FLIR®

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 traffic and public transportation agencies manage traffic flows efficiently and ensure safety. Based on advanced technology proven for more than 25 years, FLIR hardware and software solutions help you monitor motorists 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 enable officials to control traffic signals at intersections to allow urban traffic to move smoothly. In addition, they help optimize traffic flows for pedestrians and bicyclists, improving their safety in busy traffic environments. While improving traffic flows in real time, FLIR sensors also collect valuable traffic data for traffic engineers examining flow patterns on networks of roadways.

Highways, tunnels and bridges
FLIR 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 intervene quickly and avoid secondary accidents.

Rail tracks, platforms and on-board
FLIR 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 technology detects dangerous activity immediately, so accidents can be better avoided. Thermal imaging can also identify infant fires onboard passenger trains and assist operators with monitoring passenger occupancy.

Traditional video cameras, as well as thermal cameras, can be combined with FLIR traffic video analytics.

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 in tunnels, on highways, and in urban areas. Traffic lights can be adapted in real-time, according to current traffic flows. When incidents occur, early detection enables faster intervention by rescue teams, preventing secondary accidents.

Cost Effective
Video detection systems for monitoring traffic streams are extremely cost effective. Cameras can be easily installed above ground on existing infrastructure—such as mast arms, luminaires, or existing poles—eliminating the need for road closures or other disturbances. Detection zones can also be easily moved or adapted when traffic situations change.

Connected
FLIR ITS detection securely connects to all varieties of management software solutions. From video recording, and command and control, to traffic event storage and cloud data analytics combined with V2X communication, FLIR ITS products allow you to do more than detection alone.

Video Detection - Seeing is Believing
The combination of numerical data and visual images sets video detection apart from all other detection systems. The immediate visual feedback from a monitor is invaluable for traffic managers or operators to know exactly what is occurring and what appropriate actions to take.

Efficient and Reliable
Video detection and monitoring systems from FLIR ITS are used around the world. 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 operational in over 80 countries worldwide. FLIR ITS has Automatic Incident Detection (AID) installations in more than 1500 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 (night time), too much light (sun glare), and shadows that can hide vehicles or pedestrians. Thermal sensors don't face any these issues 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
Glare from the sun blinds conventional video cameras, effectively hiding vehicles, people, and animals. Thermal sensors cannot see this glare and only respond to the heat signatures 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 cars obscured by shadows or at night, when it is dark. However, since thermal sensors see heat, not light, they can see into shadows or total darkness, providing a more reliable detection solution.

Long-Range Night Viewing
At night, a highway looks like an indistinct row of lights to a video camera, making meaningful data collection and incident assessment almost impossible. But thermal cameras see the heat signatures of vehicles clearly from miles away, while also providing clear views of the roadsides, revealing vehicles that are pulled over.

Measure Temperature
Thermal cameras can measure the temperature of any object in its field of view. This unique capability allows detection of fires at their early stages over the full detection range.


See Through Smoke
Thermal cameras can penetrate smoke and, as such, provide a better view in case of fire, compared with visual cameras. This enhanced visibility can help guide emergency personnel to locate people inside the tunnels and save lives in critical situations.

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 the video image processing modules are set, detection zones are superimposed onto the video image.

