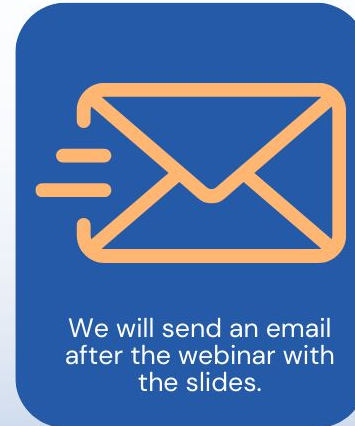


# Webinar: How AI and Geospatial Capabilities Enhance Transportation Safety

REGISTER TO ATTEND THE UPCOMING WEBINAR AND Q+A  
HOSTED BY OUR GEOSPATIAL AND TRANSPORTATION INDUSTRY EXPERTS →

WEDNESDAY, JUNE 7 | 11AM CST



**OBJECT COMPUTING PRESENTS**

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**A FUTURE LOOK:  
How Geospatial and AI  
Deliver More Safety**

6/7/23



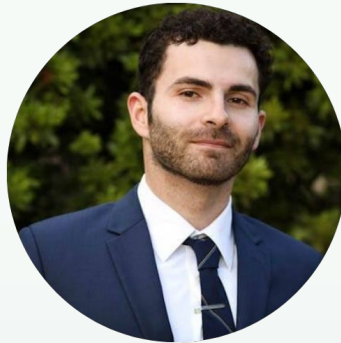
# Agenda

- Introductions
- Business challenge
- Our solution
- AI, LiDAR, and Geospatial capabilities for other industries
- Q & A

# Presenters



Andy Montgomery  
Dir. of Products and  
Innovation



Daniel Rusinek  
Data Engineer



Chris Freeman  
Commercial Lead &  
Account Executive

# Introduction

For 30 years, we've helped clients discover new business frontiers with breakthrough technologies while delivering measurable business outcomes.

We specialize in software engineering, AI, machine learning, DLT/blockchain, and connected, scalable solutions.

We work with organizations like US Intelligence Agencies, mission-critical operations like NASA, industry disruptors like Bloomberg and transportation innovators like Class 1 Railroads.





## Rail and Transportation Domain

Our transportation-focused group delivers products and services to help railroads achieve their digital objectives.

Team of 15 data scientists and software engineers have deep experience supporting Class-1 railroads, regional railroads, metro lines, and major suppliers to the rail industry.

Rail-specific IP and products include machine learning (data-driven applications), IoT (industrial sensors), and end-to-end solution development from consultation and problem solving to delivery.

# What We Do

1

**WE BUILD  
BESPOKE  
APPLICATIONS**

---

**WE CAN CUSTOM-BUILD  
YOUR APP**

2

**WE DELIVER  
NOVEL, RICH  
INSIGHTS**

---

**WE CAN IMPROVE YOUR  
EXISTING APPS**

3

**WE FUNCTION  
AS YOUR  
R&D TEAM**

---

**WE CAN EMPOWER YOUR  
TEAM TO BUILD PRODUCTS**

# Building Bespoke Applications

**1**

**WE BUILD  
BESPOKE  
APPLICATIONS**

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**WE CAN CUSTOM-BUILD  
YOUR APP**



