

# UAS for Digital Twin & AI Data Capture

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# Takeaways



- Digital Twin Concept
- Digital Twin Inputs
- Digital Twin Data Collection & Rendering
- AI for Data Collection & Analysis
- Digital Twin Workflow
- Conclusions

# Digital Twin Concept



## Digital Representation of a Physical Asset

- 3D Point Cloud or Mesh
- Geospatially Correct
- Measure
- Annotate
- Share

Digital Twins provide a way to collaborate and communicate.

# Digital Twin Inputs

- Images from UAS or Camera
- Ground Control
- QR Codes
- Asset Information



# Digital Twin Data Collection



## UAS Mission Types

- Pre-Planned
- Manual
- AI Missions

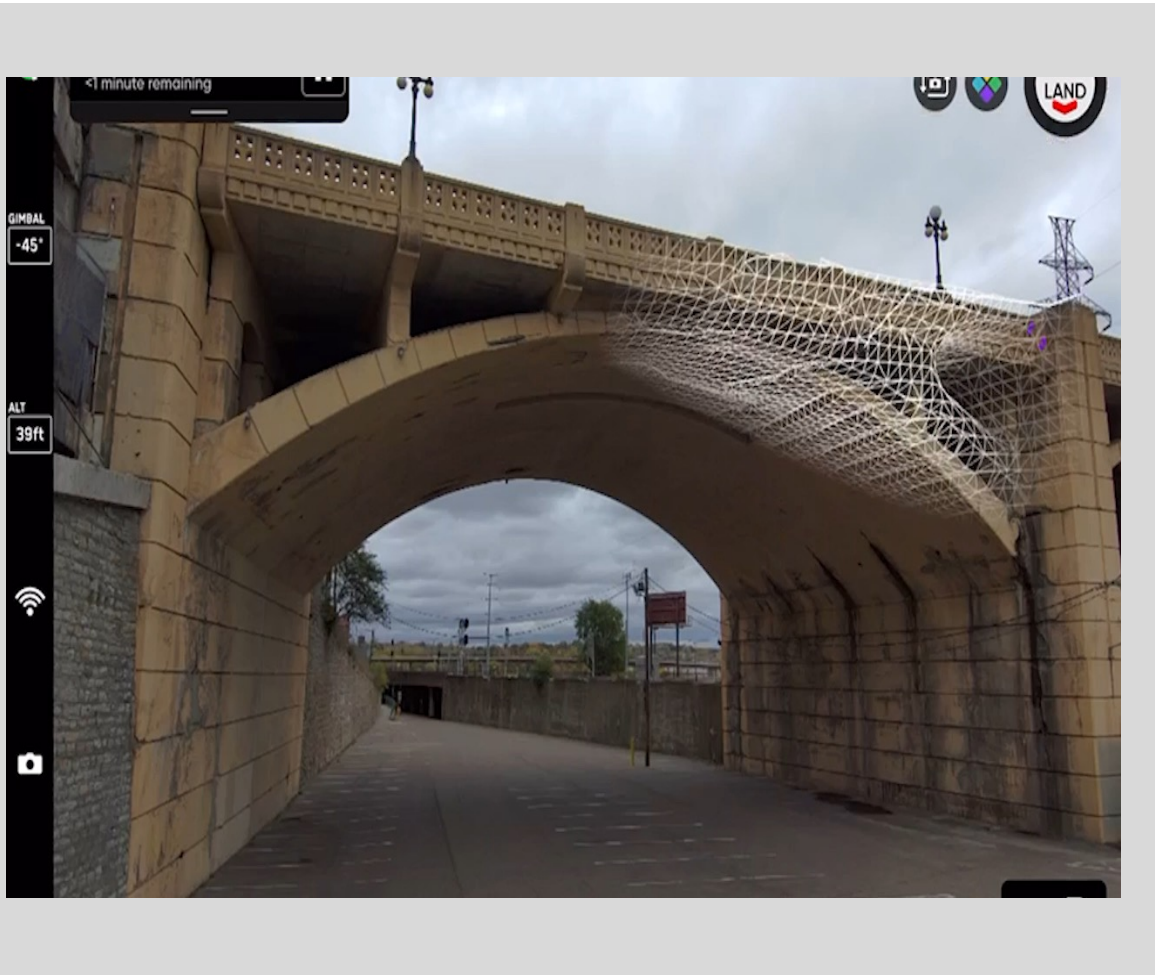
## Considerations

- Lighting Conditions
- Quality & Quantity
- Images with 70-80% Overlap

# Digital Twin Rendering



# AI For Data Collection



- Only directional input from pilot
- Autonomous mission plan and data collection
- Dense data capture

# AI for Data Analysis



## Analysis Process

- Digital Twin rendering
- Detectors identify deficiencies
- Field confirmation by inspectors
- Deficiencies quantified from model
- Quality control data set



# Digital Twin Workflow for Infrastructure Management

1. UAS Field Data Capture
2. Digital Twin Creation
3. Analyze Digital Twin
4. Field Inspection
5. Project Development & Design
6. Construction



# Conclusions



- Improved data quality
- Improved efficiency for project teams
- Improved quality control process