Utilizing AI Machine Learning to output PCI from ROW Imagery for municipal Roads

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AI for Pavement Condition Index (PCI) Measurement

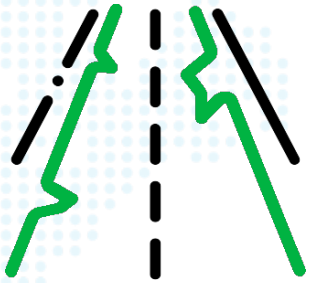
Why do we need AI for PCI measurements?

Minimal setup and upfront costs

High accuracy

Loosely coupled architecture allowing for upgrades without operational change

Implement AI for PCI scores



More than just defects:
Distress area, density, intensity and severity

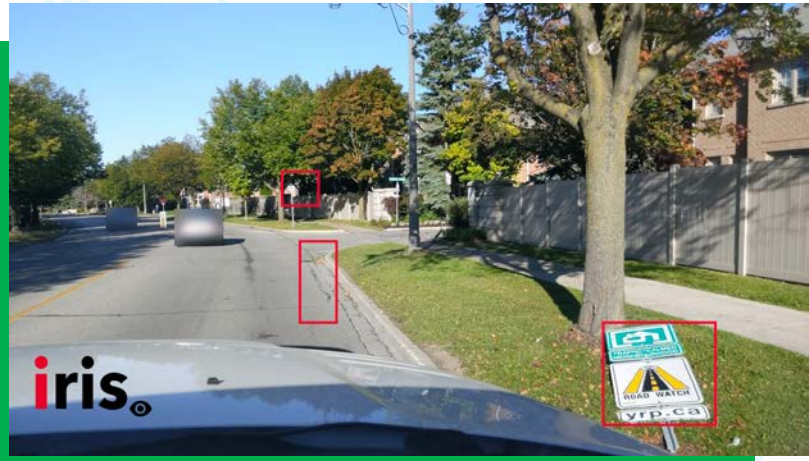
Acceleration data for Riding Condition Rating (RCR)

Process distresses for PCI factors

ASTM D 6433 standards for PCI values

Background

- Pavement distresses may be critical hazards
- ASTM D 6433 standards used to calculate PCI
- Values from 1-100 based on low, medium, high distress severities



Our Solutions.

irisGO™

- Plug & Play
- No in-cabin facing camera or audio recording
- Privacy centric: redaction of faces and license plate detail at the source

AI-enabled, dash camera that can be installed on patrol vehicles, buses, waste trucks and in static locations such as traffic lights in intersections

irisCity™

- AI-enabled data processing
- User friendly visualization dashboard
- Integration with existing work order systems

Data management and visualization portal that also integrates with existing work order, pavement, and asset management systems.

iris Technology.

AI-Enabled 4K Camera:

- AI Detection System
- AI Measurement System
- AI Patented Privacy Redaction
- GPS, Accelerometer & Gyrometer
- Real-time Cellular Data Transfer
- Multi-camera ready
- Orthoscopic imagery

Customer Portal

- Visualize data on GIS layers
- Full data access – export & download
- Integrates with external platforms
- Pre-built and custom reporting
- 30,000+ lines of code
- Purpose-built A.I. models

