



# FIG WORKING WEEK 2023

28 May - 1 June 2023 Orlando Florida USA

Protecting  
Our World,  
Conquering  
New Frontiers

## Bentley Systems

### Reality Data for Infrastructure Digital Twins

Pascal Cloutier, Product Manager

Glen Franklin, Application Engineer

Scott Becher, Senior Solutions Specialist

Gen Taurand, Product Manager



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## What is a Digital Twin?





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## Survey for Digital Twins



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Reality Mesh



Point Clouds



Images



Ortho Images





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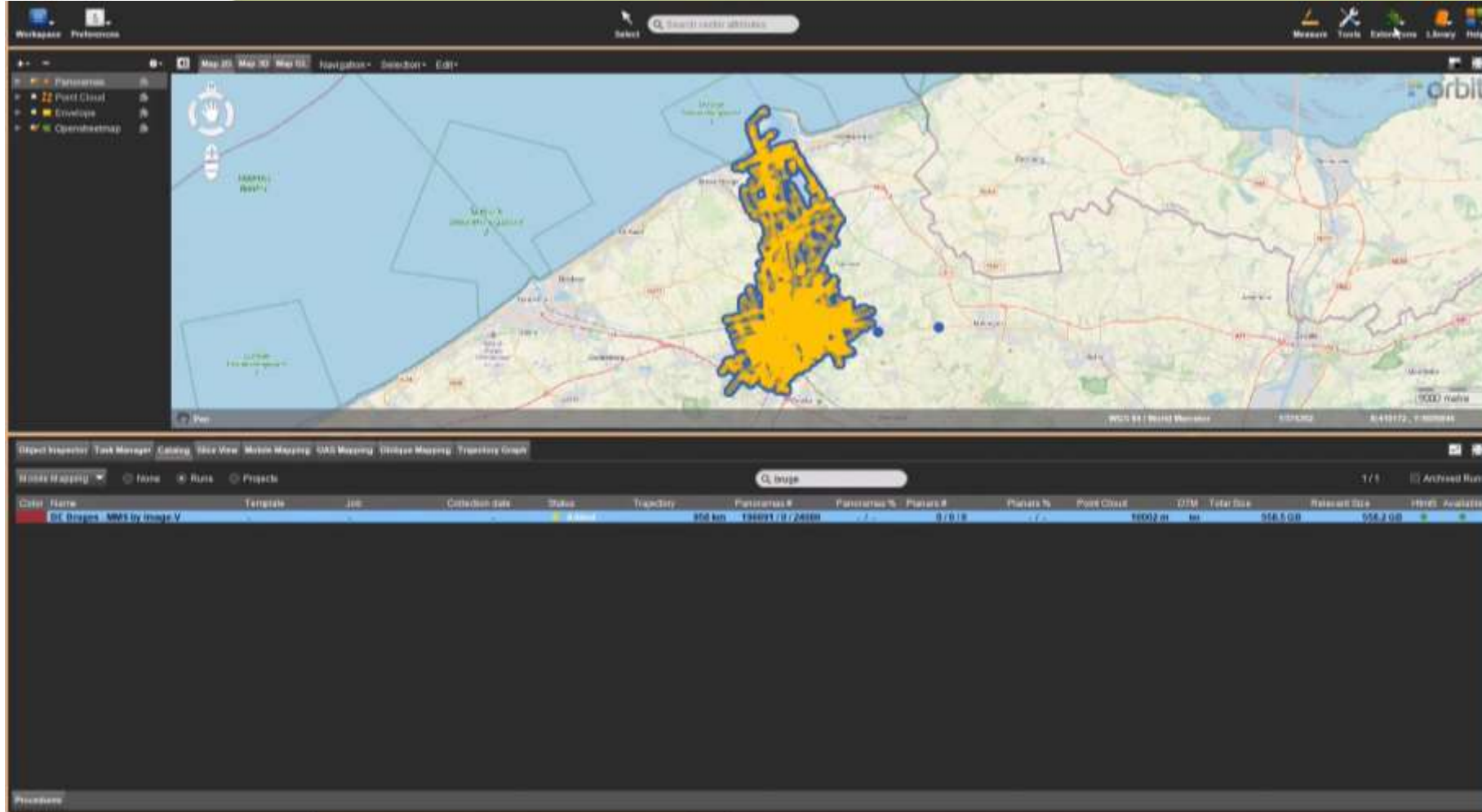




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## Digital representation

High fidelity digital representation of a physical infrastructures



## Continuously surveyed

Continuously monitor condition and performance with updated with field truth

Living digital twin



Real-world



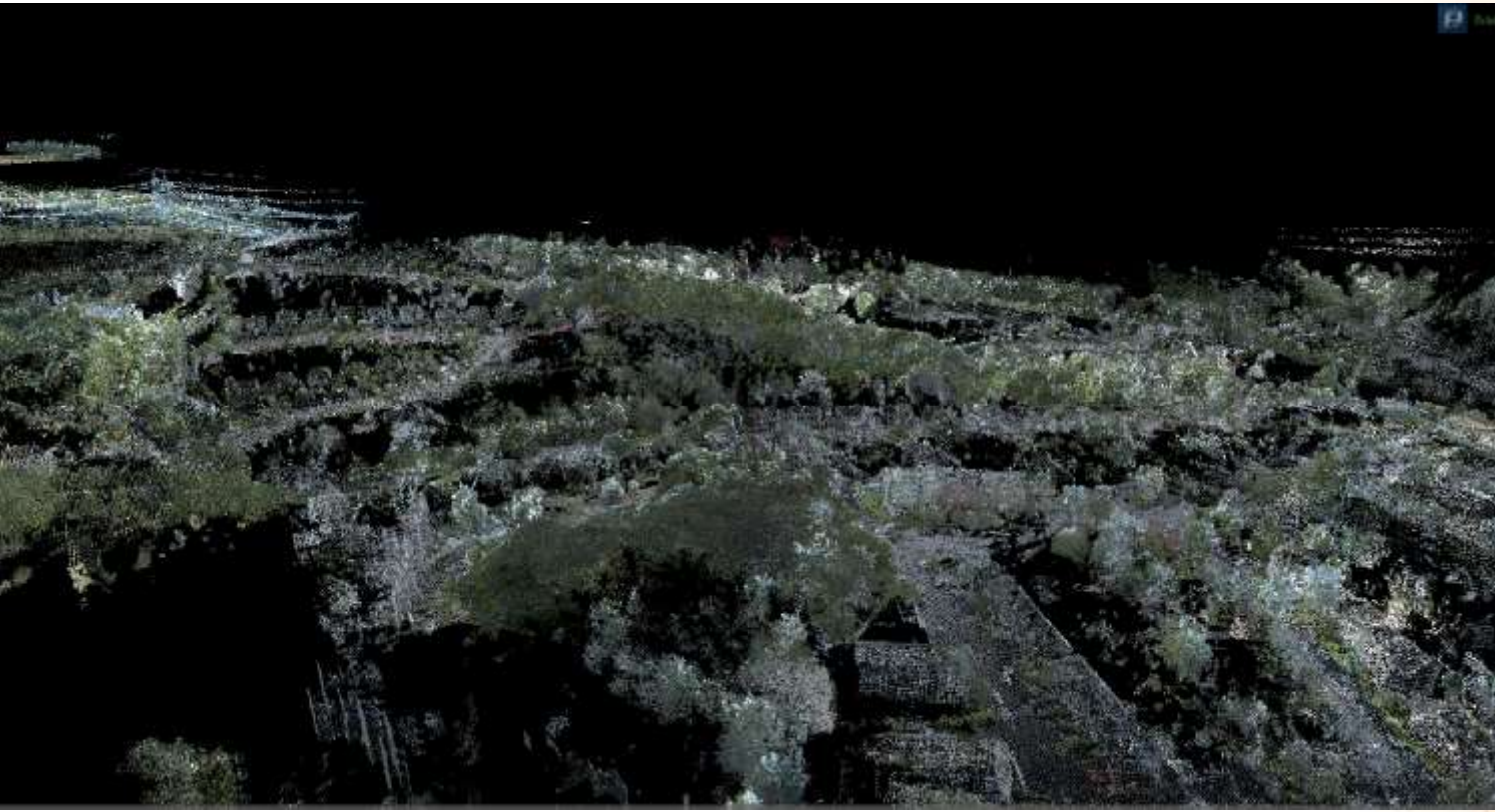


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## Manage Big Data



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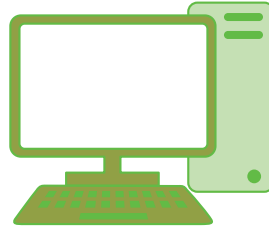


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## Legacy Workflow



Expensive systems

Hardware based  
management

Used by data experts

Unique collection skillsets

Processing per capture

Limited applications

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Legacy Reality Capture

Single capture units  
Outdated scanners  
Specialized equipment

Legacy Data Management

Stored on external hard drives  
Transfer to processing stations  
Difficult to manage space

Legacy Workflow

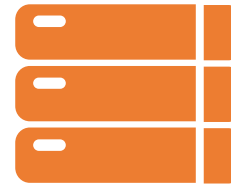
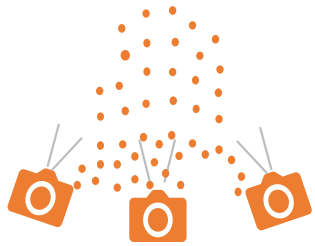
Specialized technicians required  
Unique viewing and management software  
Data consumed locally

