



IMPACT OF RECLAMITE®

A Data-Driven Comparative Assessment
Using RMT's Pavement Lifecycle
Management System

Eastern Tennessee Region



THE IMPORTANCE OF PAVEMENT PRESERVATION

Asphalt pavement begins aging immediately after placement. Oxygen, UV exposure, moisture, and temperature cycling gradually alter the asphalt binder. Maltenes oxidize and evaporate, binder stiffens, flexibility declines, and micro-cracking initiates. Long before widespread distress becomes visible, chemical aging is already underway.

Most agencies intervene only after deterioration becomes measurable through visible cracking or declining Pavement Condition Index (PCI) values. By that stage, more costly corrective rehabilitation is often required—restoring the surface, but at significantly higher lifecycle cost.

Pavement preservation shifts the timing of intervention by **targeting deterioration earlier** in the pavement lifecycle. Rather than reacting to distress, preservation strategies slow oxidation and maintain flexibility while the pavement remains structurally sound.

Reclamite® Asphalt Rejuvenator is the original Maltene Replacement Technology (MRT), designed as an early-stage preventative treatment to restore and preserve asphalt by penetrating the pavement surface and replacing maltenes lost to oxidation. Reclamite's goal is not structural reconstruction but extending pavement life through early rejuvenation and surface protection.

RECLAMITE® ASPHALT REJUVENATOR

When applied early in the pavement lifecycle:

- Provides an in-depth seal to reduce water intrusion
- Replaces maltenes lost to oxidation
- Improves binder flexibility
- Strengthens the asphalt-aggregate bond
- Slows oxidation-related deterioration



In this study, performance was evaluated using RMT's Pavement Lifecycle Management System, which leverages a multi-sensor hardware suite to collect real-time pavement condition data as vehicles travel the roadway.

This case study examines whether early Reclamite® application measurably slows deterioration and extends pavement service life under real-world conditions.

STUDY DESIGN SUMMARY

TEST SITE OVERVIEW

To evaluate the impact of early-stage preservation, RMT conducted a controlled field evaluation in Eastern Tennessee.

ROAD	PAVED YEAR	TREATMENT YEAR
Verona Lane	1998	1999
Monterey Road	2002	2003
Colonial Drive	2022	2023

Three asphalt roads had a section treated with Reclamite approximately one year after paving as well as an adjacent untreated control section. This ensured both segments experienced identical traffic loading, environmental exposure, subgrade conditions, and construction variables to isolate the performance effect of the preservation treatment.

PERFORMANCE MEASUREMENT & ANALYSIS

Using RMT's Pavement Lifecycle Management System, real-time pavement condition data — including surface distress and ride quality metrics aligned with ASTM-based PCI modeling — was collected and analyzed. For this study, the data was modeled to quantify deterioration rates, project PCI performance, predict remaining surface life, and forecast rehabilitation timing.

Illustrated below, the modeled life extension was then translated into economic value by converting inflation-adjusted rehabilitation costs into deferred capital value and subtracting the preservation treatment cost to determine the net lifecycle benefit.



STUDY COST ASSUMPTIONS

The amounts shown reflect the cost assumptions used to compare Reclamite to a Mill & Overlay rehabilitation. Expressed in 2026 dollars, these figures highlight the significant cost gap due to inflation between a preventative treatment and major rehabilitation.

