



# Integrated Urban Growth: Overcoming Connectivity and Infrastructure Gaps

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## India's Urban Growth Challenges

- India's cities are expanding rapidly—smart city missions, infrastructure modernization, digital twins, sustainable mobility.
- Despite growth, **gaps** remain:
  - Fragmented data across agencies
  - Delayed decision-making due to lack of real-time visibility
  - Inefficient construction workflows
  - Limited integration between planning, surveying, design & execution

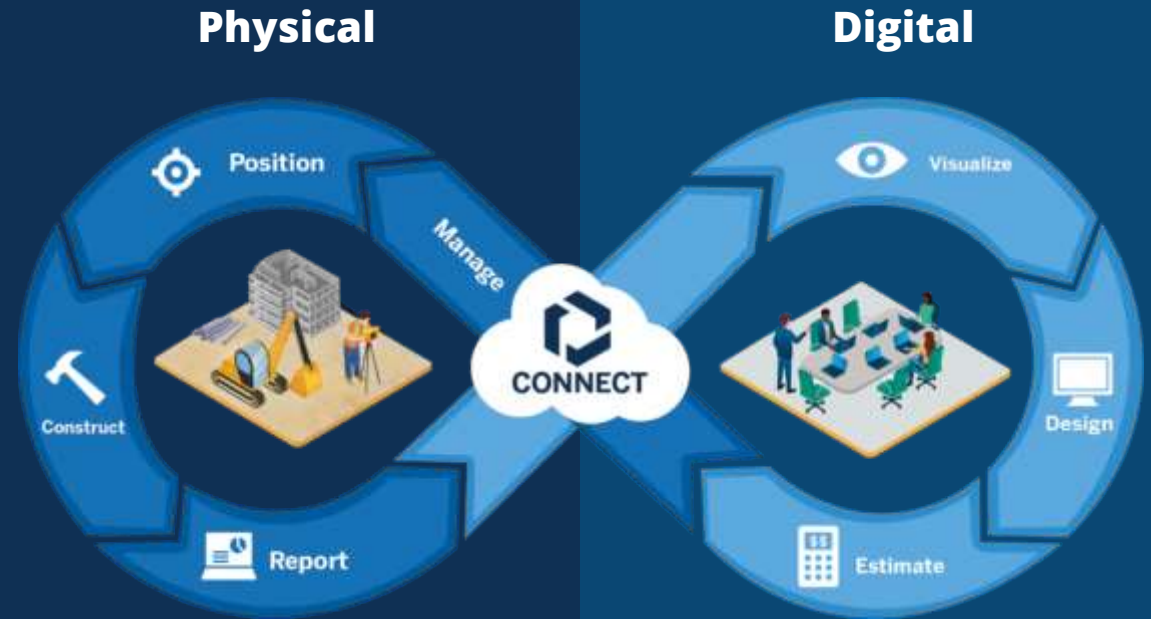
## Why Connectivity Matters

- Urban development depends on data accuracy and speed
- Disconnected workflows cause delays and rework
- Stakeholders require a single source of truth
- Real-time collaboration improves planning outcomes

*“How can connected geospatial technologies bridge these gaps?”*

# Connecting The Physical & Digital World

Trimble Field Systems connects the physical and digital worlds by offering innovative positioning technology and site management solutions, and unified workflows that boost productivity and connect all project phases.



