

“Crowdsourcing road weather: The critical role of the human in data generation”

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To address public, legal and economic pressures, managers at state Departments of Transportation are intensifying in their willingness and desire to utilize crowdsourced information to satisfy weather and road condition data needs. The transportation sector is no different than other sectors gathering data from the public; whether for research or for public information, meteorology, biology, hospitality, health care and many other fields have utilized reports from citizens for years. Transportation is also on the verge of an explosion of data via the Internet of Things, as vehicles themselves (Connected Vehicles) begin to collect and transmit data from the driving environment. Yet there is a nuanced and descriptive quality to human-generated information that in some ways proves advantageous over instrumentation-sourced data. This paper focuses specifically on human-generated content and that which is specific to agency use for road weather data collection. Three approaches to gathering crowdsourced data were identified: (1) social media monitoring, (2) third-party smartphone applications, and (3) citizen reporting programs. Each data source was compared using nine measures of comparison: data type, latency, spatial and temporal coverage, noise, accuracy/credibility, usability, quality control, incentivization, and legal/ethical considerations. This paper will compare and contrast each approach, though it is ultimately incumbent upon an agency to weigh the relative costs and benefits of each for their own purposes. For example, while one approach scores well on noise and credibility, requiring minimal post-processing and quality control, it also suffers for lack of coverage and requires in-house software development. Broadly, this paper will also present the case for employing and encouraging the abundantly available data resource that is the traveling public, even while Connected Vehicle innovation comes to fruition in coming years.