

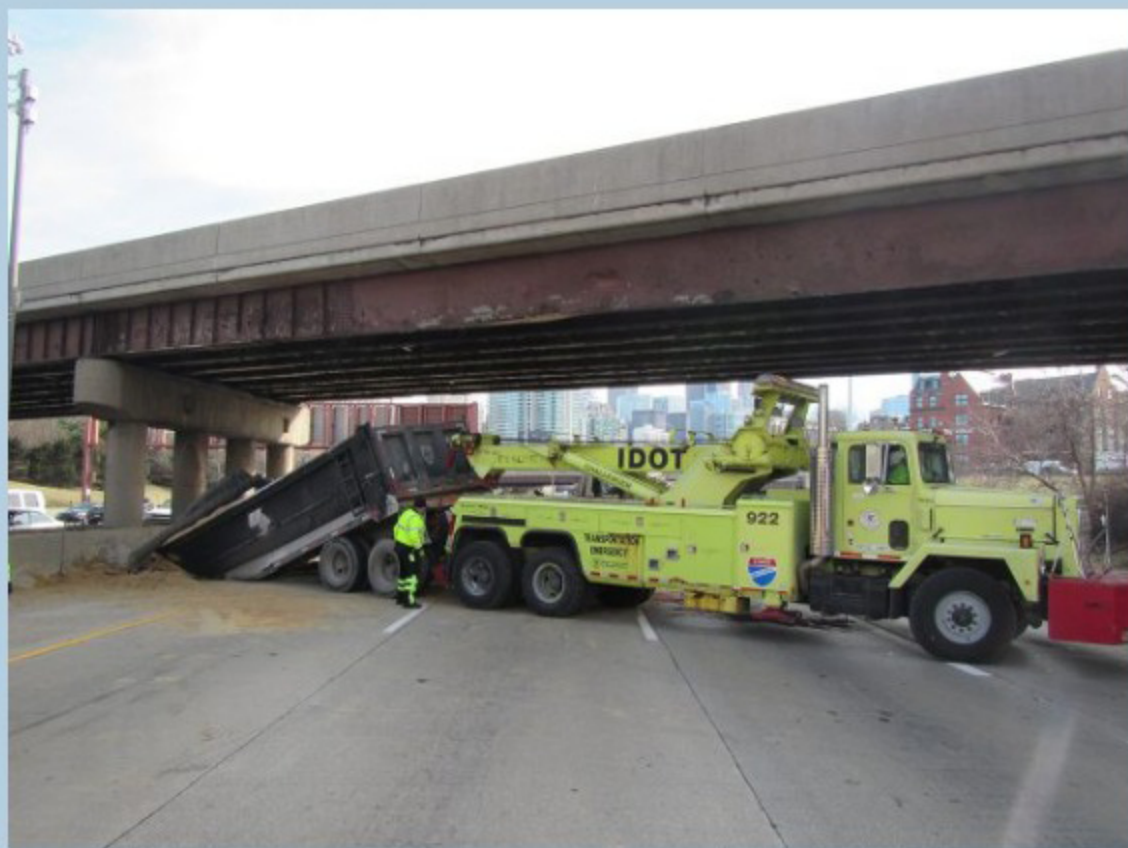
January 8, 2019

There's traffic. And then there's Chicago traffic.

The amazing thing about traffic in Chicago is that, no matter what day of the week, or what time of day, it's busy. Take the Kennedy Expressway, for example. It runs about 18 miles from the northwest corner of downtown out to O'Hare Airport. On a typical day, some portions of it handle as many as 327,000 vehicles, each one in a hurry to get wherever it's going.

When one of those vehicles is a dump truck, traveling 70 miles an hour with its bucket inexplicably raised, something bad is bound to happen. And it did.

When the raised bucket hit the underside of a bridge, not only was the bucket ripped off and the truck flipped, the heavy steel girder on the north side of the bridge was severely bent. Fortunately, the pavement on the bridge was intact and only one lane had to be closed. But repairing the bridge posed a serious challenge. Closing the bridge and the expressway below to replace the girder was out of the question. Disrupting that much traffic is simply a non-starter.



Instead, WHKS engineers were asked to apply a tricky heat-straightening treatment, which, when conducted properly, can warp the bent steel back into its original shape. By applying alternating heating and cooling cycles, the beam will expand and contract in a controlled way. Depending on which side of the beam you heat and cool, the steel can be made to return to its original shape.



Of course we're not talking about using your sister's hair dryer on it. The steel in these girders is an inch and more in thickness and it takes some serious heat to make a difference. But isn't just simply a matter of aiming a blast furnace at it. The temperature of the steel must be kept within a very specific range or its internal properties will change, and it will lose its strength or become too brittle.

Using nightly lane closures to minimize traffic disruption, the contractor applied the heat treatment and were able to return the beam to its original shape. Mostly. One dented section refused to cooperate and the engineers were forced to design and bolt in place a supplemental plate to provide the needed strength.

But the repair was a success and the traffic in and out of the Windy City continues to flow.

