REMOTE SENSING SERVICES

Potential business benefits of oblique cameras for an NMCA

EuroSDR Workshop
Oblique Aerial Cameras
Sensors and data processing

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Monday 9th October 2017

Ordnance Survey

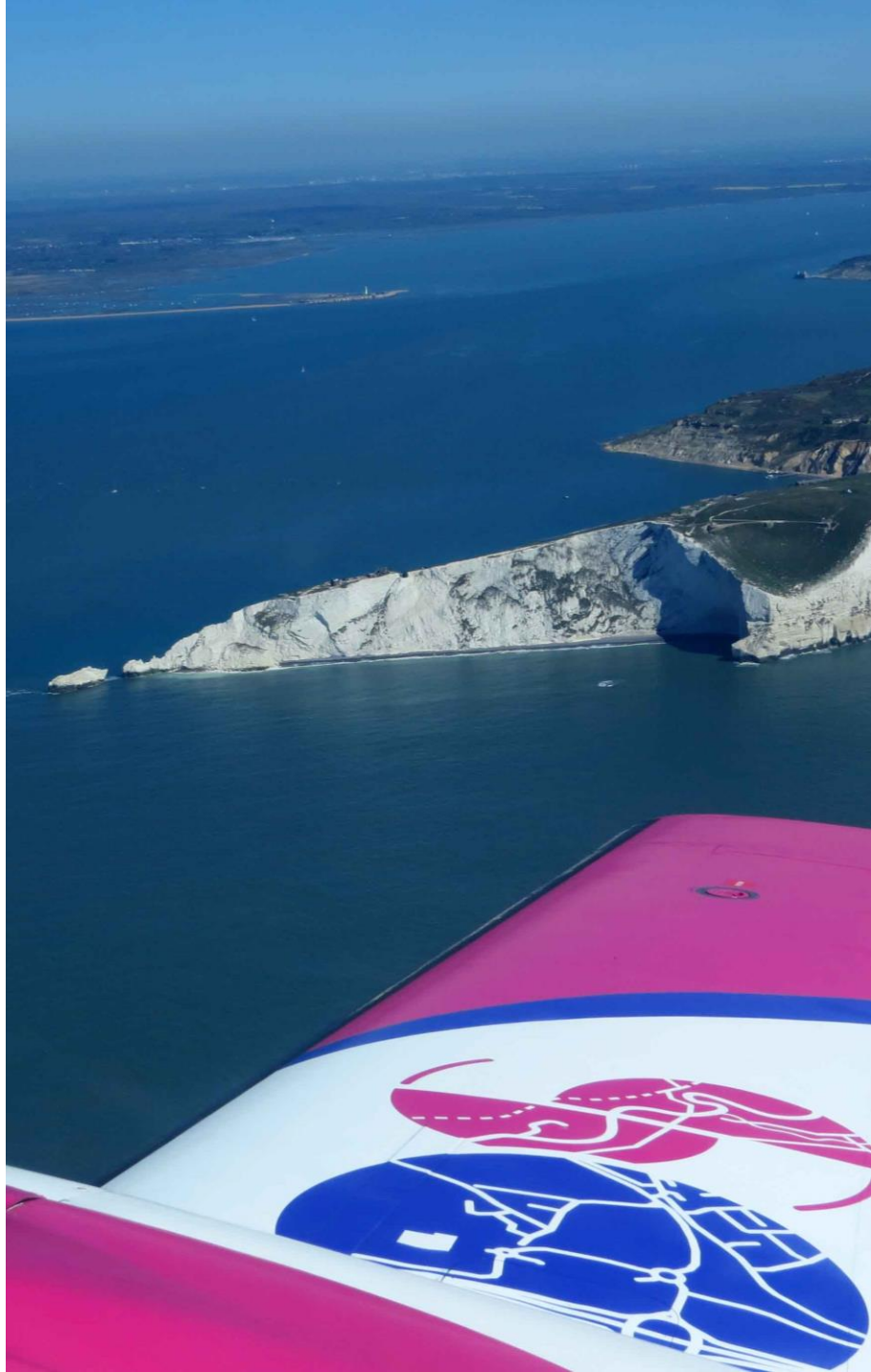
Aims of the talk

The use of Remote Sensing at Ordnance Survey

Current Oblique Camera Technology investigations

Future Business requirements

Potential Business Benefits to an NMCA



Who we are

- National Mapping Agency of Great Britain.
- 250,000 km sq.
- Providing accurate and up-to-date geographic data, relied on by government, business and individuals.

- Some key producs
  - **OS MasterMap®**
    - **Topography Products**
    - Green Space
    - Highways
    - Water Networks
    - **Imagery**
    - Integrated Transport Network
  - **Height Products**
    - **OS Terrain 5 (DTM)**
    - Building Height Attributes

The use of Remote Sensing at Ordnance Survey

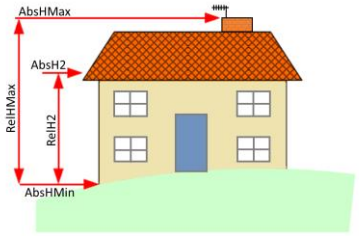
Products updated using Remote Sensing

Topography

Imagery Layer

OS Terrain 5 (DTM)

