Put large and under-utilized data to use with 4D real-world digital context

Lomme Devriendt

Senior Manager, Acceleration Initiatives

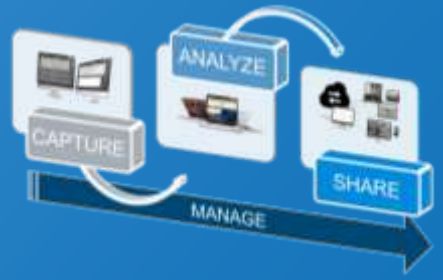
Lomme Devriendt
Senior Manager
Acceleration Initiatives

We are discussing today

Reality Modeling is going mainstream, providing at high speed 4D digital context.

How to avoid the downstream manual processes and add it easily to your existing workflow?

Make use of Bentley's brand new Reality Modeling solution: Orbit!



SCOPE

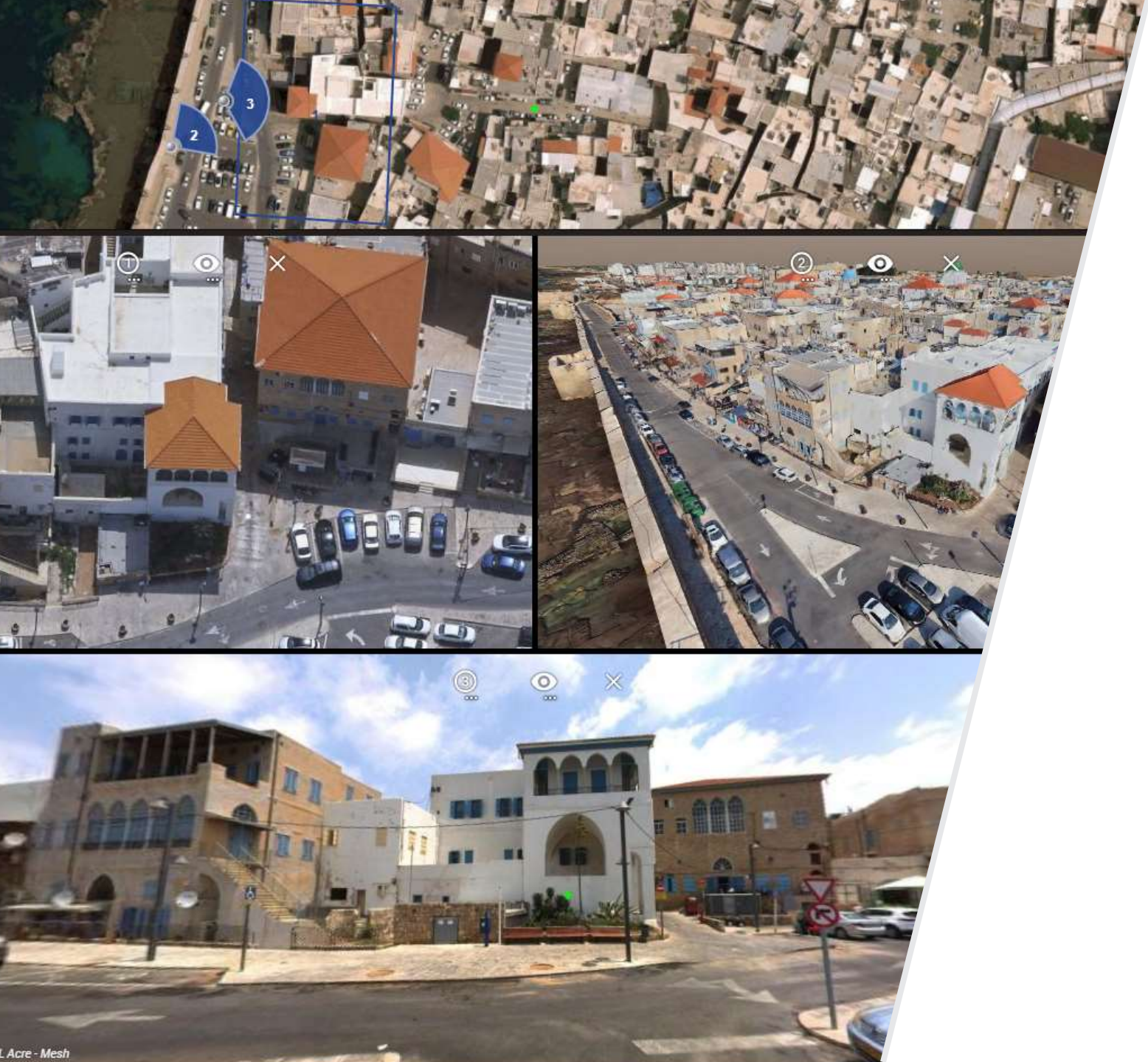
The dynamic, continuous way of capturing Reality Data.

