

# Structural Health Monitoring Market 2026: Key Trends, Progression Status and Business Trends to 2035

The structural health monitoring market is experiencing strong global momentum as industries increasingly adopt real-time monitoring systems to ensure the safety, efficiency, and longevity of critical infrastructure. In 2025, the market exceeded USD 3.5 billion, and it is projected to reach USD 8.8 billion by 2035, expanding at a CAGR of 10.9% throughout 2026-2035. This growth reflects rising investments in smart infrastructure, aging civil structures worldwide, and the growing role of data-driven monitoring technologies in predictive maintenance and risk prevention.

## Structural Health Monitoring Industry Demand

The structural health monitoring (SHM) market involves the deployment of sensors, software, data acquisition systems, and connectivity technologies to assess the structural integrity and performance of buildings, bridges, tunnels, dams, aircraft, wind turbines, and other critical assets. SHM systems collect and analyze real-time data to detect cracks, corrosion, stress, vibrations, or fatigue, enabling early intervention and reducing the risk of catastrophic failures.

### Demand for SHM solutions is influenced by several factors:

- **Cost-effectiveness:** SHM reduces maintenance expenses by enabling predictive repairs rather than reactive fixes.
- **Ease of administration:** Modern SHM systems offer automated and remote monitoring, reducing manual inspections.
- **Long operational life of infrastructure:** Sensors and software extend structural lifespan by identifying issues early and ensuring timely maintenance.
- **Growing awareness of structural safety** due to natural disasters, aging structures, and increasing urbanization.
- **Digital transformation** in infrastructure monitoring, supported by IoT, AI, cloud analytics, and wireless sensing.

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## Structural Health Monitoring Market: Growth Drivers & Key Restraint

### Growth Drivers

- **Rising Infrastructure Modernization & Aging Assets**

Governments worldwide are investing in restoring and upgrading deteriorating bridges, tunnels, dams, and power plants. SHM systems are essential for assessing the health of aging structures and ensuring public safety.

- **Increasing Adoption of Advanced Technologies**

Integration of IoT sensors, AI-based analytics, drones, and wireless communication enhances real-time monitoring and predictive maintenance. These innovations improve accuracy, reduce downtime, and support large-scale infrastructure digitization.

- **Growing Emphasis on Disaster Prevention and Safety**

The global rise in earthquakes, floods, and industrial accidents is pushing infrastructure owners to adopt SHM systems to detect early structural failures and minimize potential hazards.

### **Restraint**

- A major restraint is the high installation and maintenance cost of SHM systems, especially for large infrastructure projects. Budget limitations, particularly in developing regions, slow adoption due to the need for specialized hardware and skilled technicians.

## **Structural Health Monitoring Market: Segment Analysis**

### **Segment Analysis by Method**

- **Monitoring:**  
Continuous structural performance tracking using sensors and analytics; widely adopted across civil and industrial infrastructure.
- **Destructive Testing:**  
Used in specific testing environments to assess material limits and validate infrastructure performance.
- **Non-Destructive Testing (NDT):**  
Critical for detecting cracks, corrosion, and internal defects without damaging the structure. Stable adoption across aerospace, construction, and energy sectors.
- **Visual Inspection:**  
Traditional method supplemented by drones and imaging systems for remote and safe inspections.
- **Ultrasonic & Radiography:**  
Advanced inspection methods used for precision assessment in manufacturing, metal structures, and aerospace applications.

## Segment Analysis by Technology

- **Wired SHM Systems:**  
Preferred for high-accuracy, long-term structural monitoring across large assets like bridges and tunnels.
- **Wireless SHM Systems:**  
Rapidly growing due to easy installation, lower costs, and compatibility with IoT and cloud platforms.
- **Corrosion, Crack, Damage & Strain Monitoring:**  
These targeted solutions enable early detection of structural deterioration and improve maintenance efficiency.
- **Hotspot Monitoring & Multimodal Sensing:**  
Increasingly adopted for complex structures requiring monitoring of multiple parameters simultaneously.