Cost of Mill & Overlay

\$123,200
\$17.50/SY
Per lane mile

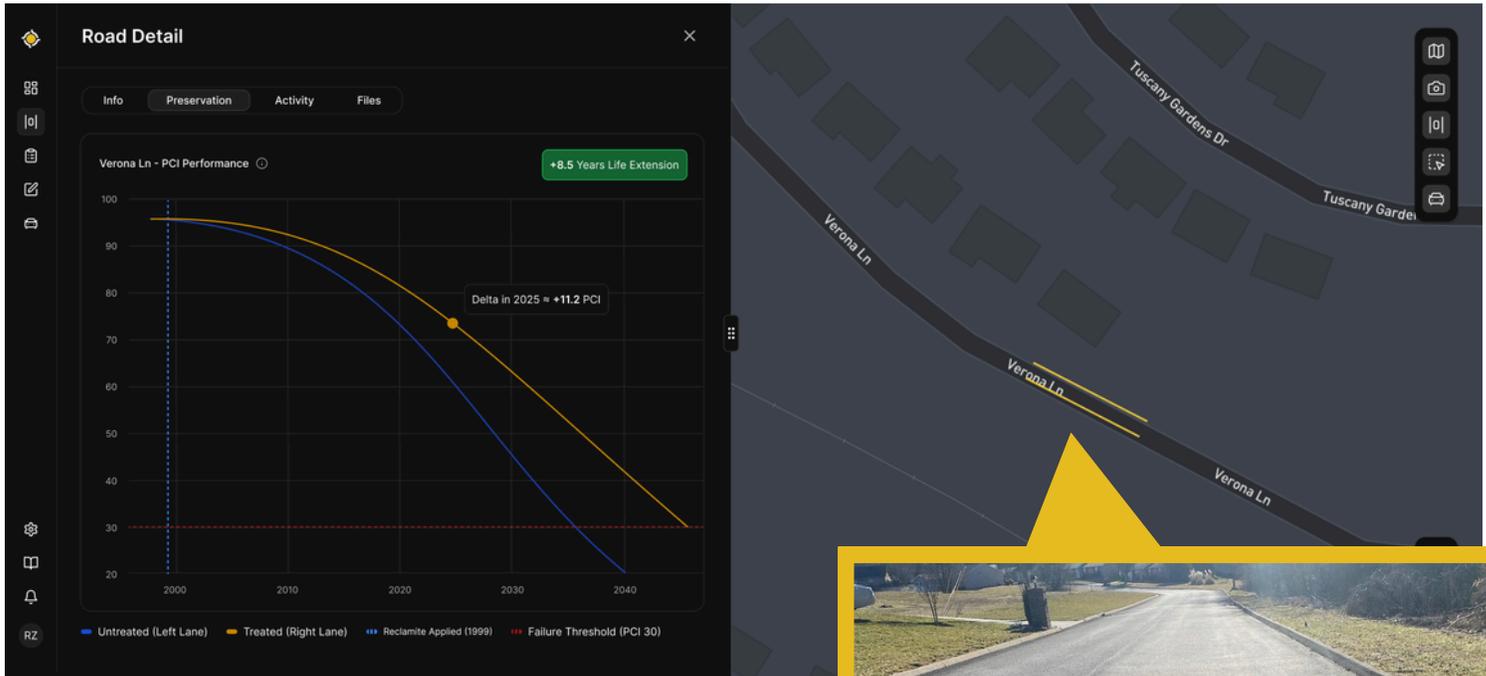
Cost of Reclamite

\$9,152
\$1.30/SY
Per lane mile

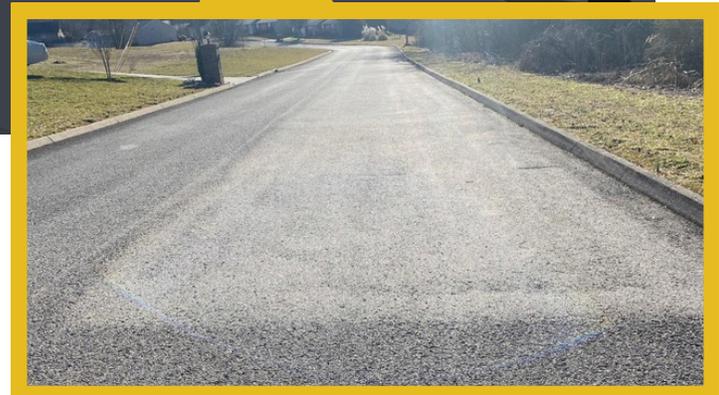
VERONA LANE

PERFORMANCE OBSERVATION

PAVED IN 1998 | TREATED IN 1999



With the longest performance history in the study, the treated section demonstrates sustained resilience, maintaining **+11.2 PCI** by 2025 and declining more gradually over time. At failure (PCI 30), the treatment provides approx. **8.6 additional years of pavement life**.



The treated side has visibly less raveling, weathering, and road noise compared to the untreated lane.

PERFORMANCE SUMMARY

Values shown are in 2026 Net Present Value.

<p>Service Life Extension</p> <p>8.56 YRS</p> <p>≈ 8y 6m</p>	<p>Deferred Rehabilitation Value</p> <p>\$27,877</p> <p>Per lane mile</p>	<p>Reclamite® Project Cost</p> <p>\$9,152</p> <p>Per lane mile</p>	<p>Net Lifecycle Benefit</p> <p>\$18,725</p> <p>ROI = 205%</p>
<p>Projected Failure Without Treatment (PCI 30)</p> <p>APR 2036</p> <p>37y 10m from June 1998</p>		<p>Projected Failure With Treatment (PCI 30)</p> <p>NOV 2044</p> <p>Postpones reconstruction to 2044</p>	

