Practical AI for Public Works: Modernizing Roadway Lifecycle Management

Presented by:

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Roadway Management Technologies

Welcome!

- **RMT: Who Are We?**
- **With you Today**

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The Smart Agency Shift

- **Key local government challenges:**
  - Aging infrastructure
  - Workforce shortages
  - Budget constraints
  - Rising cost of materials
  - Climate stress
  - Disconnected Systems
  - Critical events

HIGHLIGHTS

The gas tax has lost

80% of its purchasing power

since it was last raised in 1993

Why Form a Pavement Management or Preservation Plan?

"Preservation" is the same as "management". <u>At the end of the day, we are simply trying to extend the life of our roads!</u>

Makes Your Job Easier	Capitalizes Your Agency Properly	Communicates to Officials and Constituents	Keeps Good Roads from Becoming Bad Roads
Through effective, repeatable process	Provide data for funding opportunities	Address concerns and complaints easier	Maintaining quality roads is easier more affordable and economical

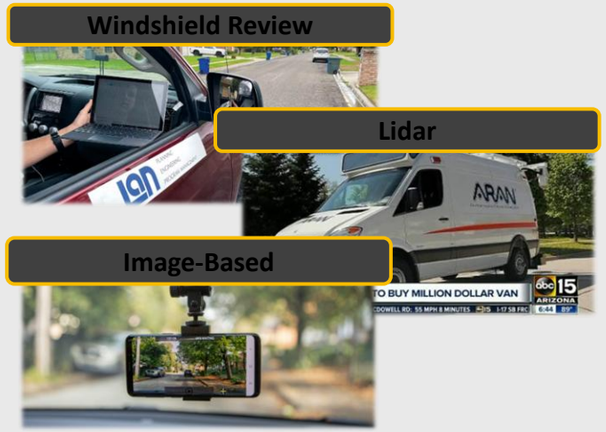
Assessment Standards

PCI	PASER	IRI
0 – 100 scale	0 – 10 scale	Inches / mile
Most objective	Focused on treatment	No distress identification
Impossible to complete manually at scale	Subjective	Fast, sometimes low cost
Severity is subjective	Easy to do, difficult to repeat	Sensitive to speed bumps

Current Tools and Systems are Outdated and Disconnected, Leaving Agencies Blind to Real-Time Conditions

Agencies processes for pavement management are characterized by (i) antiquated data collection practices, (ii) expensive processing processes, and (iii) disconnected processes and systems that are not "built to purpose"

1. Data Collection



- Significant manual effort
- Costly
- Static data
- Incomplete and error-prone
- Not actionable
- Slow

2. Data Processing

- Expensive
- Subjective
- Driven by static conditions
- Time consuming

3. Housing and Tracking

- Systems are not built to suite for managing pavement networks, one of agency's largest assets
- Cumbersome

Roadway Lifecycle Management, Rebuilt for Leaders in the 21st Century

RMT is the only built-to-purpose, end-to-end Roadway Lifecycle Management platform that creates smarter, safer, and sustainable roadway networks through continuous monitoring

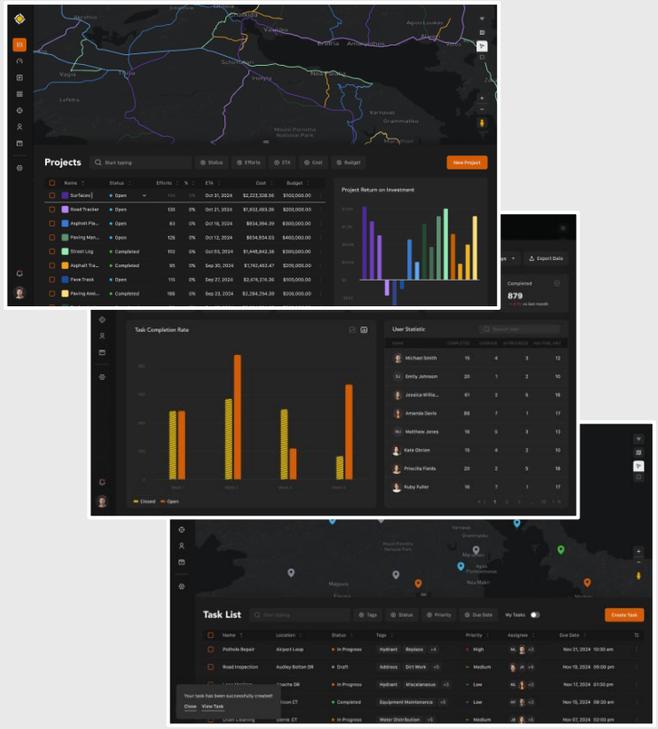
Secure, Smart Fleets	RoadManTech AI	RoadManTech SaaS	Service	RoadManTech Field App	Execution Support
Continuous, crowd-sourced data collection through proprietary hardware	One of a kind, sensor-fusion driven AI creating real-time roadway intelligence	Executive dashboards and by-road views with actionable insights	Dedicated account management partnering with your team	Field solutions app enables enrichment, execution and event defense	Project management tools, AI-monitoring, and work order support

Living Digital Twin Network Models Delivered through Proprietary Hardware, AI, and SaaS Solution

In-House Hardware

- Sensor fusion (multiple sensor inputs)
  - Photos every 75 feet
  - Vibration and Gyro data at 52,000 points per second
  - V3 radar live + patent pending
- “Trust but verify” machine learning AI
- MADE IN AMERICA

RoadManTech SaaS Platform



- Automated principal component collection, analysis, and interpretation
- Refreshed every night
- Real-time executive dashboards
- Automated budget optimization recommendations
- Return on investment analytics
- Roadway Lifecycle Management workflow

What is AI?

ChatGPT 5

How many oreos fit in Neyland Stadium?