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## Modern Workflow



Faster collections

High accessibility

Affordable systems

Multisystem Processing

Cloud Processing

Process for consumption

Federated data

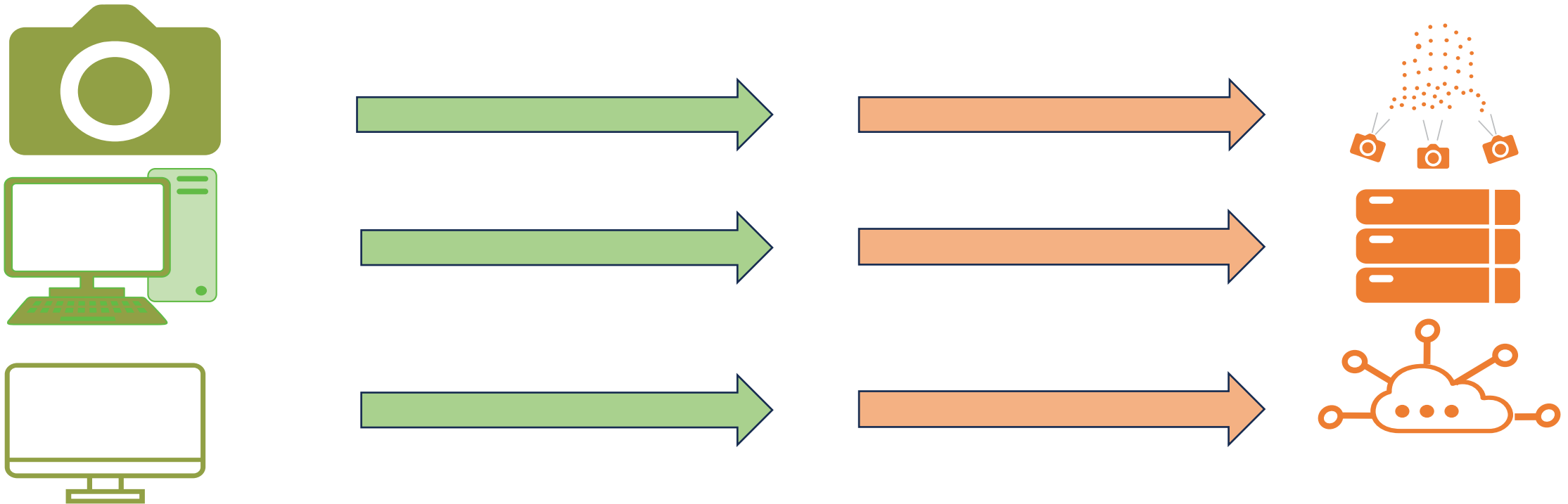
Anytime access

Input for Digital Twin

How do we move from a legacy to modern workflow?

How do we manage our increased volume of Reality Data?

How do we change to accommodate these needs?







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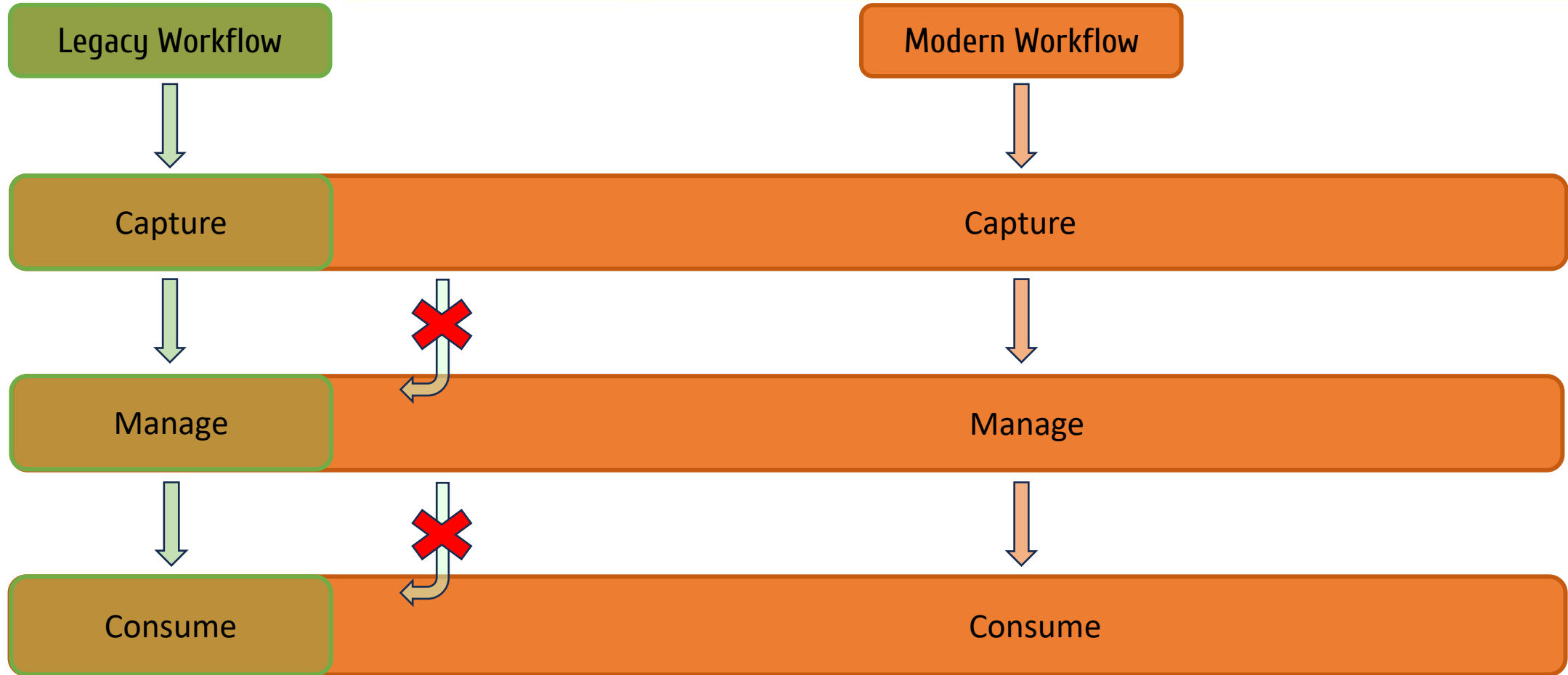
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Automation of processing  
Multi-computer processing  
Cloud processing API  
Cloud servers

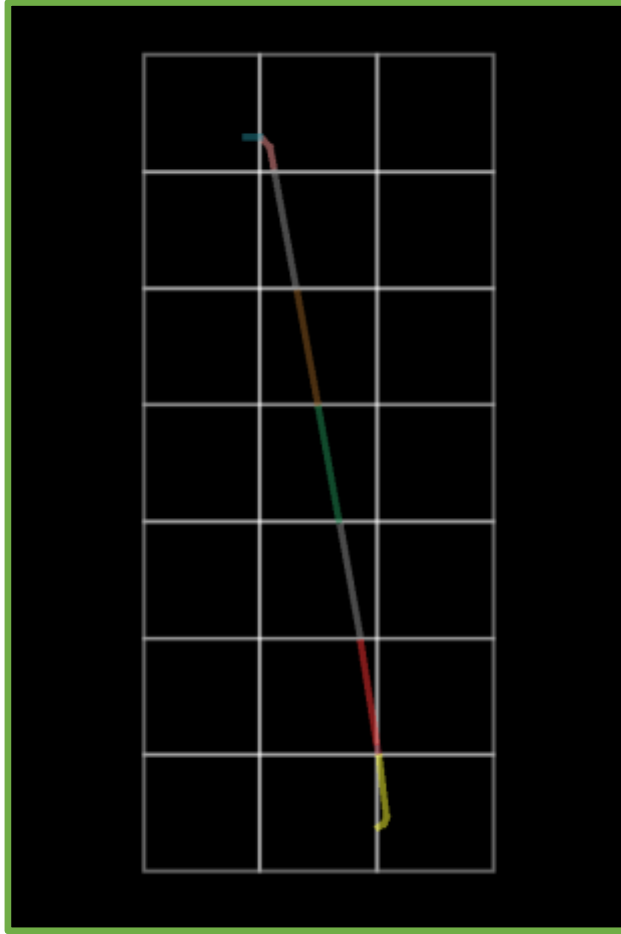


Web based  
Multi-applications  
Broader and more interactive uses

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The screenshot shows a software interface with a 3D point cloud map of a grid area. The map is overlaid on a grid with coordinates ranging from 1.1 to 5.7. Below the map is a table with the following columns: Type, Name, Collect, Status, Trajectory, Parcenas #, Parcenas %, Parcenas #, Parcenas %, Field C., DTM, Ortho, Mean, Total St., Review, Color, Web, and Avail.

