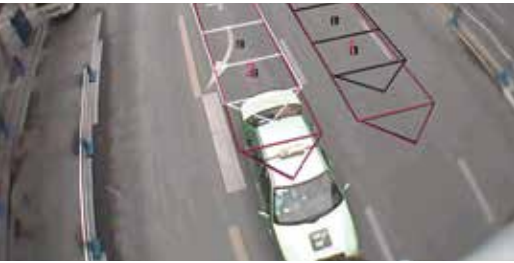


Intelligent Transportation Systems

Detection and monitoring solutions for traffic and public transportation applications in the USA



Detection and monitoring solutions for traffic and public transportation applications



Detection and monitoring solutions from FLIR help traffic and public transportation authorities manage their traffic flows efficiently and ensure safety. Based on proven technology of more than 20 years, FLIR's 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 the safety on our public railways.

Urban areas

FLIR's traffic sensors help you control traffic lights at intersections, so your urban traffic can flow smoothly. In addition, they help optimize traffic flows for pedestrians and bicyclists and improve their safety in busy traffic scenes.

Highways

FLIR detection technology helps avoid incidents and traffic jams on highways. Early detection of road irregularities enables rescue teams to intervene fast and avoid secondary accidents.

Tunnels

FLIR's incident detection solutions help save lives in tunnels and avoid secondary accidents, by detecting smoke, lost cargo, pedestrians and many other traffic events very fast.

Railway tracks and platforms

FLIR's thermal imaging cameras prevent serious accidents and infrastructure damage by detecting vehicles that have stopped on railway tracks at level crossings. FLIR's thermal cameras also detect people on train/metro/tram tracks and platforms in an early stage, so accidents can be avoided.



Safer journeys, smoother flows

Enhancing safety and efficiency for road traffic and public transportation



Intersection control

FLIR's video and thermal sensors are a highly reliable alternative to loops and other detection technologies. By detecting vehicles, bicyclists and pedestrians, FLIR's sensors enable smart intersection control. FLIR allows you to improve safety and efficiency today, just like in countless cities that have already implemented FLIR technology at their intersections.

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

Pedestrian safety and mobility

FLIR's pedestrian sensors allow you to control your traffic lights in favor of pedestrians or make pedestrians more visible in traffic. With dynamic traffic light control and warning sign activation, you can make your intersection or pedestrian crossing safer and at the same time prevent unnecessary delays to both pedestrians and motorists.

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

Highway monitoring

FLIR's thermal imaging cameras help keep an eye on our highways. Because they do not suffer from vulnerability to low light conditions (nighttime), too much light (sun glare) or 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, wrong-way drivers, queues, slow-moving vehicles, fallen object or pedestrians in a matter of seconds, so you can prevent secondary accidents from happening.

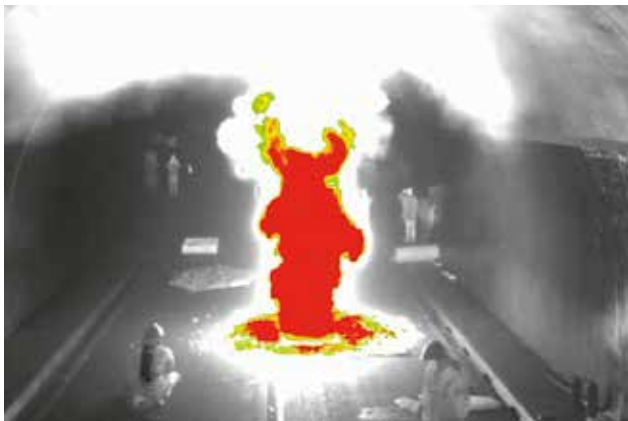
- Detect in a matter of seconds
- Prevent secondary accidents
- See any traffic irregularity instantly



Data collection & flow monitoring

FLIR's cameras and sensors accurately monitor traffic flows and help you to keep highways safe. FLIR solutions can efficiently make a distinction between several levels of service: fluid, dense, congested or stop & go. Other applications include queue monitoring during road works and travel time calculation based on flow information.

- Collect valuable traffic data
- Monitor queues
- Ensure safety during road works



Fire detection in tunnels

FLIR thermal imaging cameras allow tunnel operators to monitor traffic flows and detect incidents or fires in an early stage. Firefighters also use thermal cameras to enhance their vision and to see through smoke or detect hot spots.

