



HOUSTON

engineering, inc.

ENGINEERING | TECHNOLOGY | SOLUTIONS

VARIOUS DRONE CAPABILITIES

Two horizontal bars are positioned below the title. The top bar is light blue and tapers to the right. The bottom bar is a solid olive green and has a constant width.

Drone Technology



WHAT DATA CAN A DRONE CAPTURE?



High Quality Photos



4K Resolution Video



Volume of Material



Existing Topography for Digital
Elevation Models

(accuracy will depend on project)



Drone Technology: Types of Services



Measure Stockpile and Gravel Pit Volumes

Capture large volume data much faster than traditional methods while also relieving personnel from dangerous working conditions.



InfraWorks Orbit of Stockpile

Project Example: Lake Park Bridge Construction Progress



AERIAL AND MOBILE LIDAR

Two horizontal bars are positioned below the title. The top bar is light blue and tapers to the right. The bottom bar is a solid olive green and has a constant width.

Capturing LiDAR



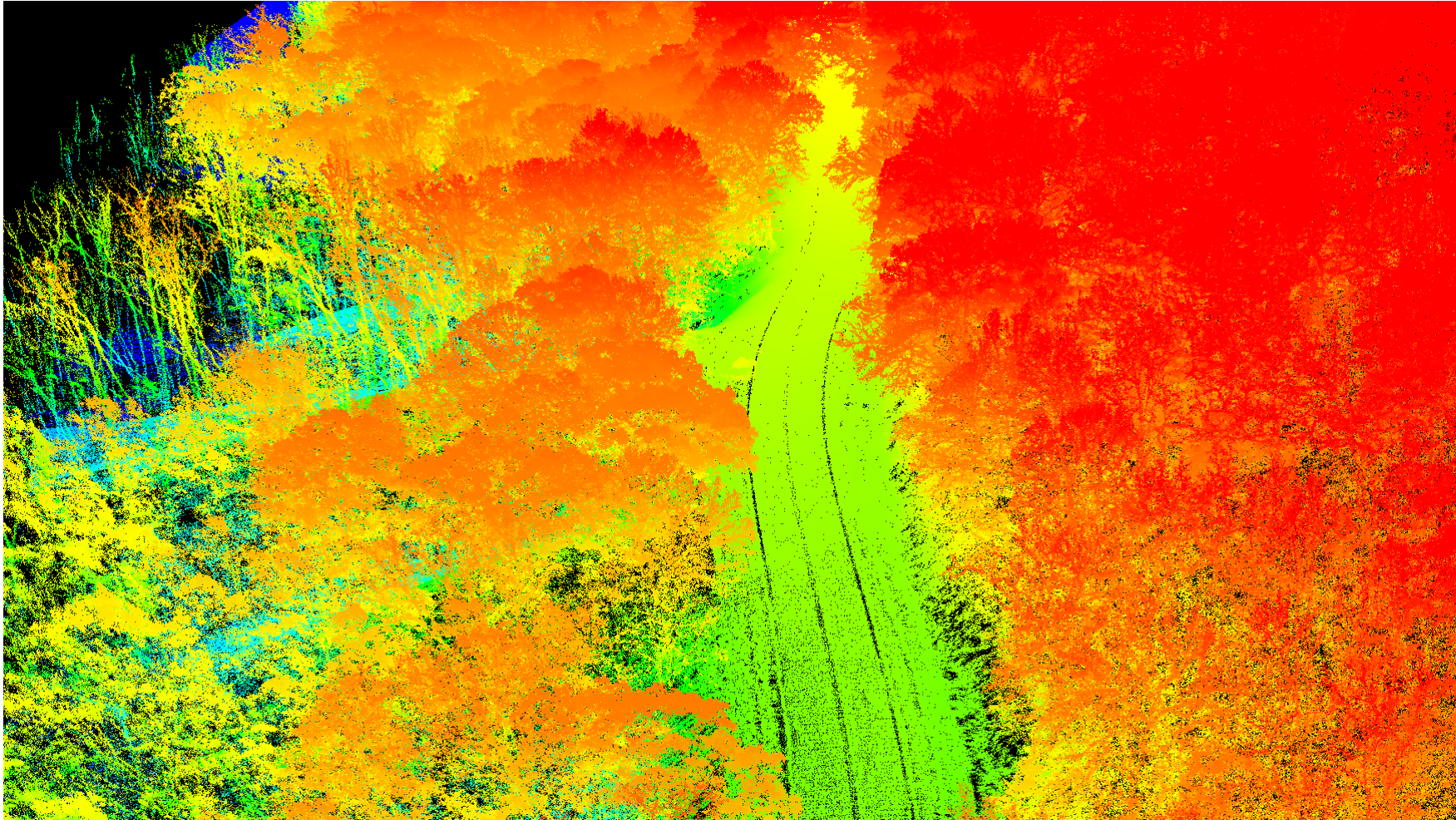
HEI uses state-of-the-art drone and mobile LiDAR systems and analysis software to provide cost effective and accurate survey packages to clients.



