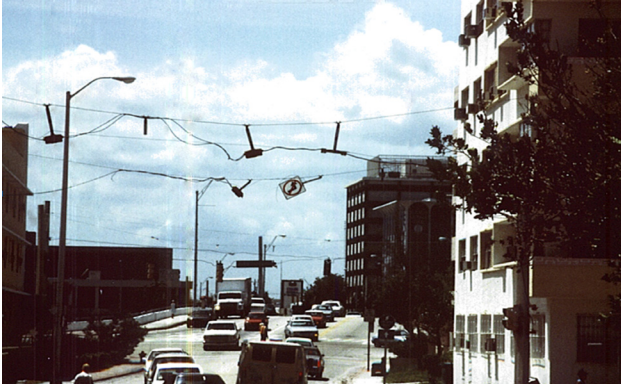


Florida Department of Transportation Research

Development of Hurricane Resistant Cable Supported Traffic Signals
BD545-57 (11/07)

Dual cable traffic signal support systems are common in Florida. In these systems, the signal is supported by an upper draped cable using a hanger and a quick disconnect box located just above the signal. Below this



Dual cable system damaged by Hurricane Andrew

cable, a second straight cable, the messenger, supports the electrical wiring to the signal and is attached to the hanger just above the quick disconnect box. Dual cable systems are prone to severe damage by high-velocity winds, as was evidenced by Hurricane Andrew in 1992 and several storms since, most notably during the 2004 hurricane season. When high-velocity winds occur, the presence of the messenger cable causes extreme stresses to occur in the hanger and quick disconnect box frequently resulting in failure of the signal support system.

Single cable systems are commonly used in other hurricane-prone regions of the country. To compare the performance of single cable systems and dual cable signal systems, researchers at the University of Florida subjected each type of system to controlled, high-velocity wind conditions.

The researchers built a test site and conducted 31 wind load tests on the systems. They subjected each system to wind speeds of up to 115 miles per hour. Each system supported a five-head traffic signal during the experiments. The researchers measured wind speed, signal rotation, and cable tension. The tests showed that signal rotation on both systems allowed 50 percent direct signal light visibility at wind speeds of 70 MPH (extreme thunderstorm and pre-hurricane). However, during high-velocity (hurricane) winds, the dual-cable configuration showed significant tension increases in the messenger cables, with accompanying force increases in the hanger, disconnect box, and poles. The single-cable system experienced little increase in cable tension; the system behaved like a simple pendulum.



Single cable system on SR 26 in Newberry, Florida.

The study confirmed that, under conditions of high-velocity winds, the single cable system is more reliable than the dual-cable system. Thus, the single cable system is less likely to suffer damage during hurricanes. Consequently, the single cable configuration might not only provide a more reliable post-storm traffic management system, but could result in system repair and replacement cost savings.