

GE
SMART
ASIA 2018



Locate
#Locate18



WHEN

9 – 11 APRIL 2018

WHERE

ADELAIDE, AUSTRALIA

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FUTURE TECHNOLOGIES COMPLEMENTING SURVEYING AND MODELLING PRACTICE

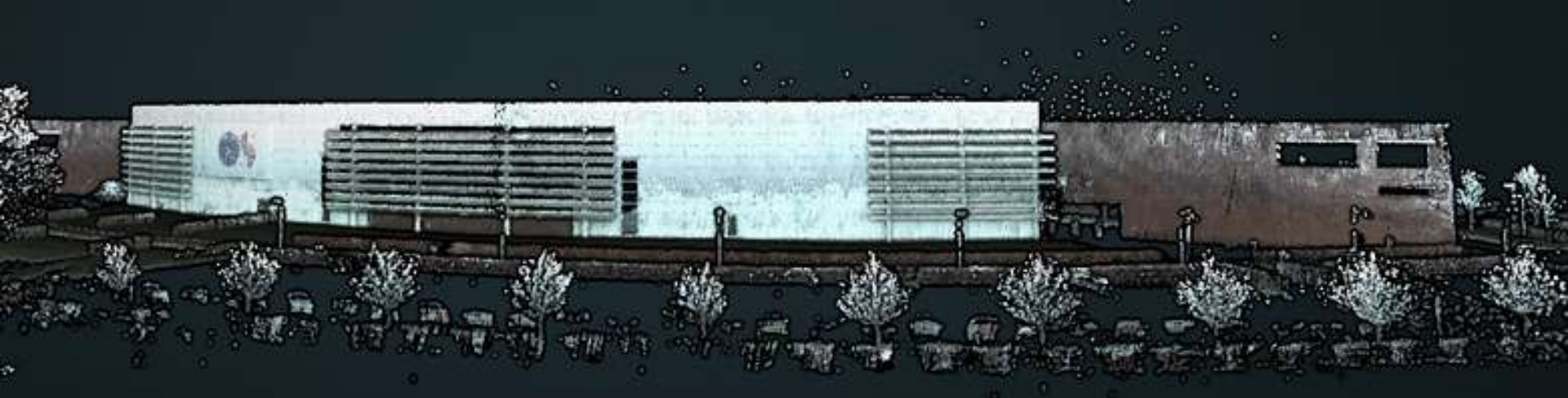
Carsten Roensdorf
KL, 18/10/2016



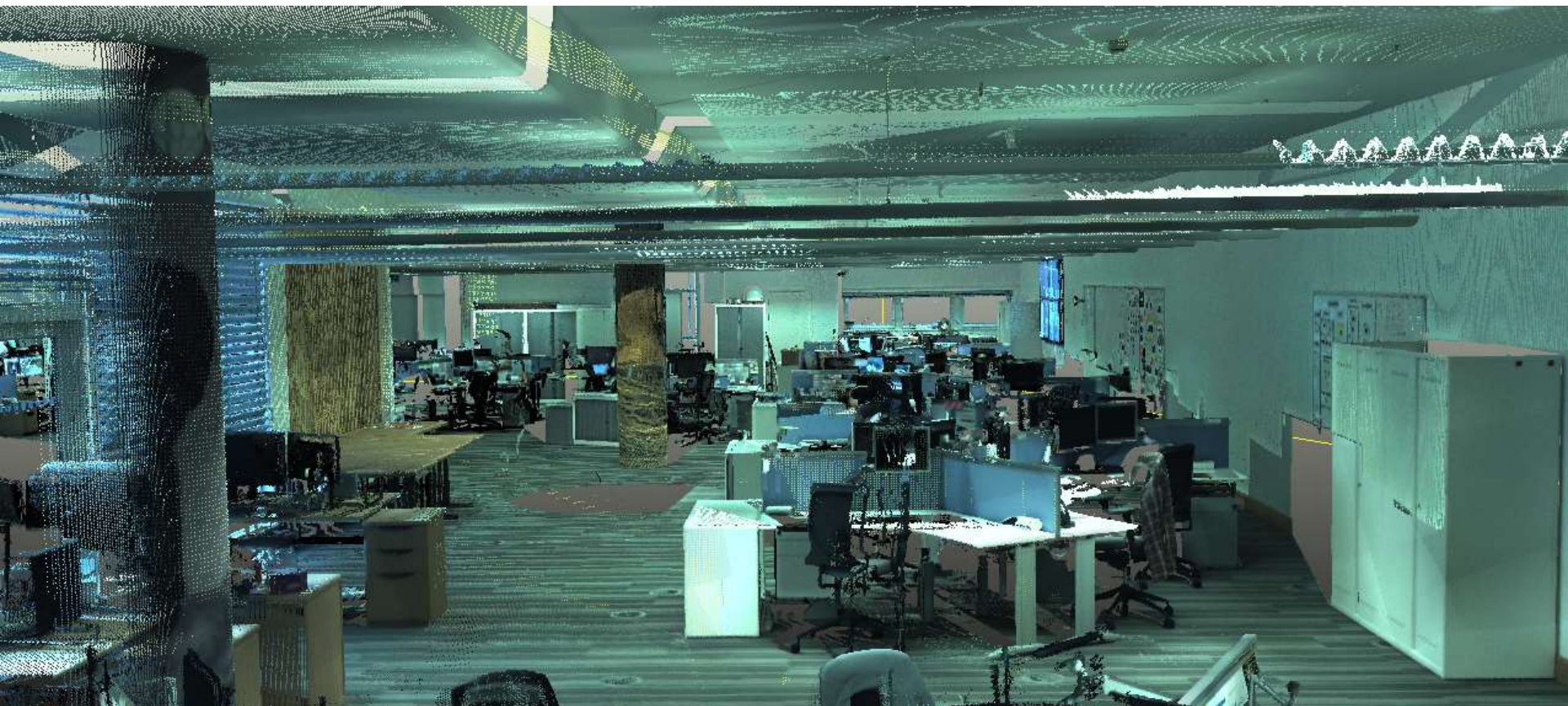


GEOVATION





