

# Iowa's High-Mast Lighting Towers: A Proactive Approach to a Problem

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## ABSTRACT

The Iowa DOT owns 233 high-mast lighting towers, ranging from 100 to 180 feet tall. These structures are typically located at the intersection of major highways and interstates and provide broad illumination to the traveling public. In 2000, a statewide inspection was conducted of the 193 towers in the inventory at that time. A 140-foot tower located near Sioux City collapsed in 2003 due to the development of a large fatigue crack at the welded connection at the base plate. Subsequently, cracks were found in 20 other towers. In all cases, the cracked structures were taken out of service.

This paper will present forensic information about the collapsed and cracked towers and describe the instrumentation and long-term monitoring of Iowa towers. Preliminary findings of the monitoring will be included. The goal of the testing is to determine the types of vibration and stress ranges that the towers are experiencing. This testing will provide a better understanding of the ways the towers in Iowa will perform over time and will help develop policy for long-term inspection and maintenance of these structures.

Note: This research was still in progress at the time of publication; contact the lead author above for more information.

**Key words: high-mast light towers—instrumentation and monitoring of light towers—long-term light pole performance**