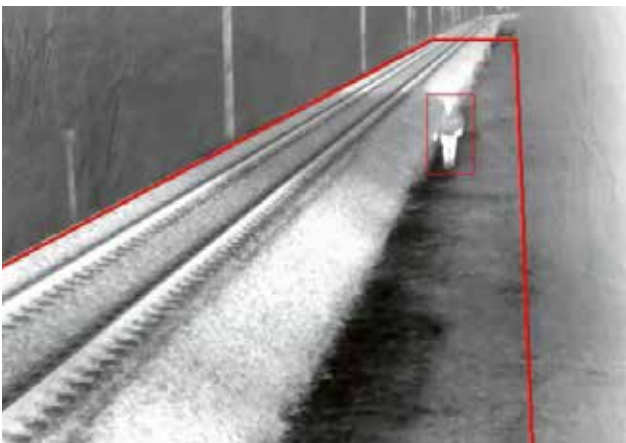
- Detect incidents and fires in an early stage
- Monitor tunnel traffic
- See through smoke



Vehicle detection at railway crossings

FLIR's thermal imaging cameras can prevent collisions between trains and obstacles at level crossings by detecting if a vehicle stops on the tracks and is blocking the passage for an oncoming train. This way, train or tram operators can be warned for oncoming danger or warning lights can be activated.

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



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



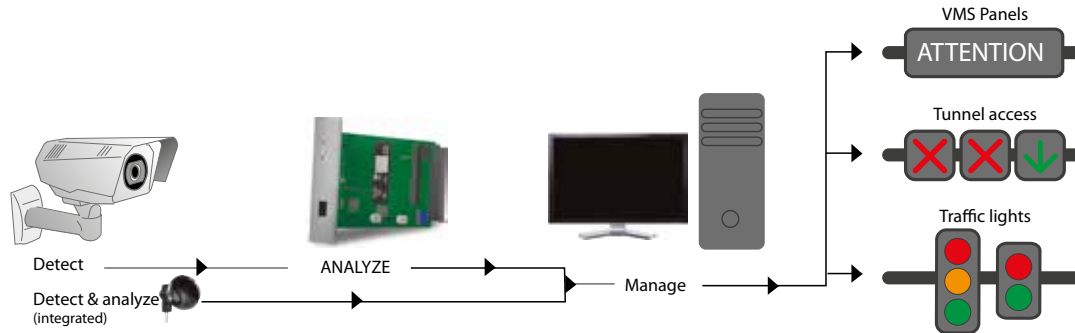
Driver vision enhancement

FLIR's thermal imaging night vision systems installed onboard trams allow drivers to see clearly in total darkness or in bad weather conditions. Compared to traditional headlights, they offer increased detection of potential hazards, like pedestrians, cars, animals, on the tracks.

- See obstacles at night or in bad weather
- Detect obstacles from a farther distance
- React faster to emergencies

How video detection works

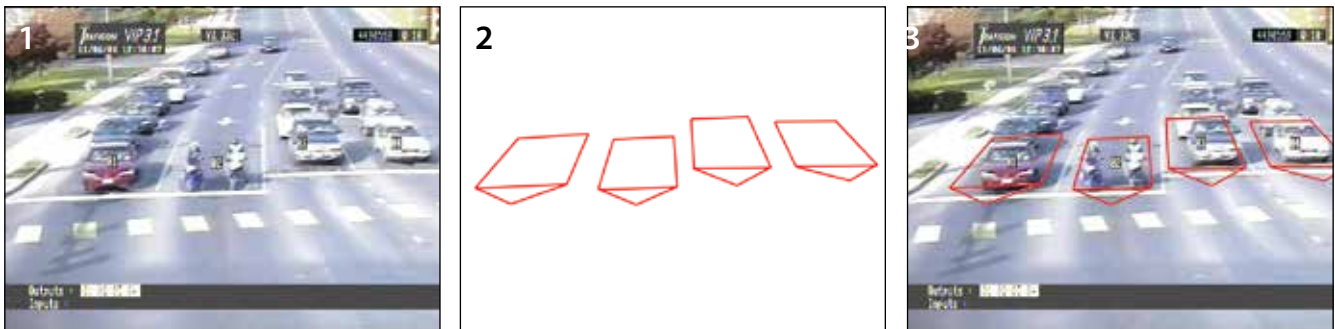
An installed video or thermal imaging camera sends an input signal to a detection unit. This unit can either be on board of the camera or integrated into a standard 19-inch rack. When the camera or the video image processing modules are set, detection zones are superimposed onto the video image.



