

# Roadside Sensor Infrastructure Market Forecasts to 2032 – Global Analysis By Component (Hardware, Software and Services), Sensor Type, Deployment Mode, Application and By Geography

<https://marketpublishers.com/r/R9F991B0C8F2EN.html>

Date: July 2025

Pages: 200

Price: US\$ 4,150.00 (Single User License)

ID: R9F991B0C8F2EN

## Abstracts

According to Statistics MRC, the Global Roadside Sensor Infrastructure Market is accounted for \$4.6 billion in 2025 and is expected to reach \$10.2 billion by 2032 growing at a CAGR of 11.8% during the forecast period. Roadside Sensor Infrastructure refers to a network of interconnected devices and technologies installed along roads, highways, and urban streets to monitor, collect, and transmit real-time traffic and environmental data. These sensors include cameras, LiDAR, radar, inductive loops, and ultrasonic devices, enabling detection of vehicle speed, traffic density, road conditions, and pedestrian movements. Integrated with communication systems, they support intelligent transportation systems (ITS), traffic management, autonomous vehicle operations, and safety applications. This infrastructure enhances traffic efficiency, reduces congestion, improves road safety, and facilitates data-driven urban mobility planning.

Market Dynamics:

Driver:

Advancements in sensor technologies

Sensors are being deployed to capture real-time data on traffic flow, vehicle classification, environmental conditions, and infrastructure health. Integration with edge computing, AI analytics, and V2X communication is enhancing responsiveness and decision-making. Public and private investments in smart mobility and urban safety are

reinforcing adoption. Demand spans across highways, urban corridors, toll systems, and autonomous vehicle zones. These dynamics are positioning sensor innovation as a key driver of the roadside sensor infrastructure market, thereby boosting overall market growth.

#### Restraint:

##### High initial deployment costs

Advanced systems such as LiDAR arrays, thermal imaging, and multi-sensor fusion demand significant investment and technical expertise. Regulatory compliance and maintenance protocols further increase operational overhead. Delays in funding approvals and procurement cycles are slowing rollout timelines. Stakeholders must balance long-term benefits with short-term financial constraints. These factors are constraining market expansion despite rising demand for intelligent infrastructure.

#### Opportunity:

##### Urbanization and traffic congestion

Roadside sensors are being used to optimize flow, reduce bottlenecks, and support multimodal transport planning. Integration with smart city platforms, autonomous mobility pilots, and emissions tracking is expanding application scope. Public initiatives in congestion pricing, safety enhancement, and infrastructure resilience are reinforcing adoption. Demand for scalable, responsive, and data-driven traffic management is accelerating innovation. These developments are creating favorable conditions for market growth, thereby advancing deployment of roadside sensor technologies.

#### Threat:

##### Environmental and weather-related limitations

Manufacturers face challenges in designing robust, weather-resistant systems that maintain functionality under variable conditions. Calibration drift, signal interference, and physical damage are increasing maintenance complexity. Public trust and operational continuity depend on consistent performance across diverse geographies. Delays in standardization and durability testing are slowing deployment in harsh environments. These limitations are introducing technical risk and constraining full-scale market development.

### Covid-19 Impact:

The Covid-19 pandemic disrupted the Roadside Sensor Infrastructure market, causing temporary delays in infrastructure projects, reduced traffic volumes, and budget reallocations. Supply chain interruptions and labour shortages affected sensor production, installation, and servicing. However, the increased focus on contactless monitoring, digital infrastructure, and resilient urban systems partially offset the slowdown. Post-pandemic recovery is driven by growing demand for scalable, intelligent, and safety-enhancing roadside technologies. Innovations in remote diagnostics, automated calibration, and cloud-based analytics are accelerating adoption. These shifts are reshaping the roadside sensor landscape across global markets.

The image sensors segment is expected to be the largest during the forecast period

The image sensors segment is expected to account for the largest market share during the forecast period owing to its versatility, resolution capabilities, and integration across traffic enforcement, surveillance, and vehicle detection systems. These sensors are being deployed in smart intersections, toll booths, and autonomous corridors to capture high-fidelity visual data. Manufacturers are optimizing sensor design for low-light performance, weather resistance, and real-time analytics. Demand remains strong across urban safety, law enforcement, and infrastructure monitoring applications. Regulatory support for automated traffic control and data transparency is reinforcing adoption.

The environmental monitoring segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the environmental monitoring segment is predicted to witness the highest growth rate driven by demand for air quality tracking, noise pollution assessment, and climate resilience. Sensors are being integrated into roadside infrastructure to measure particulate matter, CO<sub>2</sub> levels, temperature, and humidity in real time. Public and private initiatives in sustainable mobility, emissions reduction, and urban health are accelerating deployment. Integration with smart city dashboards, regulatory reporting tools, and predictive analytics is enhancing utility. Demand for data-driven environmental governance and public transparency is reinforcing momentum.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share due to its advanced transport infrastructure, strong regulatory framework, and high investment in smart mobility. The U.S. and Canada are leading in sensor deployment across highways, urban corridors, and autonomous vehicle zones. Public initiatives in traffic safety, emissions monitoring, and infrastructure modernization are reinforcing demand. Regional manufacturers and global players are scaling deployment through public-private partnerships and federal funding programs. Regulatory clarity and enterprise readiness are supporting widespread adoption.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR driven by rapid urbanization, expanding smart city projects, and government investment in intelligent transport systems. Countries like China, India, Japan, and South Korea are scaling sensor deployment across traffic management, environmental monitoring, and autonomous mobility pilots. Public-private partnerships and mobile-first strategies are improving access in urban and semi-urban areas. Demand for cost-effective, scalable, and compliance-ready solutions is reinforcing innovation. Regional manufacturers and global players are collaborating to localize and scale offerings.

Key players in the market

Some of the key players in Roadside Sensor Infrastructure Market include Siemens AG, Schneider Electric SE, Bosch Mobility Solutions, FLIR Systems, Inc., Kapsch TrafficCom AG, Iteris, Inc., SWARCO AG, Q-Free ASA, Sensys Gatso Group AB, Indra Sistemas S.A., Cubic Corporation, TomTom N.V., Huawei Technologies Co., Ltd., Econolite Group, Inc. and Teledyne Technologies Incorporated.

Key Developments:

In August 2025, Schneider Electric collaborated with Nozomi Networks to launch the industry's first embedded OT security sensor for smart Remote Terminal Units (RTUs). This integration enhances cybersecurity for field-to-central control system data sharing, providing comprehensive protection for critical infrastructure.

In November 2024, Siemens partnered with Roadscor to support the Vision Zero initiative through advanced traffic engineering. Utilizing Siemens' Simcenter Prescan and HEEDS software, the collaboration focuses on proactive safety analysis to design

safer road infrastructures.

#### Components Covered:

Hardware

Sensors

Communication Devices

Power Supply Units

Software

Data Processing Platforms

Analytics Tools

Cloud Integration Solutions

Services

Installation and Deployment

Maintenance and Support

Consulting and System Integration

#### Sensor Types Covered:

Cameras

LiDAR

Radar Sensors

Infrared Sensors

Magnetic Sensors

Acoustic Sensors

Inductive Loop Sensors

Piezoelectric Sensors

#### Service Types Covered:

Sensors

Probes and Analyzers

Software and Services

#### Deployment Modes Covered:

On-Premises

Cloud-Based

#### Applications Covered:

Traffic Monitoring and Management

Automated Tolling Systems

Parking Management

Weigh-in-Motion Systems

Vehicle Profiling and Classification

Road Condition Monitoring

Environmental Monitoring

Other Applications

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments

- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

#### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

#### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

#### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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