

# Modernizing Roadway Measurement with RSA 3D

## Virginia Department of Transportation Shoulder Rumble Strip Planning

Using mobile LiDAR and RSA 3D, RDV Systems helped VDOT replace manual roadway measurements with a digital workflow to support shoulder rumble strip planning.



### The Challenge

VDOT has prioritized shoulder rumble strips to help address roadway departure crashes, but many rural paved roads lack sufficient lane and shoulder width to accommodate them. Determining which roadways are eligible requires accurate geometric measurements.

Historically, contractors collected these measurements manually using measuring wheels at intervals of several hundred feet. The process was labor-intensive, costly, and placed field crews in active travel lanes on narrow, winding rural roads - while providing only a limited representation of changing roadway conditions.



#### LABOR-INTENSIVE

Manual field measurements



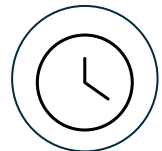
#### COSTLY

Fixed mobilization and extended field time



#### POTENTIALLY UNSAFE

Crews in active travel lanes



#### LIMITED DETAIL

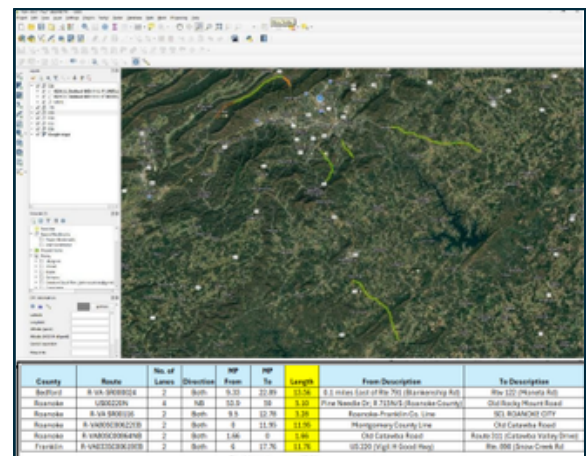
Measurements at intervals of several hundred feet



### The RSA 3D Solution

VDOT Salem District turned to RDV Systems to implement a LiDAR-based approach to roadway measurement. Using RSA 3D, mobile LiDAR data was transformed into detailed lane and paved-shoulder measurements at 10-foot intervals across the study corridors.

The digital workflow provided a consistent, high-resolution geometric dataset while eliminating the need for manual roadway measurements in live traffic.



## Results and Benefits

RSA 3D replaced widely spaced manual measurements with consistent roadway geometry measurements collected at 10-foot intervals, giving VDOT a more detailed dataset for evaluating shoulder rumble strip eligibility.



## Improved Accuracy

Measurements every 10 feet provided a more detailed representation of roadway width.



## Enhanced Safety

Reduced the need for field crews to collect measurements within active travel lanes.



## Reduced Cost & Schedule

Digital analysis reduced labor, mobilization, and time associated with traditional field measurements.



## Reusable Data

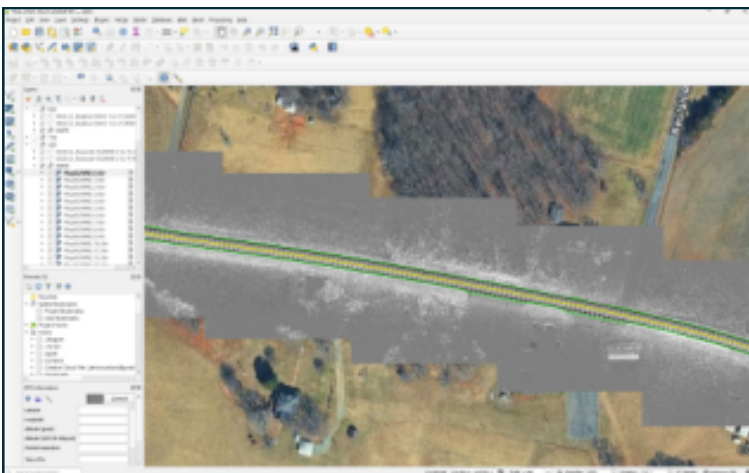
Created a planning-level geometric dataset that can support future safety analysis, design evaluation, and corridor planning.



## Faster, Smarter Decisions

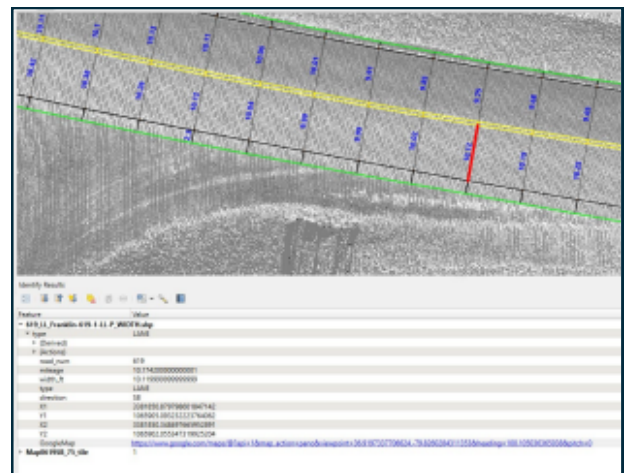
VDOT could rapidly assess rumble strip eligibility, prioritize feasible locations, and make better use of limited safety funding.

# RSA 3D in Action



## Corridor-Level Analysis

LiDAR-derived roadway geometry evaluated digitally across the study corridor.



## 10-Foot Roadway Measurements

Detailed lane and shoulder measurements capture changing roadway conditions.



## Turning LiDAR into Actionable Roadway Intelligence

The VDOT project demonstrates how LiDAR can replace labor-intensive field measurements with a repeatable digital workflow. By extracting roadway geometry at consistent intervals, RSA 3D gives agencies detailed information that can support safety planning while reducing personnel exposure and manual data collection.

### One Dataset. Multiple Uses.

RSA 3D demonstrated the potential to extend automated analysis beyond individual corridors to larger roadway networks. By applying consistent criteria across large datasets, agencies can identify potential deficiencies, focus engineering resources, and prioritize locations for further investigation.



#### Safety Analysis

Support roadway safety evaluations



#### Design Evaluation

Inform design and improvement projects



#### Corridor Planning

Enable long-term network planning

### Why RSA 3D?

RSA 3D transforms LiDAR and roadway data into detailed, engineering-ready geometric measurements without requiring traditional field measurement workflows. By automating roadway analysis within a repeatable 3D environment, RSA 3D helps agencies improve data consistency, reduce field exposure, accelerate planning, and make more informed roadway safety decisions.

### Case Study Takeaway

The VDOT project demonstrates how RSA 3D can transform existing LiDAR into detailed, reusable roadway intelligence—reducing manual field measurement while supporting safer, more efficient transportation planning.

### See RSA 3D in Action

Discover how RSA 3D can support your roadway safety program



CONTACT RDV SYSTEMS