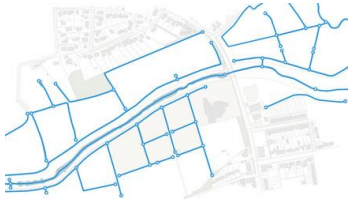
Building Height Attributes



Green Space

Highways

Water Networks

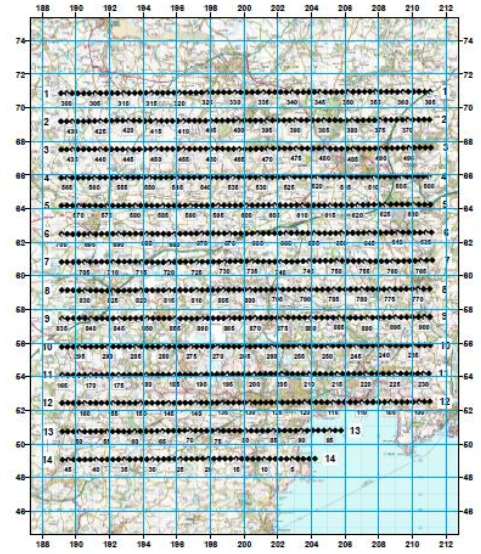


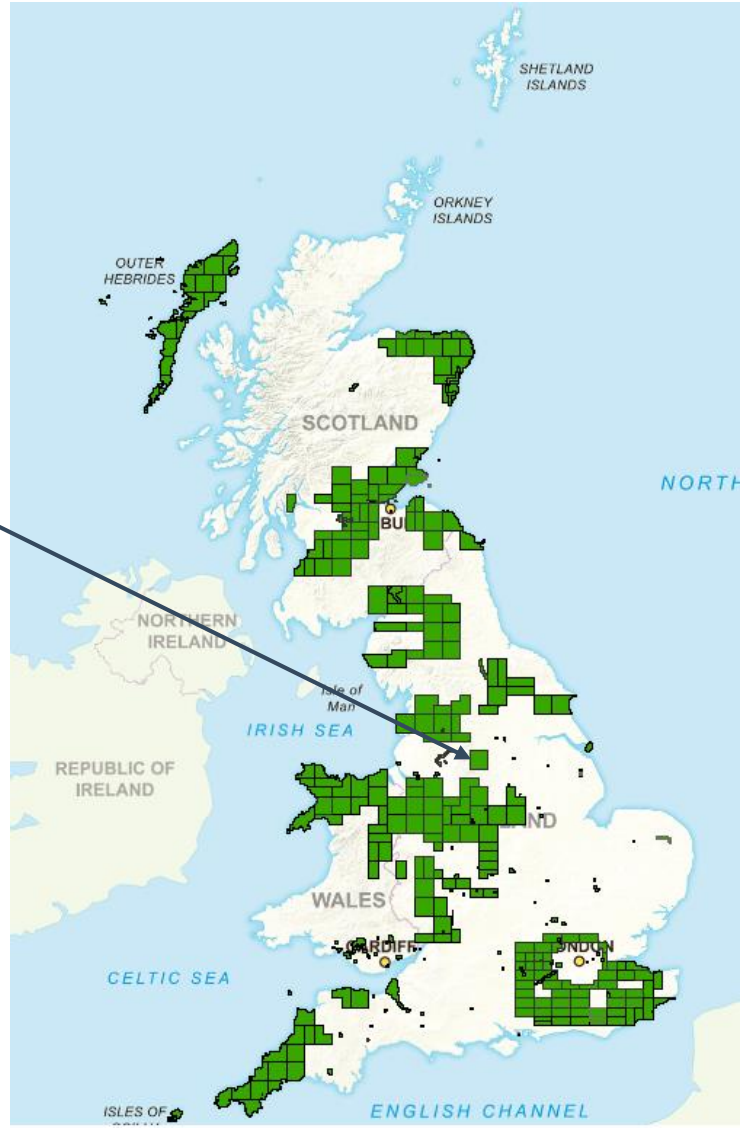
Integrated Transport Network

The use of Remote Sensing at Ordnance Survey

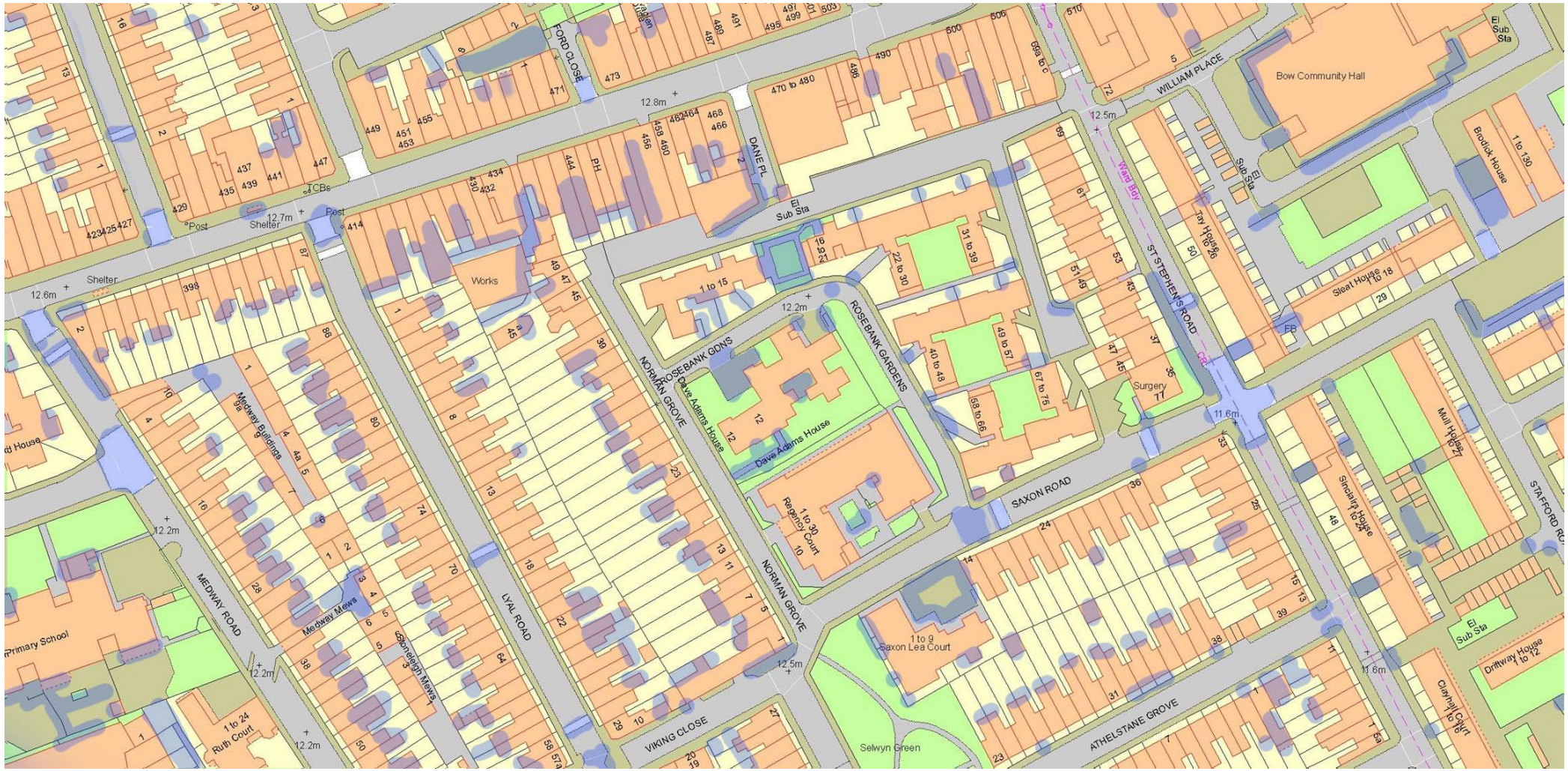
OS Flying Unit
Based at East Midlands
2 x Cessna 404
Vexcel Imaging UltraCam XP's
Nadir cameras

