



BRIDGES - Case Studies

Throughout the world many countries have developed systems, methodologies, and tools for management of bridges. The effectiveness of these programs heavily depends on the relevance, and accuracy of data acquired from the procedures employed for condition assessment of the bridges.

For example, in the United States as of 2003, 26.6% of the US bridges were structurally deficient or functionally obsolete, as reported by the Federal Highway Administration (FHWA). This assessment of the structural and functional condition of the nation's highway bridges is based upon data reported to the FHWA by bridge owners across the country and maintained by FHWA in the National Bridge Inventory (NBI) database. Bridge owners have been reporting this data since 1972 when FHWA established the National Bridge Inspection Program. The bridge inspection program requires that qualified inspectors inspect highway bridges at least once every two years and that the results are reported to the FHWA. This data is used to report the condition of the nation's highway bridges to Congress every two years and to administer the Highway Bridge Replacement and Rehabilitation Program (HBRRP). Last year the HBRRP provided more than \$3.5 billion to replace or rehabilitate deficient bridges.

A-Solution - Structural Health Monitoring(SMH)

A key element of every bridge management program is structural health monitoring (SHM). This is a term increasingly used over the last ten years to describe a range of systems implemented on full-scale civil infrastructures and whose purposes are to assist and inform operators about continued 'fitness for purpose' of structures under gradual or sudden changes to their state.

Instrumentation is an essential component of any SHM programme and can complement existing established "visual" inspection procedures isolating individual structures that may require particular or immediate visual inspection.

Currently instrumentation is used for SHM situations such as:

- (i) modifications to an existing structures ,
- (ii) monitoring of structures affected by external works,
- (iii) monitoring during demolition,
- (iv) structures subject to long-term movement or degradation of materials,
- (v) feedback loop to improve future design based on experience,
- (vi) fatigue assessment,
- (vii) novel systems of construction,
- (viii) assessment of post-earthquake structural integrity,
- (ix) the move towards performance-based design philosophy.

In collaboration with our technical partners Sauls Seismic Inc, YieldPoint has instrumented a number of bridges in The US.



d-TILT (EL) sensor being prepared for installation on a bridge in Florida(US) by Sauls Seismic Inc.

Literature:

New Ways to Predict Bridge Performance Publication No. FHWA-HRT-10-062 HRTM-04/07-10(1M)E