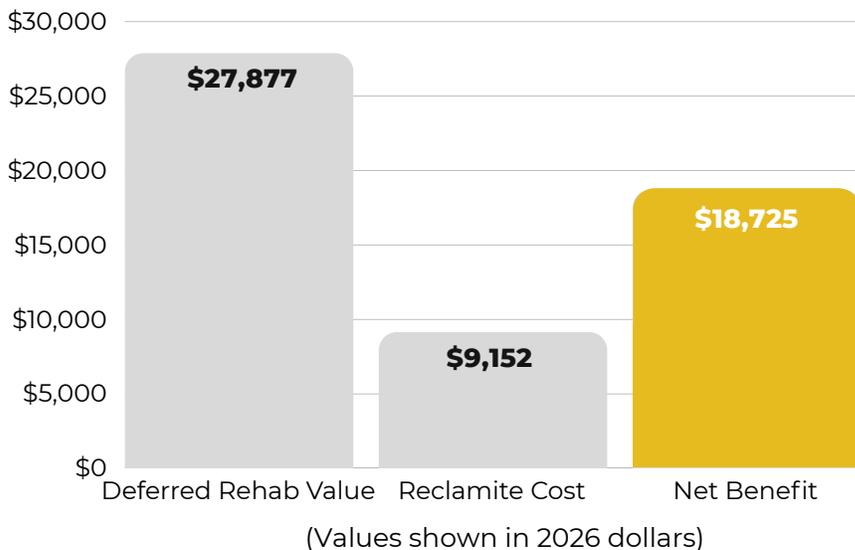
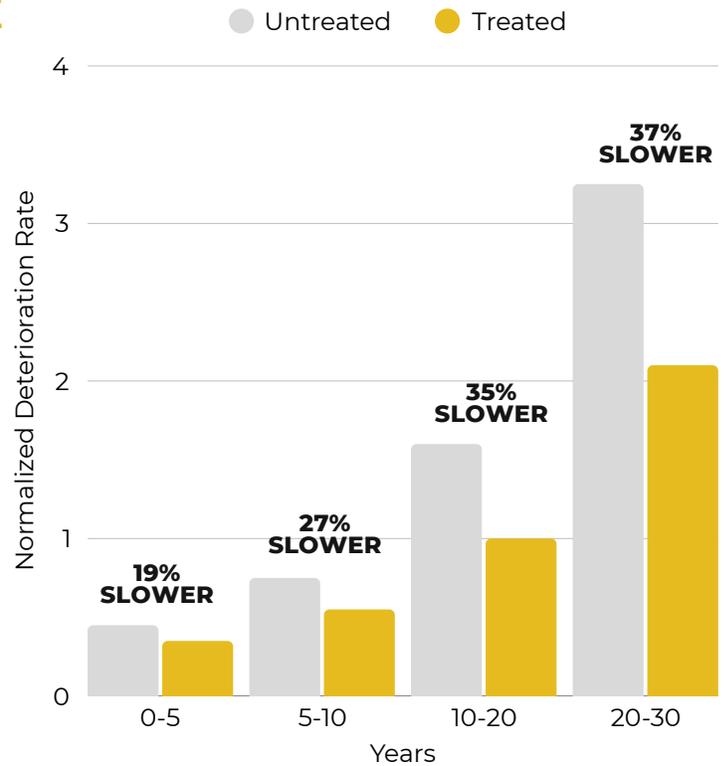
VERONA LANE

PERFORMANCE OBSERVATION

NORMALIZED ANNUAL PCI DETERIORATION RATE OVER TIME

This graph shows the percent of pavement condition lost per year across each **Pavement Lifecycle Stage (Years Since Construction)**. On the oldest roadway in the study, the treated section consistently deteriorates more slowly than the untreated lane at every stage. The performance gap increases as the pavement ages, demonstrating that the **treatment reduces the annual rate of decline**.

The difference between the treated and untreated sections establishes the initial proof that preservation modifies the deterioration curve rather than simply improving condition temporarily.