Typical flight diagram
(15cm GSD
80/30% overlap)





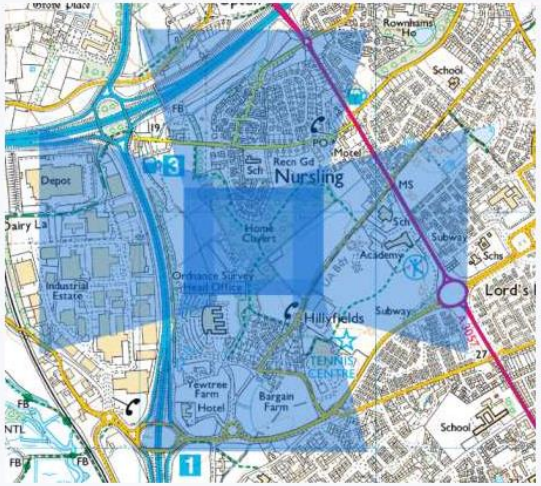
Urban geospatial database mapping

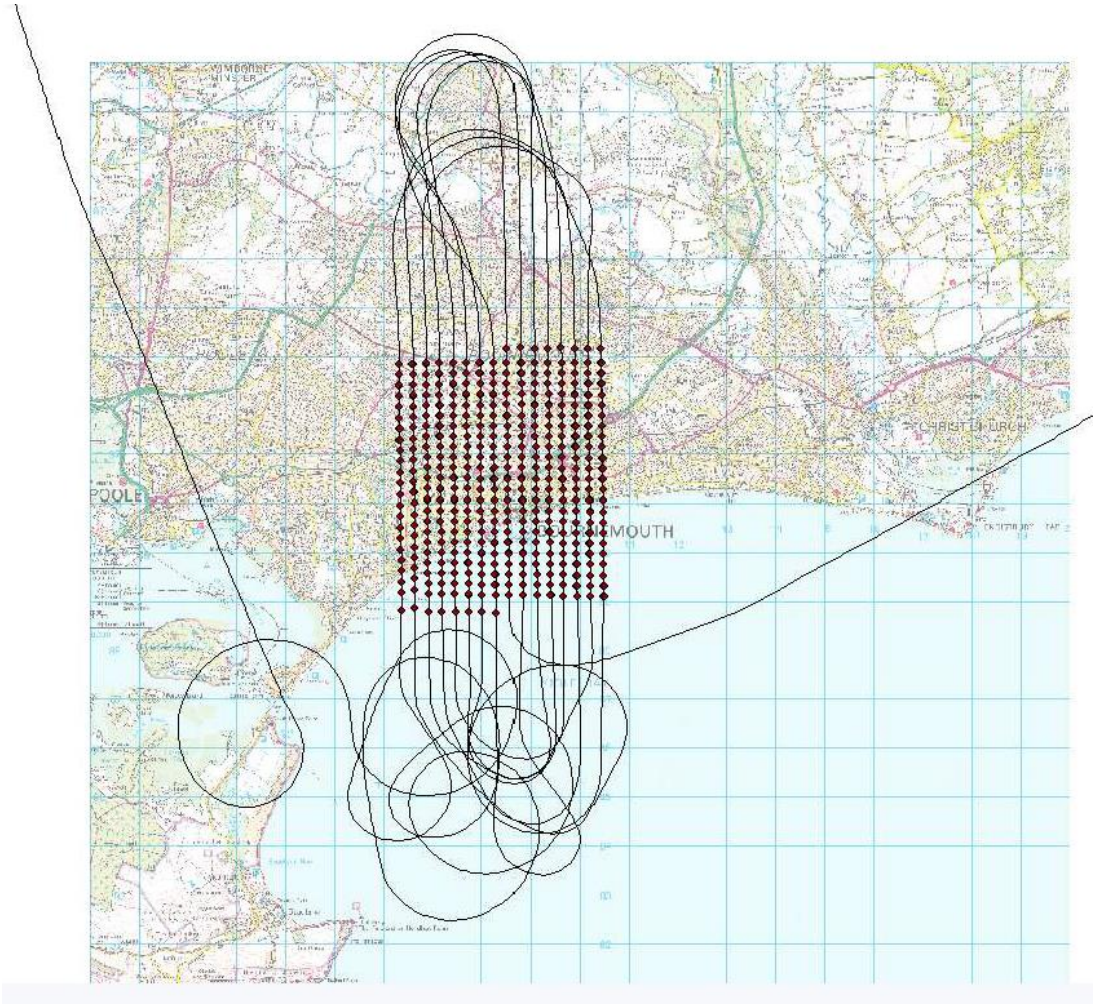


Current Oblique Camera Technology Investigations

2015 investigations

Leica RCD30 Penta Oblique camera trial – 2015

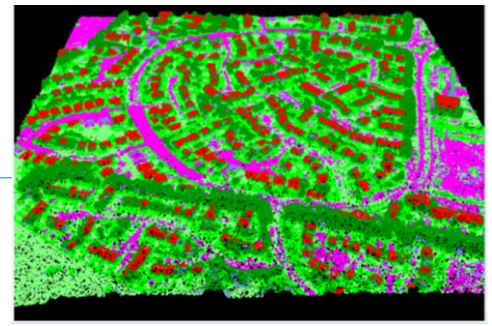




2015 investigations - findings

3D Building Modelling visualization

Classified Point Cloud



Digital Surface Models (DSM's)

