FLIR

INTELLIGENT TRANSPORTATION SYSTEMS

24/7 Detection and Monitoring
solutions to enhance safety
and keep traffic flowing

ENHANCING SAFETY AND EFFICIENCY FOR ROAD TRAFFIC AND PUBLIC TRANSPORTATION

Traffic managers around the world rely on intelligent detection and monitoring solutions to help manage safe, efficient traffic flow. With more than 30 years of proven transportation experience, FLIR offers advanced hardware and software solutions to help you monitor traffic and vulnerable road users (VRUs) in urban environments, reliably and accurately detecting incidents in tunnels and on highways, collecting detailed traffic data, and ensuring public safety.

Urban Traffic

FLIR's range of thermal and visual traffic sensors help you control intersections and optimize the flow of vehicles and improve safety for VRUs. These traffic sensors can provide the most basic data such as loop information at an intersection, up to the most detailed information such as counting and classification of the different type of vehicles and VRUs. On top of this data collection, FLIR traffic sensors can provide accurate location information, together with heading and speed data. All of this enables the sensor to provide information for the most advanced traffic adaptive systems.

Highways, Tunnels, and Bridges

FLIR automatic incident detection solutions help save lives in tunnels, on highways, and on bridges by detecting different types of incidents, including accidents, wrong-way drivers, lost cargo, pedestrians, smoke, and fire. Early detection of road irregularities enables first responders to intervene quickly and avoid secondary accidents. These solutions collect data and traffic information to make the traffic more efficient and are made of stainless steel to prevent corrosion in the harshest of environments.

Enhanced Traffic Efficiency

- Control intersections and crosswalks to reduce bottlenecks
- Optimize traffic flow
- Collect valuable data for traffic engineers

Enhanced Traffic Safety

- Improve signal control with edge-based Automatic Incident Detection (AID)
- Detect traffic irregularities early
- Detect vulnerable road users (VRUs)

DETECTION AND MONITORING SOLUTIONS

FLIR has field-proven solutions to help cities run safely and ensure traffic efficiency on highways, bridges, and in tunnels. By combining AI- and video analytic-enhanced cameras with traffic management and data analytics software, FLIR is helping cities around the globe run more smoothly.

Real-Time Analysis

Real-time analysis of optical 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.

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.

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.

Efficient and Reliable

Video detection and monitoring systems from FLIR are used around the world. Traffic managers appreciate their high detection rates and speed. This results in a low Mean Time to Detect (MTTD) and a low False Alarm Frequency (FAF).

Connected

FLIR sensors securely connect to all varieties of management software solutions. From video recording, command and control, traffic event storage, cloud data analytics, and V2X communication, FLIR transportation solutions are capable of much more than detection.

Proven Technology

Over 300,000 FLIR traffic cameras are operational in over 80 countries worldwide. FLIR has Automatic Incident Detection (AID) installations in more than 3500 tunnels and traffic light management systems at more than 75,000 intersections worldwide.

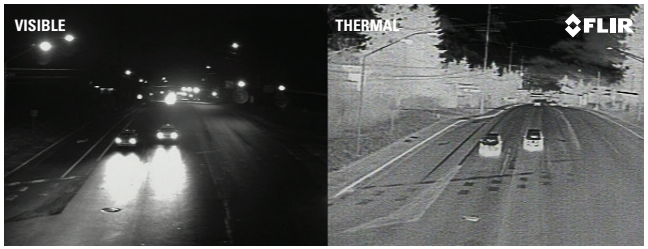
THERMAL IMAGING FOR TRAFFIC APPLICATIONS

While visual cameras are traditionally used for traffic video analysis, they are inherently vulnerable to low light conditions (nighttime), too much light (sun glare), and shadows that can hide vehicles or pedestrians.

Thermal sensors don't face any of these issues because they create a crisp image based on 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 in all weather conditions and regardless of the amount of light available. Therefore, thermal is highly recommended in safety critical applications such as protecting vulnerable road users. The most challenging conditions for an optical camera are the same conditions that decrease the visibility for the drivers—so in these conditions it is even more important to use thermal sensors.

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.



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.