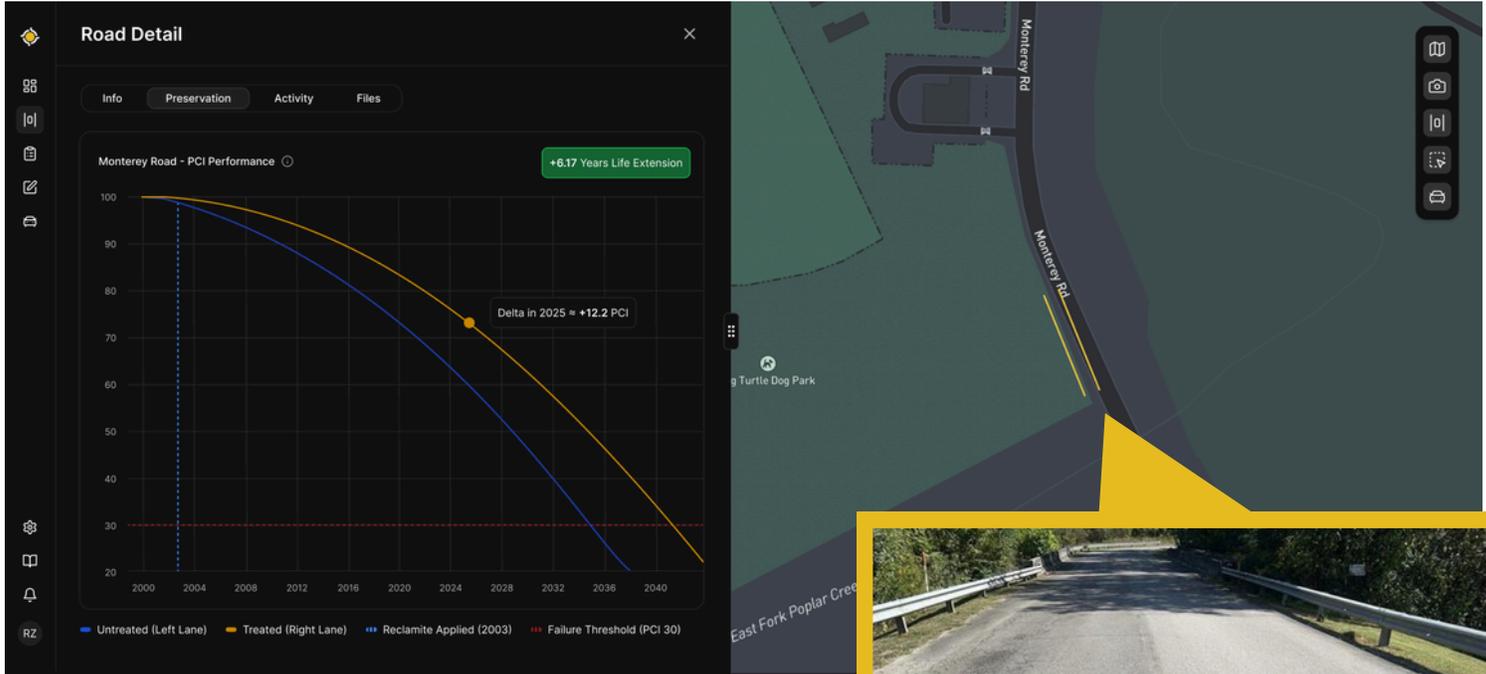
LIFE-EXTENSION ECONOMICS

When adjusted to 2026 dollars, this earliest paved section demonstrates the long-term financial impact of timely preservation. Roads constructed in the late 1990s were built with longer expected surface lives than many roads constructed today. Even under more favorable historical construction conditions, early treatment extended service life, deferred major rehabilitation, and generated a strong net benefit. Preservation is not routine maintenance; it is capital optimization.

MONTEREY ROAD

PERFORMANCE OBSERVATION

PAVED IN 2002 | TREATED IN 2003



Performance separation becomes pronounced over time, with the treated lane maintaining a **+12.2 PCI** advantage by 2025 and following a significantly flatter deterioration curve. Projected to PCI 30, the treatment postpones failure from 2035 to 2041, delivering **6.2 years of added service life**.



The treated lane shows less cracking, surface breakdown, and a smoother ride quality compared to the untreated lane.

PERFORMANCE SUMMARY

Values shown are in 2026 Net Present Value.

<p>Service Life Extension</p> <p>6.17 YRS</p> <p>≈ 6y 2m</p>	<p>Deferred Rehabilitation Value</p> <p>\$23,332</p> <p>Per lane mile</p>	<p>Reclamite® Project Cost</p> <p>\$9,152</p> <p>Per lane mile</p>	<p>Net Lifecycle Benefit</p> <p>\$14,180</p> <p>ROI = 155%</p>
<p>Projected Failure Without Treatment (PCI 30)</p> <p>JAN 2035</p> <p>32y 7m from June 2002</p>	<p>Projected Failure With Treatment (PCI 30)</p> <p>MAR 2041</p> <p>Postpones reconstruction to 2041</p>		