Thought for 16s

About **60 billion Oreos** (order-of-magnitude).

Assumptions I used (Fermi style):

- Neyland's "bowl" ≈ an ellipse ~800 ft × 700 ft footprint, average height ~100 ft → **~4.4×10⁷ ft³** of fillable volume.
- Oreo ≈ cylinder **4.6 cm** diameter × **0.8 cm** thick → **~13.3 cm³** each.
- Packing efficiency for stacked discs **~0.64** (space lost to gaps).

Calculation: $4.4 \times 10^7\ \text{ft}^3 \rightarrow 1.25 \times 10^{12}\ \text{cm}^3$; apply packing → $\frac{0.64 \times 1.25 \times 10^{12}}{13.3} \approx 6.0 \times 10^{10}$ Oreos.

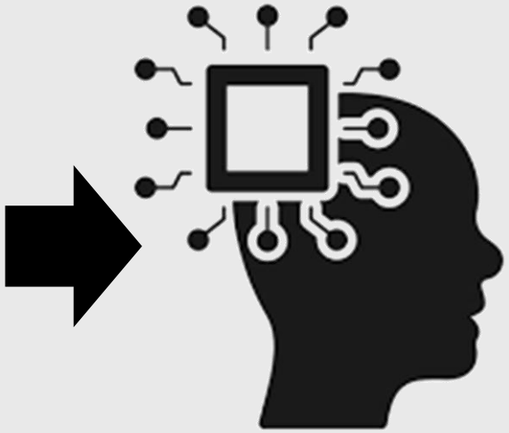
If you want it packed only up to the concourse or only on the field, I can re-run with tighter geometry.

Ask anything

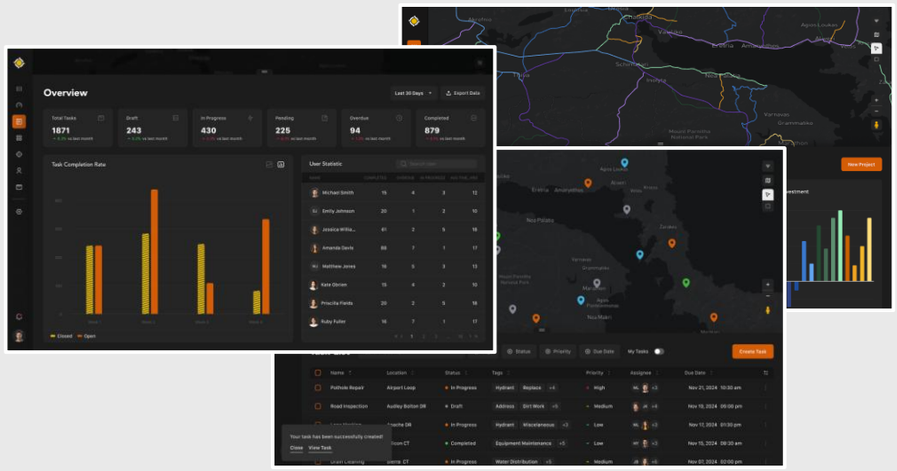
How Does This Work?

Principle Components

- Material
- Climate
- Base
- Traffic patterns
- Critical events
- Work quality

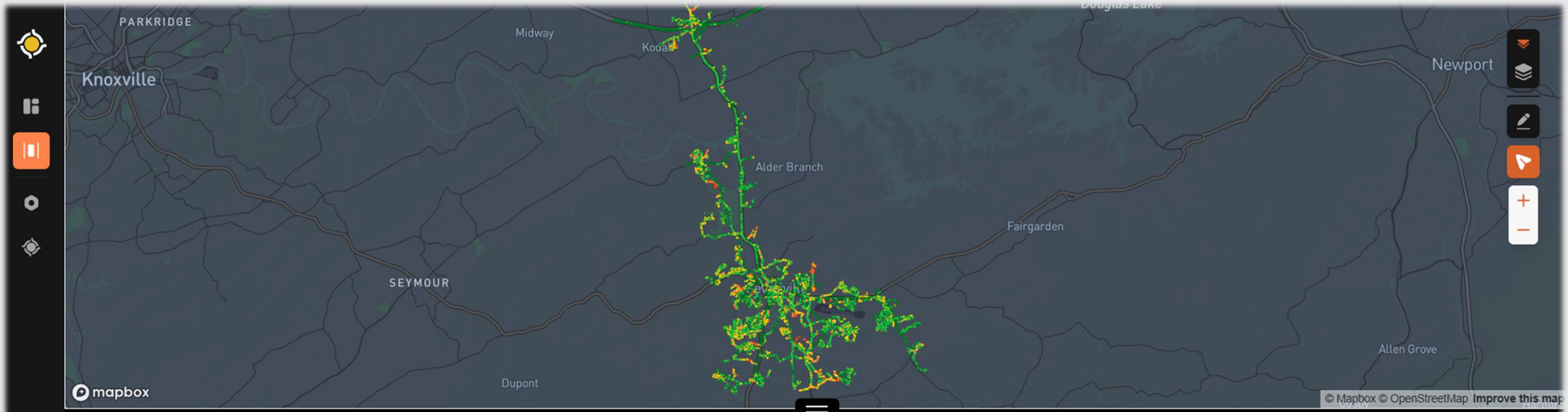


Actual Performance, on Every Road



Product Walkthrough

Interactive Map



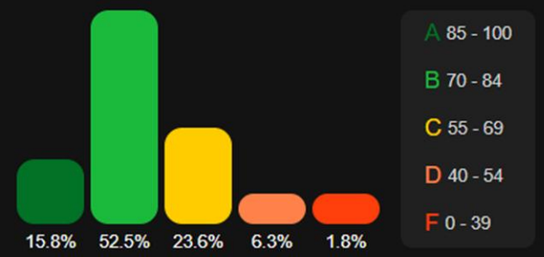
Roads List

Search by road name or id

Filters | Export

Road Name	PCI	Running PCI	Surface Life	Asset Value
COUNSELOR	79	-2	8 Years and 11 Months	$19,358.30
ALDERMAN	73	0	10 Years and 8 Months	$35,872.08
RIDGE	78	-2	13 Years and 2 Months	$33,302.17
OLD NEWPORT	72	-9	11 Years and 3 Months	$29,888.61
COLLIER	69	-5	10 Years and 4 Months	$49,917.23
ERNEST MCMAHAN	76	-4	12 Years and 6 Months	$5,905.71
MIDDLE CREEK	80	-1	13 Years and 11 Months	$5,949.91