Building Classification

Building Modelling
e.g. Leica 3D Modeller

2017

Future Business Requirements

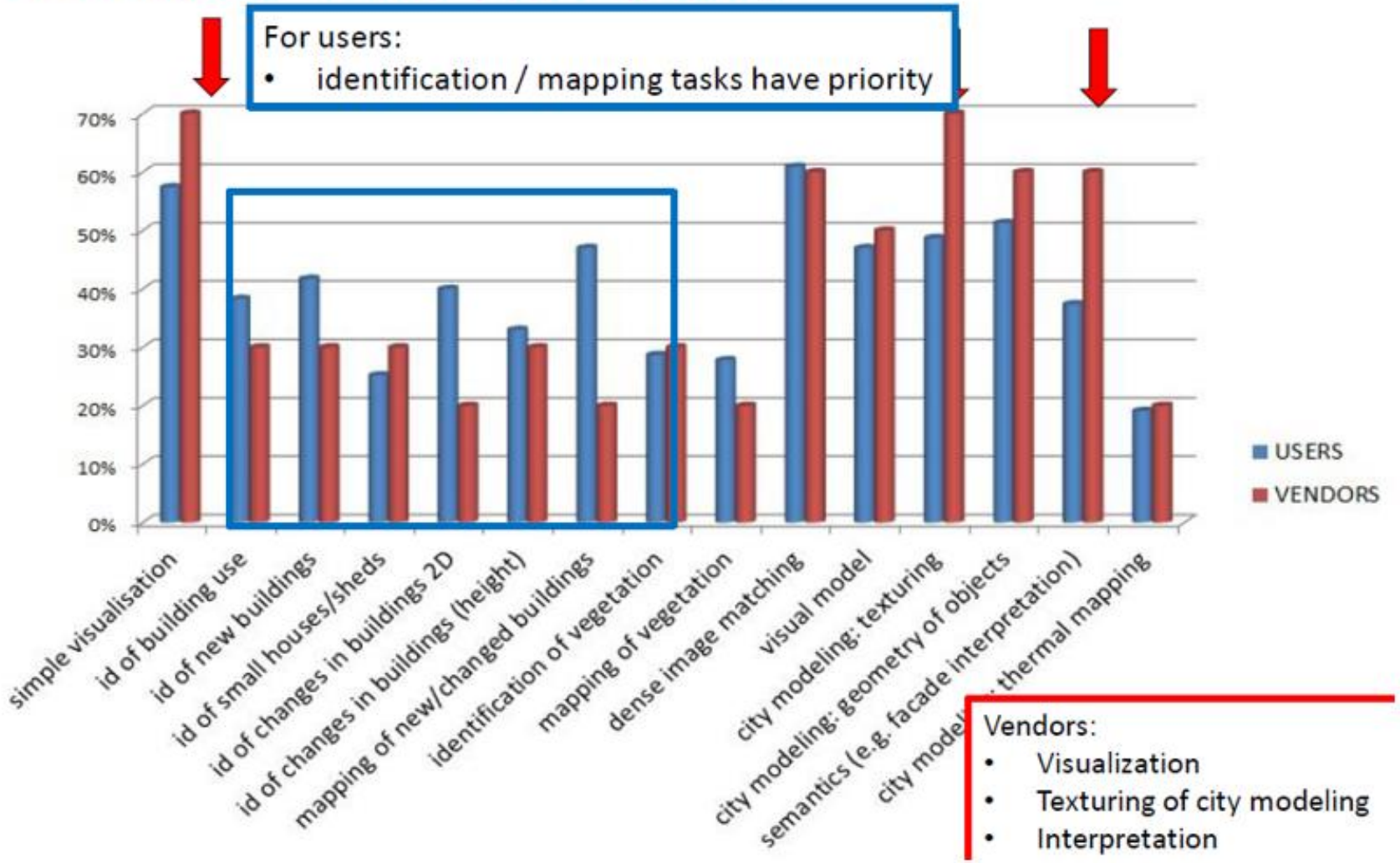
EuroSDR E-Learning

Advantages of oblique datasets

- Production of 3D vs 2.5D point clouds
- Reduced occlusions
- Derivation of 3D topographic layers / info directly from 3D point clouds (no need for stereo restitutions)
- Measurements on building façades and, generally, in narrow streets
- Better modeling of man-made and complex objects (sheers, overhangs, canopies, underpasses, etc.)
- Territory identification and interpretation for more efficient evidence-based decision making process
- Potential solution for quick updating 3D city models
- In general, improve the quality of the geo-product offered by NMAs

Questionnaire

Best application with oblique imagery?



