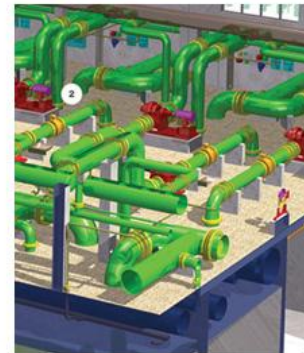




Information mobility – virtual and physical environments

John Taylor
Industry Solutions Director



MINING

- Ivara
- STAAD
- OpenPlant
- Raceway and Cable Management
- promis.e
- Bentley Map
- Descartes
- InRoads
- GEOPAK
- gINT
- topoGRAPH

WATER & WASTEWATER

- WaterGEMS
- SewerGEMS
- OpenPlant
- AutoPLANT
- STAAD
- RAM
- gINT

CONSTRUCTION

- ProjectWise Navigator
- ConstructSim
- ProStructures
- AECdsim
- MicroStation
- Descartes
- InRoads
- Geospatial Server

BUILDINGS

- AECdsim
- Generative Components
- RAM
- STAAD
- ProStructures
- Hvaccomp
- speedikon
- gINT
- InRoads
- GEOPAK

3D CITIES

- Bentley Map
- Geo Web Publisher
- Descartes
- InRoads
- AECdsim
- Geospatial Server

COMMUNICATIONS NETWORKS

- Bentley Fiber
- Bentley Coax
- Bentley Plant
- Bentley Inside Plant

NUCLEAR

- AssetWise for Nuclear
- OpenPlant
- AutoPIPE
- STAAD
- Raceway and Cable Management
- Ivara
- Data Quality Manager

BRIDGES

- InspectTech
- RM Bridge
- LEAP Bridge
- SUPERLOAD
- GEOPAK
- InRoads
- MXROAD
- gINT
- ProStructures

ROADS

- InRoads
- GEOPAK
- MXROAD
- SUPERLOAD
- LEAP Bridge
- RM Bridge
- Exor
- gINT
- InspectTech
- topoGRAPH

CAMPUSES

- Bentley Map
- AECdsim
- Descartes
- Geospatial Server
- RAM
- STAAD
- Raceway and Cable Management
- GEOPAK
- InRoads
- MXROAD
- gINT

RAIL & TRANSIT

- Bentley Rail Track
- Optram
- InRoads
- MXROAD
- GEOPAK
- RM Bridge
- LEAP Bridge
- gINT
- topoGRAPH

SUBSURFACE UTILITIES

- WaterGEMS
- SewerGEMS
- sisNET
- Exor
- GEOPAK
- gINT
- Utilities
- Designer
- MXROAD

POWER PLANTS

- OpenPlant
- AutoPLANT
- AutoPIPE
- STAAD
- ProStructures
- Raceway and Cable Management
- AECdsim
- Ivara
- gINT
- Descartes
- GEOPAK
- InRoads

UTILITY NETWORKS

- Substation
- Utilities
- sisNET
- Descartes
- GEOPAK
- InRoads
- Ivara
- Raceway and Cable Management
- STAAD

PROCESS PLANTS

- OpenPlant
- AutoPLANT
- Raceway and Cable Management
- promis.e
- AutoPIPE
- ProStructures
- STAAD
- Ivara
- Data Quality Manager
- gINT

OFFSHORE

- SACS
- AutoPIPE
- ProStructures
- OpenPlant
- Data Quality Manager
- gINT

WIND FARMS

- SACS
- STAAD
- ProStructures
- Substation
- InRoads
- gINT

Bentley's Solutions

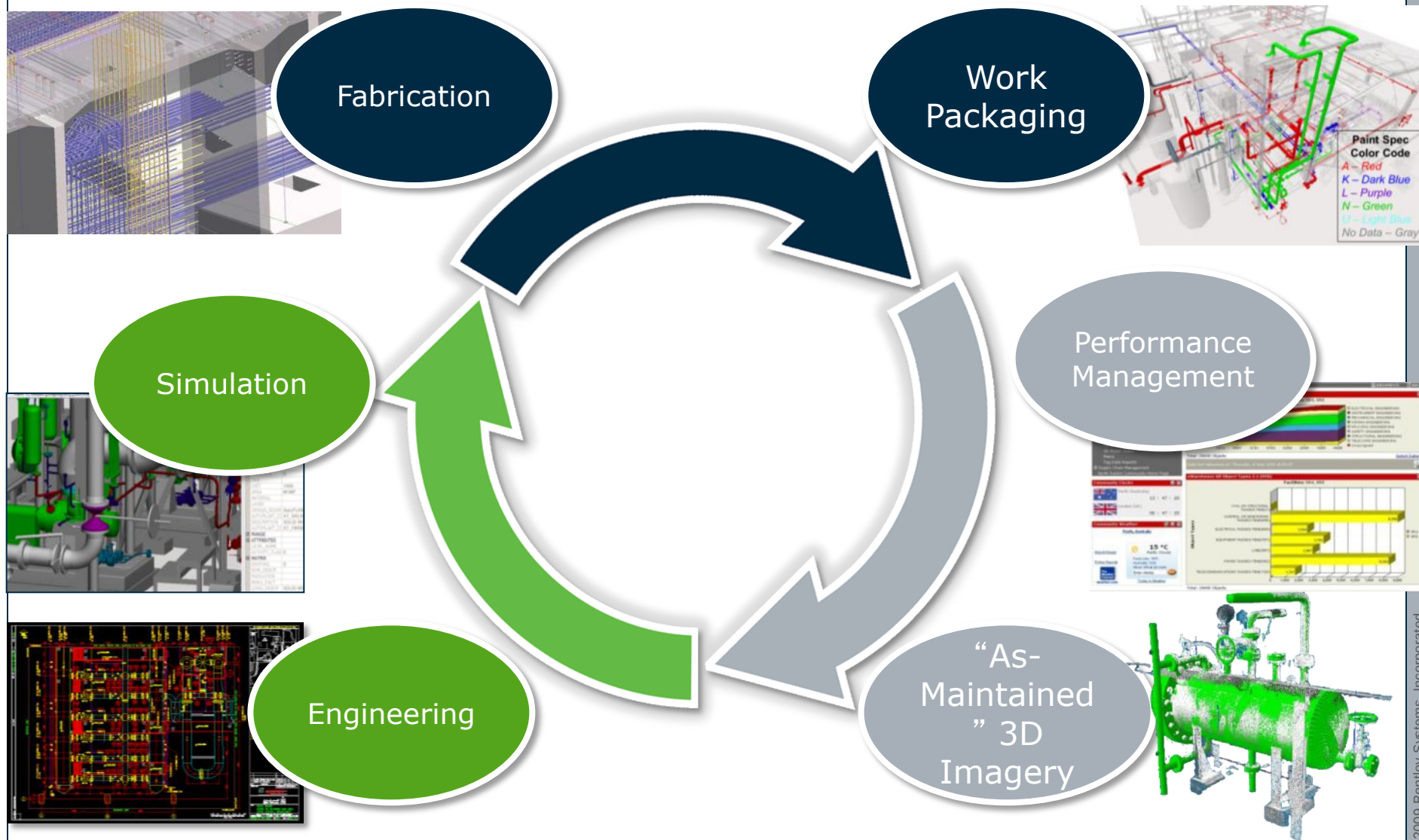
- MicroStation
- ProjectWise
- AssetWise

