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Road Weather Applications

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Research Goals

- Identify the range of sources for collecting robust data that will support road condition and pavement forecasing, specifically focusing on the incorporation of mobile data information and data from public sector mobile sources such as fleets.
- Develop algorithms and capabilities to translate mobile data into useable weather and road condition observations.
- Incorporate these observations into effective management systems and the weather-responsive traffic management and advanced decision support tools.

Research Outcomes

- Reducing the adverse impacts that weather conditions have on the safety and operation of the Nation's roads is possible.
- Providing the technology platforms, information, tools, and resources that can help surface transportation users and managers respond to weather events with effective strategies and programs.
- Serving as a catalyst for the development of new products and services.

INTRODUCTION

The Road Weather Applications program invests in applied research in partnership with the public and private sectors to address high-risk problems whose solutions benefit both manufacturers (in terms of enhanced or new products and markets) and state and local agencies (in terms of being able to procure state-of-the-art technologies).

The program promotes the adoption of advanced technologies, techniques, and tools such as capturing and translating vehicle data into weather and pavement observations and utilizing that data to create more sophisticated applications and integrated decision support systems. The result is a research initiative that benefits state and local agencies, private weather providers, and the traveling public.

RESEARCH PLAN

The Road Weather Applications program seeks to:

- Improve safety by reducing crash risk due to inclement weather, increase awareness among agencies and users of the real-time conditions, and restore safer driving conditions quicker and more efficiently.
- Increase mobility by restoring capacity, reducing weather related travel delays, and creating more uniform traffic flow.
- Increase travel time reliability during inclement weather events.
- Increase productivity and reduce operation costs by optimizing the use of labor, pavement treatments, and equipment staging, while minimizing adverse environmental impacts.

The research plan for 2010–2014 has a two-fold focus:

1. The program continues to invest in high-risk applied research to expand the breadth and capabilities of road weather data sources, technologies, traffic management and decision support tools, and information.
2. The program coordinates research with other ITS Research programs, such as Dynamic Mobility Applications; V2V and V2I Communications for Safety; and Applications for the Environment: Real-Time Information Synthesis (AERIS), to determine how existing road weather technologies can be optimized through incorporation into the resulting applications from these programs.

U.S. Department of Transportation
Research and Innovative Technology Administration

The Road Weather Applications Research includes:

Track 1: Technology and Application Development and Adoption

- Identify and integrate new and expanded road weather data sources (in particular, mobile sources and State and local DOT fleets) that enhance roadway safety, capacity, and efficiency while minimizing environmental impacts.
- Analyze the capability of existing vehicle sensors to collect road weather data.
- Research the characteristics and quality of the data that can be retrieved from vehicles.
- Develop algorithms and capabilities to translate mobile data into useable weather and road condition observations.
- Assess whether existing standards for data collection and transmission need to be modified.
- Refine weather forecasting and transportation models that take advantage of these rich new data sources.
- Foster the adoption of new and enhanced models and applications.

Track 2: Leverage Existing Technologies

Analyze how to maximize the use of available road weather information and technologies for greater safety and operational benefits by:

- Integrating existing observational networks and data management systems.
- Investigating the translation needs and formats for taking existing observational data and making it useable for dynamic mobility or environmental applications.
- Incorporating recent advances in weather-responsive traffic management and decision support tools into operations.
- Improving weather modeling capabilities and forecast tools, by increasing the understanding of the road surface and atmospheric interface.
- Enhancing mechanisms for communicating road weather information to users, including transportation officials and the public.

Track 3: Stakeholder Engagement

- Maintain and expand the unique partnership that has been developed among the public, private, and academic sectors; the transportation and weather communities; and operations and research personnel to achieve a multi-disciplinary problem solving approach.
- Engage with the private sector to build new services around the data and application platforms that result from the research.
- Enhance mechanisms for communicating road weather information to users, including transportation officials and the public.
- Integrate road weather technologies into an information infrastructure.

Track 4: Cross-Cutting Activities

- Enable technology transfer of effective road weather scientific and technological advances into the commercial marketplace.
- Improve education and training of road weather information users, such as state and local transportation officials and private sector transportation contractors.
- Foster the incorporation of road weather science into the post-graduate curriculums of academic institutions.
- Coordinate with transportation weather research programs in other modes, such as aviation.

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