Digital Twin

A digital twin is a digital representation of a physical asset, process or system, as well as the engineering information that allows to understand and model its performance.

It can be continuously updated from multiple sources.

It enables users to visualize the asset, check status, perform analysis and generate insights in order to predict and optimize asset performance.



4D Digital Context

A key component of the digital twin is the time-based Digital Context which exists of :

- reality meshes
- point clouds
- terrain models
- imagery
- etc.

Captured with different Reality Modeling techniques

Reality Modeling capturing systems

A strong focus on continuous and dynamic survey:

- walking: handheld, backpack.
- driving: car, boat, train.
- flying: drone, plane.

Indoor – outdoor – underground

- use of multiple sensors

Continuous and fast data capturing, collection of huge data sets

WORKFLOW CHALLENGES

Common challenges faced by reality data acquisition experts and people working with it.

CHALLENGES for reality modeling

1

How to MANAGE the terabytes or petabytes of reality data captured over time?

Based on the dynamic way of data capturing, enormous volumes of reality data are captured these days. How do we deal with this growing volume of reality data?

We refer to a project in Flanders, Belgium, where the user was capturing with 4 mobile mapping cars the entire **64000 kms** of public roads in LiDAR and 360 degrees imagery. This ends up in a database of **80TBs of point cloud** datasets, and **12.4 million pictures**. How do we deal with such volumes?

CHALLENGES for reality modeling

CHALLENGES for reality modeling

2

How to deal with the multiplicity of captured reality data in one single 4D Digital Context?

Combining aerial, indoor, and outdoor collections, consisting of 360 degrees streetview, oblique or nadir aerial imagery, photogrammetric and LiDAR point clouds, and so forth. How do we deal with this growing complexity of reality data?


3D Mapping Cloud
3dmapping.cloud/publication/
1
Viewing northeast
2
Viewing northeast
3
Viewing north
4
Viewing north
3

