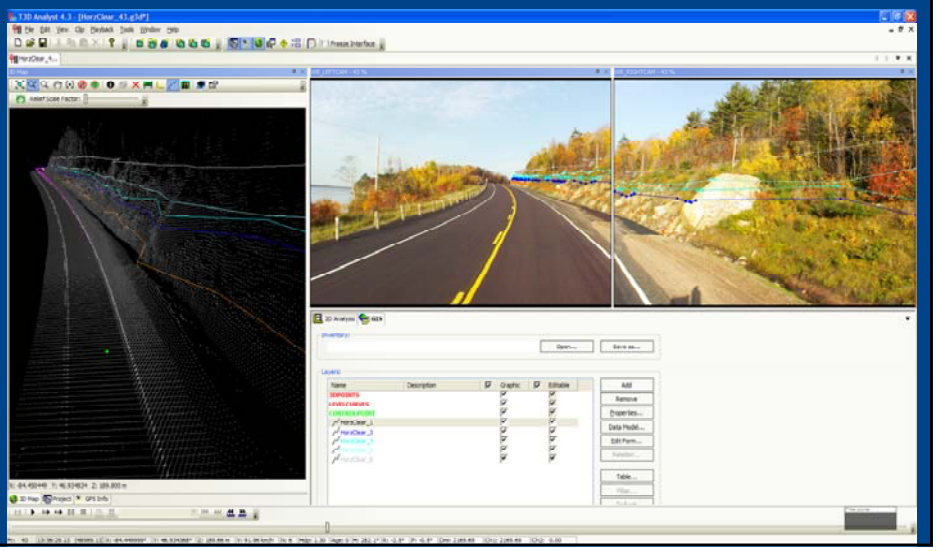


Applications

3D Point Cloud



Applications *Automatic Clearances*



Convergence ROI

- More accurate, repeatable and efficient data collection
- Capital investment is not limited to one narrow application
- Cost reductions through automated data extraction
- Optimized budget allocation and maintenance/management decisions

✓ Better value for shareholders and taxpayers

Conclusion

- An organization can leverage MMS to be used in their asset surveys, GIS, pavement condition monitoring and 3D models or as built drawings
- Focus on automating data extraction from point cloud data
- Improving accuracy through use of control points to obtain `near` survey grade absolute positioning
- LiDAR now means that MMS now has a wide variety of potential applications for network, corridor and project level surveys.

Questions?

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