Research Project Brief

Report 26-R40: Short-Term Field Evaluation of Spray-on Rejuvenators for Asphalt Pavement Preservation

VTRC Virginia Transportation Research Council

Background

Spray-on rejuvenators are surface-applied pavement preservation treatments intended to mitigate oxidative aging of asphalt binder in the near-surface region. Although several agencies have evaluated these treatments, reported performance has varied widely. Prior to this study, VDOT did not have an established specification or standardized evaluation framework governing their use.

Research Objectives

- Evaluate the feasibility of applying spray-on rejuvenators under Virginia conditions.
- Assess short-term field performance and near-surface material response.
- Document constructability considerations.
- Develop and refine a special provision to guide future applications.

Approach

- Comprehensive literature and specification review.
- Field trials in the Lynchburg District (non-residential routes, 2023).
- Field trials in the Northern Virginia District (residential routes, 2025).
- Evaluation of proprietary products through short-term monitoring of near-surface binder rheology, surface friction, texture, ride quality, rutting, and pavement condition indices.

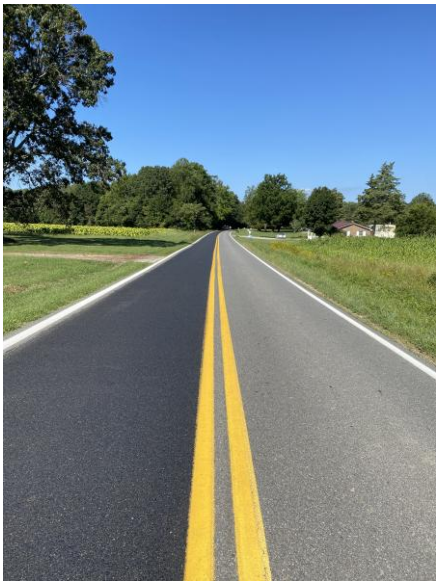
Outcomes

- Demonstrated constructability of spray-on rejuvenators under Virginia conditions.
- Quantified product-dependent near-surface binder response.
- Documented short-term friction and texture behavior.
- Developed and field-implemented a VDOT special provision to guide spray-on rejuvenator applications.
- Established baseline data to support continued long-term monitoring.

Research Benefits

- Provides VDOT with a framework for evaluating spray-on rejuvenators.
- Reduces implementation risk through a field-tested special provision tailored to Virginia conditions.
- Supports consistent application practices across districts.
- Establishes foundation for future performance-based refinement.

Freshly Applied Spray-on Rejuvenator



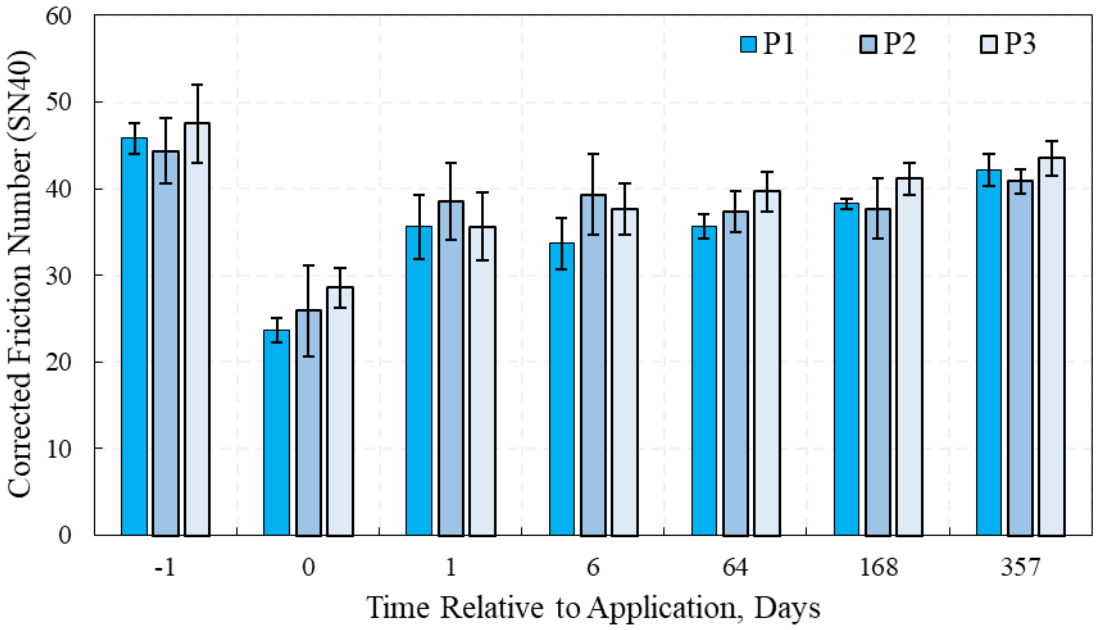
Spray-on Rejuvenator After Curing

Principal Investigators

Ilker Boz, Ph.D., P.E.
Senior Research Scientist

Elizabeth Turochy
Research Scientist

Research Findings



Spray-on Rejuvenators Function as Surface-Level Preventive Treatments

Proper pavement selection and early application timing are critical.

Measurable changes in near-surface binder rheology were observed under Virginia field conditions.

Response was product- and pavement-dependent, reinforcing that performance is not uniform across applications.

Implementation Practices Govern Short-Term Performance and Risk

Application rate control, spray uniformity, curing time, and access control are essential.

Immediate but temporary surface friction reductions were confirmed, followed by recovery.

No short-term adverse effects on ride quality, rutting, or texture were observed under evaluated conditions.