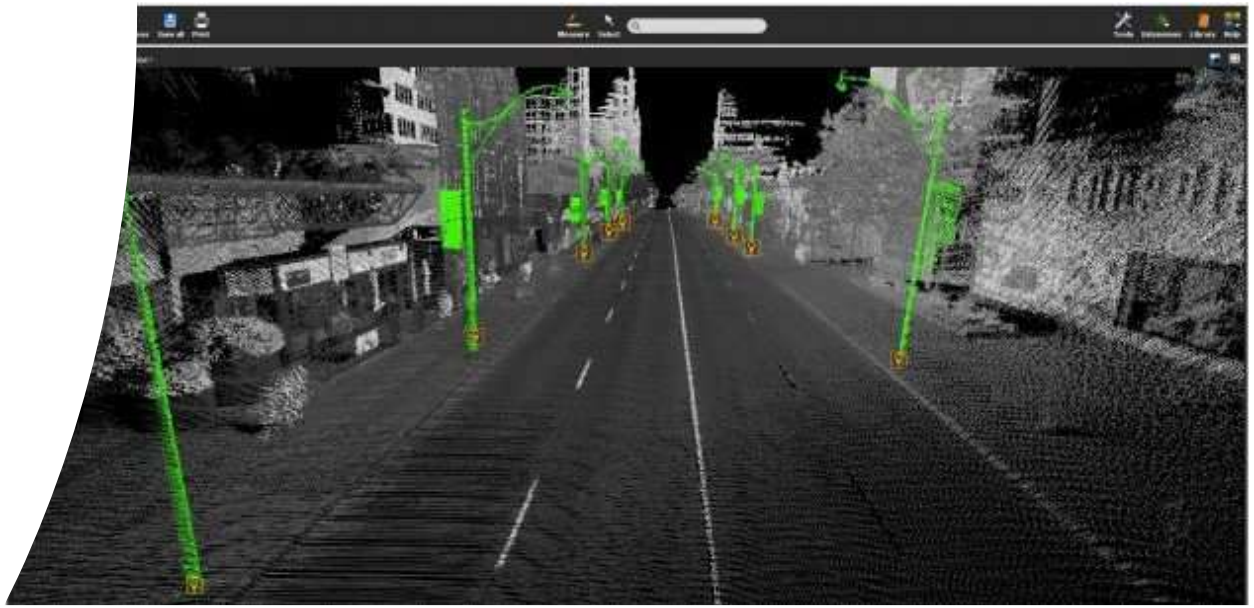
CHALLENGES for reality modeling

3

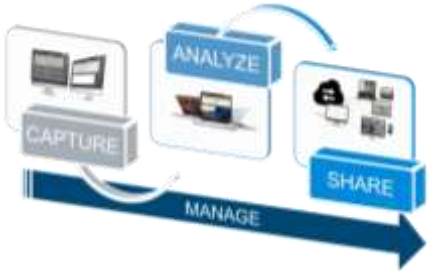
How to avoid manual work processes & being able to update assets at the speed of data collection?

Users are updating their reality data at enormous speed and volumes. How do we make sure that the map and features are updated at the same speed?

More semi and fully automated workflows to update assets and performing analyses are required these days.



Analyze with cohesive AI/LiDAR detection



ANNOTATION → AI DETECTION → QA/QC → ENRICHMENT

