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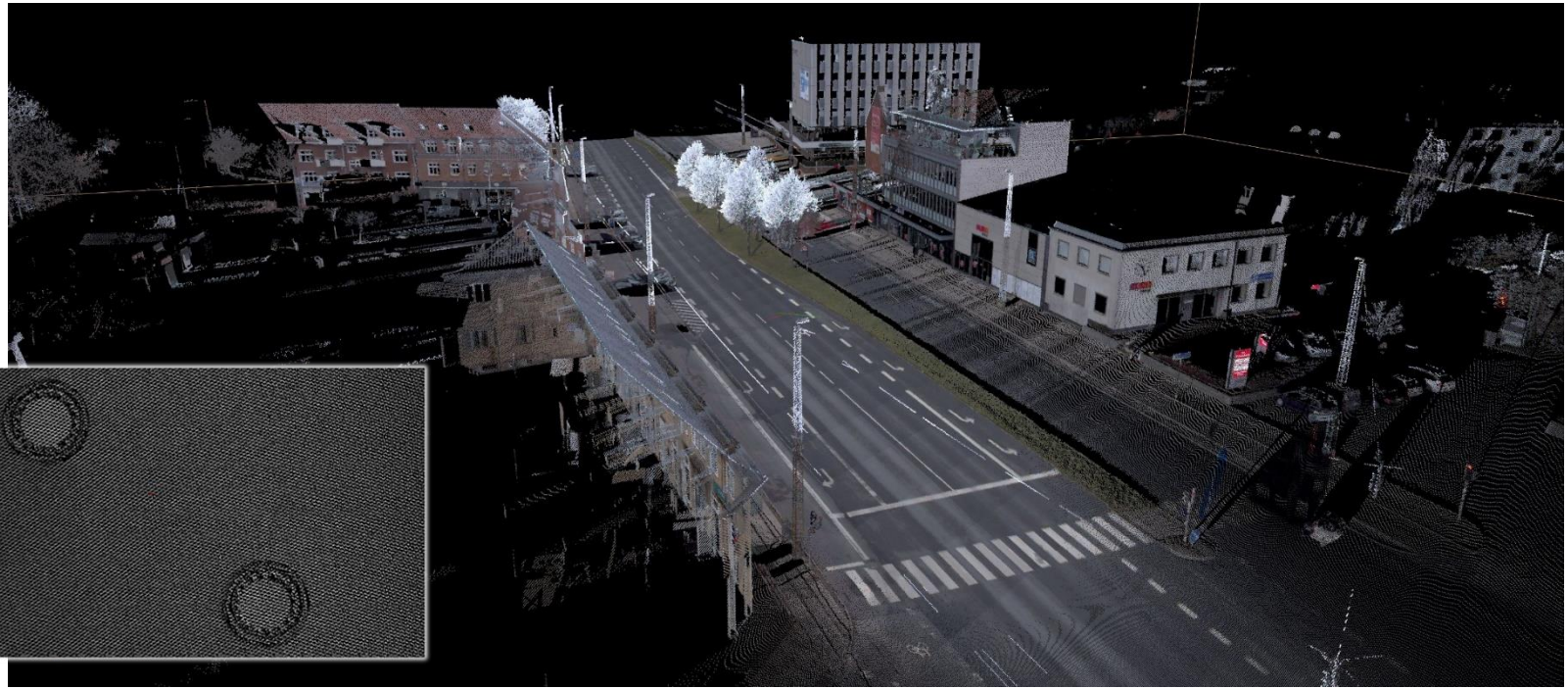
INTERGEO 2018

Mobile Mapping mass data collection

Mobile Mapping

Mobile Mapping is the process of collecting geospatial data from a mobile vehicle, typically fitted with a range of sensors, most typically cameras and/or lidar systems.