Network PCI Scores



Customizable Dashboard & Reports

Dashboard

Export PDF

Network Status

Network PCI
75.59 +0.42%
Pavement Condition Index

Remaining Surface Life
2,383 +29.16%
Mile-Years

Network Value
$51,073,786.45 +0.42%
Million

Network Coverage

1,593/ 1,679
Coverage

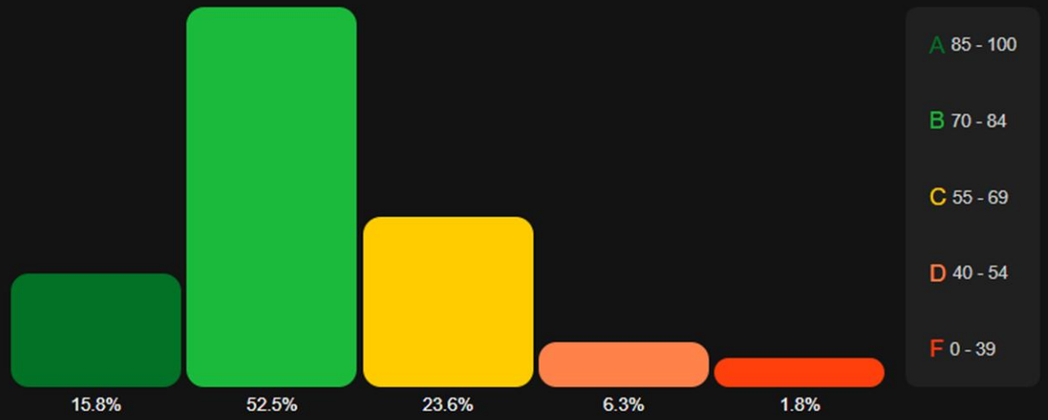
Covered Uncovered

Project Summary

5/ 5
Projects

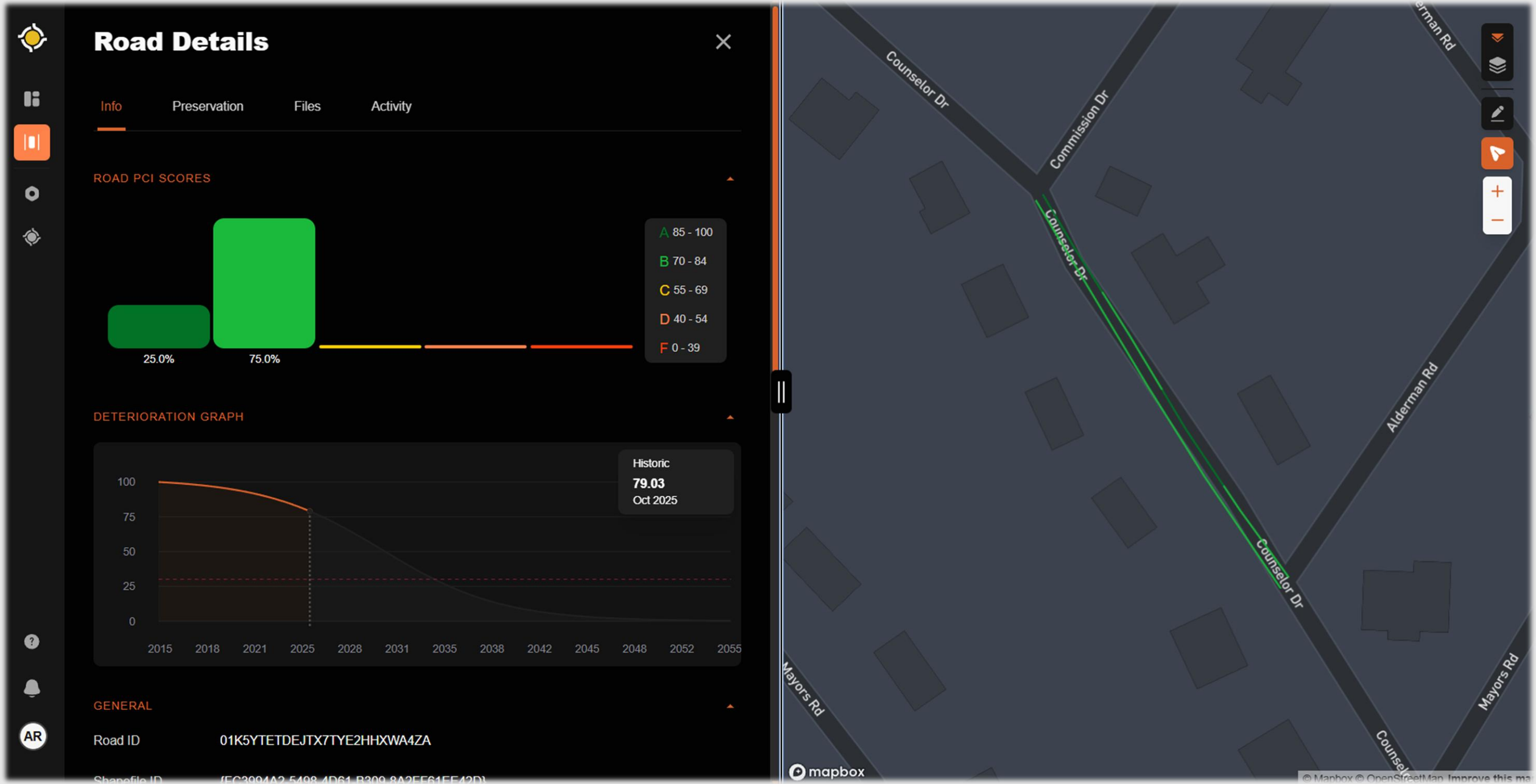
Opened Completed