CHALLENGES for reality modeling

4

How to share and bring this reality data to all users?

Enormous volumes of reality data need to be shipped to all kind of domains and expertise. We need to make sure that data is getting further then the expert and is used company/organization wide, and even abroad. How can we easily share, and use captured reality data on the field, in the office and in the cloud?

SOLUTION

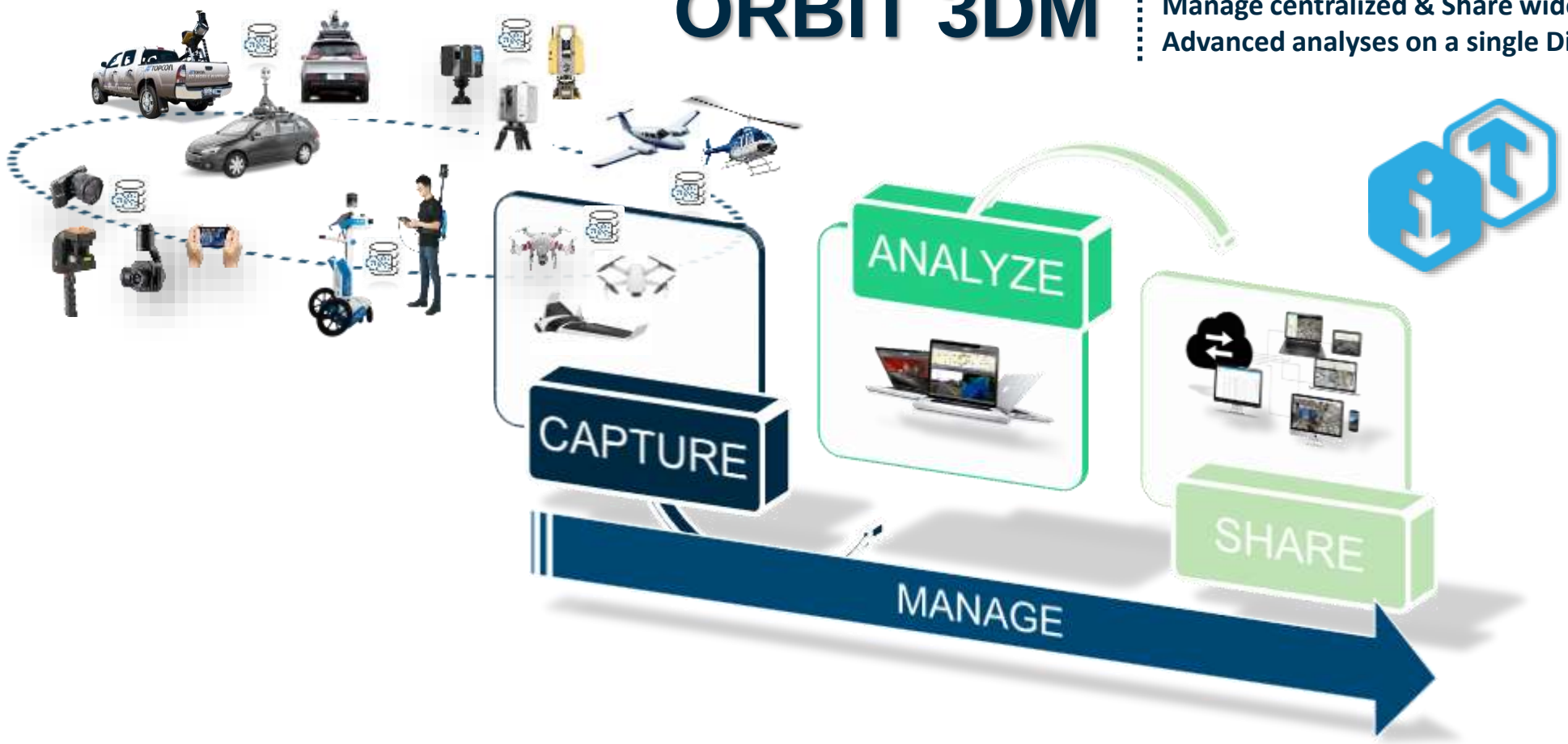
Save money, reduce time and effort to extract, update and share your digital twin assets with Bentley’s reality modeling solution