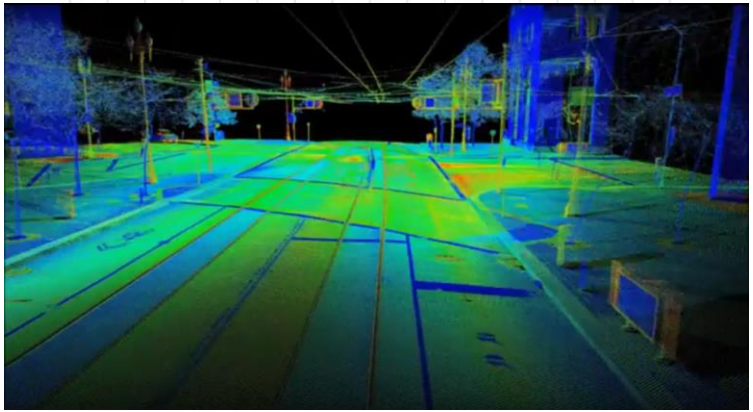
Mobile Mapping



Mobile Mapping

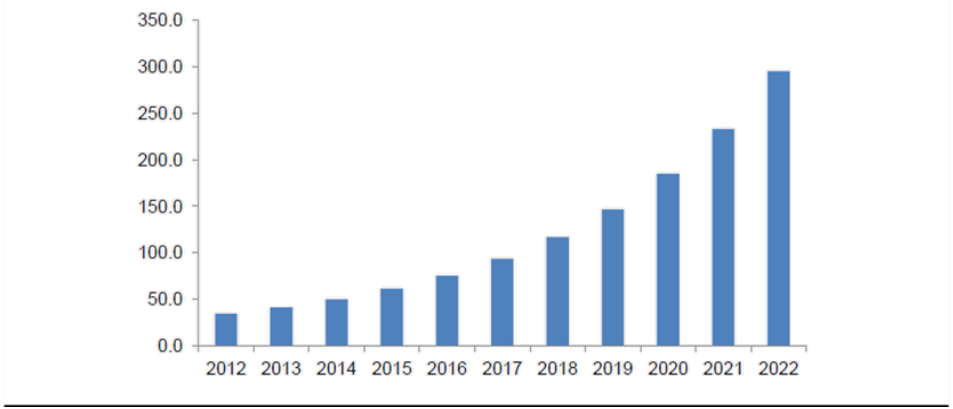
Market Trends & Growing Demand

- Growth driven by technology adoption
- Understanding that mobile mapping provides time and cost saving
  - Eliminates the need for mobilization costs
  - Ability to collect huge amount of information in a very short time period
- Removes the need for traffic diversion
- Provides safety for project personnel
- Rising demand for 3D imagery for various application
- Increasing urbanization and government spending on large scale infrastructure projects
- Smart city and 3D city initiatives

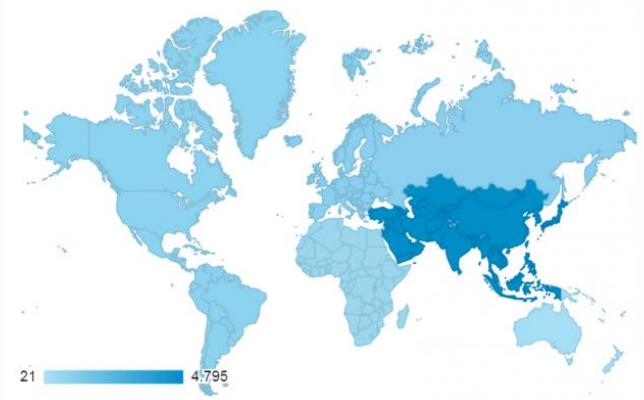


Mobile Mapping Technology Adoption

- Mobile Mapping – the fastest growing survey market segment
- High level interest out of the **Middle East** and **APAC** regions

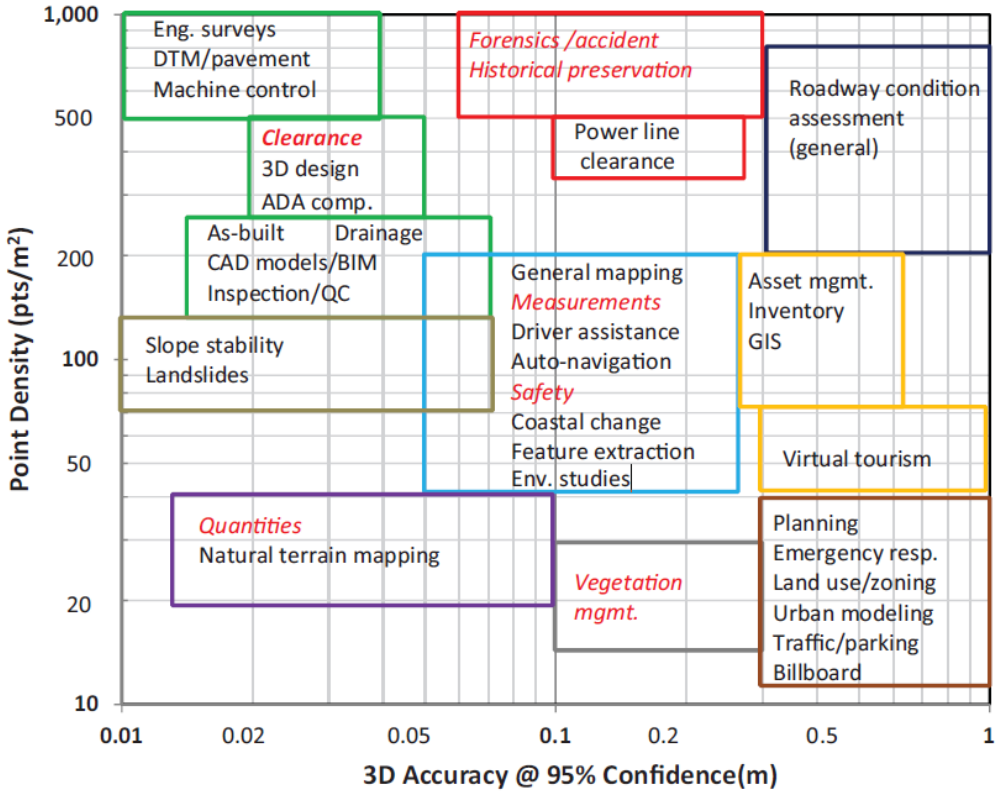


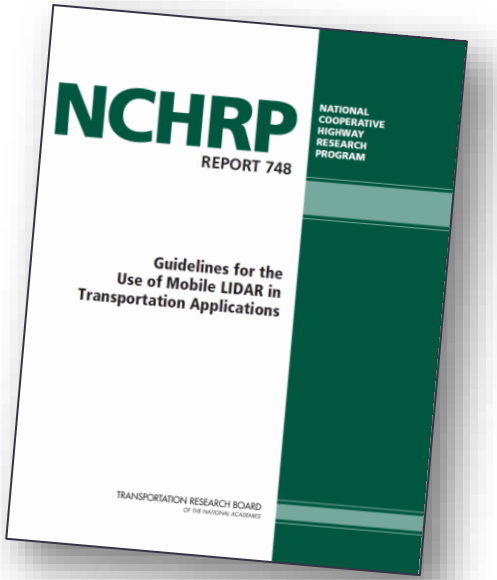
Source: AMS Journal, Earth Imaging Journal, ESA Online Journals, Journal of Surveying Engineering, Company Annual Reports, Primary Interviews, Grand View Research



