

Case Study – Bridge Monitoring

Subway Bridge Bearing Misalignment

Central Europe 

Background

During a routine inspection of a metro bridge in Central Europe, significant misalignment and displacement of an elastomeric bearing were identified. As it was unclear how the damaged bearing would behave under continued operation and whether the observed deformations would worsen over time, the responsible authorities commissioned a measurement-based investigation.

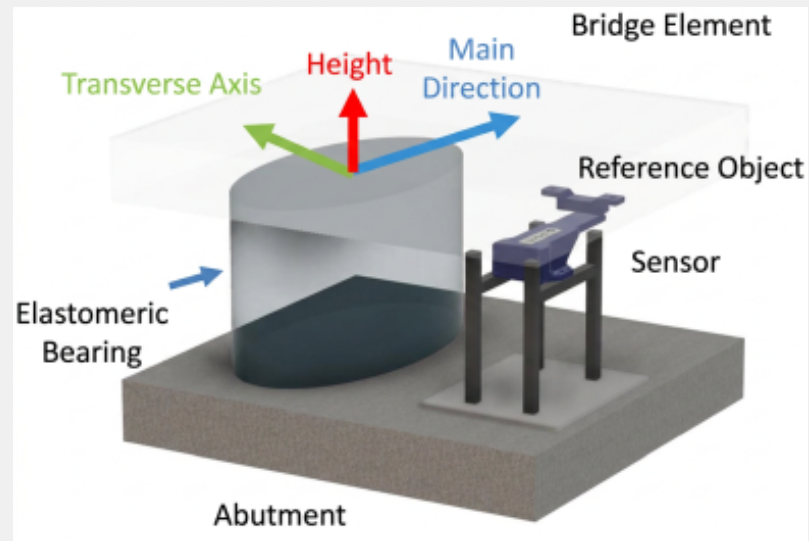


Requirements

To assess the bridge's structural safety, a monitoring solution capable of reliably capturing complex movements was required. The system needed to measure three-dimensional movements and temperature with long-term accuracy, enabling precise correlation of deformation patterns with seasonal variations and supporting evidence-based maintenance planning.

Solution

To meet these requirements, the bridge was equipped with SuessCo 6D-Sensors in the area of the affected bearings. Over a period of one year, the sensors continuously recorded three-dimensional movements together with temperature data. This long-term monitoring provided a comprehensive dataset, enabling the structural response to thermal effects to be analysed throughout the complete seasonal cycle.



Result

The measurements documented movements of up to 25 mm along the principal axis and displacements of up to 0.9 mm in the transverse direction. The analysis showed that the bearing misalignment remained stable and was strongly correlated with temperature. After a full seasonal cycle, the component consistently returned to its original position when the same temperature conditions occurred. This precise dataset provided evidence that no progressive deterioration was taking place. Based on the monitoring results, targeted measures were identified to maximise the remaining service life of the infrastructure.