Bentley
Sustaining Infrastructure

Challenges

- Increases in the world population and move to urban environments
- Need for better, current and more detailed spatial information to inform decision making
- The world is 3D but many systems are 2D or 2.5D for data representation
- Much of the infrastructure we wish to know about has already been built but is poorly documented
- Information needs to be readily consumed, up to date and easily accessible
 - Virtually
 - Physically

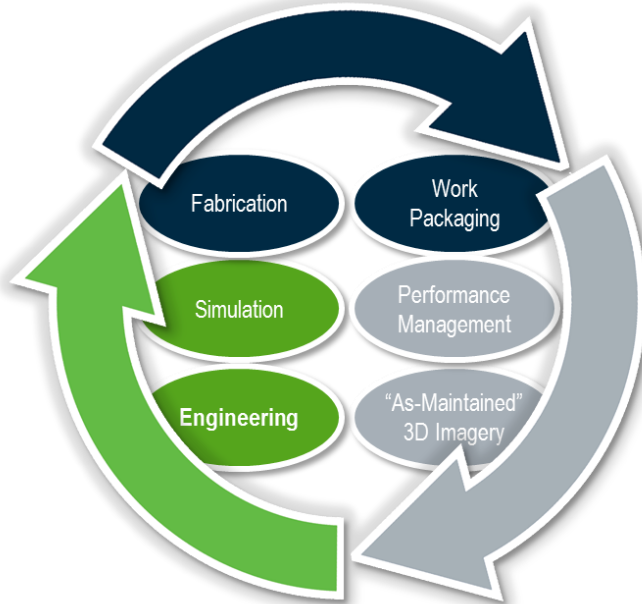
Infrastructure Information Lifecycle



Information Lifecycle

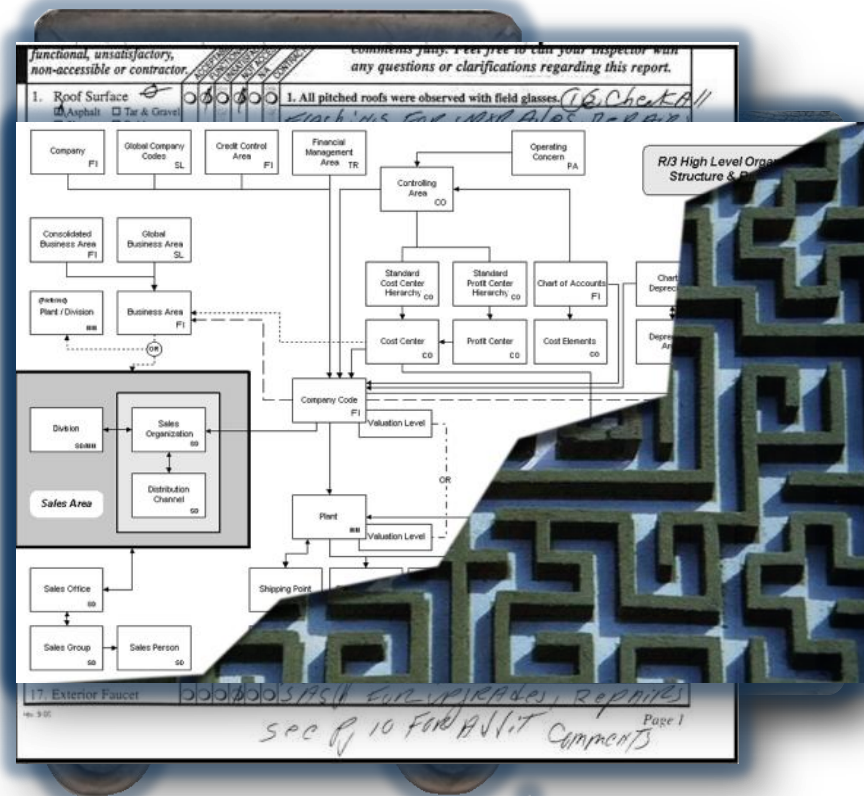
vs.

Information Mortality



Information Mortality...

"Blobs" Closed file
Monolithic data
File information
Structure
labyrinth



3 D



2 D



Plan of Egyptian House, ca.
1550 B.C.

3 D



PHYSICAL

DOCUMENTATION

VIRTUAL

3 D



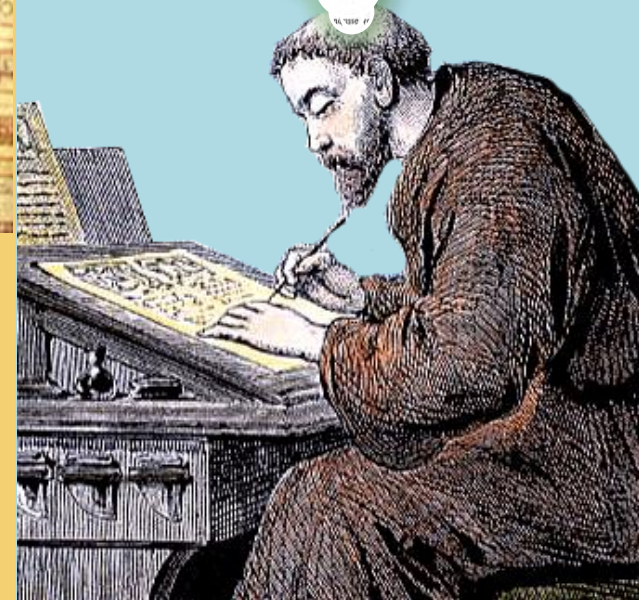
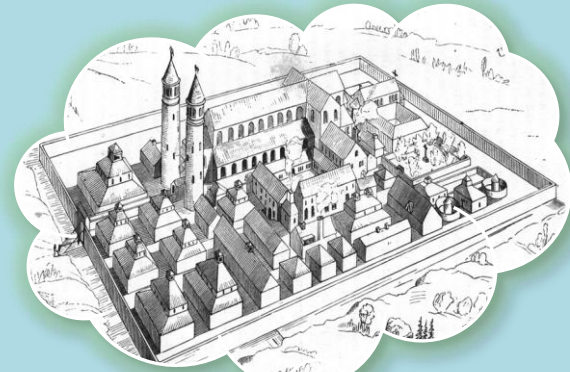
Abbey of St. Gall

2 D



Plan of St. Gall Monastery
819 A.D.

