



case study

Corridor-Wide Roadway Safety Analysis with RSA 3D

Project Overview

RDV Systems used its RSA 3D platform to conduct a comprehensive roadway safety analysis along Telegraph Road in Stafford County, Virginia. Using LiDAR, high-resolution imagery, and automated analytics, the study evaluated stopping sight distance (SSD), passing sight distance (PSD), intersection sight distance (ISD), horizontal curve geometry, safe speeds, and roadside clear-zone conditions. The analysis identified potential sight-distance, geometric, and roadside hazards to support targeted engineering review and proactive safety improvements.



The Challenge

Telegraph Road includes multiple horizontal curves, varying roadside development, and a mix of residential and commercial frontage - creating potential concerns related to run-off-road crashes, limited sight distance, and roadside hazards. Traditional assessments can require extensive field work, increasing both time requirements and worker exposure to traffic.

Turning Roadway Data into Actionable Safety Insight

RSA 3D Solution

Using mobile LiDAR and high-resolution imagery, RSA 3D automated multiple roadway-safety analyses across the Telegraph Road corridor. The platform also classified roadside objects - including vegetation, utility poles, signs, buildings, fences, and mailboxes - and correlated those objects with roadway geometry to identify potential safety deficiencies.



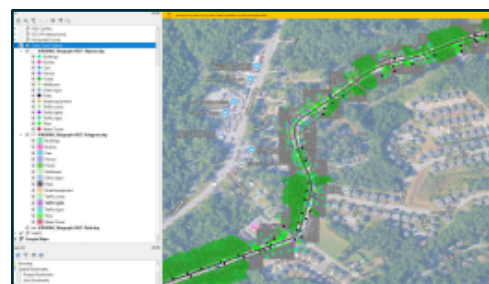
INTERSECTION SIGHT DISTANCE

3D visibility analysis



PASSING SIGHT DISTANCE

Pass / No Pass Analysis



CLEAR ZONE ANALYSIS

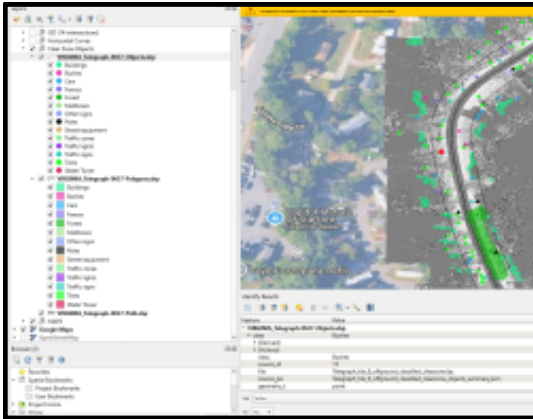
Corridor-wide object classification

Key Findings

ROADSIDE OBSTACLES Multiple objects were identified within the recoverable clear zone.	VEGETATION Vegetation obstructed roadway signage and reduced driver visibility.
SIGHT DISTANCE Horizontal curve segments exhibited constrained sight distance.	SPEED Geometric conditions were identified where available stopping sight distance warranted speed review.
FIXED OBJECTS Higher fixed-object densities were identified within curved and developed roadway segments.	ENGINEERING VALUE Findings help focus engineering review and prioritize mitigation such as vegetation clearing, object relocation, speed review, or roadway improvements.

From Digital Analysis to Action

By combining multiple roadway-safety analyses within a single digital environment, RSA 3D provided engineers with a consistent, corridor-wide view of potential safety concerns. Findings can be used to focus engineering review and prioritize mitigation strategies such as vegetation clearing, object relocation, speed review, or roadway improvements.



DIGITAL ANALYSIS

Roadside object identification and classification



FIELD VERIFICATION

Roadside signage and vegetation conditions

Benefits Delievered

- **Automated** corridor-wide safety analytics
- **Reduced** field exposure and improved worker safety
- **Consistent** high-resolution roadway measurements
- **Faster** identification of critical safety concerns
- **Scalable** deployment across statewide roadway networks
- **Deliver** GIS-ready shapefiles and engineering reports

Why RSA 3D?

The Telegraph Road project demonstrates RSA 3D's ability to evaluate multiple roadway-safety conditions across an entire corridor - from sight distance and horizontal curves to speed and roadside hazards. By integrating LiDAR, imagery, automated analytics, and engineering-ready outputs, RSA 3D provides a repeatable approach for identifying potential safety concerns and prioritizing further engineering review.



CONTACT RDV SYSTEMS