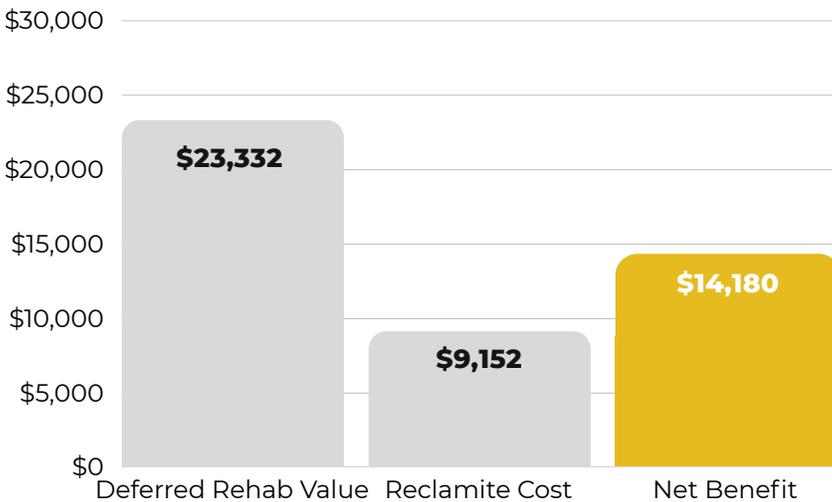
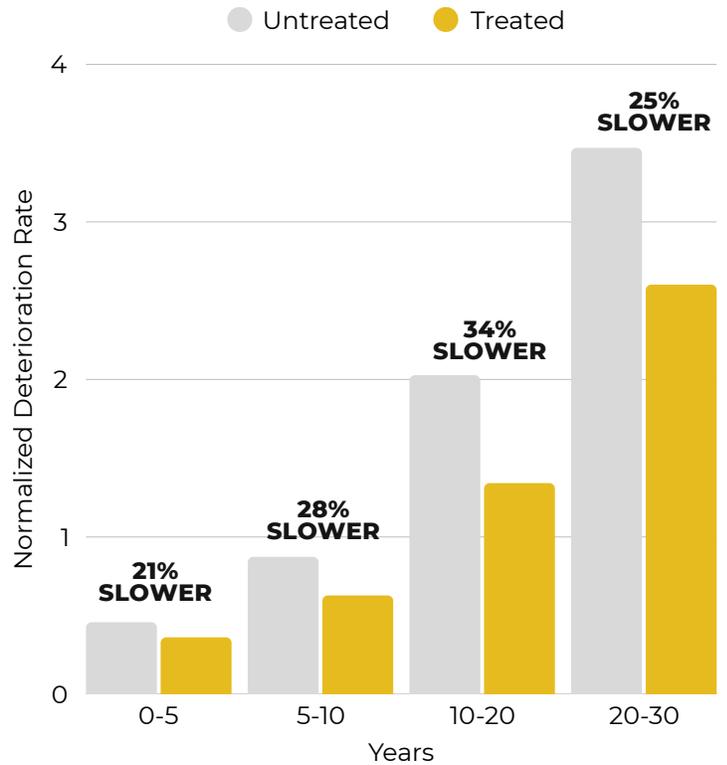
MONTEREY ROAD

PERFORMANCE OBSERVATION

NORMALIZED ANNUAL PCI DETERIORATION RATE BY AGE

Using the same normalized PCI methodology, the 2002 section demonstrates that the performance gap not only persists but becomes more pronounced as the pavement ages. The treated lane maintains a moderate rate of decline while the untreated section accelerates in later years.

This reinforces that early preservation does not create a short-term effect, but produces sustained lifecycle performance improvement.



(Values shown in 2026 dollars)

