TopoDOT®

Latest Developments in Pavement Condition Analysis using Mobile LiDAR
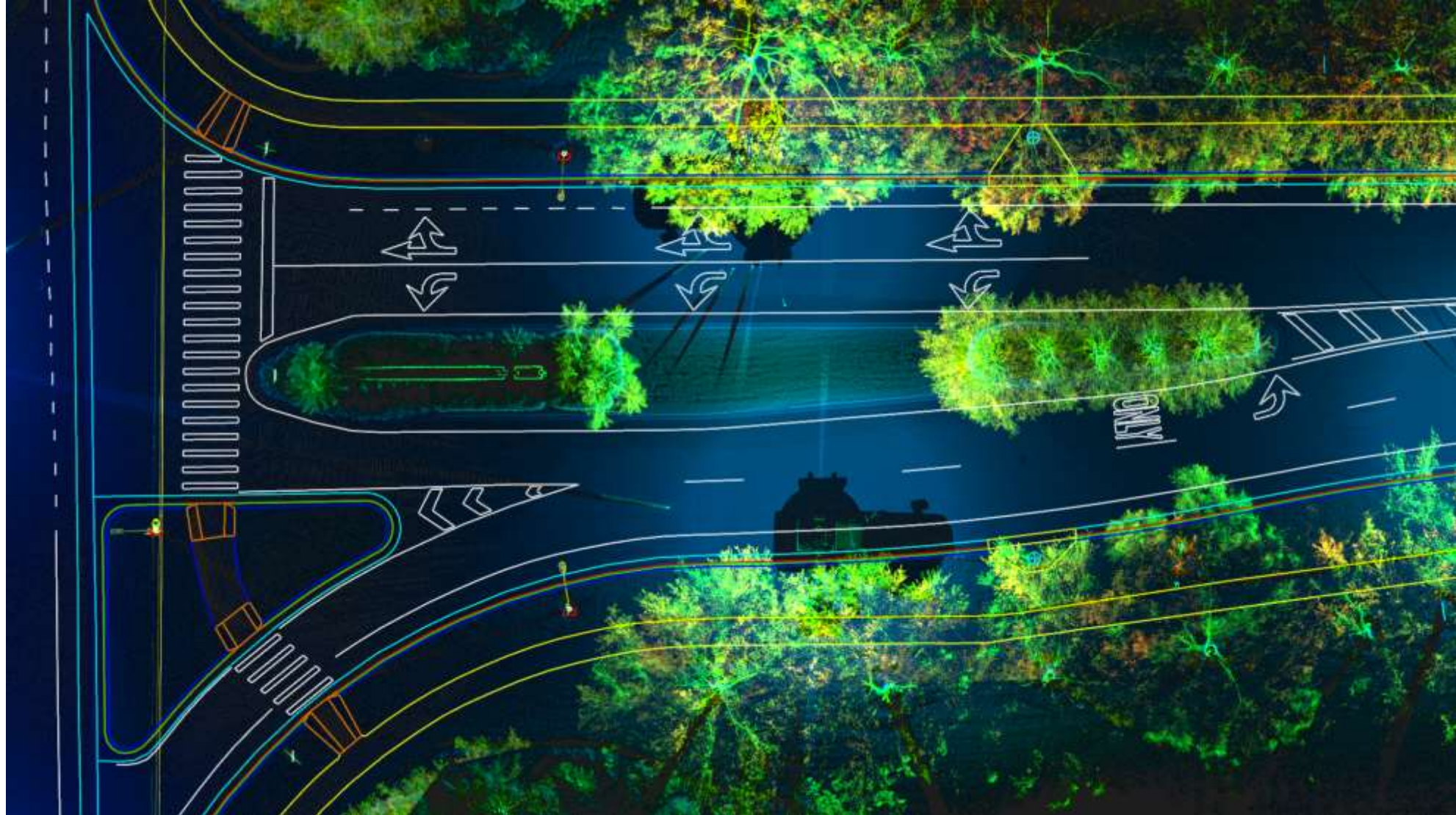
FIG 2023
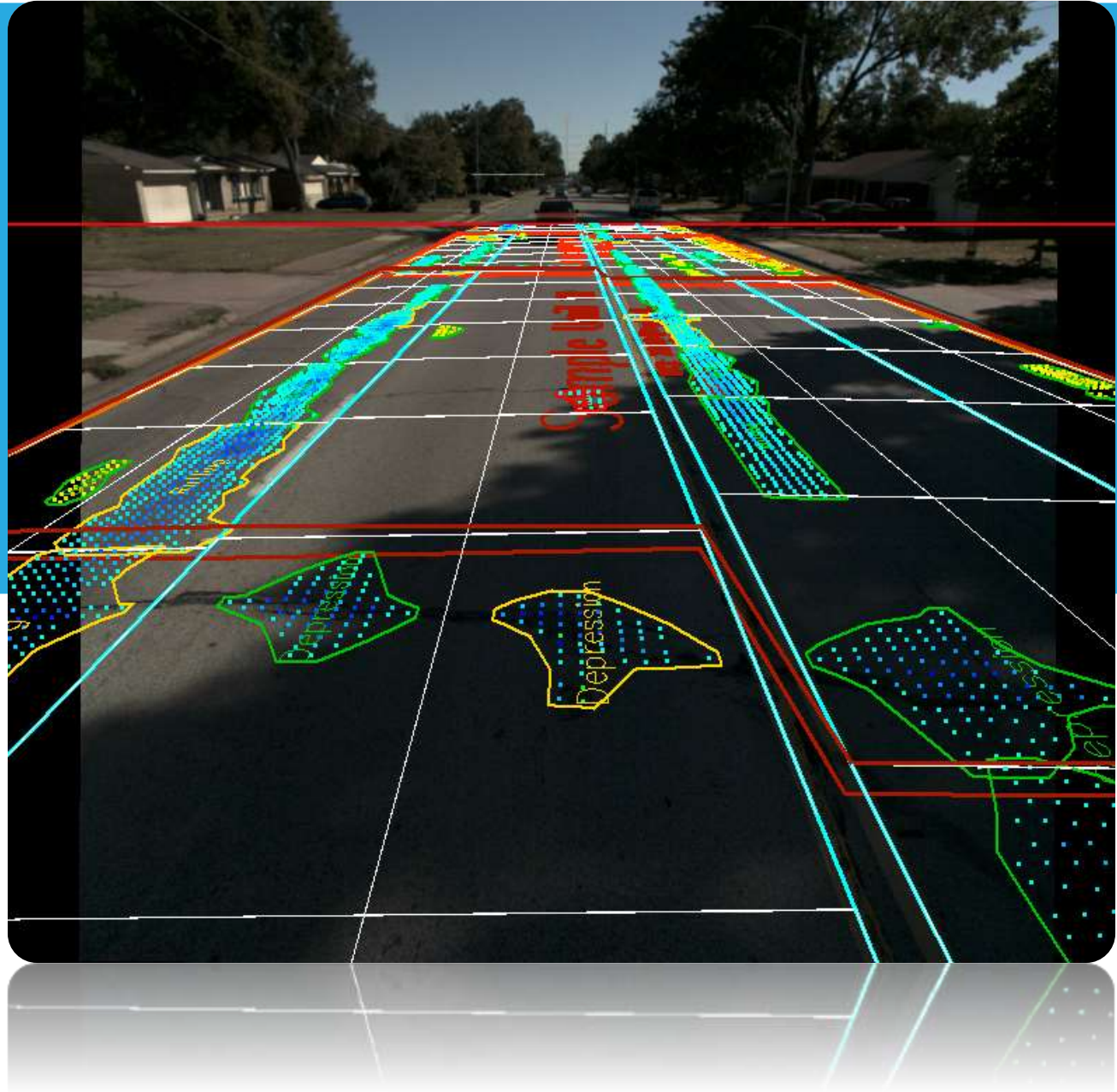
Presented by:

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The TopoDOT **Solution**

Turning Data into Deliverables

The **Team**

The **Team**

TopoDOT®

30+ Years in LiDAR Industry

15+ Years Development

HQ in Orlando, FL. USA

Offices in UK, Romania,
Australia and China

UNITED STATES

ROMANIA

CHINA

AUSTRALIA

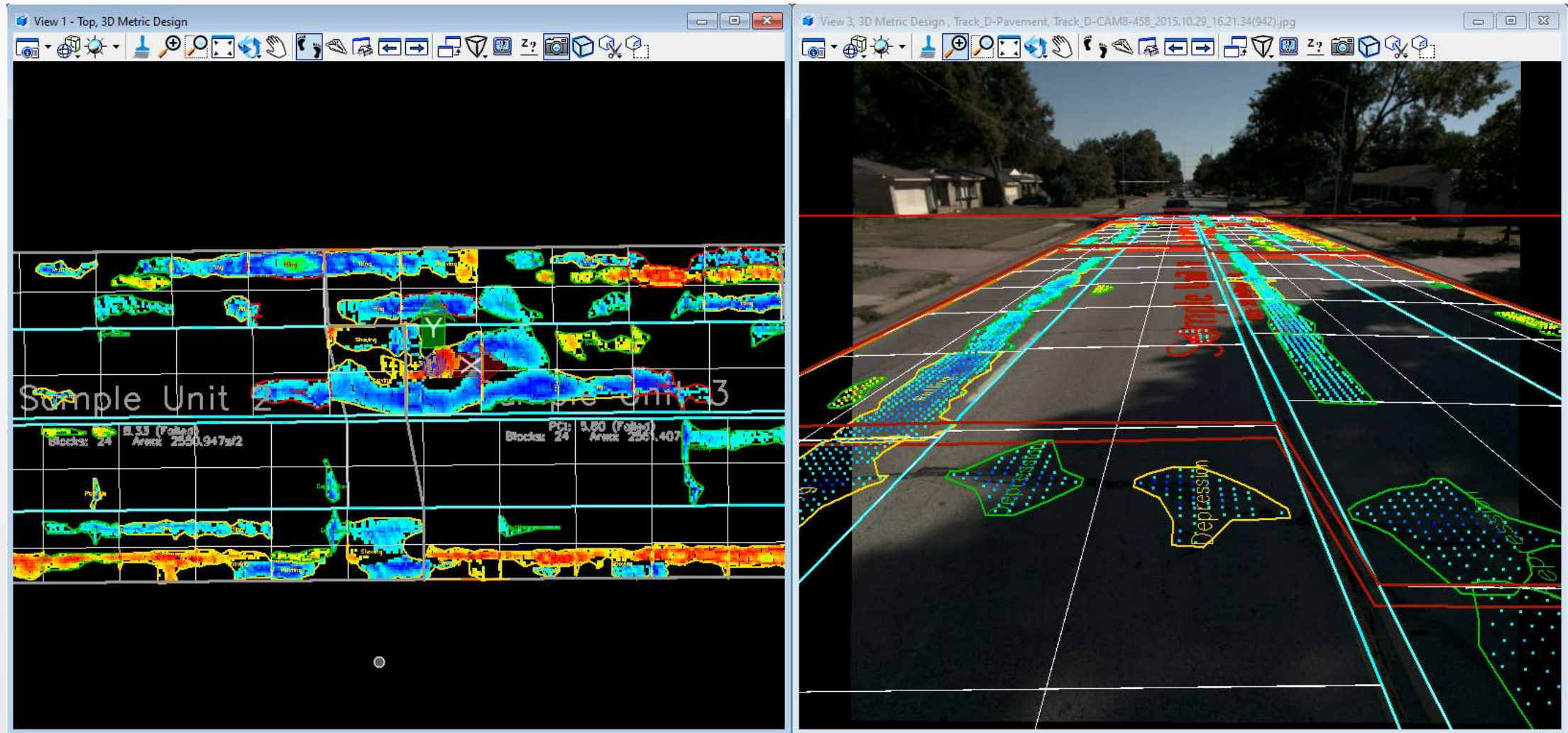# The TopoDOT **Community**

5000+ users 600+ companies/agencies

Pavement **Condition**

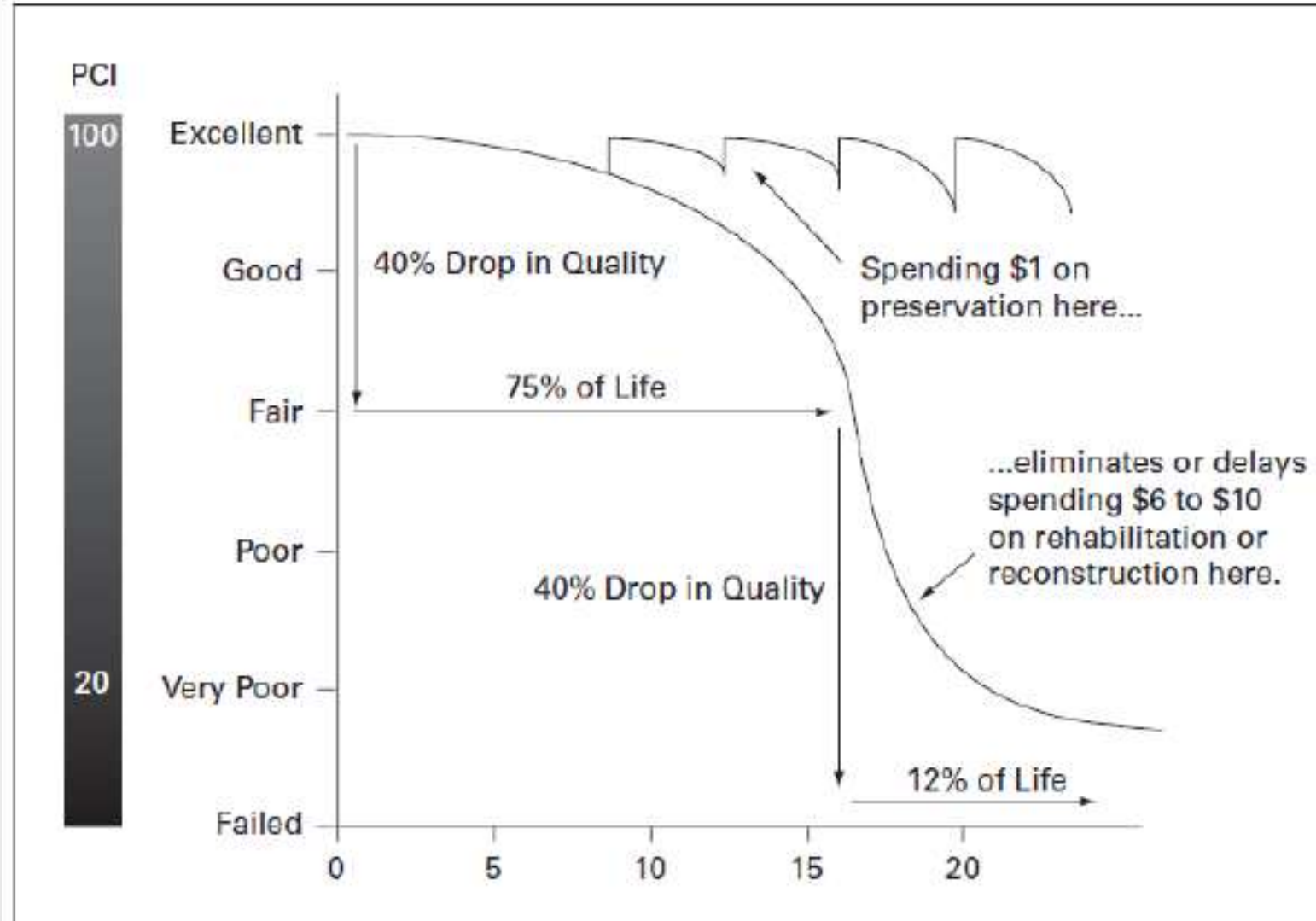TopoDOT brings automatic extraction to pavement condition projects

Pavement **Condition**

TopoDOT brings automatic extraction to pavement condition projects

PCI

🟥	0 - 40
🟥	41 - 55
🟧	56 - 70
🟨	71 - 85
🟩	86 - 100

What is the **Opportunity?**

TopoDOT/Mobile LiDAR opens up the market for small to medium projects

What is PCI?

Pavement Condition Index – a Standard

- History: The PCI for roads and parking lots was originally developed by the U.S. Army Corps of Engineers

- ASTM D6433: Covers the determination of roads and parking lots pavement condition through visual surveys using the Pavement Condition Index (PCI) method of quantifying pavement condition.

- How was it traditionally collected?

- Can it be collected with the geospatial equipment – a Mobile LiDAR System? We think so!

Distress Extracted from **Pointcloud**

Automatic Distress Types - Terminology

- **Bumps -** small, localized, upward displacements of the pavement surface

- **Corrugation -** also known as "washboarding", is a series of closely spaced ridges and valleys (ripples) occurring at fairly regular intervals, usually less than 3 m (10 ft) along the pavement.

- **Depression -** localized pavement surface areas with elevations slightly lower than those of the surrounding pavement.

- **Potholes -** small—usually less than 750 mm (30 in.) in diameter bowl-shaped depressions in the pavement surface. They generally have sharp edges.

- **Rutting -** A surface depression in the wheel paths.

- **Swell –** An upward bulge in the pavement's surface, long, gradual wave more than 10 feet long.

- **Shoving –** A permanent, longitudinal displacement of a localized area of the pavement surface caused by traffic loading. When traffic pushes against the pavement, it produces a short, abrupt wave in the pavement surface.

Distress Extracted from **Imagery**

User Identified Distress Types - Terminology

- **Cracking –** Several types, Alligator, block, edge, joint, longitudinal, transverse, etc

- **Bleeding –** A film of bituminous material on the pavement surface that creates a shiny, glasslike, reflecting surface that usually becomes quite sticky.

