

The low-cost smart system for dynamic infrastructure monitoring



- ✓ Quick Set up
- ✓ No specialist expertise needed
- ✓ Quantifying rate of deterioration
- ✓ Analysis beyond the visible



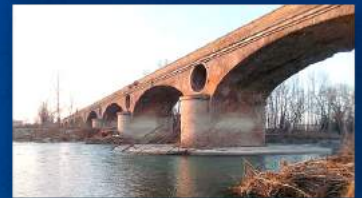
Rezzona.com

Benefits to asset managers

- Cost effective
- No specialist expertise needed
- General tool for bridge inspectors
- Increases confidence in visual assessment
- GPS enabled
- Alerts of bridge strikes and overweight vehicles

Technical features

- Objective, quantitative condition assessment
- Assesses condition of the overall structure, including hidden defects
- Actionable insights
- Simple output
- Automated reports and alerts
- Digital asset management tool for network of assets



Key features

- ✓ Periodic and permanent monitoring
- ✓ Rate of deterioration
- ✓ Complementary to visual inspection
- ✓ Alarm functions

Technical solution

The Rezzona monitoring system uses a 3-axis accelerometer with two inclinometers and temperature sensor. 2000 readings are collected every second and data is processed and uploaded into the cloud every 8 seconds.

The high-sensitivity accelerometer allows temperature-induced natural vibration (background vibration) to be used as the basis for complex statistical analysis.

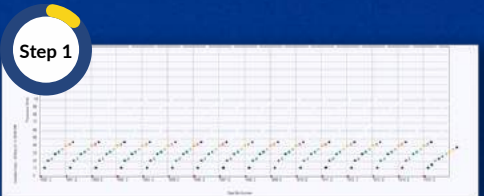
Natural frequencies are determined by 99% statistical probability and correlated with temperature variations.

For permanent monitoring Finite Element models are validated against the measured natural frequencies. The rate of deterioration or Health Index is quantified based on the changes in stiffness.

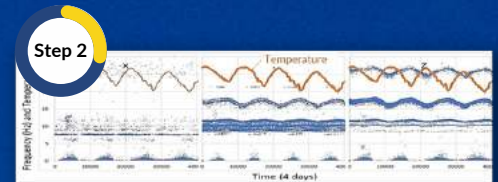
The system has been validated through extensive scientific research and tested on permanent installations over several years.



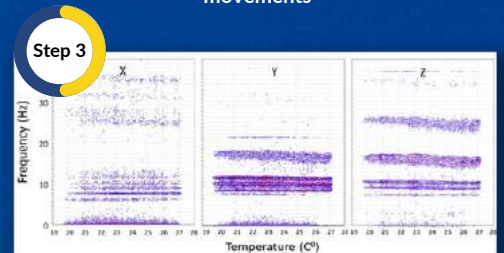
CX1 Accelerometer



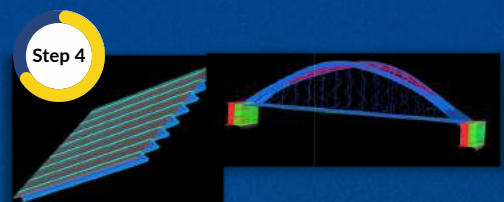
Periodic monitoring:
Comparing different locations against each other



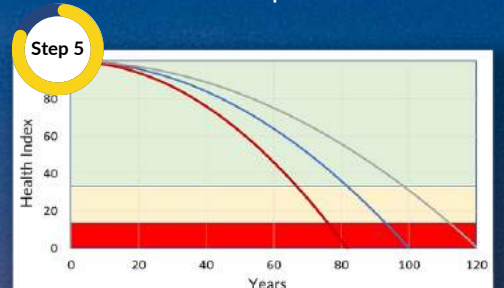
Permanent monitoring:
Frequency variation caused by daily temperature movements



