**American Association of State Highway and Transportation Officials**

**Special Committee on Research and Innovation**

FY2020 NCHRP Problem Statement Outline

**1. Problem Title**

Development of Business Case and Communication Strategies for a State DOT Resilience Program

How can state DOTs develop strategies to ensure the public supports resilient transportation systems and their organizations integrate resiliency into the project life cycle for both natural and human caused hazards?

**2. Background**

Many State Departments of Transportation (DOTs) have faced significant disruptions to transportation system performance for a variety of reasons. Flooding, extreme heat, wildfires, cyberattacks, critical infrastructure failure, coastal erosion, and storm surge are just some of the hazards state DOTs have had to respond to along with many of their partners. A focus on system disruptions, the ability of the transportation system to anticipate and respond to such disruptions, and the subsequent consequences to transportation system performance and to a state and its communities are primarily perceived as system resilience and security concerns.

The future portends even more disruptions from a variety of sources. The transportation sector is the 3rd most vulnerable sector to cyberattacks according to leading insurance magazine. Worldwide, transportation is the #1 target of terrorists. Future climate and extreme weather conditions are likely very different than historical trends (with expectations of greater impacts on the transportation system). Disruptions to transportation system have significant multiplier impacts to the economy and society. With an increasingly interconnected world, transportation systems are often dependent on assets and infrastructure over which transportation officials have no control (e.g., the electrical grid). And, of course, such disruptions are highly visible and the ability to mitigate them is often viewed as a measure of the effectiveness of an agency.

In addition, the Fixing America’s Surface Transportation (FAST) Act included several requirements for transportation agencies that reflected an increasing concern for resilience and security. For example, statewide and metropolitan transportation planning processes were to consider projects/strategies to improve the resilience and reliability of the transportation system. It continued all prior National Highway Performance Program (NHPP) eligibilities, and added among four new eligible categories, one for projects to reduce the risk of failure of critical NHS infrastructure (defined to mean a facility, the incapacity or failure of which would have a debilitating impact in certain specified areas). It is apparent that system resilience is becoming an ever more important concern for transportation officials at all levels of government.

TRB's Cooperative Research Programs have devoted substantial resources to investigating many different aspects of system resilience and security. However, as will be discussed in the literature review section, no research has been conducted on resilience-oriented communications strategies and how state transportation officials can make a business case for investing in resilience strategies. This was a key conclusion reached at a recent meeting of the AASHTO Committee on Transportation Security and System Resilience (CTSSR). A significant need exists in providing state transportation officials with such a framework and set of strategies.

This research topic will explore how a state DOT can institute formalized processes to ensure the public is aware of how resiliency is part of the organization’s overall mission and how to advocate for resiliency in the life cycle of a DOT’s planning, engineering, design, operations and construction activities. The proposed research would collect examples of state DOT communications best practices and lessons learned.

This research is directly related to the strategic plan/work plan for the Committee on Transportation Security and System Resilience (CTSSR), Committee on Performance-Based Management, Committee on Environment and Sustainability and other Program Delivery and Operations committees.

**3. Literature Search Summary**

CRP programs have devoted considerable resources to the resilience and security challenges facing transportation agencies (see TRB's periodic update review of such research at <http://onlinepubs.trb.org/Onlinepubs/dva/SecurityActivities.pdf>). A review of this literature shows that much of it focuses on physical or cybersecurity threats and how DOTs can prepare for, address, and respond to related disruptions. A good example of this type of research is *Protection of Transportation Infrastructure from Cyber Attacks: A Primer* (NCHRP 221/TCRP 67) that examines different functional areas of a DOT and how they can protect themselves against cyberattacks. Much of the literature focuses primarily on raising awareness of how important resilience is to the effective performance of transportation systems. When searching the research databases under "communications" and "resilience" labels, no references relating to the proposed research topic were returned (except as they related to communications technologies).