- **Lane Shoulder Drop Off –** A difference in elevation between the pavement edge and the shoulder

- **Patching –** An area of the pavement that has been replaced with new material to repair the existing pavement.

- **Polished Aggregate –** Portion of aggregate extending above the asphalt is either very small, or there are no rough or angular aggregate particles to provide good skid resistance.

- **Railroad Crossing –** Depressions or bumps around, or between tracks, or both.

- **Weathering –** The wearing away of the pavement surface due to a loss of asphalt or tar binder and dislodged aggregate particles.

What is the **Process?**

TopoDOT applied to Pavement Management

Manage
- Import, organize and store geospatial MLS data on the storage medium of your choice (local or cloud)

Assess
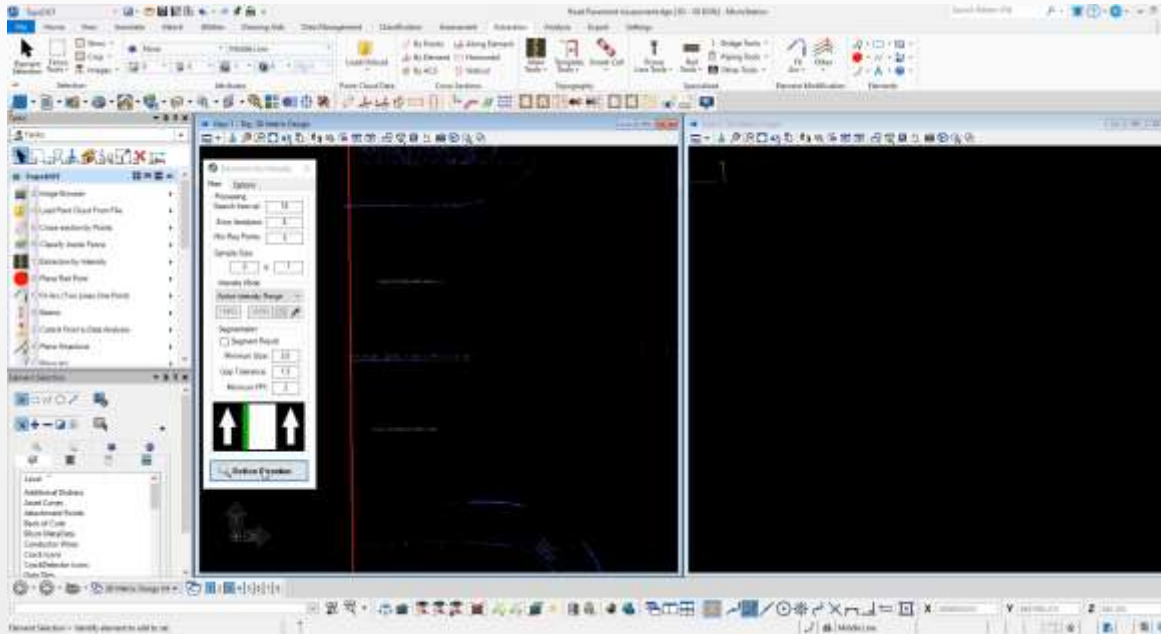- Assess point cloud quality

Extract
- Extract lane lines
- Run automated pavement analysis
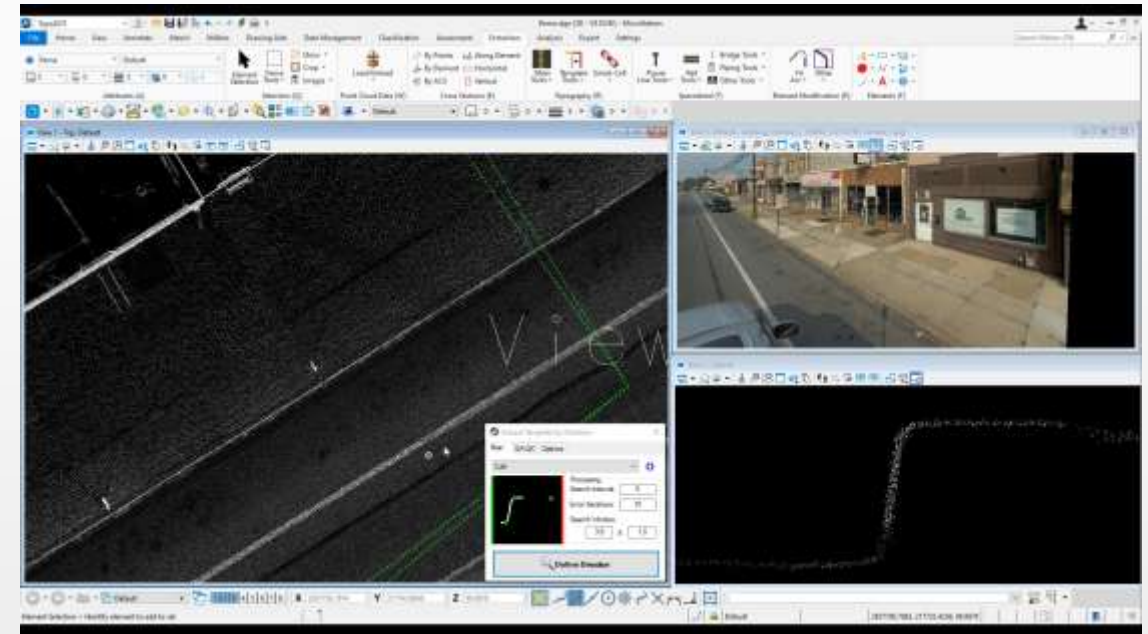- Export to PAVER