Long-Range Night Viewing

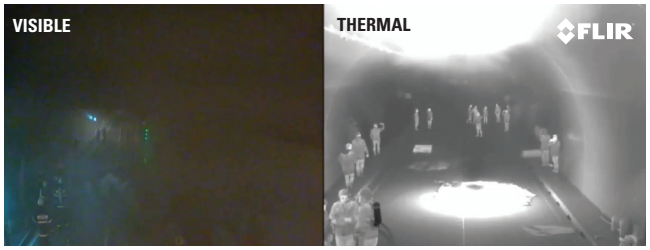
At night, a highway looks like an indistinct row of lights to a video camera, making meaningful data collection and incident assessment almost impossible. But thermal cameras see the heat signatures of vehicles clearly from miles away, while also providing clear views of the roadsides, revealing vehicles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

Shadows

Video cameras can miss pedestrians, cyclists, animals, and cars at night or in heavy shadow. However, since thermal sensors see heat, not light, they can see into shadows or total darkness, providing a more reliable detection solution.

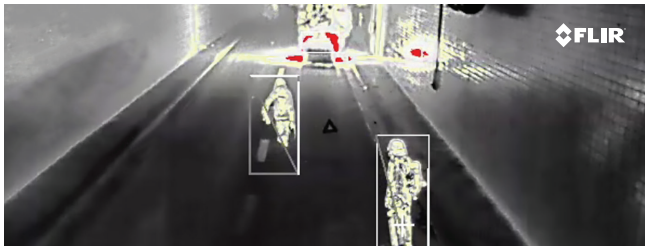
Smoke

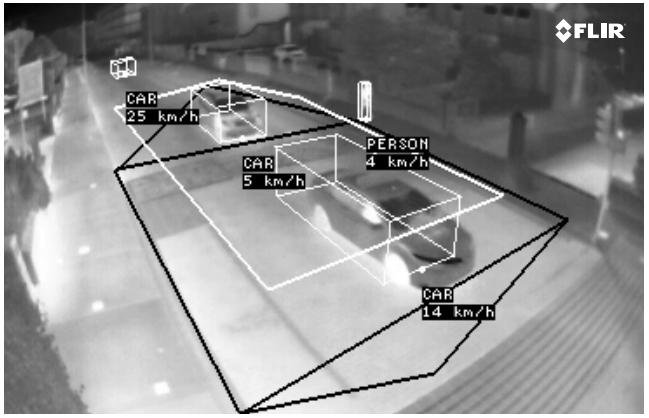
Thermal cameras see through smoke, offering better visibility than visual cameras in the event of a fire. This enhanced vision can help emergency personnel quickly locate and evacuate victims during tunnel fires and other incidents.



Measure Temperature

Thermal cameras display the temperature differences of any objects in their field of view. This unique capability allows detection of fires at their early stages over the full detection range.





