

Perpetual Pave

Demonstrate Good Use of

By Mary Lou Jay

Minnesota taxpayers should be pleased with the efforts of their state's transportation officials. For the fifth time in six years, a Minnesota roadway has earned a Perpetual Pavement Award from the Asphalt Pavement Alliance. That means Minnesota taxpayers have not only saved on road repair and reconstruction costs but also have avoided the inconvenience of frequent repair projects.

Minnesota isn't the only multiple honoree; California, Montana, Nebraska and Tennessee have all earned the designation in previous years. Details on the 2006 Perpetual Pavement Award winners are below.

California Department of Transportation San Diego Freeway

The California DOT (Caltrans) is being honored for the section of the San Diego Freeway (I-405) between Harbor Boulevard and Beach Boulevard.

The road opened in November 1966 with eight lanes. Two lanes in each direction had a 6.5-inch subbase, a 4-inch aggregate base, a 7.8-inch road mix base and a 7-inch hot-mix surface layer. Other lanes featured a 7.8-inch subbase, a 4-inch aggregate base, a 7.8-inch road mix base and a 5.4-inch HMA surface course. The road was widened in



California: San Diego Freeway.

1988, with one lane added in each direction.

In 1997 Caltrans completed a 2.36-inch in-place inlay for two northbound and southbound lanes and did the same for the remaining lanes two years later. Other than crack sealing, the pavement has required no other major maintenance. A core sample taken in 2004 confirmed the road's structural integrity.

The road, designed for an ADT (average daily traffic) count of

36,000 vehicles in 1965 and 132,000 vehicles in 1985, now carries 375,000 vehicles each day.

"The construction methodology that they used at the time, the compaction, mix design and testing, was geared towards longevity," says Majid Movahed, Caltrans District 12 pavement engineer. "The mix that they produced and the properties that they tried to maintain actually doubled the road's life cycle to almost 40 years."

ment Winners

Public Money

Minnesota Department of Transportation TH 61

The winning eight-mile section of TH 61 runs between Wabasha and Kellogg in the southeast section of the state. Staging the construction from 1969 through 1972 allowed the foundation to go through seasonal cycles and enhanced the overall pavement structure stability.

The initial road consisted of 12 inches of granular subbase, 6 inches of aggregate base, 2 inches of an asphalt binder course and 3 inches of an asphalt wearing course. Nineteen years later the Minnesota Department of Transportation (Mn/DOT) added a 1-inch asphalt leveling course and a one-inch asphalt wearing course. In 2000 the state milled 1.5 inches and laid two courses of 1.5-inch asphalt overlays.

The road has carried approximately three million ESALs (equivalent single axle loads) during its 37-year lifetime.

“The methodology used during the road’s construction in 1969 was innovative and now has become an accepted standard,” said Nelrae Succio, district engineer, Mn/DOT District 6 Rochester. “This combination of granular subgrade, aggregate base, and bituminous layers on top provides a good foundation on which to build. Using this type of design to extend the pavement life benefits many.”



Minnesota: TH 61.



Tennessee: State Road 14.

Tennessee Department of Transportation State Route 14

The section of State Route 14 that runs between L.M. 2.42 and L. M. 16.54 in Tipton County is Tennessee's fourth Perpetual Pavement Award win-

ner. The state did grading and drainage of the road in 1963, then placed 14 inches of crushed stone and 0.5 inches of a bituminous surface treatment. The Tennessee DOT constructed the asphalt pavement in 1970 with a three-inch binder, a 1.25-inch leveling

course and a 1.5-inch surface course.

In 1993 some portions of the road received 1.5 inches of hot-in-place recycled asphalt and 1.25 inches of asphalt surface course. Remaining sections got 2 inches of binder and 1.25 inches of asphalt surface course in 1996-97.

Since opening, State Route 14 has withstood approximately 8 million ESALs in the highest traveled sections, with truck traffic as high as 22 percent.

"Some unique construction practices, such as the hot-in-place recycling of the surface layer, were utilized during the life span of this section of roadway," says Gary Head, engineering director of TDOT's Materials and Tests division. "Although it may not fit the classic mold of today's Perpetual Pavement design, this section of State Route 14 in Tipton County has stood the test of time."

Montana Department of Transportation Interstate 90

Interstate 90 between milepost 230 and 240 is Montana's second Perpetual Pavement Award winner. It is located on the continental divide, where elevations range from 5,500 to 6,300 feet and extreme temperature and weather events are not unusual. Over 40 years, it has carried approximately 72 million vehicles.