# Trimble Workflow (CDE)

**1 Plan work ahead**  
Construction activities and field survey tasks

**2 Send from office to field**  
Prepare and send design data from the office to the field

**3 Collect survey data in the field**  
Create preliminary report

**4 Securely store field data in the cloud**

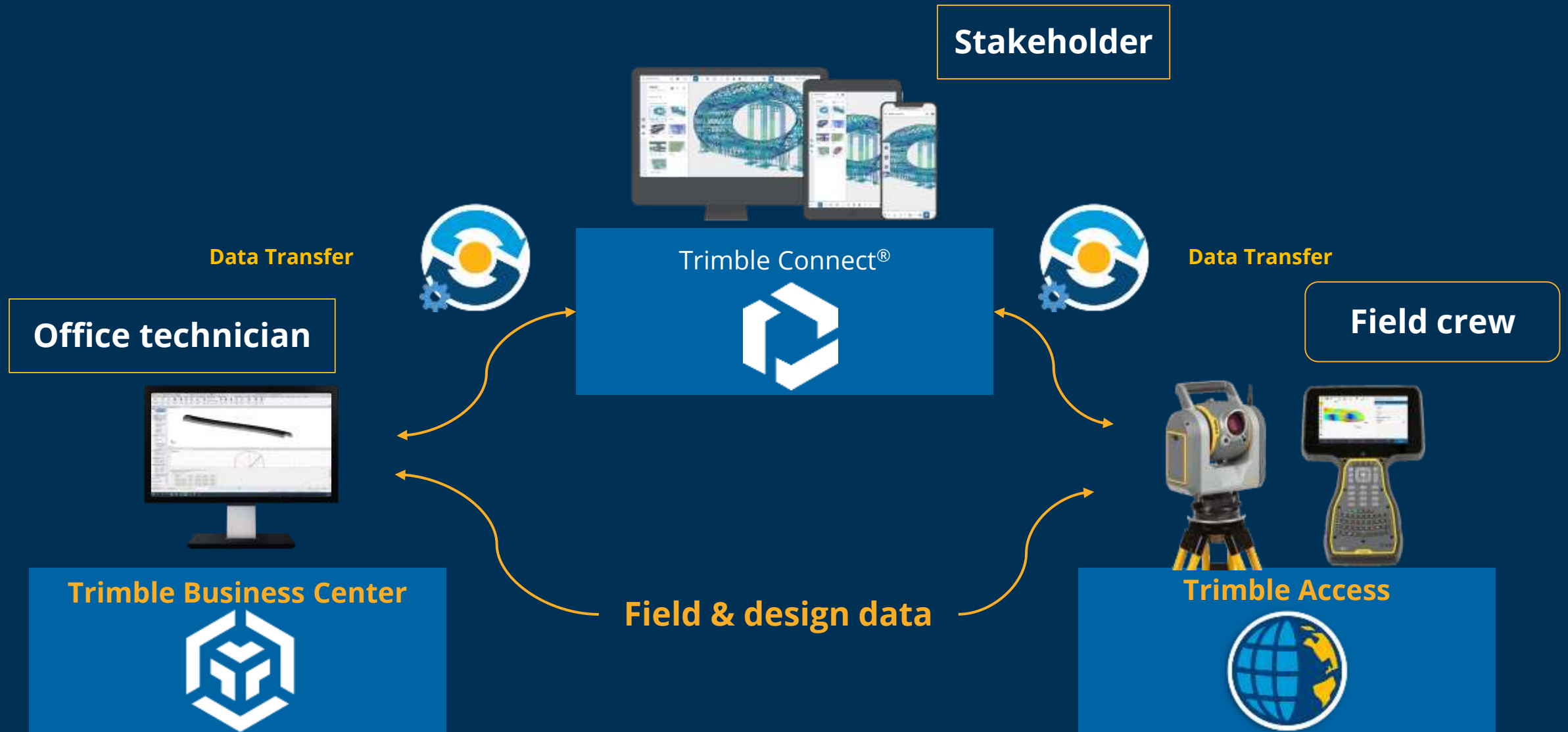
**5 Process & prepare final deliverables in the office**

**6 Share deliverables digitally**  
Stay "at the table" and continue creating value by providing additional data and services as they are required by the client

**7 Update project status to help track progress**  
Store completion status per construction object, based on field data / deliverables report



# Connecting the field-office-stakeholders



# Urban Development – Data Collection is a CHALLENGE





# Digital Twins and Smart Cities

- **Analyze** traffic patterns, optimizing transportation routes and **plan for urban mobility**
- Contribute to **smart city governance** by offering a data-driven approach to decision-making, enabling **informed choices**
- Speed and coverage of data capture allows models to be updated **quickly** and **easily**
- Foster **collaboration** among various city departments with a shared platform for **geospatial data**





# Utilities and Fiber to the Home

- Enable **efficient creation** and management of **detailed inventories** for utilities
- Assist in **rapid damage assessment** during emergencies and natural disasters
- Support **predictive maintenance planning** based on historical data
- Assess **right-of-way considerations** for laying fiber infrastructure and design **cost-effective fiber networks**



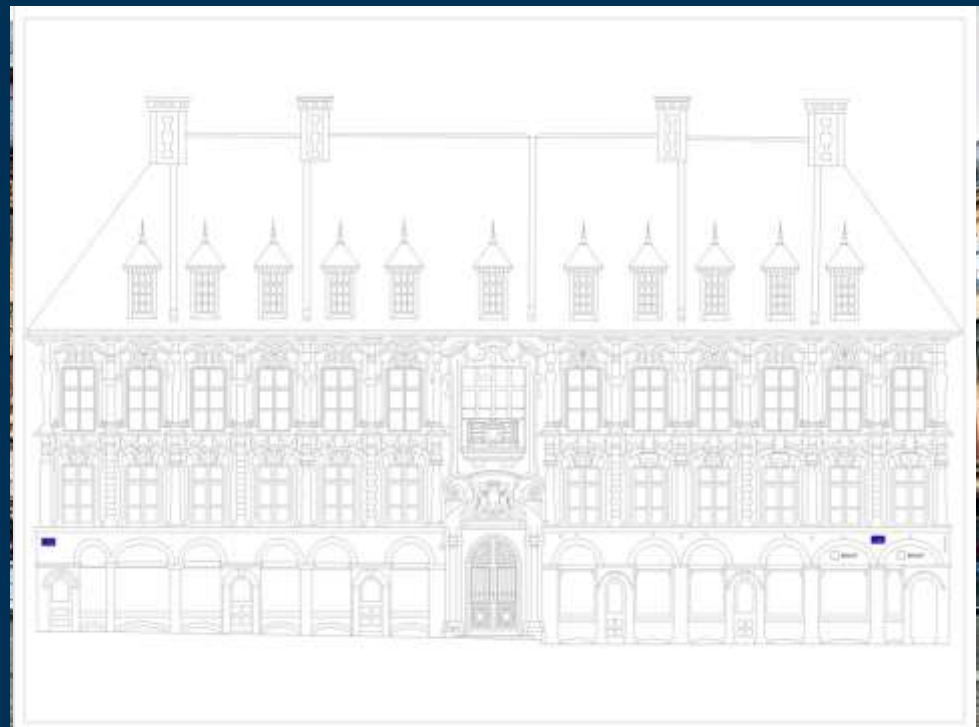
# Maintenance of Transport Infrastructure

