by Tom Kuennen, *Contributing Editor*

Photo courtesy of Wirtgen America, Inc.

Cold milling of aged asphalt produces reclaimed asphalt pavement (RAP), and is encouraged by various environmental sustainability rating systems

Roadway Environmental Ratings: What's Best for Your Agency?

There's a choice of programs to use in rating sustainable roads

The quest to define which pavements and highways that can be considered "environmentally sustainable" has gotten a lot harder, just as it's gotten easier.

It's gotten easier because state, county and municipal agencies can choose from a variety of programs that enable them to evaluate and rate the "green-ness" of a particular pavement.

But it's gotten harder because, well, there are so many to choose from.

Unlike the nationally recognized LEED system – which is the only accepted environmental certification program for buildings and structures – there is a variety of different evaluation/certification programs for roads or civil engineering structures at international, national and state levels.

For example, even as the Transportation Association of Canada's *Green Guide for Roads* poses sustainability guidance for road construction for the Dominion of Canada, the Ontario Ministry of Transportation is promulgating its own *GreenPave* points-based rating system.

Similarly, the New York State DOT has developed the *GreenLITES (Green Leadership In Transportation Environmental Sustainability)* pavement rating system, and in 2011Illinois introduced *I-LAST*, the Illinois-Livable and Sustainable Transportation rating guide.

Even so, in the United States *Greenroads* is the national leader by its entrenched position. Established in 2010, the Greenroads Foundation is developer of the Greenroads Rating System, and the foundation manages the certification process for sustainable roadway and bridge construction projects in the United States and internationally.

Greenroads rates a project's sustainable elements in seven categories: *Project Requirements, Environment & Water, Access & Equity, Construction Activities, Materials & Resources, Pavement Technologies,* and *Custom Credits*, which are intended to accommodate good ideas that don't fall under the previous headings. Accumulated points will position a project for one of four levels of certification: Bronze, Silver, Gold and Evergreen.

Joining these state and national programs in October

2012 was the full-scale release of INVEST by the Federal Highway Administration. An acronym for *Infrastructure Voluntary Evaluation Sustainability Tool*, INVEST 1.0 follows a beta version in fall 2010, and pilot version in 2011, and is a practical, web-based collection of best practices.

"Sustainability is an opportunity for an organization to adjust its course," said Stephen T. Muench, Ph.D., P.E., Greenroads director, and associate professor at the University of Washington-Seattle, at the National Pavement Preservation Conference in Nashville Aug. 29. "It permits a look at organizational priorities to see if there's a need to adjust them. Rating systems play a role in this adjustment because they are a reasonable means to manage and communicate sustainability efforts."

Greenroads follows LEED

Whether acknowledged or not, these programs follow the footsteps of the *Leadership in Energy and Environmental Design program*. LEED recognizes environmentally sustainable building and neighborhood design, and LEED certification is administered by the U.S. Green Building Council.

The building industry uses the LEED system to evaluate the degree of "green" design a structure or development incorporates. The LEED Green Building Rating System is a voluntary third-party rating system in which credits are earned for satisfying specified green building criteria. Projects are evaluated within five environmental categories: *Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources*, and *Indoor Environmental Quality*. Certified, Silver, Gold and Platinum levels of green building certification are awarded, based on the total credits earned.

In 2009 LEED was expanded to include complete residential developments, encompassing drives, pavements and parking areas where inclusion of reclaimed asphalt pavement (RAP) and recycled concrete aggregate (RCA) can boost sustainability points. This LEED-NR (for Neighborhood Development) rating system integrates the principles of smart growth, urbanism and green building into the first national rating system for sustainable neighborhood design.

In February 2012, the Meador Kansas Ellis Trail Project in Bellingham, Wash., became the first-ever project to achieve Greenroads certification. This project – actually a six-block area of downtown Bellingham – was reviewed by the Greenroads Foundation as an independent third party, and was certified to meet Greenroads Silver certification.