Network PCI Scores

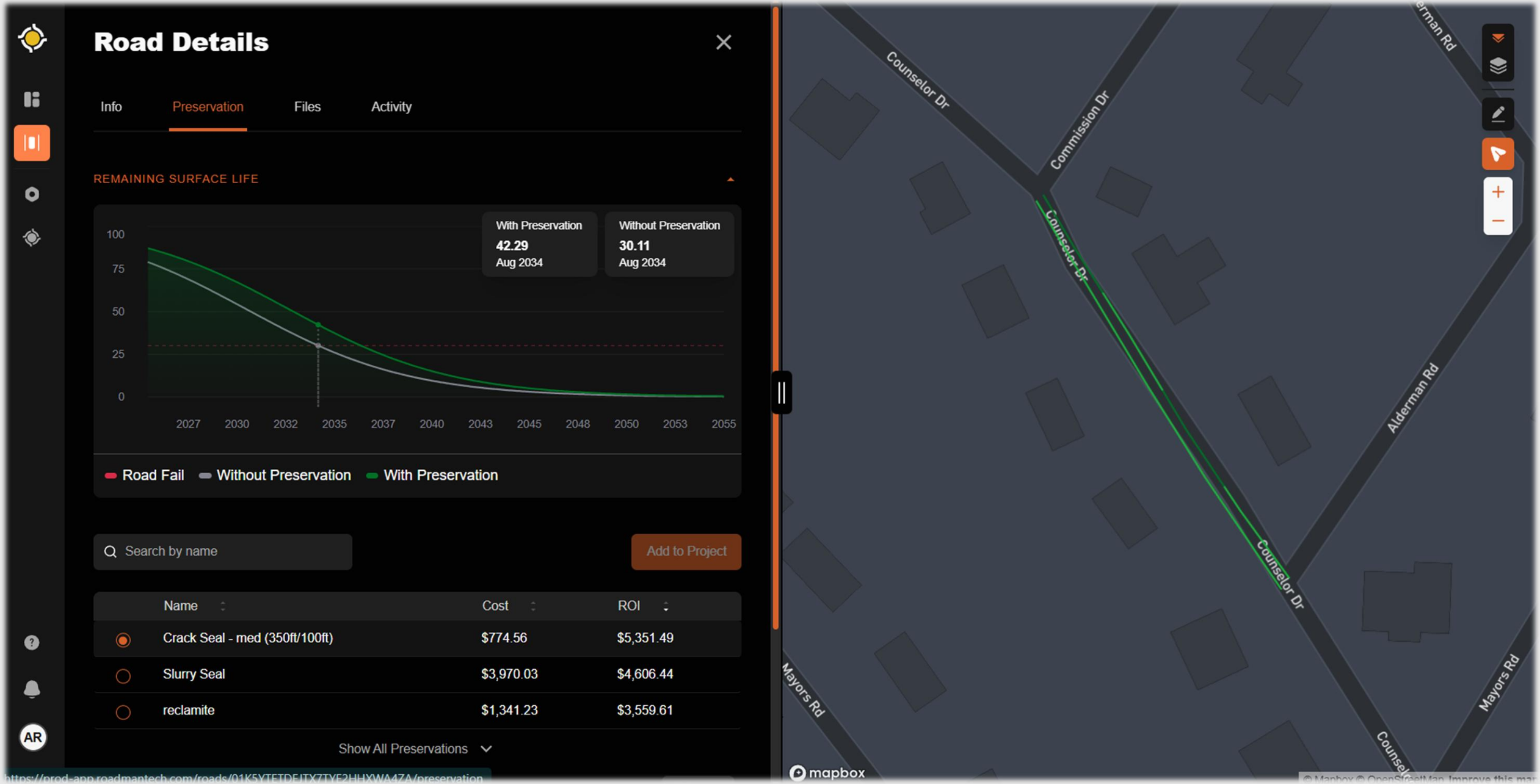


A 85 - 100
B 70 - 84
C 55 - 69
D 40 - 54
F 0 - 39

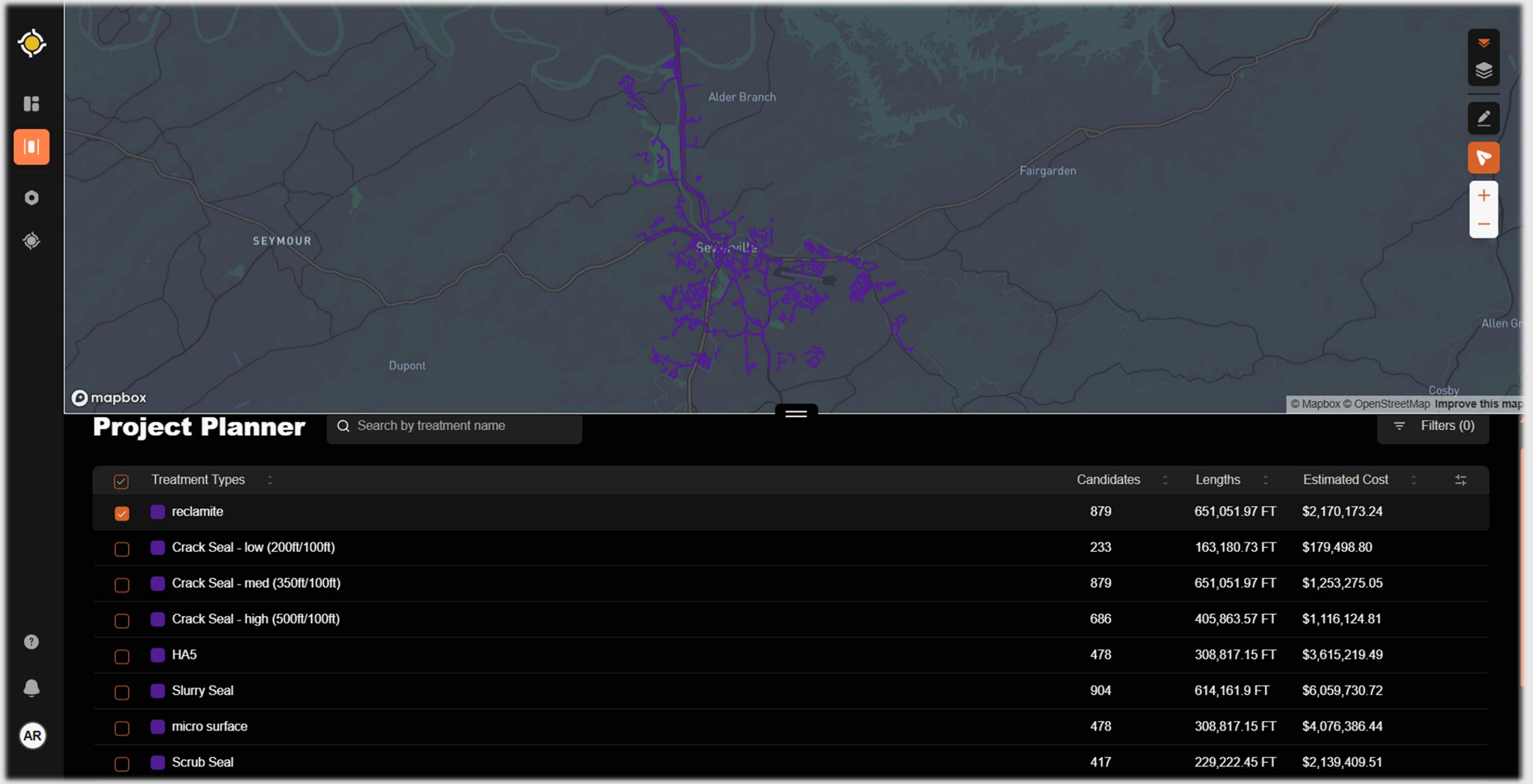
Single Road View



Single Road View Preservation Tab



Project Planner



Project Planner Road Selection

Project Planner / reclamite

Preservation Candidates | Projects

Name	Projects	PCI	Length	Cost	ROI
PARKWAY		85	1,140.298 FT	$3,800.995	$10,087.84
ROBERT HENDERSON		85	448.368 FT	$1,494.559	$3,966.56
MURPHY		85	197.452 FT	$658.173	$1,746.791
BROADVIEW		85	318.972 FT	$1,063.238	$2,821.835
EMILY		85	1,292.419 FT	$4,308.063	$11,433.598
RIVER		85	2,648.242 FT	$8,827.473	$23,428.114
RED BANK		85	736.102 FT	$2,453.672	$6,512.045
HARDIN		85	877.308 FT	$2,924.358	$7,761.247
RIVERGATE		85	344.475 FT	$1,148.249	$3,047.452
MURPHY		85	768.866 FT	$2,562.885	$6,801.898
Total (20 selected)			13,367.07 FT	$44,556.91	$118,254.04