ORBIT 3DM Bentley

PART OF the Reality Modeling portfolio

ORBIT 3DM

- No data, type, or size limits
- Manage centralized & Share widely
- Advanced analyses on a single Digital Context



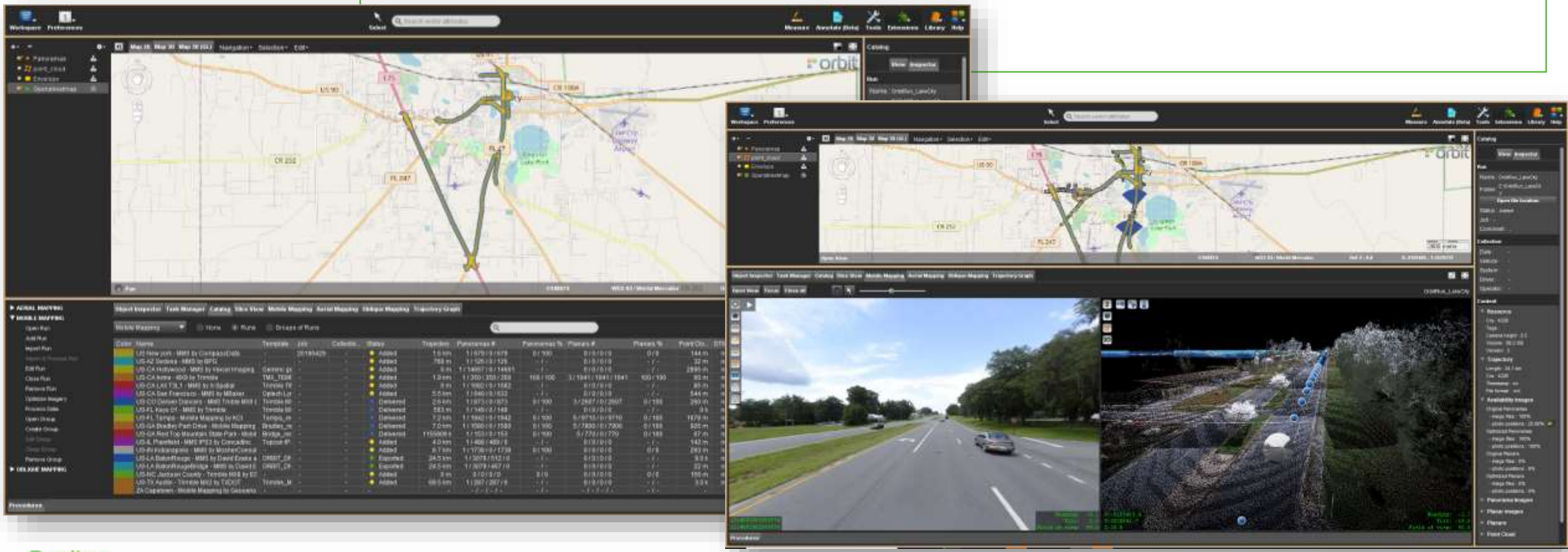
ORBIT 3DM Bentley

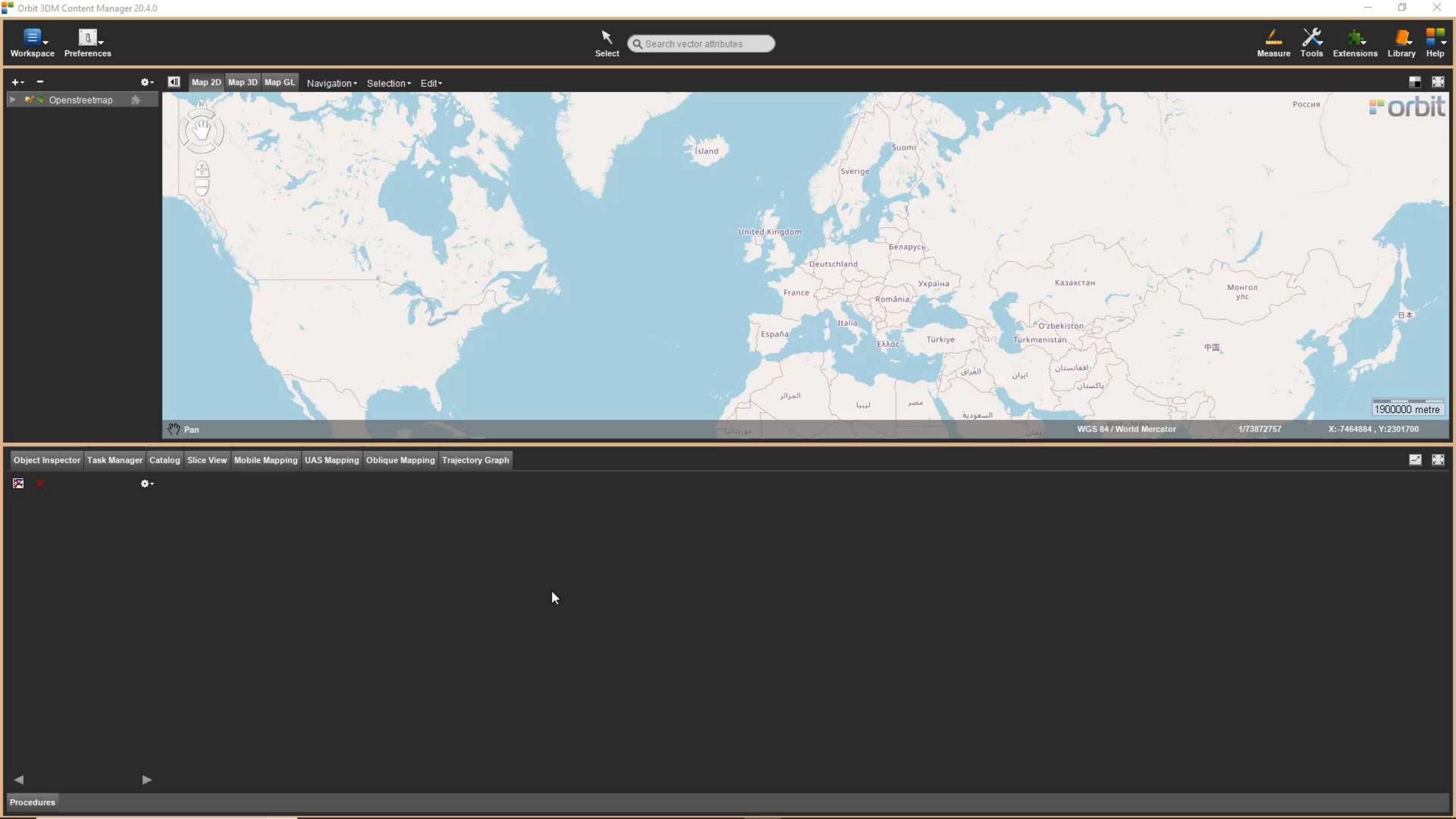
CAPTURE with drones, cars, boats, … & process

ORBIT 3DM Bentley

MANAGE all Reality Data centralized

- No limits on data size/project (GBs, TBs, PBs, ...)
- No limits on type or brand of capturing system (drone, backpack, plane, car, …)
- No limits on type of data (LiDAR, Mesh, 360 Imagery, Oblique/Nadir Imagery, …)
- Unique repository to handle, clean, catalog, optimize, QA/QC all captured reality data