Type	Name	Collect	Status	Trajectory	Parcenas #	Parcenas %	Parcenas #	Parcenas %	Field C.	DTM	Ortho	Mean	Total St.	Review	Color	Web	Avail
▲	FIG Big Data Grid 1 2 (0)	-	-	1.1 km	1 / 219 / 0 / 0	0 / 0							316.9 K	131.5 K			
▲	FIG Big Data Grid 1 3 (0)	-	-	4.4 km	1 / 904 / 0 / 0	0 / 0							1.3 MB	399 KB			
▲	FIG Big Data Grid 1 4 (0)	-	-	1.6 km	1 / 362 / 0 / 0	0 / 0							486.5 K	211 KB			
▲	FIG Big Data Grid 2 2 (0)	-	-	464 m	1 / 82 / 0 / 0	0 / 0							180.3 K	96.1 KB			
▲	FIG Big Data Grid 2 3 (0)	-	-	10.5 km	1 / 2227 / 0 / 0	0 / 0							3 MB	1.1 MB			
▲	FIG Big Data Grid 2 4 (0)	-	-	9.3 km	1 / 1990 / 0 / 0	0 / 0							3.5 MB	1.1 MB			
▲	FIG Big Data Grid 2 5 (0)	-	-	2.4 km	1 / 479 / 0 / 0	0 / 0							668.6 K	374 KB			
▲	FIG Big Data Grid 2 6 (0)	-	-	1.4 km	1 / 201 / 0 / 0	0 / 0							402.5 K	195.7 K			
▲	FIG Big Data Grid 2 7 (0)	-	-	4.4 km	1 / 914 / 0 / 0	0 / 0							1.2 MB	912.6 K			
▲	FIG Big Data Grid 2 8 (0)	-	-	12.1 km	1 / 2502 / 0 / 0	0 / 0							3.4 MB	1.4 MB			
▲	FIG Big Data Grid 3 4 (0)	-	-	6.0 km	1 / 1894 / 0 / 0	0 / 0							2.4 MB	1 MB			
▲	FIG Big Data Grid 3 5 (0)	-	-	4.4 km	1 / 1029 / 0 / 0	0 / 0							1.5 MB	574.8 K			
▲	FIG Big Data Grid 3 6 (0)	-	-	3.2 km	1 / 743 / 0 / 0	0 / 0							1 MB	418.8 K			
▲	FIG Big Data Grid 3 7 (0)	-	-	592 m	1 / 107 / 0 / 0	0 / 0							105.0 K	70.1 KB			
▲	FIG Big Data Grid 4 2 (0)	-	-	1.7 km	1 / 442 / 0 / 0	0 / 0							544.4 K	253.4 K			
▲	FIG Big Data Grid 4 3 (0)	-	-	7.2 km	1 / 1820 / 0 / 0	0 / 0							2.2 MB	1 MB			
▲	FIG Big Data Grid 4 4 (0)	-	-	2.3 km	1 / 623 / 0 / 0	0 / 0							720.8 K	290.8 K			
▲	FIG Big Data Grid 4 5 (0)	-	-	2.5 km	1 / 768 / 0 / 0	0 / 0							650.9 K	426.8 K			
▲	FIG Big Data Grid 4 6 (0)	-	-	2.9 km	1 / 716 / 0 / 0	0 / 0							885.5 K	403.1 K			
▲	FIG Big Data Grid 4 7 (0)	-	-	264 m	1 / 52 / 0 / 0	0 / 0							90.9 K	40.5 KB			
▲	FIG Big Data Grid 5 6 (0)	-	-	564 m	1 / 194 / 0 / 0	0 / 0							218.8 K	116.5 K			
▲	FIG Big Data	-	-	196 km	1 / 18287 / 0 / 18287	6 / 100			11480 m				480.4 K	450.8 K			
▲	Management 1 3	-	-	64 m	1 / 19 / 0 / 19	0 / 100			3.0 m				158 MB	157.9 K			
▲	Management 2 2	-	-	80 m	1 / 25 / 0 / 25	0 / 100			3.0 m				265.9 K	265.9 K			

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200,000 km data

11,000 Resources

100 Tb Data

Viewed as  
3 Resources



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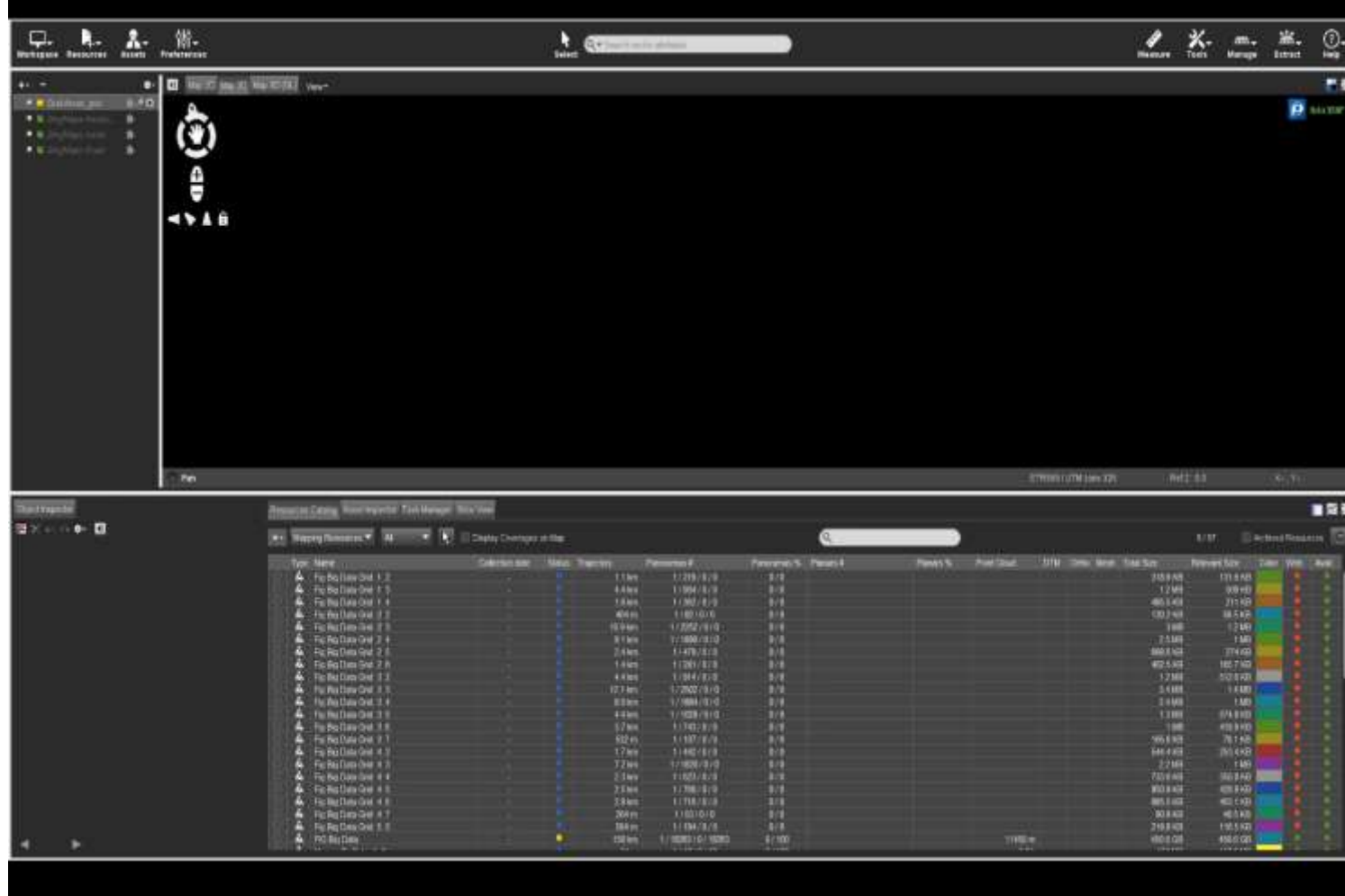




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## The Digital Twin Experience



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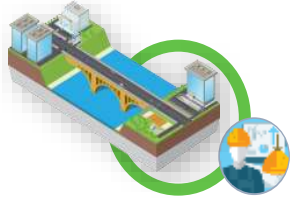
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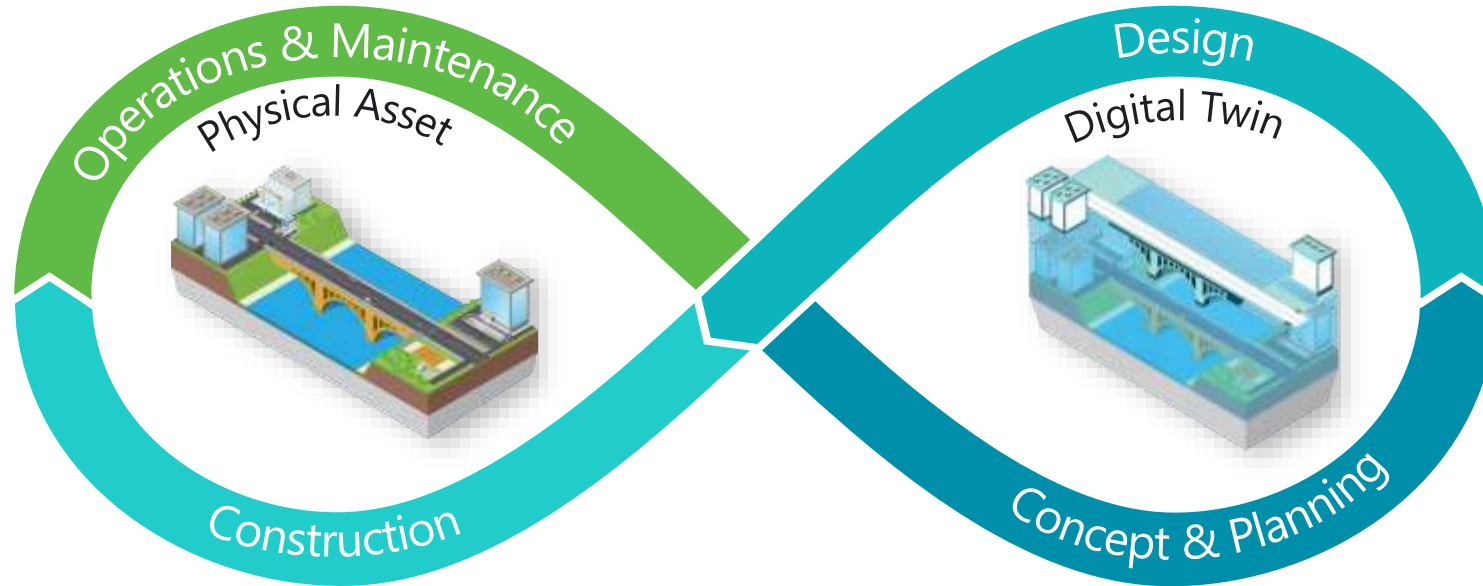
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- Asset Inspection
- Asset Condition Monitoring
- Permitting & Routing
- Asset Information Management
- IoT Sensor Data