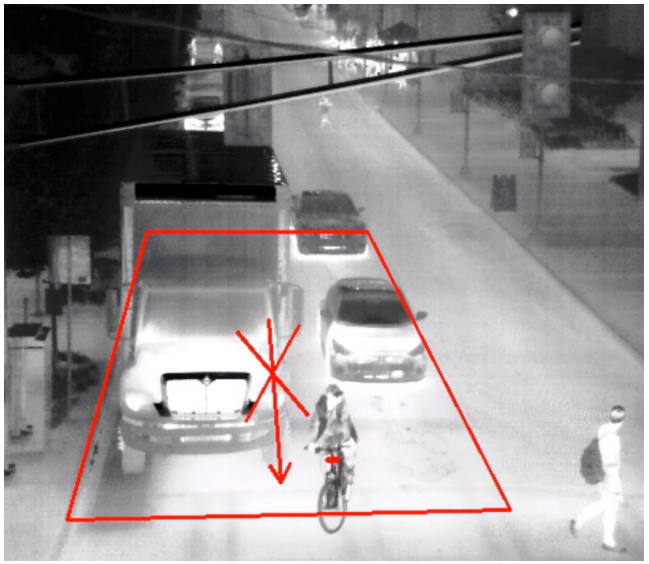
AI-enhanced thermal traffic detection

How Video Analytics Work

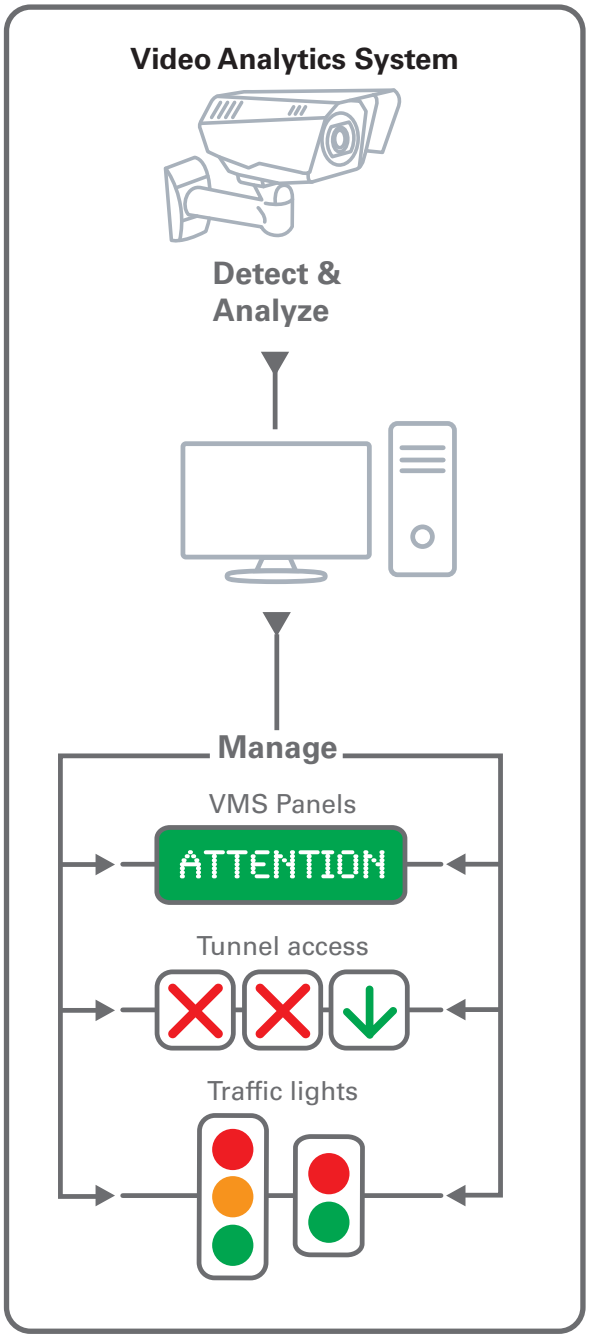
FLIR's intelligent traffic sensors directly analyze optical and/or thermal video in the camera, enabling them to work on the full frame rate at high resolution, with detection zones superimposed onto the scene. This allows for optimal balance between performance, impact on networking, and storage infrastructure.