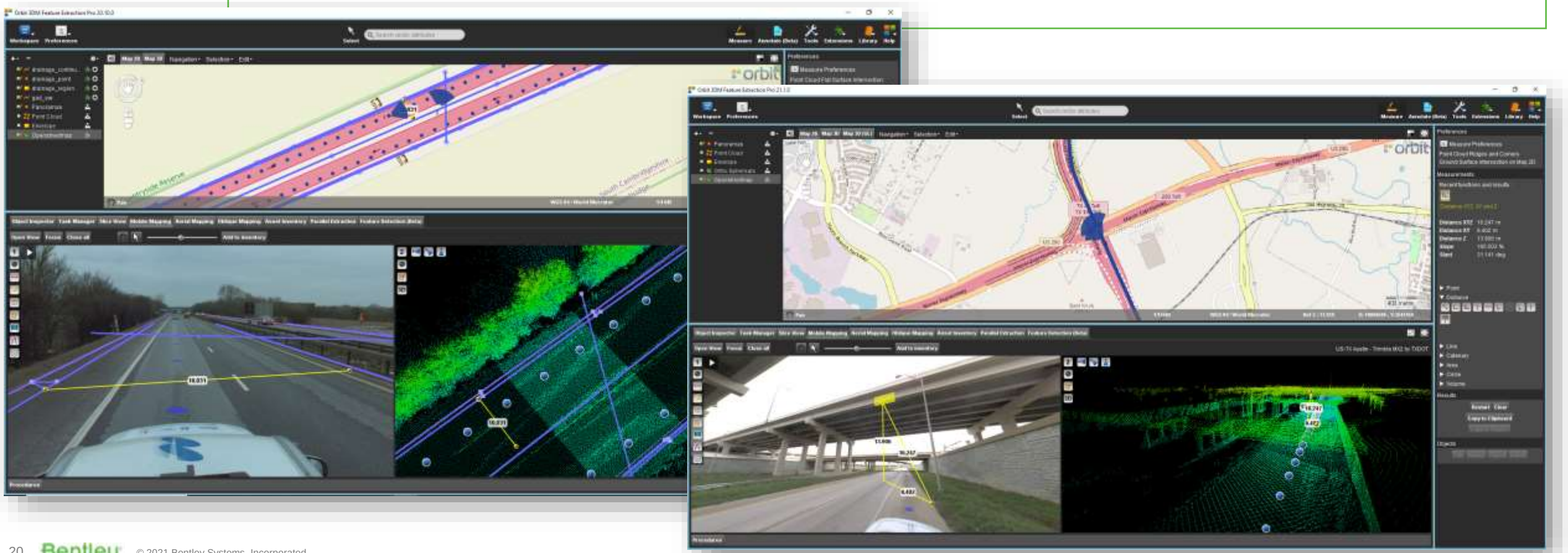



Orbit 3DM Content Manager 20.4.0
Workspace
Preferences
Select
Search vector attributes
Measure
Tools
Extensions
Library
Help
Openstreetmap
Map 2D
Map 3D
Map GL
Navigation
Selection
Edit
Island
Suomi
Sverige
United Kingdom
Беларусь
Deutschland
France
Україна
România
Казахстан
Монгол улс
Italia
España
Ελλάς
Türkiye
O'zbekiston
Türkmenistan
日本
中国
العراق
ایران
افغانستان
پاکستان
الجزائر
ليبيا
مصر
السعودية
Россия
orbit
1900000 metre
Pan
WGS 84 / World Mercator
1/73872757
X:-7464884 , Y:2301700
Object Inspector
Task Manager
Catalog
Slice View
Mobile Mapping
UAS Mapping
Oblique Mapping
Trajectory Graph
Procedures

ORBIT 3DM Bentley

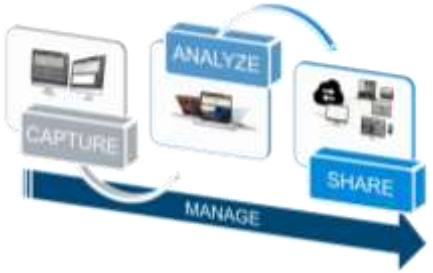
ADVANCED ANALYSIS, semi & full automated

- Fusing LiDAR, Imagery, Mesh, CAD/GIS into a single context for mapping
- Advanced semi and fully automated measurements for points, lines, areas, volumes, …
- Embedded in GIS/CAD workflow with standard 3rd party exports
- Dedicated workflows for automated clash detection, clearance analyses, cable network detection, auto-rail
- measurements, pole/tree analyzers, slicing/profiling, ….

