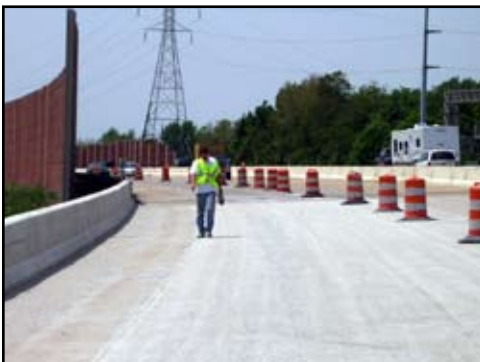


South Bend, IN: Ironwood Bridge

PROBLEM

On the Ironwood Bridge in South Bend, Indiana, a slight curve with limited visibility and an average annual snowfall of 71 inches creates dangerous, potentially-fatal driving conditions.

The bridge's close proximity to Lake Michigan (20 miles south) also makes it susceptible to "lake-effect" snow, created when cold air travels across the warmer lake, picks up water vapor and freezes. This leads to some of the worst possible winter driving conditions.



To complicate the situation, in order to mitigate tire-pavement noise, 30-foot noise walls were installed along the north and south right-of-ways. The walls partially shade the bridge deck, block the warming effects of the sun and cause hazardous snow blowing and drifting.

That's why the Indiana Department of Transportation (INDOT) installed SafeLane™ surface overlay—to create safer road conditions and reduce accidents.

BACKGROUND

US Route 20 spans 3365 miles from Massachusetts to Oregon and is the longest road in the US. In South Bend, it's a fifteen mile limited-access freeway with a speed limit of 65 mph.

The Ironwood Bridge runs two eastbound and two westbound lanes separated by barriers. Approximately 36,000 vehicles cross the bridge each day, ten percent of which are commercial.

In a four-year period ending in 1999 (the latest data available) INDOT recorded seventeen accidents on the bridge, ten of which were ice and snow related.

SAFELANE™ OVERLAY HISTORY

To minimize water seepage and chemical intrusion and extend the life of infrastructure, transportation departments have been using epoxy overlays for three decades. SafeLane™ surface overlay was created to provide all the benefits of standard epoxy overlays plus, it is the only overlay that minimizes snow and ice-related accidents.

SafeLane™ overlay is a patented combination of epoxy and aggregate invented by Russ Alger, director of Michigan Technological University's Institute for Snow Research. MTU licensed the technology to Cargill, Incorporated for worldwide sales and installation.

After it is applied to a surface, transportation departments "charge" it with standard liquid anti-icing chemicals. The overlay acts like a rigid sponge, stores the chemicals inside and releases them automatically during winter weather conditions. This helps prevent frost or ice from forming on road and bridge surfaces. In addition, SafeLane™ overlay keeps releasing anti-icing chemicals over multiple events and greatly reduces the need to send highway maintenance crews out during winter storms.

"Billions of tax dollars are spent each year to preserve and maintain roads and bridges. SafeLane™ overlay can extend the life of roads and bridges by acting as a sealant to reduce the effects of chloride and water intrusion. More importantly, it can reduce accidents and save lives," said Bob Persichetti, general manager for SafeLane™ surface overlay.

At that time, as often as twice a week, INDOT applied liquid brine (sodium chloride solution) to high-volume bridges and roadways. Rock salt or liquid brine was also applied before or during snow storms.

SOLUTION

In May of 2005, Michigan Technological University (MTU) installed SafeLane™ overlay on the eastbound lanes (11,790 square feet) and left the westbound lanes untreated as a control.

RESULT

Since the installation of SafeLane™ overlay, no winter weather-related accidents have been reported.

Steve Giese managed the project and monitored the results. Over two winter seasons and 12 major snow events, his team observed snow plowing, brine applications and visual comparisons between the east and westbound lanes. During those events, the eastbound lanes had almost twice the friction of the westbound control lanes. The eastbound bridge deck remained clear of snow and ice while the control area displayed snow and ice accumulation. In addition, plowing removed all the snow from the SafeLane™ overlay-treated lanes, fewer chemical applications were needed and mobility was maintained longer.

“If I can get 36,000 vehicles over that bridge in an ice storm without any crashes, it’s worth its weight in gold,” said Steve Giese, operations manager at INDOT’s Plymouth sub-district.



INDOT’s Tom Konieczny agrees. In the August, 2006 issue of Bridge Design & Engineering he commented, “The goal in South Bend was to improve safety and reduce accidents on the Ironwood Bridge. We met that goal this past winter and we’re thrilled with the results.”

ALTERNATIVE

In 2004 LaPorte District maintenance engineer Tom Konieczny considered installing a Fixed Anti-icing Spray Technology (FAST) system. FAST systems are electronically controlled units that are mounted on bridges and spray anti-icing chemicals on the pavement surfaces. However, because of the cost, the program was rejected.

HOW IT IS INSTALLED

Installing SafeLane™ overlay is simple. First, the surface is prepared. Oils and contaminants are cleaned off, and the surface is repaired if needed. Concrete surfaces are then shot-blasted to roughen up the surface and ensure a good chemical bond. Sub-licensed installers mix and prepare the epoxy, and crews then manually spread the epoxy using squeegees. A layer of aggregate is then immediately distributed across the surface. After the first layer cures and is swept, a second layer of epoxy and aggregate is applied. Once cured, any loose rock is then swept off and vacuumed up by sweeper trucks.

FACTS AND FIGURES

Installation Date: May 2005
Installer: Michigan Technological University
Location: US Route 20 at Ironwood Road
Area: 11,790 square feet
Average Daily Traffic: 36,000 vehicles

References

- 1.) <http://www.fhwa.dot.gov/infrastructure/longest.htm>
- 2.) <http://wf.ncdc.noaa.gov/oa/climate/online/ccd/snowfall.html>
- 3.) http://en.wikipedia.org/wiki/Lake_effect_snow
- 4.) <http://surfaceweather.noaa.gov/resources/SW2-flyer.pdf>