Source: GIM International – July/August 2018

Applications for mobile mapping solutions



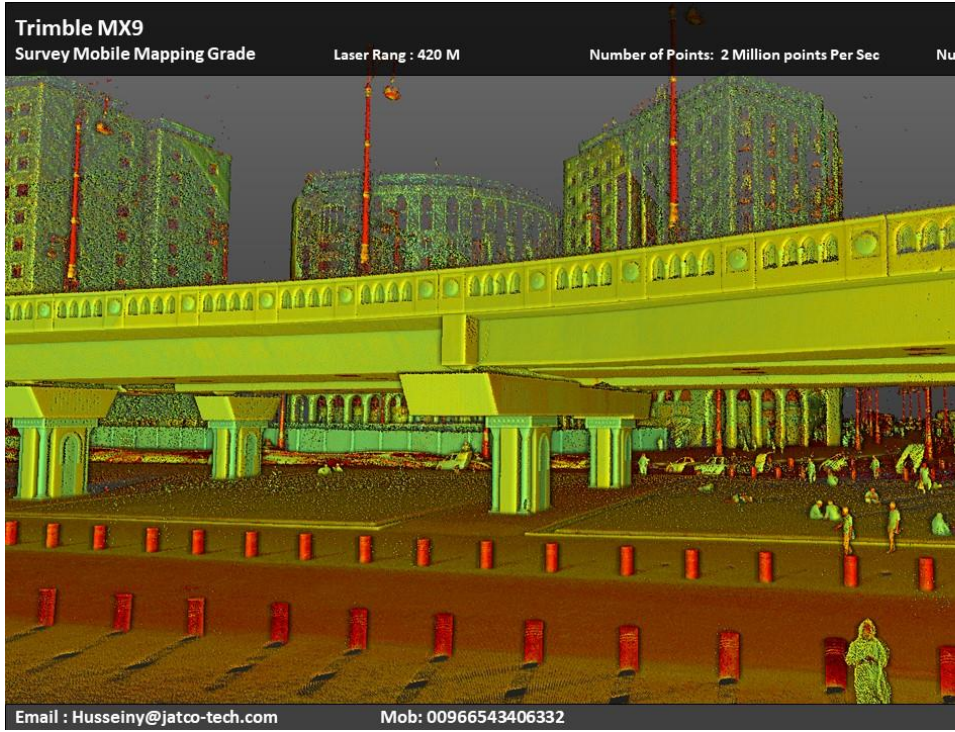


Trimble

Source: ***Guidelines for the Use of Mobile LIDAR in Transport Applications - Transportation Research Board (USA)***

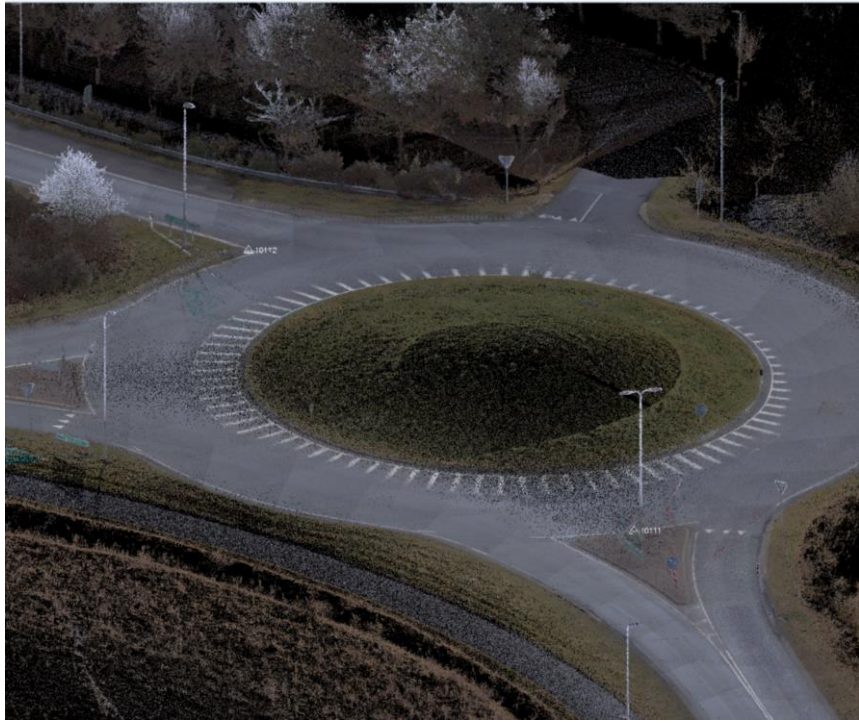
Accuracy and density

- Customers more and more considering that data accuracy needs to be higher even if only asset management is the goal.
- Reason is, that in **BIM and lifecycle** management functions coming together.



Example applications

- **Construction Design**
  - Mobile Mapping systems can be used to collect data for use in the design phase
- **Network planning**
  - Valuable data for planning of various types of networks such as e.g. fiber optic
- **Quality Control**
  - Design models can be compared with point clouds collected for construction quality control
- **As-Built and Repair Documentation**
  - Provide detailed documentation for as-builts or repairs compared to traditional paper plans



Some typical local government responsibilities

Sample of areas that can benefit from mobile mapping data

- Infrastructure maintenance
- Maintenance of public spaces
  - Up-to-date overview of all assets
  - Planning field work
- Utilities & Public works
  - Roads, light rail, waterways, …
- Permits
  - Construction
  - Modifications
  - Parking
  - Green areas, …
- Tax
  - Disputes, …
- Public safety
  - Police
  - Fire Department

Local government

Source: City of Amsterdam (data.amsterdam.nl)

