

IIS-075

**Development of an Early Warning System for Defined Loading Events in
Highway Bridges and Transportation Structures**

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Abstract

Field testing and monitoring of highway bridges is regularly performed to establish the in-service performance and condition of existing structures while on site and remotely. In cases where long-term monitoring takes place, there are often times when certain loading events occur that are of considerable interest to the owners and/or researchers. For example, when an overloaded vehicle crosses a bridge with a very low load posting. A visual inspection of the structure is likely required to ensure there is no damage to the structure. However, such an inspection can only occur if the owner is aware that the vehicle has crossed the bridge. The same would be true in situations where a structure is impacted by over height vehicles. However, the occurrence of these events is only realized (if at all) after the event has occurred, possibly days or weeks later since daily downloading of data are required for review. If no data acquisition system is in place, there may be no record of the event.

In other cases, it may be desired to know when some form of quantifiable change in behavior or structural condition has occurred immediately after the event takes place. For example, if a drastic change in the response (e.g., due to a girder fracture), relative position (e.g. settlement) or some other measurable change occurs. Currently, the availability and ease-of-use of such systems to perform this are limited and the costs can be substantial.