esri Partner Network Silver

esri ArcGIS System Ready Specialty

Top 10% partner globally

aws

Single tenancy
Local data residency

IoT

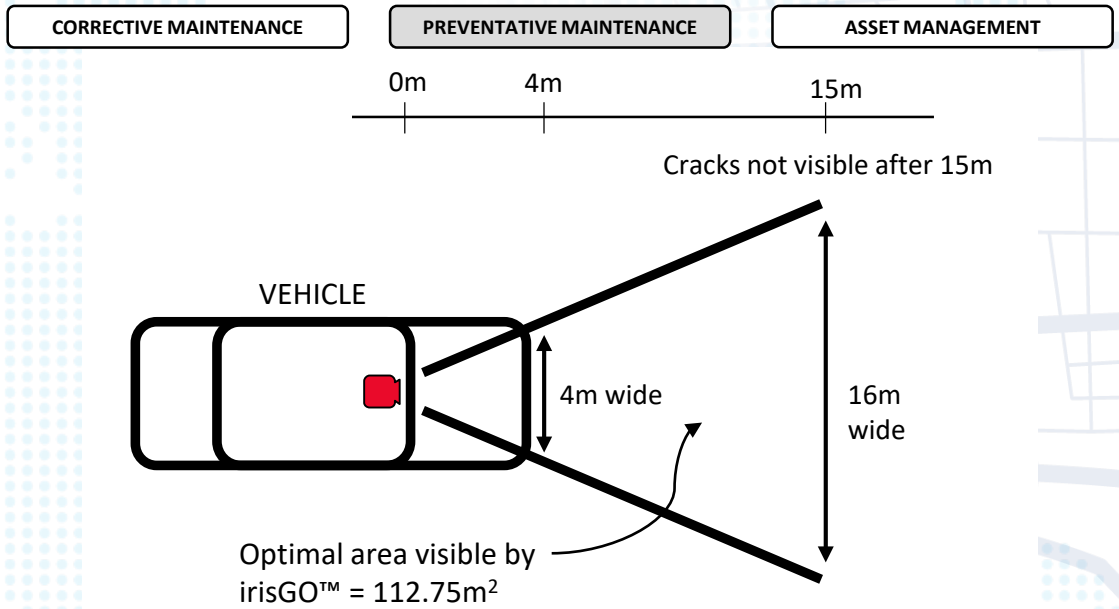
TELUS

verizon

iris

Pavement Condition Survey

- Pavement Condition Index (PCI)
- International Roughness Index (IRI)
- Passes engineering QA/QC testing