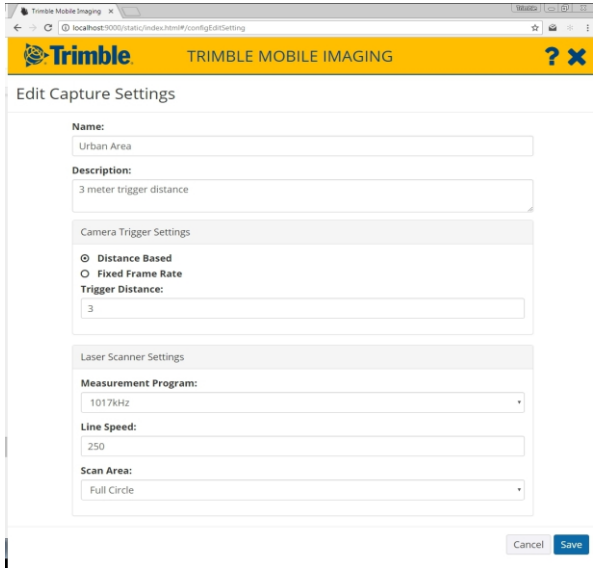
Local government

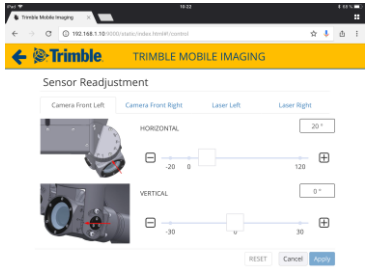
How could a system look like

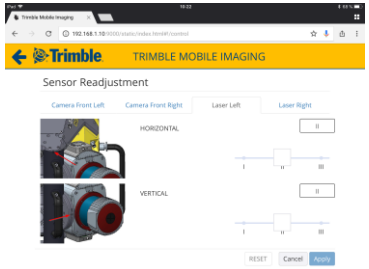
- GNSS antenna
- IMU
- Spherical (360°) camera
- 2 Adjustable Lasers
- 2 Adjustable Side looking cameras
- Back-Down looking camera
- Single cable
- Roof rack

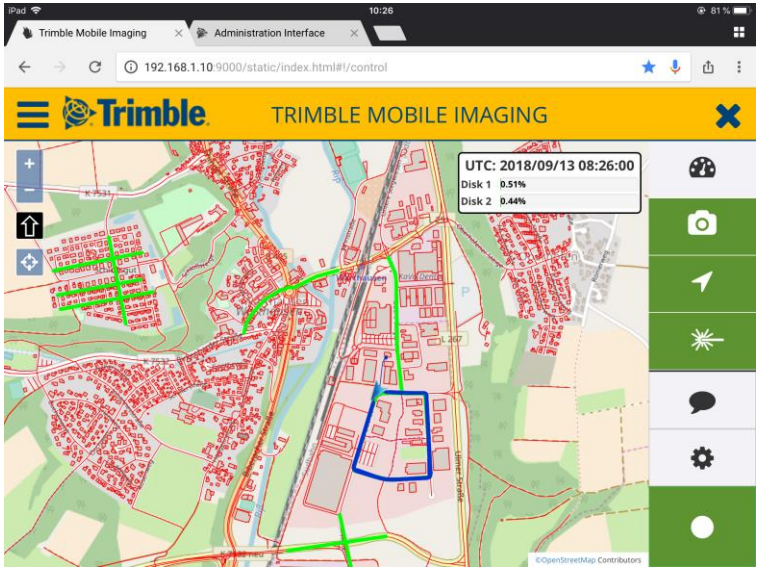
Data capture

- Background map for tracking of route and supervision of planned area
- Mission setup options
- Supervision of data acquisition