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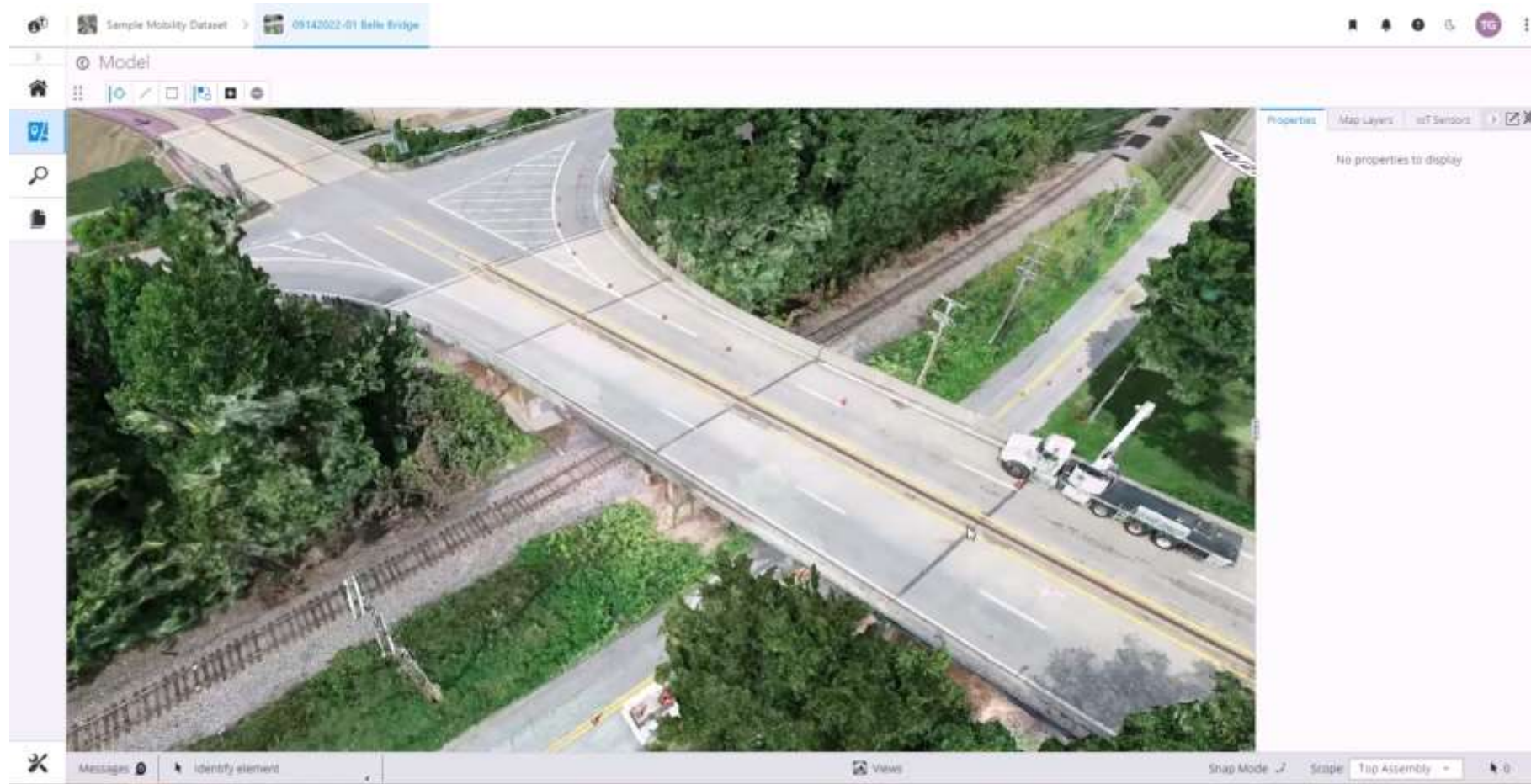
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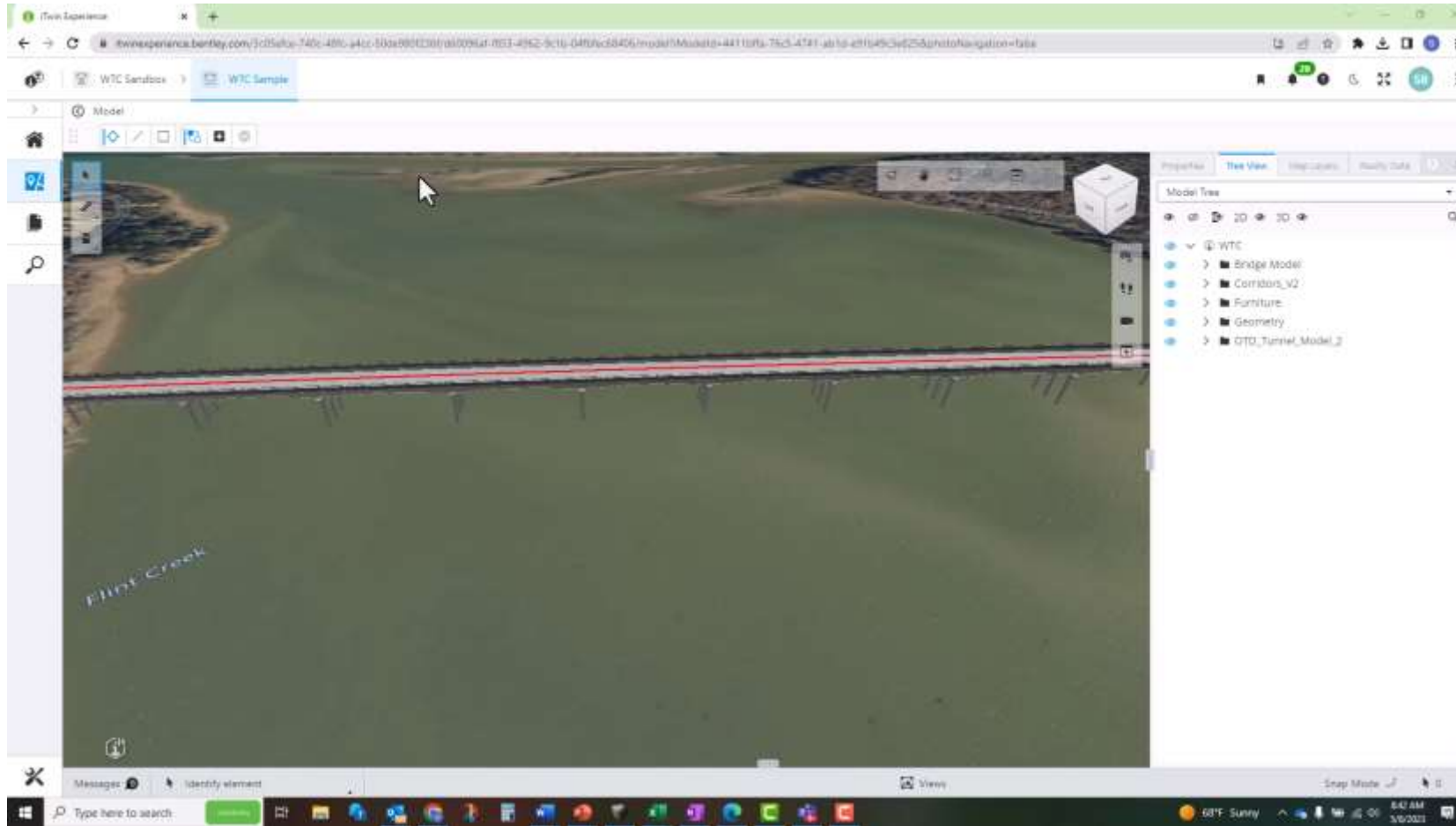
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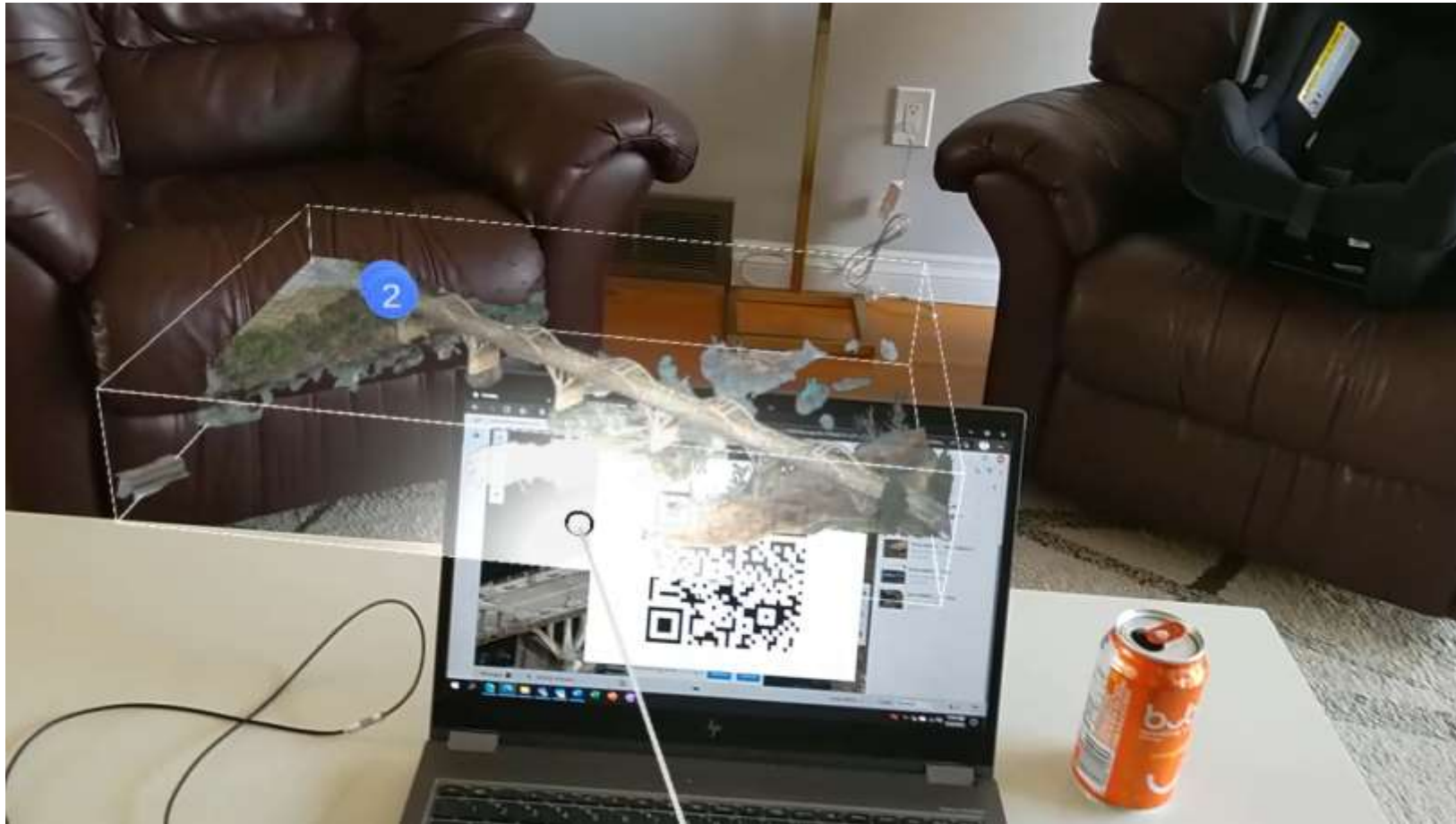
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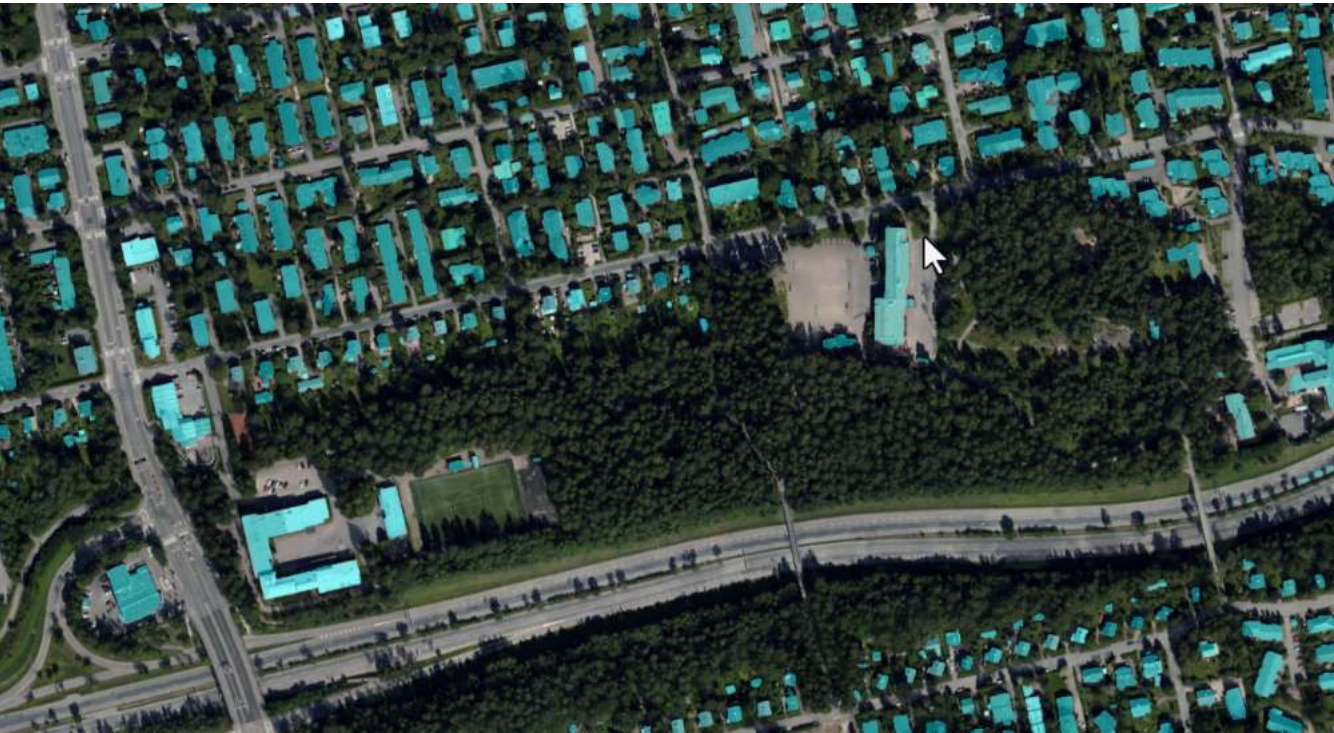