Update for 2017

3D Building Modelling

Smart Cities mapping

user case; –Geospatial requirement for **5G** Telecommunications Planning

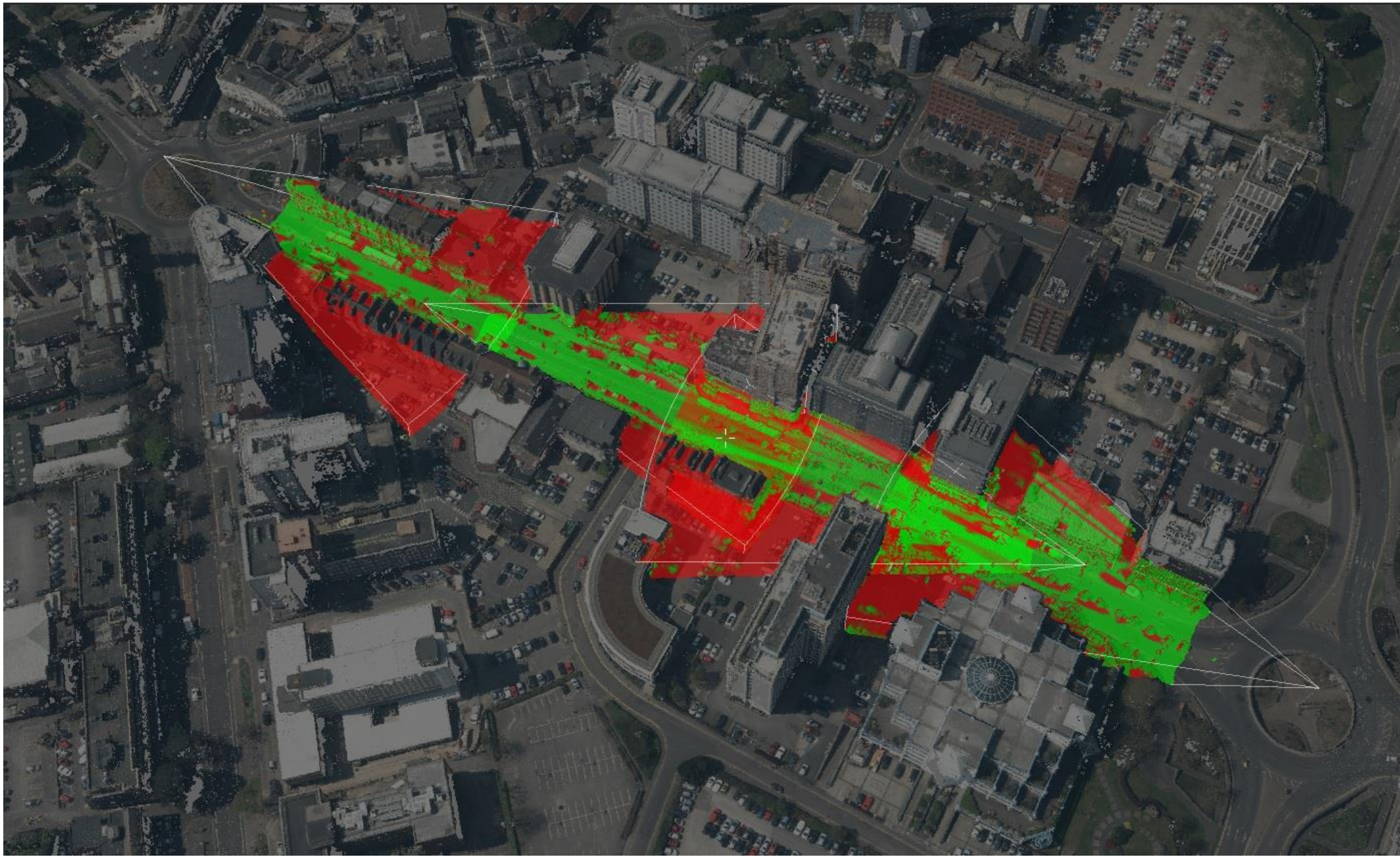
3D Building Visualisation & City Model texturing