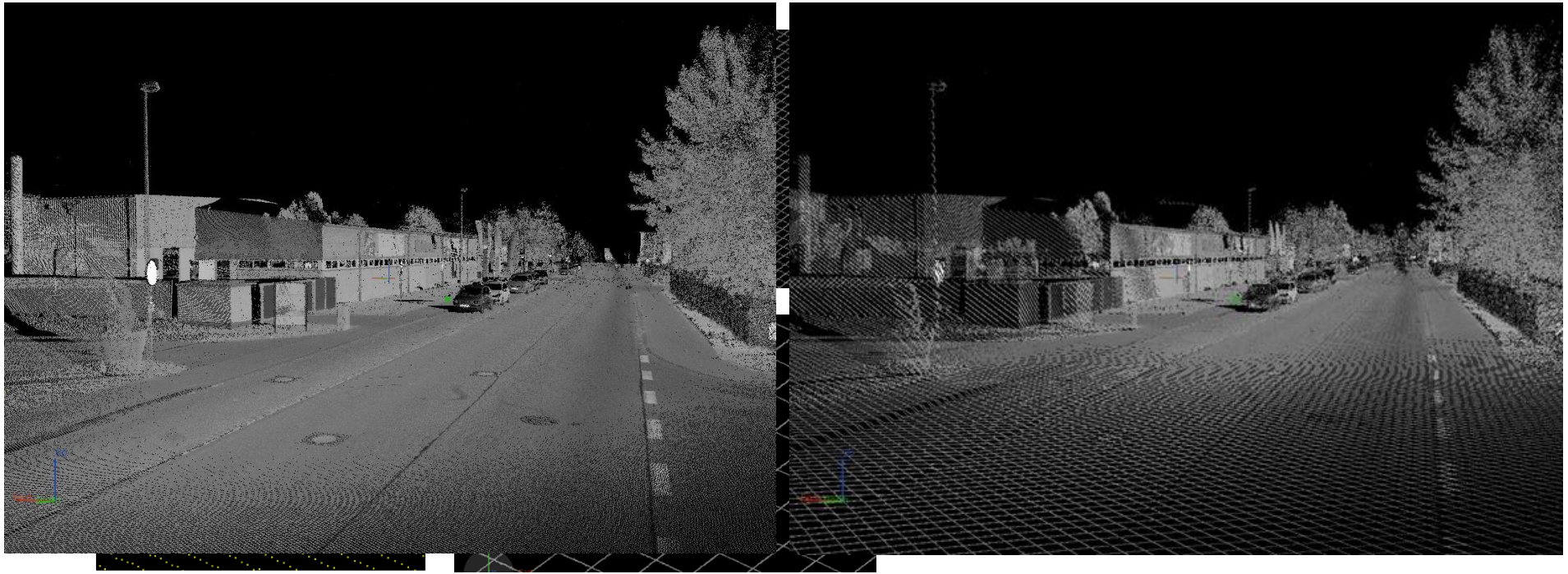








Data capture flexibility

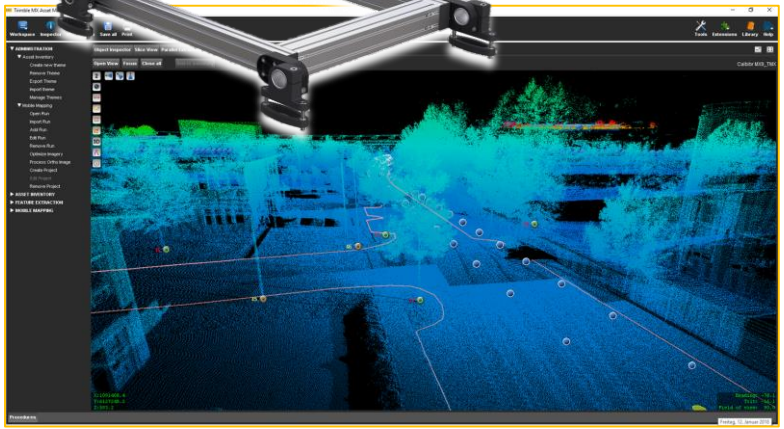


Acquiring data one time

- More and more customers still willing to acquire all the data at maximum capacity.
  - Having to visit the site again is more cost intensive than storing the data.

