

Abstract

This report focuses on the use of axial strain data obtained from truss members in a bridge to calculate the loading on the span. Statistical evaluations of traffic load effects show that codes predict much higher loads than even congested traffic conditions. Therefore, in order to best calculate loads from axial strain data of truss members, a finite element model was created which combined the axial stresses of the truss and the collective bending of the deck and stringers. After the finite element model was created, a variety of moving unit axle loads were applied on the deck to build a separate program which could parse the axle data and accurately calculate the axle loads. This was achieved by parsing strain data and weigh-in-motion data simultaneously. Weigh-in-motion technology measures axle weights as the vehicle approaches the deck and therefore provides information on the magnitude of individual axle weights. Therefore, only the location of these forces were needed to best match the axial strains from the strain gauges.