



# INTELLIGENT INTERSECTION TRAFFIC CONTROL LABORATORY FACT SHEET

*Research that is Essential, Indispensable, and Connected to our Customers.*

## PURPOSE

The Intelligent Intersection Traffic Control Laboratory (IITCL) is an outdoor facility that supports the Federal Highway Administration's (FHWA) various research programs and research activities conducted by other U.S. Department of Transportation (USDOT) agencies. This includes USDOT's two major intelligent transportation system (ITS) programs: the Cooperative Intersection Collision Avoidance Systems (CICAS) initiative and the Vehicle Infrastructure Integration (VII) initiative. The IITCL serves as a testing ground for intersection-related research projects and as a place to integrate and demonstrate advanced technologies. Since its inception, many successful demonstrations and research activities have been conducted at the IITCL.

## DESCRIPTION

The IITCL is equipped with the most advanced technologies in the ITS and traffic control industries. For example, the IITCL features a comprehensive traffic signal control system, a dedicated short-range communication (DSRC) system, an advanced system for the detection of vehicles and pedestrians, a fiber-optic communication system, a CICAS driver infrastructure interface (DII) warning system, and a separate traffic signal cabinet with various computers and communication devices. The DSRC system can provide 5.8 and 5.9 gigahertz communication capacity to test vehicles equipped with DSRC onboard units.

The fiber-optic communication lines can transmit live videos and real-time data to central computers located in FHWA's Traffic Research Laboratory (TRRL). FHWA also installed two DIIs with light-emitting diodes at IITCL for research and technology demonstrations. These technologies enable researchers to conduct numerous traffic engineering, human factors, traffic safety, pedestrian safety, collision avoidance, simulation, and other technology studies.

## MISSIONS

- Supports FHWA and USDOT research and technology development programs by providing a testing facility for research activities conducted by multiple agencies nationwide.
- Advances the state of the art and the state of the practice in ITS and traffic engineering by providing a place to integrate and test technologies.
- Serves as a technical resource for the CICAS initiative and other research programs through data exchange and seminars.

## SPECIAL CAPACITIES

- Provides a testing environment for intersection-related technology, engineering, human factors, and operations studies.
- Enables vehicle-infrastructure communication through the DSRC system in support of the CICAS and VII research activities.
- Integrates various ITS and operations technologies by providing cabinet space and

systems communications for many ITS devices, including sensors, controllers, and operations software and hardware.

- Hosts ITS, CICAS, VII, and other types of demonstrations.

## PRODUCTS AND SERVICES

- Onsite support of USDOT's ITS Joint Program Office, FHWA's Office of Operations, and other USDOT research and development programs.
- Test ground for CICAS, VII, and other USDOT research programs.
- Data collection for intersection-related traffic and human factors studies.
- Integration and evaluation of sensors, controllers, and communication products.
- Demonstration opportunities for representatives from government agencies, the private sector, and research institutes.

## EXPERTISE

IITCL combines the expertise of systems engineering, traffic engineering, communications, data acquisition and processing, and intersection-related ITS operations.

## CONTACT

Laboratory Manager: Peter Huang, Ph.D., P.E.  
peter.huang@fhwa.dot.gov  
202-493-3484

*The Turner-Fairbank Highway Research Center (TFHRC) has more than 24 laboratories for research in the following areas: safety; operations, including intelligent transportation systems; materials technology; pavements; structures; and human centered systems. The expertise of*

*TFHRC scientists and engineers covers more than 20 transportation-related disciplines. These laboratories are a vital resource for advancing the body of knowledge created and nurtured by our researchers. The Federal Highway Administration's Office of Research, Development, and Technology*

*operates and manages TFHRC to conduct innovative research to provide solutions to transportation problems both nationwide and internationally. TFHRC is located in McLean, VA. Information on TFHRC is available at [www.tfhrc.gov](http://www.tfhrc.gov).*