3 D



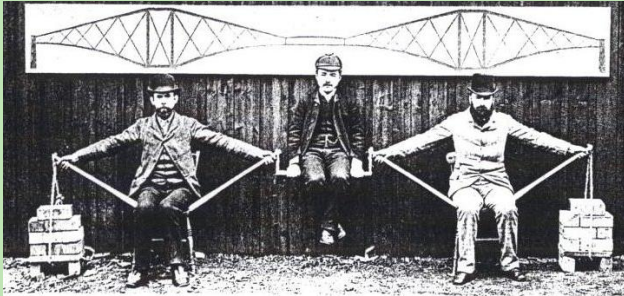
**Survey
Illustrate
Construct**

PHYSICAL

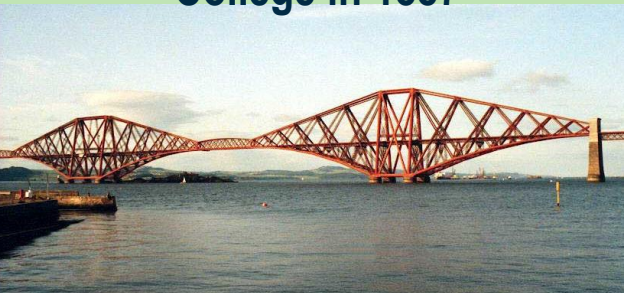
DOCUMENTATION

VIRTUAL

3 D



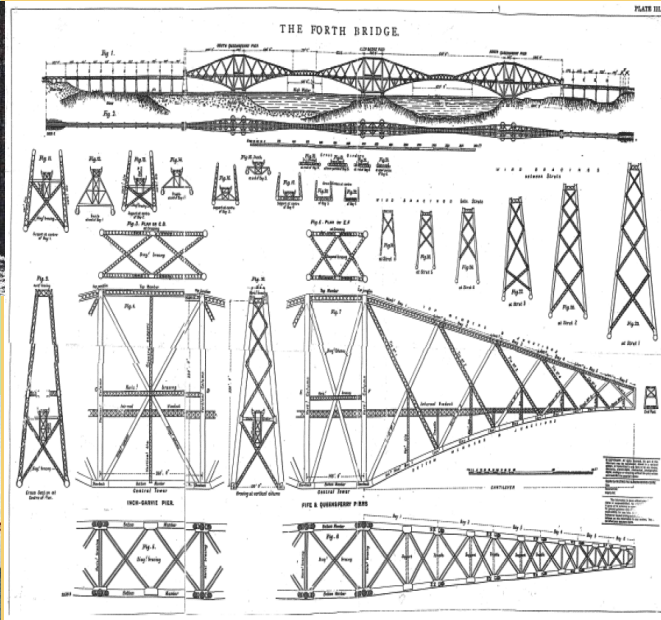
**Demonstration at Imperial
College in 1887**