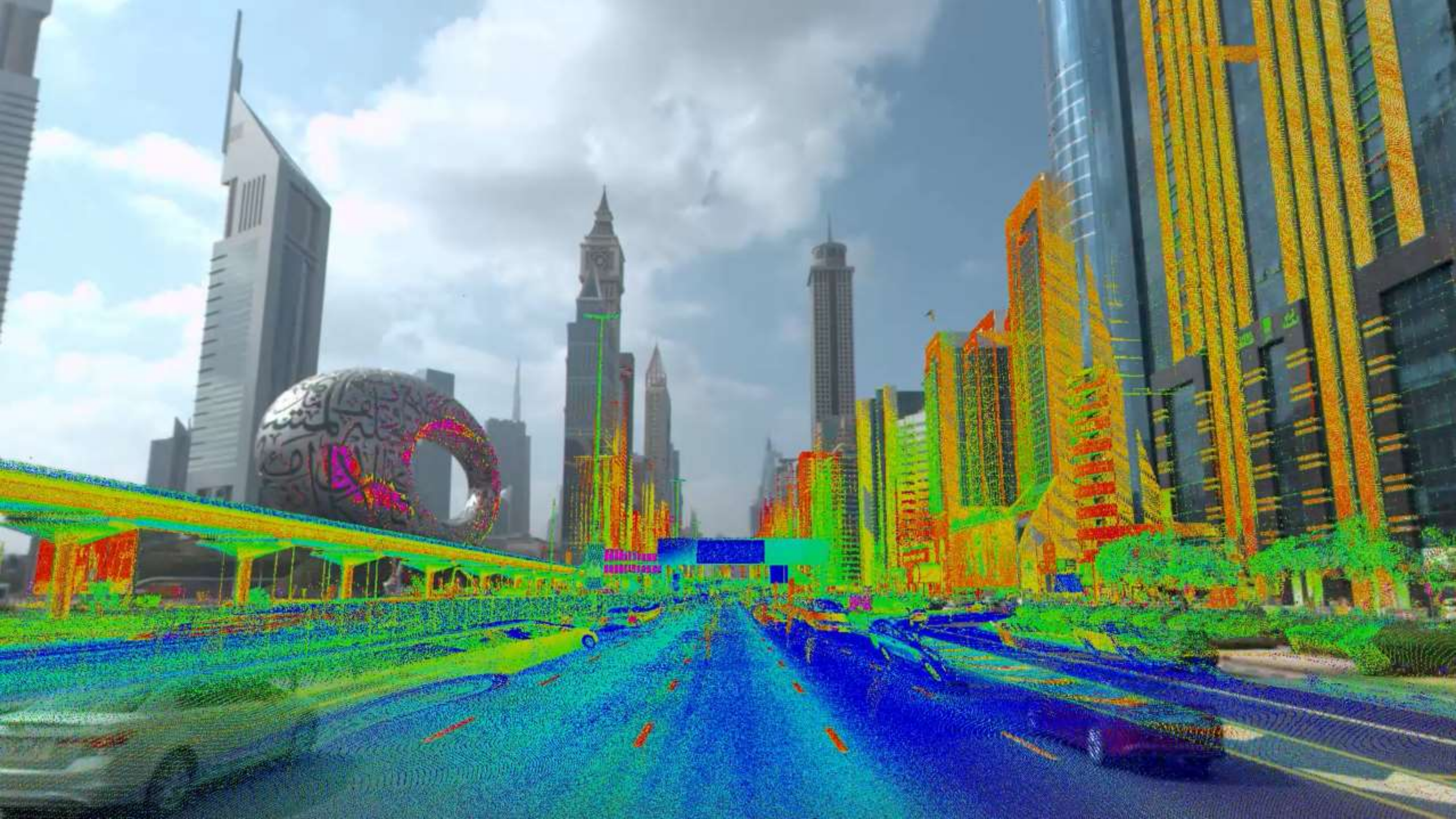


- Assess **vertical clearances** of bridges and infrastructure to a **high degree of accuracy**
- Carry out **as-built checks** to **enable comparisons** to design values
- Provide **precise 3D data** for route **planning purposes**
- Identify **potential safety hazards** and maintenance issues for **risk mitigation**.



