

## Transmission in Highway ROW: Maintenance Considerations

There are a variety of considerations for transmission developers and departments of transportation to enable the safe and efficient deployment of transmission infrastructure into highway rights-of-way (ROWs).

This document provides information regarding transmission line maintenance considerations for transmission lines in a highway or interstate ROW without causing undue burden or risk to the ongoing activities of the DOT.

Through discussions with state DOTs, the NextGen Highways team has identified that safety of employees and vehicles passengers, timing and magnitude of traffic impacts, ROW access, and impacts on future highway construction needs as the primary concerns for state DOTs.

In 2003, Wisconsin passed Act 89, prioritizing the siting of transmission lines within existing transmission and highway corridors across the state. Since the passage of this bill, a portion of 26 transmission projects have been sited in highway ROW, including eight projects sited within interstate ROW. In total, over 200 miles of highway and interstate ROW have been used to:

- Conserve forests and other undeveloped habitats
- Minimize the need for private land
- Minimize the environmental and viewshed impacts for the public • Utilize corridors that have already been disturbed

The NextGen Highways team has conducted a thorough review of the planning and design of the [Badger Coulee](#) transmission project, which is a 345 KV transmission project developed by American Transmission Company and Xcel Energy. The project runs approximately 180 miles from La Crosse County, WI to Dane County, WI, predominantly along and within the interstate highway right-of-way.

Prior to construction, a number of routes were considered and a detailed examination of highway ROW impacts for each route option were captured in a [constructability report](#).

*Please note, this document does not provide a detailed discussion of highway design, construction, and maintenance. This report only touches on these needs as they directly relate to transmission infrastructure in the highway ROW.*

# Transmission Maintenance Considerations

A transmission line can last several decades or more. Over this time strong winds, heavy snow and ice, and other elements take their toll on the transmission line. Inspections and maintenance are performed on a regular basis to ensure the reliability, longevity, and safety of all transmission assets. These activities include:

- Visual inspection and condition assessment
- Vegetation management
- Cleaning and repairs

## Inspections and Condition Assessment

Overhead transmission lines require regular inspections along the entire route length to ensure the wire conductors, insulators, towers and pole structures, footings, and grounding equipment are in working order. For these inspections, access to the pole structure locations may be needed. Fortunately, the adoption of drone technology to inspect transmission lines has greatly reduced the need for pole site and ROW access for visual inspections. Due to cost savings compared to visual inspections, remote inspection via drones for transmission inspections has seen rapid uptake in the utility industry. Utilities are also beginning to deploy advanced sensing technology that can alert them to damage more quickly than conventional approaches and even help anticipate future maintenance needs.

## Vegetation Management

The utility or transmission owner and the DOT's vegetation management goals and strategies should be coordinated to ensure compatibility. While the utility's priority is to keep vegetation growth minimal directly under the transmission line to avoid electrical arcing risk, the DOT may rely on vegetation for roadway hazard management. For example, WisDOT uses living snow fences along highways to minimize snow drift across the highway roadway. Furthermore, the methods of vegetation management should be communicated and coordinated. For example, the DOT may require the utility to regularly trim vegetation instead of spraying pesticides less frequently to avoid exacerbating erosion problems. With early coordination, vegetation management objectives can be achieved by both the DOT and the utility.

## Cleaning and Repair

In addition to vegetation management, maintenance of a transmission line includes cleaning insulators (and replacing them when necessary), tightening joints, replacing damaged poles or pole components, and restringing cables. Many of these activities are scheduled based on the expected useful life of various components of the transmission line.

## Conclusion

The considerations above provide a thorough look at what states may need to explore when contemplating the design, construction, and maintenance of transmission in the ROW. The Badger Coulee transmission line demonstrated that high-voltage overhead AC transmission can be successfully sited within the interstate highway corridor. With careful coordination between utilities and DOTs throughout the design, construction, and maintenance processes, transmission cost and reliability needs can be balanced with highway operation, maintenance, and expansion needs. Moreover, the selection of the final Badger Coulee route by the WI Public Service Commission, which was longer and more expensive than other routes not using the highway ROW, shows that this project was designed to achieve the public policy goals of Wisconsin and deliver a net benefit to the public.