



Fiscal Year (FY) 2024-25 Research Initial Scope of Work (ISOW)

Task ID: 4476

Task Title: California Multimodal Supply Chain Resilience Analysis

- What is the need? Resilience, as defined by the National Academies, is "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events". California's size and unique geography makes it vulnerable to climate change disruptions such as extreme weather events, coastal retreat, wildfires, and debris flows; seismic activity; and human caused disruptions such as pandemics and foreign policy changes. These disruptions impact the safety and economic competitiveness of Californians. When routes are closed, some communities have no alternative routes to receive essential goods. Disruptions also put the freight workforce and public into unsafe conditions and loss of profit. California needs comprehensive freight resiliency planning for the safety, equity, and economic competitiveness of the state. To begin the process of developing a Strategic Freight Resilience Plan, Caltrans will need to conduct an analysis of the California Multimodal Freight System to identify resilience strategies throughout the varied landscape. The call for freight resilience planning has come from the state and federal levels. National plans calling for freight resilience include the FHWA order 5520 and the National Freight Strategic Plan. FHWA Order 5520 (2014) establishes a call for policy on planning in preparedness to freight disruption in accordance with Executive Order 13653 regarding climate change. The National Freight Strategic plan identifies resilience as a goal of the plan to improve and maintain the national freight system. The 2021 Infrastructure, Investment and Jobs act also calls for resilience to climate concerns. The legislature specifically calls out resilience planning for the "enhancement of freight resilience to natural hazards or disasters, including high winds, heavy snowfall, flooding, rockslides, mudslides, wildfire, wildlife crossing onto the roadway, or steep grades" (Title I, Sec. 11110, 6C). Through this guidance, The Office of Strategic Planning identified the development of a statewide freight resiliency strategic plan as an objective in implementing Safety and Resiliency Goals in the 2023 California Freight Mobility Plan. Caltrans needs a Freight Resilience Plan for the health and competitiveness of California and the data derived from this research will allow The Office of Freight Planning to move forward with this project.
- What is the product? The proposed research will produce a report that identifies high-priority safety concerns on vulnerable state routes and proposes methods to assess and mitigate these threats. A key first step in this process is to identify critical and vulnerable

freight infrastructure and key supply chains that have resiliency concerns, based on a list of regionally focused climate stressors and likely impact if these were to cause service disruptions. Defining and creating thresholds for such assessment will help focus guidance on the most critical state facilities. The research will also provide a redundancy analysis of truck and rail networks, which will provide the state with information on which corridors could withstand disruptions and what industries could potentially be most affected in climate-related incidents. This spatial analysis will allow researchers to also identify communities with a lack of goods movement resilience, who could potentially suffer most if a disruption affected last-mile delivery or a key community industry.

3. What is the plan to implement the product following a successful research project? The conclusion of this research will lay the foundation of the California Freight Resiliency Plan. The information obtained will help guide the freight resilience vision and goals and how the Office of Strategic Freight Planning will provide strategies and technologies to address the areas of concern through a planning lens. Implementation will also include a distribution of the information gathered from this research in various Freight planning documents and can be used at the district level. The Office of Strategic Freight Planning and the Office of Technical Freight and Project Integration will lead the effort to produce the Freight Resiliency Plan by submitting an SPR study to use the data obtained in this research to finish the plan prior to the 2027 California Freight Mobility Plan.
4. Related Research: