INTELLIGENT TRANSPORTATION SOLUTIONS

24/7 DETECTION AND MONITORING

Solutions for Traffic and Public Transportation Applications
ENHANCING SAFETY AND EFFICIENCY FOR ROAD TRAFFIC AND PUBLIC TRANSPORTATION

Traffic managers all over the world use technology from FLIR Intelligent Transportation Systems to keep roadways flowing safely and smoothly. Detection and monitoring solutions from FLIR help prevent traffic jams, accidents, and congestion. Based on advanced technology proven for more than 25 years, FLIR's hardware and software solutions help you monitor moments and pedestrians in urban environments, detect incidents on highways and in tunnels, collect traffic data, and ensure safety on our public railways.

URBAN INTERSECTIONS

FLIR traffic sensors are effective in real-time detection in urban environments. In addition, they help manage traffic flows for pedestrians and bicyclists, improving their safety in busy traffic environments. Urban traffic flows demand real-time, precise vehicle detection and traffic data for traffic agencies managing flow patterns on networks of roadways.

HIGHWAYS, TUNNELS AND BRIDGES

FLIR's automatic incident detection solutions help save lives in tunnels and on highways and bridges by detecting smoke, fire, stopped vehicles, lost cargo, pedestrians, wrong-way driving vehicles, and other traffic events. Early detection of road irregularities enables first responders to act quickly and avoid secondary accidents.

RAIL TRACKS, PLATFORMS AND ON-BOARD

FLIR's thermal imaging cameras prevent serious accidents and infrastructure damage by detecting vehicles blocking level crossings and people entering metro tunnels or falling from platforms onto tracks. FLIR's technology detects dangerous activity immediately, so accidents can be better avoided. Thermal imaging can also identify instances of fire or conduct passenger loads and track passengers entering passenger cars.

DETECTION & MONITORING SOLUTIONS FOR TRAFFIC AND PUBLIC TRANSPORTATION APPLICATIONS

By combining video and thermal cameras with intelligent video analytics, radars, and V2X communication technology with traffic management and data analytics software, FLIR ITS has the field-proven solutions you need to keep all transport modes safe and running at peak efficiency.

Real-time Analysis

Real-time analysis of video or thermal camera images allows for more efficient traffic management, including real-time, automatic incident detection. Traffic signals can be adapted in real-time, according to current traffic flows. Flows increase or decrease, and traffic incidents are further identified by incident teams, preventing secondary accidents.

Video Detection – Seeing is Believing

Video detection and monitoring systems from FLIR ITS are used around the world. From roads, intersections, and tunnels, to rail tracks, platforms, and on-board, FLIR ITS video detection systems help traffic managers see what is happening in real-time.

Cost-Effective

Video detection systems for monitoring traffic streams are extremely cost-effective. Cameras can be easily installed on existing structures, above ground. In some cases, cameras can be retrofitted to existing structures. Most incidents are detected with cameras, which can detect and report dangerous activity immediately, so accidents can be better avoided.

Efficient and Reliable

FLIR ITS video detection and monitoring systems are used for traffic management worldwide. Traffic managers appreciate their high incident detection rates and speed. This results in a low Mean Time to Detect (MTTD) and a low False Alarm Frequency (FAF).

Proven Technology

More than 250,000 FLIR ITS video detectors are in operation in more than 80 countries worldwide. FLIR ITS has Automatic Incident Detection (AID) installations in more than 1,500 tunnels, and FLIR ITS solutions are being used for traffic light management at more than 50,000 intersections worldwide.
THERMAL IMAGING FOR TRAFFIC APPLICATIONS

While video cameras are traditionally used for traffic video analysis, they need additional algorithms to overcome their inherent vulnerability to low light conditions (nighttime), too much light (sun glare), and shadows that can hide vehicles or pedestrians. Thermal sensors don’t have any of these concerns because they create a crisp image based on subtle differences in heat signatures within a scene. Thermal sensors need no light to work, are not blinded by direct sunlight, and provide uninterrupted 24-hour detection of vehicles, pedestrians, and cyclists, regardless of the amount of light available.

Sun Glare
Sun glare from the sun’s bright conventional light blinds conventional video cameras and hides objects people, and vehicles. Thermal sensors convert this glare into a heat signal, revealed in the form of a signature that they detect.