The City of Bellingham incorporated many sustainable elements into the project's design, including recycled porcelain aggregates made from over 400 crushed toilets that were diverted from the landfill; asphalt with recycled content of 30 percent and recycled concrete aggregates; porous pavements that naturally treat runoff and provide effective stormwater management; low-energy LED street lighting; and new amenities and improvements for pedestrians and bicycles using the Whatcom Creek Trail.

An international standard, the Greenroads Rating System is a collection of sustainable roadway design and construction best practices that address water, environment, access, community impact, construction practices and materials. There are 11 project requirements that must be completed in order for a roadway to be considered a Greenroad, as well as 37 voluntary credits that a project team can choose to pursue.

After a rigorous review process, the Greenroads Foundation then assigns a project score based on the number of points earned by meeting the requirements and achieving credits. If certification is attained this score translates to one of the four certification levels.

Photo courtesy of Greenroads

Drainage is an important element of sustainable design; here, in Tacoma, Wash., a roadside drainage swale keeps exhaust byproducts like residual hydrocarbon compounds and heavy metals from pavement surface out of water supplies. Natural bacteria in soil neutralize products in runoff prior to runoff reaching existing aquifer.

"The Greenroads Rating System can be used to help manage, improve and communicate sustainability," Muench said. "It represents an independent verification of sustainable features that truly matter and make a difference."

Globally, 12 projects are currently pursuing Greenroads certification, ranging from new construction to reconstruction to overlay and bridge projects. Registration for project certification became available in 2011. More information is available at www.greenroads.org.

FHWA Rolls Out INVEST

At press time in early October, the INVEST sustainable pavements rating system was rolled out. INVEST isn't a points-based certification system with levels of certification; instead, it's a voluntary, web-based self-evaluation tool for assessing sustainability over the lifecycle of a transportation project or program. It addresses project environmental sustainability from system and project planning, through design and construction, to operations and maintenance.

INVEST 1.0 – which was radically changed from an initial 1.0 pilot version – was released via webinar on Oct. 10. For sustainability to be fully integrated into highway and transit programs, FHWA says, it must be considered throughout the project lifecycle. Therefore INVEST focuses on three fundamental themes in agency operations: *System Planning & Processes, Project Development,* and *Transportation Systems Management, Operations & Maintenance*.

"INVEST is Federal Highway's tool to encourage sustainability," said Heather Holsinger, environmental protection specialist in FHWA's Office of Planning, Environment and Realty, also at the National Pavement Preservation Conference in Nashville. "It's a web-based, voluntary, and is not mandatory. It looks at project development through public planning, through design and construction, and finally through operations and maintenance."

Goals of INVEST are to support the U.S. DOT's aims for livability and sustainable transportation, increase the body of knowledge regarding sustainability aspects of both asphalt and concrete materials in pavement design, construction, preservation and maintenance, and to boost use of sustainable technologies and practices in pavement design, construction, preservation and maintenance, Holsinger said.

"The program allows agencies to assess individual or multiple projects," she told the NPPC. "Projects can be looked at prospectively in a design phase, or retrospectively look back to get a sense of what was done. And it helps agencies communicate sustainability goals, which is a really important aspect of the tool itself."

More information – and the program – may be downloaded at www.sustainablehighways.org.

Two More Rating Systems

Two other transportation infrastructure rating systems are worth mentioning, Envision and CEEQUAL

- **Envision**. A new infrastructure rating system, Envision

was developed by the Institute for Sustainable Infrastructure (ISI) to help designers, builders and infrastructure owners build and direct infrastructure projects toward increasing levels of sustainability. Use and application of Envision requires training, experience and expertise.

ISI develops and maintains Envision, is a collaboration between ISI in Washington. D.C., and the Zofnass Program for Sustainable Infrastructure at the Graduate School of Design at Harvard University. ISI was founded by the American Council of Engineering Companies, the American Public Works Association and the American Society of Civil Engineers.