Aerial via Drones or Helicopter
Mobile via vehicles

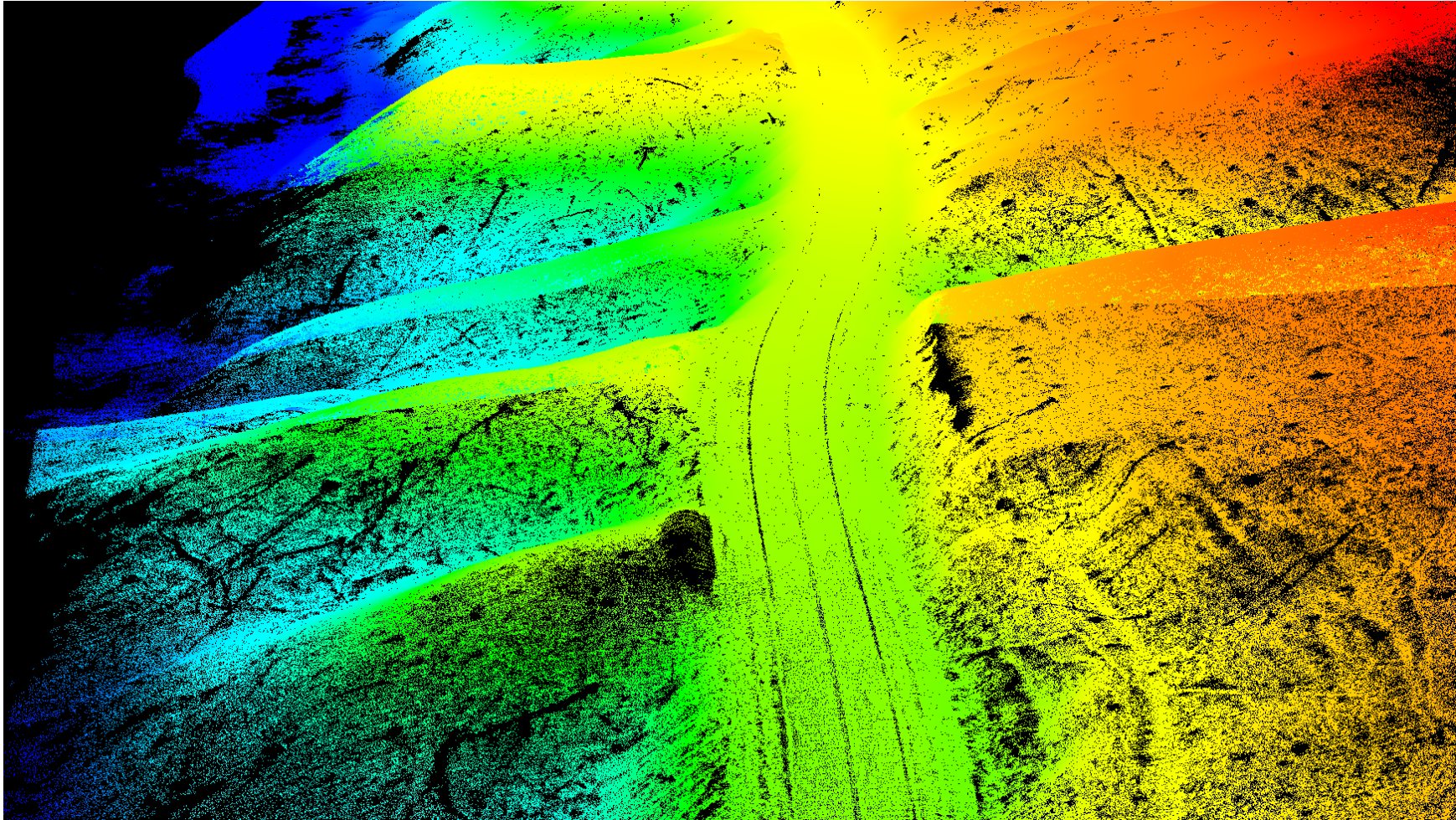


Too Much Data?



Full LiDAR collection

Nope!