Forth Rail Bridge, 1890

PHYSICAL

2 D

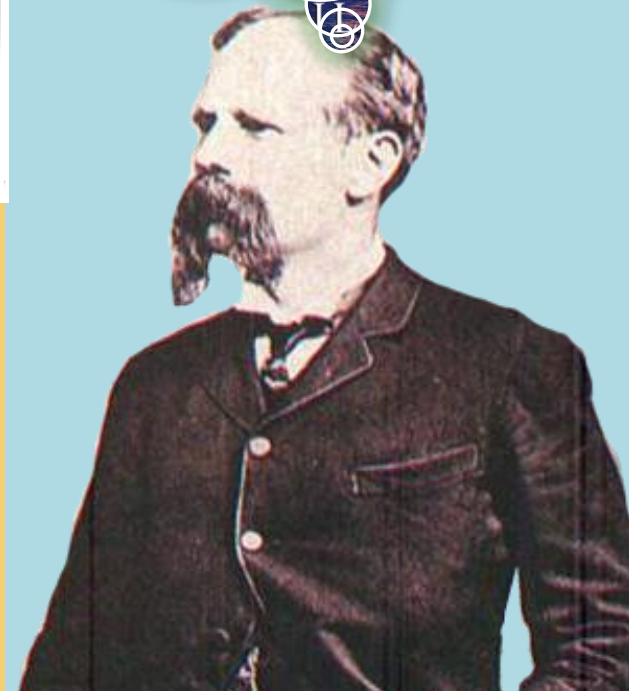


Plans of Forth Rail Bridge, 1880

**Survey
Illustrate
Construct
Inspect
Maintain**

DOCUMENTATION

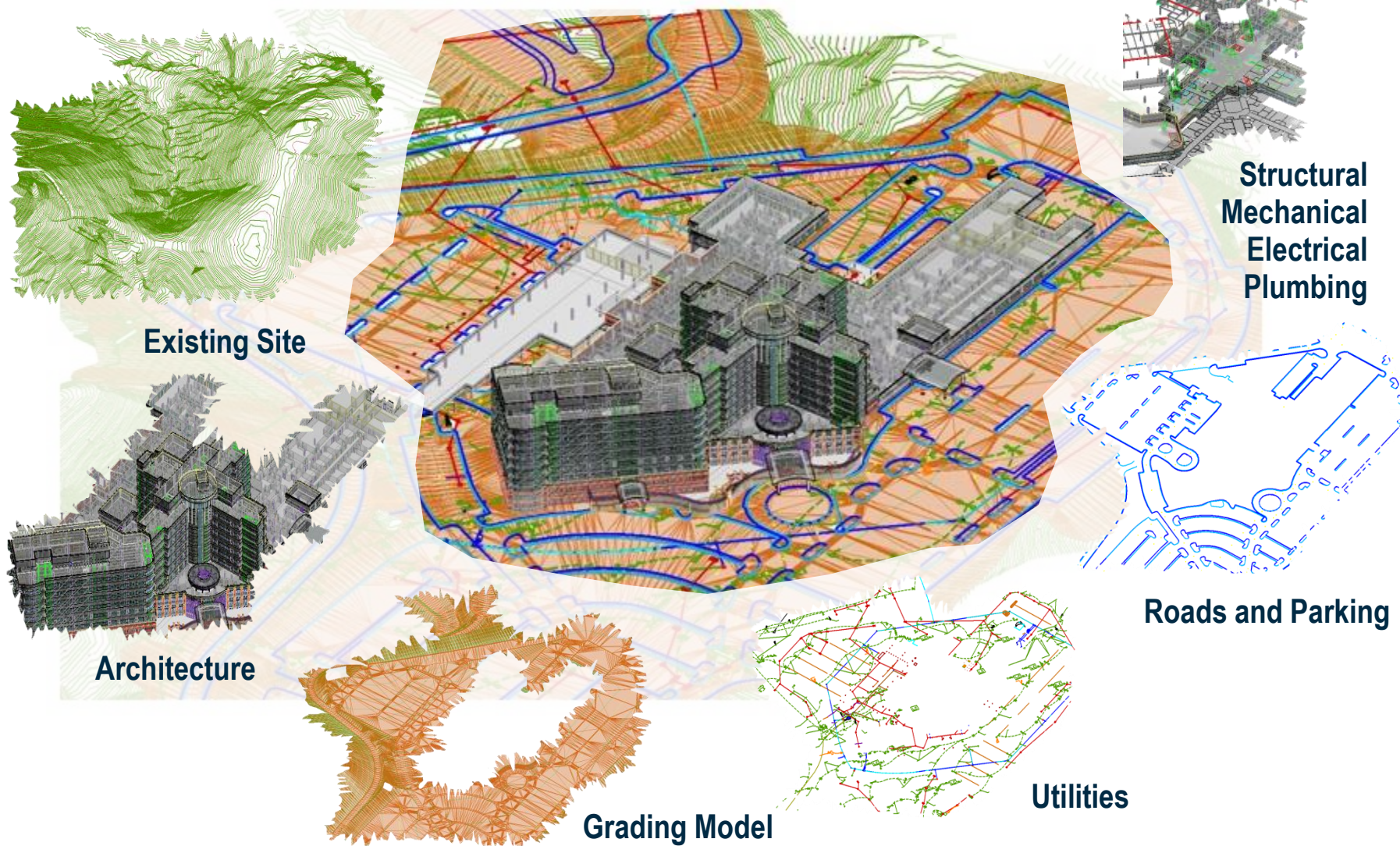
3 D

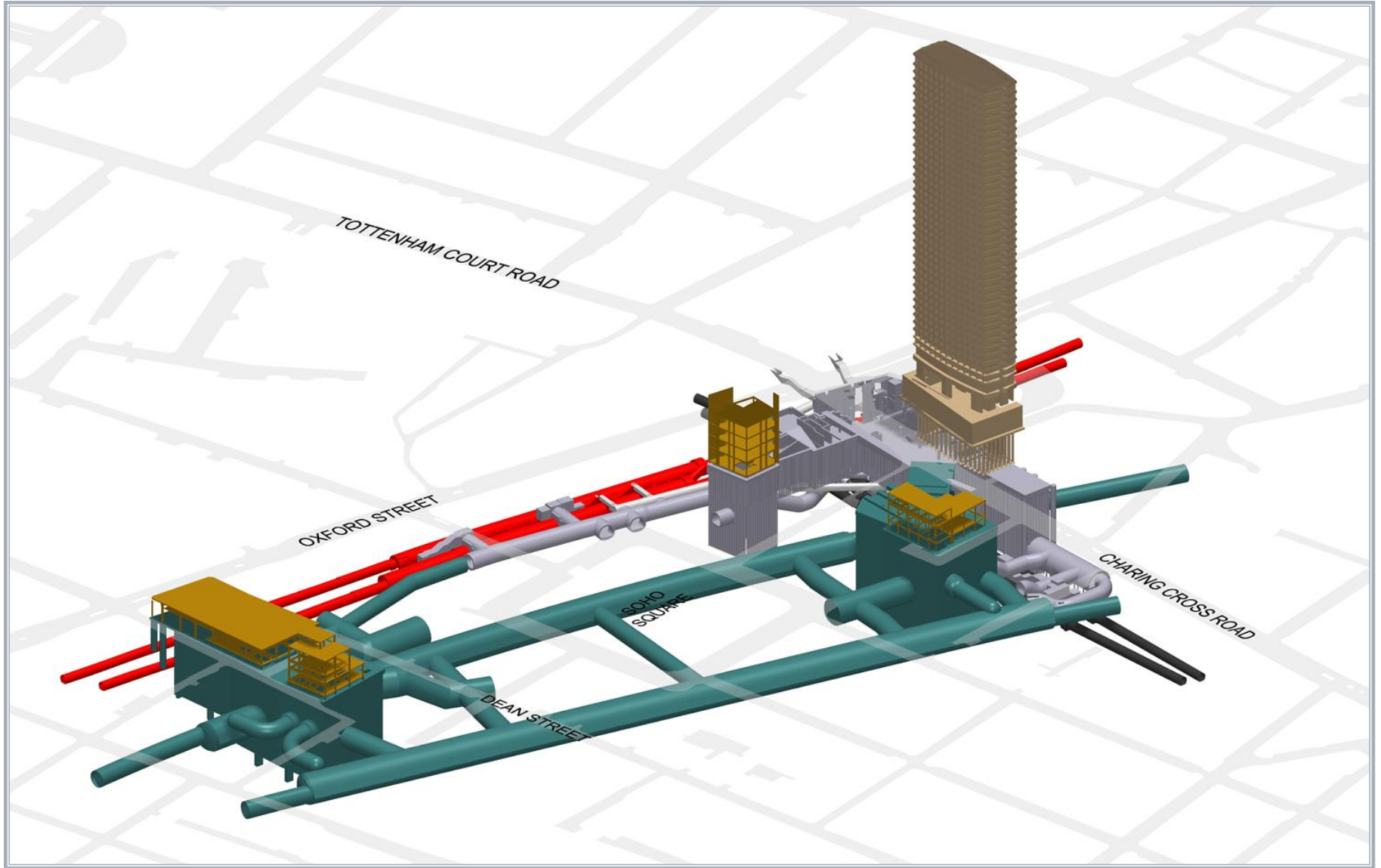


VIRTUAL



Infrastructure Information Modelling





A New way of working: 3D Imaging of Physical to Virtual



Connecting Virtual and Physical

Connected Devices



Bentley's Point Cloud Portfolio

- Addresses **point cloud information mobility** requirements in the market
- Offers **centralised point cloud data management** and **streaming of point cloud data** to multiple clients
- Superior point cloud **visualisation** and efficient **3D modelling** workflows



