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MaineDOT Research Summary

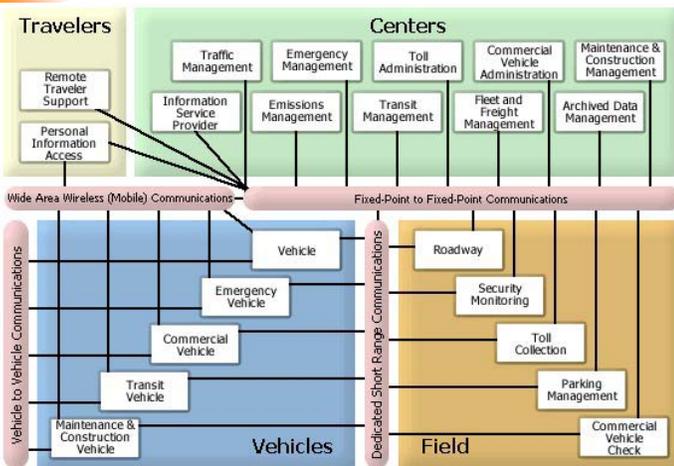
June 2005



Maine ITS Development

MaineDOT's Transportation Research Division recently completed two major projects: the development of an Intelligent Transportation Systems (ITS) Strategic Plan, and the development of the Statewide ITS Architecture. The Strategic Plan, seeks to identify ITS opportunities, refine priorities, define possible ways to organize for future deployment, and avoid fragmentation of future ITS implementations.

The Strategic Plan will expedite deployment and integration of ITS projects in the future. In fact, the Plan has already begun to bear fruit; about \$8 million of recommended ITS projects were approved for inclusion in the Biennial Capital Work Plan for Fiscal Years 2006-2007. Projects ranged all across the board, and included various ITS domains, including Commercial Vehicle Operations, public transit, traffic incident management, and public outreach.



The second major completed project was the Statewide ITS Architecture. The project leveraged the initial needs assessment conducted for the Strategic Plan, and expanded stakeholder involvement to a new level. Architecture "Visioning workshops" were held on in January & February, and attracted nearly 60 participants from numerous agencies. The purpose of the Visioning Workshops is to discuss Operational Concepts, especially related to Emergency Management and Disaster Response & Evacuation. The statewide ITS architecture will help ensure that ITS projects are developed in an integrated and cost-effective manner. The ITS architecture is also required for securing federal funding for ITS projects.

New Products Being Used in Maine



Snowplowable Pavement Markings: Conditions sometimes make it difficult to identify traditional markings, especially if the marking system is worn. Pavement marking paints can wear off completely before maintenance can reapply the marking. An alternative is to supplement the primary pavement marking system by installing snowplowable reflective pavement markers. Three manufacturers installed their products on our Test Deck located on the Scarborough Connector in September 2004. Each marker was placed 40' apart for a total of ten markers per manufacturer. Locations were ground out and markers epoxied into place. After one season of snow plowing all markers are performing well.



3M's LPM 1200 Liquid Pavement Marking: Along Rt. 4 in Avon a liquid pavement marking system was applied in 2004. The product is a polyurea-based marking paint that requires a special set-up on the paint truck since it is a two-part system and mixed just prior to lay down. The stated benefits of the 3M system is a longer lasting line, 4 to 5 years as opposed to yearly (or more) marking with water-based products currently in use. It also can be laid in cooler temperatures which would extend the marking season. LPM 1200 has a higher retroreflectivity than water-based traffic paint with glass beads owing to their proprietary ceramic elements which supplement the glass beads. Although more expensive up front and not intended for state-wide use, this product may have a place for a long-lasting highly visible line in high traffic locations. As a safety factor, LPM 1200 sets up very rapidly thus reducing the time required for crews working in the roadway.

Behavior of Pile-Supported Integral Abutments at Bridge Sites with Shallow Bedrock-Phase 1



Current design of reinforced concrete integral abutments require a minimum pile length of about 12 to 15 ft. When ledge conditions exist that eliminate integral abutments from consideration, more expensive abutments are constructed. Not only does the bridge cost go up but often times in-stream work is significantly increased causing environmental concerns.

This study investigates the design criteria of integral abutments on piles. Using finite element modeling, it is shown that current design procedures are conservative. The implementation of the proposed methods could potentially save hundreds of thousands of dollars in each two year transportation program. Phase 2 of the study is underway. An integral abutment bridge in Coplin Plantation has been instrumented. Results are being compared to Phase 1 design methodology. The Bridge Program has been impressed with the preliminary results and plans to begin implementation of new design guidelines immediately.

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WIMPI Construction Begins:



Through a National Science Foundation (NSF) grant and partnership with Worcester Polytechnic Institute and UMaine the Department has begun constructing a weigh-in-motion pavement instrumentation (WIMPI) site along Rt. 16 in Guilford. The site will allow us to measure the actual distresses in the pavement layers due to traffic loads and climatic changes. We are particularly interested in determining pavement damage due to heavy trucks during the spring thaw period. The information will be used to modify the current AASHTO design and calibrate the upcoming AASHTO 2002 guide. Phase 1, installation of instruments and short term monitoring, was funded in the FY 04/05 SPR program. Phase 2 will add longer term monitoring of the test site and extensive laboratory and field material testing.