OS Head Office, Southampton



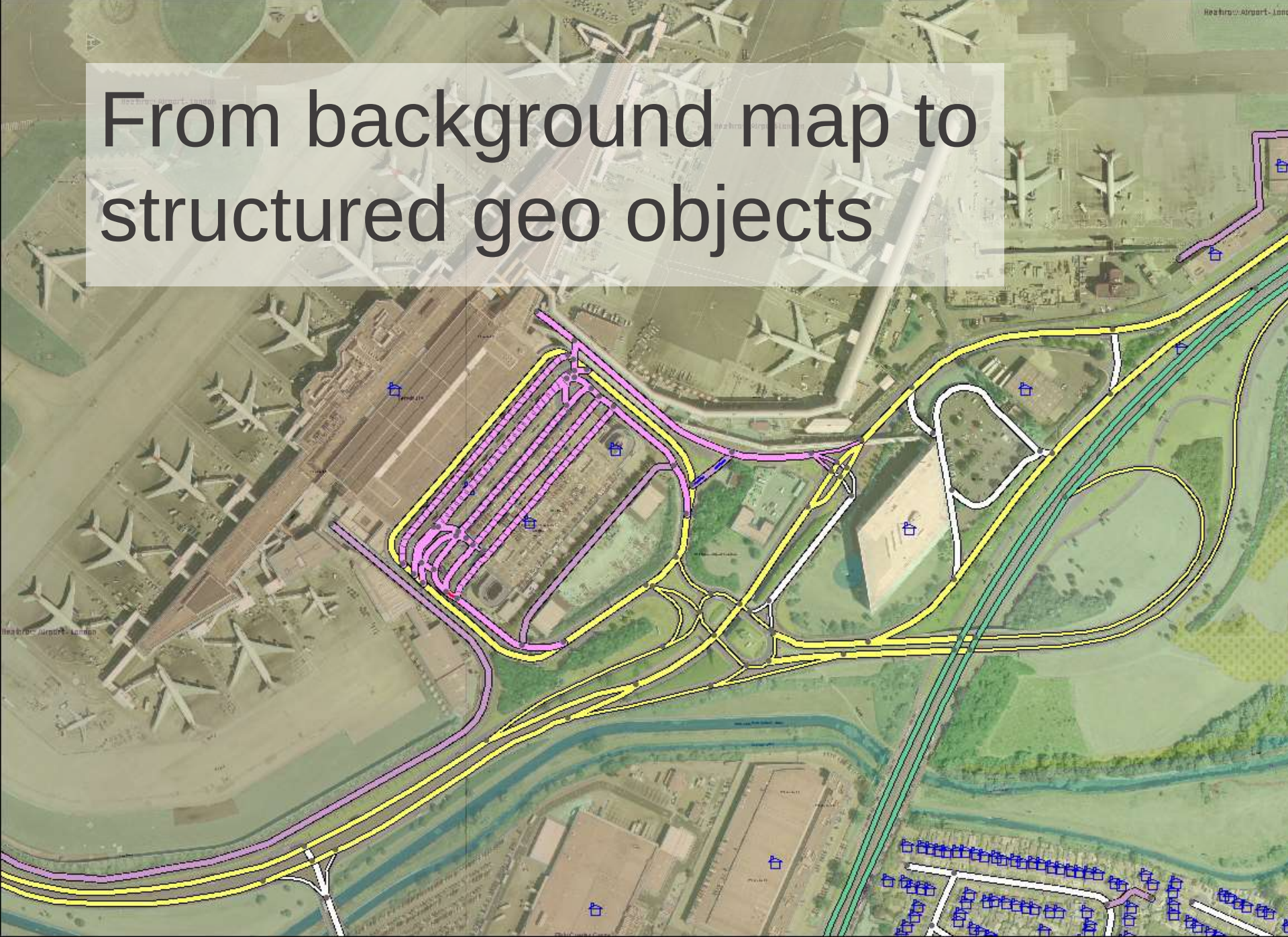
Real world model



Virtual



From background map to structured geo objects



Evolution of Geographic Information in National Mapping

1791 to
1850s



Initial
Survey



National
Coverage

1936 to
~1955



Metric,
national
CRS



Nationally
consistent
data

1975 to
~1994



Digital