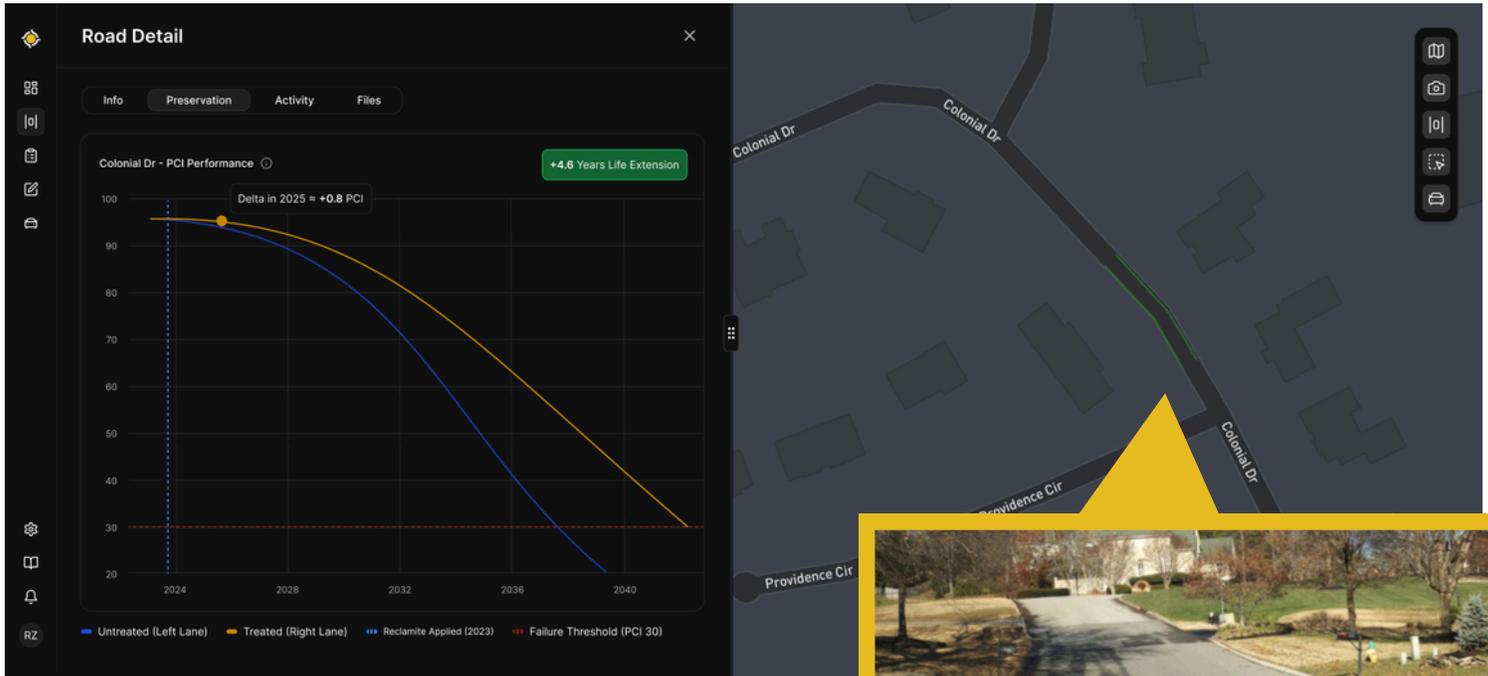
LIFE-EXTENSION ECONOMICS

In 2026 dollars, the benefit continues to be evident as rehabilitation costs escalate over time. Each additional year of deferred rehabilitation avoids a significantly higher future construction expense. As pavements age and replacement costs rise, preservation becomes progressively more valuable, not simply as a cost-saving measure, but as a financial risk avoidance strategy against construction inflation.

COLONIAL DRIVE

PERFORMANCE OBSERVATION

PAVED IN 2022 | TREATED IN 2023



At an early stage in its lifecycle, the treated lane already demonstrates measurable separation, holding **+0.8 PCI** (98.2 vs. 97.4) in 2025 and modeling a flatter long-term deterioration curve. Projected to a PCI 30 failure, the treatment adds roughly **4.6 years of service life**.



Field observations after rainfall showed improved sealing and reduced moisture intrusion in the treated pavement.

PERFORMANCE SUMMARY

Values shown are in 2026 Net Present Value.

<p>Service Life Extension</p> <p>4.59 YRS</p> <p>≈ 4y 7m</p>	<p>Deferred Rehabilitation Value</p> <p>\$36,296</p> <p>Per lane mile</p>	<p>Reclamite® Project Cost</p> <p>\$9,152</p> <p>Per lane mile</p>	<p>Net Lifecycle Benefit</p> <p>\$27,144</p> <p>ROI = 297%</p>
<p>Projected Failure Without Treatment (PCI 30)</p> <p>JAN 2038</p> <p>15y 7m from June 2022</p>	<p>Projected Failure With Treatment (PCI 30)</p> <p>AUG 2042</p> <p>Postpones reconstruction to 2042</p>		

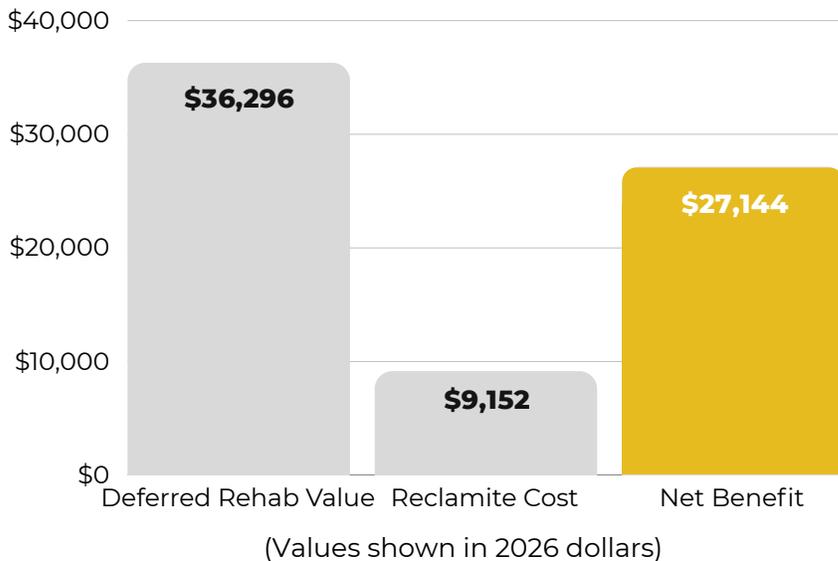
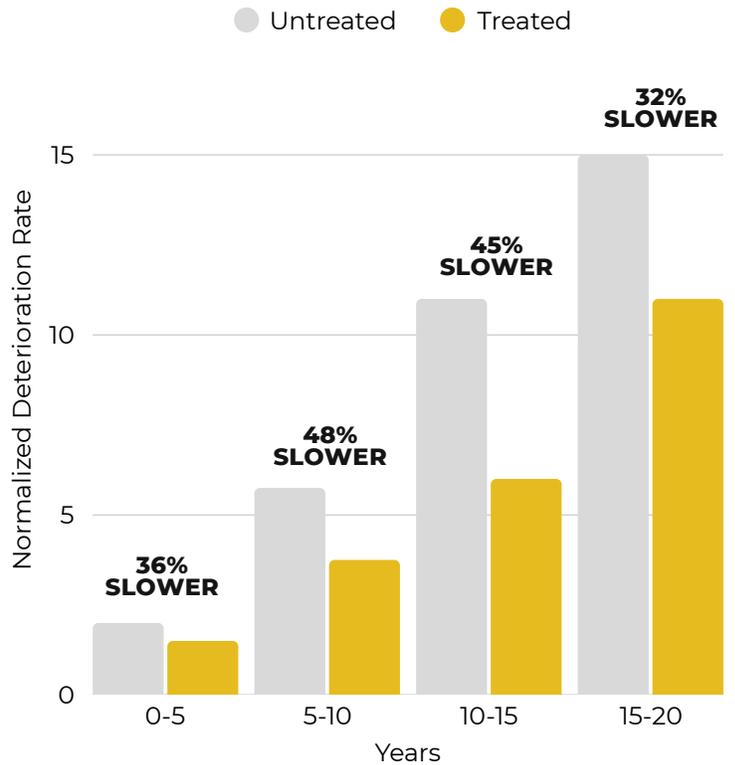
COLONIAL DRIVE