Data

3D Lasers

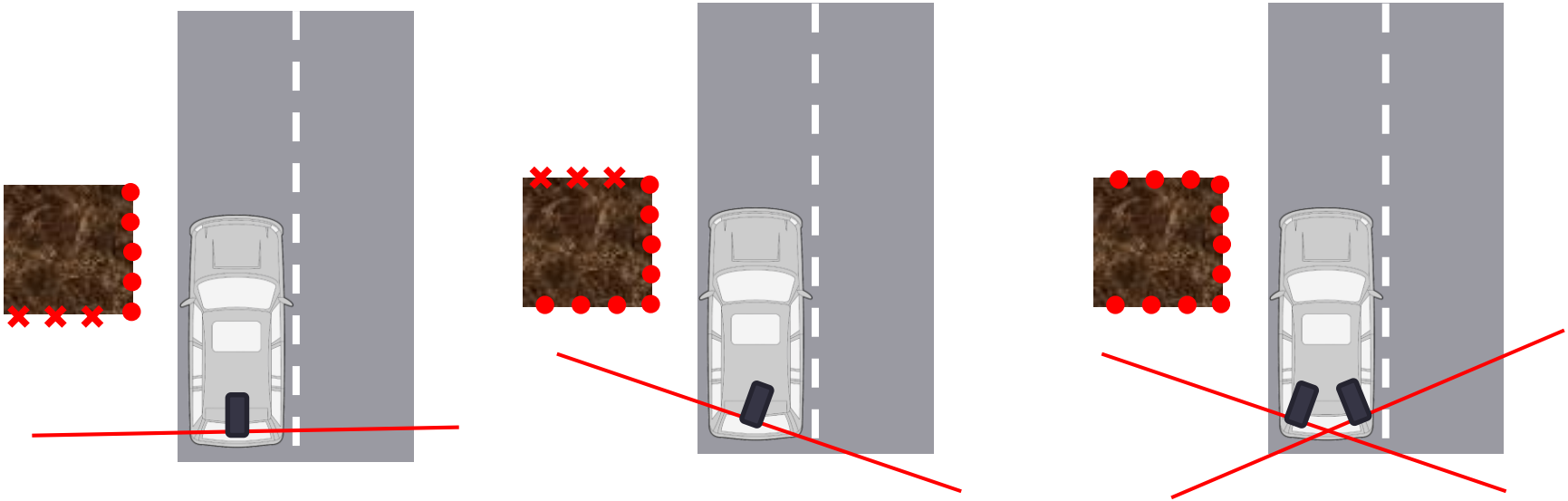


Planar

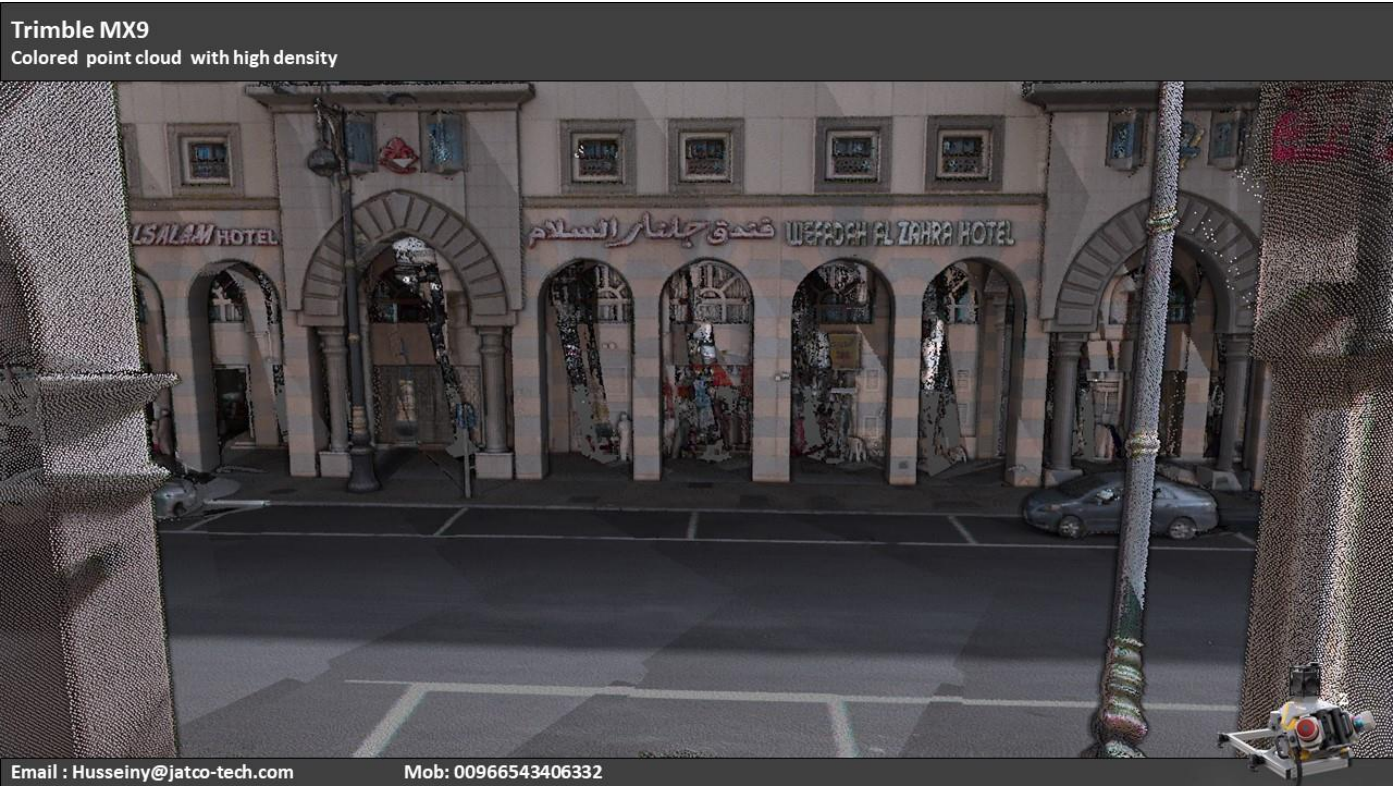
Panorama

Trimble

Single versus Dual laser



Very dense and highly accurate data



- Up to 2 Mil points per sec
- Highly accurate GNSS/IMU
- Panoramic camera, additional side-looking, backward/ downward looking cameras

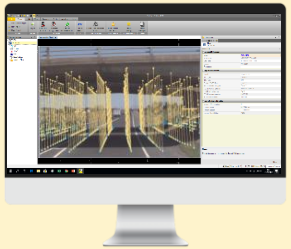
Data processing

In field
data collection

Data Processing

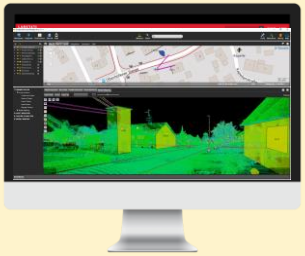
Pre-processing and
trajectory correction
(Base Station, GCPs)
Colorization

