

Project Title: Development of Freeway Corridor Capacity Measure to Improve Transportation Resilience
<p>Project Abstract (Brief Description): Natural disasters like hurricanes and floods occur throughout the world. However, coastal areas tend to be the most vulnerable to these disasters. During imminent life and death conditions, such as those posed by hurricanes, evacuations are used as a protective action. And although evacuations have a long track record of success, they can be complex, costly, and at times even risky. Capacity is one of the most important characteristics of a freeway facility which quantifies its traffic carrying capability, and is a critical component to the resilience of transportation systems and the evacuation process. The current state-of-the-art is to define freeway capacity for a single, uniform (weaving, merge, or diverge) section of a freeway. However, measuring capacity on a single section instead of a corridor may overestimate the carrying capability that can be sustained throughout the freeway. This suggests that a vehicle traveling along a corridor may face flow breakdown at multiple bottleneck sections (which act as independent elements of a series system) and not only one. Thus, a comprehensive approach which considers the whole freeway corridor as a system consisting of multiple bottlenecks with different characteristics is needed to better assess its traffic carrying ability. The goal of this research is to introduce the concept of corridor capacity to better estimate the resilience of freeway operation. As such, the concept of Sustained Flow Index (SFI), the product of traffic volume (<math>(q_i)</math>) and its probability of survival (<math>(S_c(q_i))</math>) of a single, uniform section of a freeway, is extended to freeway corridor analyses. Based on the new derivations, the optimum volume (i.e. capacity) of a corridor can be estimated. A case study will be conducted in this research to estimate the capacity of a freeway corridor consisting of multiple bottleneck sections using traffic data from a coastal area.</p>
Describe Implementation of Research Outcomes (or why not implemented) - Place any photos here <i>To be determined upon conclusion of the project:</i>
Impacts/Benefits of Implementation (actual, not anticipated) <i>To be determined upon conclusion of the project:</i>
Web Links: martrec.uark.edu
Budget (Funding) Amounts & Source(s) (US DOT +Match(s) =Total Costs): \$69,714 (USDOT) + \$48,869 (Match) = \$118,583
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