Download at: www.bentley.com/iWare



On-Demand 3D Measurement

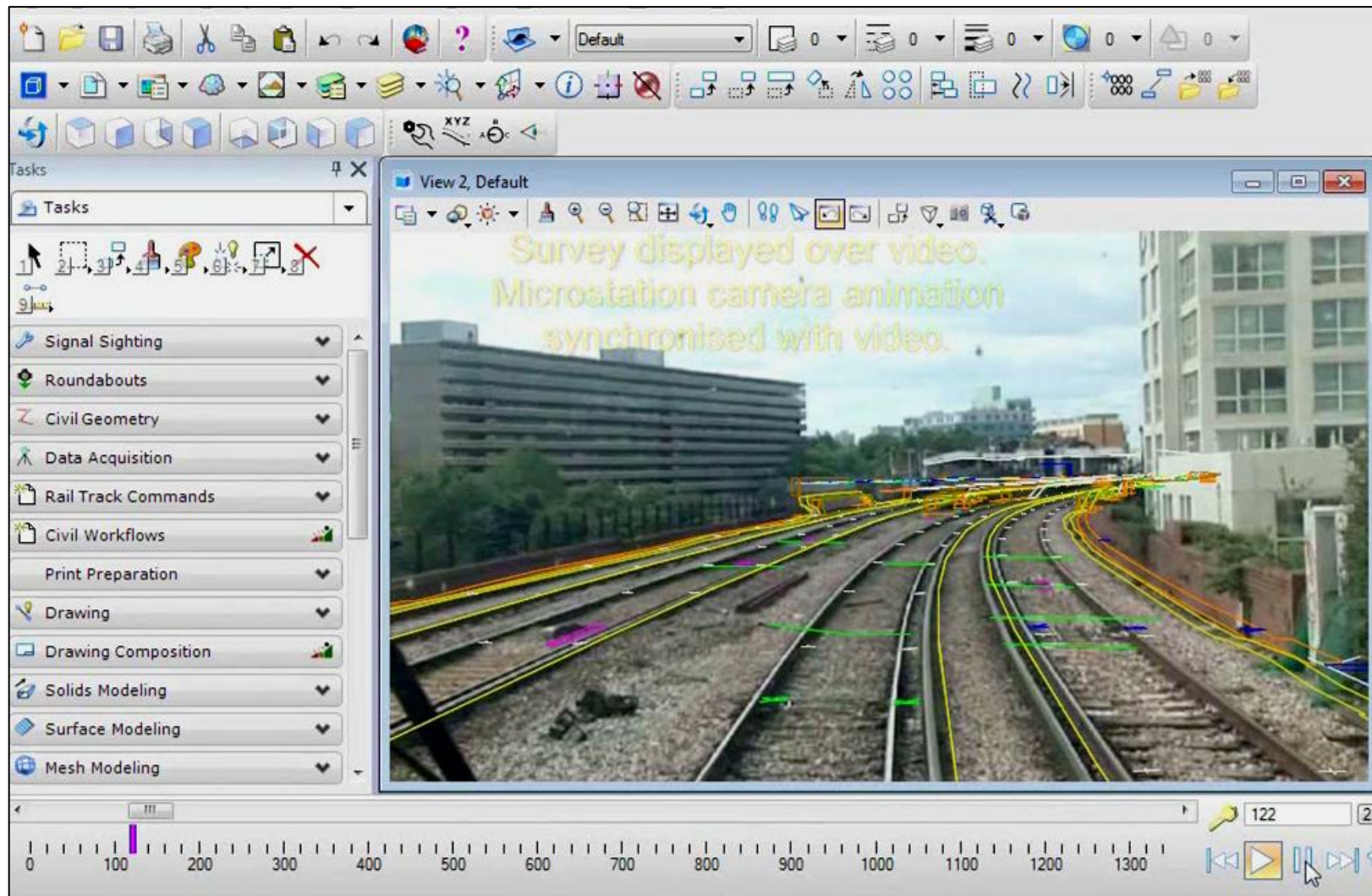


Data captured by StreetMapper

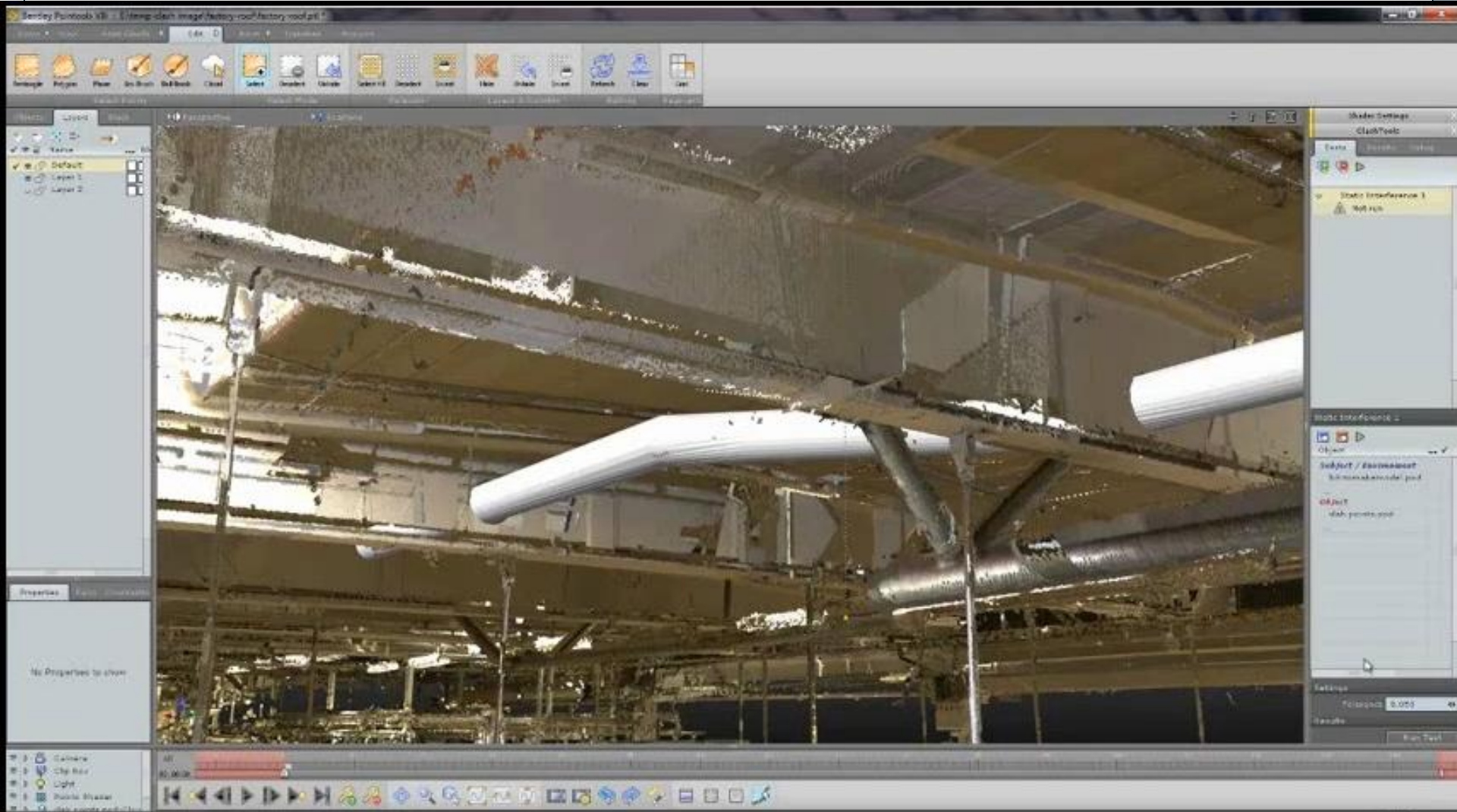
Retrofitting – Simulate equipment replacement