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## Leverage Data with AI



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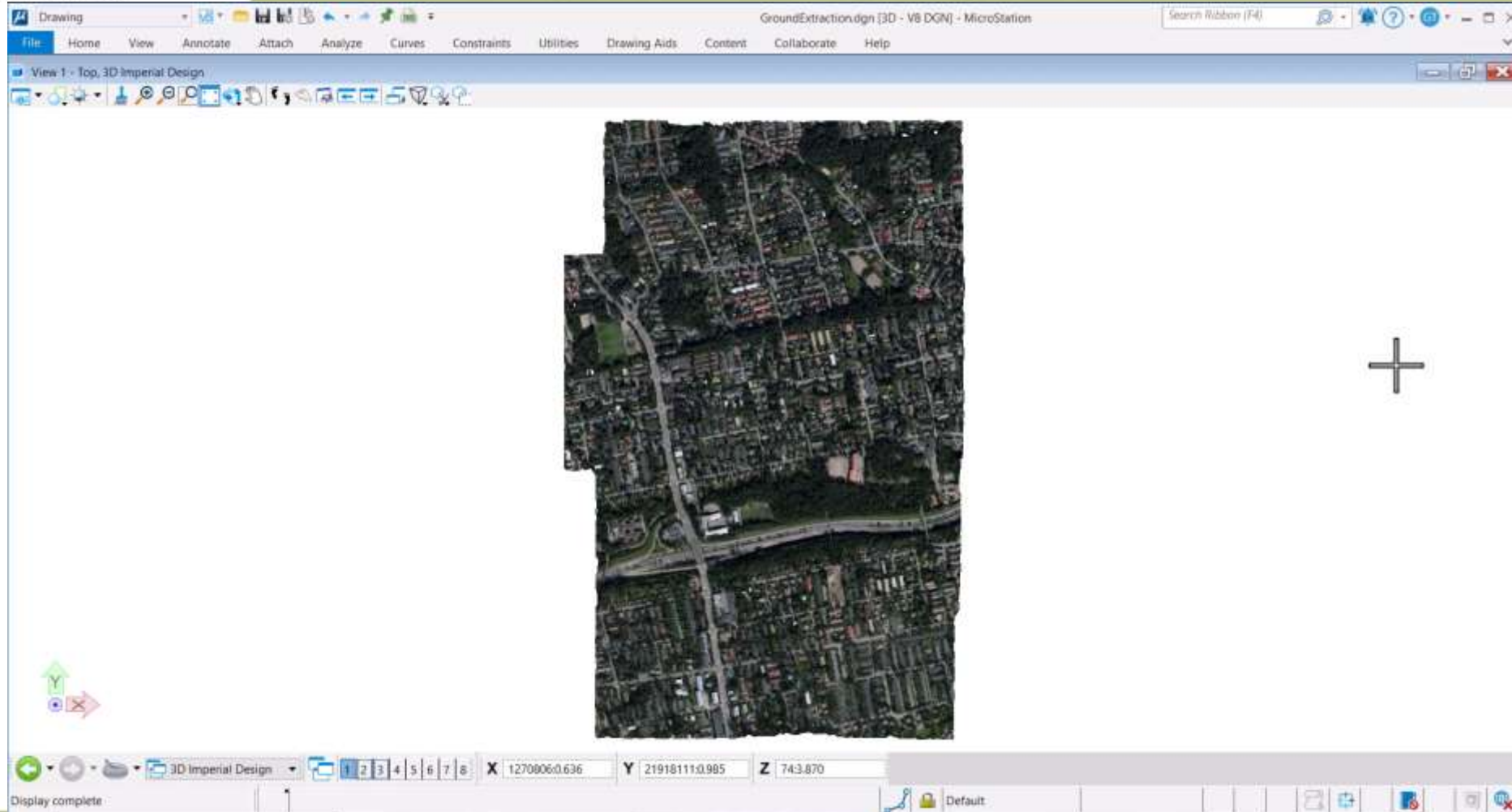