The **Workflow**

1 – Initial Boundary Lines

Paint Lines

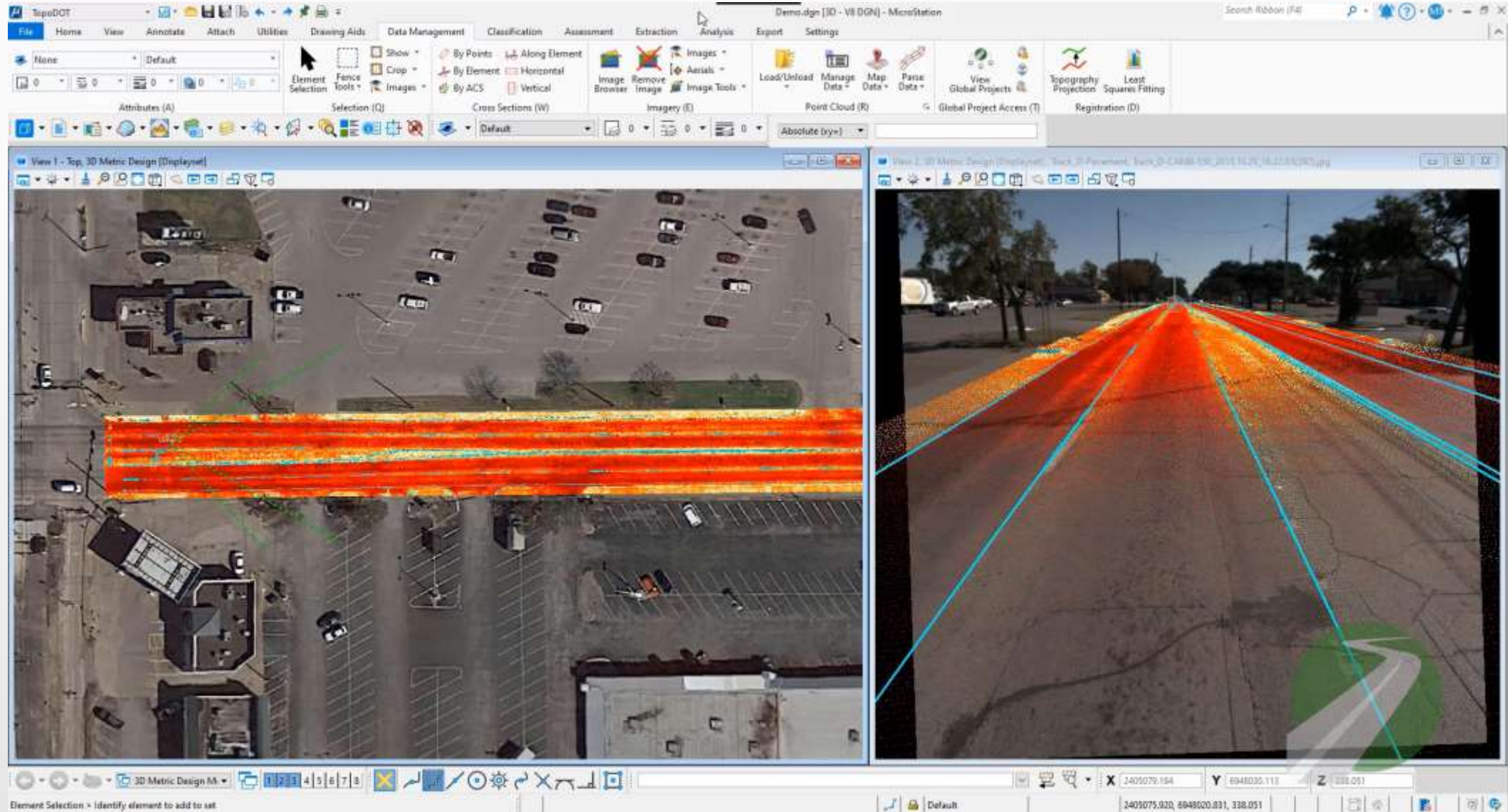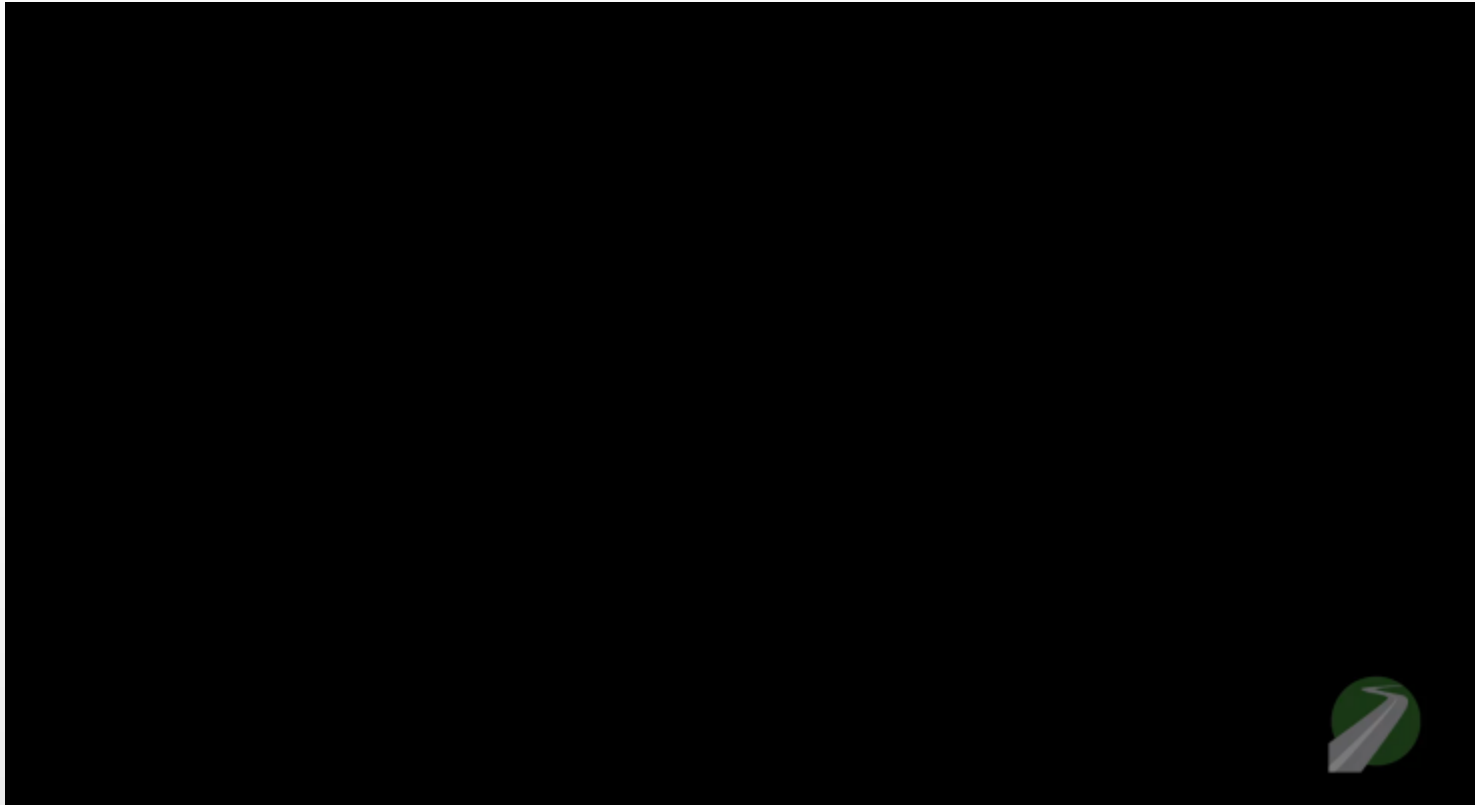Edge of Pavement