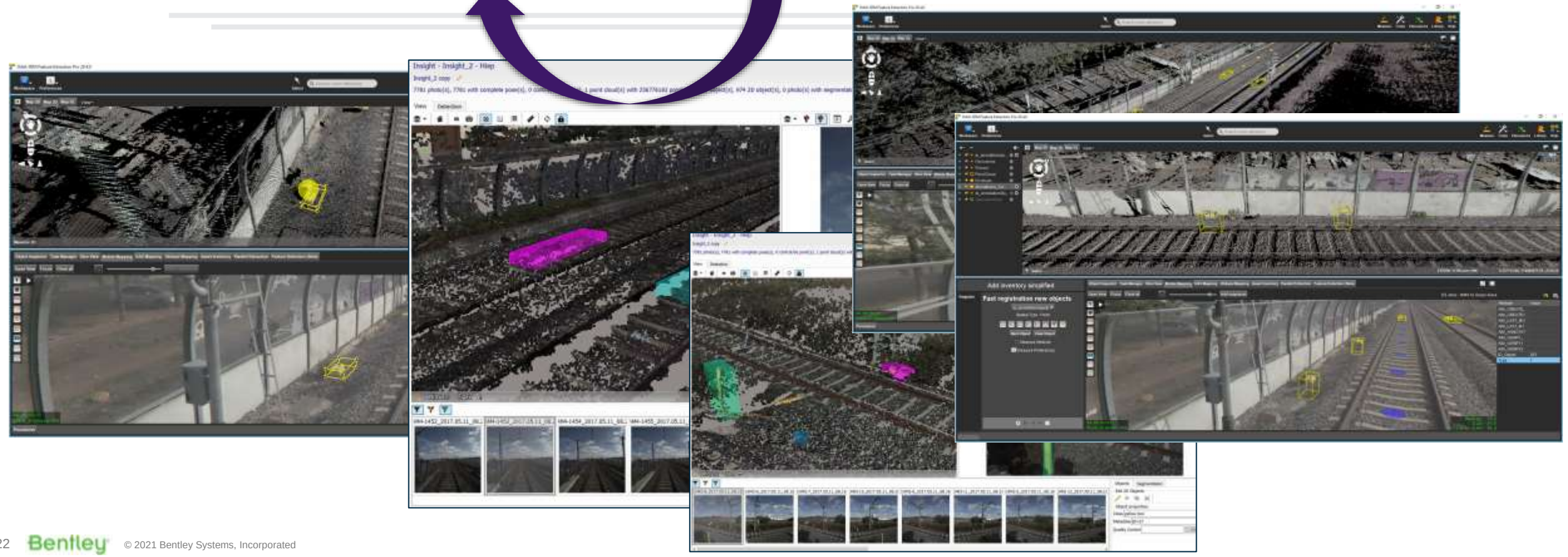



Orbit 3DM Feature Extraction Pro 20.4.0 F:\Data.Demo\US-CO Denver\US-CO Denver.ogw
Workspace
Preferences
Select
Search vector attributes
Measure
Tools
Extensions
Library
Help
Map 2D
Map 3D
Navigation
Selection
Edit
Planars
Point Cloud UAS
Envelope
Obliques
Envelope
Panoramas
Planars
Point Cloud MMS
Envelope
railways
roads
buildings
landuse
water
Point Cloud ALS
Ortho UAS
Ortho 1m
Openstreetmap
400 metre
Pan
NAD83(2011) / Colorado Central
1/18610
X:959617 , Y:517068
Oblique Mapping
Project
ancers - OBL by Geomni
original images : 0
processed images : 42
positions : 42
footprints : 42
DTM : Not available
Viewing Type
By image direction
NESW
N-S
W-E
N
By camera
Footprints
No footprints
Color :
Transparency :
Navigate
Follow Focus
Follow Zoom
Force equal zoom
Object Inspector
Task Manager
Slice View
Mobile Mapping
UAS Mapping
Oblique Mapping
Asset Inventory
Parallel Extraction
Open View
Focus
Close all
Add to inventory
US-CO Denver Dancers - MMS Trnble MX9 by ConpassData
2019-01-21 18:00:51
pano_000003_000235
Heading: 66.6
Tilt: 12.4
Field of view: 130.0
Procedures