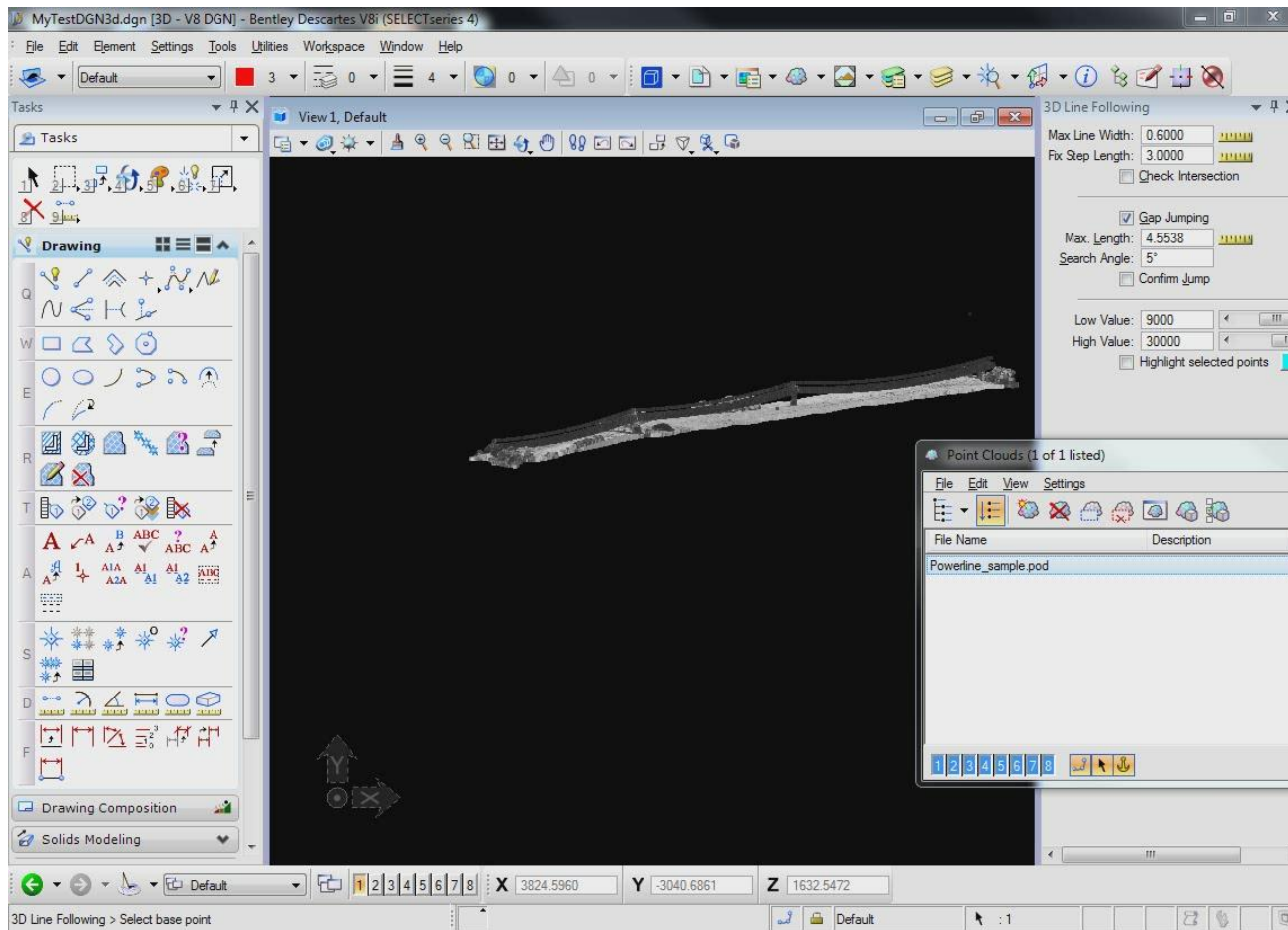
2.5D Imaging *Physical to Virtual*



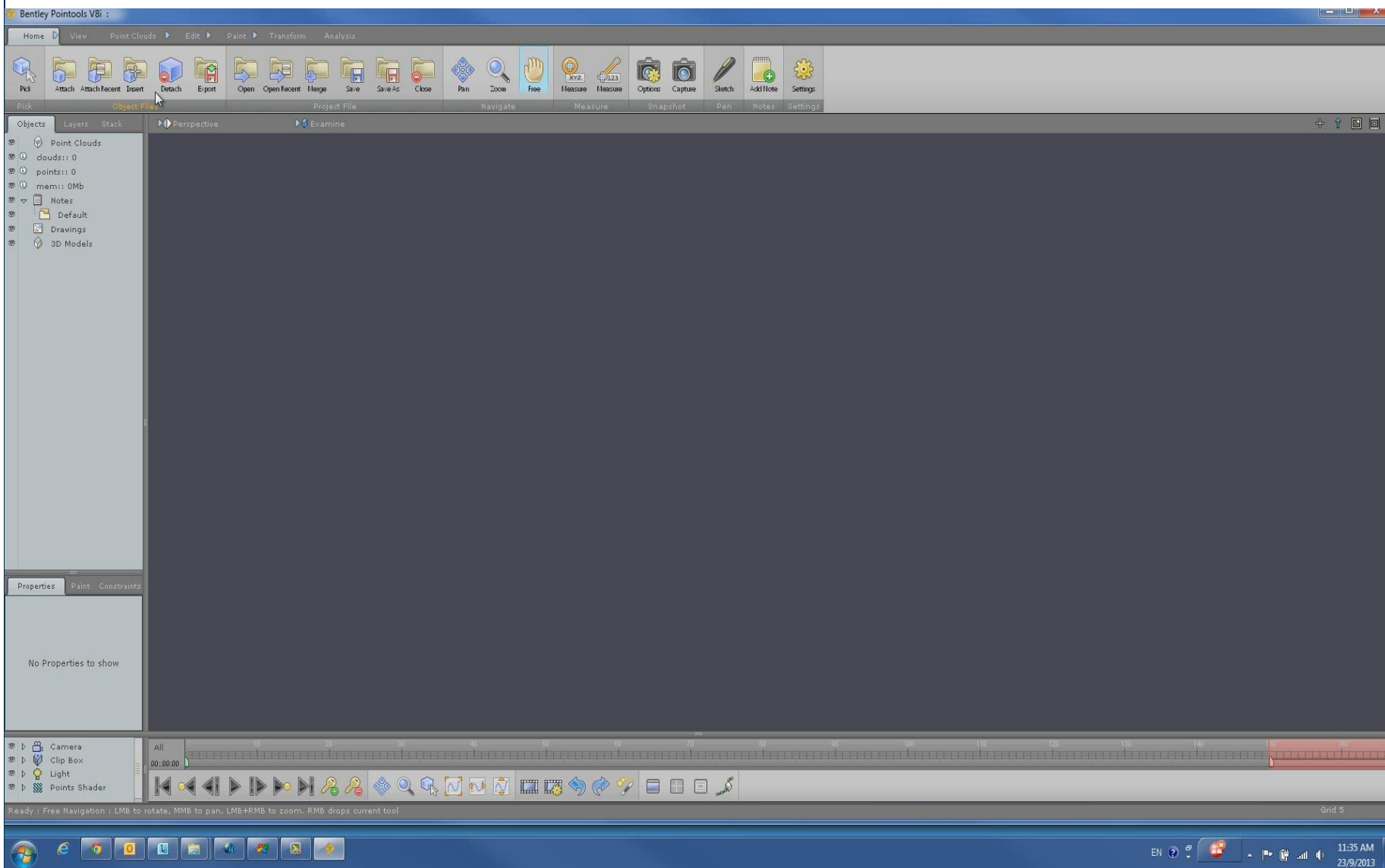
Point-cloud Clash Detection



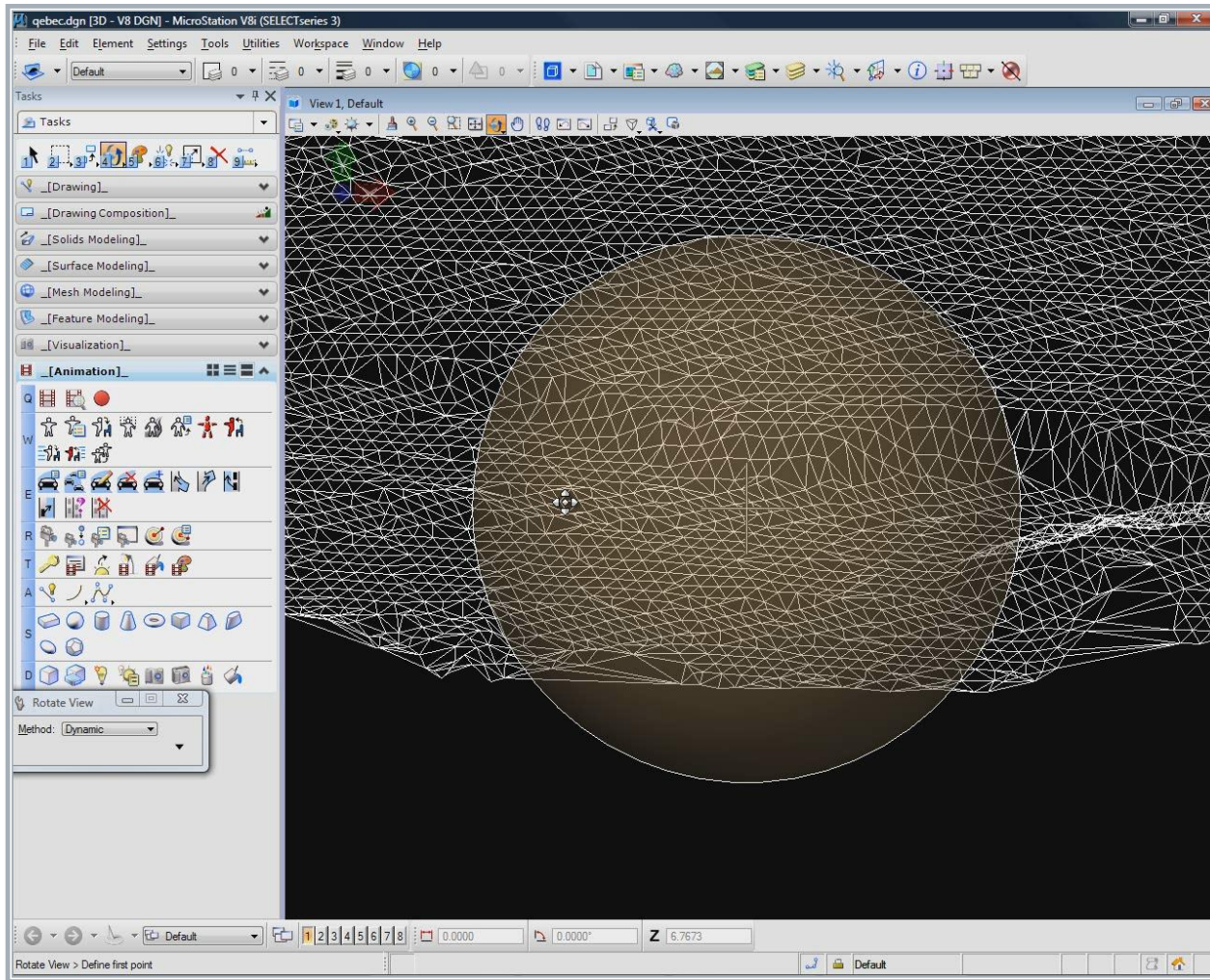
