



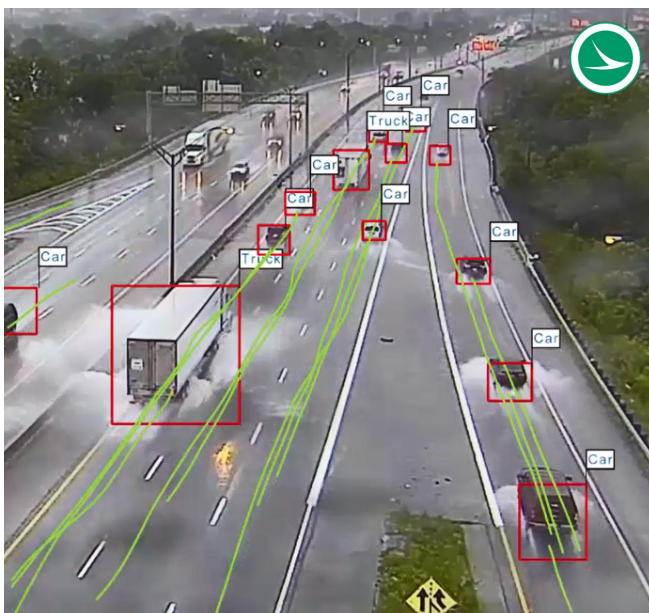
Valuable Detection and Data for ITS

Artificial intelligence delivers highly accurate solutions

Accuracy in automatic incident detection and roadway usage data is essential to improving safety and mobility on roadways. Previous generation video analytics technologies provided a solid foundation for detection and data solutions for intelligent transportation systems (ITS) but were challenged by overlapping vehicles, headlights, and other common disturbances. With the latest camera hardware supporting on-board deep neural network-based video analytic detectors tailored for ITS, highly accurate detection is now achievable.

The latest Bosch INTEOX ITS cameras offer artificial intelligence (AI) driven video analytics. A higher performance processing platform supports embedded neural network-based video analytic detectors developed specifically for ITS detection and data.

Called Traffic Detector software, the analytics technology is developed on Bosch's intellectual property in automotive applications. It uses artificial neural networks that attempt to mimic the human brain, allowing it to learn from large amounts of data and recognize patterns to tackle complex tasks more accurately.



Detection Accuracy Exceeds 90%

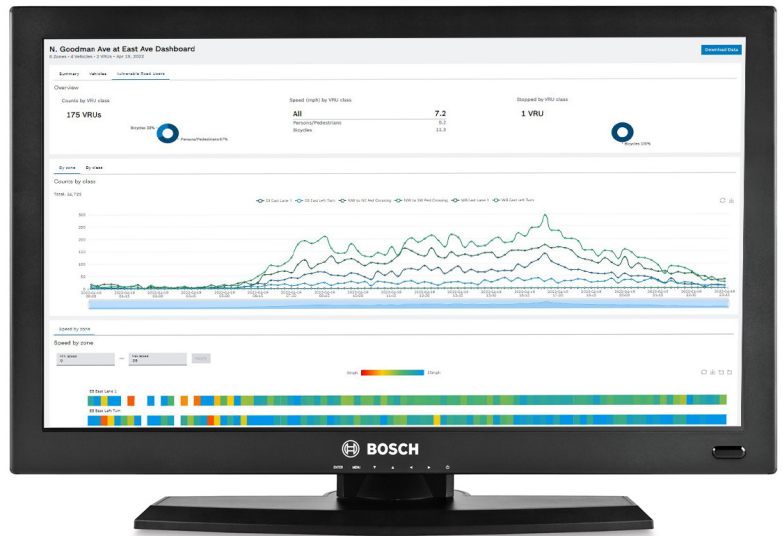
Traffic Detector software classifies pedestrians, bicycles, motorcycles, cars, trucks, and buses. The software improves detection capabilities in congested scenes for accurate counting of overlapping vehicles at traffic lights or in traffic jams, while ignoring disturbances caused by headlights, extreme weather, sun glare, vibration, and shake. These disturbances are nearly eliminated to deliver accurate detection for real-time use cases and statistical data reporting.

The cameras automatically detect safety risks and other traffic events. Alerts for pedestrian presence, slow vehicles, stopped vehicles, traffic queues and congestion, and vehicles traveling the wrong way enable real-time safety solutions. With high precision detection, accuracy levels extend beyond 90% – a necessary threshold for ITS safety applications.

Extend Beyond Safety

In addition to real-time alerts of potential safety risks, the on-board AI detectors enable each Bosch INTEOX camera to serve as a sensor that gathers data for informed decision-making. The cameras generate comprehensive metadata that is streamed independent of the video.

Bosch makes it easy to aggregate data from multiple cameras in the Bosch ITS Data Service, where it is optimized for analysis of vehicle and vulnerable road user (VRU) patterns. Dashboards deliver actionable information on traffic patterns, congestion points, and more for business intelligence purposes. The aggregated data can be exported and accessed using the REST API. This historical data helps traffic engineers better understand roadway usage to manage volume, mobility, and safety.



Simply Trusted ITS Camera Portfolio

Bosch INTEOX fixed and moving cameras for ITS meet the requirements for roadway environments, including highways, intersections, bridges, and tunnels. The cameras are easy to install, and Traffic Detector software is simple to implement. Point the camera at the desired field of view, calibrate, and Traffic Detector is enabled to start gathering data.

The cameras are secure by design, an approach centered on a built-in Secure Element with Trusted Platform Module functionality, storing all certificates

and keys needed for authentication and encryption. The Bosch Remote Portal serves as the gateway to the cloud-based Bosch ITS Data Service. Connecting to the Bosch Cloud and Remote Portal is secure. Connectivity is initiated by the camera using an end-to-end certificate-based encrypted path. Once a secure connection is established, the camera can be licensed to push its data stream to the Bosch ITS Data Service. Cloud-based event recording and real-time push notifications about important events can also be licensed for a complete solution.



**FLEXIDOME INTEOX
7100i IR ITS**



**DINION INTEOX
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**AUTODOME INTEOX
7000i ITS**



**MIC INTEOX
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With highly accurate automatic incident detection and rich vehicle and VRU data aggregation, deep neural network-based video analytics tailored for ITS accelerate the drive toward smarter, safer, and more sustainable transportation ecosystems. For more information, contact intelligent.transportation@us.bosch.com