**X**track.ai™





## Business Challenge

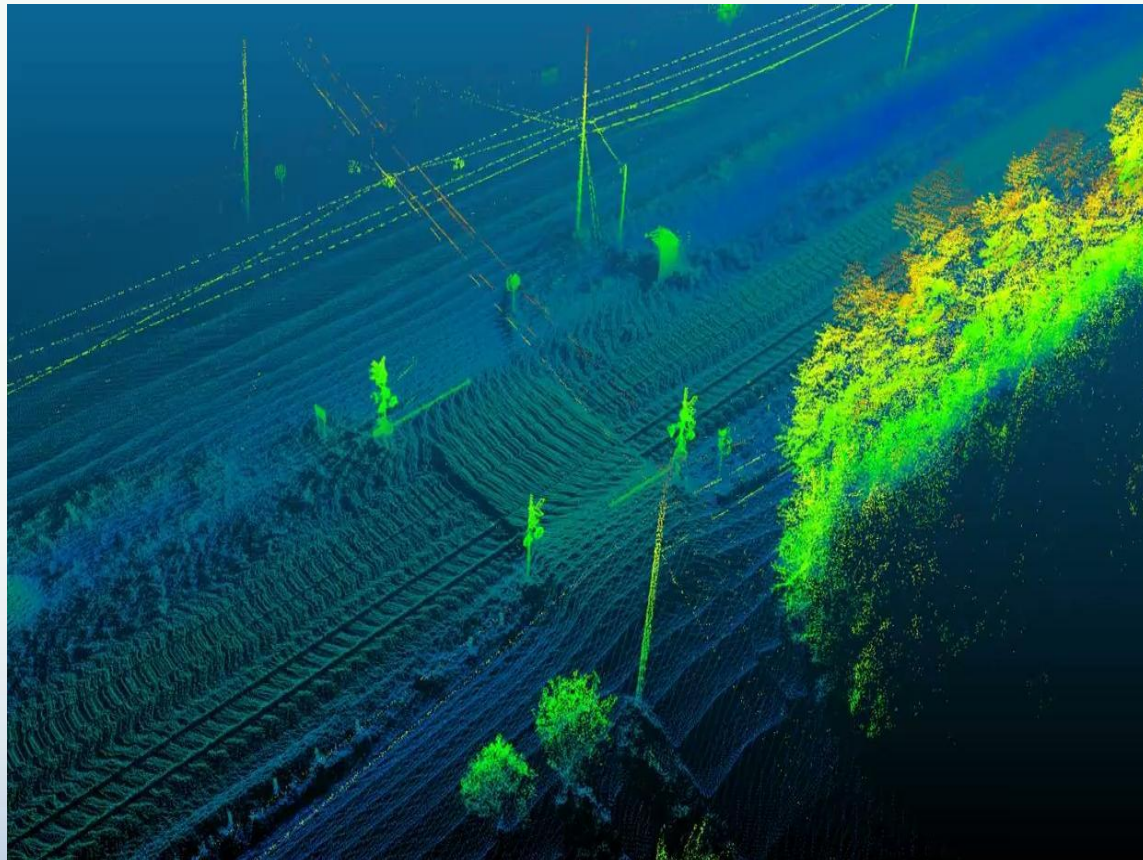
- Class 1 Railroads have thousands of crossings without active warning devices
- Maintaining automobile driver visibility at these crossings is a serious safety concern
- Necessary improvements
  - Manual and random inspection process
  - Maintenance planning



## Shaping the Solution

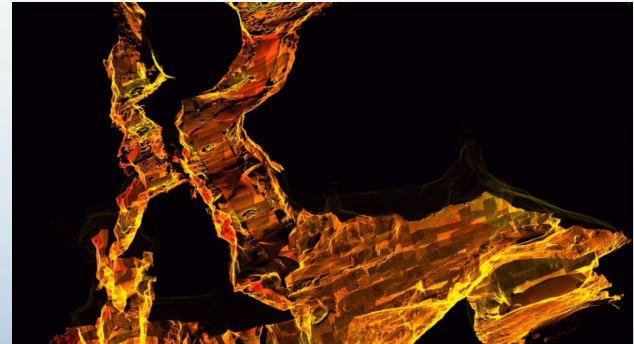
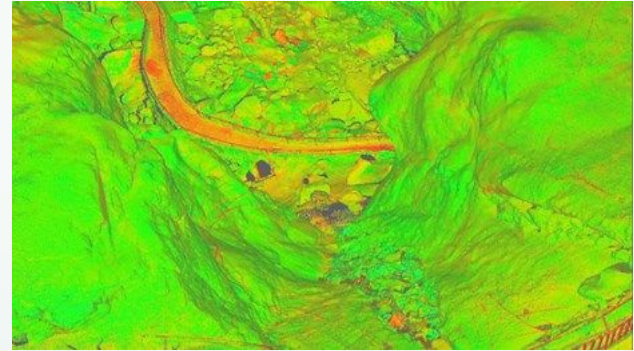
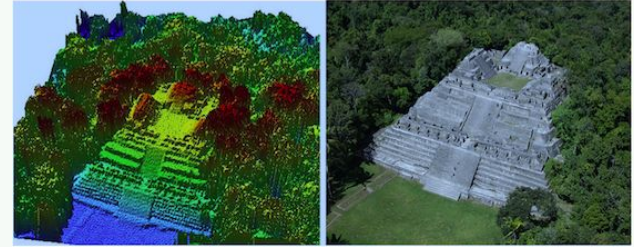
- LiDAR data collection occurs 1-6 times annually
- LiDAR data analysis and insights provide opportunities analyze elevation, vegetation and other obstructions
- These insights can create indispensable tools for reporting and maintenance scheduling