spaghetti

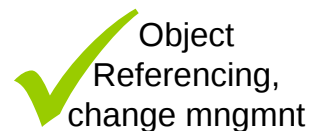


GIS use

2000 to
2001



Topological
geometric
object layers

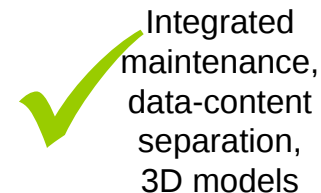


Object
Referencing,
change mngmnt

2011



Classification,
Componentisation
Rules and 3D



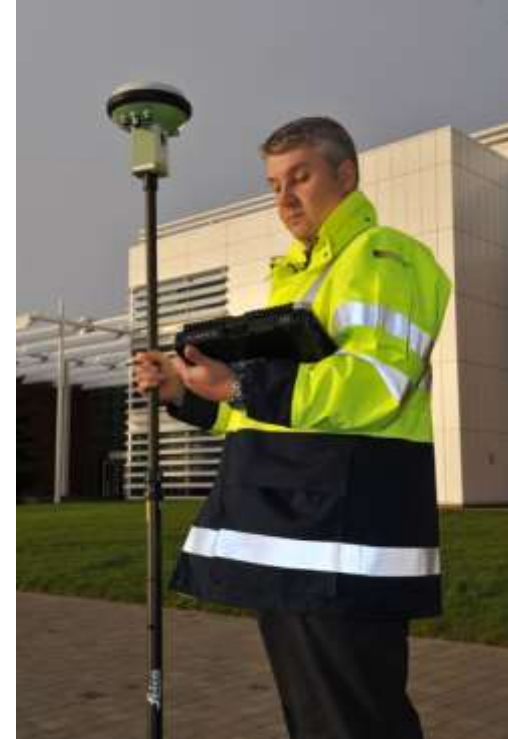
Integrated
maintenance,
data-content
separation,
3D models



