

The New I-35W Bridge—Super Sensors and Sustainable Innovations**Description of Innovation**

The new I-35W Bridge in Minneapolis, Minnesota is a modern concrete bridge for the future. The 10-lane interstate bridge with a 504' main span across the Mississippi River was opened to traffic on September 18, 2008 to replace the steel truss bridge that tragically collapsed on August 1, 2007. It was designed and built in 11 months through a Minnesota winter while all eyes of the world watched the new futuristic bridge take shape. The bridge is designed to be able to carry rail in the future along with the ability to suspend a pedestrian bridge underneath. The design of the 504' main span over the Mississippi River features 120 precast segments, weighing up to 200 tons each that were assembled in just 47 days. The bridge "thinks" with innovative, state-of-the-art "smart bridge" technology, utilizes the first use of outdoor LED lighting for a highway and each part of the bridge has custom developed concrete focused on eco-friendly sustainable design. The new bridge achieved the Minnesota Department of Transportation's vision for safety, quality and innovation by incorporating sustainable design and new technologies.

Innovative "Smart Bridge" Technology

State-of-the-Art Smart Bridge technology comprised of 323 sensors embedded in the concrete during construction monitor bridge behavior in real-time. During construction, the smart bridge systems monitored the temperature of the concrete to ensure high-quality during curing. Over the service life of the bridge, the information collected by the sensors will assist the Minnesota Department of Transportation in managing operations by enhancing bridge inspections with structure performance data, maintaining efficient and safe traffic flow, and providing infrastructure security. Temperature, humidity and wind speed measurements also trigger the bridge's automated anti-icing system. Information gathered from the sensors will be managed in partnership among the Minnesota Department of Transportation, the Federal Highway Administration and the University of Minnesota's Department of Civil Engineering and will provide valuable feedback about bridge traffic patterns, infrastructure maintenance and security, and design sustainability for future bridges.

First use in the United States of LED Highway Lighting

Low energy, low maintenance LED highway lighting was used for the first time in the United States on the new I-35W Bridge. The energy savings and effects of this new lighting method are being studied in conjunction with the Department of Energy for future applications throughout America. Preliminary tests show an energy savings of 18% for the LED fixtures when compared to traditional high-pressure sodium (HPS) fixtures. The LED fixtures also offer a significant savings in maintenance costs with a standard life of 10-15 years rather than the required relamping every 4 years for other fixtures.

First major use in North America of Eco-Conscious cement

Two 30' tall gateway sculptures that mark the river crossing at each end of the new bridge represent the first major use in North America of a new environment friendly cement that cleans the air utilizing a nanotechnology. When ultraviolet rays from the sun hit the surface of the concrete containing this eco-cement, a photo catalytic reaction occurs removing pollutants from the air. The cement is also self-cleaning, removing contaminants from the surface of the gateway elements.



New I-35W Bridge, Minneapolis, MN

A modern concrete bridge for the future with eco-conscious concrete



First use in United States of LED highway lighting

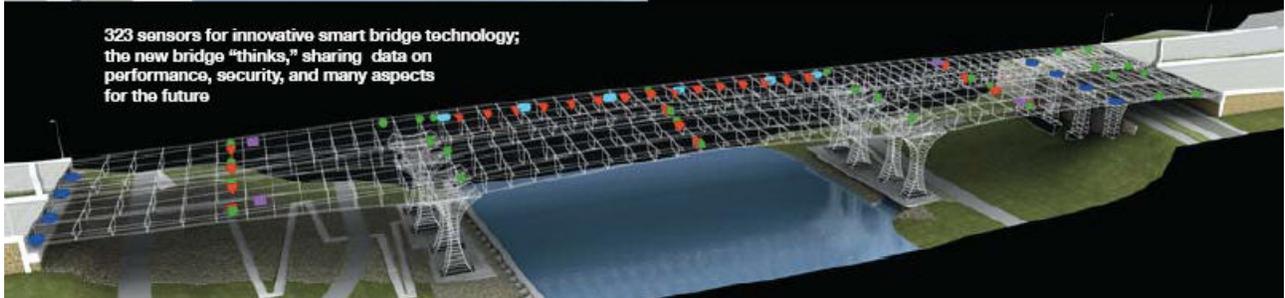


Dramatic blue LED lighting highlights the 70' tall curved piers that support the modern sculptural concrete bridge across the Mississippi River

First major use in North America of eco-conscious cement for 30' gateway sculpture expressing a symbol for water (nano-technology results in cleaning pollution from the air when UV light hits the concrete surface)



Future suspended pedestrian bridge connects trails on both sides of the river



323 sensors for innovative smart bridge technology; the new bridge "thinks," sharing data on performance, security, and many aspects for the future