# LiDAR Footage



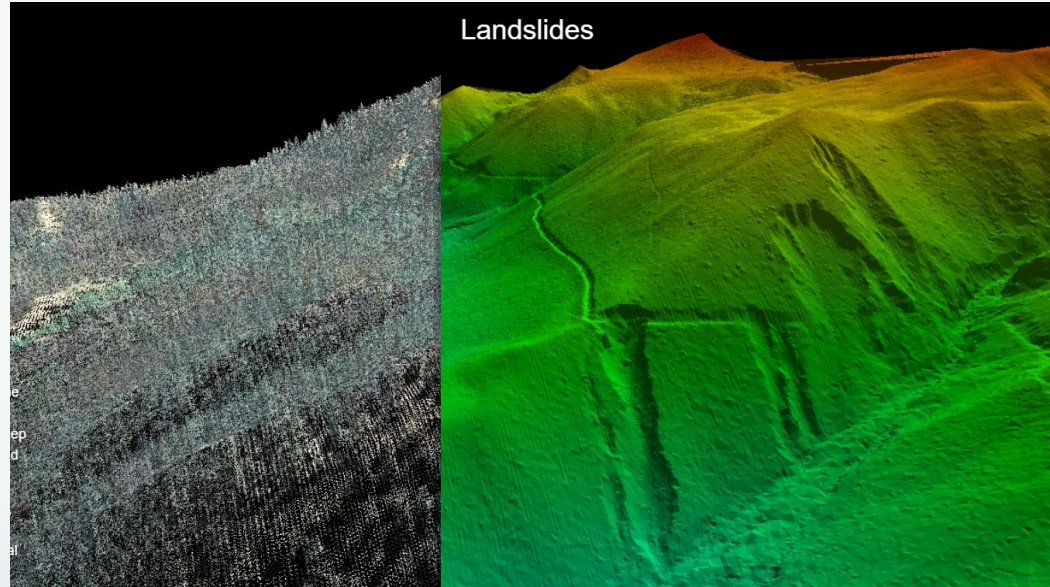
# Why LiDAR?

- Unlock concealed landscapes beneath tree canopies
- Generate detailed 3D models of previously inaccessible areas
- Gain aerial view of vast scenes
- Versatile deployment on aircraft, ground-based, or space platforms
- More affordable than ever

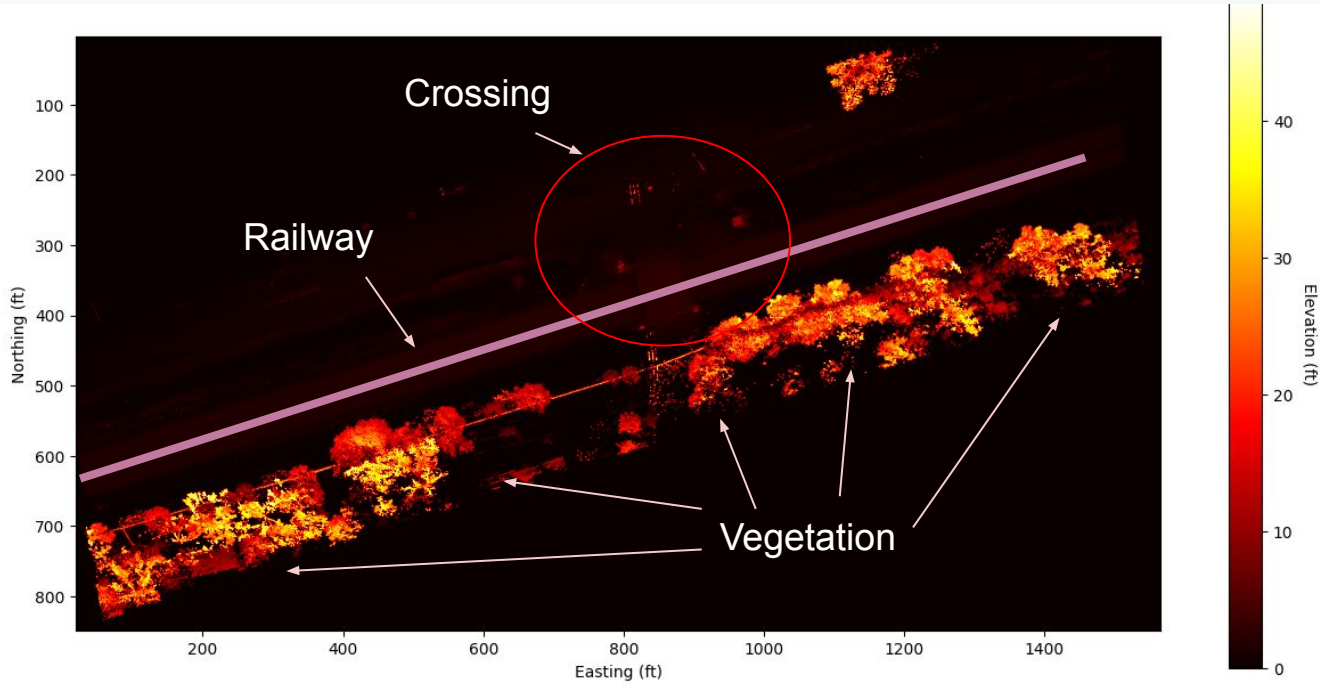


# Processing LIDAR Data into Heightmaps

- LiDAR point clouds are difficult to analyze as is
- Large file sizes
- Common practice to reorder LiDAR points into even grids
- Advanced Analytics with other sources
- Ex: Landslide Analysis (USGS)