When a vehicle or a pedestrian enters a detection zone, dedicated algorithms generate different types of traffic data. This includes presence and incident-related data, information for statistical processing, and data for pre- and post-incident analysis. Compressed images and alarms are transmitted to the technical control room. The system can be installed so that the video image processor triggers a third-party system, such as a traffic light, electronic traffic sign or any other VMS panel. 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 actions.
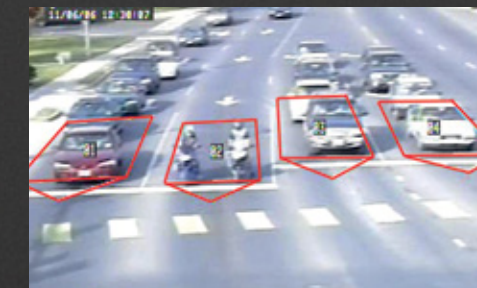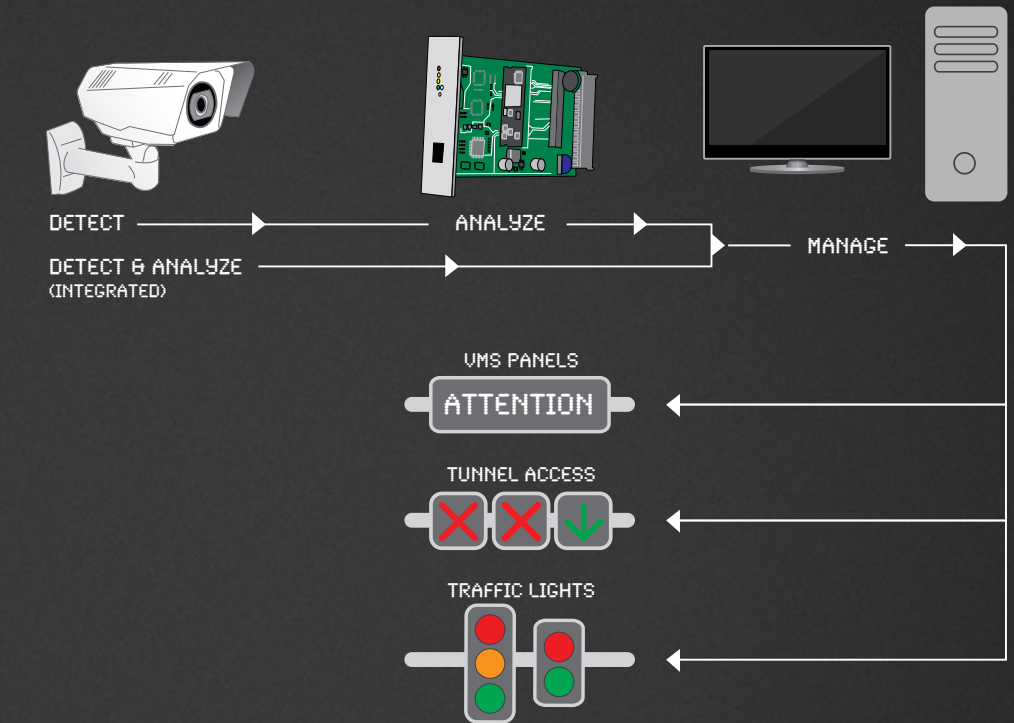
Pinpoint analytics for easy vehicle detection and recognition.

Precise detection zones can be set using analytics.

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SAFE AND EFFICIENT JOURNEYS

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.

Vehicle Detection

FLIR video, thermal and radar sensors are highly reliable, accurate and non-intrusive detection technologies specifically designed for signal control and traffic management. By detecting vehicles so efficiently, FLIR sensors enable smart intersection control for greater safety, just like in countless cities that have already implemented FLIR technology at intersections.

- Improve city traffic flows

- Reduce unnecessary delays

- Enhance safety for all road users
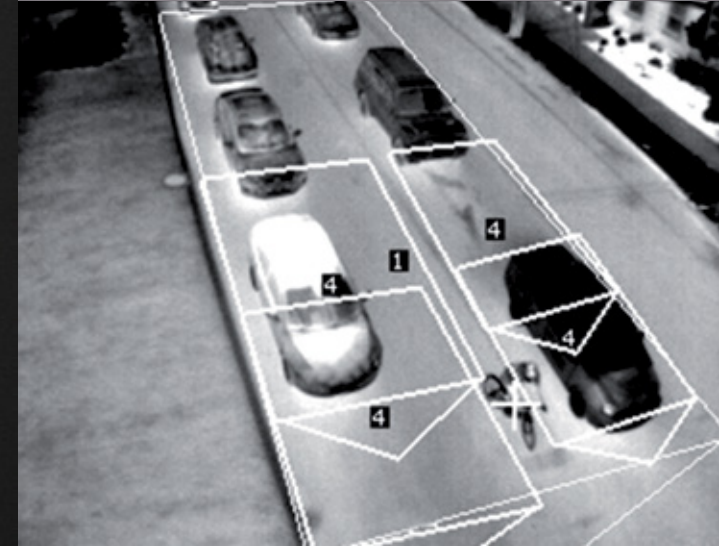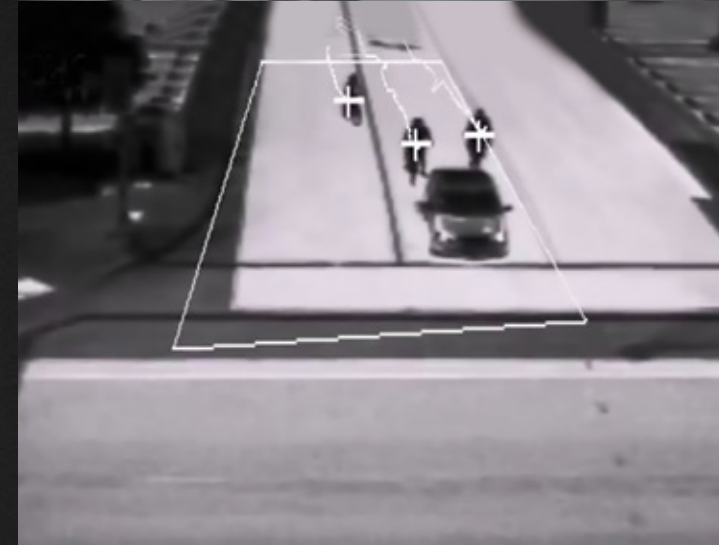
Pedestrian safety and mobility