Analyze, measure, and report at every update



ANNOTATION → AI DETECTION → QA/QC → ENRICHMENT

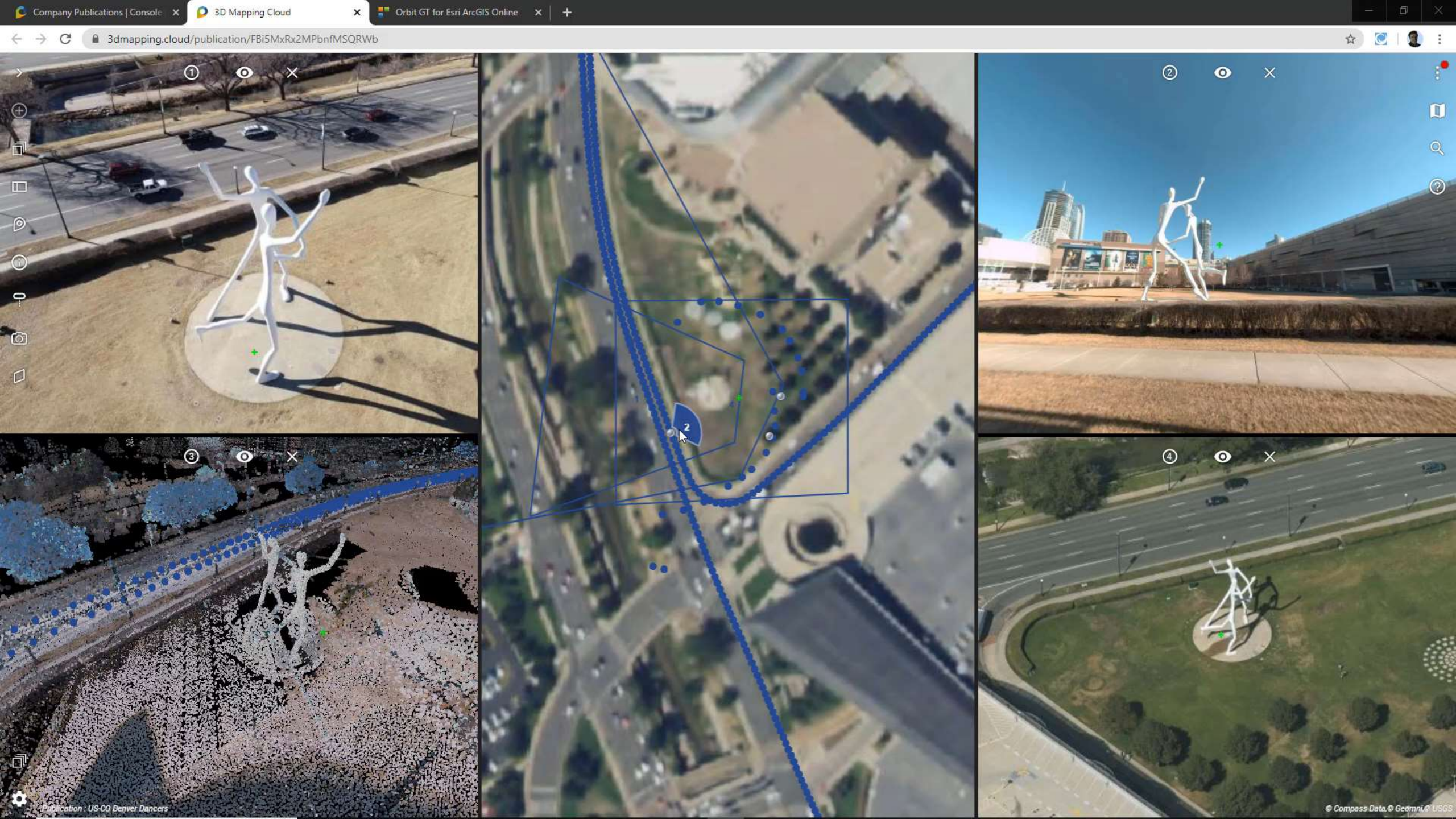


SHARE internally and externally, re-use Reality Data

- Easily host a combined set of reality data online: imagery, LiDAR, Reality Meshes, … in a single web viewer. Every colleague can access the Reality Data for his job!
- Share at the same time to 3rd party software applications (Esri, QGIS, Bentley Systems, …)
- No limits on the volume of data sharing (huge LiDAR/Imagery sets can be viewed online)
- IT neutral: on-premise or cloud-based license available

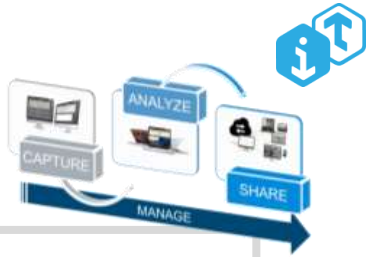
SHARE internally and externally, re-use Reality Data

Bentley
Advancing Infrastructure


Company Publications | Console
3D Mapping Cloud
Orbit GT for Esri ArcGIS Online
3dmapping.cloud/publication/FBi5MxRx2MPbnfMSQRWb
Publication : US-CO Denver Dancers
© Compass Data,© Geomni,© USGS

CONCLUSION

Bentley's Reality Modeling portfolio, the 4D Digital Context solution for your Digital Twin



Reduce time and effort to manage, extract, update and share your Digital Twin assets.

- Don't struggle with system or volume of data
- Avoid the use of manual work processes
- Reduce repetitive tasks
- Save the time of your experts

Get your 4D Digital Context workflow today!