Ground Classification Only

Benefits vs. Traditional Survey Methods

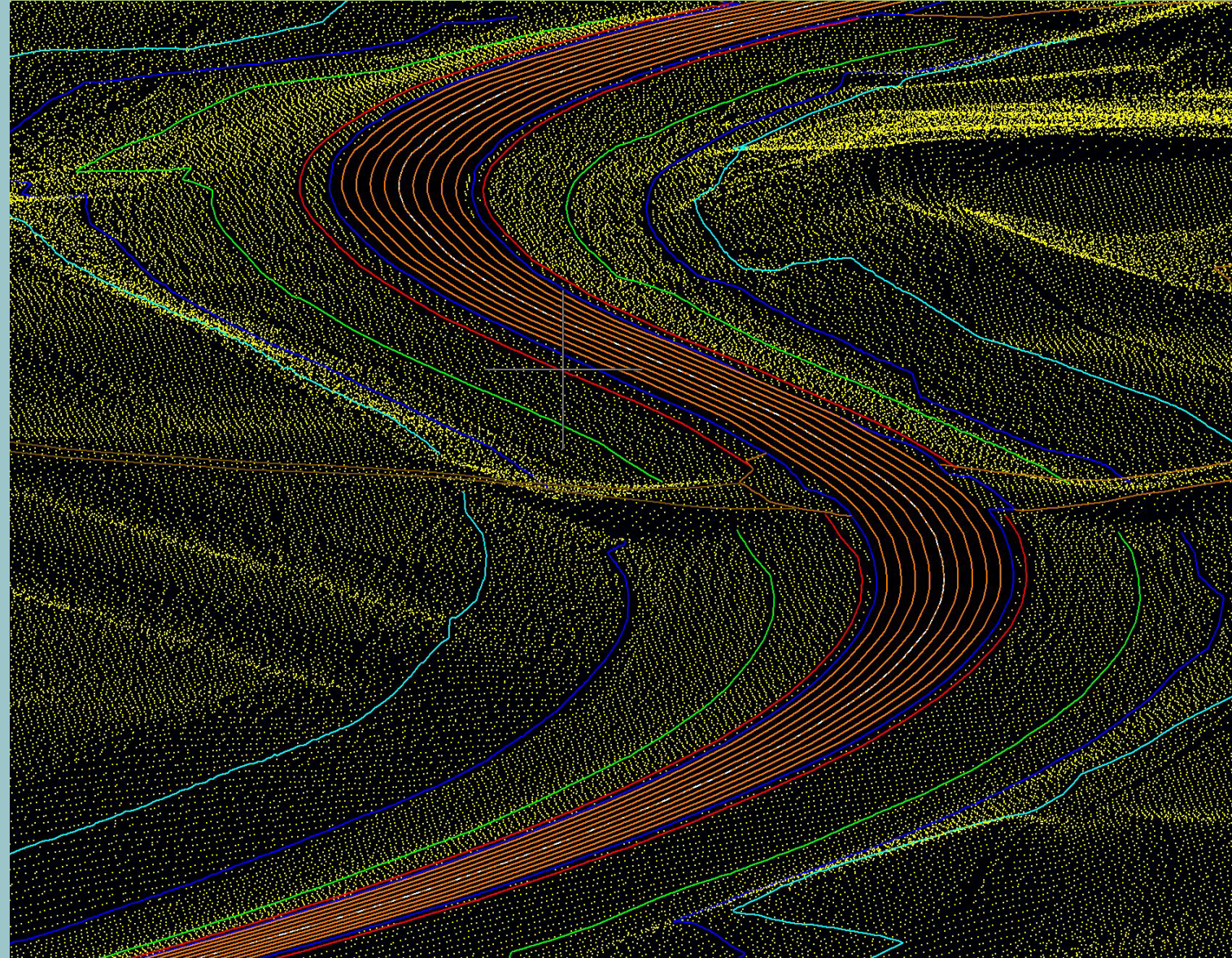


Benefits vs. Traditional Survey Methods



Flexibility and Time Savings

- Mobile LiDAR can collect large areas in a single day.
- LiDAR Collection requires much less time on site than a typical survey crew.
- Eliminates the scheduling hassles of a plane for aerial LiDAR.
- Surveying from an office chair after collection.

