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Validation of Visibility Data from Road Weather Information Systems by Comparing Three Data Resources: Case Study in Ohio

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Abstract : Adverse weather conditions, particularly those with low visibility, are critical to the driving tasks. However, the direct relationship between visibility distances and traffic flow/roadway safety is uncertain due to the limitation of visibility data availability. The recent growth of deployment of Road Weather Information Systems (RWIS) makes segment-specific visibility information available which can be integrated with other Intelligent Transportation System, such as automated warning system and variable speed limit, to improve mobility and safety. Before applying the RWIS visibility measurements in traffic study and operations, it is critical to validate the data. Therefore, an attempt was made in the paper to examine the validity and viability of RWIS visibility data by comparing visibility measurements among RWIS, airport weather stations, and weather information recorded by police in crash reports, based on Ohio data. The results indicated that RWIS visibility measurements were significantly different from airport visibility data in Ohio, but no conclusion regarding the reliability of RWIS visibility could be drawn in the consideration of no verified ground truth in the comparisons. It was suggested that more objective methods are needed to validate the RWIS visibility measurements, such as continuous in-field measurements associated with various weather events using calibrated visibility sensors.

Keywords : RWIS, visibility distance, low visibility, adverse weather
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