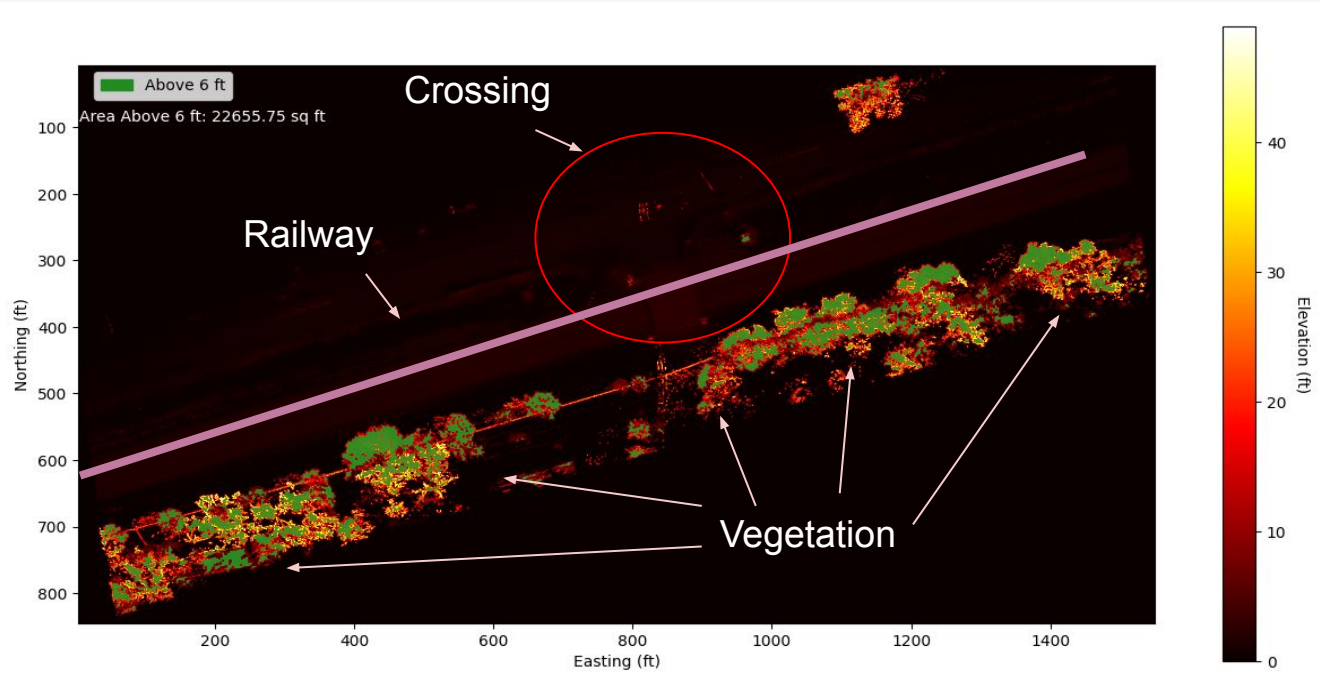


# Quantifying Tree Coverage for Informed Management Decisions



- Heightmap clearly identifies overgrowth vegetation
- Different color scales can emphasize different features

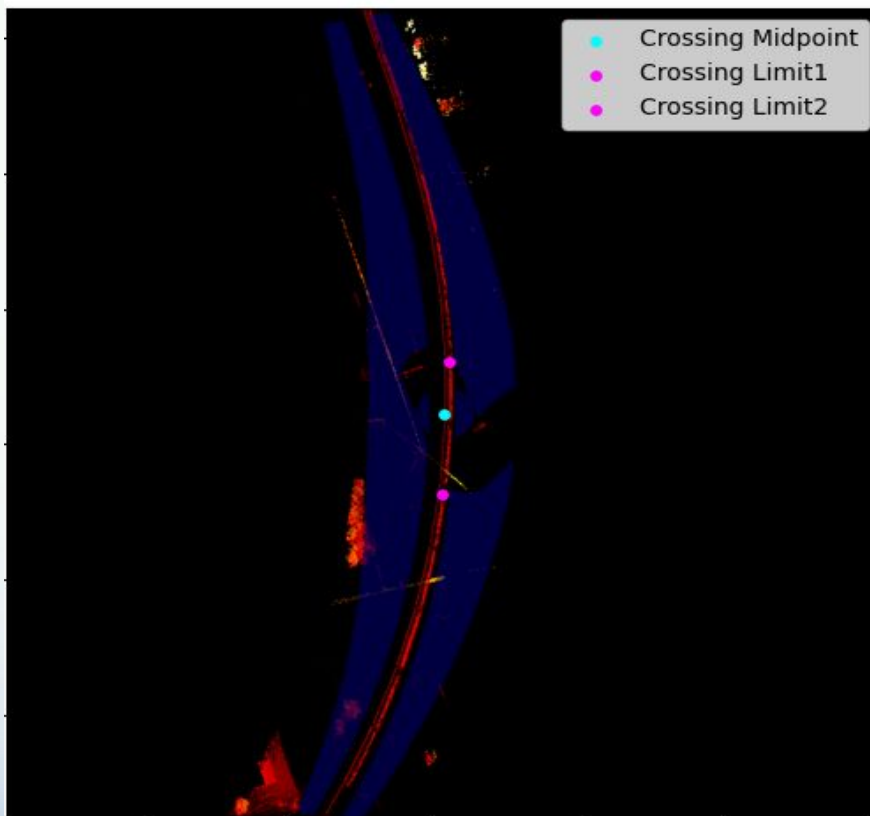
# Quantifying Tree Coverage for Informed Management Decisions



