

Traffic Systems, Inc. Applications Note:



Connecticut DOT Implements Stop Bar and Advance Intersection Vehicle Detection with Sensys Wireless Vehicle Detectors



In 2011, Connecticut DOT faced a dilemma: How could it improve traffic flow through increasingly congested roadways, add new intersection signalization and upgrade older ones, all with a dwindling budget? A further complication was that because the pavement on many connecting town roads was in poor condition, loops were out of the question. Some DOT roads also needed repair, so the project had to coordinate with road resurfacing and consider its impact on roadway devices.

The DOT found a solution with the Sensys wireless in-pavement vehicle detection system provided by Traffic Systems, Inc. and installed by Electrical Contractors, Inc. (ECI). Using the Sensys system, the DOT rapidly upgraded its intersection signalization and improved traffic flow at nine intersections. A tenth intersection upgrade is soon to begin.

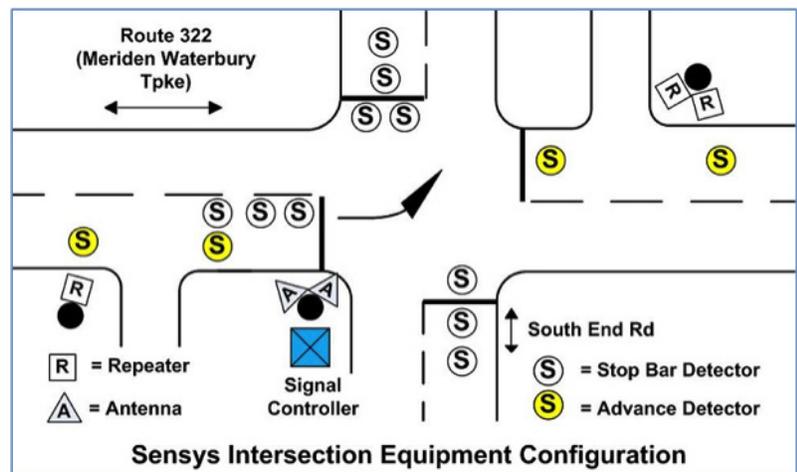


Connecticut DOT Tests an Innovative New Solution:

Connecticut DOT kept an open mind as they learned how key features of the Sensys system could cost effectively work around their multiple intersection improvement challenges. The Sensys system uses battery powered, wireless in-pavement magnetometer detectors that communicate wirelessly to an antenna and Ethernet access point in the signal cabinet. The access point and integrated contact closure card processes detector data and sends vehicle detection outputs to the signal controller.

The wireless detectors require only a single 4 inch diameter pavement bore. They eliminate the need for the conduit and wire runs required for video detection and loops, significantly reducing installation cost and time. Based on favorable experiences at other DOTs, Connecticut designed wireless vehicle detection into the RFQ specifications for a 10 intersection project, and selected Sensys Networks. This was to serve as a test case for potential future usage.

The primary applications of the Sensys system were for stop bar vehicle detection and signal actuation for left turn lanes, side street detection, and advance vehicle detection for higher speed through-traffic (see diagram). The Sensys equipment enabled the DOT to detect vehicle entry into congested intersections from private businesses without the need for video systems or installing equipment on private premises.



Faster, Lower Cost Installation Unimpeded by Roadbed Conditions and Obstacles:

The Connecticut DOT was impressed at the quality, ease and speed of the Sensys system installation. Even though this project was ECI's first time installing wireless in-pavement Sensys detectors, they routinely completed a three sensor turning lane installation in only 25 minutes. This reduced lane closure time and the associated traffic impact. Nine intersections are now complete and operational. The tenth intersection will be installed in conjunction with an adjacent construction project.

But most important, the contractor was able to easily install the Sensys detectors where poor pavement prevented reliable operation of loops, and where "line of sight" occlusions prevented the use of video vehicle detection. In addition, the DOT utilized battery powered Sensys repeaters to communicate with advance detection sensors installed upstream of the intersections. Repeaters also made it possible for detectors to be installed and operate reliably at a complex town green split-roadway configuration with obtrusive overhead utilities. Using repeaters, the DOT extended the system functionalities and overcame obstacles without the need for prohibitively expensive conduit and wiring.

Simple Configurations and Reliable, Maintenance Free Operation:

The Sensys system configurations at the 10 Connecticut intersections required minimal equipment quantities for reliable vehicle detection, even at the most difficult sites. The average intersection used 3 detectors in each left turn lane and intersection stop bar, with only a single antenna pair and access point. In higher speed lanes, two upstream advance detectors were installed with a wireless repeater to re-transmit signals back to the intersection. Traffic Systems, Inc. provided completely configured Sensys system plans with pre-selected communications channels, parts lists, equipment kits and full documentation for each intersection. They also provided on-site guidance to the contractor, acceptance testing, and conducted full training for the DOT and contractor staff.

The Sensys Vehicle Detection System is completely solid state and maintenance free. Detectors and repeaters have a ten and seven year battery life. Their performance and reliability is not affected by temperature, humidity, lighting conditions, wind or precipitation. Sensys devices can continuously send status messages for device health, signal strength and battery power levels. This is particularly useful because it allows maintenance staff to monitor battery life and proactively schedule their replacements, which is a procedure that's similar to the original installation, but quicker and easier. Intuitive, easy to use software tools assist installers in configuring and cataloging Sensys devices prior to installation. The system also monitors radio frequency (RF) signal strength and interference. In the extremely rare event that interference is detected, the installer can simply select a different communication channel, even after detectors are installed in the pavement.

A new "deep" sensor will soon be available that can be installed five inches below the pavement to accommodate milling and resurfacing.