## Segment Analysis by Connectivity

- **Wired Connectivity:**  
Offers stable and high-fidelity data transmission for mission-critical monitoring applications.
- **Wireless Connectivity:**  
Gaining traction due to flexibility, scalability, and compatibility with AI, IoT, and cloud systems.

## Segment Analysis by Offering

- **Hardware:** Sensors, data acquisition units, and signal processing equipment form the backbone of SHM installations.
- **Sensors:** Includes strain gauges, accelerometers, fiber-optic sensors, and corrosion monitoring devices.
- **Data Acquisition Systems:** Responsible for collecting, digitizing, and transmitting real-time data for analysis.
- **Software & Services:** Includes analytics platforms, maintenance services, integration solutions, and monitoring-as-a-service models.

## Segment Analysis by End-User

- **Civil Infrastructure (Bridges, Dams, Tunnels, Stadiums, High-Rise Buildings):**  
The largest adopter due to global infrastructure spending and rising safety regulations.

- **Energy:**  
Increasing monitoring needs driven by equipment aging, offshore expansion, and renewable energy growth.
- **Aerospace & Defense (Aircraft, Military Vehicles, Spacecraft):**  
High reliance on SHM for precision, safety, and performance assessment.
- **Mining & Others:**  
Adoption driven by safety regulations and monitoring needs for heavy machinery and underground structures.

### **Segment Analysis by Application**

- **Corrosion Detection, Crack Detection, Damage Detection:**  
Widely used across civil, industrial, and energy infrastructure.
- **Strain & Hotspot Monitoring:**  
Critical for assessing stress concentrations and predicting structural failures.
- **Multimodal Sensing:**  
Growing due to the need to analyze multiple structural parameters simultaneously.
- **Wired & Wireless Connectivity Applications:**  
Shape how data is acquired and transmitted, influencing overall monitoring efficiency.
- **Other Applications:**  
Includes vibration analysis, acoustic monitoring, and fatigue assessment.

### **Structural Health Monitoring Market: Regional Insights**

#### **North America**

North America leads SHM adoption due to large-scale aging infrastructure, stringent safety regulations, and early integration of digital technologies. High demand comes from bridges, dams, aerospace, and energy sectors, supported by strong government investments and technological advancements.

#### **Europe**

Europe exhibits strong growth driven by smart city initiatives, sustainability goals, and rigorous structural safety standards. The region benefits from modern engineering practices, renewable energy expansion, and increased monitoring of historic structures.

#### **Asia-Pacific (APAC)**

APAC is expanding rapidly due to extensive infrastructure development, rapid urbanization, and growing industrialization. Countries like China, Japan, South Korea, and India invest

heavily in smart infrastructure monitoring, high-speed rail, and megaprojects, creating strong market momentum.

### **Top Players in the Structural Health Monitoring Market**

Key companies operating in the structural health monitoring market include Hexagon AB (Sweden), Siemens AG (Germany), Robert Bosch GmbH (Germany), General Electric Company (U.S.), Honeywell International Inc. (U.S.), Campbell Scientific, Inc. (U.S.), National Instruments Corporation (U.S.), Nova Metrix LLC (U.S.), COWI A/S (Denmark), Hottinger Brüel & Kjær (HBK) (Germany), Acellent Technologies, Inc. (U.S.), Digitexx Data Systems, Inc. (U.S.), Kinemetrics Inc. (U.S.), Geokon, Incorporated (U.S.), RST Instruments Ltd. (Canada), Straininstall UK Limited (U.K.), SGS S.A. (Switzerland), Pure Technologies (Xylem Inc.) (U.S.), Advitam Inc. (France), and Feac Engineering Pty Ltd (Australia).

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**Contact for more Info:**

**AJ Daniel**

**Email:** [info@researchnester.com](mailto:info@researchnester.com)

**U.S. Phone:** +1 646 586 9123

**U.K. Phone:** +44 203 608 5919