

Enhance safety • Increase productivity • Improve quality



[www.movesolutions.it](http://www.movesolutions.it)

- Move Solutions
- move\_solutions
- MoveSolutionsIT

# PROACTIVE BRIDGE MONITORING

Real-time insight for safe,  
resilient bridges.

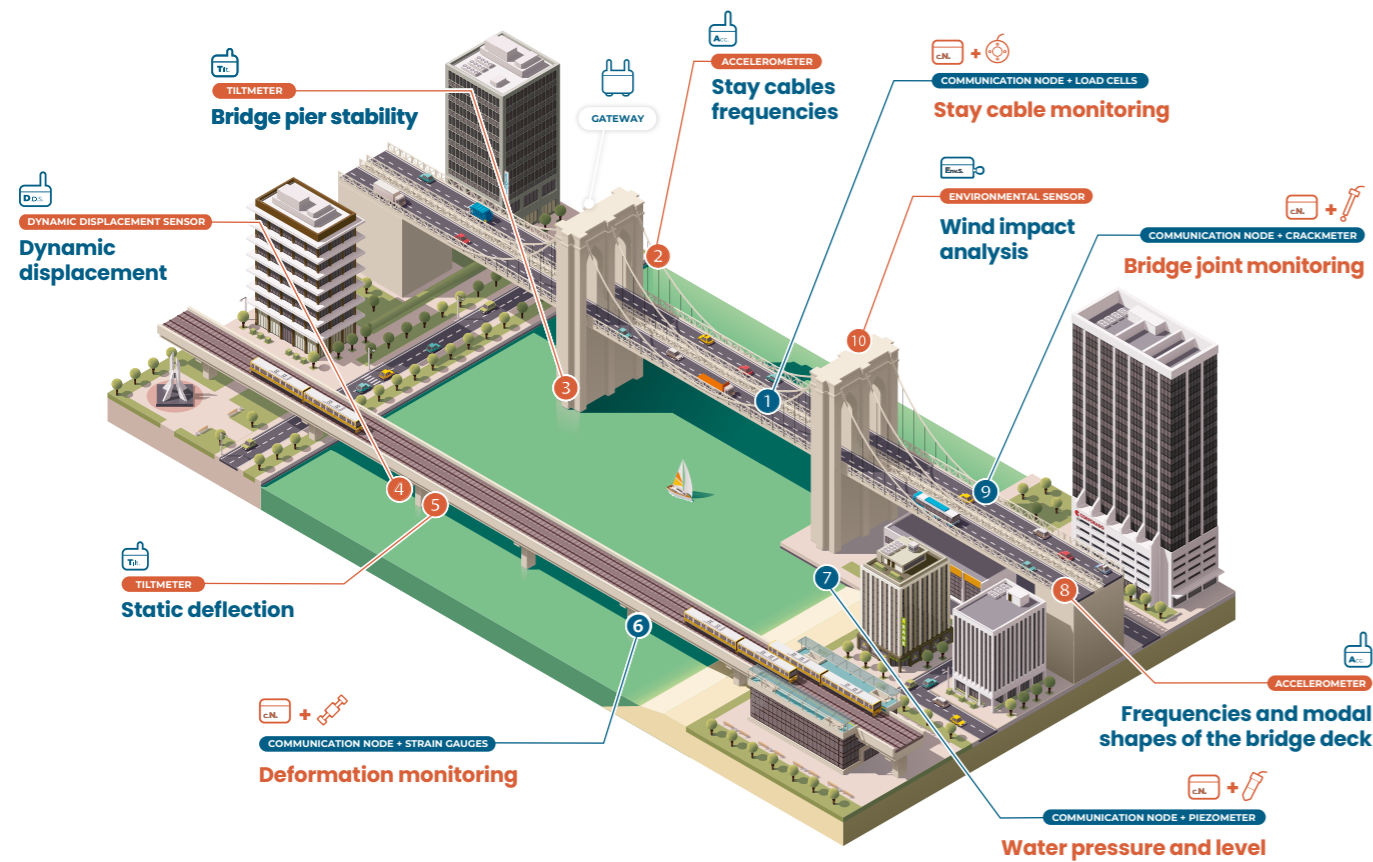
✉ [info@movesolutions.it](mailto:info@movesolutions.it)

☎ +39 338 26 39 556 (IT)  
+1 412 75 80 608 (US)

📍 Via Marcantonio Colonna, 35, 20149 Milan – Italy  
Via Carlo Piaggia, 382, 55100 Lucca – Italy  
111 W Main St, Mt Pleasant, Pennsylvania – USA

# Smart bridge monitoring

## with dynamic and static wireless IoT sensors



### ACCELEROMETER

Measure acceleration (mg) and frequency (Hz) on three axes, synchronizing devices for modal analysis.



