Examining the Impact of Pavement Rehabilitation Trigger Values and Annual Rehabilitation Funding on the Long-term Network-Level Pavement Condition
A Case Study with the Indiana State Urban Road Network

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ABSTRACT

Management of highway assets, including pavements, is immensely challenging in an era of uncertain funding for transportation agencies and higher service expectations from the public. Furthermore, the maintenance of pavement assets in good serviceable condition is one of the most cost-intensive operations for a highway agency. Between 1996 and 2008, the Indiana DOT spending on improvement of pavement assets fluctuated between 35% and 50% of its asset management budget annually (Everett 2012). Therefore, pavement managers are constantly exploring strategies to fulfill their mission of maintaining roads in good condition with the minimum budget. Strategies may include examining the effectiveness of individual pavement treatments or assessing approaches to prioritizing pavement needs for fund allocation.

A network-level approach for cost control that remains to be examined deeply is the change in a treatment threshold modification strategy would aid agencies in the face of budget restrictions. However, implementation of such a strategy would have to occur only after evaluation of the long-term influence of a certain treatment trigger policy on the pavement conditions at the network level. This paper explores the impact of changing the pavement rehabilitation trigger policy and varying the available budget on pavement roughness condition at the network-level. The Indiana State Urban road network is used as a case study.

METHODOLOGY

Management of highway assets, including pavements, is immensely challenging in an era of uncertain funding for transportation agencies and higher service expectations from the public. Furthermore, the maintenance of pavement assets in good serviceable condition is one of the most cost-intensive operations for a highway agency. Between 1996 and 2008, the Indiana DOT spending on improvement of pavement assets fluctuated between 35% and 50% of its asset management budget annually (Everett 2012). Therefore, pavement managers are constantly exploring strategies to fulfill their mission of maintaining roads in good condition with the minimum budget. Strategies may include examining the effectiveness of individual pavement treatments or assessing approaches to prioritizing pavement needs for fund allocation.

A network-level approach for cost control that remains to be examined deeply is the change in a treatment threshold modification strategy would aid agencies in the face of budget restrictions. However, implementation of such a strategy would have to occur only after evaluation of the long-term influence of a certain treatment trigger policy on the pavement conditions at the network level. This paper explores the impact of changing the pavement rehabilitation trigger policy and varying the available budget on pavement roughness condition at the network-level. The Indiana State Urban road network is used as a case study.

CONCLUSION AND FUTURE WORK

In the first phase of the research, the effect of changing the pavement rehabilitation trigger policy and the expended agency cost on the resulting pavement roughness condition at the network level has been demonstrated for the Indiana State Urban road network.

The next phase involves seeking, for different road functional classes, the pavement rehabilitation trigger where the maximum 20-year pavement smoothness is achieved at minimum expended agency cost. The framework for this phase is demonstrated in a flowchart.

Additionally, a traffic sensitivity analysis will be conducted where the traffic level expected against 20-year agency funding commitment. The framework for this phase is demonstrated in a flowchart.

REFERENCES