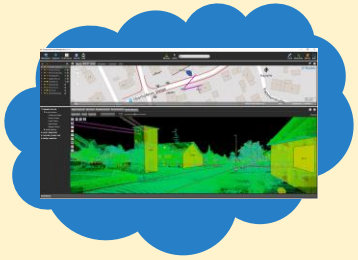
TBC



Engineering/
CAD

Model & Analyze





Trimble MX

Trimble MX Publisher

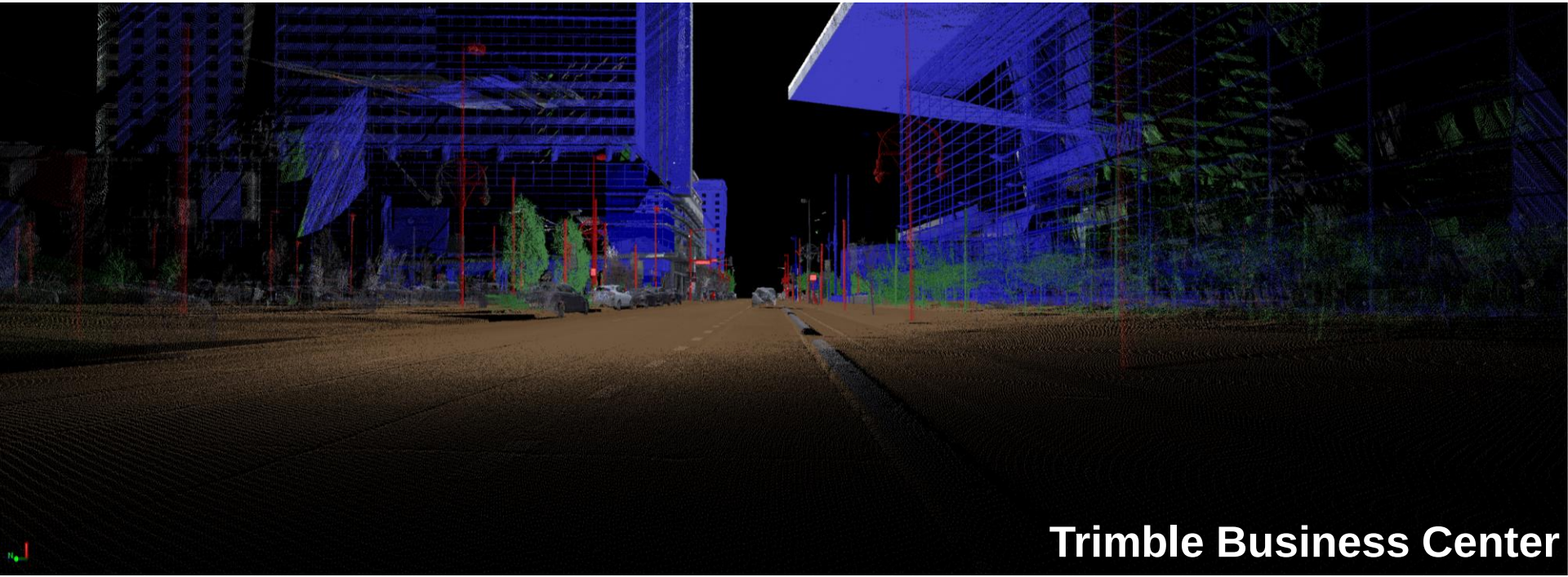
Mapping / GIS

Collect

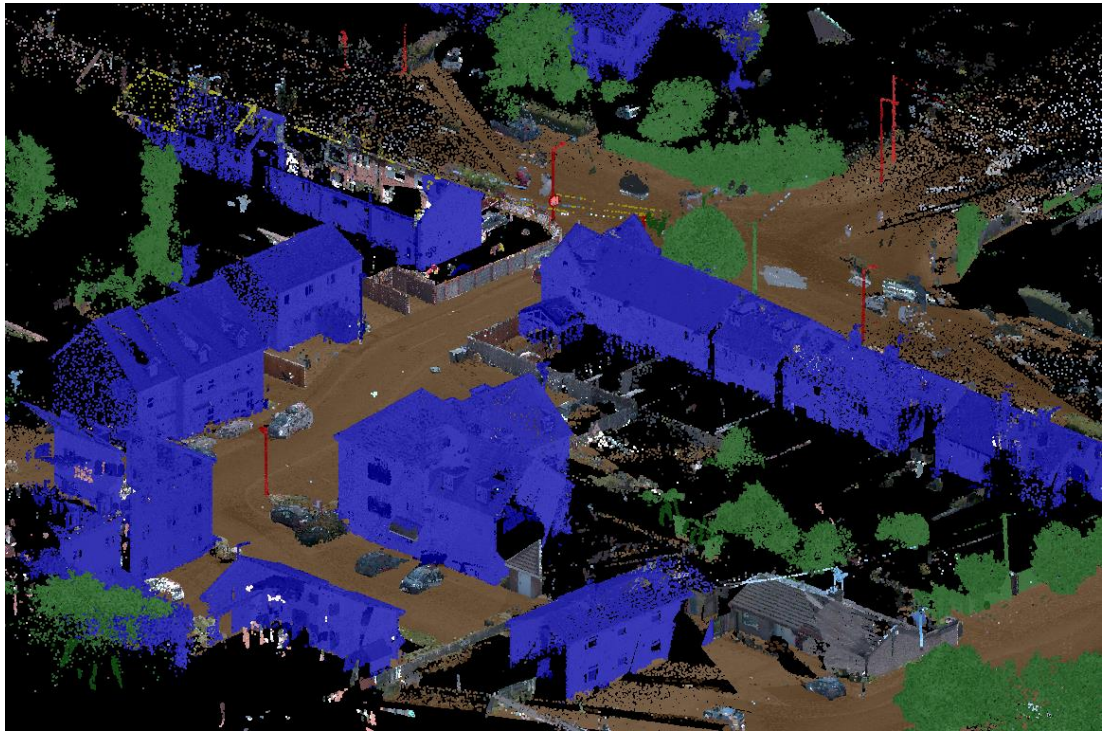
Process

3rd party software solutions

Denver, Colorado – ILFM conference center



Auto Classified Point Cloud



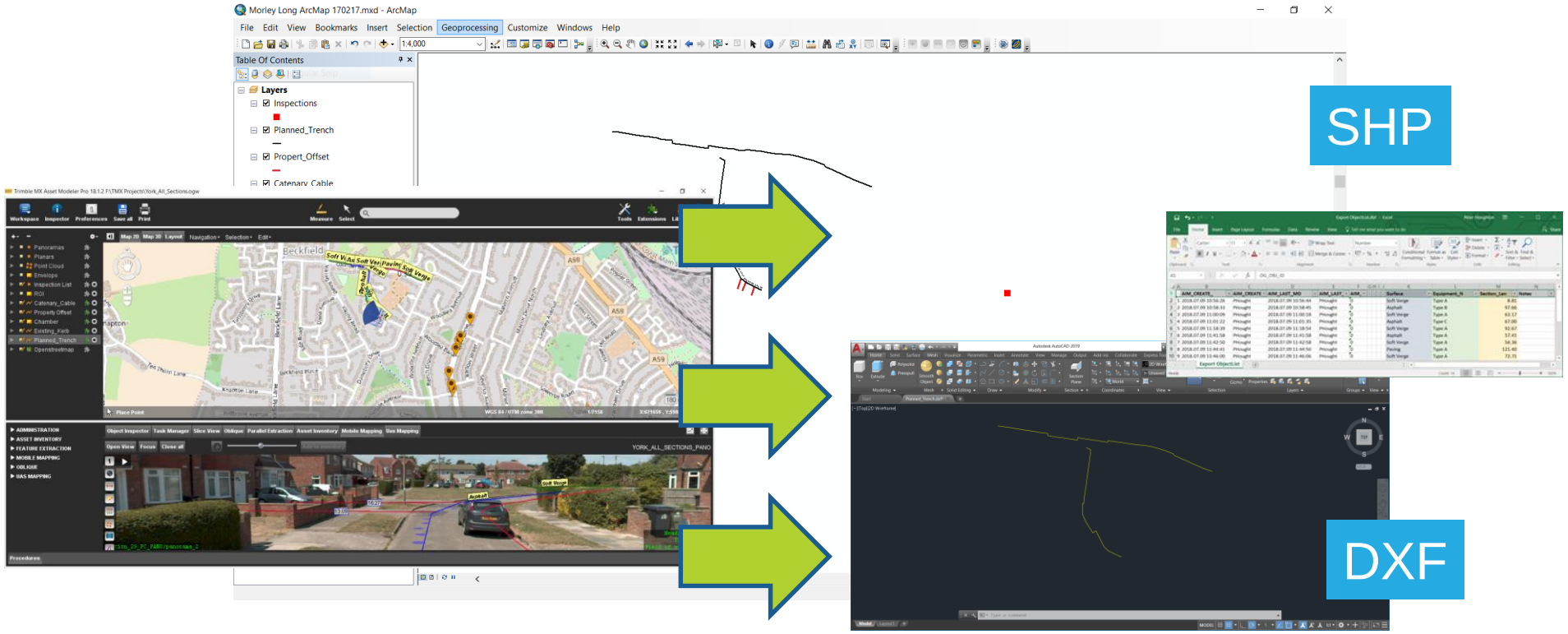
- Buildings
- Ground
- High vegetation
- Poles and signs
- Power lines

(Semi) Automated Feature Extraction

- Select from point cloud or from images the element you need/want to extract

