
SAFEGUARDING CRITICAL BRIDGES

Structural Health Monitoring and Weigh In Motion
to enhance bridge safety and extend service lifetimes



Addressing the problem of aging and degraded bridges

Globally, many bridges have exceeded their intended lifespan, with a significant portion classified as structurally deficient or obsolete. Aging isn't the only issue – bridges face rising traffic, vehicle overloading, extreme weather, and poor maintenance. The result? Closures or strict weight limits, causing major traffic disruptions.

How can operators reduce risks, ensure safety, and extend service life? Kistler's SHM & WIM solutions offer the answer, helping prevent failures and prolong bridge lifetimes.



Kistler's SHM & WIM solutions help bridge owners safely manage their infrastructure



STRUCTURAL PERFORMANCE



TRAFFIC-LOAD EFFECT



SITE SPECIFIC BRIDGE CAPACITY

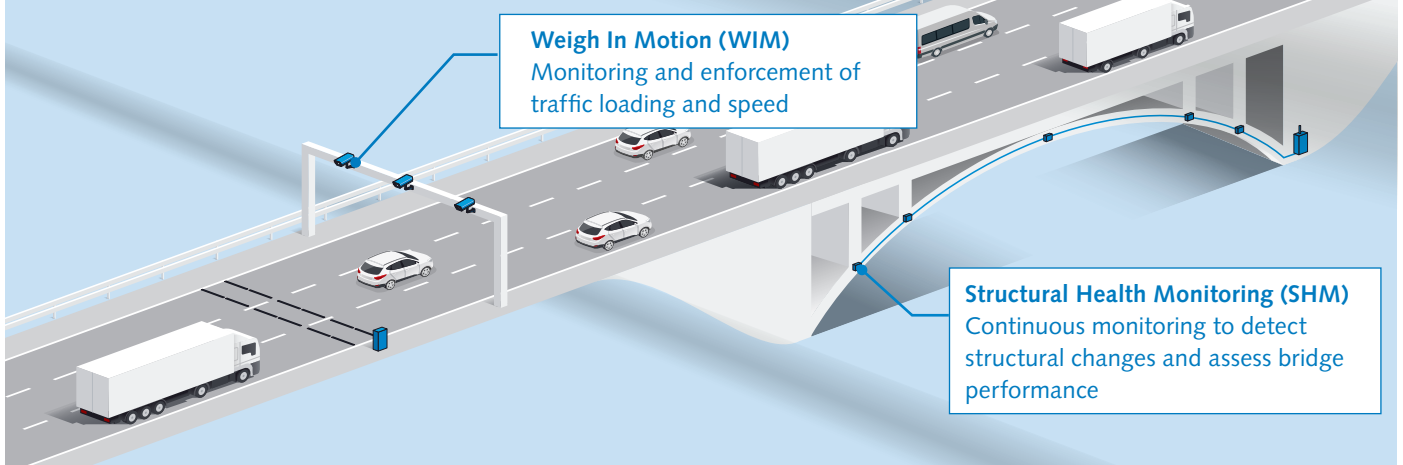


Kistler's SHM –
continuous structural monitoring
with alarms triggered by changes in
structure

Kistler's WIM
continuous traffic monitoring with
alarms triggered by overloaded
vehicles

Bridge safety –
thanks to updated assessment of real
bridge capacity

Bridge Structural Health Monitoring (SHM) – combined with automatic weight enforcement (WIM)



Kistler combines Weigh In Motion with Structural Health Monitoring: the holistic solution for efficient bridge protection

As an operator, you gain unique advantages from continuous sensor-based bridge monitoring to complement your conventional field inspections. Kistler responds to the challenge of bridge and traffic monitoring with an integrated dual solution: SHM combined with WIM.

SHM & WIM: Two solutions in one, delivering multiple benefits:

- **24/7 real-time automatic monitoring** – see what's happening on and inside your bridge
- **Continuous measurement** of your bridge's actual structural performance
- **Immediate alerts** triggered by significant structural variations
- **Early detection** of issues and faults – before they lead to serious or costly damage
- **Ongoing monitoring** of traffic and traffic loads, with alarms for overloaded vehicles
- **Automatic enforcement** – WIM data can be used to cite overloaded vehicles
- **Highly reliable bridge load rating** through combined SHM and WIM data
- **Accurate traffic load data and real traffic spectra**, compared to Eurocode 1, which uses more conservative assumptions – resulting in severity levels up to **30% higher**

Smart traffic monitoring ensures safety and efficiency on Turkey's Çanakkale Bridge



New bridge connecting two continents 1915 Çanakkale Bridge (Dardanelles Bridge), Çanakkale, Turkey

The 1915 Çanakkale Bridge, the world's longest suspension bridge at over 5 km, features a main span of 2,023 meters and crosses the Dardanelles Strait in northwestern Turkey. It plays a pivotal role in regional development and enables swift overland trade, with a crossing time of just six minutes.

To monitor traffic loading and ensure structural safety, a Weigh In Motion (WIM) system was installed at the bridge. Kistler's KiTraffic Basic WIM system measures axle loads, total vehicle weights and vehicle speeds automatically and even provides many more traffic insights. The setup includes two WIM sensors per lane across six lanes in each of the two spans, and has been operational since 2021.

The WIM system ensures efficient traffic management, supports data-driven lifespan calculations, enables accurate load analysis, and protects the bridge from overloaded vehicles, thereby enhancing the overall safety.

Would you like to learn more about
our SHM application?

Explore now:



www.kistler.com/bridges

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