- Allows us perform spatial analysis with simple logic
- All pixels greater than 6 are shaded green
- Many more analytical possibilities

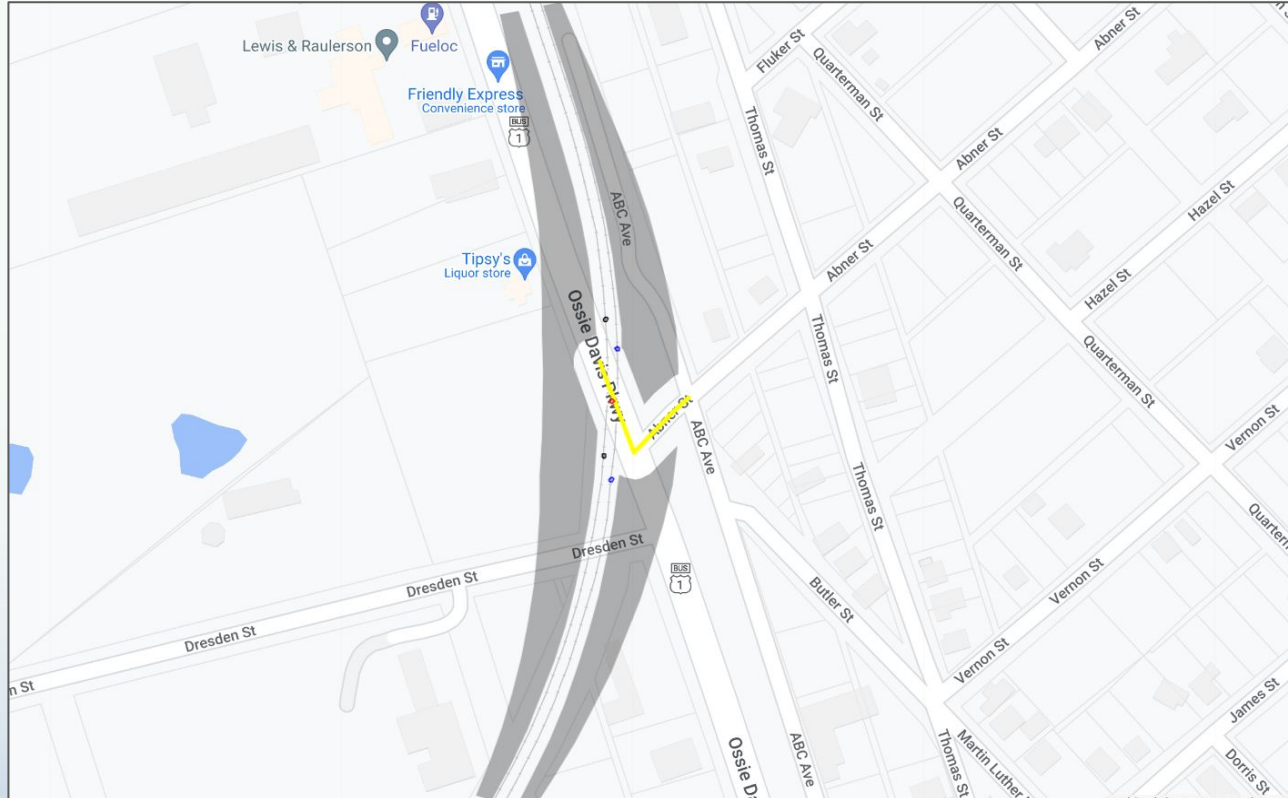
# Compliance Shape Creation

- Robust algorithm can handle any 2D geometry
- Minimal GPS surveying required
  - Track centerpoint
- Quick performance
- Map API integration can handle several unique geometries