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 to both pedestrians and motorists.

- 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 thermal and visual analytics provide real-time traffic signal control by detecting the presence of vehicles, bicyclists and pedestrians at intersections. This generates valuable traffic data, including counts, occupancy, classification at the stopbar and between intersections. By anonymously using Wi-Fi technology to track how people and vehicles move at intersections, FLIR sensors measure travel times, delays, points of origin and destinations. FLIR integrates both presence data and traffic flow data into a single source in the cloud, resulting in high-resolution, high-quality intersection data.

- Capture, store and fuse valuable traffic data

- Measure intersection performance

- Real-time congestion mapping

- Better insights, better decisions

FLIR DETECTORS AND SENSORS FOR
TRAFFIC SIGNAL CONTROL
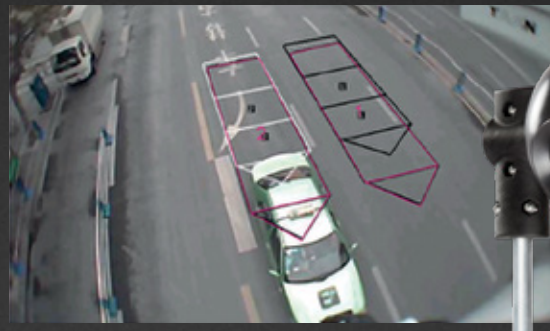
TrafiCam
Vehicle Presence Sensor

The TrafiCam series of vehicle presence sensors combines a CMOS camera and video detector in one. TrafiCam allows you to control traffic lights dynamically, based on vehicle presence information. The TrafiCam series includes the TrafiCam vehicle presence sensor for standalone use and the TrafiCam x-stream vehicle presence sensor and data collector with video streaming.
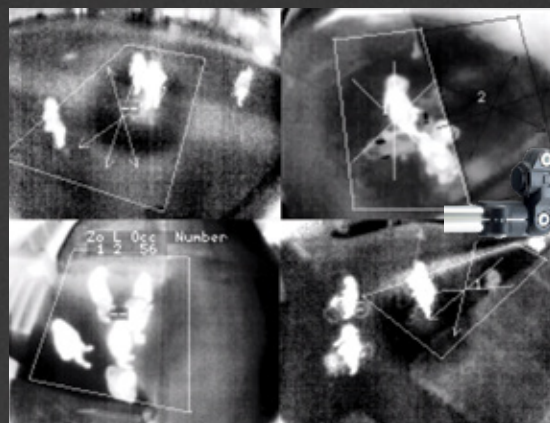
TrafiOne
Smart City Sensor

FLIR TrafiOne is an all-round sensor that tracks waiting and crossing pedestrians and bicyclists in urban environments. TrafiOne uses thermal imaging technology to reliably detect in all weather conditions and even in total darkness. The integrated Wi-Fi tracking technology provides traffic engineers with high-resolution data on vehicles, bicycles and pedestrians at intersections. The sensor includes an HD visual C-MOS camera for streaming video.

ThermiCam2/TrafiSense2
Integrated Thermal Traffic Detector

ThermiCam2/TrafiSense2 is an intelligent thermal sensor capable of detecting vehicles, bicyclists, and pedestrians for dynamic traffic signal control and data collection. Integrated Wi-Fi technology allows simultaneous thermal detection, travel time, and delay time calculation. Since the ThermiCam2/TrafiSense2 relies on thermal energy rather than light, it offers 24/7 traffic monitoring and can detect road users at night, through glare, and in harsh weather conditions.

