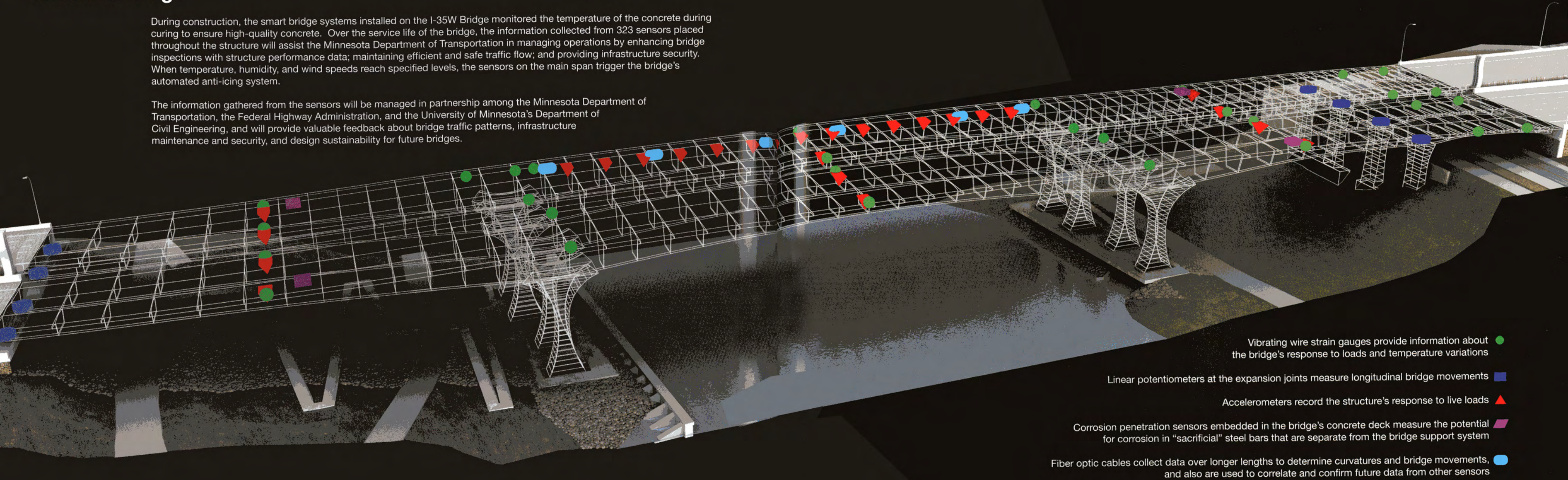


A Smart Bridge

During construction, the smart bridge systems installed on the I-35W Bridge monitored the temperature of the concrete during curing to ensure high-quality concrete. Over the service life of the bridge, the information collected from 323 sensors placed throughout the structure 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. When temperature, humidity, and wind speeds reach specified levels, the sensors on the main span trigger the bridge's automated anti-icing system.

The 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.



Vibrating wire strain gauges provide information about the bridge's response to loads and temperature variations ●

Linear potentiometers at the expansion joints measure longitudinal bridge movements ■

Accelerometers record the structure's response to live loads ▲

Corrosion penetration sensors embedded in the bridge's concrete deck measure the potential for corrosion in "sacrificial" steel bars that are separate from the bridge support system ■

Fiber optic cables collect data over longer lengths to determine curvatures and bridge movements, and also are used to correlate and confirm future data from other sensors ●