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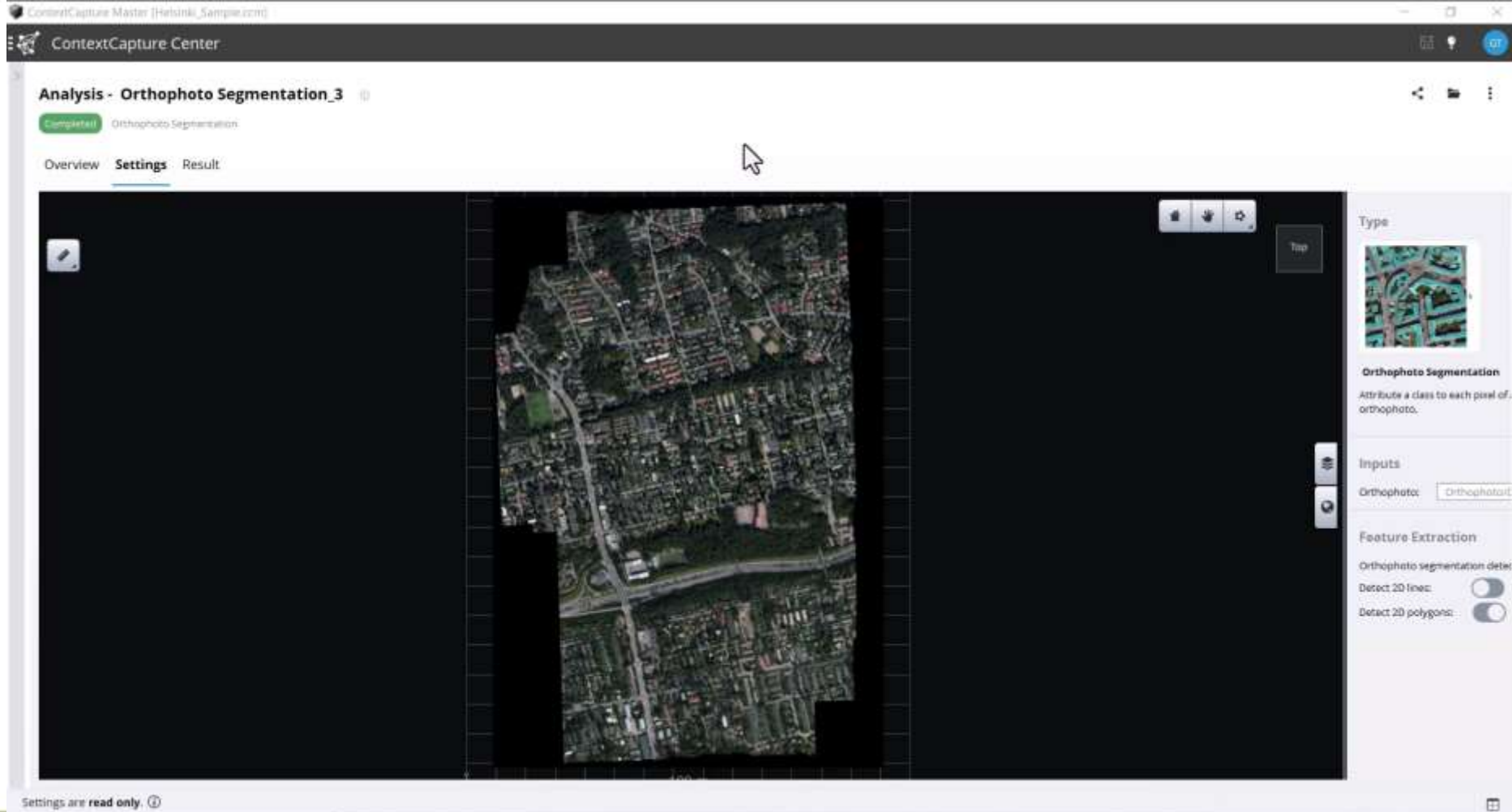


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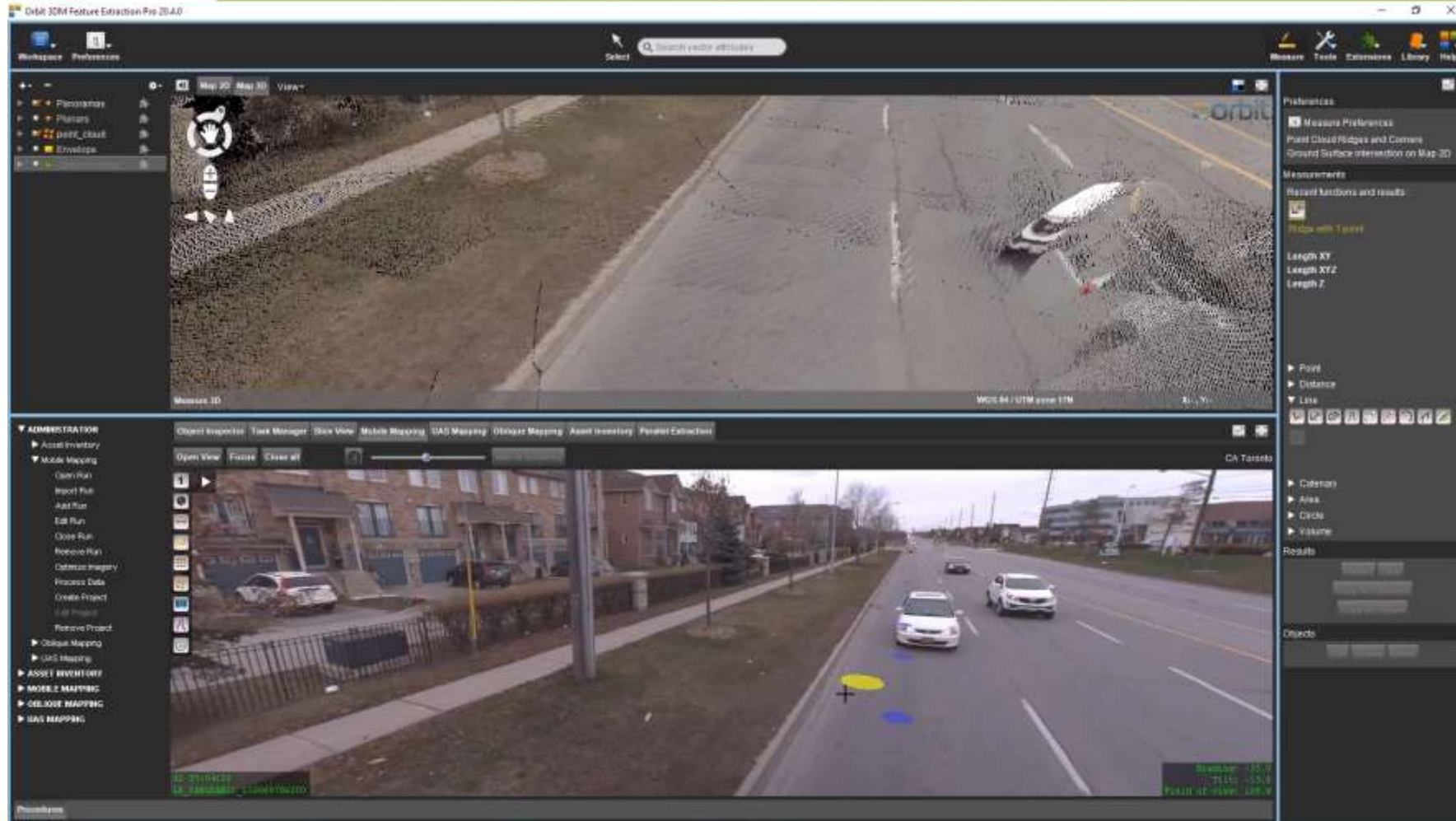