TrafiSense2 V2X/ThermiCam2 V2X
Intelligent Thermal Traffic Sensor with V2X

TrafiSense2 V2X/ThermiCam2 V2X is an intelligent thermal sensor for vehicle, pedestrian, and bike detection. Integrated V2X technology allows simultaneous thermal detection and V2X message processing. Since the TrafiSense2 V2X/ThermiCam2 V2X relies on thermal energy rather than light, it offers 24/7 traffic monitoring and can detect road users at night, through glare, and in harsh weather conditions.
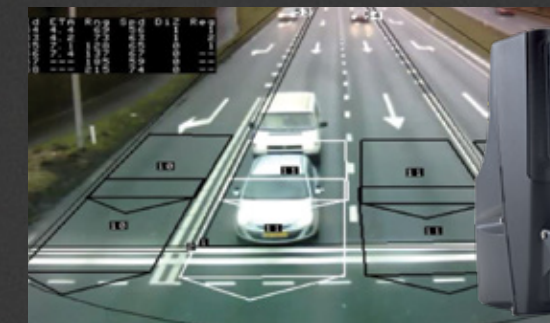
TrafiRadar
Video Sensor & Radar Combination

FLIR TrafiRadar is a combination of a video sensor and radar, providing information on the location and speed of vehicles approaching or waiting at an intersection. 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 lights in a more optimal way.

Acyclica by FLIR
Smart City Platform

The Acyclica smart city platform provides the information and insight necessary to understand congestion. Acyclica transforms mountains of data into actionable information to help agencies understand travel times, traffic patterns, and congestion. From point-and-click origin-destination analysis to real-time congestion mapping, Acyclica helps agencies understand how people are moving. A range of automated reports, powerful user interface, and comprehensive APIs ensure that data is where you need it when you need it.

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

FLIR thermal imaging cameras keep an eye on our highways. Because they aren't vulnerable to low light conditions, excessive sun glare, or high contrast scenes (shadows), they offer a truly 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
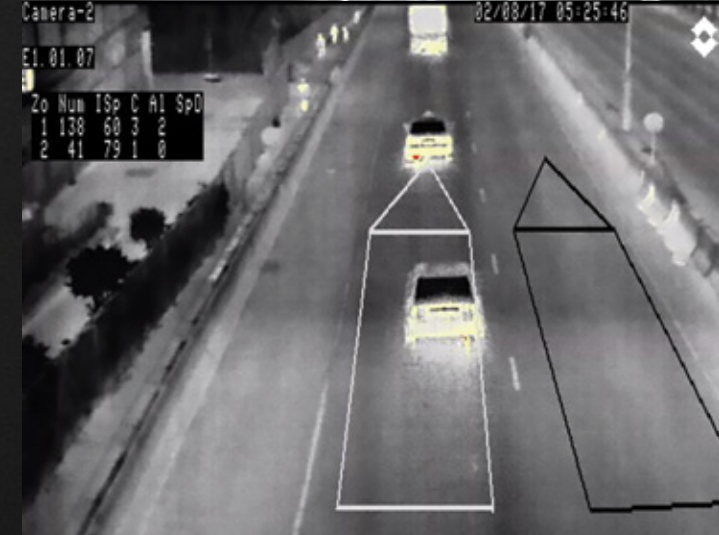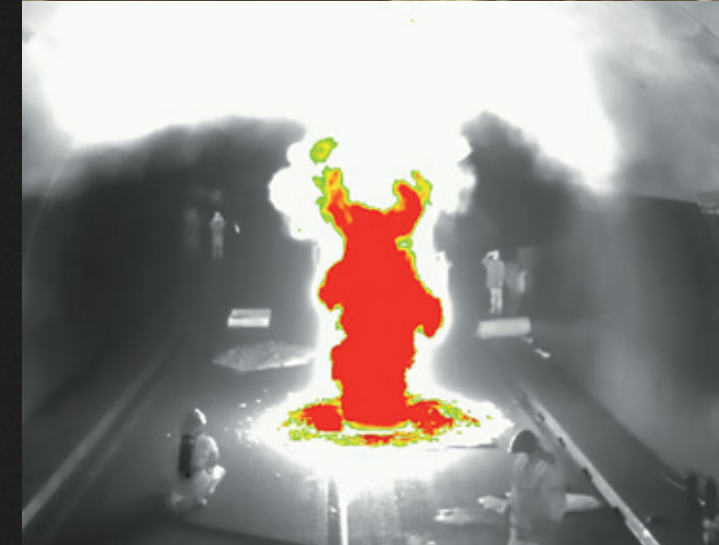
Automatic Incident Detection