Headlights
Headlights are confusing to video cameras, making accurate observation of highway traffic at night challenging. Thermal sensors, however, are immune to headlight glare, so they see clearly.

See into Shadows
Video cameras can miss pedestrians, cyclists, animals, and vehicles, even on a highway at night. Thermal sensors, however, can reveal an object's true heat signature, allowing them to see clearly into shadows or total darkness.

How Video Analytics Works
An installed video or thermal imaging camera sends an input signal to a detection unit, either onboard the camera or integrated into a standard 19-inch rack. Once the camera or video/image processing modules are set, detection zones are pre-programmed and sent to detection modules. When an alarm is generated, the traffic manager in the control room will receive a visual image of the scene so that he or she can take appropriate action.
Pedestrian safety and mobility
FLIR sensors allow you to include pedestrian movement into traffic control strategies and make them more visible to traffic.

With dynamic traffic light control and warning sign activation, operators can make intersections and pedestrian crossings safer, while also preventing unnecessary delays in both pedestrian and motorist traffic.

- Replace inefficient push buttons
- Enhance pedestrian safety
- Reduce unnecessary delays

Bicycle Detection
By looking at heat signatures, thermal cameras can make a reliable distinction between bicyclists and vehicles. Traffic signals can be adapted to give bicyclists green time ahead of vehicle traffic for greater visibility. Bicycle detection will provide an extended clearance time for bicyclists, allowing them more time to cross an intersection without causing unnecessary delays.

- Above-ground thermal sensors reliably detect bicyclists in mixed traffic environments
- Trigger bicycle warning signals dynamically
- Adapt traffic signals to enhance bicycle safety

High resolution data analytics
FLIR’s thermal and visual analytics provide the traffic signal controller with real-time presence data of vehicles, bicyclists, and pedestrians at intersections. This generates valuable traffic data, including counts, occupancy, classification on the stopbar and pedestrian origins and destinations. FLIR's advanced analytics incorporate both visual and thermal data streams, which can be used to better understand high-impact intersection issues.

- Capture, store and fuse valuable traffic data
- Measure intersection performance
- Real-time congestion mapping
- Better insights, better decisions

SAFER JOURNEYS, SMOOTHER FLOWS
From thermal video detection and traffic light control to high resolution analytics, FLIR ITS offers an array of tools that better ensure safe and efficient movement of vehicles, bicyclists, and pedestrians in urban settings. Because our sensors operate above-ground, they also are more affordable than conventional in-ground detection technology.
FLIR DETECTORS AND SENSORS FOR TRAFFIC SIGNAL CONTROL

FLIR TrafiCam
Vehicle Presence Sensor

The TrafiCam series of vehicle presence sensors combines a CMOS camera and video detector to control traffic lights dynamically based on vehicle presence information. The TrafiCam series includes the TrafiCam vehicle presence sensor for isolated use and the TrafiCam x-stream vehicle presence sensor and data collector with video streaming.

FLIR TrafiOne
Smart City Sensor

FLIR TrafiOne is an all-in-one sensor that tracks waiting and crossing pedestrians and bicyclists in urban environments. FLIR TrafiOne uses thermal imaging technology to reliably detect all weather conditions and various object types. The embedded Wi-Fi tracking technology provides traffic engineers with high-resolution data on vehicles, bicyclists, and pedestrians at intersections. The sensor includes an HD visual CMOS camera for streaming videos.

FLIR TrafiSense/ThermiCam
Mixed Traffic Detector

TrafiSense/ThermiCam is a traffic detector based on high-resolution thermal imaging technology and used for vehicle and pedestrian detection in mixed traffic conditions, traffic control, traffic management, and data collection.

FLIR TrafiRadar
Video Sensor & Radar Combination

FLIR’s TrafiRadar is a combination of a video sensor and radar, providing information on the location and speed of vehicles, pedestrians, and bicyclists. The TrafiRadar warns the traffic light controller whenever a vehicle is present in the dilemma zone, either extending green time or extending all red lights in order to improve overall safety at signalized intersections. As a result, better decisions can be made to control the traffic light in a more optimal way.