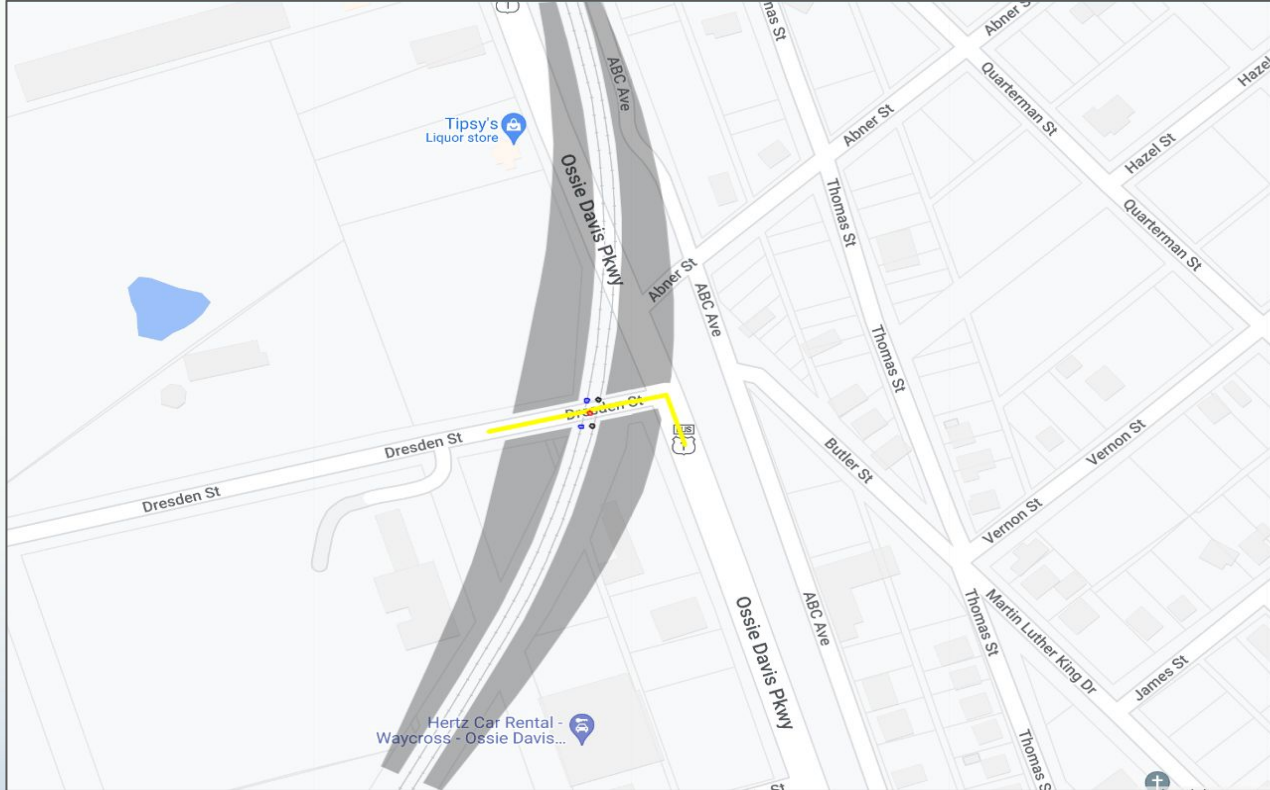


# Complex Intersections



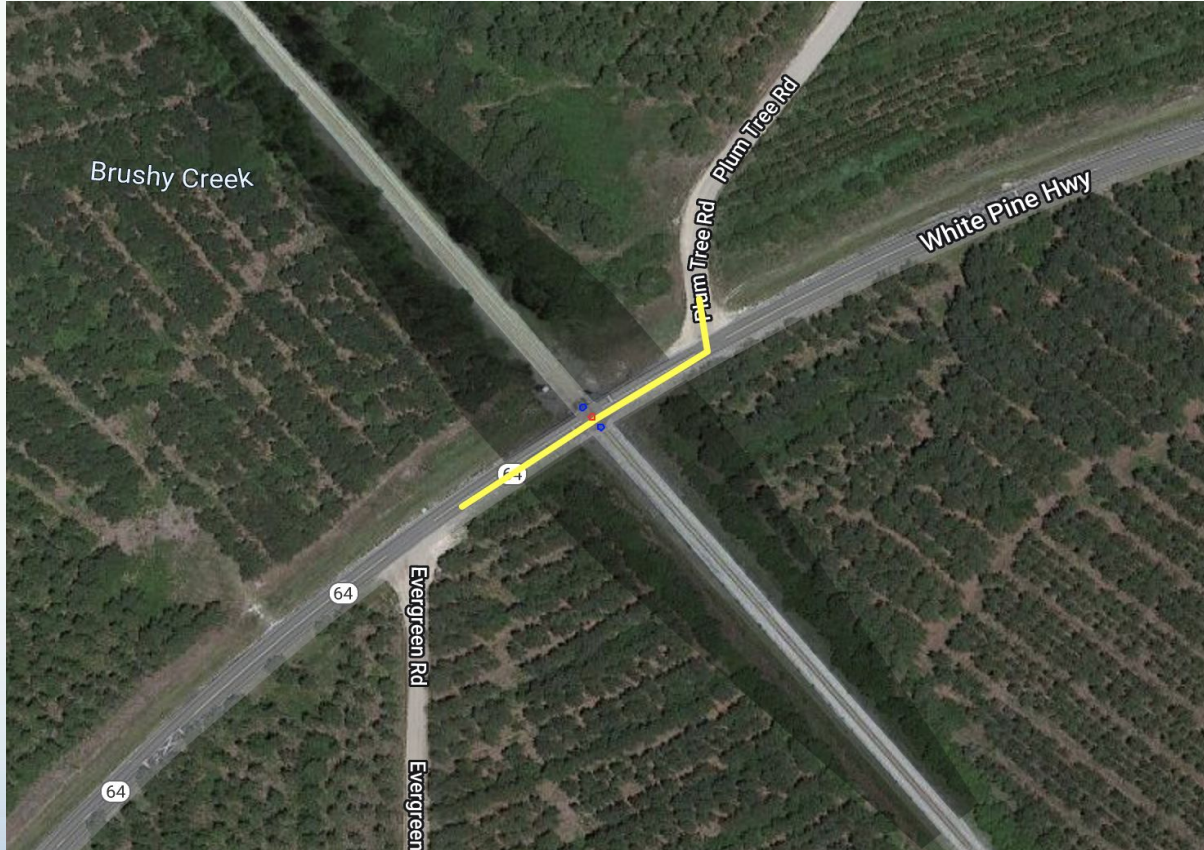
- < 90 degrees
- Non-parallel crossings posed a significant challenge
- Our algorithm can handle any of these cases

