“Planning Efforts to Implement a MDSS”

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Deputy Director

Assistant Director - Operations

- Set Policies & Procedures
- Budget Approval
- Maintain Statewide Consistency
- Share National Perspective on Maintenance & Operations Issues
- Maintenance Management System

District Engineer

Assistant District Engineer

Maintenance Crews

Day-to-Day Activities
Maintenance and Operations Division

Kent Mayer

- Architecture
- Highway Maintenance

Denise Inda

- Emergency Operations & Homeland Security
- Freeway Operations ITS
Integrated Transportation Reliability Program - *ITRP*

*Defined intersection of PLANNING and IMPLEMENTATION*

*Intersections represent opportunities for research and applications development to leverage existing data and information*
Congestion Breakdown

Non-recurrent Congestion = 55%
- Traffic Incidents, 25%
- Bad Weather, 15%
- Special Events, 5%

Recurrent Congestion = 45%
- Bottlenecks, 40%
- Poor Signal Timing, 5%
- Work Zones, 10%
MDSS GOALS

- Improve Safety of Traveling Public
- Improve Operational Efficiency (LOS)
  - Fuel Savings
  - Route Optimization
  - Material Optimization (Anti-Icing)
  - Environmental Stewards (Lake Tahoe)
  - Knowledge Management
- Maximize Substantial Funding Reductions
PROBLEM STATEMENT

In addition to the snow plow visibility research, a feasibility study will also be conducted as part of the proposed project. The goal of the feasibility study is to determine what type of communication system would best allow NDOT to transmit real-time data to a central location, which is the foundation required for a Maintenance Decision Support System (MDSS). The specific tasks to be conducted include:

1. Evaluate the bandwidth available for digital data transmission over the existing 800 MHz analog communication system.
2. Examine existing commercial digital communication technologies for transmission of vehicle and road condition data to support an MDSS for NDOT.
3. Develop a set of detailed recommendations for implementing a real-time data transmission system specific to NDOT.
4. Outfit two snow plows with a proof-of-concept data transmission system.

BACKGROUND SUMMARY

The maintenance decision support system (MDSS) started as a federal highway administration (FHWA) project aimed at helping winter maintenance personnel make decisions (Pisano, et al., 2005). The key component to the MDSS is accurate weather and road condition information. Based on this information, an MDSS employs data fusion, predicts local weather conditions, and can recommend road maintenance actions all in an effort to reduce information overload and increase the efficiency of winter road maintenance (Mahoney, et al., 2005). Widespread adoption of MDSS is beginning, with thirteen states currently sharing/pooling MDSS data (Mewes, et al., 2008).

What started as an FHWA program has since transitioned into private sector companies (e.g. Meridian Environmental Technology). Integration of MDSS with MDC/AVL (mobile data computers/automated vehicle locator) provides improved communications between drivers and dispatchers (Pisano, et al. 2006). However, most AVL systems make use of the cellular phone
Weather Forecasts = Getting Better

Financial Forecasts = Not So Good
Challenges

- Decreasing Revenues
- Lack of Expertise
- Limited In-House I.T. Resources
- Limited National B/C Information (Policy & Budget Priorities)
Encouraging Outlook

- Statewide Weather Service Provider
- Administrator Who Supports MDSS
- Aggressive Equip. Replacement Schedule
- Dedication to Doing Things Better
- Willingness to Work with Other States to Leverage Resources
- Very Good Existing Snow & Ice Program
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THANK YOU