Consumer v GIS customers

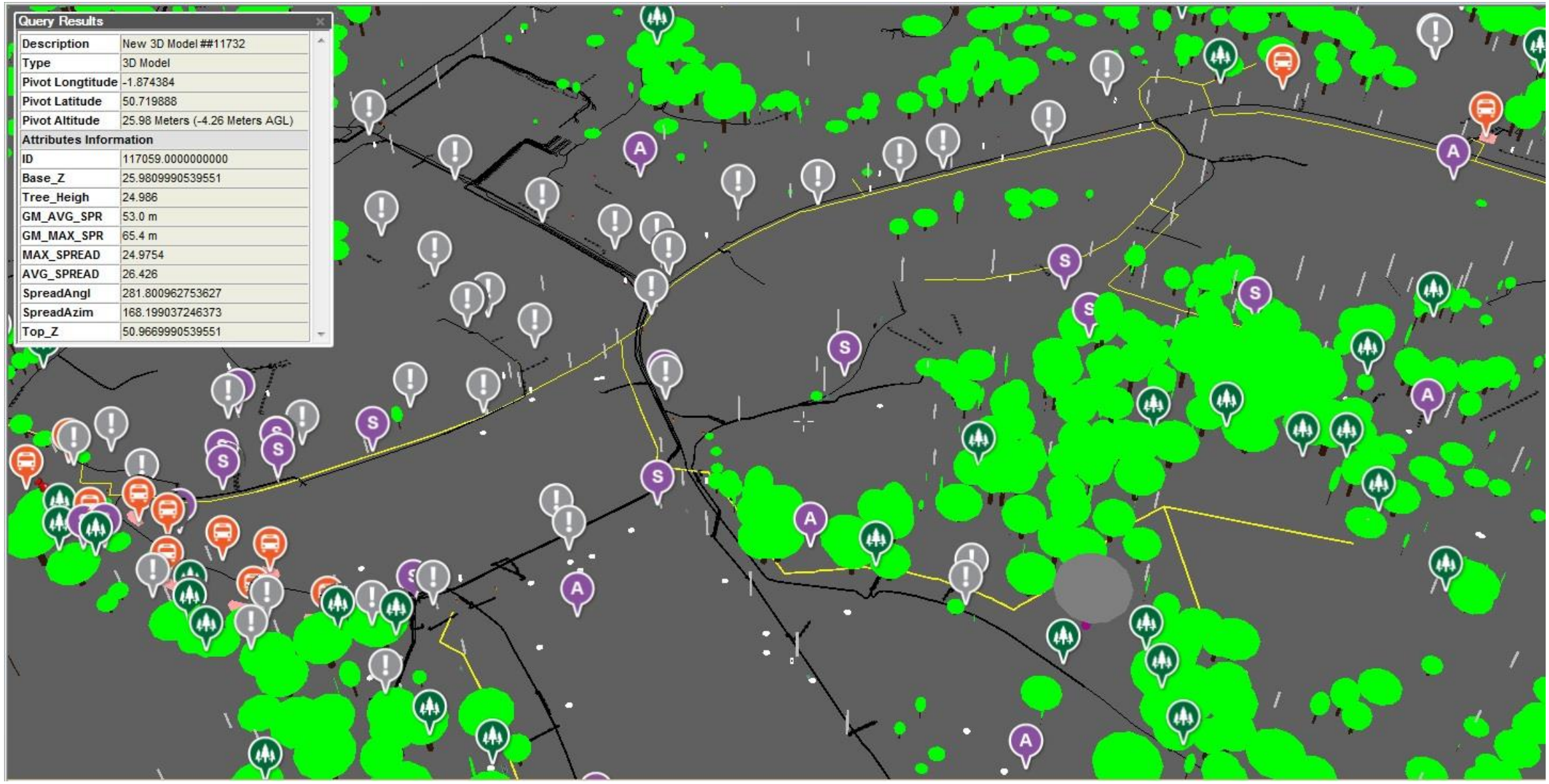
Oblique Ortho-imagery

Smart Cities

User Case; Geospatial data for 5G Telecom Planning