# Complex Intersections



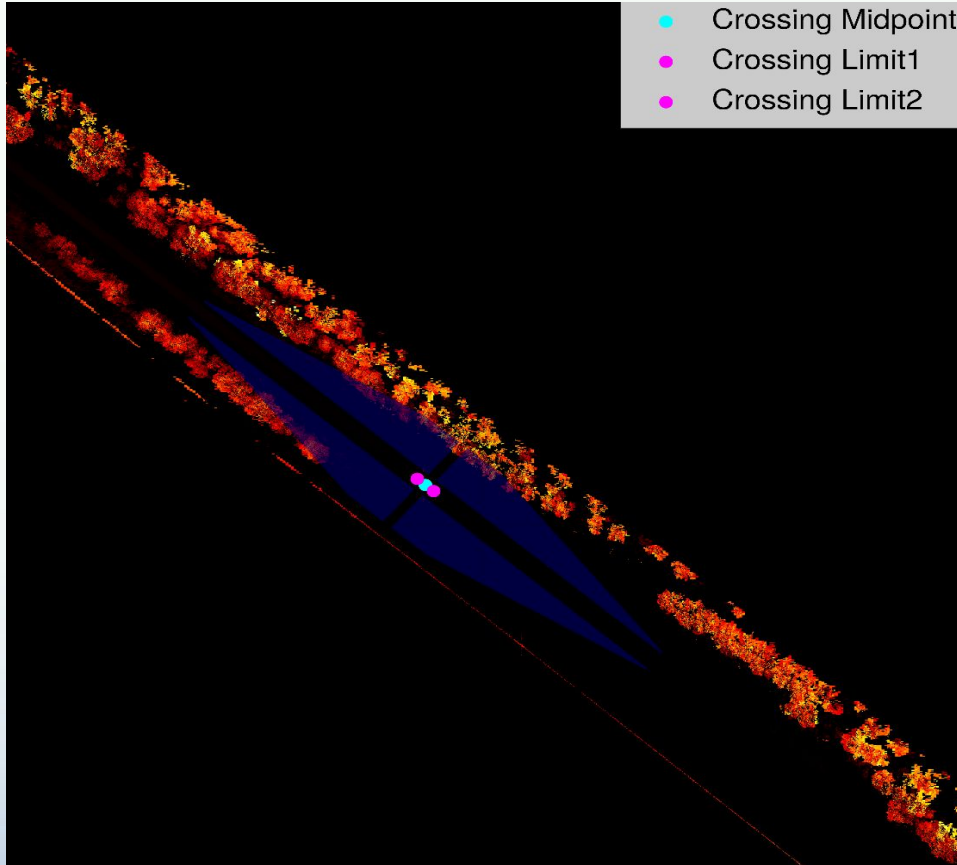
- > 90 degree crossing
- Non-parallel crossings posed a significant challenge
- Our algorithm can handle any of these cases