FLIR ITS-IQ
Web-Based Analytics Platform

FLIR combines both presence data and traffic flow data into a single, intuitive and scalable platform that performs data management, high-quality data delivery in real-time, and enables complex traffic simulations and filters to be applied to the data in order to provide the ultimate experience in understanding congestion. The ITS-IQ platform enables traffic planners to better understand and manage traffic in a city by providing real-time traffic data and analytics.
FASTER RESPONSE TIME, RELIABLE DETECTION
The ability to identify and respond quickly to incidents on roadways and in tunnels is an essential component of any effective traffic management system. FLIR traffic cameras and sensors can reliably detect incidents—including collisions, stopped vehicles, and wrong-way drivers—in challenging lighting and weather conditions. FLIR imagers can also monitor differing levels of traffic flows, and even detect a fire in a tunnel long before traditional sensors even activate.

Highway Monitoring
Traffic thermal imaging cameras keep an eye on our highways. Because they aren’t vulnerable to low light conditions, excessive glare, or high contrast scenes (shadows), they offer a true 24/7 solution for highway operators.

• Monitor traffic 24/7
• See your traffic accurately, day and night
• Enjoy a clear view in all weather conditions

Automatic Incident Detection
Effective incident management depends entirely on fast incident detection and verification. FLIR’s detection solutions allow you to detect stopped vehicles, queues, wrong-way drivers, or any traffic irregularity in a matter of seconds, so you can prevent secondary accidents from happening.

• Detect in a matter of seconds
• Prevent secondary accidents
• See any traffic irregularity instantly

Fire Detection in Tunnels
FLIR thermal imaging cameras allow operators to detect fires in their early stages. In case of a fire, the thermal cameras enhance the visibility of the operator by seeing through smoke and detecting hot spots.

• Detect incidents and fires in an early stage
• Monitor tunnel traffic
• See through smoke

Data Collection and Flow Monitoring
FLIR cameras and sensors keep highway traffic flowing smoothly by accurately monitoring traffic flows. FLIR solutions can efficiently meet the demands of transportation and traffic management. Real-time traffic monitoring allows for a host of applications including queue monitoring during road work and travel time calculations based on traffic flow.

• Collect valuable traffic data
• Monitor queues
• Ensure safety during road works
FLIR DETECTORS AND SENSORS FOR ROADS AND TUNNELS

FLIR ITS-Series Dual AID
Intelligent Dual Vision Automatic Incident Detection
FLIR ITS-Series Dual AID cameras combine best-in-class thermal and visual imaging technology with advanced video analytics to provide a complete solution for automatic incident detection, data collection, and early fire detection. These cameras have proven their effectiveness worldwide during high-speed incidents and tunnels, and are now being used to monitor the power of thermal imaging, which allows traffic operators to see clearly in total darkness, in bad weather, and over a long range.

FLIR FLUX
Traffic Management System
FLUX is an intelligent software platform for use with a FLIR video detection system. FLUX collects traffic data, events, alarms, and video images generated by the video detectors. FLUX also offers video management capacity and real-time monitoring capabilities on selected video images, video output, and video files.

FLIR Cameleon ITS
Command & Control Software
Cameleon ITS is the central software platform for transportation monitoring and management that allows for the control of ITS-specific devices, including cameras, LED signs, detector stations, signal heads, and incident detection.

FLIR VIP-Series
Integrated Detection Boards
FLIR’s integrated detection boards provide automatic incident detection, data collection, recording of pre- and post-incident image sequences, and streaming video in one board. VIP Series boards have been installed in over 100 projects in over 15 countries worldwide. VIP modules can be combined with FLIR’s FLUX Traffic Management System to provide a complete solution for traffic management.

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PUBLIC TRANSPORTATION SAFETY

FLIR ITS is playing a vital role in helping public transportation systems operate safely. Our cameras can detect activity around platforms and tracks, monitor the seat occupancy and passengers in buses and trains, and even detect onboard fires—all in an effort to reduce the risk of accidents and improve efficiency.

Trackside Monitoring

FLIR thermal imaging cameras can detect people on stairs, on or under tracks. Whether a person just fell from the platform or is deliberately walking on the tracks, FLIR cameras ensure 24/7 detection on tracks or in tunnels, regardless of the surrounding illumination.

- Detect people on tracks
- Prevent damage to infrastructure
- Enhance safety

Vehicle Detection at Railway Crossings

FLIR’s thermal imaging cameras can prevent collisions between trains and vehicles at level crossings by detecting when a vehicle stops on the tracks. In this way, train and tram operators can be warned in advance.