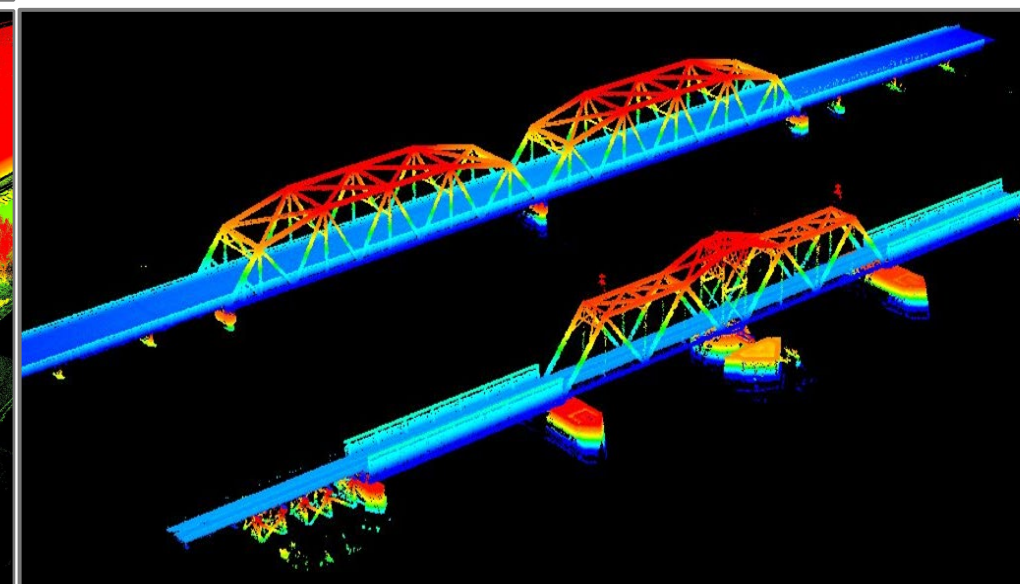
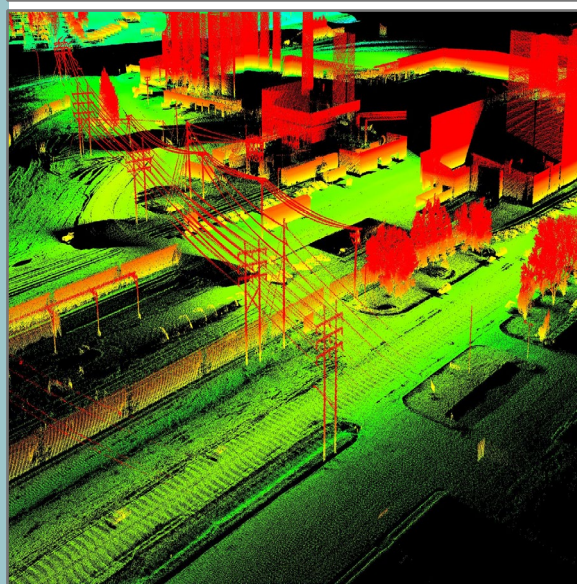
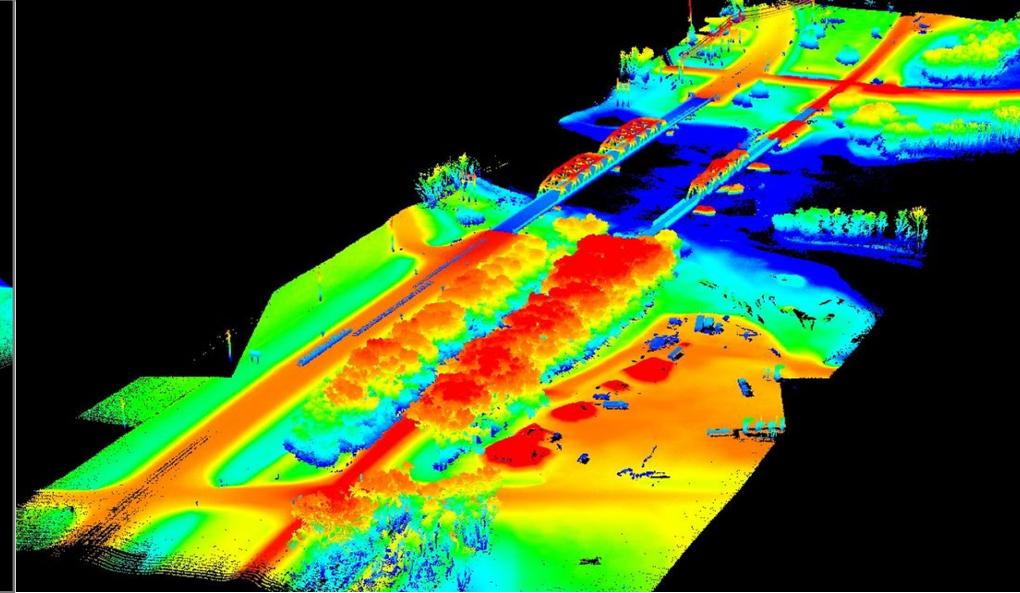
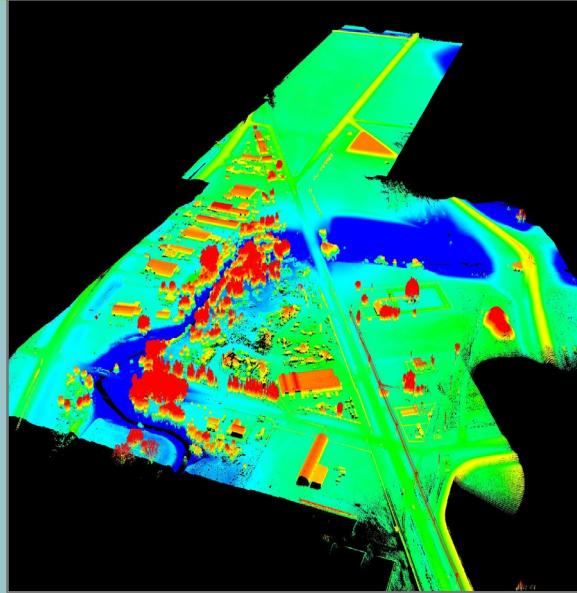


Benefits vs. Traditional Survey Methods



Quality and Accuracy

- Mobile LiDAR allows us to capture millions of data points with survey-grade vertical accuracy
- More data points = highly accurate surface models for design deliverables.
- Need experts in data processing
- Provide product to end user in various formats, including MicroStation or AutoCAD.





Quality and Accuracy

- Mobile LiDAR typically can't acquire beyond roadway inslopes (down bottom and backslopes require other methods)
- Most projects going forward are a **combination** of Aerial and Mobile LiDAR



Benefits vs. Traditional Survey Methods



Cost

- Vs. Traditional Survey

Rough Cost Savings Estimate:

- less expensive than traditional survey methods
(dependent on project size)

