



Crossing-i:

The Automated, Drone-Based, Crossing Inspection System

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Background

- Incidents at highway-rail grade crossings contribute to hundreds of fatalities a year. Lack on critical infrastructure data ("humped" crossings, inadequate sight distance) increase related risks.
- Drone-enabled 3D technologies can provide rapid, objective, and repeatable evaluation of the crossing environment, including vertical grades, acceptable sightlines, and identifying/locating relevant assets, such as signage.
- The Crossing-i system provides accurate and highly visual data and analytics from office environment to identify shortcomings/risks and establish prioritizations.

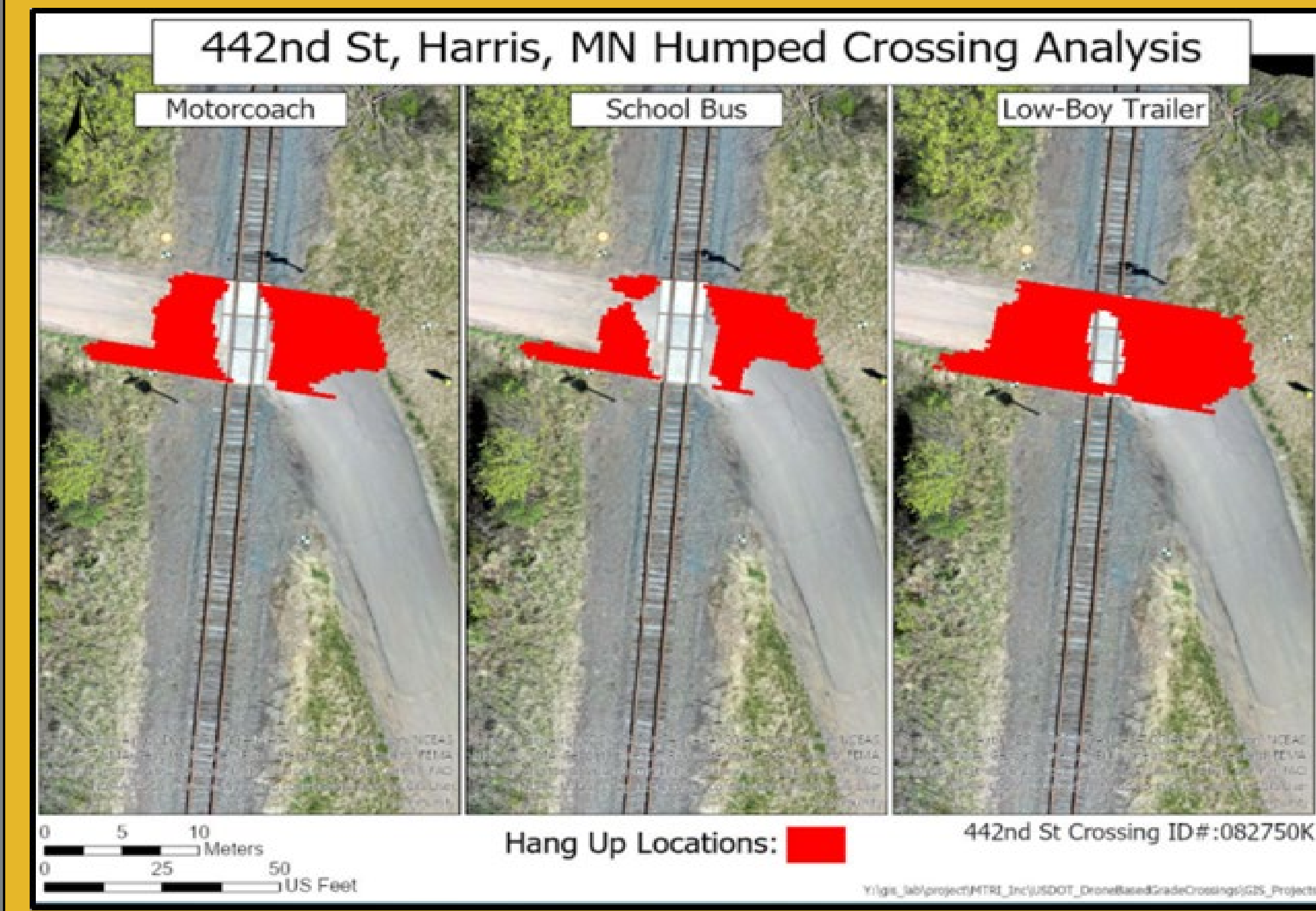
Partners and Crossing-i Demonstrations



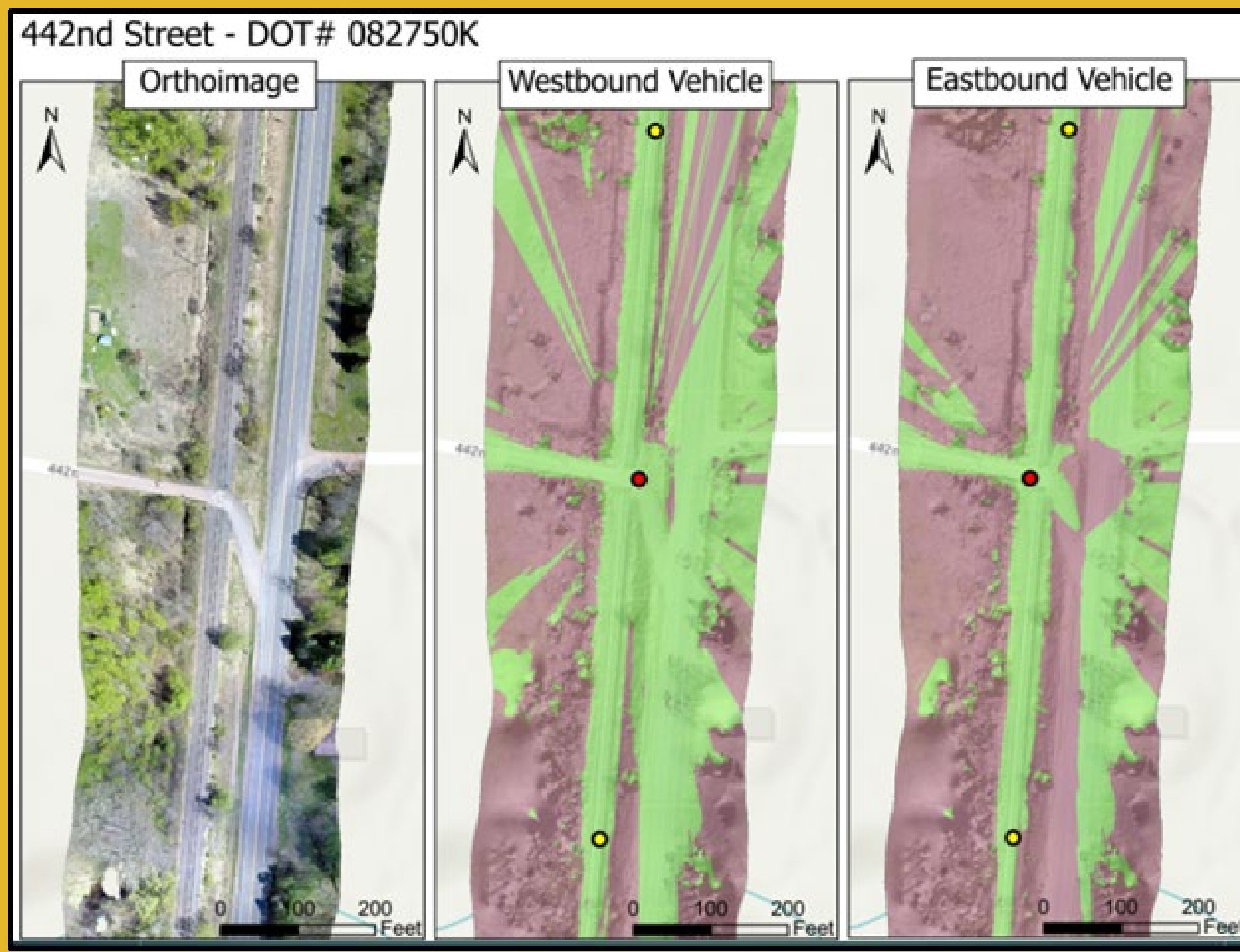
- 37 crossings surveyed in x states
- Field demonstrations with five state DOTs and four railroad companies.
- Collaboration and feedback for improvements

Automated Crossing-i Analysis Tools

"Humped" Crossings



Visual Sight Lines



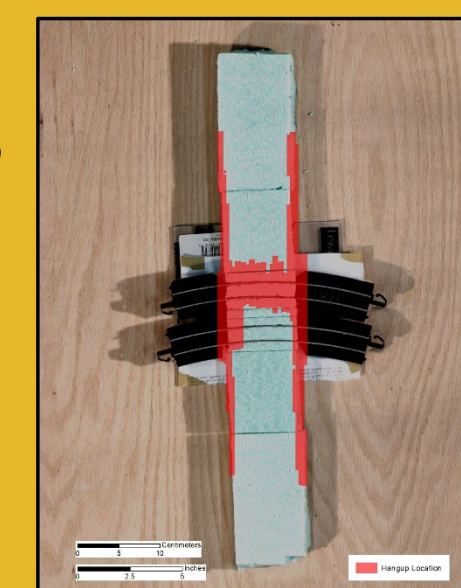
Sign Identification



Crossing-i Development Under SBIR

Crossing-i was initially developed under Small Business Innovation Research Grants (Phase 1 and 2), funded by the Federal Railroad Administration