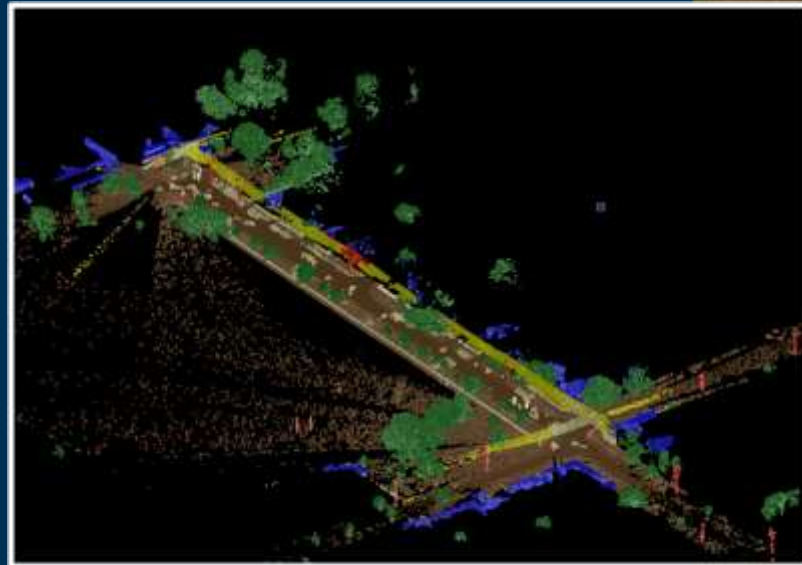
# Cultural Heritage





# Automatic Classification

- Buildings
- Ground
- High/Medium Vegetation
- Poles and signs
- Power lines
- Dividers
- Steps



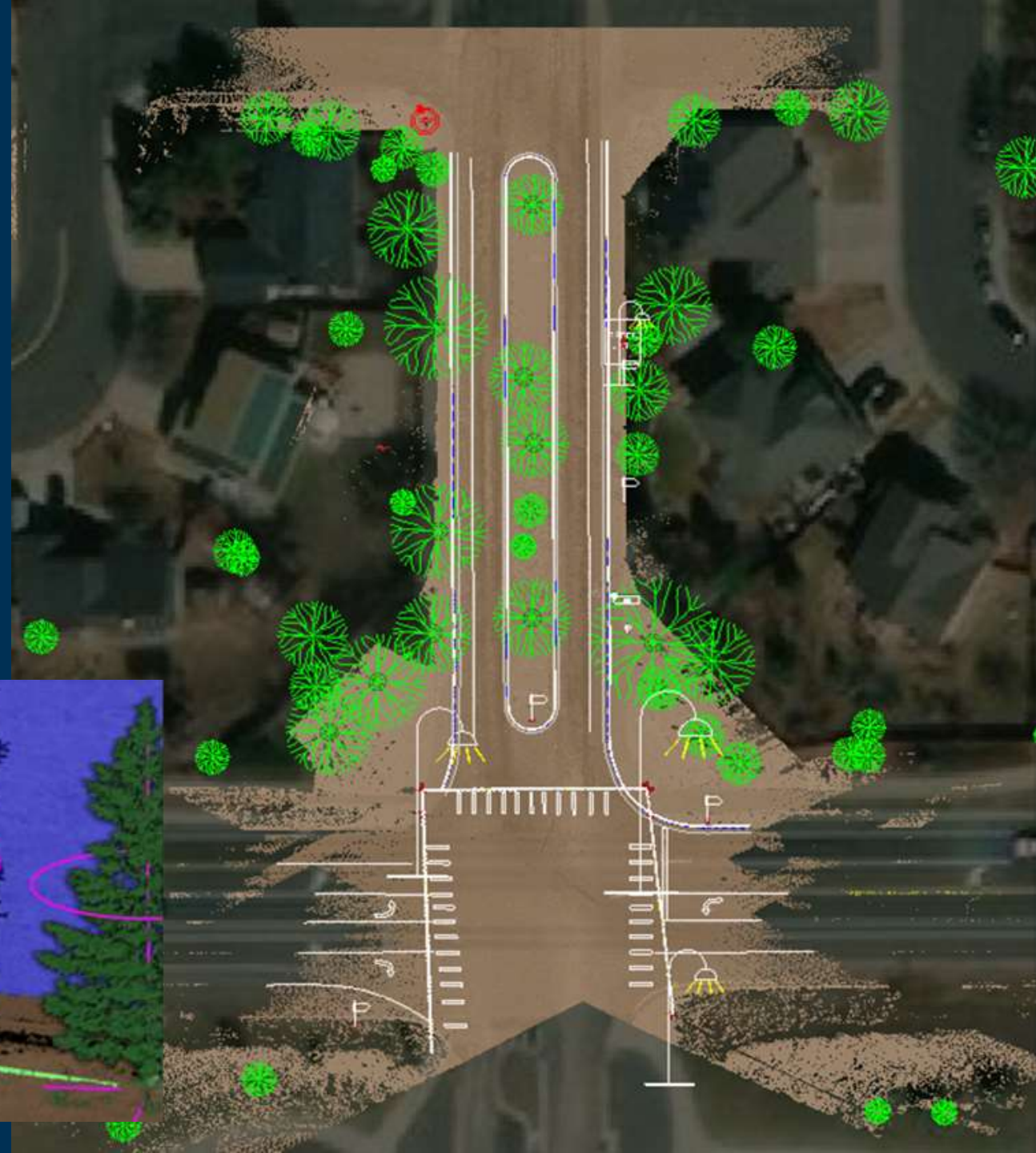
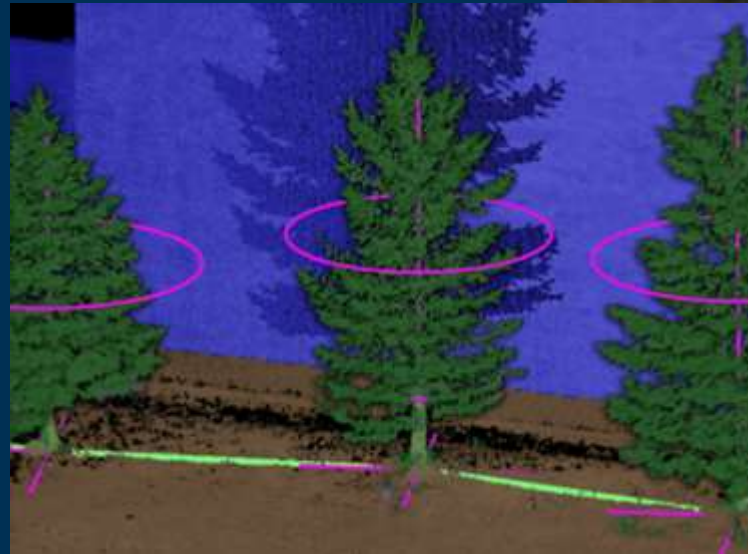
# Feature Extraction