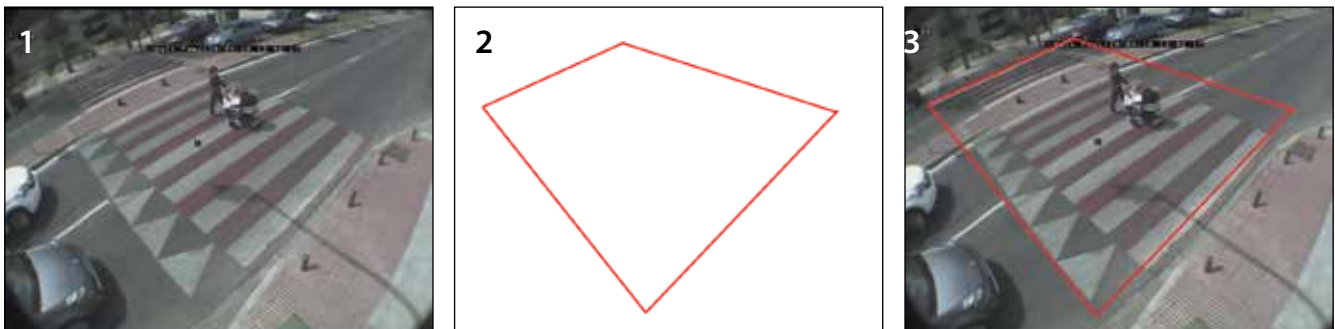
When a vehicle or a pedestrian enters a detection zone, a detection is activated by the system. Dedicated algorithms generate various types of traffic information: presence and incident-related data, data for statistical processing, and data for pre- and post-incident analysis.

Traffic data, 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 decide to take appropriate actions.

Vehicles



Pedestrians



1. A video camera is monitoring traffic. Its video signal is used as input for the detection unit.
2. During set-up of a video detector, detection zones are superimposed onto the video image.
3. Vehicles, pedestrians or bicyclists crossing the detection zones are detected.

Thermal imaging cameras for traffic applications

Traditionally, CCTV cameras are being used for video monitoring. Although CCTV cameras are reliable tools for video analysis, they need additional algorithms to overcome the limitations of traditional video cameras. In order to work at night, light needs to be installed. CCTV cameras can also be blinded by light from the sun. Vehicles or pedestrians that are moving in shadows are sometimes not detected.

Thermal imaging cameras do not have these issues. A thermal imaging camera creates a crisp image based on subtle temperature differences. They do not need any light whatsoever. They are also not blinded by direct sunlight.

FLIR's high-performance thermal imaging cameras give you uninterrupted 24-hour detection of vehicles, pedestrians and cyclist regardless of the amount of light available.

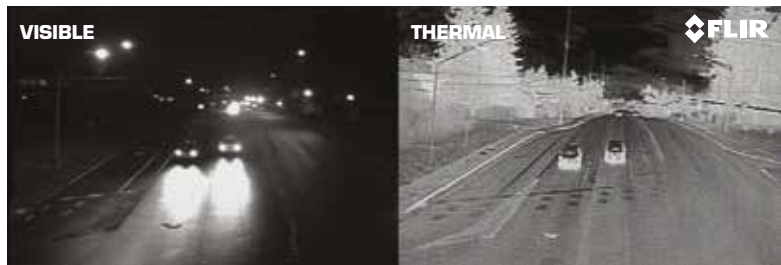
Sun glare

Glare from the sun blinds conventional video cameras, effectively hiding vehicles, people, and animals. Thermal cameras ignore this glare, and only respond to the heat signatures they detect.



Headlights

Headlights are confusing to CCTV cameras. This causes false and missed calls and makes accurate observation of highway traffic at night impossible. Thermal cameras are immune to headlight glare, so they see clearly.



See through shadows

Video cameras can miss pedestrians, cyclists, animals, and even cars if they're in the shadows. But since thermal cameras see heat, not light, there are no shadows in a thermal world.

