An assessment of probabilistic disaster of Arkansas transportation network: Resilience modeling concepts

Arkansas economy is highly reliant on the performance of the Arkansas transportation (ART) networks. However, AR transportation networks are susceptible to diverse threats and disruptions that can cause repercussions on the commerce and the economy.

The conditions of any disruptive event can be broadly characterized as intense, unsettling, and severe under both pre-and post-disaster applications.

This disruption in transportation networks incurs huge financial losses. Beyond financial losses, these disasters have wreaked havoc on business, manufacturing and production industry, job market, and devastation of human life.

So, How to make the AR transportation networks more resilient and sustainable under uncertainty?

To compensate above challenges, a comprehensive model will be developed based on the Machine Learning Technique utilizing Bayesian Network (BN) specifically to deal with risks and uncertainties associated with the complex network of AR transportation networks under disruption. The model can be used to investigate the potential for cascading failures and to prioritize critical components for repair, replacement, or reinforcement.

Proposed machine learned model can assess and predict disasters in the ART network based on seven main factors (environmental, technical, economic, social, political, safety, and legal) and help in developing a resilient transportation network within the State.

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Estimated Project Duration: 18 Months

Prepared By: Niamat Ullah Ibne Hossain, PhD
Agency: Arkansas State University
Phone: (662) 497-1129
Reviewer: Kim Romano

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