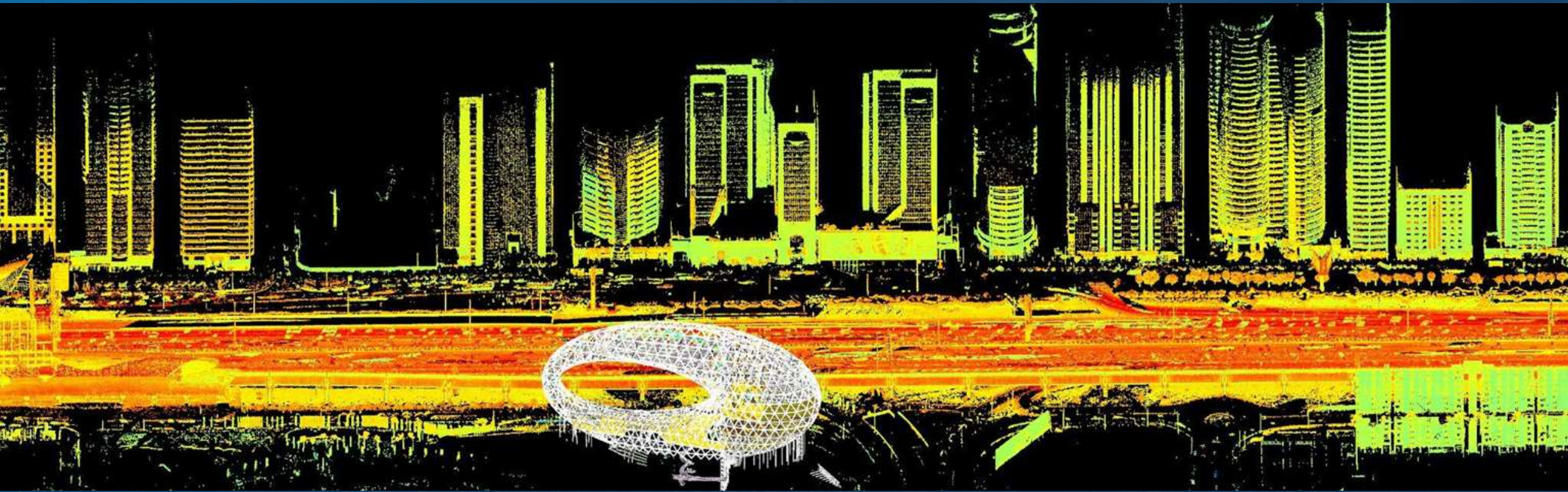
## Line Features

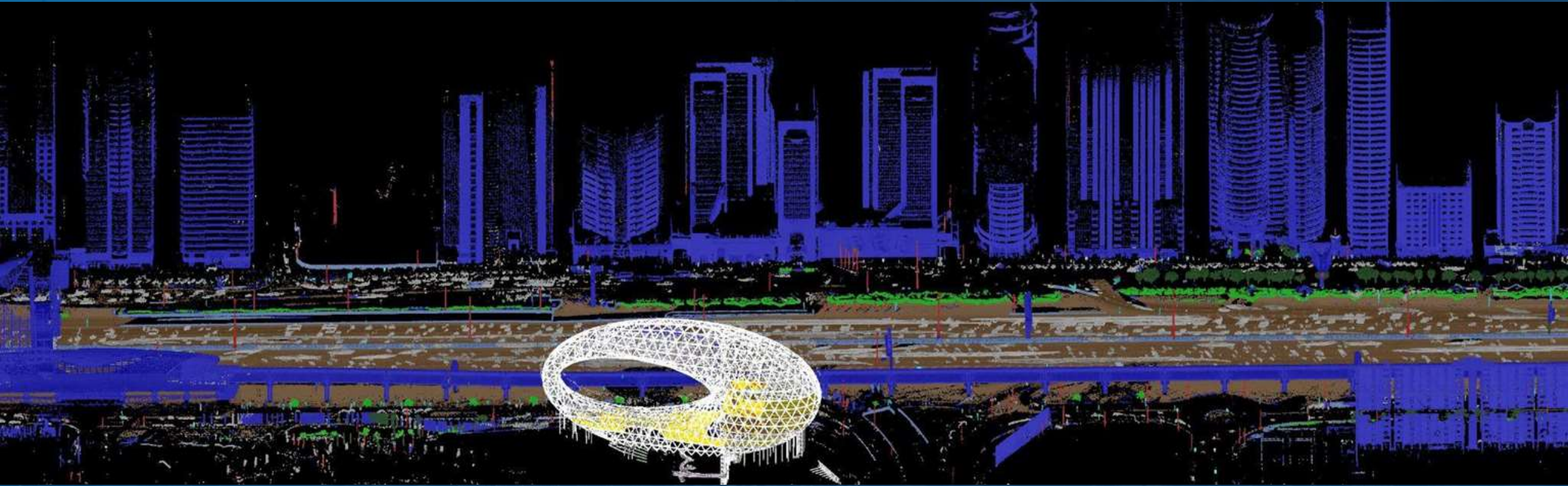
- Overhead Line
- Curb and Gutter
- Lane Lines