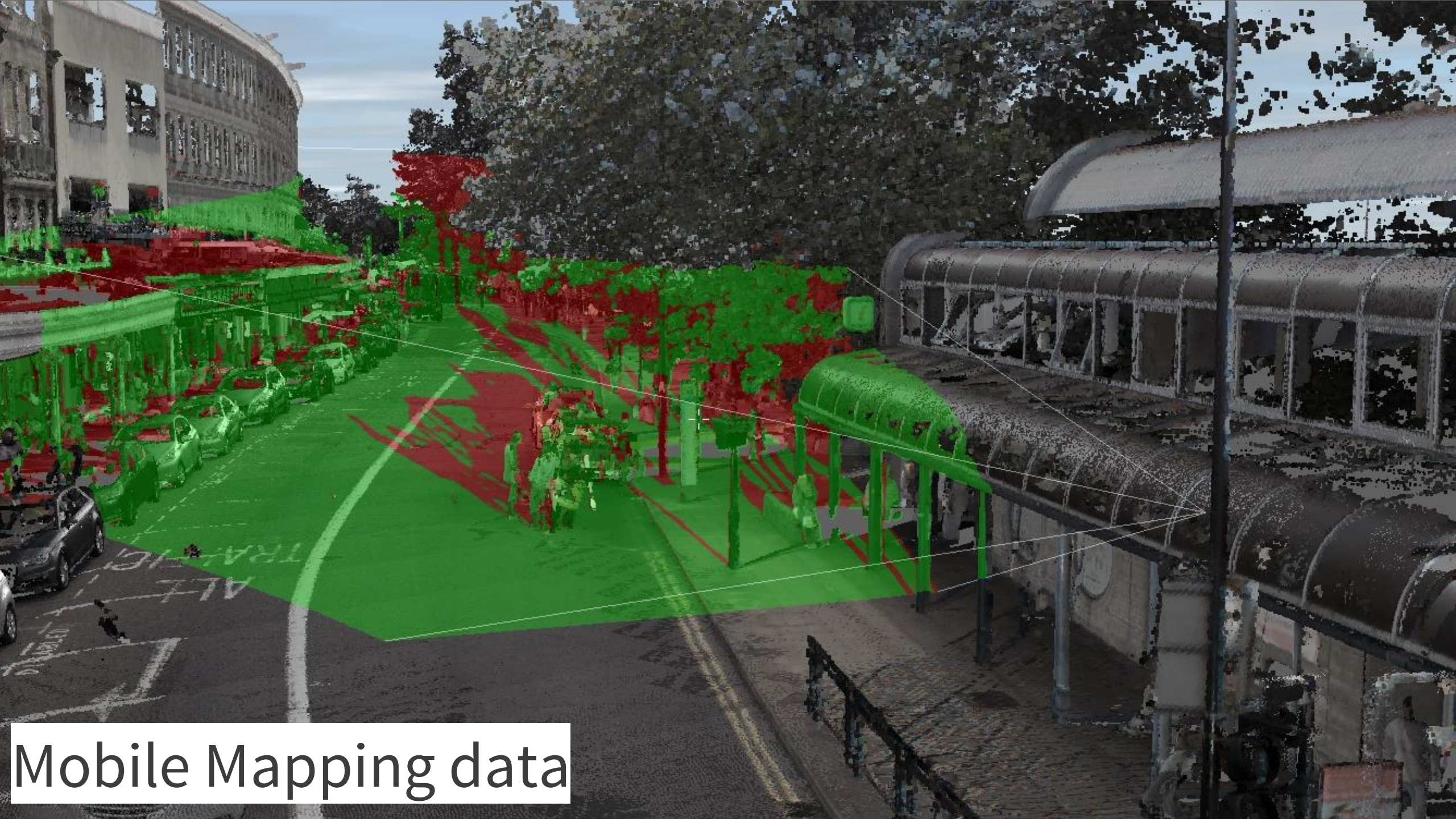
Smart Cities



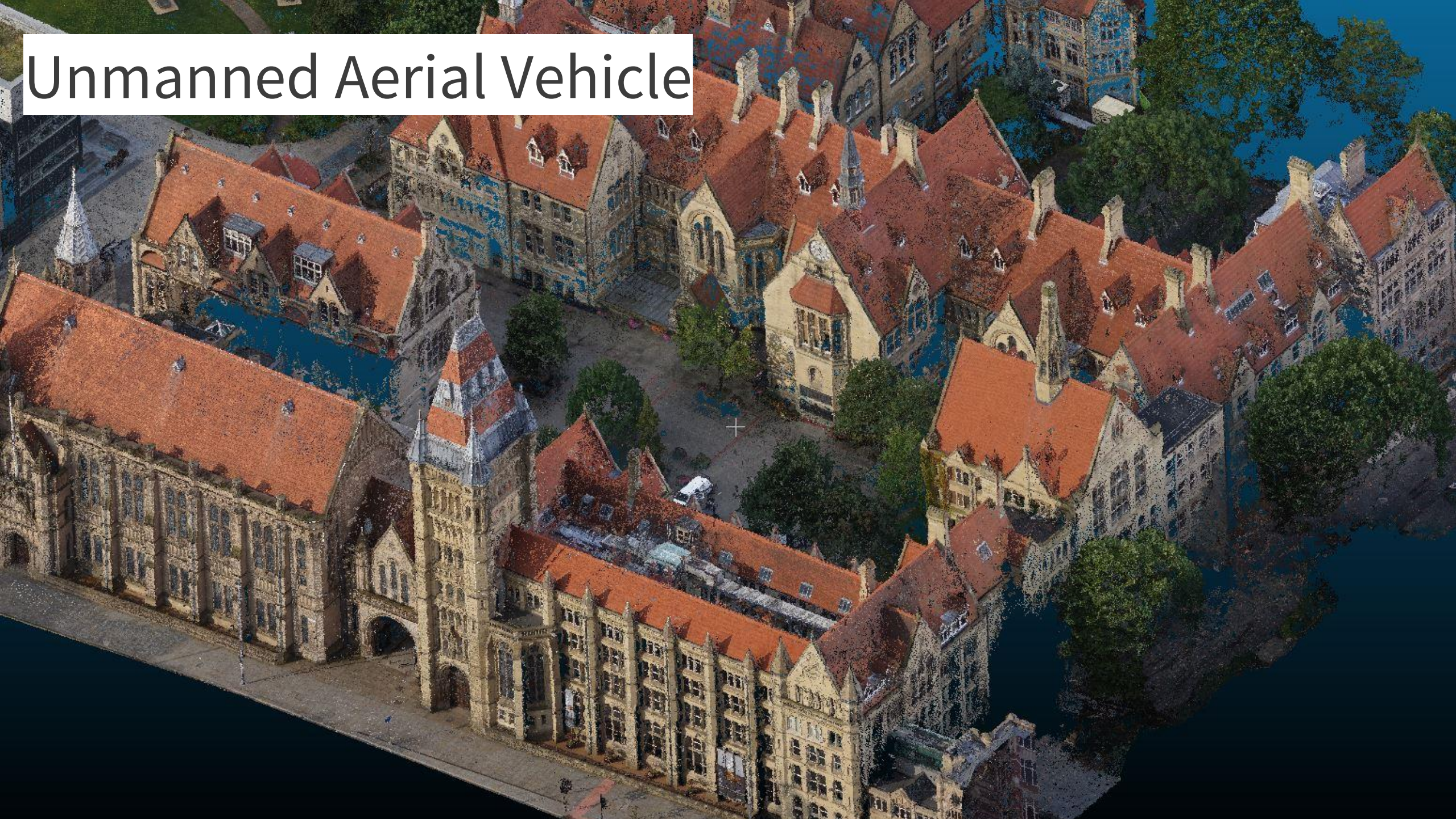
High definition geospatial data for 5G Telecommunication planning.