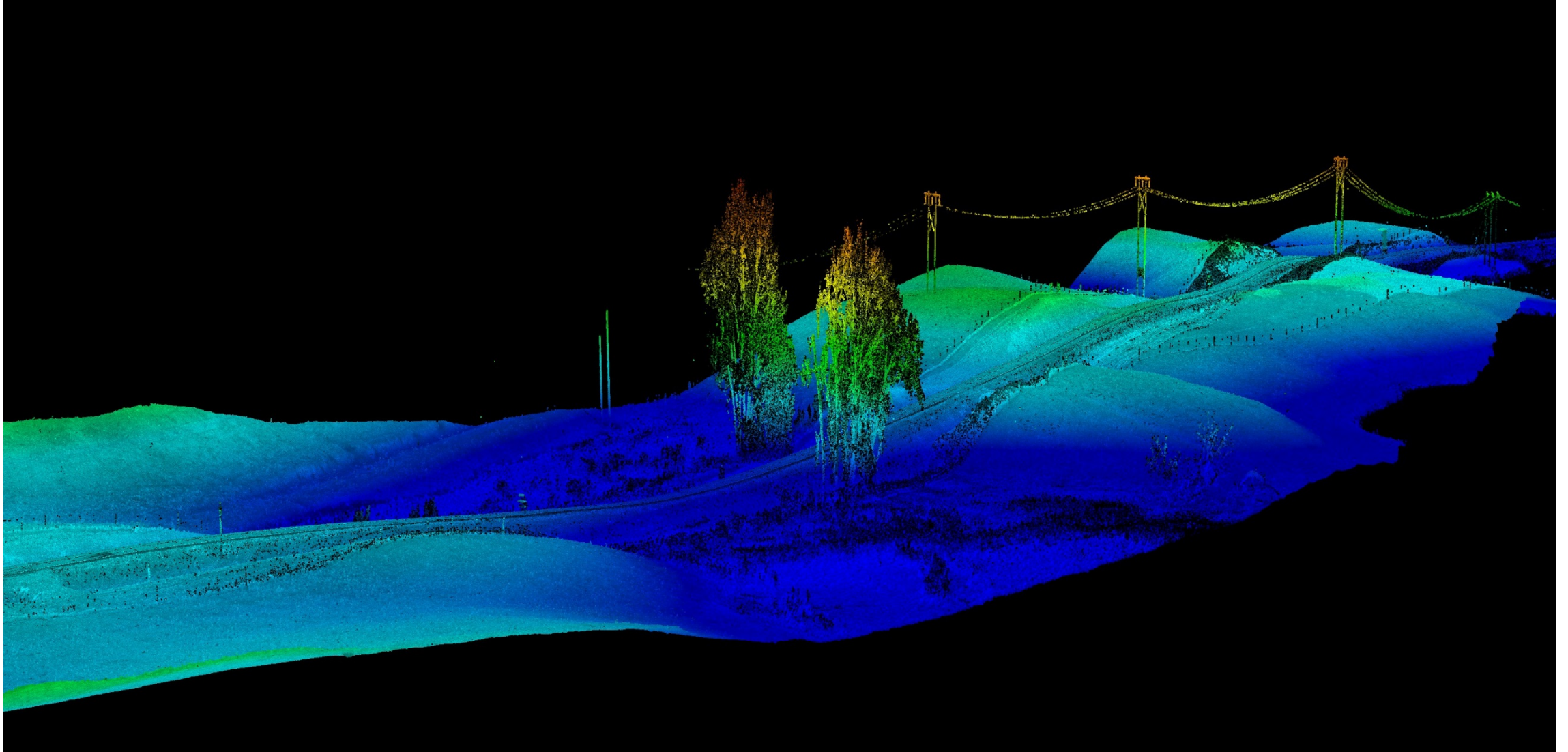


Safety

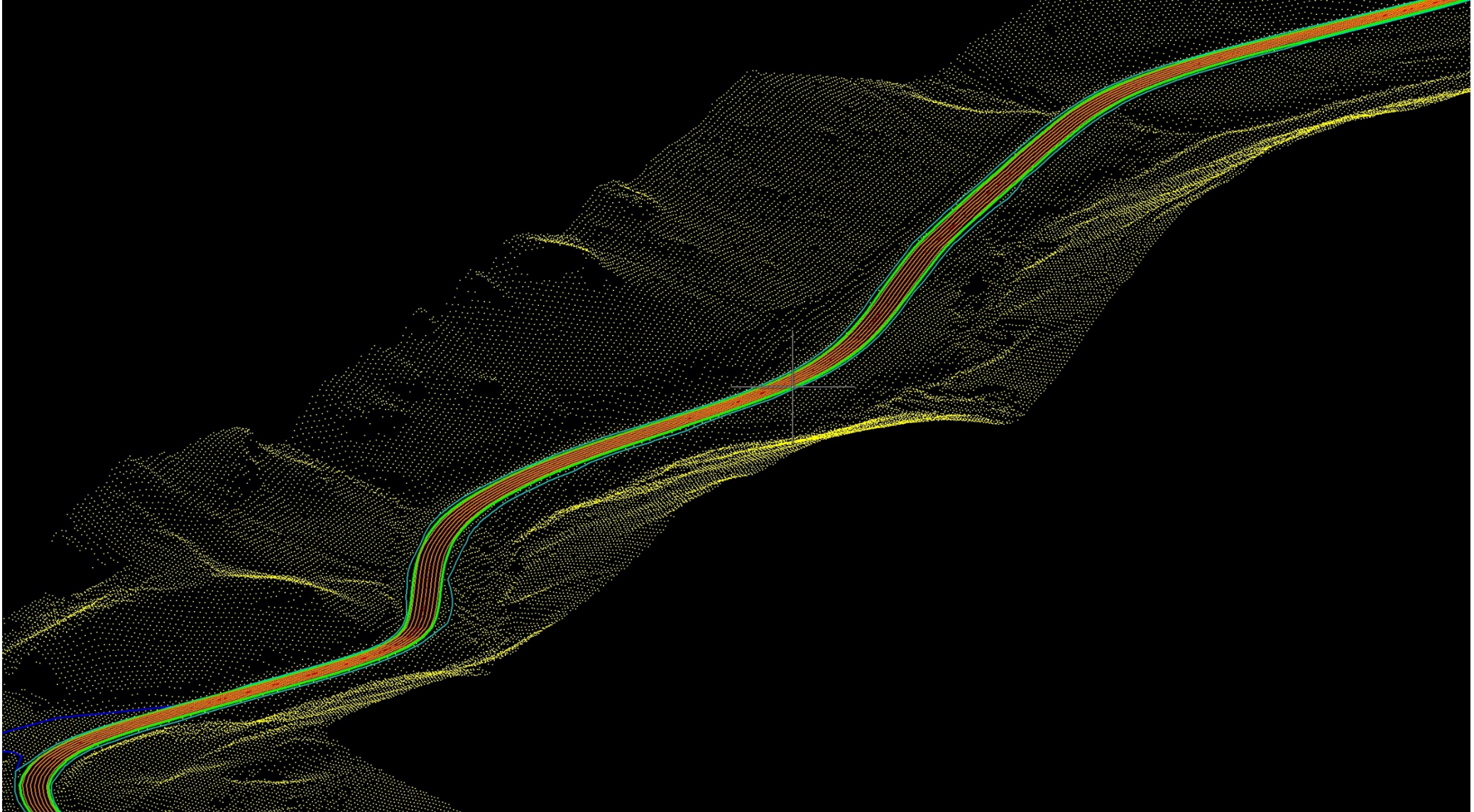
- Drones can be flown over rough, unstable terrain or unreachable areas.
- Team uses trained pilots
- LiDAR can be collected at **NIGHT**