# Our Solution



- Algorithm generates compliance triangle around crossing using GPS

# Our Solution



- Alert maintenance crews through app if sightline is impeded

# Our Solution

Overview

Crossings

Scan Data

Work Orders

Crossing mapped to Google Maps

Tabular data with viewer can be adjusted for new schemas

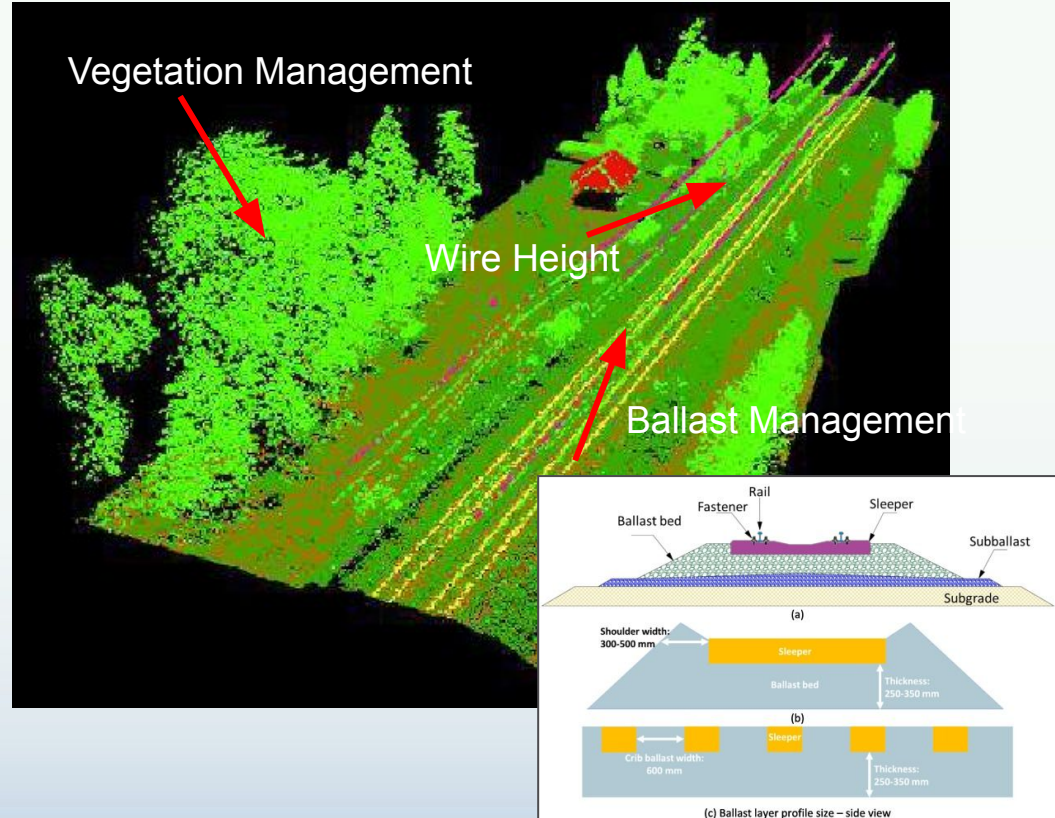
Color coded for action required

<input type="checkbox"/>	Last Scanned	Condition	Crossing ID	Division	Subdivision	Last serviced	
<input type="checkbox"/>	Nov 12 2012	⚠ Visibility Occlusions Detected	637615E	FLORIDA	FITZGERALD	Aug 02 2019	⋮
<input type="checkbox"/>	Mar 12 2022	⚠ Visibility Occlusions Detected	624508C	FLORIDA BUSINE	MIRAMONTE	Aug 17 2018	⋮
<input type="checkbox"/>	Mar 12 2022	🔧 Pending Work Order	622862C	FORT LAUDERDALE	PRIVATE INDUSTRY	Jan 13 2015	⋮
<input type="checkbox"/>	Mar 12 2022	✅ No Recommendations	915308X	ST PETERSBURG	16TH STREET SOUTH	Apr 25 2021	⋮
<input type="checkbox"/>	Mar 12 2022	⚠ Visibility Occlusions Detected	624732M	TAMPA	VALRICO	Jun 13 2014	⋮
<input type="checkbox"/>	Mar 12 2022	✅ No Recommendations	621155G	ORLANDO	S ORANGE AVE	Apr 25 2021	⋮
<input type="checkbox"/>	Apr 16 2022	✅ No Recommendations	339659H	LAKE CITY	GRADED R	Apr 25 2021	⋮
<input type="checkbox"/>	Apr 16 2022	✅ No Recommendations	621551X	HAINES CITY	LYLE AVE	Apr 25 2021	⋮
<input type="checkbox"/>	Apr 16 2022	🔧 Pending Work Order	624900R	MADISON	PRIVATE RD	Oct 22 2017	⋮
<input type="checkbox"/>	Apr 16 2022	🕒 Needs Review	624845T	POMPANO BEACH	PRIVATE SCOT-MN I	Jan 13 2015	⋮

- Alert maintenance crews through app if sightline is impeded

## Related Case

- Ballast management
- Drainage
- Object identification
- Tunnel inspection
- Asset location and validation





Please type questions into the Chat.  
We will answer them now.



# OBJECT COMPUTING

YOUR OUTCOMES ENGINEERED



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ObjectComputing.com