Effective incident management depends entirely on fast incident detection and verification. FLIR detection solutions allow you to detect stopped vehicles, wrong-way drivers, queues, slow-moving vehicles, fallen objects or pedestrians 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 vision of the operators 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 highways safe by accurately monitoring traffic flows. FLIR solutions can efficiently make a distinction between several levels of service: fluid, dense, congested or stop and go. Other applications include 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

VIP-HD
Integrated Detection Boards

FLIR integrated detection boards provide automatic incident detection, data collection, recording of pre- and post-incident image sequences and streaming video in one board. VIP modules have been installed for road and tunnel projects all over the world. VIP boards can handle analog and HD network streams (VIP-HD), and can even be combined with video encoding.

TrafiBot2
Automatic Incident Detection

The FLIR TrafiBot2 is a compact, rugged camera solution for automatic incident detection. Combining full HD visual imaging with advanced video analytics, TrafiBot2's advanced processing generates traffic data and incident detection information for tunnels, bridges, and highways, including alerts on stopped vehicles, wrong-way drivers, and lost cargo.

ITS-Series AID
Intelligent - Automatic Incident Detection

The FLIR ITS-Series AID camera provides critical traffic information, supporting traffic operators with alerts on stopped vehicles, wrong-way drivers, pedestrians, lost cargo, traffic flow data and much more. The FLIR ITS-Series AID thermal camera can measure the temperature of any object in its field of view. This unique capability allows for the detection of fires at their early stages over the full detection range, even through smoke.
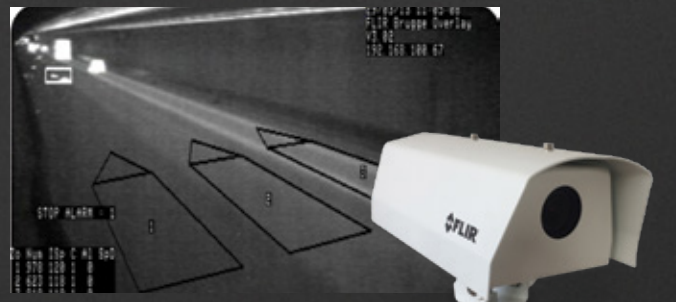
ThermiBot2
Intelligent Thermal Imaging Camera

ThermiBot2 AID cameras combine best-in-class thermal imaging technology with advanced video analytics to provide a complete solution for automatic incident detection and data collection. Traffic video analytics from FLIR have proven their effectiveness worldwide along highways and in tunnels, and with the addition of thermal, allow traffic operators to see clearly in total darkness, bad weather, and over a long range.

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. FLIR traffic video analytics have proven their effectiveness worldwide along highways and in tunnels and are now combined with the power of thermal imaging, which allows traffic operators to see clearly in total darkness, in bad weather and over a long range.

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 can control network video recorders, video walls, mobile and fixed cameras.
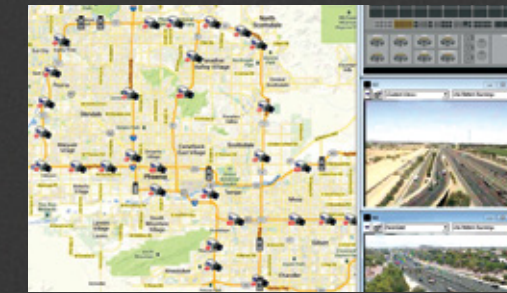
FLIR Cameleon ITS
Command & Control Software

Cameleon ITS is a central software platform for transportation monitoring and management that allows for the control of ITS-specific devices, including cameras, DMS signs, detector stations, gates, signal heads and incident detection.

FLIR United VMS
Network Video Management System

FLIR United VMS is a reliable, enterprise-level software solution for video surveillance, supporting an unlimited number of cameras over IP networks. United VMS features enhanced cybersecurity, edge device integration, and global administration.