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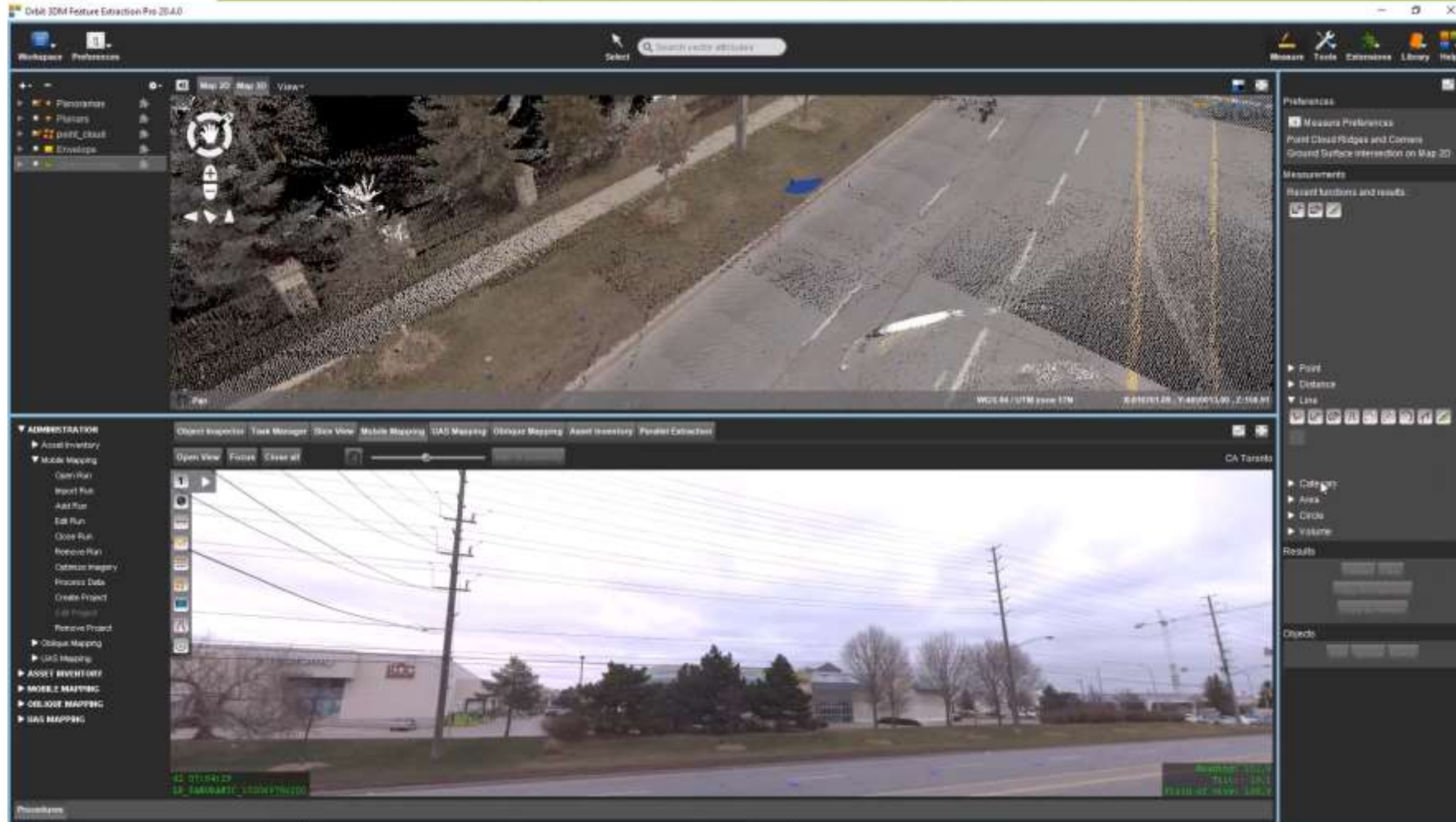
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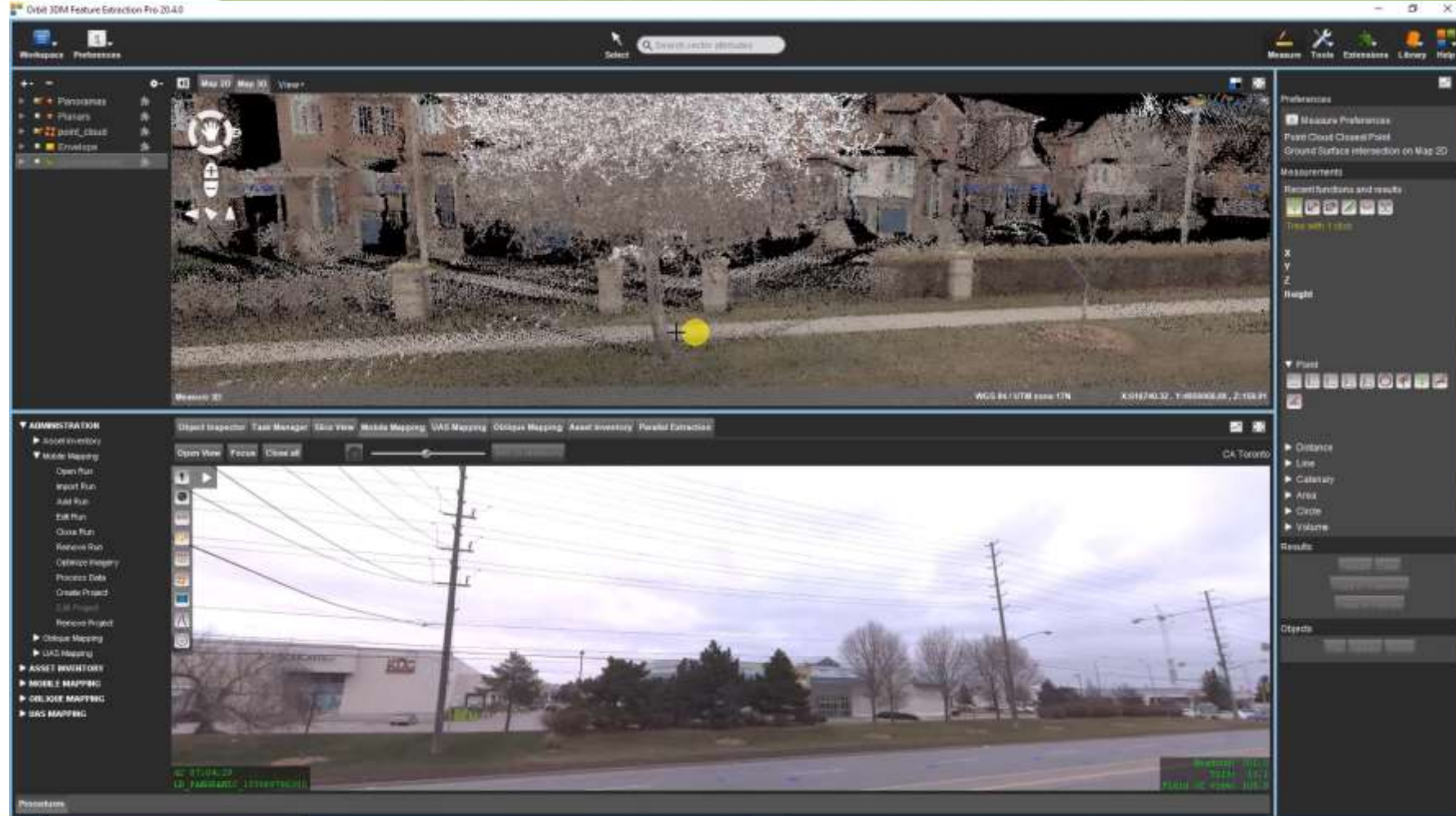




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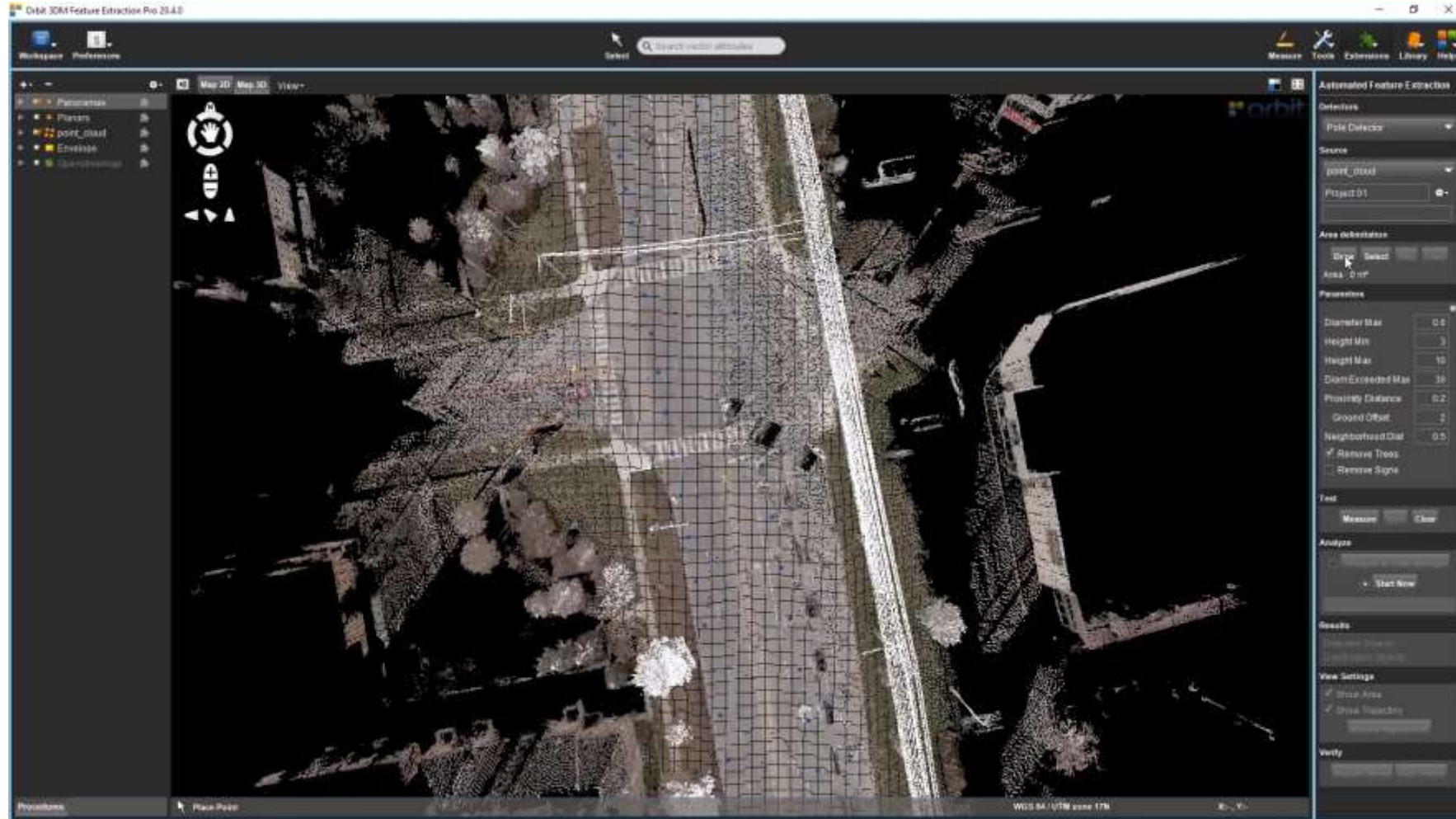
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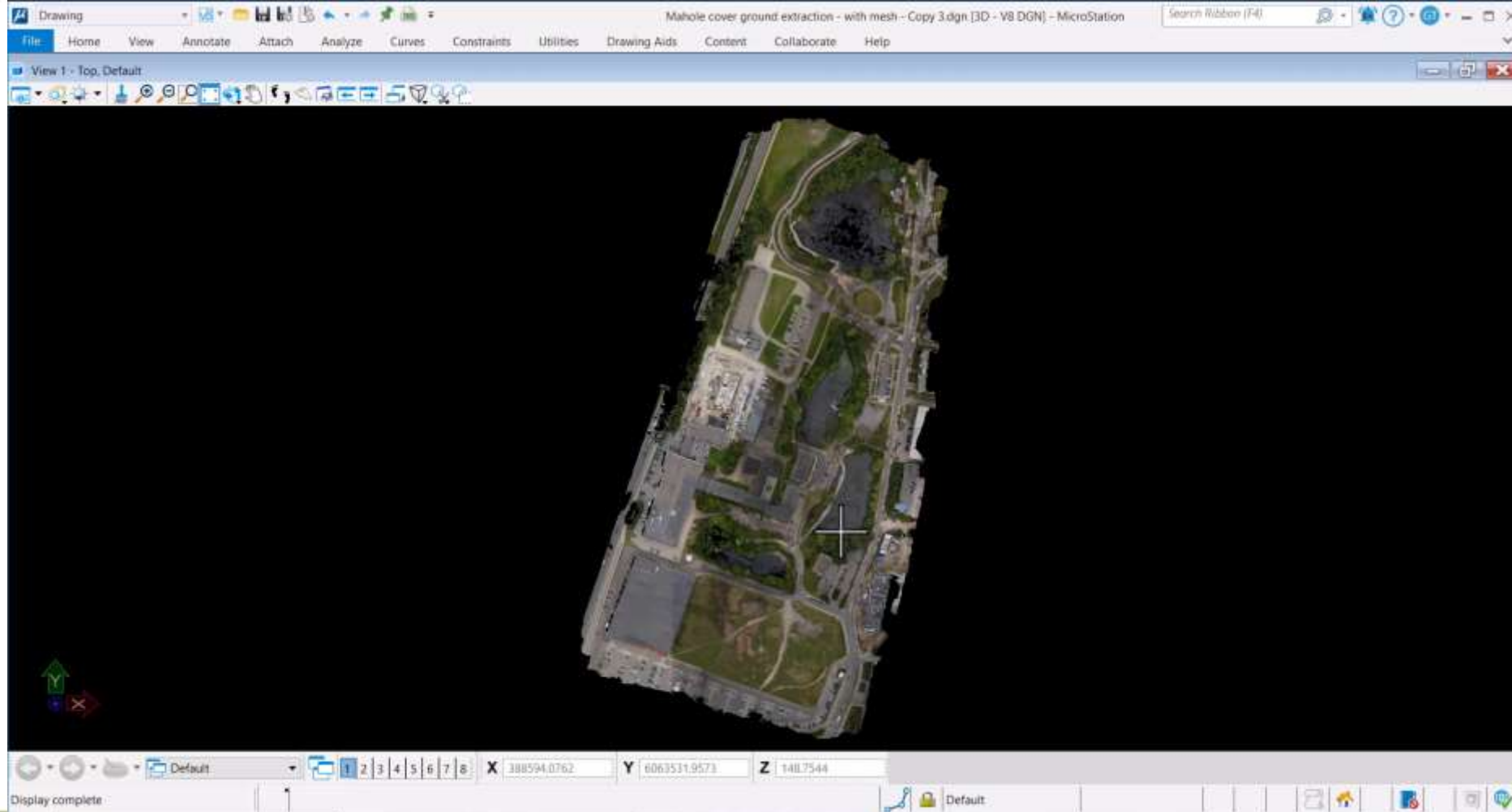