1. Prototype and algorithm development
2. Testing in laboratory environment
3. Develop Crossing-i analysis tools for automated analysis
4. Initial deployment and test at crossings
5. Web portal development for client access.
6. Business plan development
7. Next Steps:



- A. MTRAC Innovation Hub for Advanced Transportation 1 year project (Aug 2022-2023)
 - A. Seeking partners for technology implementation and commercial partnerships
 - B. Create virtual environments and reporting useful for Crossing Diagnostics
 - C. Perform data collections in multiple states across the U.S.

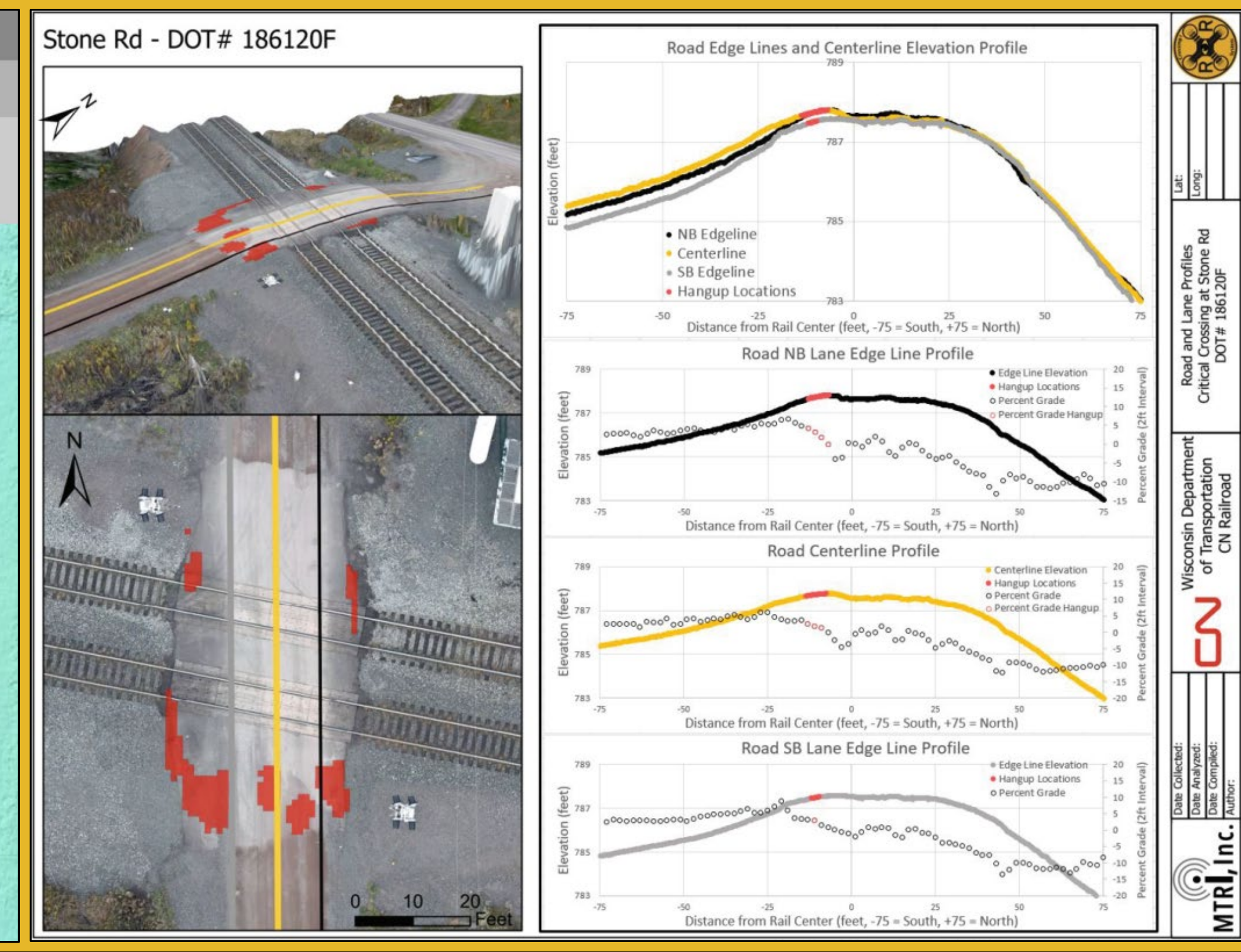