OGC[®]
Making location count.
www.opengeospatial.org

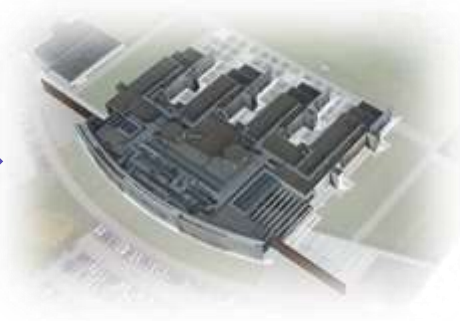
HOW DO WE SURVEY?

- OS have been looking to the future of Surveying
 - New surveying equipment
 - Advances in Remote Sensing
 - 3D
 - Point clouds
 - Building and object models



CURRENT TRENDS

- 3D data collection
- Mobile Mapping
- Terrestrial scanners
- UAVs
- Internal data collection
- Smart
- IoT (4D surveying, streaming)
- BIM



MOBILE MAPPING

- Data collection systems that can be mounted on a vehicle such as car or train
- Incorporate lasers and panoramic cameras
- Gives a unique view of the world and can capture data in areas that are hard to access
- 1m measurements/second, > 100m range



Image source: <http://www.trimble.com/Imaging/Trimble-MX8.aspx>



Leica Pegasus:two
Trimble's MX8

MOBILE MAPPING POINT CLOUD



TERRESTRIAL SCANNERS



Tested P40, MS60 and SX10 prototype

INTERNAL DATA COLLECTION



GeoSlam
Zeb-Revo



Trimble
TIMMS cart



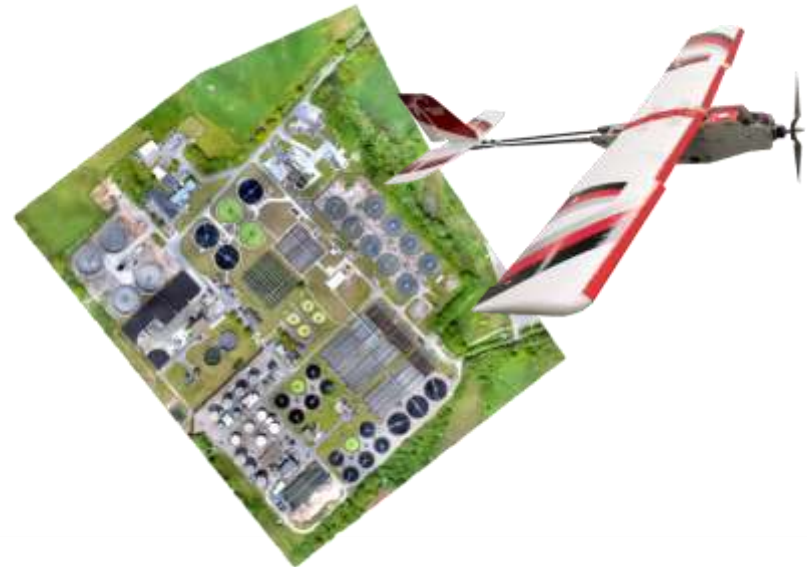
Leica
Pegasus:Backpack

UAV

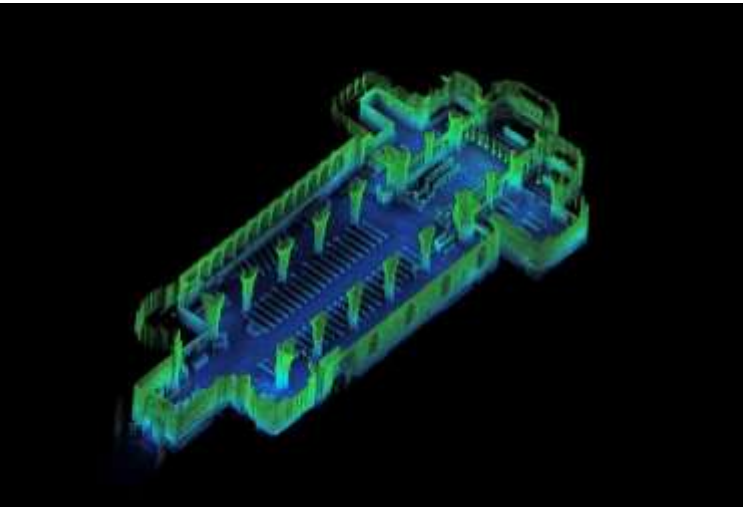