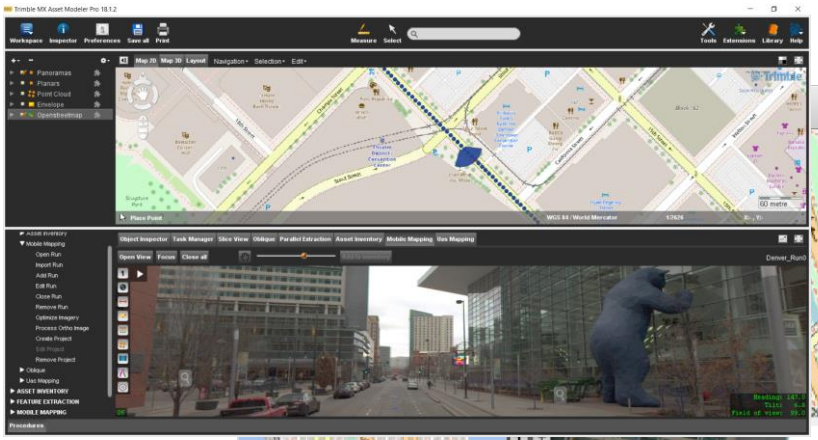
Object extractions and measurements

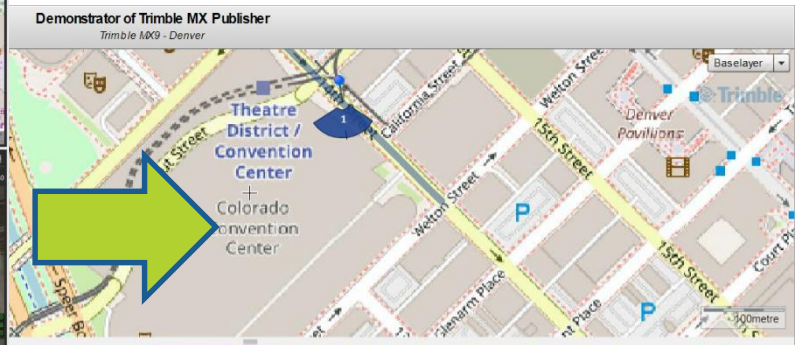
Export to GIS/CAD platforms



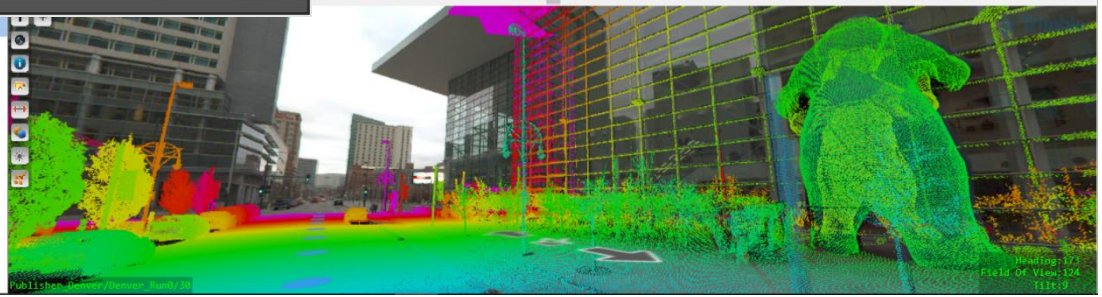
Trimble

Sharing data





- Trimble MX7 - Leeds
- Trimble MX7 - Abingdon
- Trimble MX7 - Axis
- Trimble MX2 - LA River
- Trimble MX7 - Dammam
- Trimble MX7 - Napa
- Trimble MX7 - Vantaa Urban
- Trimble MX7 - Rail Dresda
- Trimble MX7 - Amsterdam Boat
- Trimble MX7 - Ireland Highway
- Trimble MX7 - Troyes
- Trimble MX7 - Cycling Route



Thank You