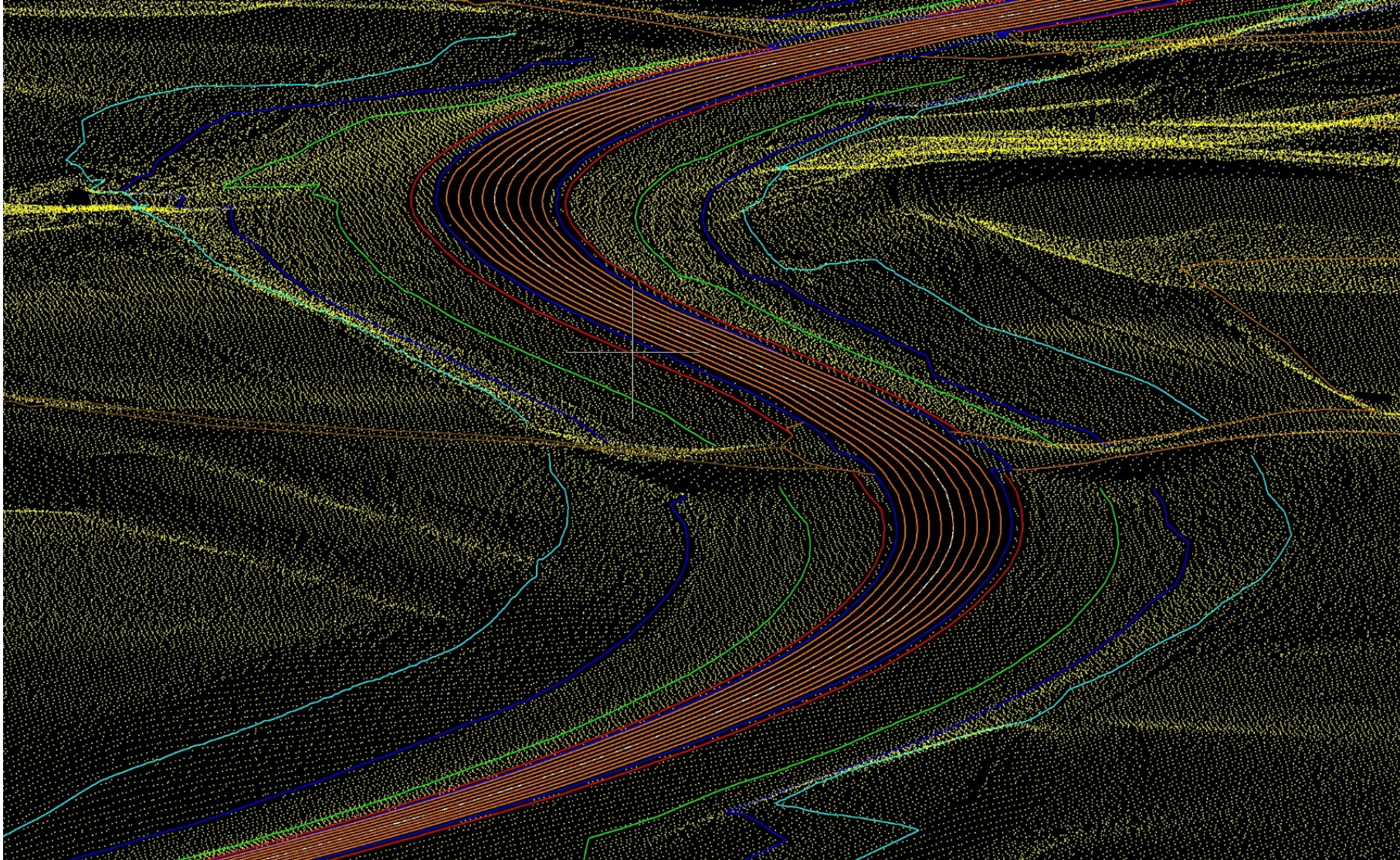
How LiDAR Enhances Projects



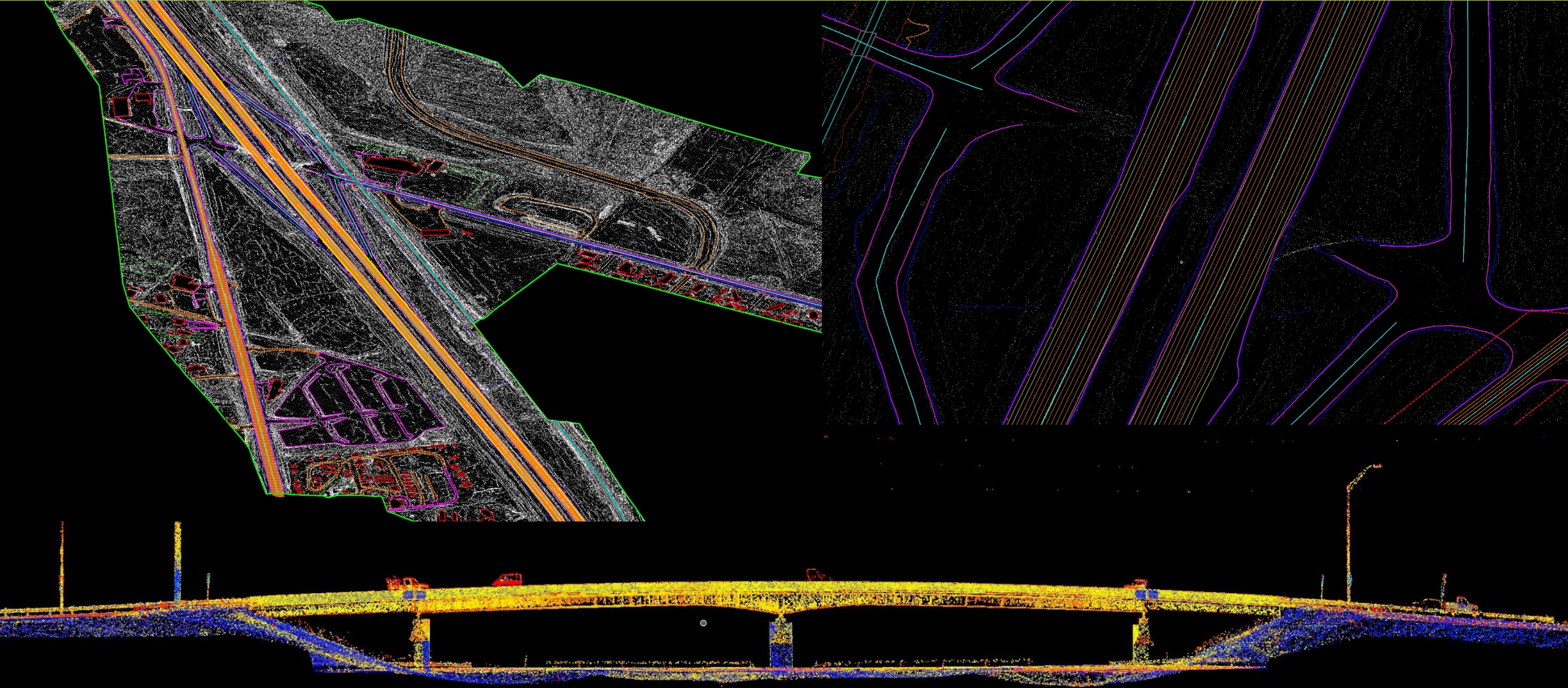
Project Example: Wabasha County