Results 1-10 of 879 ‹ Previous 1 2 3 ··· 88 Next › Rows per page 10

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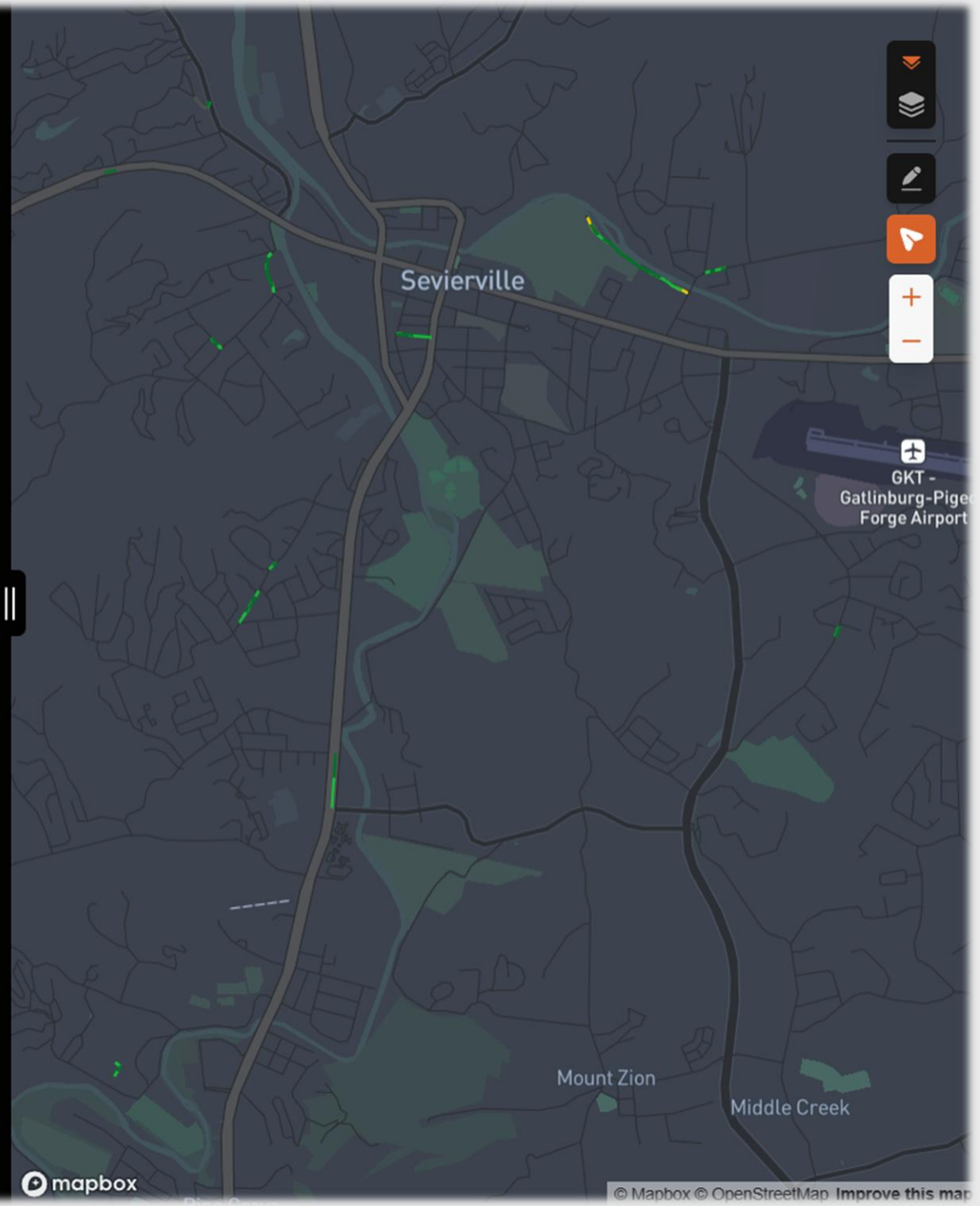
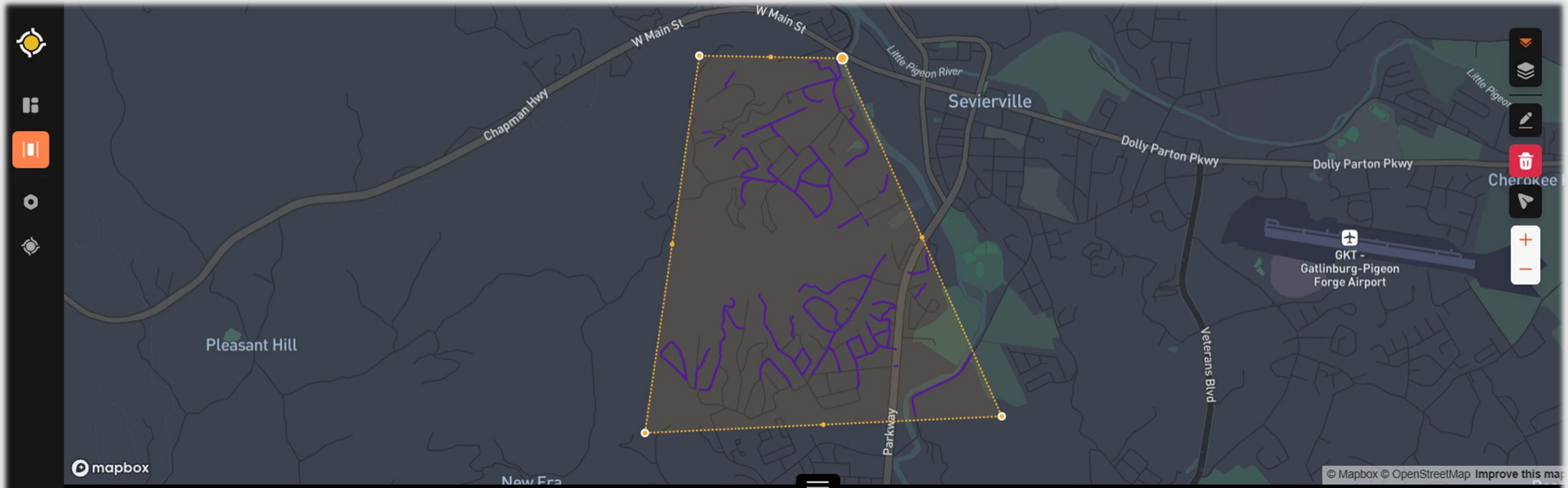


