

PROJECT BRIEF

Storrow Drive Tunnel Rehabilitation

PROJECT PROFILE

CLIENT:

Massachusetts Department of
Conservation & Recreation (DCR)

LOCATION:

Boston, MA

VALUE:

- Data alerting of structural distress in the girders enabled effective mitigation measures to be implemented

SERVICES PROVIDED:

- Provide real-time data for informed project decision making
- Monitored strain gages to provide sensitive load-bearing data

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GEOTECHNICAL INSTRUMENTATION & MONITORING

Geocomp provided instrumentation and monitoring services by installing 20 uniaxial strain gages and 6 strain gage rosettes on the web and flanges of girders at locations specified by the structural engineers. Three thermistors were also placed onto the beams. Geocomp’s iSite®-HS (high speed) data loggers were installed to read all of these sensors at 50 times per second. The data are streamed through a wireless modem to Geocomp servers. The iSite®-HS data loggers also send a separate stream of data consisting of readings on all sensors every 15 minutes to Geocomp’s iSiteCentral® system. Users access this information via a web browser to see real-time graphs of sensor readings over time. The system produces approximately 3GB of data per day that must be processed and graphed for evaluation. Processing takes the system about one hour and graph 24 hours worth of data. The strain gages are sufficiently sensitive to detect each car traveling over Storrow Drive westbound.



BACKGROUND

Storrow Drive is a major crosstown expressway in Boston, MA, and is maintained by the Massachusetts Department of Conservation & Recreation (DCR). A portion of Storrow Drive eastbound drops into a tunnel beneath Storrow Drive westbound at the Berkeley Street Underpass. This 55-year old section, the Storrow Drive Tunnel, carries 103,000 vehicles a day through Boston’s Back Bay neighborhood, and was showing serious signs of decay. The structural members in the roof of the eastbound tunnel showed unusual indications of structural distress. Structural engineer for DCR, designed an instrumentation program consisting of strain gages and temperature sensors to evaluate strains induced by in-service live loads and loads from controlled load tests. The aim of the program is to help evaluate questions about the current level of safety for vehicular traffic.