PERFORMANCE OBSERVATION

NORMALIZED ANNUAL PCI DETERIORATION RATE BY AGE

On the newest roadway, normalized deterioration rates again confirm slower condition loss in the treated section. Because preservation was applied early, the pavement begins its service life aging more gradually, preventing the rapid acceleration typically observed in untreated asphalt.

Together, the results across construction years show that the performance impact is repeatable and independent of original paving date.



LIFE-EXTENSION ECONOMICS

When evaluated in 2026 dollars, Colonial Drive shows the highest net benefit. This is largely due to two compounding factors: today's roads are typically constructed with shorter estimated surface lives than those built 20+ years ago, and major rehabilitation activities such as mill and overlay have experienced substantial cost inflation. Treatments like Reclamite have not escalated at the same rate. The widening gap between preservation costs and full rehabilitation costs amplifies the economic return, resulting in a significantly higher net benefit for newer pavements.

AVERAGE PERFORMANCE OBSERVATION

This graph represents the average pavement performance observed across all three test roads. After normalizing by pavement age, the treated pavement consistently deteriorates more slowly, maintaining a higher condition level throughout its lifecycle.

Key findings:

- **Slowed Deterioration:** Across all three roads, the Reclamite®-treated sections deteriorated more slowly and maintained higher condition levels throughout the pavement lifecycle than untreated pavement.
- **Meaningful Mid-Life PCI Advantage:** By mid-life, the treated pavement holds an average **+5.8 PCI** advantage, corresponding with noticeably reduced cracking, raveling, and surface weathering.
- **Surface Life Extension:** At a PCI 30 failure threshold, the treated pavement reaches failure approx. **6.5 years** later, delaying major rehabilitation such as mill and overlay.

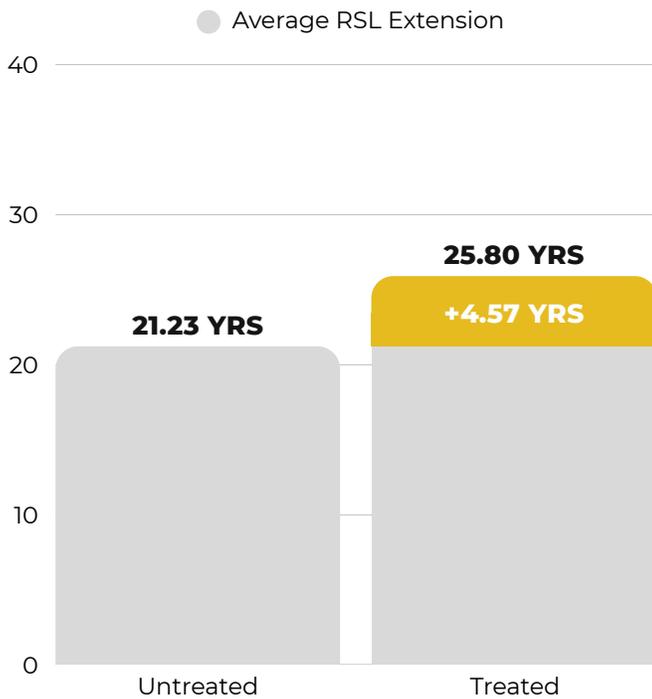


PERFORMANCE SUMMARY

Values shown are in 2026 Net Present Value.