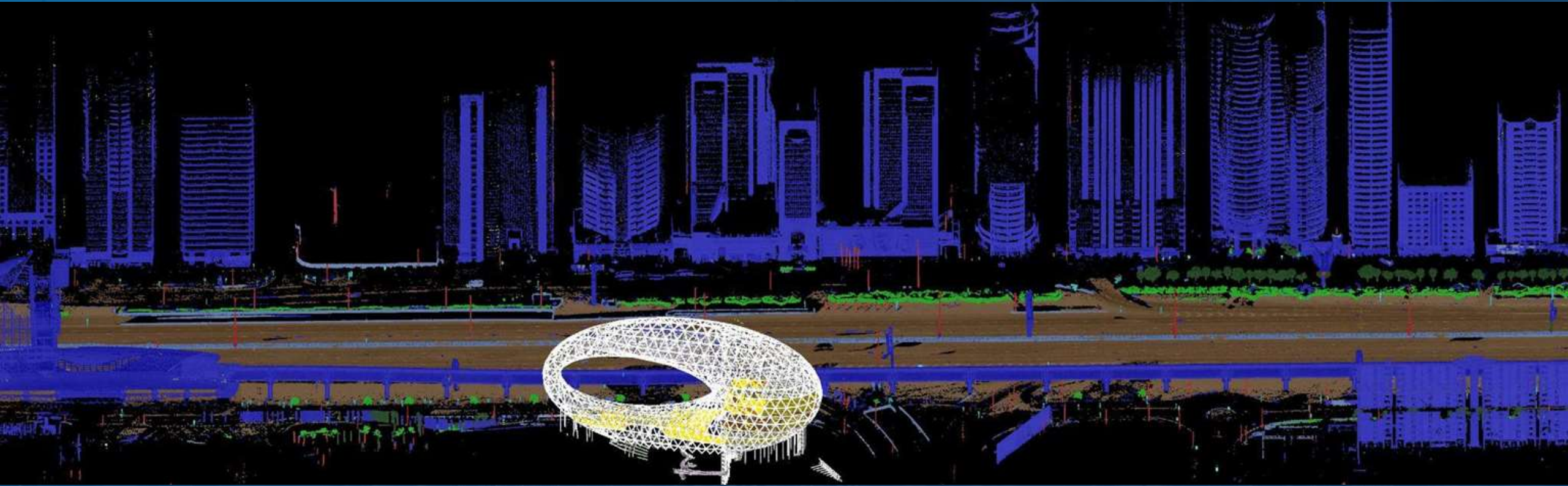
## Point Features

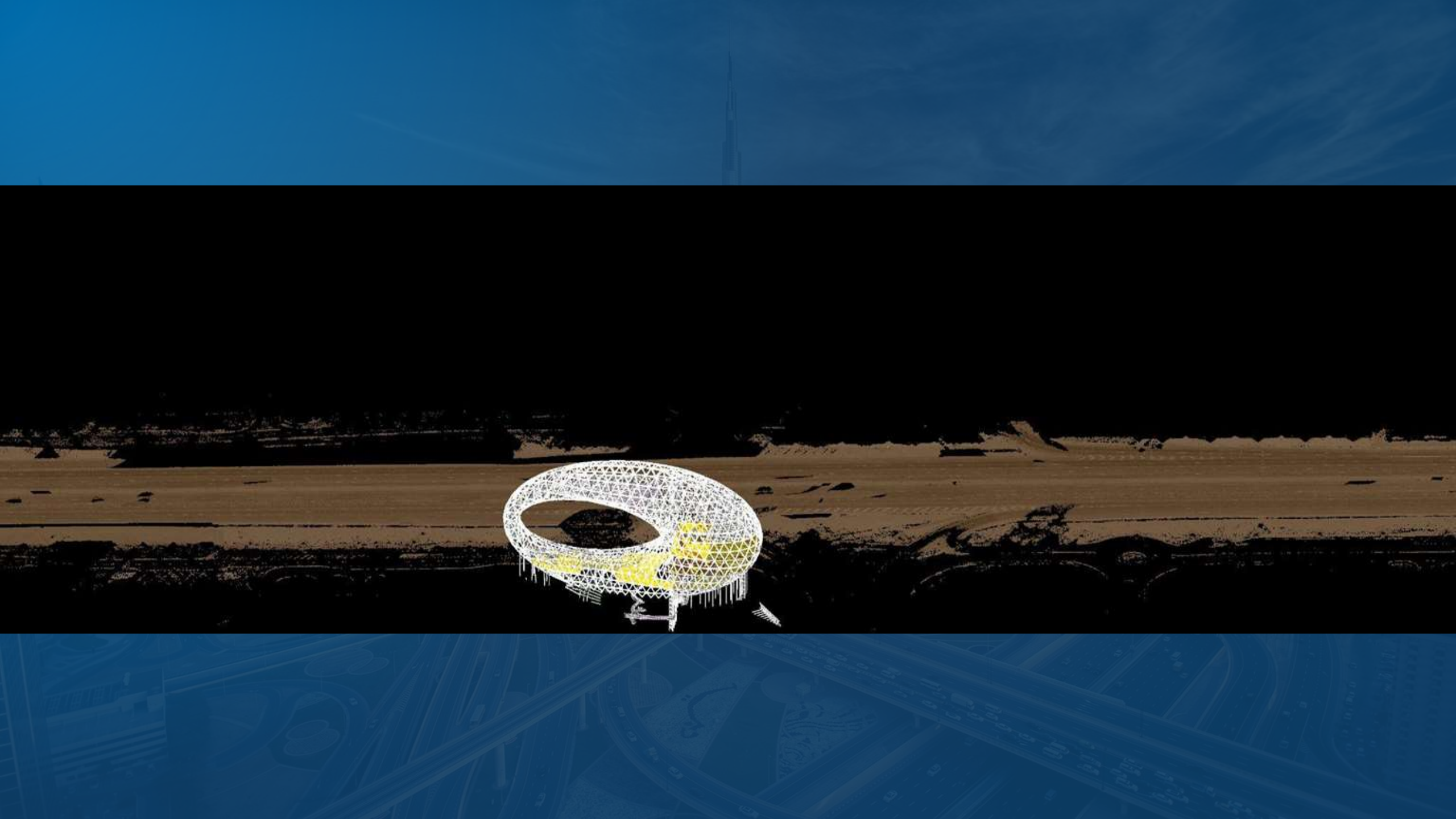
- Tree
- Pole
- Sign
- Manholes

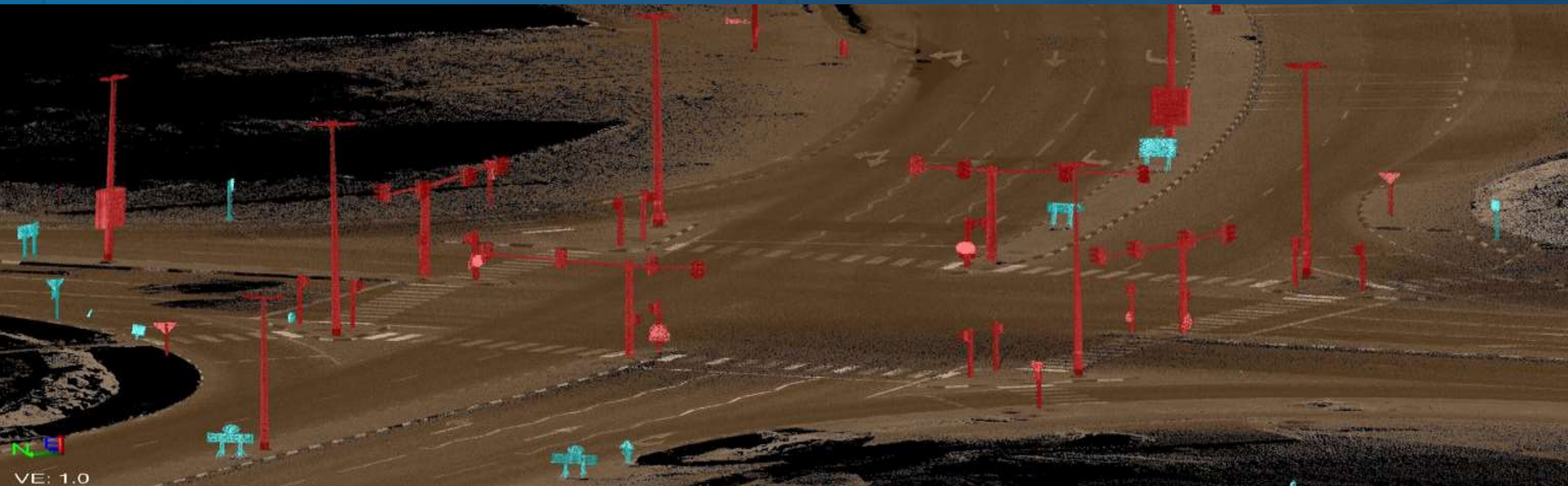










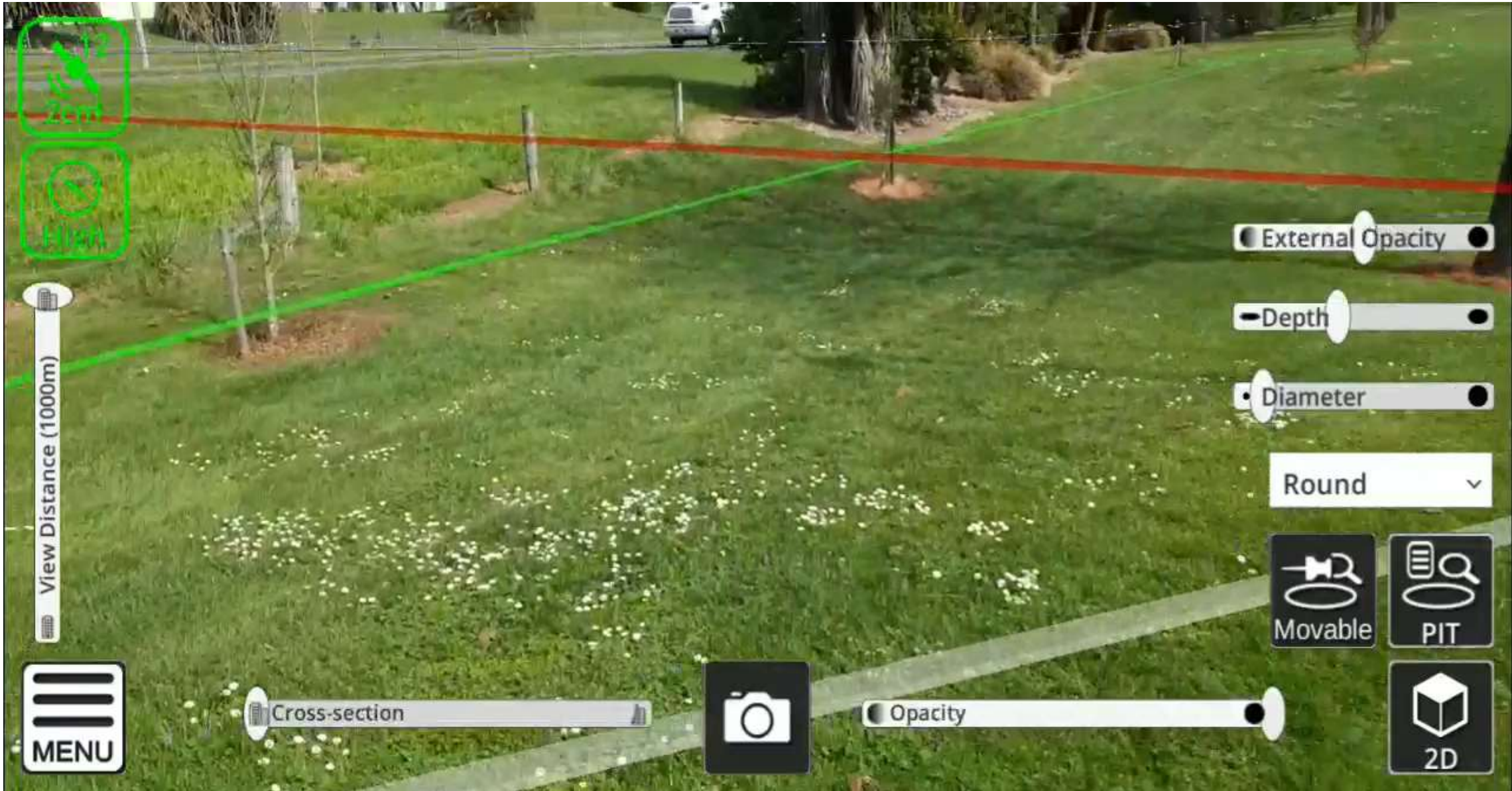


VE: 1.0