### TILTMETER

Measure rotation, ground deformation and triaxial tilt changes, with the option of synchronizing devices to better assess the stability of structures.



### ENVIRONMENTAL SENSOR

Tracks air quality, noise, and wind in real time via LoRaWAN, fully integrated with the MyMove IoT Platform.



### DDS DYNAMIC DISPLACEMENT SENSOR

Measure the dynamic amplitude of the displacement (mm) and the vibration frequency through an FFT algorithm.



### COMMUNICATION NODE

Make geotechnical and environmental probes suited for wireless communication and receive alarms for threshold breaches.

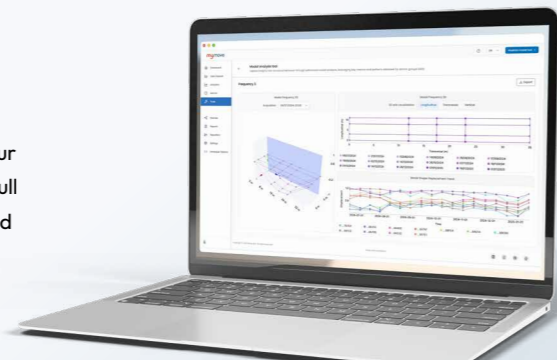


### GATEWAY

Collect data measured by the sensors and transmit them to the MyMove IoT Platform where they will be processed and analyzed.

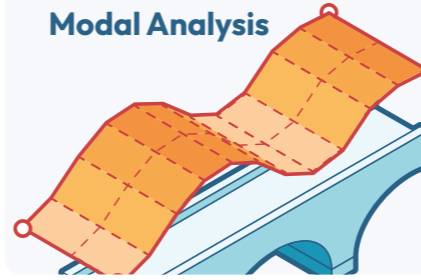


MyMove centralizes all structural and environmental data from your monitoring system into a single cloud platform—giving engineers full control, real-time visibility, and actionable insights without the need for multiple tools.



### ADVANCED TOOL

## Modal Analysis



The Modal Analysis Tool processes synchronized acceleration data from multiple wireless sensors to extract modal frequencies, vibration modes, and structural stiffness changes. It provides 3D and 2D visualizations of modal shapes and displacement trends,

helping engineers evaluate dynamic behavior in bridges, towers, heritage buildings, and other structures exposed to operational or environmental loads.

## How our structural monitoring system works

From sensor installation to data analysis, Move Solutions delivers a fully wireless structural health monitoring solution.



**Install sensors**

Deploy **wireless devices** on site. Sensors connect automatically via LoRaWAN.



**Collect and manage data**

Data flows to the cloud and is managed in **MyMove**, remotely and in real time.



**Analyze structural behavior**

Turn raw data into engineering insights with **advanced built-in Tools** for smart analysis.



**Automate reporting**

Generate **customized PDF reports automatically**—ready to share with stakeholders.

## CASE STUDY — Bridge

### East Huntington - Gunner Gatski Bridge

September 2023 | West Virginia, USA



The West Virginia Department of Transportation launched a real-time SHM program on the **East Huntington Bridge**, a cable-stayed structure spanning the Ohio River and carrying over 14,000 vehicles daily. Traditional inspections proved insufficient to track evolving structural behavior in such high-risk environments.

Move Solutions, together with **Marshall University** and **HNTB**, deployed 57 wireless sensors connected to the **MyMove platform**. The system included accelerometers on cables, deck, and towers; tiltmeters for long-term drift; displacement sensors; crackmeters; a weather station; and a collision detection system.

Data is transmitted via LoRaWAN gateways to provide continuous insight into modal response, vibrations, and potential damage.

Already, the system detected vortex-induced vibrations, optimized maintenance of dampers, and confirmed structural integrity after a local earthquake—preventing costly inspections and saving over \$600K in avoided replacements.

This project demonstrates how IoT-based SHM delivers safety, cost-efficiency, and a scalable model for future smart infrastructure.