Permanent monitoring:
Temperature-dependent frequency variations



Finite Element models validated against measured natural frequencies



Rate of deterioration estimated from changes in natural frequencies and stiffness



Systems

Rezzona Check-up



- Compares different locations against each other

Rezzona Annual



- Quantifies condition over time
- Identifies rate of deterioration against Finite Element model

Rezzona 365



- Identifies rate of deterioration against Finite Element model continuously
- Alarm functions (e.g. bridge strike, overweight vehicles)
- Online display

Rezzona Unlimited



- Complements standard visual inspections
- Registers condition against GPS location on website
- Condition insight for individual structures and network of assets



Our story

The Rezzona system was developed from decades of academic work. It was funded jointly by the European Commission and the US Department of Transportation within the Infracation framework project (2015-2017).

Dr John Nichols has extensive expertise in structural monitoring and statistical analysis of large data sets. Dr Adrienn Tomor has worked with bridge inspectors and on structural health monitoring for a number of years. They became increasingly aware of the lack of effective - and easy to use - monitoring solution to quantify the condition and deterioration of bridges and structures.

Dynamic monitoring is one of the few methods that can give objective insight into the 'global' behaviour of structures. It is widely used in scientific research but typically requires specialist expertise and manual post-processing. The team has set out to make dynamic monitoring easy to use and cost effective for practitioners. Their aim is to support asset managers, who are often juggling between limited resources and an increasing number of bridges needing repair and strengthening.

Complementing the valuable data collected by bridge inspectors, the system offers objective actionable insight for asset managers, including hidden defects. Nothing can replace bridge inspections and engineers. But we want to make their jobs easier.



Contact us

Email: rezzona2023@outlook.com

Website: Rezzona.com



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Costs

System	Monitoring approach	Solution	Output, function	What is included	Initial Price / Conference Price* Initial / Subsequent /Monthly
Rezzona Check-up	One off Monitoring	<ul style="list-style-type: none"> Comparison of different locations or structures against each other 	<ul style="list-style-type: none"> Compares XYZ frequencies for different locations against each other 	<ul style="list-style-type: none"> 2 weeks rental of specialist equipment Consulting (5 hours for 10 readings, £50 for additional readings) 	£1000 £800
Rezzona Annual	Periodic Monitoring	<ul style="list-style-type: none"> Comparison of structural condition over time Supplements annual /periodic inspections Quantifies rate of deterioration Provides baseline for future assessment 	<ul style="list-style-type: none"> Compares XYZ frequencies over time Identifies rate of deterioration against Finite Element model 	<ul style="list-style-type: none"> 2 weeks rental of specialist equipment Finite Element modelling (small/medium **/large structure) Subsequent consulting (up to 5 locations) 	£3,900** £3,120**
Rezzona 365	Permanent Monitoring	<ul style="list-style-type: none"> Identifies rate of deterioration Alerts of bridge strikes or changes in condition Weigh-in motion 	<ul style="list-style-type: none"> Identifies rate of deterioration against FE model continuously Alarm functions (e.g. bridge strike, overweight vehicles) Online display 	<ul style="list-style-type: none"> Purchase of specialist equipment (sensor, computer, wifi) Finite Element modelling (small/medium **/large structure) Monthly monitoring fee for permanent location (incl. alerts, excl. wifi subscription) 	£10,000** £8,000**
Rezzona Unlimited	Unlimited 2 year monitoring (periodic or permanent)	<ul style="list-style-type: none"> Registers behaviour against GPS location on website Complements visual inspection Collects reference data for individual structures and network of assets 	<ul style="list-style-type: none"> Complements standard visual inspections Registers condition against GPS location on website Condition insight for individual structures and network of assets 	<ul style="list-style-type: none"> Purchase of specialist equipment (sensor, computer, GPS, wifi) Monthly monitoring fee for any number of locations (excl. wifi subscription) 	£19,000 £15,200

*Conference pricing for organisations having booked initial call with us by 10 April 2023