- Attribute data associated with ratings
- Spatial inventory with detection and quantification of pavement distress
- Cracking, rutting, raveling, depression, bumps, potholes, and patches
- Visualized in irisCITY™ or your own system



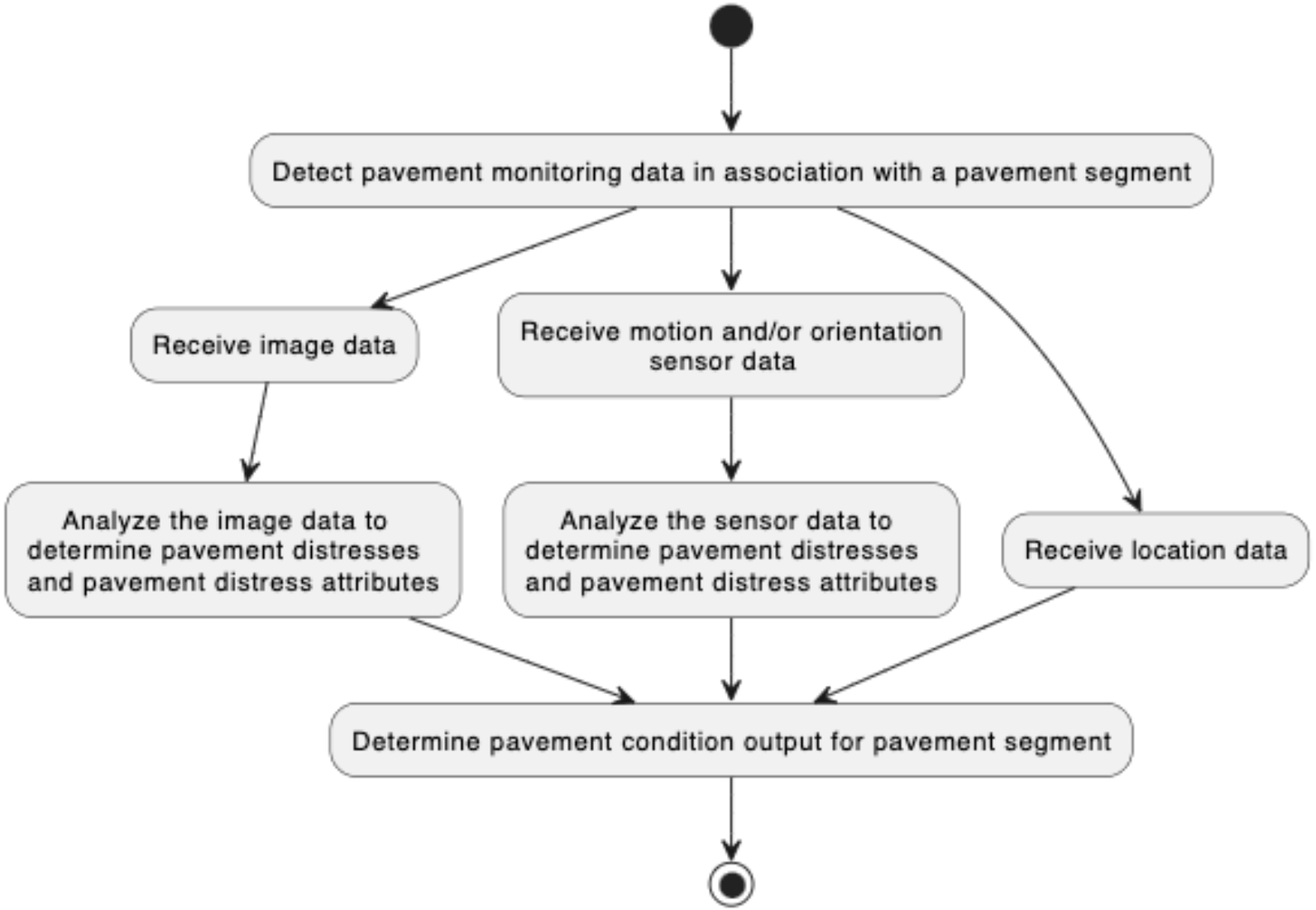
ASTM INTERNATIONAL Standards Worldwide
PCI
D6433-18