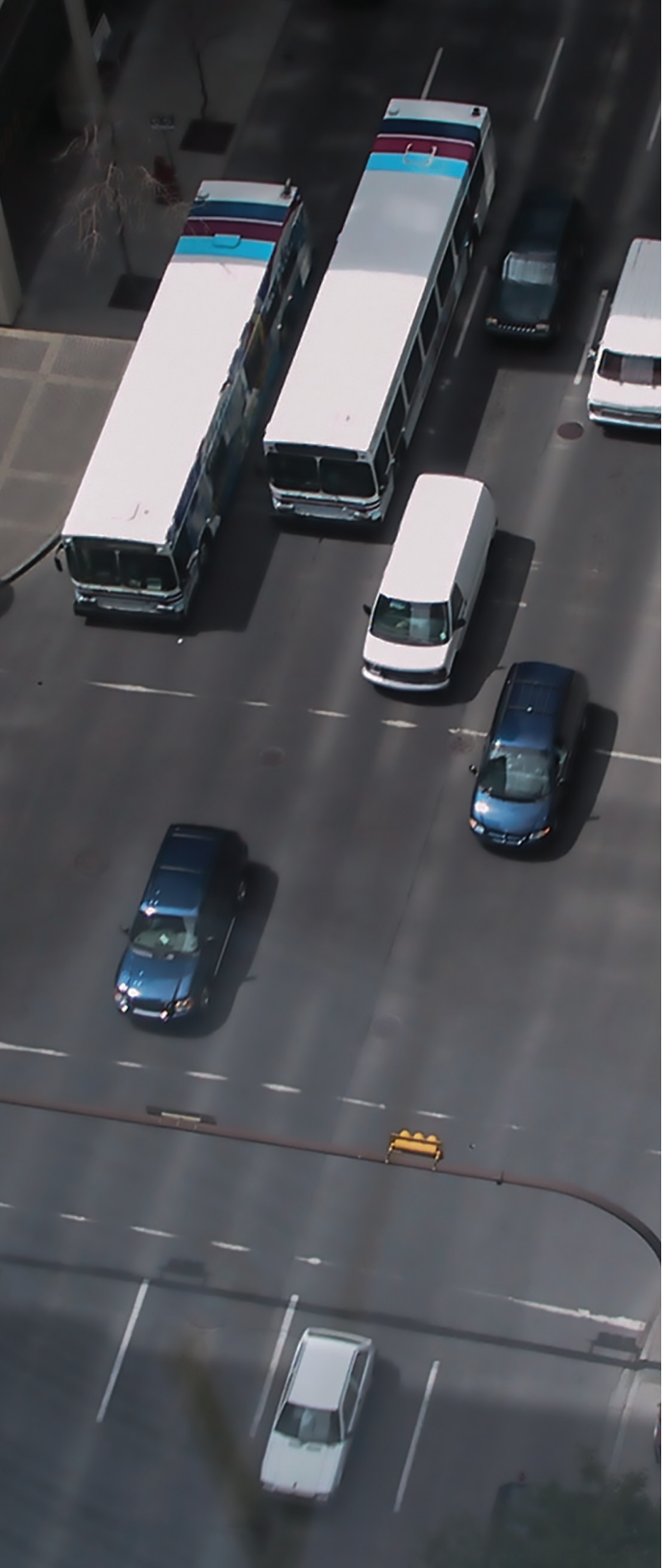
When a vehicle or a pedestrian enters a detection zone, dedicated algorithms generate different types of traffic data. This includes presence and incident-related data, information for statistical processing, and data for pre- and post-incident analysis. Compressed images and alarms are transmitted to 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, allowing them to act.



Precise detection zones can be set using analytics.





URBAN SMART CITY SOLUTIONS

FLIR Intelligent Traffic Solutions collect valuable data that allows monitoring systems to detect the position and speed of vehicles, predict traffic flow, and—with the inclusion of thermal imaging—detect potential fires by measuring temperatures across the scene.

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.

- Constant detection of pedestrian occupancy at crossings dynamically controls wait time
- Replace inefficient push buttons
- Improve safety for vulnerable road users

Vehicle Detection

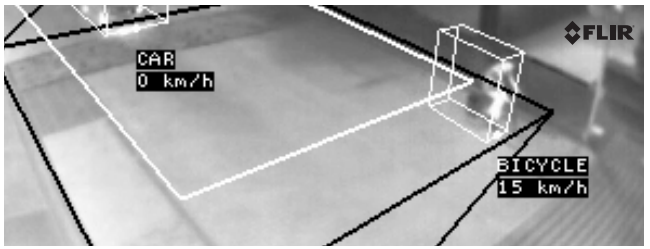
FLIR traffic sensors are reliable, accurate, and non-intrusive detection technologies specifically designed for signal control and traffic management. By detecting vehicles so efficiently, FLIR sensors enable smart intersection control for greater safety.

- Improve city traffic flows
- Reduce unnecessary delays
- Enhance safety for all road users

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 stop bar, and between intersections. Through Wi-Fi technology that anonymously tracks movement through intersections, FLIR sensors can 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.

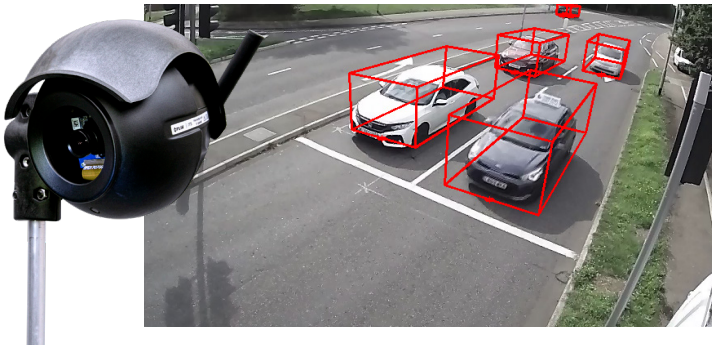
- Capture, store, and fuse valuable traffic data
- Measure intersection performance
- Real-time congestion mapping
- Better insights, better decisions