Targeted Project Areas



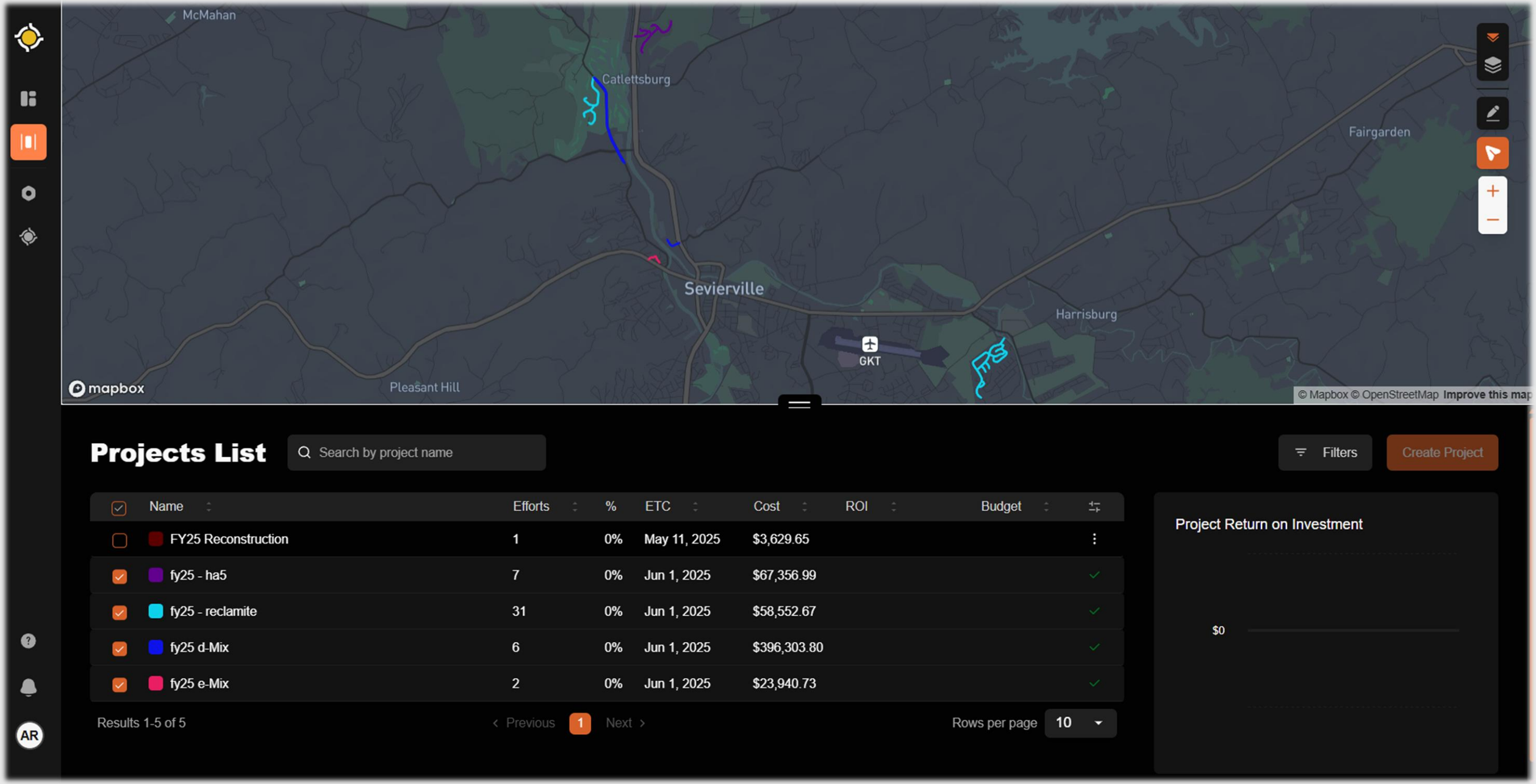
Project Planner

Search by treatment name

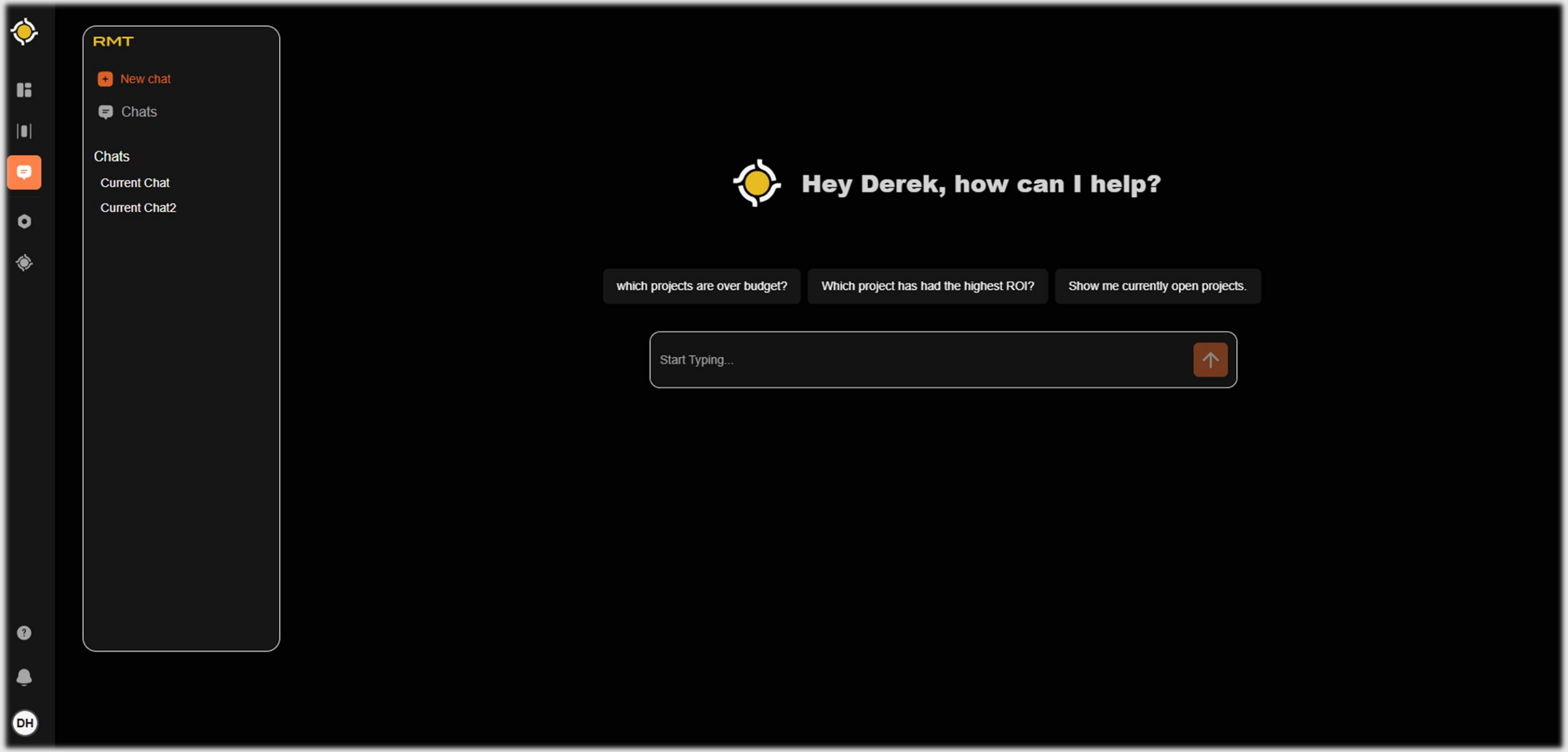
Filters (0)