ASTM INTERNATIONAL Standards Worldwide
IRI
E950M-09

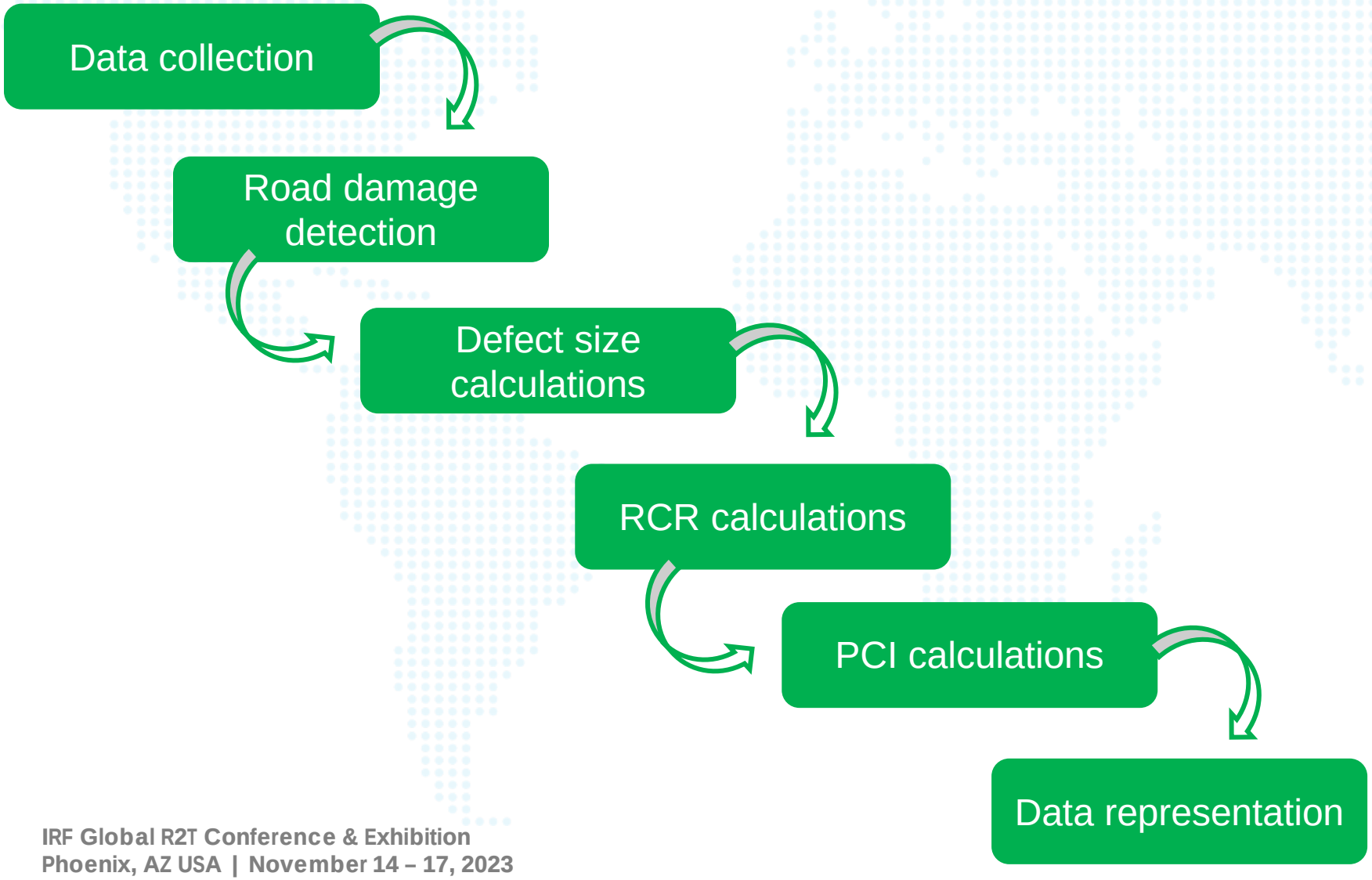
Ontario
O. Reg. 239/02

Ontario
MTO SP-022/024

How did we achieve it?



Experimentation approach



Perspective Matrix

Figure 2. Original road image collected by irisGO™ with calibration bounding boxes

