

Case Study – Bridge Monitoring

Metro Line

Latin America 8

Background

A metro bridge in a major Latin American metropolitan region required monitoring at several critical locations to assess structural movements and changes in condition. As a key part of the public transport network, the bridge is exposed to high operational loads and varying environmental conditions. Uncertainty about the causes and extent of movements in several structural elements raised concerns about future maintenance and repair costs. Initial damage had already been identified in the elastomeric bearings.



Requirements

- Early detection of critical movements and structural changes
- Robust, low-maintenance sensor technology with high measurement accuracy
- Automatic alerts in case of unusual behaviour
- Flexible and rapid installation without disrupting operations

Solution

SuessCo 3D-Sensors were installed at the most critical structural points of the metro line: at the viaduct piers, at a pedestrian bridge of a metro station, and at the elastomeric bearings of the load-bearing structure.

The sensors capture three-dimensional movements as well as temperature profiles. They enable the detection of temperature-dependent movement patterns as well as long-term, irreversible displacements. Measurements are taken at two-hour intervals, with data transmission carried out reliably via LTE-M.



Result

The continuous monitoring delivers important insights into the behaviour of the structural components.

At the viaduct piers, bearing movements were detected as a consequence of sub-millimetre settlement.

At the pedestrian bridge of the metro station, displacements and trends indicating irreversible structural changes were identified.

In the area of the elastomeric bearings, the Z-axis showed cyclic, temperature-induced movements. At the same time, loads were identified that had already caused visible damage to the elastomer.

The data obtained enables early assessment of potential risks, targeted planning of maintenance measures, and a sustainable improvement in the safety and availability of the infrastructure.