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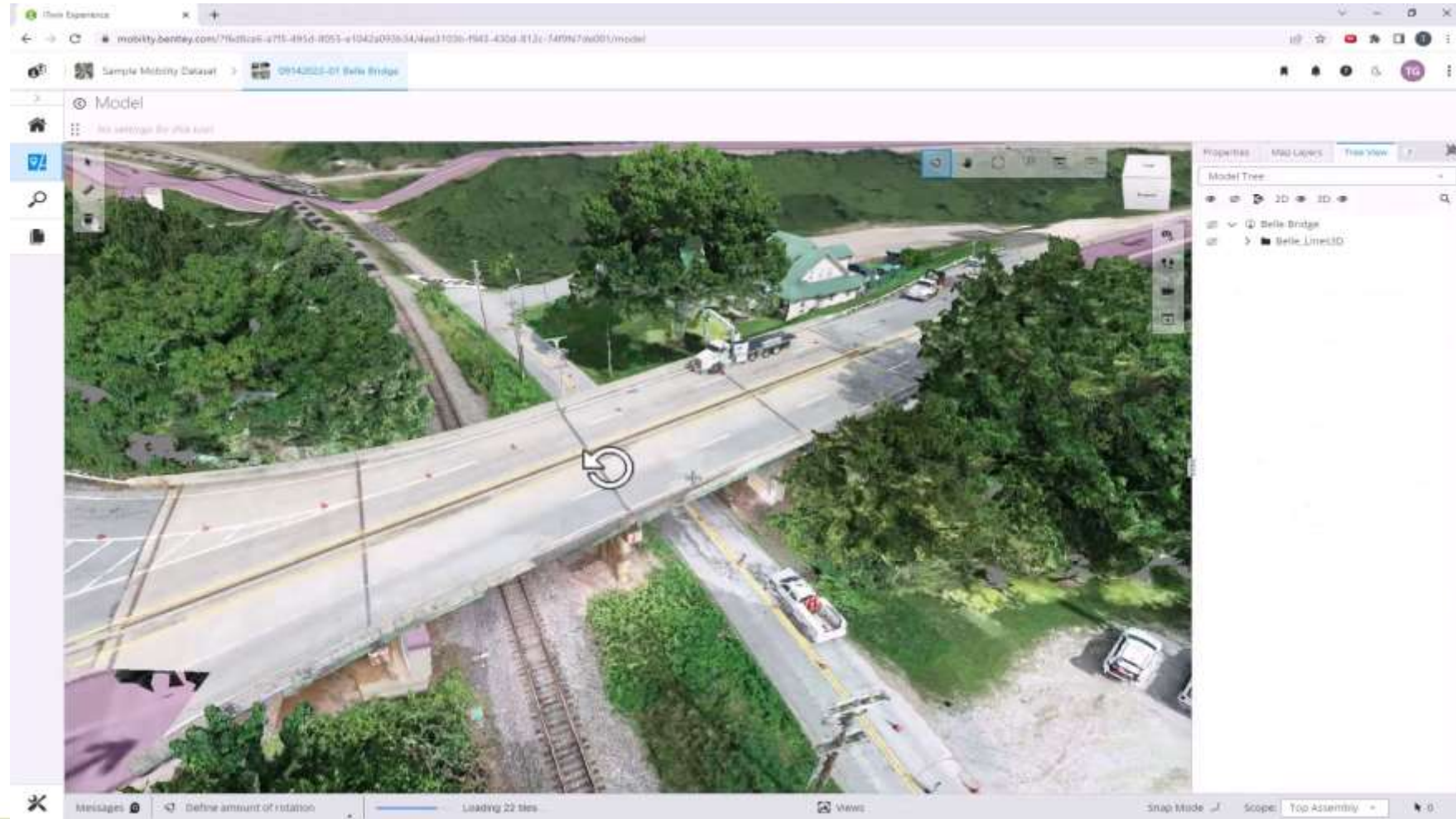
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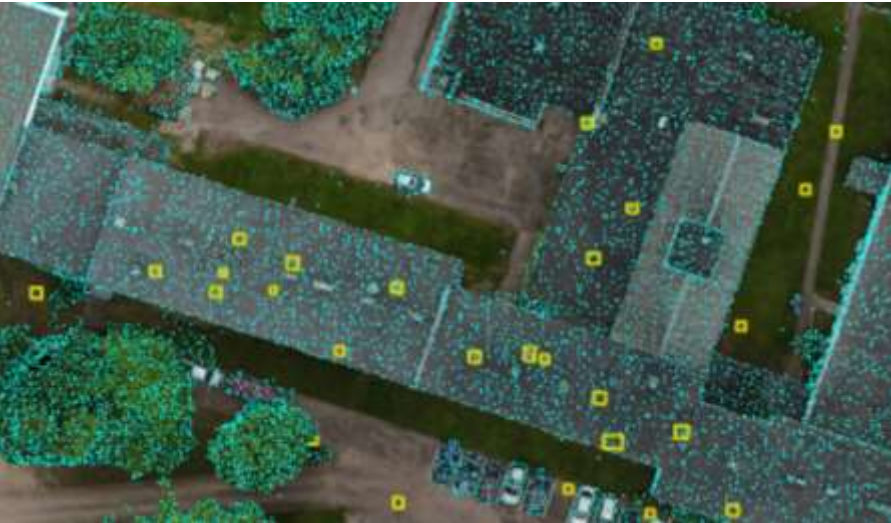




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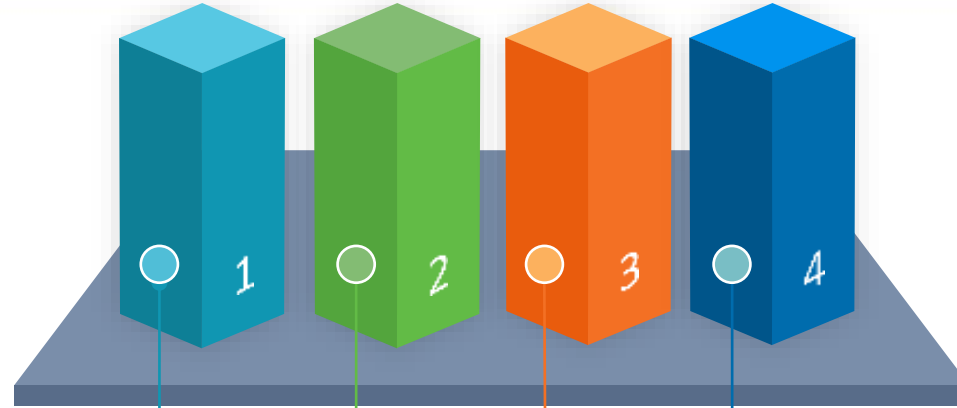
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## Reduce Costs



- Equipment costs
- Labor savings
- Streamline data sharing
- Minimize revisits

## Improve Sustainability



- Minimize travel to sites
- Reduce traffic disruptions
- Equipment running
- Extend life of assets

## Enhance Safety



- Traffic
- Swift water currents
- Extreme temperature
- Wildlife

## Improve Reliability



- Consistency
- Accuracy
- Accessibility



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## Come and see us!



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