A historic town in east central New York has evolved a system of pavement surface treatments designed to preserve its road infrastructure, maximize the use of taxpayer dollars and minimize the impact on resources and environment, according to the head of the community’s highway department.

“We have a preventive maintenance program that’s designed to keep our good roads good, not one that has us chasing after bad roads that may soon need reconstruction,” said Mark Minick, highway superintendent for the town of Stillwater. Minick is responsible for taking care of some 62 miles of roadways in the town, which is famous for the Battle of Saratoga – considered by historians as the turning point of the Revolutionary War. A suburban bedroom community situated at the confluence of the Hudson and Hoosac Rivers, Stillwater houses some 8,000 residents, many of whom commute to work in Albany, located less than 20 miles to the south.

An Eclectic Approach

Minick explained that the highway maintenance program consists of an array of pavement surface treatments that target structurally sound roads, not those with structural deficiencies that make them candidates for the more expensive mill-and-fill operations or total reconstruction. As town highway superintendent for 20 years, he has spearheaded an eclectic approach to pavement preservation, experimenting with diverse treatments and selecting what he considers the best for...
New York Community Shields Roads With Thin Pavement Treatments

Owner: Stillwater, N.Y., Highway Department
General Contractor: Gorman Brothers
specific road conditions.

He pointed out that the department was using chip seal – an application of asphalt emulsion followed by a thin layer of aggregate – as part of this program almost 20 years ago.

“We didn’t know it was pavement preservation – in fact, we hadn’t even heard that term in those days,” he said. Terminology aside, he knew that chip seal was an effective, economical way to protect structurally sound pavements. Over the years he began experimenting with other thin surface treatments, looking for more economical and environmentally friendly ways to extend the service life of pavements as road budgets shrank and the public became more aware of the need to conserve resources and protect the environment.

Among the thin surface treatments utilized by the highway department today are micro surfacing, Nova Chip, single- and double-chip seal, and fiber-modified chip seal. Minick plans to install a thin asphalt overlay using 6.3-millimeter stone on a town road later this season.

Choosing the Treatment

These thin surface treatments are recognized as various forms of pavement preservation by many federal, state and local transportation officials. Furthermore, the processes are regarded as being eco-efficient, i.e., they use less material – hence fewer resources and energy – than the production and application of mill-and-fill operations in which two inches or more of existing asphalt pavement is removed and replaced with an equal thickness of HMA, or total pavement reconstruction.

In its “Pocket Guide To Asphalt Pavement Preservation,” The Federal Highway Administration notes that studies show every additional dollar spent on preventive maintenance treatments saves up to $10 in future rehabilitation costs.

Highway superintendent Minick agrees. With this in mind, one of his criteria for matching a treatment to a road is that he can reasonably expect to get eight to 10 years of extended pavement life from that treatment. But there are many other factors he has to appraise as well.

“I have to consider a lot of things when I’m deciding what to do with a road,” he said. “For example, I look at my total maintenance budget for the year, at when a particular road was last treated, and whether it’s going to need reconstruction in five years or so. I’ll take in the appearance of the road after spring thaw, the pavement’s quality of ride, and the fact there may be some pavement cuts for utility construction in the near future.

“Also, it makes a difference if a road is in a residential development, or if it experiences a lot of traffic or carries heavy trucks,” Minick said.

After weighing these factors for a particular road, the highway superintendent selects any one of several appropriate treatments, or even a combination of them.

Fiber Reinforcement

One of the department’s first major road maintenance projects for 2010 was Brickyard Road. Subject to moderate traffic including some heavy truck traffic, this 22-ft.-wide local road had a pavement that was still structurally sound, but was showing some cracking and was due for preventive maintenance. To extend the service life of the pavement, Minick chose the application of FiberMat, a fiber-reinforced surface treatment, for approximately 22,000 sq. yds. of roadway. FiberMat differs from chip seal in that chopped fiberglass strands are added to a polymer-modified asphalt emulsion before the aggregate chips are placed over the emulsion.

“About eight years ago we tried FiberMat on a few test roads and liked how it looked and performed,” Minick said. The department added the process to its growing maintenance repertoire and currently has between two and five miles of FiberMat applied every year. One of the roads, located in an industrial area, received an application of FiberMat seven years ago and is still standing up well, he said. He added that the fiber-reinforced process is especially useful because it can replace a double-chip seal.

“Sometimes a single-chip seal doesn’t provide what we want for a certain road condition, so in the past we’d apply a double-chip seal. However, we’ve found that the FiberMat is stronger and more cost effective to install, and are more likely to use it instead of the double-chip seal.”

One of The First to Try

Gorman Brothers, a division of The Gorman Group headquartered in Albany, applied the FiberMat for the Stillwater project, with Kim Wilson serving as the company’s sales representative. Gorman had introduced the process, which was originally developed in Europe, to the U.S. Northeast in 2002. Stillwater was one of the first towns to try the treatment.

“It’s fortunate for the industry that there’s a community like Stillwater that will look at new techniques,” said Wilson.

“This willingness advances the knowledge of pavement preservation, especially the practical, field aspects of applying these surface treatments, and benefits everybody concerned about protecting their roads,” she added.

According to Gorman, the FiberMat mixture acts as a resilient waterproof membrane that effectively bridges alligator pavements and also delays reflective cracking.

It can be applied as a surface treatment, FiberMat Type A, or as a stress absorbing membrane interlayer, FiberMat Type B. The product can be applied quickly and can be opened to traffic within 15 minutes, regardless of temperature or humidity.
Type B has the advantage of not being a membrane that can tear because it is sprayed on. Like Type A, Type B can be applied quickly and can be opened to traffic within the initial lay-down and the overlaying of the final wearing course. The overlay can even be applied at a later date.

**A Glass Sandwich**

For the Stillwater project, a Type A surface treatment was applied by Gorman’s FiberMat application machine, a computer-controlled, trailer-mounted unit towed by an asphalt distributor. Gorman’s BearCat distributor held 4,000 gallons of CRS-1P, a cationic rapid-setting asphalt emulsion modified with styrene butadiene rubber (SBR) latex polymer, which was provided by BASF Corporation through its representative, Fred Mello. Inside the application machine are more than 20 spools of fiberglass that feed glass strings through a cutter, which chops the strings into 2.75-inch lengths. These short glass strands are blown by a compressor onto the pavement at the rate of between two and four ounces per sq. yd. through a row of special jets positioned between two rows of emulsion nozzles. Simultaneously, the SBR latex polymer-modified emulsion from the asphalt distributor, heated to between 155 and 165 degrees Fahrenheit, is channeled through the two rows of nozzles at a combined rate of between 0.4 and 0.6 gallons per sq. yd. Application rates for fiberglass and emulsion vary depending on use of Type A or B process as well as the condition of the pavement.

The result of the FiberMat application is a layer of fiberglass strands sandwiched between two layers of latex polymer-modified emulsion.

Immediately behind the application machine, Gorman’s Etnyre chip spreader broadcast stone at the rate of between 22 and 25 lbs. per sq. yd. The contractor embedded the stone chips – a hard, 1/4-inch limestone – into the FiberMat using a 25-ton CAT PS150C pneumatic roller.

Stone chips were purchased by the highway department through a Saratoga County contract and delivered to the job by the department’s own dump trucks. Purchasing stone through the county cuts costs for municipalities taking advantage of the arrangement.

Based on the department’s success with the process, Minick expects good performance from the Brickyard FiberMat application – just one of the pavement-preservation treatments that are serving the town well.