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 metro, tram or railway 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 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 Imager

The FLIR ITS-Series Rail is a cost-effective solution that uses advanced algorithms to detect pedestrians and vehicles in danger around train tunnels and platforms. The FLIR ITS-Series Rail can be used to prevent collisions by detecting vehicles stuck on level crossings or blocking the path of approaching trains. The calibrated FLIR ITS-Series Rail camera can also measure the surface temperature of objects within its field of view, which allows it to detect fires at their earliest stages.

FLIR RSX-F
Thermal Sensor for Rolling Stock

The FLIR RSX-F is an intelligent sensor that provides advanced, non-contact fire detection on passenger and cargo trains. Combining a thermal imager, HD camera and advanced on-board analytics, the FLIR RSX-F can detect fires more quickly than conventional sensors, while performing with lower false alarm rates. The FLIR RSX-F also captures the heat signature of train passengers to determine seat occupancy. This allows rail operators to optimize passenger flows.

FLIR THERMAL IMAGING CAMERAS

FLIR ITS-Series
Thermal Imaging Traffic Cameras

The FLIR ITS-Series provides effective, reliable traffic detection and monitoring in total darkness and in harsh weather conditions. It can be integrated with a variety of third party video analytics for enhanced performance. The camera features multiple lens options, from 7.5mm to 35mm, as well as simple "plug-and-play" installation on existing infrastructure, with hybrid IP and analog video out and a design that meets weather resistant, IP66 requirements.
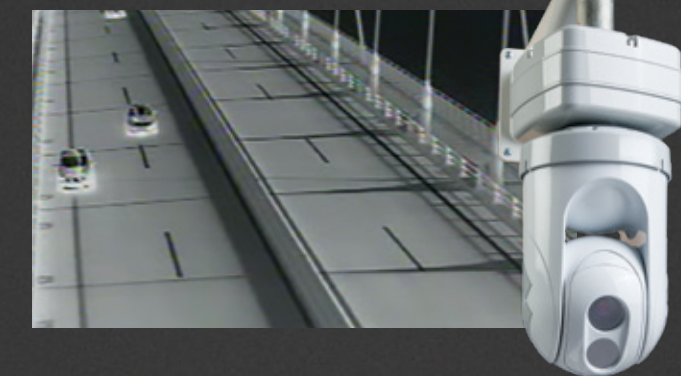
D-Series ITS
Thermal Cameras in Outdoor Dome Enclosure

Combined with FLIR video detection analytics, the FLIR D-Series ITS multi-sensor traffic dome camera functions as an advanced incident detection and data collection system. The FLIR D-Series ITS deploys a 640 x 512 pixel thermal imager with a day/night 36X zoom color CCD camera. The outdoor dome enclosure provides precision pan/tilt control, which can be controlled over IP and serial networks. FLIR D-Series is the perfect replacement for day/night dome cameras, for clear 24/7 imaging in a discrete enclosure.

PT-Series HD ITS
Multi-Sensor Pan-Tilt Traffic Monitoring camera

Combined with FLIR video detection analytics, the FLIR PT-Series HD ITS provides precise pan/tilt control, while providing fully programmable scan patterns. Enabled for control and operation over digital and serial networks, PT-Series ITS thermal cameras are available in high-resolution 640 × 512 formats, which provide up to sixteen times the image clarity and long range threat detection than lower resolution thermal cameras. Multi-sensor configurations also include a day/night 36X zoom color HD camera.

LEARNING ABOUT YOUR TRAFFIC SOLUTION

FLIR ITS has options for you to learn all about your traffic solutions. 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.

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

- Flexible training schedules and classes

- In-Person Training

- Online Training

THE SIX HALLMARKS OF FLIR ITS:

Real-Time-Analysis

Video Detection
(Seeing is believing)

Cost Effective

Efficient & Reliable
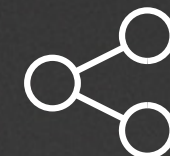
Connected

Proven Technology

Traffic Solutions Now and in the Future
The six hallmarks of FLIR ITS are revolutionizing how traffic flows on roadways throughout the world. Our unique, field-proven solutions help keep vehicles, pedestrians, and bicycle traffic moving smoothly and safely. By combining video cameras, thermal sensors, intelligent video analytics, and command and control software, FLIR Intelligent Transportation Systems has the right solution for your specific situation. Traffic managers all over the world use technology from FLIR ITS to keep roadways safe and running at peak efficiency. FLIR ITS solutions help protect citizens, as well as critical infrastructure. FLIR takes pride in making 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**

Specifications are subject to change without notice

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