- Capture imagery from restricted areas
- Small area, high value sites – not worth flying an aircraft over
- Fly below restricted airspace
- Quick to capture
- Bespoke surveys



Image source: <https://www.aibotix.com/en>



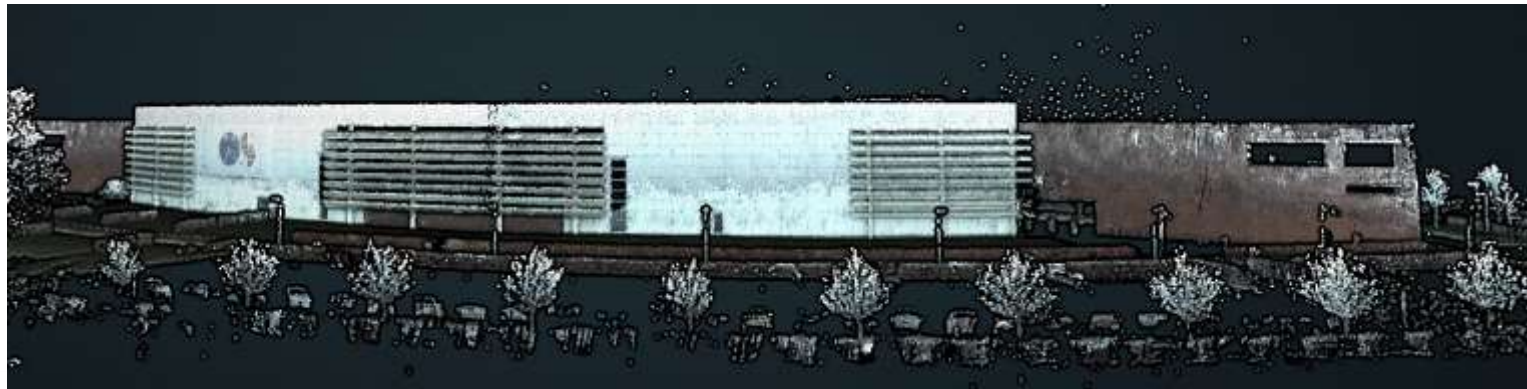
POINT CLOUD EXAMPLES



terrestrial SX10 (prototype) scanner



oblique camera point cloud



Pegasus:Two backpack

CHALLENGES

- Point cloud datasets can be massive
 - Terrestrial systems can produce GB, TB or even PB of data
 - Fragmented datasets need to be used alongside other data
- Joining data from different systems requires high quality metadata
 - There may be requirement to analyse point data from certain systems or certain timescales
 - Accuracy information needs to be retained
- Most 'customers' cannot use point cloud data
 - Due to volume of data and skill required to use and analyse, customers often do not want raw point data

MANUAL EXTRACTION

Mobile Mapping can be used to extract:

- Business names
- Street furniture
- Number of floors
- Entrances and exits to buildings

Indoor Survey equipment can be used to extract:

- Assets for Facility Management
- BIM features
- Internal geometry



AUTOMATED EXTRACTION

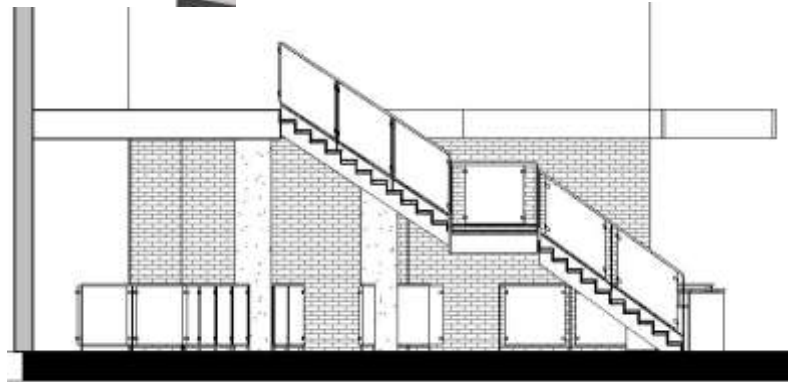
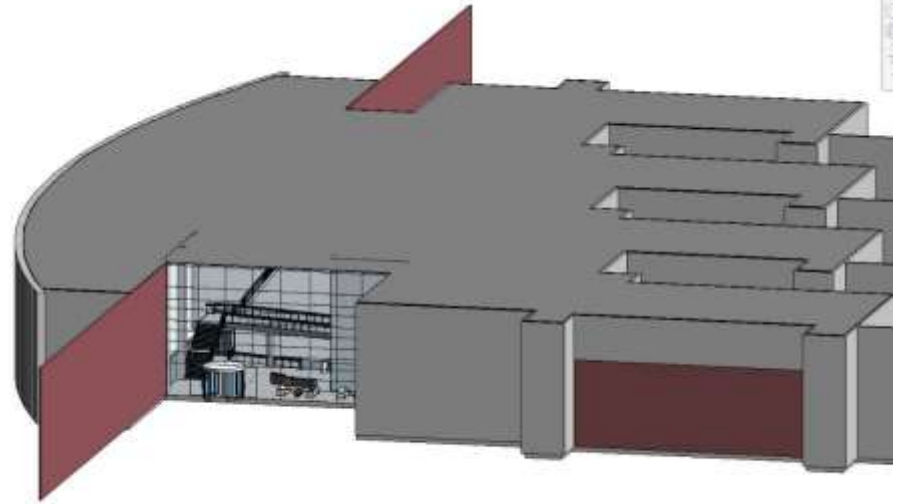
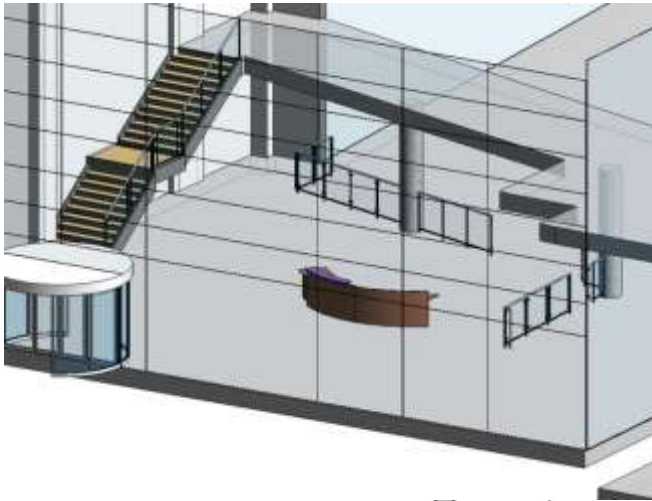
- Classification
- Automatic extraction of Features
 - Street furniture
 - Road markings
 - Buildings
 - Vegetation



3D DATA – ATTRIBUTED MESHES WITH GIS OVERLAY



3D MODELS - BIM



SUMMARY

- Mobile Mapping systems greatly increase the potential data collection amount providing a new perspective.
- Terrestrial systems provide a high-resolution point cloud – fit in with field surveyor program of work
- Internal scanning provides new perspective to mapping
- UAVs are being used more often in both recreational and commercial situations. Strict controls on use, limit potential but are required for safe use
- Need to manage huge volumes of point cloud data
- Data acquisition is changing and workflows need to evolve with it
- 1 in 5 technologies we look at will be used, typically evaluate 5-10 products/technology

os.uk/international

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