# Integrating Data at Site- Utilities





# Trimble Geospatial

GNSS Positioning Services



Survey & Mapping  
GNSS Systems

High Precision  
Mixed Reality



Mobile & Cloud  
"Asset First" Software

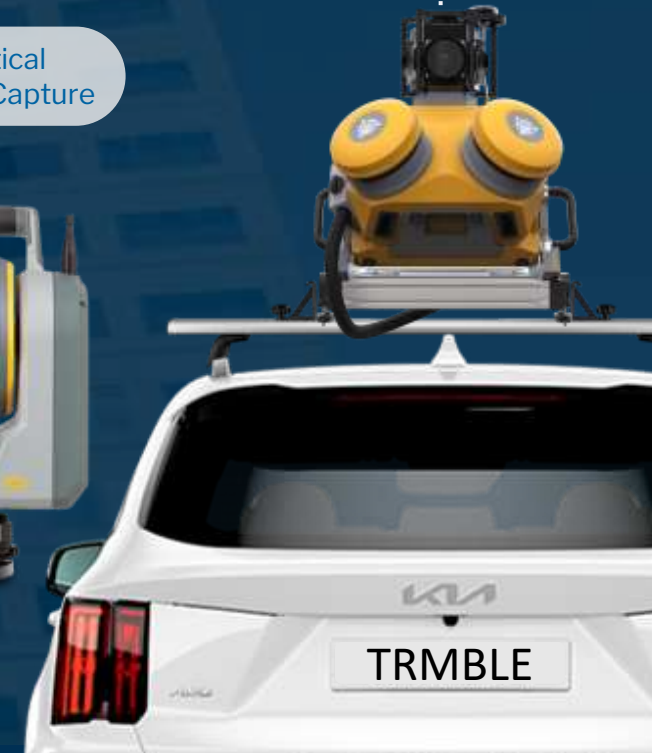


Ruggedized & Specialized  
Handhelds, Controllers, & Tablets

High Precision Optical  
Positioning & Reality Capture



Mobile Mapping



TRIMBLE

# Thank you

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KIITOS  
BEDANKT  
Teşekkürler  
DANKIE  
Ευχαριστώ  
Спасибо  
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ありがとうございます

