

Rejuvenating Sprays Extend Pavement Life in Florida

BY SANDY LENDER

The general public might not understand why officials select relatively new pavements for preservation treatments, but agencies know it puts plans in place to make best use of taxpayer money. A common experience is surprise among the public to see road workers tending to pavements that don't appear to need repair. The Bartow, Fla., Department of Public Works in central Florida provides a good example of preservation on relatively new pavements.

To seal and protect a two-year-old, 9.5-mm Superpave structure that contains 30 percent reclaimed asphalt pavement (RAP) in Bartow, officials chose to perform a rejuvenating spray treatment with the liquid, plant-based *Delta Mist* penetrative asphalt rejuvenator from Collaborative Aggregates LLC, Wilmington, Mass. The product was developed by Dr. John Warner and his team of research scientists at Warner Babcock Institute using their *12 Principles of Green Chemistry*. Bartow

can provide a template for other transportation agencies' potential for success.

CHECK AMBIENT CONDITIONS

On a partly cloudy day of 80 deg F and 30 percent humidity in February 2020, assistant director Corbett Watson, P.E., oversaw the rejuvenating spray process for South Floral Avenue.

"Based on the application procedures, there are limits to this type of application when it comes to humidity and dampness or watershed on the existing pavement areas to be treated," Watson says. "I would have to say it is equally important for either one [temperature or humidity]. If it's too hot, the product will not absorb into the asphalt pavement, and if too wet, it will have the same problem. The procedures are usually set by the manufacturer of the product to ensure the functionality is correct."

For the use of *Delta Mist*, for example, the manufacturer recommends temperature of the pavement surface be 50 deg F and rising and recommends ideal ambient

average humidity levels of 85 percent or lower. Collaborative Aggregates' Pete Engle concurred with Watson: "We couldn't have asked for better weather."

CHECK LOGISTICS

Bartow let the project to RJM-McQueen Contracting Inc., Collins, Miss., to apply the rejuvenating spray to a section of South Floral Avenue that was 1,800 linear ft. by 23 ft. wide. Watson said they wanted to "do a decent length of pavement" to try the treatment.

Given the Bartow agency's budget has typically included mill-and-fill applications in the past, officials have been seeking ways to stretch the service life of the improved pavement structures with minimal extra dollars being spent. Watson indicated the City of Bartow intends to incorporate more pavement preservation treatments going forward. "This is an important process to start now, due to increasing cost and maintenance of existing conditions of city streets," Watson says.



IMAGE CREDIT: SANDY LENDER

Contractor RJM McQueen places *Delta Mist* penetrative rejuvenating spray on the Bartow, Fla.'s Floral Avenue project at a rate of 0.10 gal./sq. yd.; material sprays white prior to cure

The RJM team applied Delta Mist via an E.D. Etnyre distributor truck at a rate of 0.10 gal/sq. yd. for Floral Avenue, which is neatly within the 0.05 to 0.135 gal/sq. yd. that the manufacturer recommends, based on the pavement surface condition.

RJM also is the contractor that applied Delta Mist on the National Center for Asphalt Technology (NCAT) Pavement Test Track at Auburn University, section N7. Jason Nelson, track manager, says if an agency has been experiencing top-down cracking, a rejuvenator application has the potential to revitalize the surface binder, which would potentially extend the lifetime of the pavement.

Delta Mist penetrates the top 3/8 in. of the surface pavement and slows the oxidation of the asphalt binder. It minimizes loss of fines and aggregates, giving the binder the opportunity to hold the aggregates for a longer time, offering a longer service life to the treated pavement.

"We treated both sides of the street," Watson said. "We're not going to see a difference for about six months, but we'll also look at the line between the treatment versus the non-treatment."

CURRENT BENEFITS

While Bartow officials have to wait for traffic loads to reveal performance,

Section S3, which is the third section on the south tangent of the NCAT Pavement Test Track, is already yielding good information. The plant-based Delta Mist was selected to be part of a test trial that subjects it to Federal Aviation Administration evaluation standards.


NCAT associate director and research professor Dr. R. Buzz Powell, P.E., says "Eight products marketed as surface rejuvenators were tested off-track on a practice mix paving area, and Delta Mist was included in that. Mississippi and Tennessee DOTs chose four products to test on-track based on the off-track results. The state DOTs made that decision to further test those four products, and Delta Mist was chosen."

This means the products are undergoing the equivalent of 10-plus years of traffic loads in one three-year testing cycle. "We're measuring changes in the rheology of the surface asphalt as a result of the use of this product," Powell said. He shared that our industry as a whole, "wants to be good stewards of our resources, so we're interested in the performance of these products. As a result of this research, agencies will be able to quantify their return on investment by connecting measured long-term rheological change with the cost of each application."

Part of the investment Bartow didn't have to make was application process add-ons.

The RJM team didn't have to add any sand or aggregate covering to the penetrating asphalt rejuvenating spray. Further, both Engle and Watson spoke to the clarity of reflective markings after the treatment. The Delta Mist goes down as a white spray, which cures to a clear coating, thus Bartow DPW crews had no clean-up or re-striping to perform. This added to the quick turn-around for the treatment. Watson said they returned the pavement to traffic within two hours for each of the individual lane applications.

That traffic includes some sensitive assets for Bartow. South Floral Avenue is heavily traveled, leading to Polk County School administration, city education offices, activity centers, a pool, and other parks and recreation facilities and an over-55 retirement community of 336 homes, which residents still accessed during the project time in February.

Using the odorless and environmentally positive preservation method to stretch city maintenance dollars is a path forward for Bartow, and others. "I think it's becoming more the norm in our counties," Watson says. 

Edited from material contributed by Collaborative Aggregates. Sandy Lender is a long-established writer and editor in the asphalt industry



Delta Mist rejuvenator cures transparent and traffic can be returned after two hours