With respect to on-going or proposed research, the current NCHRP 20-117, “Deploying Transportation Resilience Practices in State DOTs” is focusing on guidance to state DOTs on how to become more resilient. Part of this project includes the development of a guidebook for state DOT officials on desired resilience actions, and one of the chapters in the guidebook presents the need for effective internal and external communications. However, the chapter will not provide detailed guidance on how to do so. The guidebook also suggests as part of this communications strategy the need to develop a cogent business case on why state DOTs should be concerned about resilience. This business case is intended to explain to other government officials, legislators, and the public why the DOT should spend funds on a range of activities that are needed in the event of major disruptions.

Although not a research project, it is noteworthy that several Transportation Research Board Committees sponsored a competition, “Communicating the Unique Challenge of Transportation Resiliency and Sustainability.” The winner of this competition presented at the October 8-10th, 2018 National Resilience Summit. Many applications were submitted indicating the interest in the topic.

The research proposed by this problem statement will build upon the NCHRP 20-117 project as well as others that have mentioned the need for effective communications for enhancing transportation system resilience and supporting resilience-oriented DOT activities.

**4. Research Objective**

This research will 1) examine state DOT communication strategies and processes to make the public and stakeholders aware of how resiliency is part of the state DOT's overall mission, and 2) build a business case for investing in resilience strategies. It is expected that the research would examine best communications practices of transportation agencies relating to both the evolutionary nature of considering resilience in agency activities and the more immediate communications efforts in response to disruptions (e.g., Georgia DOT bridge deck fire, Caltrans wildfires, South Carolina DOT hurricane efforts, and Washington State DOT I-5 Skagit River bridge collapse). The intent would be to analyze best case applications of effective communications strategies (including the technology of information dissemination) and lessons learned from recent disruptions. In addition, the research would focus on how to build a business case for including resilience in a DOT's activities.

The desired outcomes would include a guideline on identifying and implementing effective communications strategies, and prototype business case descriptions.

**5. Implementation Planning**

The guideline is expected to be very clear on the steps necessary to develop communications strategies to facilitate, and thus the implementation results of this research could be implemented with a modicum of out too much additional support. However, presentations at AASHTO meetings, peer exchanges aimed at specific target audiences, and webinars would be helpful in disseminating project results.

**6. Estimate of Problem Funding and Research Period**

Recommended Funding**:**

$300,000 research support

$50,000 dissemination support

Research Period:

18 months

**7. Urgency and Potential Benefits**

This research topic was identified by the CTSSR as one of the most pressing needs for state DOT officials in fostering a resilience culture in their agencies. As noted, there is almost no attention given to this topic in past or current research. As DOTs and state transportation officials increasingly face more system disruptions, having an effective communications program will be a critical component of their success in response. Given the nature of the topic and the importance it has for all those involved with transportation system resilience at all levels of a DOT, the research will create significant benefits to state DOT officials. The likelihood of implementation of research results is extremely high.

**8. Person(s) Developing the Problem Statement**

Kim Avery

Bureau of Field Services Director

Michigan Department of Transportation

269-337-3910

Averyk@michigan.gov

Timothy Sexton

Chief Sustainability Officer

Minnesota Department of Transportation

651-366-3622

Timothy.sexton@state.mn.us

**9. Nomination for AASHTO Monitor**

Timothy Sexton

Chief Sustainability Officer

Minnesota Department of Transportation

651-366-3622

Timothy.sexton@state.mn.us

**10. Potentially Interested AASHTO Councils and/or Committees**

Communications Committee, Environment and Sustainability Committee, Committee on Planning, Committee on Performance-based Management,

**11. Submitted By**

Michael P. Lewis, Chair of AASHTO Committee on Transportation System Security and Resilience

Executive Officer

Colorado Department of Transportation

303-757-9201

michael.p.lewis@state.co.us

Lorenzo Parra, Vice-Chair of AASHTO Committee on Transportation System Security and Resilience

Director Highway Operations Center

Massachusetts Department of Transportation Highway Division

617-946-3029

Lorenzo.parra@state.ma.us

*Please submit completed problem statement at:*

<http://bit.ly/NCHRP2020Submittal>

*Questions on the process can be directed to* lsundstrom@nas.edu.