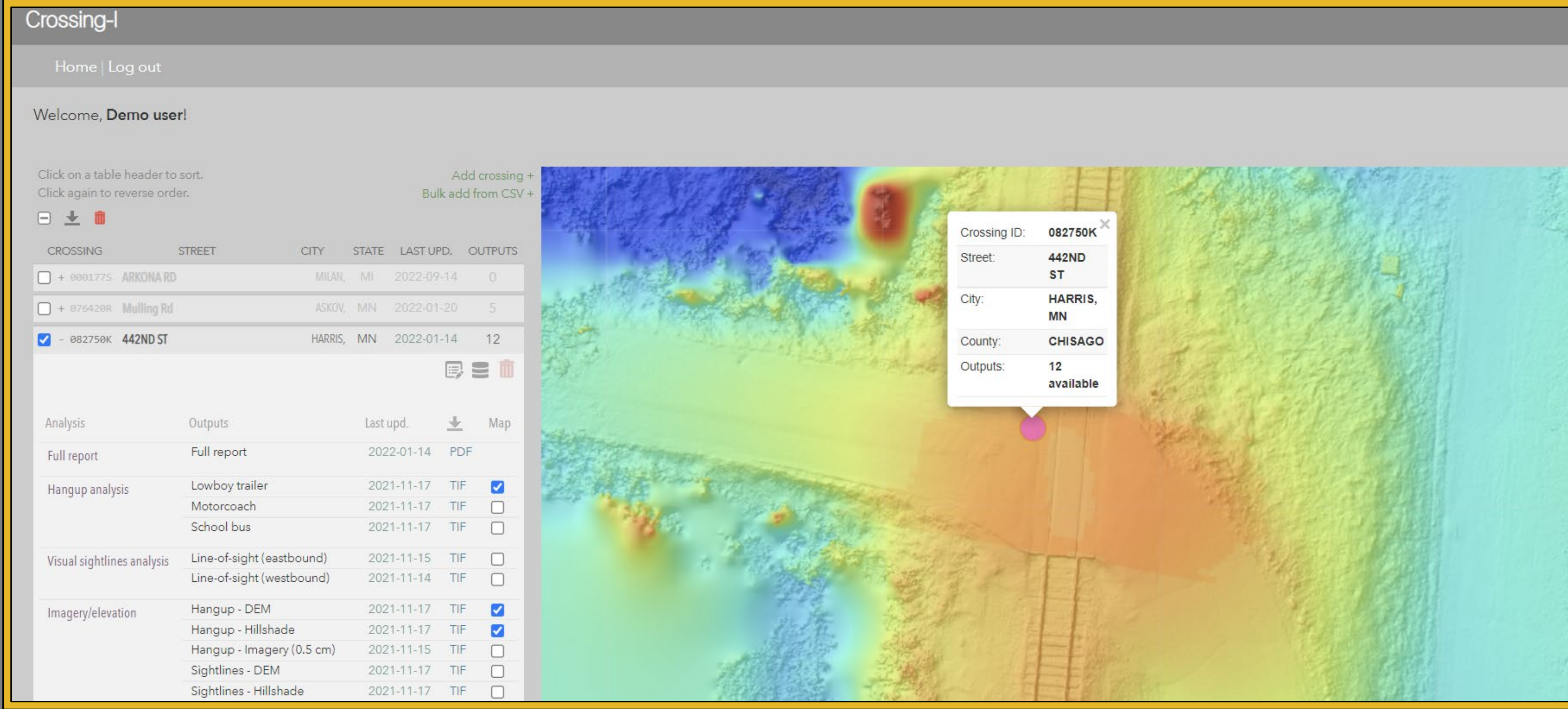
Web Portal for Reporting and Data Sharing

- Customer access through Crossing-i web portal, analysis data, Crossing-i Reports created by MTRI, Inc.
- Integration of FRA crossing database to provide customer access to all associated data for a crossing.

A Single Drone System for Crossing Inspection



- Crossing-i uses a single customized drone platform (Tarot X6) capable of autonomously performing a pre-planned flight mission
- We use Aeropoint ground control targets
- High-resolution, geo-located data products, in a 30-45 minutes time period per crossing.



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