Treatment Types	Candidates	Lengths	Estimated Cost
reclamite	87	55,003.05 FT	$183,343.49
Crack Seal - low (200ft/100ft)	7	3,586.85 FT	$3,945.54
Crack Seal - med (350ft/100ft)	87	55,003.05 FT	$105,880.87
Crack Seal - high (500ft/100ft)	29	18,077.5 FT	$49,713.11
HA5	29	18,077.5 FT	$211,627.22

Project Performance Tracking



AI Assistant



Automated Asset Recognition

How We Do This at RMT

RMT

Pavement

Assets

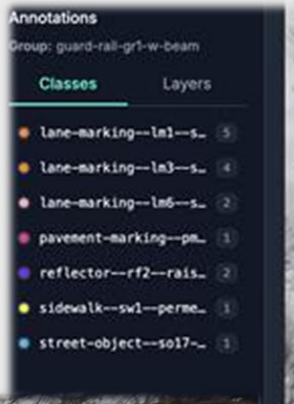
Continuous data from connected Fleets

Artificial intelligence

Living, actionable insights

Automated Asset Recognition

Automated Asset Recognition



CASE STUDY

CAPE CORAL, FLORIDA

RMT
ROADWAY MANAGEMENT TECHNOLOGIES

Cape Coral
FLORIDA

ROADWAY LIFECYCLE MANAGEMENT

ACCOUNT NAME

Cape Coral FLORIDA

- City of Cape Coral, Florida
- Second Largest City in Florida

SIZE/COVERAGE

3,142 Lane Miles

120 Square Miles

224,000 Population

BEFORE RMT

The City of Cape Coral faced significant challenges in managing its roadway network due to the absence of a formal pavement management system (PMS). The city sought a solution that would centralize all paving-related information, provide objective roadway evaluations, and streamline maintenance and project planning. Cape Coral's need for a comprehensive pavement lifecycle management approach was driven by the challenges of maintaining an expansive roadway network using legacy providers and processes.

TODAY

By implementing RMT's Roadway Lifecycle Management solution, the city created a proactive strategy to manage its pavement network efficiently. The integration of real-time data and workflows into decision-making processes has ensured that funding allocations were data-driven and will continue to be optimized for long-term sustainability. ***For fiscal year 2025, Cape Coral is now expecting to increase the number of lane miles of road touched by repaving efforts by approximately 50%. RMT's team identified the roads to be touched using the RoadManTech platform and decision logic provided by Cape Coral's team.*** This project set a precedent for other municipalities looking to transition from reactive maintenance to predictive asset management, informed by real-time data and truly intelligent systems.

CAPE CORAL INITIAL PROJECT NEEDS

Evaluation of Current Practices:

Assessing pavement conditions and optimizing maintenance strategies.

Comprehensive Pavement Condition Survey (PCS):

Full network evaluation based on ASTM-D6433-18 standards to establish PCI.

Pavement Management Software Implementation:

Centralized system for data storage, budget analysis, and project planning.

Optimization of Maintenance & Rehab (M&R) Strategies:

Using predictive modeling to allocate funds efficiently.

RMT RESPONSIBILITIES

RMT provided a comprehensive Pavement Lifecycle Management solution for Cape Coral and established a relationship with the agency towards a sustainable, ongoing solution.

Evaluation of Current Program & Procedures

- Conducted a needs assessment and business process audit.
- Facilitated strategy meetings with city staff.
- Delivered a Needs Assessment Report with strategic recommendations.

Continuous Pavement Condition Survey

- Performed full network pavement condition assessments.
- Integrated real-time PCI data into a GIS-compatible database.
- Refined deterioration models using real-world conditions.

Pavement Maintenance & Rehabilitation Workflows

- Developed standardized M&R workflows.
- Provided decision trees for selecting treatments based on multiple factors.

Pavement Management Software Implementation

- Implemented a web-based pavement management system.
- Enabled ‘what-if’ scenario analysis for budget planning.
- Generated multi-year maintenance plans.

Living Pavement Management Master Plan

- Developed a long-term pavement strategy with multi-year planning scenarios.
- Provided annual updates to reflect real-time data.

CLIENT QUOTES

"From the sales process to the installation, everyone with RMT has done anything and everything necessary to ensure a smooth process. The emphasis that was placed on addressing and resolving concerns was truly remarkable. Their team demonstrated exceptional professionalism, knowledge, and dedication at every stage of the project. They not only listened to our needs but also went above and beyond to provide solutions to our specific requirements. The installation process was seamless, and their support team was always available to answer questions and ensure everything was functioning perfectly. It's clear that RMT takes pride in delivering high-quality service and fostering long-term relationships with their clients. I highly recommend RMT to anyone seeking reliable and efficient software solutions. Their commitment to excellence sets them apart from the competition!"

- Bryan Vandewalker, Director of Transportation

NEXT STEPS

- **Cape Coral-Requested Custom Asset Solutions** – Expanding beyond pavement management to include living right of way asset tracking.
- **Software Enhancements & Customization** – Continuing development based on Cape Coral's evolving needs.
- **Ongoing Training & Support** – Providing continued staff training to maximize system efficiency.
- **Multi-Year Budget & Maintenance Planning** – Assisting with long-term funding allocations and refining preservation strategies using real-time data insights.

Questions?

Book Time With RMT

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