



NEVADA DEPARTMENT OF TRANSPORTATION RESEARCH DIVISION

GALENA CREEK BRIDGE HEALTH MONITORING INSTRUMENTATION

Key · Points

Project Number:
743-18-803

Start Date:
February 13, 2019

Duration:
24 months

Project Cost:
\$299,782.00

Researcher:
University of Nevada,
Las Vegas

Principal Investigator:
Dr. Ryan Sherman
Dr. Jee Woong Park
Dr. Erol Kalkan

NDOT Champion:
Troy Martin
Structures



PROBLEM

Near the end of construction of the Galena Creek Bridge, NDOT and the University of Nevada, Reno, collaborated to install instrumentation to provide dynamic monitoring of the main arch, which spans 689 feet over Galena Creek. The instrumentation was intended to be a permanent structural health monitoring (SHM) system, but after initial testing and monitoring, the system was not maintained. Though the system has continued collecting data, it must be replaced for renewed monitoring efforts.

OBJECTIVE

To develop and implement a permanent SHM system on the Galena Creek Bridge. The SHM system will measure the structural response to traffic, wind, seismic, and thermal loadings to provide proactive measures such as analysis results and timely alarm notifications in the form of SMS and email messages. Integration into the NDOT Intelligent Traffic System (ITS) will be a key component of this study.

METHODOLOGY

The Research Team has identified a unique approach for the Galena Creek Bridge SHM system. A proven SHM system for buildings will be adapted for this bridge application. Similar hardware components to those used by USGS, including a recorded, a Linux-based computer system, and accelerometers, have proven to be accurate and reliable, and will be used on this project. Methodology will include Literature Review, Identification of parameters of interest and notification strategies, developing an instrumentation plan and deployment strategy, producing benchtop testing at UNLV, field deployment, and finally field calibration. After final field calibration and long-term field testing, the final report and implementation plan will be produced.

IMPLEMENTATION POTENTIAL

The research proposes to implement a SHM system over the Galena Creek Bridge for continuous monitoring. Structural response will be measured for various loading conditions, and notifications will alert appropriate authorities after an extreme event, allowing immediate emergency response, as needed and as appropriate.

Contact Information:
Nevada Department of Transportation – Research Division
Annex 14-15
1263 South Stewart Street
Carson City, NV 89712
(775) 888-7895
www.nevadadot.com