FLIR THERMAL AND VISIBLE DETECTORS AND SENSORS

FLIR TrafiCam™ AI

Vehicle Presence Sensor

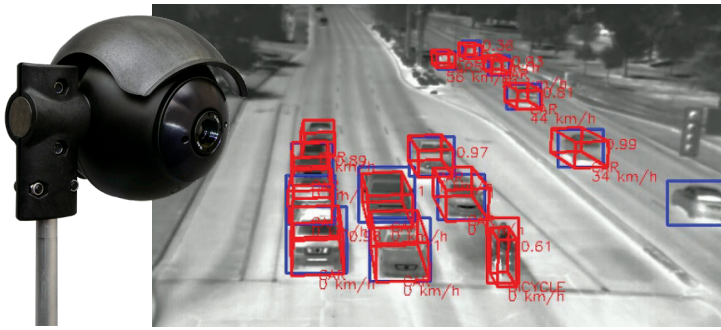
Designed to reliably detect and classify road users, TrafiCam AI is an intelligent HD visible sensor for traffic monitoring in complex urban environments. Capable of tracking multiple objects and detecting the position, speed, and heading of vehicles in any direction, the advanced edge-based AI effectively controls intersections and gathers detailed traffic data for better city planning decisions.



FLIR ThermiCam™ AI/TrafiSense™ AI

AI-Powered, Integrated Thermal Traffic Detector

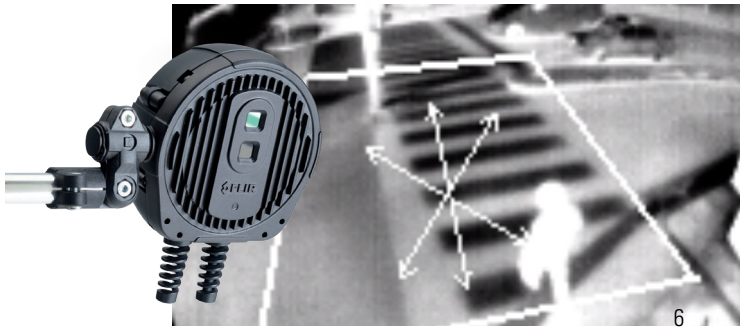
TrafiSense AI/ThermiCam AI is an intelligent thermal imaging sensor designed to reliably classify road users and provide the highest level of safety for vehicles, pedestrians, and cyclists through continuous vision and data collection. Its thermal detector doesn't rely on light, making TrafiSense AI/ThermiCam AI capable of detecting traffic and VRUs in any lighting conditions or weather, which is crucial for safety critical applications..



FLIR 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 sensor includes an HD visual CMOS camera for streaming video.



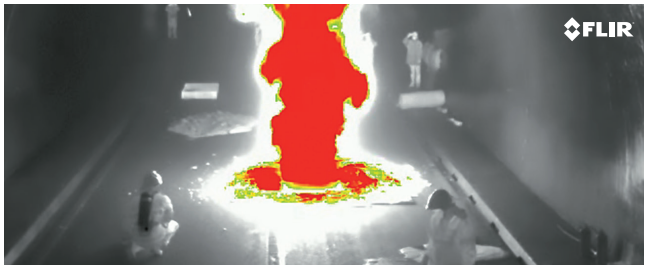
FASTER RESPONSE TIME, RELIABLE DETECTION

The ability to identify road and tunnel incidents, classify them reliably, and respond quickly is essential to effectively manage traffic. FLIR's range of cameras and sensors can perform background/foreground analysis—combined with a very performant detection model for recognizing and classifying each traffic participant—and provide the tracking information needed to support the most reliable and accurate traffic management systems on the market. But these products do more than detect incidents: they can use real-time and virtual data to create a "digital twin" of road and tunnel activity. The digital twin offers a real-time bird's eye view of traffic—invaluable information for decision-making.