- Field Survey
- Mobile Mapping
- UAV
- Airborne Oblique camera systems
- Airborne Vertical camera systems

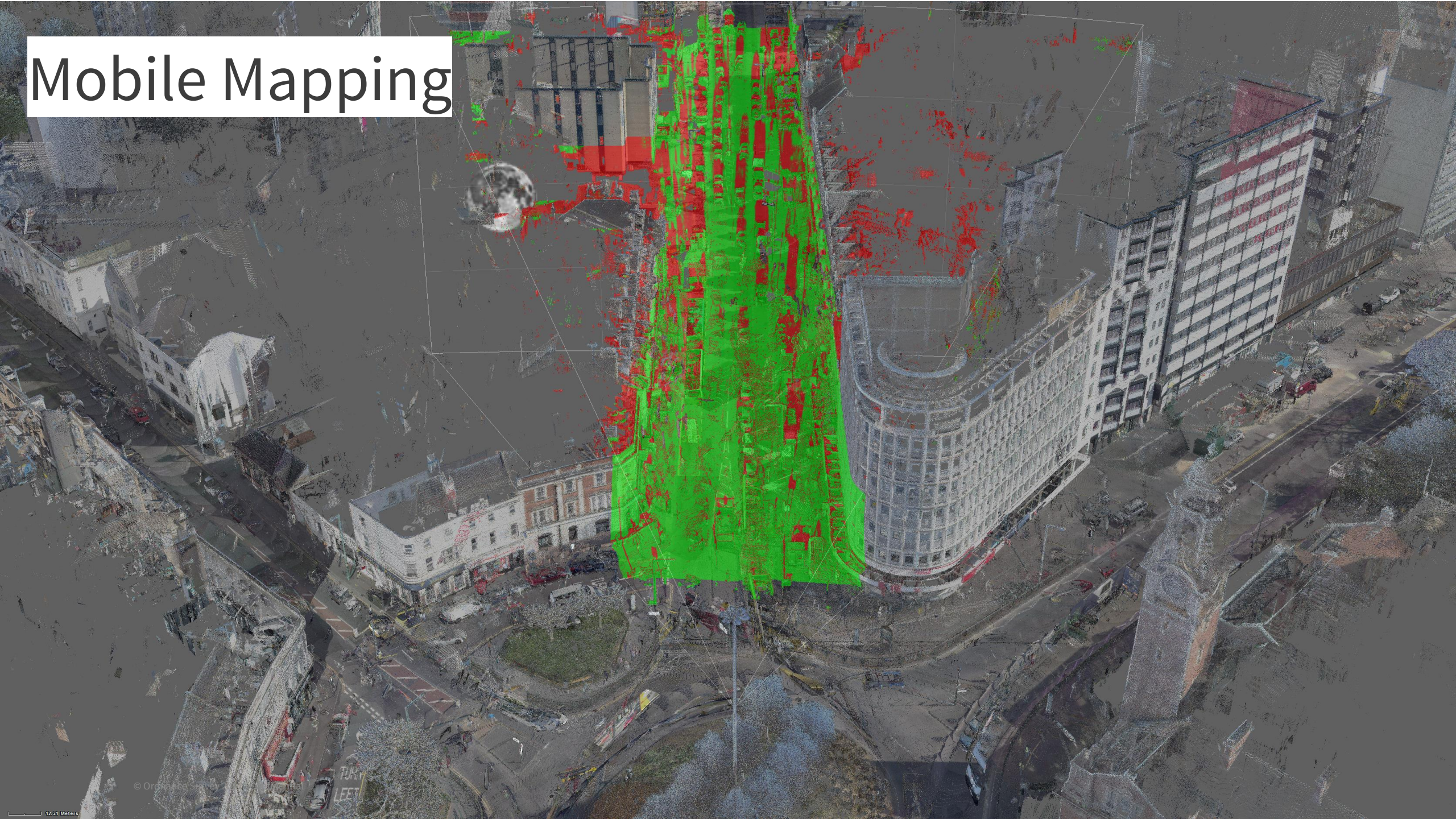
Field surveying


Mobile Mapping data

Unmanned Aerial Vehicle

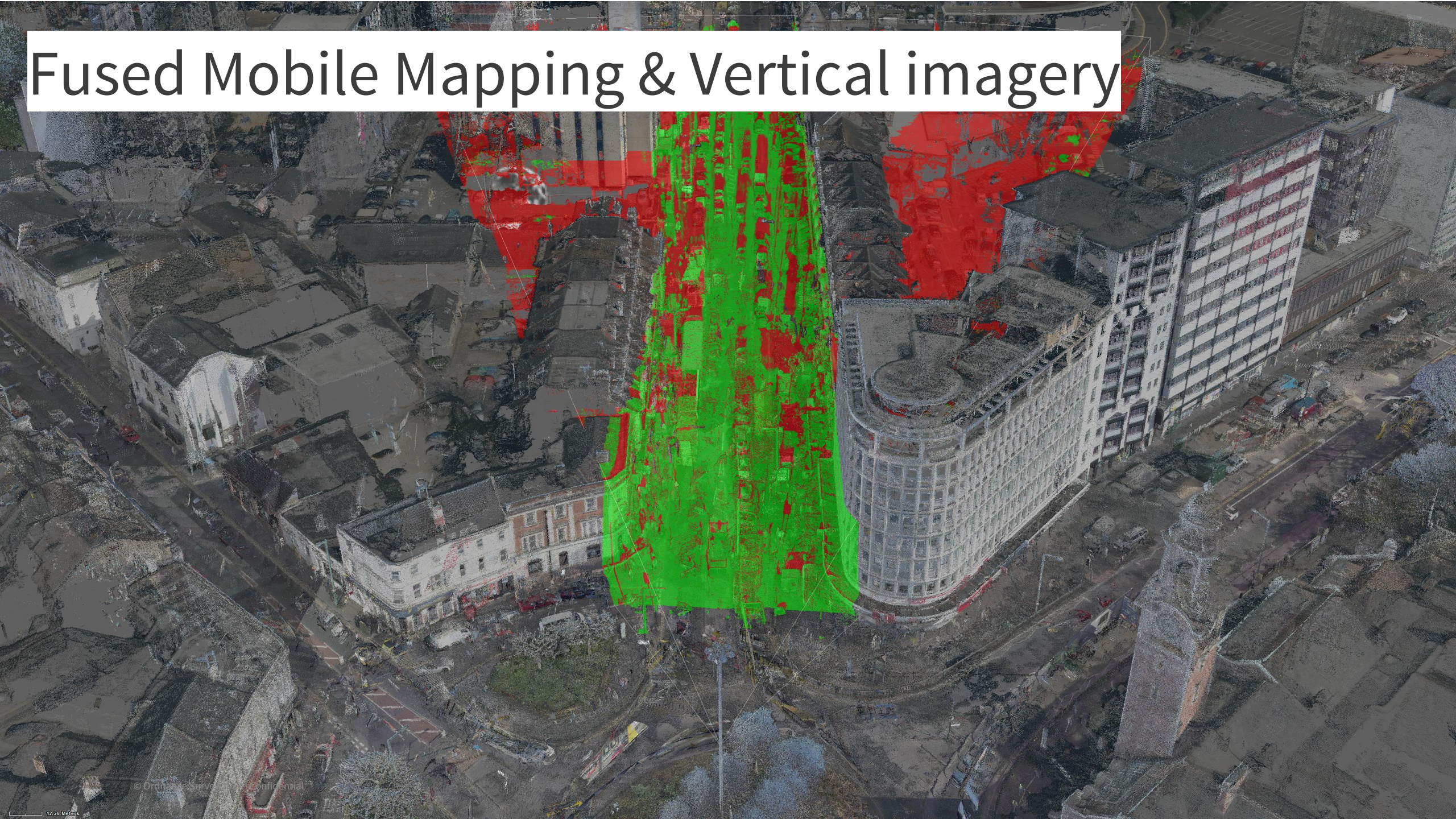


Mobile Mapping



Vertical aerial imagery

Fused Mobile Mapping & Vertical imagery




Leica Penta Oblique
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3.30 Meters

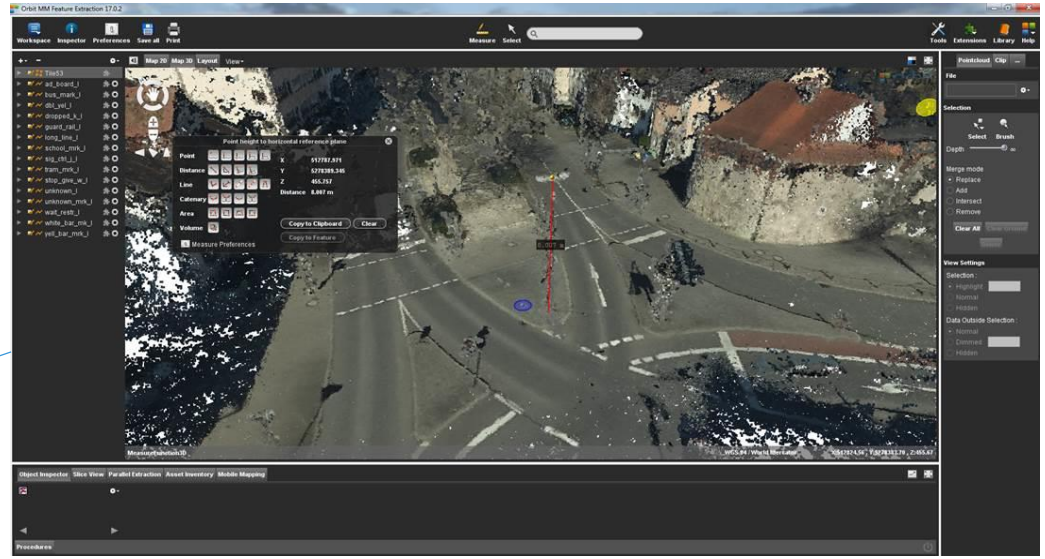
Mobile mapping

Oblique imagery

Feature Extraction

Using either:-

a) Dense 3D Point Cloud



b) Oblique and Nadir Stereo imagery

Point cloud & imagery courtesy of IGI-Systems

Potential Business Benefits to an NMCA

Investigations show a good business potential when using Oblique data for Feature Extraction for high-definition mapping.

Potential to measure building facades (using stereo imagery)

Automation of 3D City Modelling (3D Textured TIN models or 3D MESH) – helps towards creating the ‘Digital Twin’; Digital Built Britain, BIM/3D GI initiative.

Probably needs more than one use for full business realisation.

Conclusion

Oblique has advantages in:-

- Total coverage of City areas with minimal occlusions
- Multiple views of each feature
- See under features
- 3D Colourised 3D City Model automatically created
- Efficiency of data capture and processing
- Stereo Oblique capability
- Etc.

GSD very important (needs to be under 8cm in Nadir imagery for HD Mapping Feature Extraction)

Flying heights – an issue over dense urban areas

% overlap important, to avoid occlusions whilst being efficiently flown

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