<p>Service Life Extension</p> <p>6.45 YRS</p> <p>Across 3 modeled roads</p>	<p>Deferred Rehabilitation Value</p> <p>\$27,726</p> <p>Per lane mile</p>	<p>Reclamite® Project Cost</p> <p>\$9,152</p> <p>Per lane mile</p>	<p>Net Lifecycle Benefit</p> <p>\$18,574</p> <p>ROI = 203%</p>
<p>Avg Projected Failure Without Treatment (PCI 30)</p> <p>28.66 YRS</p> <p>Modeled from untreated lane data</p>	<p>Avg Projected Failure With Treatment (PCI 30)</p> <p>35.11 YRS</p> <p>Modeled from treated lane data</p>		

AVERAGE PERFORMANCE OBSERVATION



22% INCREASE IN REMAINING SURFACE LIFE (4.57 YEARS)

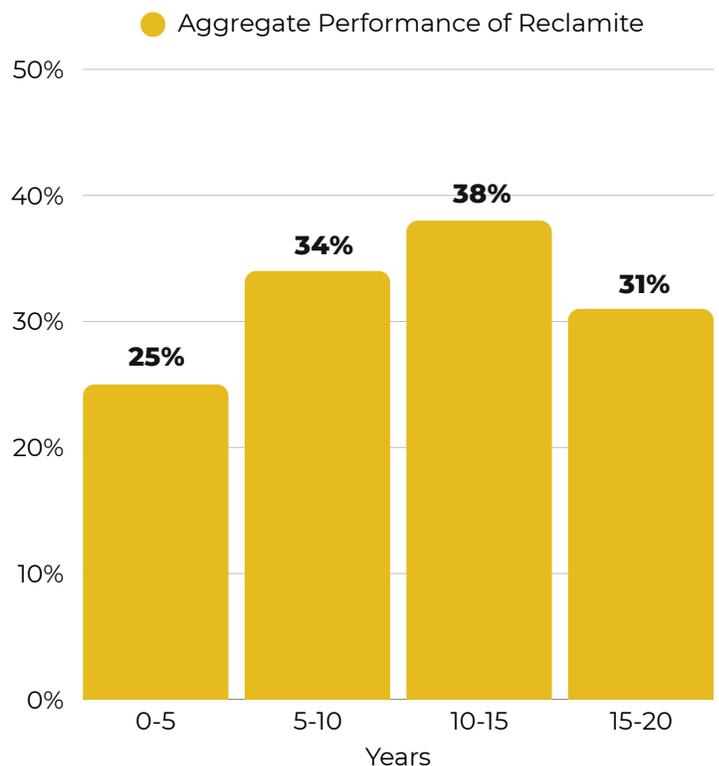
Using RMT's modeling and PCI projections, Remaining Surface Life (RSL) was defined as the years until pavement reached PCI 60, the point where preservation options begin to narrow.

Across all sites, treated lanes reached PCI 60 later than untreated lanes, demonstrating a clear preservation benefit: a gain of about **+4.57 years (+22%)** of additional preservation window.

~30-40% SLOWER CONDITION DECLINE OVER THE FIRST 20 YEARS OF SERVICE LIFE

By measuring the percent of starting PCI lost per year, the results remove starting-condition bias and allow true lifecycle comparison.

Across all sites, treated pavement deteriorated significantly more slowly. Overall, early Reclamite® application reduces deterioration roughly ~30-40%, flattens the aging curve, and preserves pavement condition longer during critical rehabilitation planning years.



KEY FINDINGS

WHAT DOES THIS MEAN FOR AGENCIES?

Reclamite® is not simply a maintenance treatment, it is a **scalable capital deferral strategy**. For agencies operating in today's cost environment, early preservation meaningfully improves pavement asset life, enhances capital planning, and generates measurable lifecycle ROI.



- Treated sections demonstrated consistently higher PCI values.
- Treated sections exhibited slower annual PCI deterioration rates.
- Performance trends indicate measurable service life extension when Reclamite® is applied within the early stages of pavement life.
- Proactive rejuvenation significantly delays capital-intensive mill & overlay cycles.
- Life extension translates directly into measurable cost avoidance and positive ROI.

WHAT 7 EXTRA YEARS OF PAVEMENT LIFE IS WORTH

- ✓ \$18,574 average net benefit per lane mile
- ✓ 203% average ROI
- ✓ Early lifecycle preservation costs a fraction of reactive rehabilitation
- ✓ Reduces total lifecycle resurfacing frequency
- ✓ Strengthens lifecycle capital efficiency

YOUR NEXT STEP

Evaluate. Plan. Preserve.

Preservation decisions should be driven by measurable outcomes, not assumptions. If your agency is evaluating how to extend pavement life, slow deterioration rates, and improve lifecycle cost efficiency, RMT can provide the data and strategy to support these decisions.

To learn more about evaluating pavement performance within your network, contact RMT.



RMT - ROADWAY MANAGEMENT TECHNOLOGIES

Noah Butler

VP Sales & Marketing

Noah@roadmantech.com | 352.283.1253