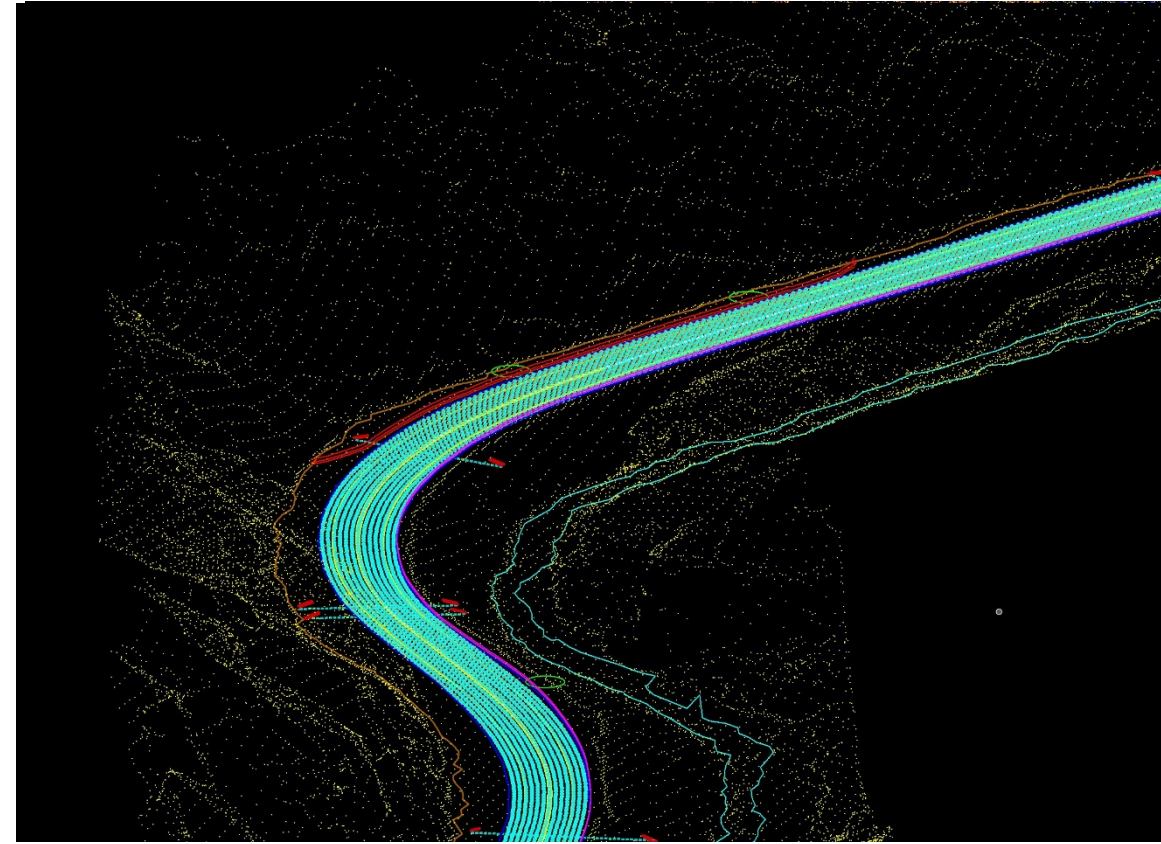
Project Example: HWY 73, NDDOT



Project Example: I90, SDDOT

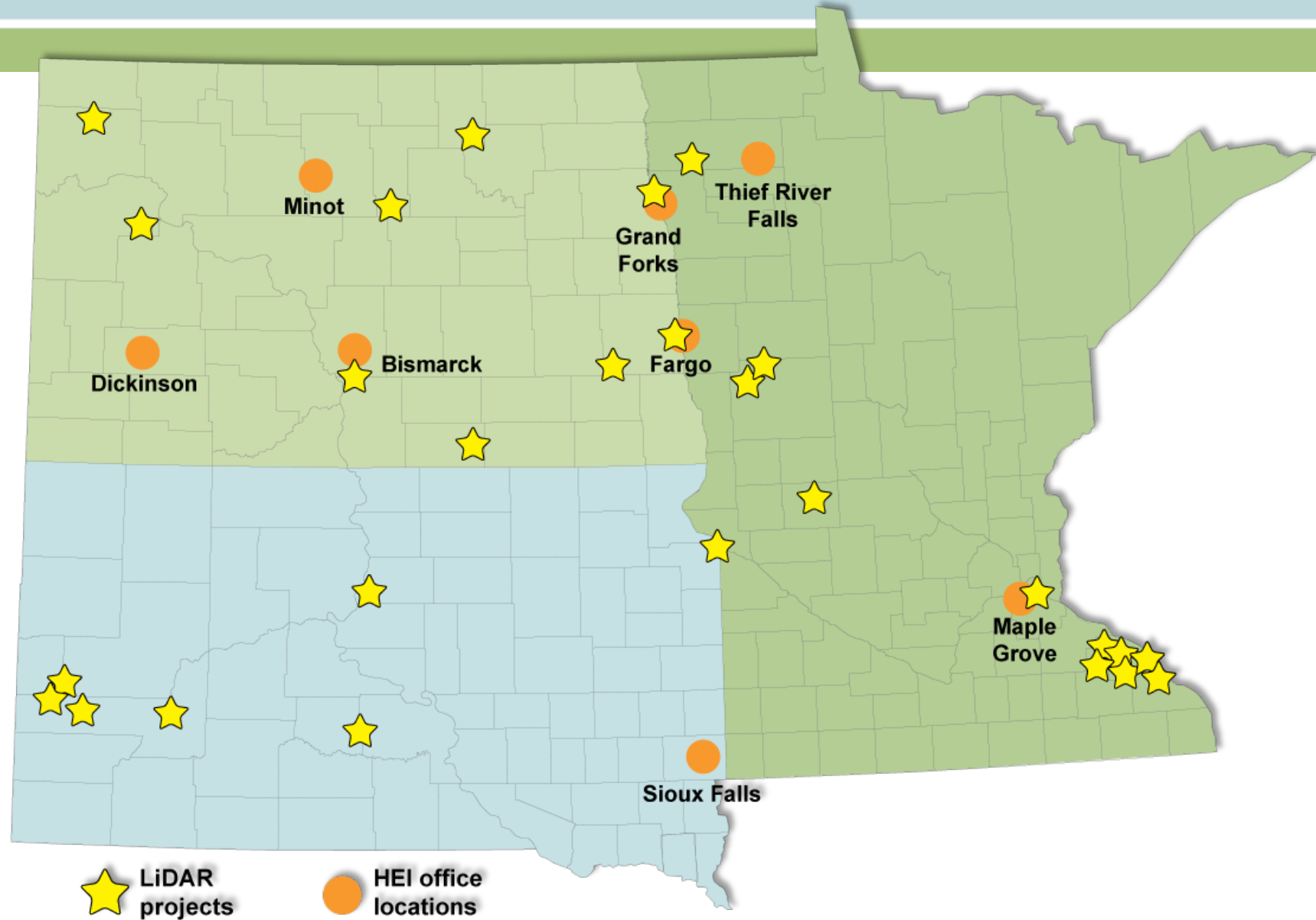


Project Example: HWY 14A, SDDOT

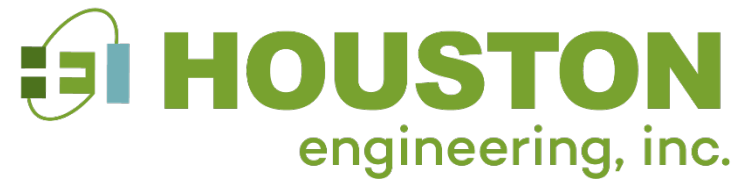


Is this a photo? Nope, it's a colorized point cloud.

Project Experience



QUESTIONS



<https://www.houstoneng.com/drones>