RESEARCH SUMMARY

INTEGRATING ROAD WEATHER TECHNOLOGY DATA IN HIGHWAY OPERATIONS

WHAT WAS THE NEED?

Inclement weather can significantly impact the performance of any transportation system, including roadways. Effective roadway operations and maintenance requires quality weather data to estimate real-time and near-future road conditions. While there are several sources of such data such as radar, Road Weather Information Systems (RWIS), and Mobile RWIS (MARWIS), these data sources are often siloed. Therefore, there is a need to develop guidance on how these data sources can be fused to provide deeper insights for winter operations and maintenance decision support.

WHAT WAS THE GOAL?

The primary objectives of this study were to establish the state-of-practice in winter weather data applications and to design a platform that integrates all weather data into a single decision support tool. Expected outcomes include documentation of the state-of-practice and interface designs for a comprehensive winter operations decision support platform.

WHAT DID THE RESEARCH TEAM DO?

 To achieve the project objectives the research team conducted an in-depth literature review of the impacts of winter weather data applications. This included impacts on safety and mobility, developing and distributing a national survey, interviewing a short list of survey respondents, and designing a comprehensive winter operations decision platform. The platform designs allow a user to view state-wide performance, discover district(s) of interest, identify roads of concern, zoom into specific segments on the target road, and view data from specific sensors/data sources on the target segment.

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WHAT WAS THE OUTCOME?

This project discovered that Road Weather Information Systems (RWIS), and Mobile RWIS (MARWIS) are all used for winter maintenance decisions but are often siloed. Most agencies using MARWIS are in a pilot phase and often use stand-alone software to view the data. This research used these findings to design a comprehensive winter operations decision support platform for MDOT SHA.

HOW WILL MDOT SHA USE THE RESULTS?

The University's research project on integrating road weather technology data into highway operations has demonstrated the substantial benefits of creating a unified dashboard that consolidates weather data from diverse sources. To leverage these findings, several key steps are crucial for effective implementation: estimating the costs associated with the software and infrastructure, conducting a comprehensive assessment of required resources (including personnel, technology, and data sources), analyzing the project's results to guide integration strategies, and meticulously planning the integration with CHART ATMS (Coordinated Highways Action Response Team – Advanced Traffic Monitoring Systems) to ensure compatibility and minimal operational disruption. These measures will be essential in enhancing highway operations significantly, by providing a more cohesive and efficient approach to managing road weather information, ultimately leading to improved safety and efficiency on the highways.

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