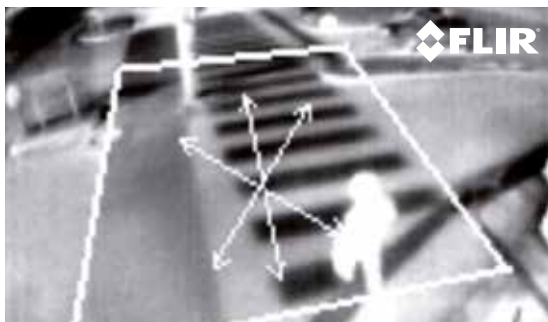
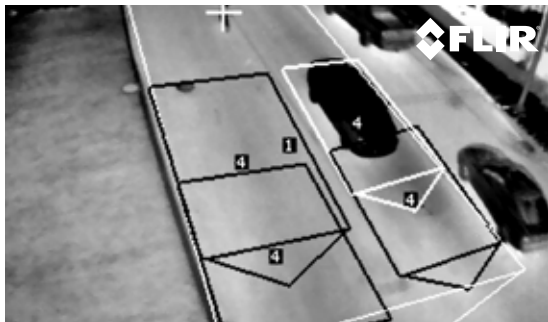


Long-range night viewing

At night, a highway looks like an indistinct row of lights to a video camera, making meaningful data collection and incident assessment impossible. But thermal cameras see the heat signatures of vehicles clearly from miles away. They also provide clear video of the roadsides for awareness of parked vehicles or other hazards.



A FLIR solution for every traffic and transportation need



FC, PT, D and ITS-Series

Thermal sensors detect heat, rather than light, and aren't confused by extreme lighting conditions, such as bright sun glare or headlights reflected off wet pavement. As a result, thermal sensors have fewer false and missed calls, enable better signal timing, and lead to more efficient traffic monitoring. Plus, thermal cameras also detect cyclists, pedestrians, and animals faster and more reliably. FLIR's thermal traffic cameras come in the compact and flexible FC-Series T, the high-performance, multi-sensor PT-Series T pan/tilt cameras or the D-Series T outdoor dome cameras and the ITS-Series with traffic analytics inside.

TrafiSense

TrafiSense is an integrated thermal camera and traffic detection sensor that gives you the power to detect vehicles and cyclists around the clock with industry-leading reliability. TrafiSense is an above-ground system that spares you the enormous installation and maintenance costs that traditional inductive loops typically require.

TrafiOne

FLIR TrafiOne is an all-round detection sensor for traffic monitoring and dynamic traffic signal control. Offered in a compact and easy-to-install package, the FLIR TrafiOne uses thermal imaging and Wi-Fi tracking technology to provide traffic engineers with high-resolution data on vehicles, bicycles and pedestrians at intersections and in urban environments.



TrafiCam Series

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 series includes the TrafiCam vehicle presence sensor for standalone use and the TrafiCam x-stream vehicle presence sensor and data collector with video streaming.



TrafiRadar

FLIR's TrafiRadar vehicle presence sensor is a combination of a video sensor and radar, offering accurate detection for a wide range of applications. TrafiRadar improves traffic safety and efficiency at signalized intersections for:

- Stop bar and advance detection
- Traffic adaptive systems
- Dilemma zone protection



VIP Series for intersection control

The cost-effective FLIR VIP3D.x video detection solution provides vehicle presence information to the intersection controller and also allows for accurate traffic data collection. The FLIR VIP BIKE platform offers high-performance bike detection for thermal cameras that overcomes the limitations of traditional inductive detection loops.





VIP Series for AID

FLIR's integrated detection boards analyze video images from traffic cameras and provide traffic operators with reliable incident detection information, traffic data collection or presence data of bikes and vehicles. VIP modules from FLIR have been installed for road, tunnel and intersection projects all over the world.



Trafibot HD

FLIR's Trafibot HD combines field-proven video detection algorithms with advanced camera optics and powerful processing technology in a single housing. Trafibot HD (with 1920 x 1080 resolution) is a network box camera that provides superior image quality, embedded AID analytics as well as multi-stream encoding. As such, the Trafibot HD offers a cost-effective combination of technologies and top-level performance.



Flux

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.



Cameleon ITS

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.



Traficon Academy

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 you a wide range of trainings to keep you up to date with the latest state of the art.



INFRARED
TRAINING
CENTER

Infrared Training Center

The Infrared Training Center is the perfect place to get high-quality interactive training from the most qualified international thermography instructors. The mission of the ITC is to make our customers and partners successful by enhancing their knowledge of IR technology, thermal imaging products, and relevant applications.



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