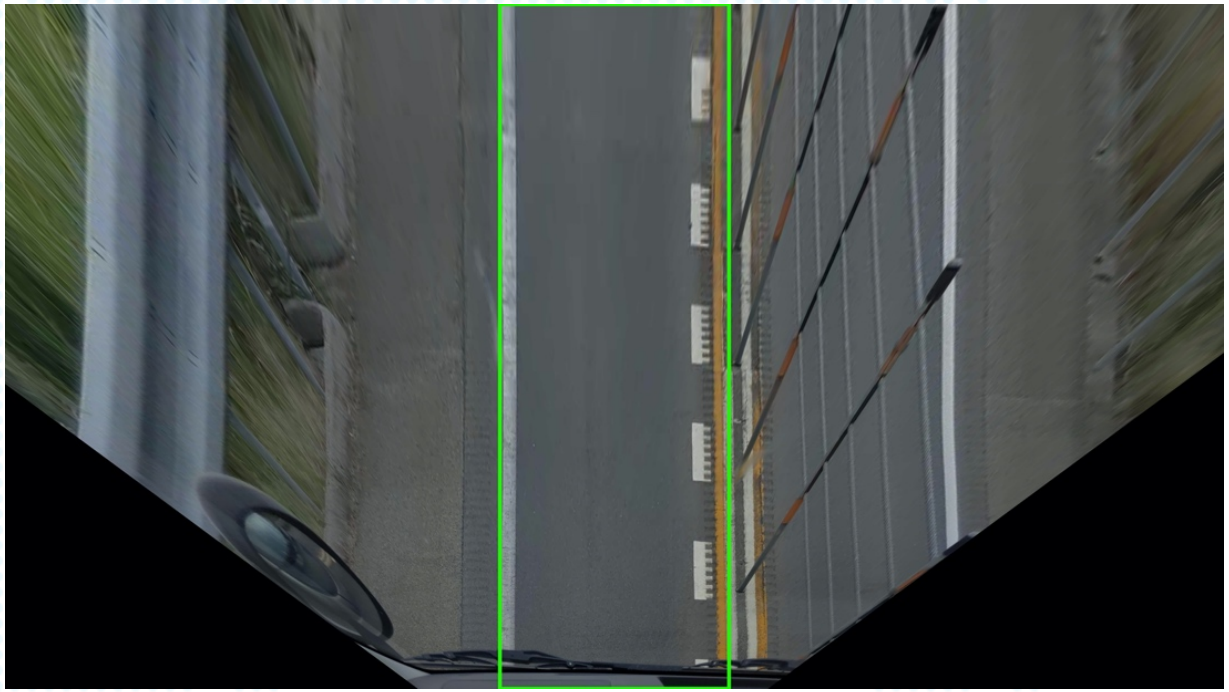
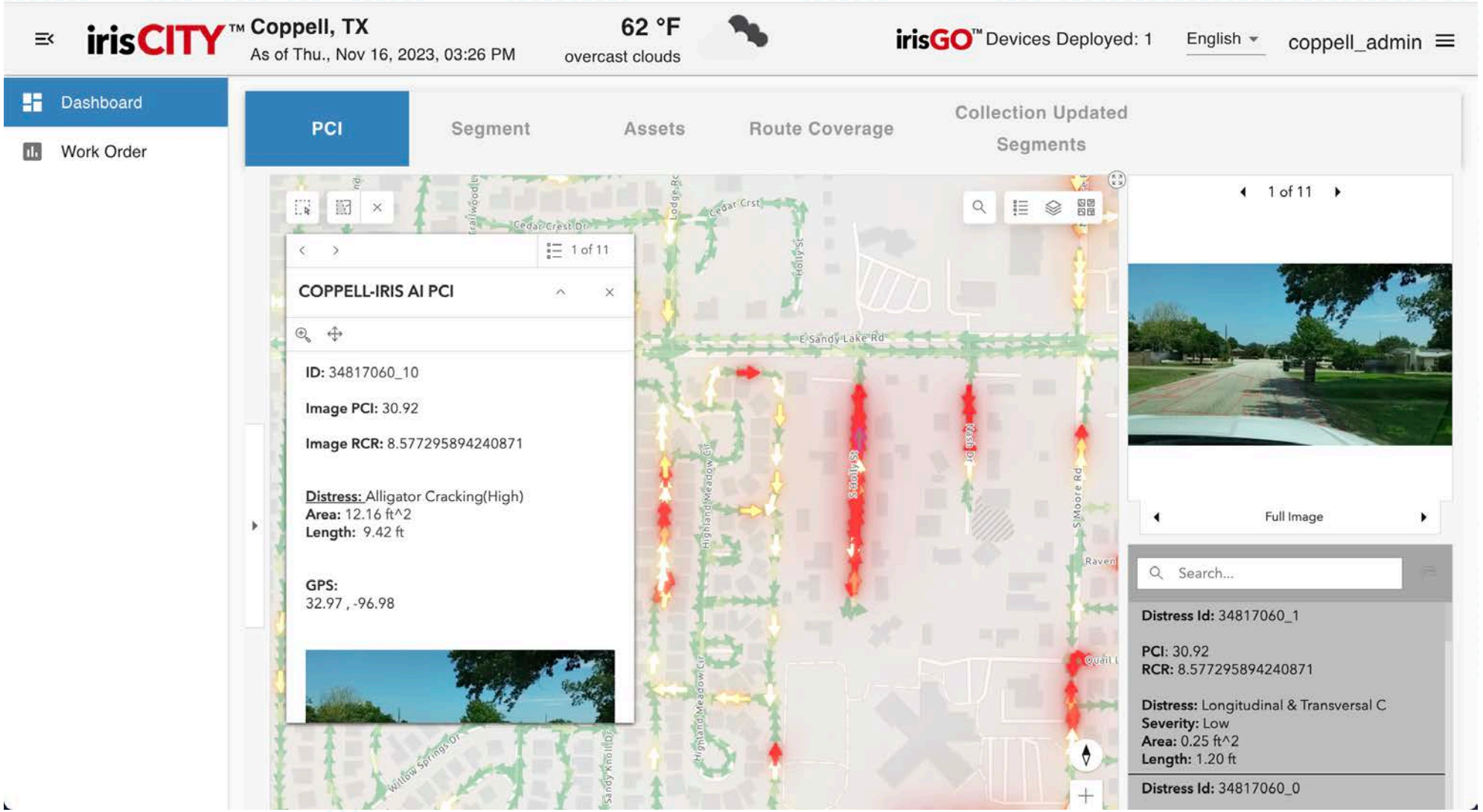
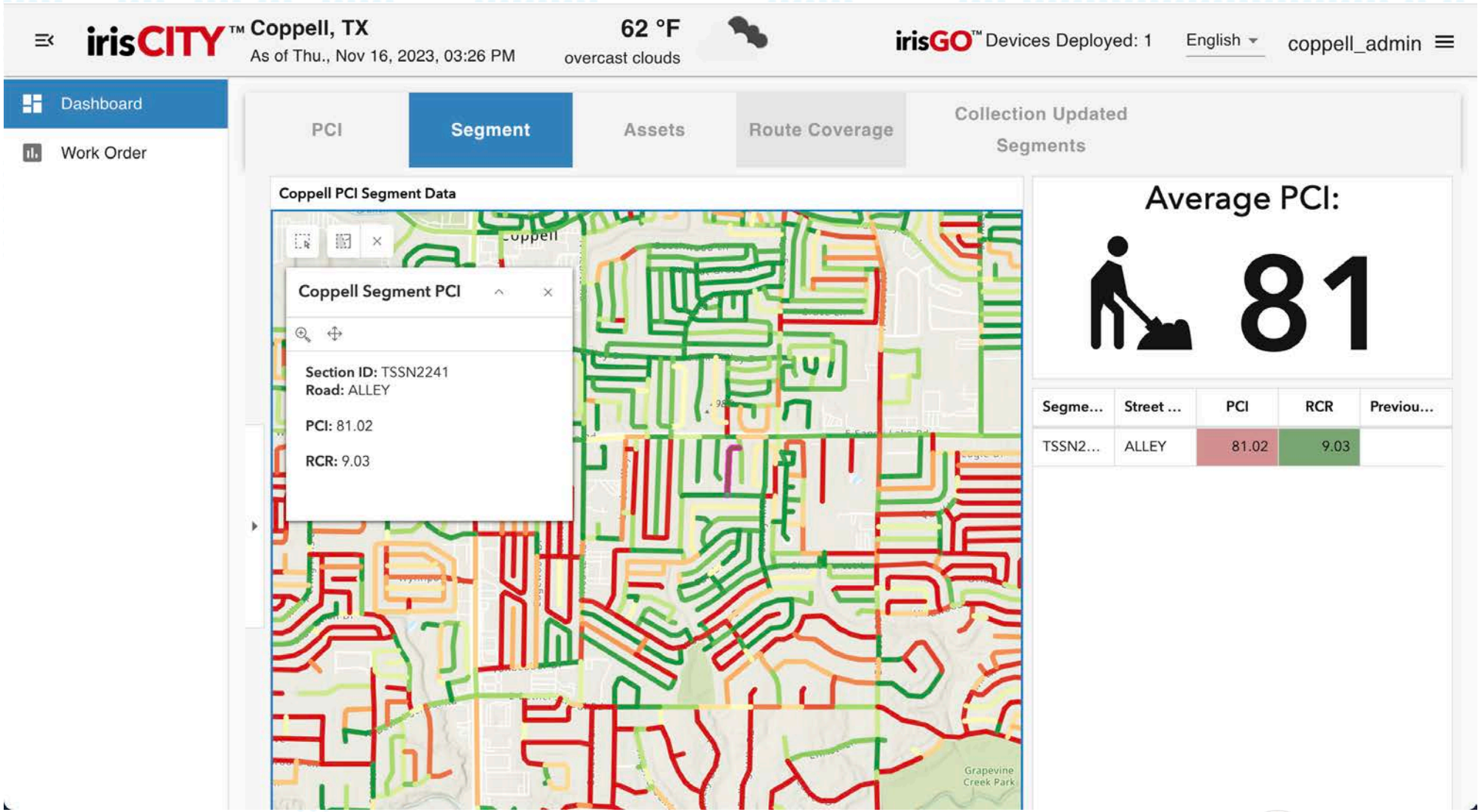


Figure 3. Converted image after perspective transformation

Data Visualization Output (point level)



Data Visualization Output (segment level)



Experimentation results

Accurate AI outputs

Consistent and acceptable to existing human intensive calculations

Accuracy improvement

Improves over time with more diverse data sets

AI frameworks and models

Fast evolving field making this approach very reliable, and backend oriented rather than change in operational data collection processes

Thank you