The Envision rating system evaluates, grades and gives recognition to infrastructure projects that use "transformational, collaborative approaches to assess the sustainability indicators over the course of the project's life cycle," ISI says, and its tools help the design team assess costs and benefits over the project lifecycle, evaluate environmental benefits, use outcome-based objectives, and reach higher levels of sustainability achievement.

Envision describes itself as a holistic rating system, in that it takes an extended, broader view of a project's environmental impact than just the elements of the project itself. "For highways, the question ought to be, 'What are the transportation choices for improving access and mobility in the community?'," the ISI states. "For water treatment plants, 'What can be done to reduce, reuse and restore the community's water supply?'" In that in both these criteria may call the project's very existence into question, Envision may be better suited for regional planning agencies or state DOTs, rather than local agencies. More information will be found at www.sustainableinfrastructure.org.

• **CEEQUAL**. The grandfather of the rating systems, and developed in the United Kingdom, CEEQUAL is an evidence-based sustainability assessment and awards scheme for civil engineering, infrastructure and landscaping, and celebrates the achievement of high environmental and social performance.

CEEQUAL rewards project and contract teams in which clients, designers and contractors go beyond the legal and environmental and social minima to achieve distinctive environmental and social performance in their work. CEEQUAL was launched in 2003, and more than 130 final and 60 interim Awards have been achieved with a further 240 projects and contracts being assessed in March 2012.

More information is available at www.ceequal.com.

State and Provincial Systems

The national initiatives are complemented by state and provincial sustainability rating systems. These include:

• **GreenLITES**. Developed by the New York State DOT, GreenLITES is a sustainability rating and self-certification program which recognizes transportation projects and operations on the extent to which they incorporate sustainable choices.

GreenLITES is modeled after the LEED and Greenroads programs. NYS DOT's certification program builds on other environmental initiatives already begun by the department and is the next step in a long-term commitment to evaluating and refining practices to encourage sustainable choices in project design. Most NYS DOT projects are evaluated under GreenLITES. The certification program is designed to be flexible, and as new best practices emerge and new innovative approaches are developed, they are added to the program.

GreenLITES certification categories are *Sustainable Sites, Water Quality, Materials and Resources, Energy and Atmosphere*, and *Innovation*.

Like Greenroads, GreenLITES certifies projects at increasing levels of sustainability: Certified, Silver, Gold and Evergreen. More information is available at www.dot.ny.gov/programs/greenlites.

• **GreenPave**. In 2010 the Ontario Ministry of Transportation launched *GreenPave*, a points-based rating system which focuses on pavements, not the entire right-of-way. MTO's goal is to establish a rating system for pavement sustainability that applies to all designs of asphalt and concrete pavement structures.

Assigning a rating to pavement design enables the ministry to incorporate more sustainable technologies in pavements and encourage industry to do the same. Certification levels includes Bronze, Silver, Gold and Trillium levels. Download more information at www.mto.gov.on.ca/english/transtek/roadtalk/rt16-1/#a6.

• **I-LAST**. The *Illinois Livable and Sustainable Transportation (I-LAST) Rating System and Guide* was rolled out in January 2010 and is a sustainability performance metric system developed by the Joint Sustainability Group of the Illinois DOT, the American Council of Engineering Companies-Illinois, and the Illinois Road and Transportation Builders Association, among other statewide groups.

The use of I-LAST is voluntary on the part of the jurisdictional agency for which a project is being developed and completed. I-LAST includes a point system for evaluating the sustainable measures included in a project. A checklist of 153 items is provided in eight categories: *Planning, Design, Environmental, Water Quality, Transportation, Lighting, Materials* and *Innovation*. Download the I-LAST manual at *www.dot.state.il.us/green/documents/I-LASTGuidebook.pdf*

NEXT MONTH: *We will again address "Green Roads" with an examination and update of existing trends in our December issue.*