Opened in 1966, this section of I-90 included 9.6 inches of crushed base, 1.8 inches of crushed surfacing materials and 4.2 inches of HMA surface course. Over the years, overlays and mill and fills have increased the hot-mix thickness to about 7.4 inches. The gravel used in the project originated in the mountains surrounding the Jefferson River valley and is known for its toughness, angularity and lack of fine materials.

In 1984, MDT overlaid the road with 1.8 inches of hot-mix and $\frac{3}{4}$ inch of open-graded friction course. In 2000 it milled the road 1.2 inches and filled it with 1.8 inches of hot-mix followed by a chip seal. Since that time



Montana I-90

the road has required only minimal maintenance patching.

"MDT believes that three factors have contributed to the success of this road," comments Dan Hill, MDT pavement design engineer. "First, the road subgrade consists of decomposed bedrock, which provides a strong, durable

foundation for the road. Second, the Jefferson River aggregate used to build the road is a very high-quality material. Lastly, MDT has a strong pavement preservation program. We believe that well-timed pavement preservation treatments have substantially extended this road's service life."

Nebraska State Highway 35.



**Nebraska Department of Roads
State Highway 35**

Nebraska's second Perpetual Pavement Award is for State Highway 35 in eastern Wayne County from

mile marker 21.68 to mile marker 26.87. The road connects Norfolk, Neb., to the urban areas of South Sioux City, Nebraska, and Sioux City, Iowa. The Nebraska Department of Roads

(NDOR) graded the road in 1935 and laid a gravel surface in 1936. Chambers Construction placed the first asphalt in 1960, laying a 6-inch granular sub-base, a 4-inch aggregate base and a 3-inch HMA surface course. NDOR widened and overlaid the road in 1977 using 3.75 inches of HMA. In 2004 1.5 inches of the existing surface was milled and replaced with 2 inches of HMA surface. Other than regular maintenance the road has required no work.

"I believe the success of this road can be attributed to good design, good construction practices, and timely maintenance activities," says NDOR's Dan Nichols. "The original design proved to be a good, cost-effective approach—minimizing initial hot-mix cost—with the placement of the soil aggregate base course. This provided a sound base for future overlays. The placement of the 6-inch granular sub-base was another well thought out approach to deal with anticipated moisture problems."

Virginia Department of Transportation Interstate 81

Virginia's Perpetual Pavement Award winner is the northbound portion of Interstate 81 from mileposts 318.4 to the West Virginia border at milepost 324.9. This section of the interstate was paved between June and September 1965 and completed in November 1965.

The original paving consisted of three layers of hot-mix asphalt (0.7 inches, 1.3 inches, and 7.5 inches) placed over a 6-inch compacted aggregate base and a 12-inch aggregate subbase. In 1991 the Virginia DOT milled 2 inches of the original surface and binder courses and replaced them with a 1.8-inch hot-mix overlay. Contractors also placed vertical fin drains to remove excessive moisture from the pavement structure. The second rehabilitation came in 2004, when contractors added a 1.5-inch stone-matrix asphalt course.

Although the road carries approxi-



Virginia's I-81. Photo by Al Covey

mately 24,800 vehicles a day, with 26 percent truck traffic, it continues to have an excellent ride quality.

"Virginia is working to become a leader in adopting engineering and construction practices that provide improved driving experiences, save taxpayer dollars, and are friendly to the environment," says Commonwealth Transportation

Commissioner David. S. Ekern. "Using these good business and engineering principles keeps us from having to spend additional funds to do major maintenance work and reduces our need to affect traffic with work zones. It also helps protect the environment." **HMAT**

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Perpetual Pavement Criteria

The Perpetual Pavement Award is given to asphalt pavements that are at least 35 years old, have never had a structural failure, and demonstrate excellence in design, quality in construction, and value to the traveling public. The average interval between the pavement's resurfacing must be no less than 13 years. Engineers at the National Center for Asphalt Technology (NCAT) evaluate the nominations for the Perpetual Pavement Award and a panel of industry experts validates the winners.

Winning states will receive an engraved crystal obelisk and a plaque during a ceremony on October 1 at the Virginia Asphalt Association's Fall Asphalt Conference in Richmond, VA. Each state will also have its name added to a permanent plaque that is kept at the National Center for Asphalt Technology (NCAT) in Auburn, AL.