Tunnel Fire Detection

Thermal imaging cameras allow operators to detect potential fires as hot spots as they increase in temperature. And if a fire breaks out, thermal cameras provide critical vision by seeing through smoke.

- Detect incidents and fires at an early stage
- Monitor tunnel traffic
- See through smoke



Highway Monitoring

Because FLIR thermal imaging cameras aren't vulnerable to low light conditions, excessive sun glare, or shadows, they allow highway operators to:

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

Data Collection and Flow Monitoring

FLIR cameras and sensors 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

Automatic Incident Detection

Effective incident management depends on fast incident detection and verification. FLIR 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

FLIR MULTISPECTRAL AND VISIBLE CAMERAS FOR ROADS AND TUNNELS

These FLIR cameras are made of stainless steel to prevent corrosion in the harshest of environments.

FLIR TrafiBot™ AI

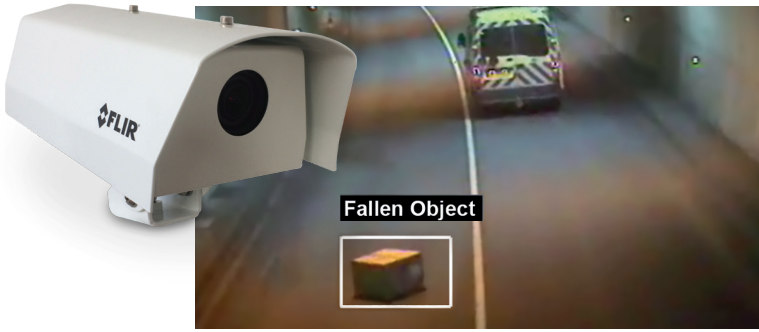
Premium Optical IP Camera with Embedded AI Deep Learning for Automatic Incident Detection

TrafiBot AI improves road safety through its ability to learn and refine how it evaluates events, out-performing non AI-based traffic cameras. With a built-in tilt sensor to cut installation time in tunnels and enhanced 4k resolution, TrafiBot AI is the efficient solution for inter-urban environments.

FLIR TrafiBot3™

Automatic Incident Detection & Traffic Data Collection

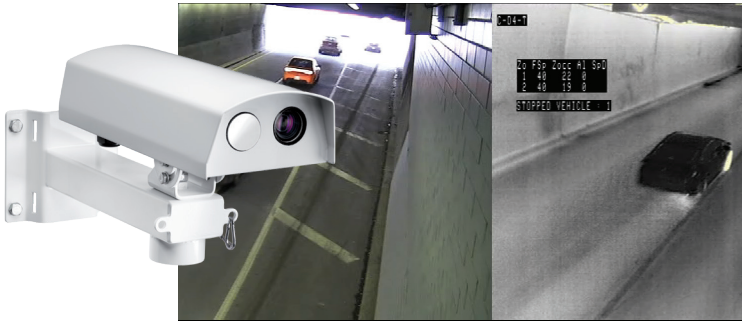
The FLIR TrafiBot3 integrated camera combines 4K visual imaging technology with advanced AI video analytics. This camera offers advanced processing that generates traffic data and incident detection information and thus supports traffic operators with alerts on stopped vehicles, wrong-way drivers, pedestrians, lost cargo, smoke, and traffic flow data.



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.

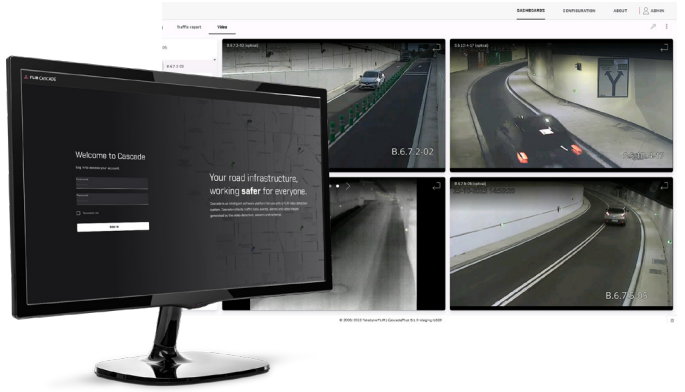


FLIR SOFTWARE SOLUTIONS FOR TRAFFIC MANAGEMENT

FLIR Cascade™

Intelligent Video Detection Management Software for Optimizing Urban and Inter-Urban Traffic Applications

FLIR Cascade turns raw data, incident records, and alerts from your fleet of FLIR traffic detectors into actionable insights. The software gathers data from the entire camera system and collects it in one place so you can focus where it counts. Advanced algorithms allow Cascade to assess and prioritize events as they happen, reducing unwanted alarms. A network connection, PC, and browser are all you need to access Cascade, taking the complexity out of traffic management so you can make informed decisions that keep vehicles moving and drivers safer.