- Detect vehicles on level crossings
- Prevent damage to infrastructures
- Enhance railway safety

Onboard Fire Detection

Intelligent sensors from FLIR ITS provide advanced, non-contact fire detection on passenger and cargo trains. They generate both thermal and HD color video feeds that function as onboard passenger safety monitoring systems.

- Advanced dynamic fire detection
- Discrete on-board surveillance

Onboard Monitoring

In addition to safety, FLIR ITS imagers can assist operators in determining seat occupancy and maximum capacity on passenger trains.

- Seat occupancy
- Maximum capacity
FLIR SENSORS AND CAMERAS FOR PUBLIC TRANSPORT SAFETY APPLICATIONS

**FLIR ITS-Series Rail**

*Rail Monitoring, Thermal Imaging*

The FLIR ITS-Series Rail is a cost-effective solution that automatically detects and alerts drivers to potential hazards near railway tracks, such as trespassers, pedestrians, and vehicles. It can be installed at any location near a railway track to ensure safety for both people and the environment. The FLIR ITS-Series Rail can be configured to notify the authorities automatically or to alert drivers manually, depending on the specific needs of the installation site.

**FLIR D-Series ITS**

*Thermal Cameras in Outdoor Dome Enclosure*

Combined with FLIR's video detection analytics, the FLIR D-Series ITS indoor dome camera functions as an advanced detection and data collection system. The FLIR D-Series ITS replaces a 640 x 512 pixel thermal imager with a high-contrast 712 x 580 color image. The FLIR D-Series ITS can also be controlled via an IP-enabled serial port, which allows for easy integration into existing systems. The FLIR D-Series ITS is the perfect replacement for day/night dome cameras, providing clear 24/7 imaging in a discrete enclosure.

**FLIR PT-Series HD ITS**

*Multi-Sensor Pan-Tilt Traffic Monitoring Camera*

Combined with FLIR's video detection analytics, the FLIR PT-Series HD ITS provides advanced performance and control, providing fully programmable scan patterns. Efficient for control and operational needs across a wide range of locations, the FLIR PT-Series HD ITS can be used in environments such as highways, airports, and other public areas. The FLIR PT-Series HD ITS cameras are designed for optimal performance in any weather condition, with adjustable zoom and resolution settings. The FLIR PT-Series HD ITS cameras are also equipped with a powerful, built-in analytics suite that can automatically detect and classify objects in real-time.

**FLIR RSX-F**

*Thermal Sensor for Rolling Stock*

The FLIR RSX-F is an intelligent sensor that provides advanced, non-contact fire detection on the wheels of rolling stock. Combining a thermal imager with an HD camera, the FLIR RSX-F can detect fires on passenger trains, allowing for early intervention and minimizing damage. The FLIR RSX-F is also equipped with advanced analytics software, which can detect and classify objects in real-time, providing a comprehensive solution for the safety of rolling stock.
LEARNING ABOUT YOUR TRAFFIC SOLUTION

FLIR ITS has options for you to learn all about your traffic solution. Whether you have chosen the solution you feel is right for your needs, or if you need help determining a solution, FLIR ITS is ready to help with the following tools:

FLIR Traficon Academy

The FLIR Intelligent Transportation Systems product portfolio and the ITS market in general are constantly changing. That’s why FLIR Traficon Academy offers a wide range of training programs to keep you up to date with the latest state-of-the-art technology.

- Flexible Training Schedules and classes
- In-Person Training
- Online Training

Traffic Solutions Now and in the Future

The six hallmarks of FLIR ITS are revolutionizing how traffic flows on roadways throughout the world. FLIR’s unique, field-proven solutions help keep vehicles, pedestrians, and bicyclists moving smoothly and safely, by utilizing a wide range of advanced video and data analytics, and command and control of software. FLIR ITS’ Intelligent Transportation Systems have the right solution for your specific situation. Traffic managers all over the world and technology from FLIR ITS is keeping roadways safe and running at peak efficiency. FLIR ITS solutions help protect lives, as well as critical infrastructure. FLIR ITS is in a position to make the places we live, work and travel to as safe as possible.

For the right solution for you and your transportation needs, visit our website at: www.flir.com/traffic
- Or reach out and contact one of our trusted ITS Sales associates across the globe: Tel. +32 (0) 56 37 22 00

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