The **Workflow**

2 – Auto Distress

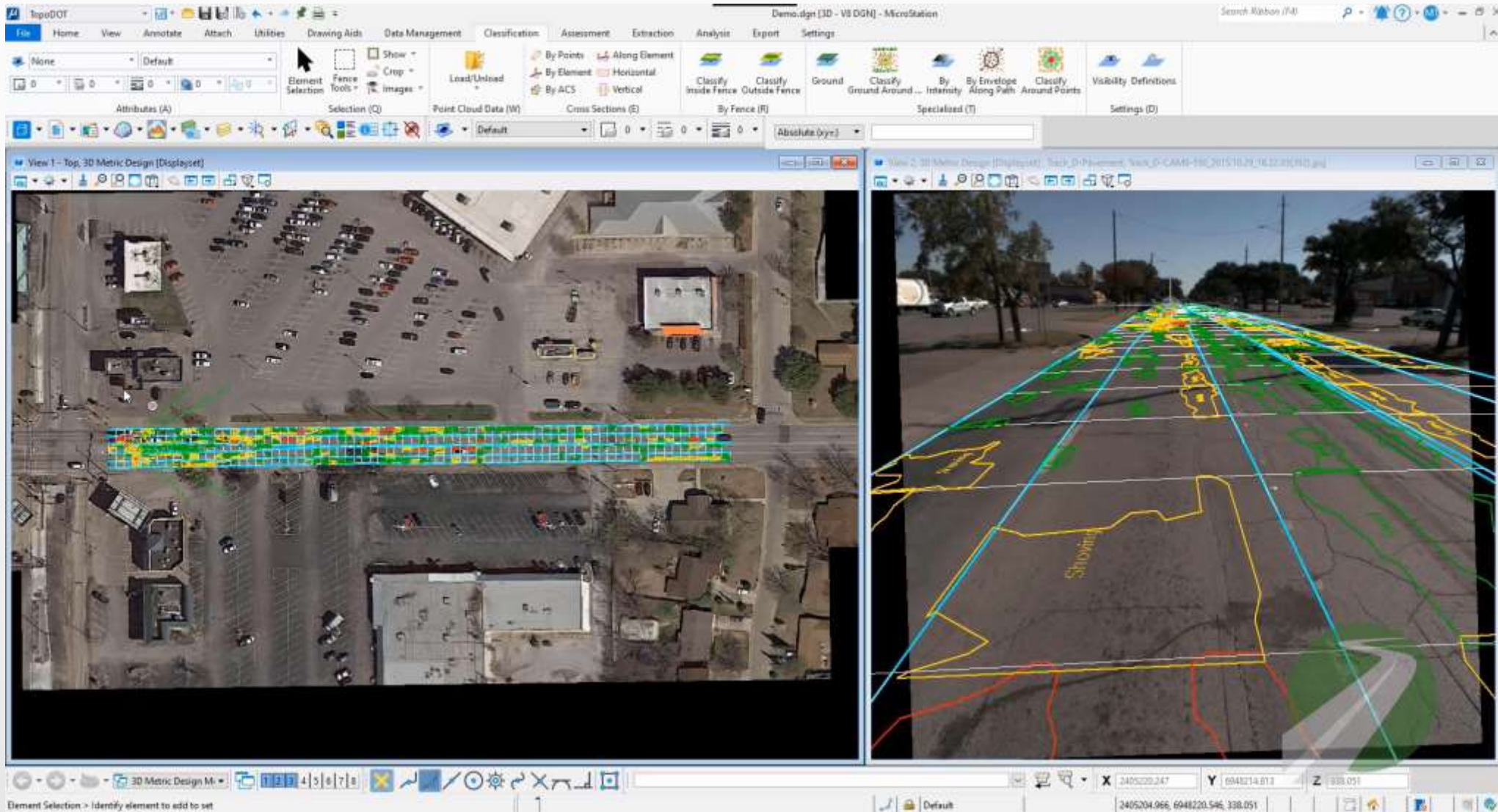# The **Workflow**

3 – User Identified Distress – 'Cracking' - Macro

The **Workflow**

4 – Automatic Reporting – Compatible with PMP's (PAVER)

Let's look at a **Case Study**

MMS applied to Pavement Management – City of Trenton, IL

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Why is this **important?**

Big Picture

- There's significant market opportunities for small to medium sized pavement projects

- The Mobile LiDAR data collected provides a broad range of applications beyond the pavement assessment.

- The TopoDOT pavement assessment process has been successfully applied for many years.

Contact Us

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