

2022 Mid-Continent Transportation Research Symposium

Ames, Iowa

September 14–15, 2022

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Assessing and Enhancing the Transportation Resilience for the State of Iowa

Alice Alipour, Iowa State University

Abstract

Flooding, as a predominant destructive hazard, leads to significant direct damage to physical road infrastructure and causes noticeable indirect losses to the communities that rely on the road network. Therefore, it is important to understand the degradation of the network caused by floods to help decision makers and transportation asset managers take adequate preventive measures for floods while preparing for consequences of possible failures.

The system-level resilience framework developed can eventually be used as a tool by Iowa Department of Transportation (DOT) engineers to optimize the pre-event mitigation and post-event recovery strategies and prioritize investments while ensuring that the transportation system is capable of absorbing shocks, adapting to changing conditions, and rapidly recovering from disruptions.

The presentation will review the following topics:

- Define resilience goals or targets (e.g., functionality level after disruptive flood events)
- Understand system characteristics (e.g., resolution level on the network)
- Characterize disruption scenarios (e.g., extreme flood at various locations on Iowa road network)
- Estimate the consequences of failures (e.g., level of physical loss, traveler delay, economic loss, loss of accessibility)
- Find optimized solutions for possible mitigative impacts, especially in hotspot regions using an actual case study region