Acyclica™ by FLIR

Smart City Platform

The Acyclica smart city platform provides the information and insight necessary to understand the traffic situation. 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.

COMPLEMENTARY PRODUCTS

FLIR Cameleon ITS

Command & Control Software

Cameleon ITS is a central software platform for transportation monitoring and management that collects all relevant information on reported incidents, lane changes, and more, enabling the operator to activate the necessary protocol to handle the specific situation as well as implement a messaging systems to immediately inform the relevant authorities.

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.

LEARNING ABOUT YOUR TRAFFIC SOLUTION

FLIR offers extensive training to help you get the most out of your transportation solution. Whether you need assistance with existing equipment or recommendations for a complete traffic management platform, FLIR experts are ready to help.

Intelligent Transportation Training

The fast-changing nature of urban environments make it difficult to keep up with the latest innovations. FLIR Academy offers a wide range of in-person and virtual training to help you leverage state-of-art technology to its fullest potential.

Smart City Sensors

Dedicated training for signal control, traffic management, vulnerable road user protection, and advanced data collection.

AID

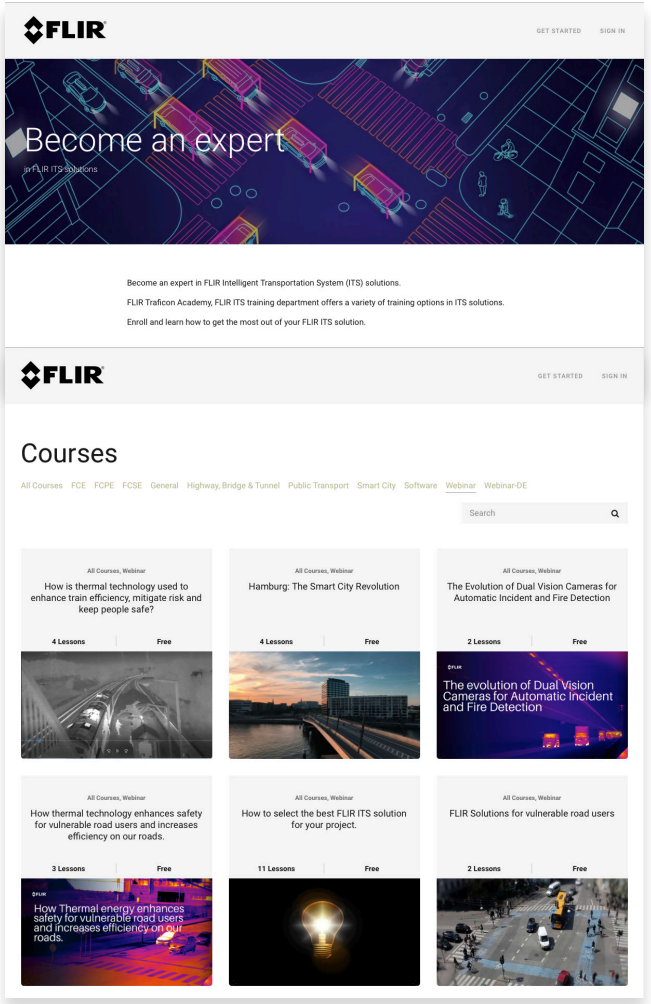
Automatic Incident Detection or (AID) courses focus on cameras and detectors used along highways, bridges, or tunnels to quickly report incidents and collect traffic data.

Management Software

Workshops dedicated to sensor installation, configuration, and operation on FLIR management software for transportation solutions.

FLIR Academy

FLIR Academy offers numerous ITS training courses at various levels from customized instructor-led classes, over virtual classes and e-learning packages to a library of webinar recordings. Everything can be found at academy.flir.com.



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Specifications are subject to change without notice

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