Linear feature Extraction



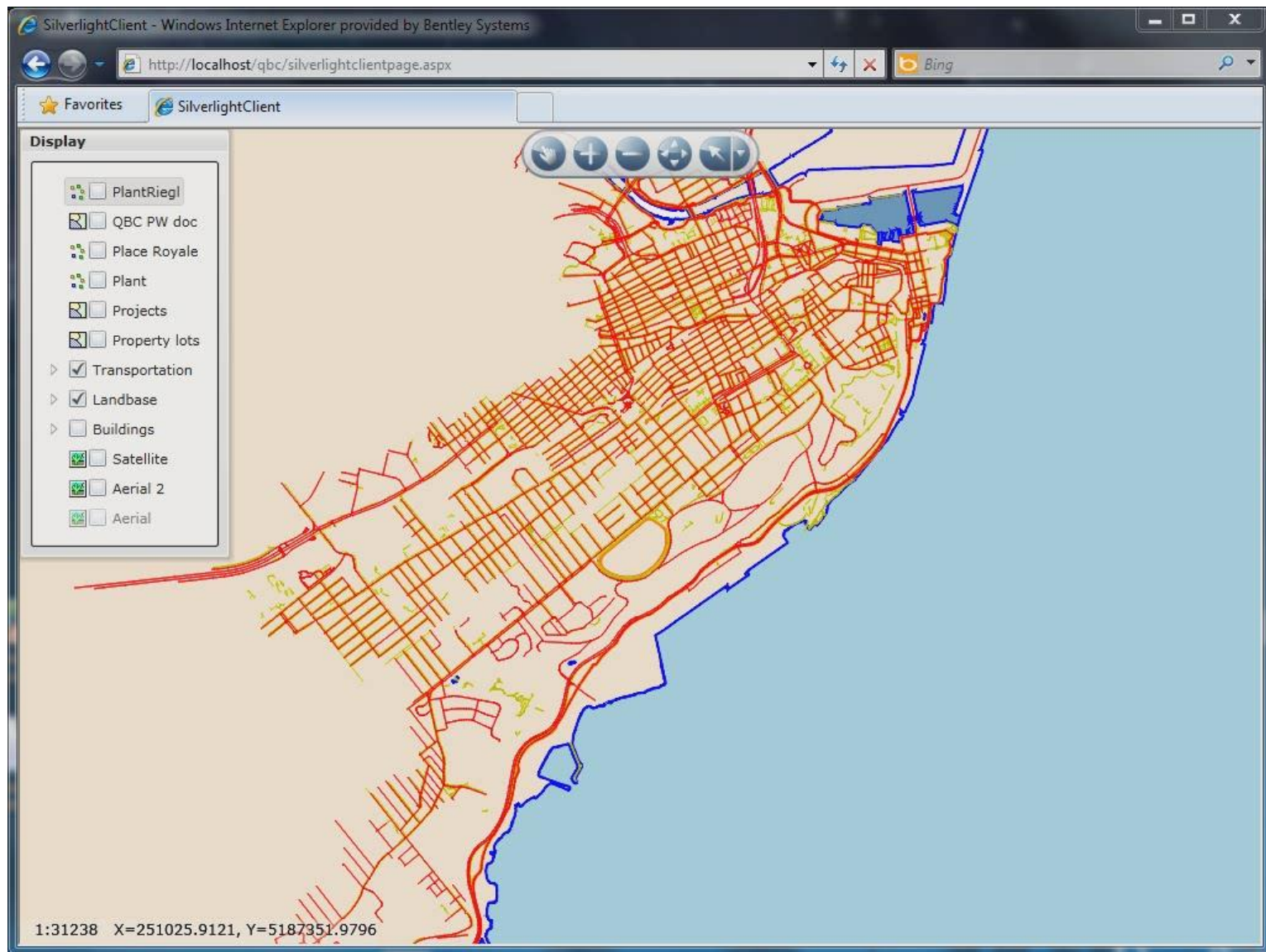
Point cloud classification layer controls



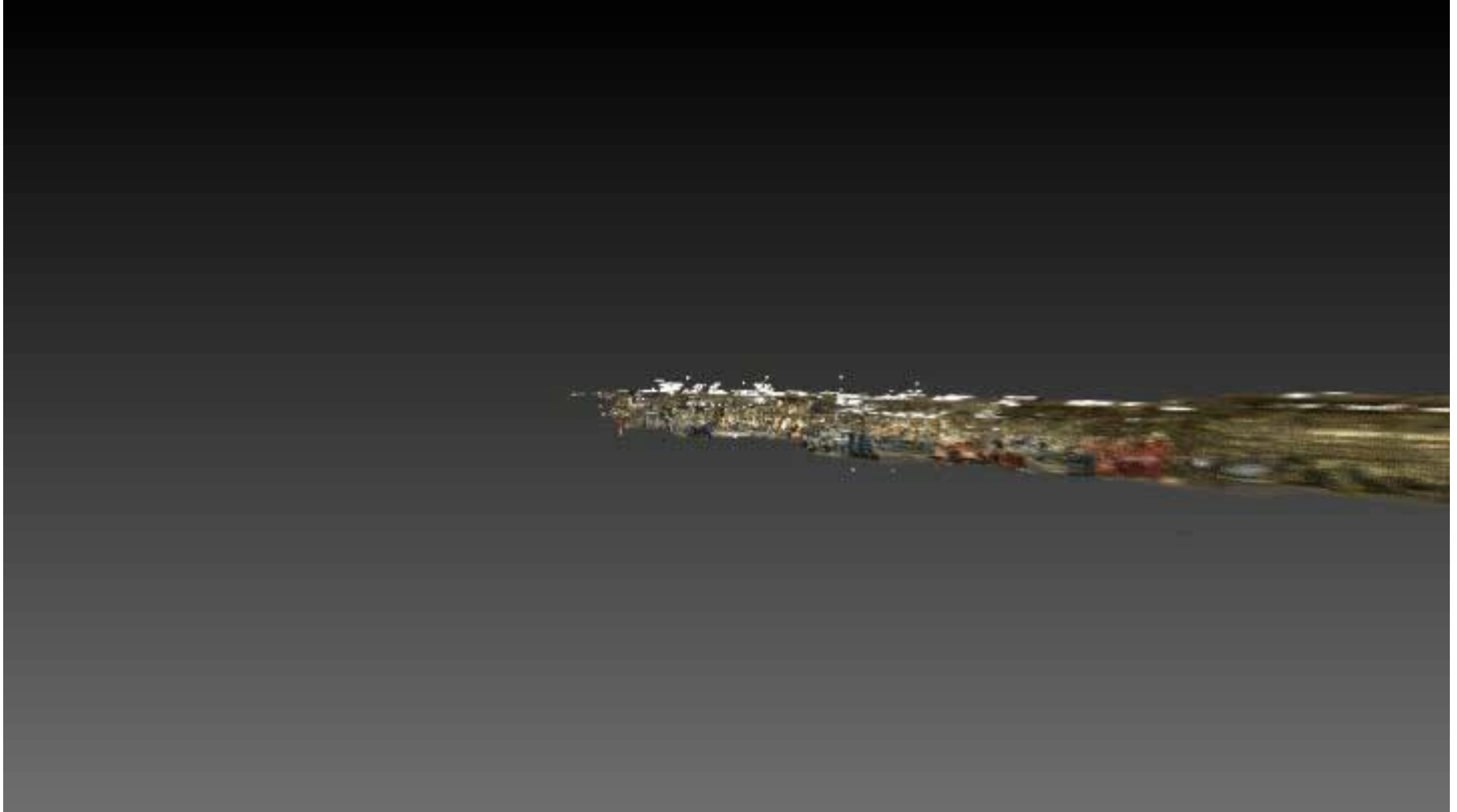
Scalable Terrain Models

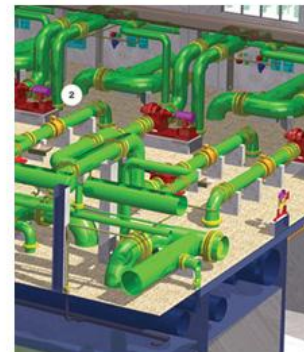


Web based 3D modelling



3D documentation and Hybrid Modelling





Thank You



Bentley
Sustaining Infrastructure