

# Connector Protects Traffic Signals

Inexpensive solution to fiber cable damage.

By Ed Sullivan

**A**lthough today's intelligent, fiber optic-based traffic control systems have become increasingly powerful and popular, too many still have an inherent Achilles Heel. That is, when a vehicle accidentally runs into the traffic light control cabinet at an intersection, the situation can quickly become disastrous—and stay that way for too long.

The reason for this dilemma is all too well known: When impact shears a cabinet from its pad, it can also rip the fiber optic cable far beyond the cabinet's branch segment all the way into the network backbone, bringing down the traffic control system, causing extensive repairs, and introducing risk to travelers and technicians. On top of costs of up to \$30,000, miles of traffic flow may be knotted for days.

"It is somewhat paradoxical that one of the causes of all this pandemonium is the durability of the fiber optic cable," explains Tom Hazelton of Optical Cable Corporation (OCC, [www.occfiber.com](http://www.occfiber.com)) "OCC is a manufacturer of advanced fiber optic cable with applications ranging from abusive military environments to the most sophisticated communications networks. And because these cables are built to withstand harsh conditions, they don't break. As a result, when impact carries an enclosure away from its base, the cable will move with it . . . unless the cable connection is designed to do otherwise."

Designing a fiber optic cable connector rugged enough to last, yet would not wipe out network asset connections, required a bit of creative engineering that OCC undertook to fulfill the concept of one of its technology partners, TrueView Products (Phoenix, AZ).



*In the event of a vehicular impact, the IRIS connector assembly, which is under positive spring tension, disengages automatically to protect the electronics of the cabinet as well as downstream fiber optic drop cabling.*

Working together with OCC, TrueView engineers developed the IRIS™ connector, the first "failsafe" breakaway fiber optic cable connector ever developed for traffic light control cabinets and highway network nodes. In the event of a vehicular impact, the IRIS connector assembly—which is under positive spring tension—disengages



automatically to protect the electronics of the cabinet as well as downstream fiber optic drop cabling and backbone cable. Using this connector, expensive collateral damage to traffic system networks can be avoided, and traffic signal cabinets can be back up running in minutes instead of hours or days.

## The Surprise Installation

The IRIS connector made its debut at a March 2009 Intelligent Traffic Engineers Conference. At the conference, officials from the city of Surprise, AZ, and the surrounding Maricopa County's Department of Transportation (MCDOT) first saw the IRIS in action.

"We recognized that it could offer valuable protection to the new intelligent traffic control system we were installing along a five-mile stretch of West Bell Road, a primary Surprise access road that carries about 60,000 vehicles on a work day," explains Israel Lopez, who was then a MCDOT manager on the project.

"This project was already specified at the time, but TrueView Products together with OCC agreed that we could have the IRIS connector on a beta test basis. So we were able to install the device in the traffic signal cabinets at 12 intersections without changing the spec," says Lopez.

The IRIS connector looked promising to Lopez not only because it would save extensive damage and related costs that were incurred when a vehicle clob-

*The IRIS connector is easily configurable to any new or existing traffic cabinet. Its unique mounting design enables it to be installed over the top of existing cabling.*

bers one of these cabinets, but would also reduce the related hazards that occur when extensive damage is done to a traffic communications network that supports message boards, traffic sensors, and TV observation cameras connected to the MCDOT traffic management system.

Jeff Dominique, TrueView president, explains that the avoidance of collateral damage to backbone cabling is the main benefit of the new breakaway connector. The fiber optic cable feeder line runs underground alongside the city streets, he says. At about 250 ft from the traffic light control cabinet at an intersection, a drop cable is connected to the backbone. Without a breakaway connector at the front end of the drop cable (in the control cabinet), a severe impact can shear the cabinet off its pad and cause collateral damage by jerking the drop cable so hard that it destroys the connection with the backbone cabling, possibly disabling some of the traffic control system's sensors, cameras, and communications devices in the process.

"You are dealing with cable composed of 96 or 144 pieces of glass fiber that is about the diameter of the human hair," says Dominique. "So, when a cabinet is moved by the impact of a vehicle, the

resulting mechanical strain can physically take out the backbone connection. And if that happens, it could cost as much as \$25,000 to repair."

Recently, a vehicle struck one of the traffic light cabinets along West Bell Road, pushing it off its pad with force enough to tug the drop cable and engage the breakaway connector, which functioned perfectly, eliminating collateral damage while also making reconnection quick and simple.

Lopez estimates that it takes two to 12 hours just to get the cabinet back in service. "Restoration of service can be delayed because many jurisdictions do not keep fiber optic cable on hand, and there is a backorder time of four to eight weeks for cable from many sources," he says. "If a cabinet is knocked out and you have sufficient slack cable in the pull boxes, you may be alright. But if additional cable is needed or qualified technicians are not available, you may be out of service for a much longer period. And that would be a painful experience."

The Surprise beta installation was overseen by Fiber Network Training and Consulting Services (FNT). FNT, which provides installation and maintenance training for IRIS, as well as cus-

tomers application and design consulting, supported this project with complimentary customer and installation crew training.

The IRIS connector is easily configurable to any new or existing traffic cabinet. Its unique mounting design enables it to be installed over the top of existing drop cables without taking the intersection down until the final cutover is ready. The connector offers up to 12 individual high-speed fiber optic information channels from multiple intersection cameras, signal status detectors, traffic management center commands, and other data collection devices.

In the event of a traffic signal controller cabinet knockdown, the IRIS connector isolates fiber damage to the stricken cabinet. Because of the built-in safety disconnect point installed at the base of the cabinet, the fiber optic cable no longer gets ripped out of the ground by the crashing vehicle. Made in the USA, the IRIS breakaway connector is composed mainly of hardened steel components, making it a "green" product that is recyclable.



*Mr. Sullivan is a technical writer based in Hermosa Beach, CA.*

## Visionary Plan for Emergency Management

**U**nder the federal National Incident Management System (NIMS) program, which was implemented in the aftermath of the 9/11 terrorist attacks, all levels of government must use a standardized organizational structure for managing emergencies, minimizing risk, and maximizing response capability. Every government entity (federal, state, and local) must also operationalize the standard components of NIMS, including finance, logistics, operations, and planning within the NIMS national framework and incorporate the ability to rapidly evaluate and restore vital community infrastructure components.

The Management Services division of Calvin, Giordano & Associates (CGA, [www.calvin-giordano.com](http://www.calvin-giordano.com)), has partnered with the Town of Davie to create Florida's first comprehensive local Infrastructure Branch Plan for handling natural and man-made disasters.

A new software application, endorsed by ESRI ([www.esri.com](http://www.esri.com)) and developed by Geographic Technologies Group in collaboration with Davie, is being utilized by the town in its innovative plan. The Damage Assessment Resource Tool software is being coupled with

a Command Center GIS to provide the Davie emergency management team with a powerful and sophisticated tool. The combined GIS-enabled software package streamlines the process of inventorying and assessing damage, uploading of field data on a real-time basis, providing dashboard real-time statistics, and automating the important process of reporting to elected officials, the public, and the Federal Emergency Management Agency (FEMA).

The department of public works and capital projects from Davie, headed by director Manny Diez, presented its Infrastructure Branch Plan at the recent 2010 Florida Hurricane Conference in Fort Lauderdale, winning praise for its innovative Infrastructure Branch response and recovery operational concepts, processes, and system. Helene Wetherington, director of CGA's Emergency Management Services Division, believes that Davie's plan is still in the maturation process and will hopefully be presented to FEMA for use as a national strategic template for creating and managing a local Infrastructure Branch Plan.