

# **MAPPING FREIGHT NETWORK CONNECTIVITY IN PUERTO RICO: A GIS-BASED DASHBOARD**

*Yesenia Marie Rivera-Lopez and Carla Lopez Del Puerto*

Department of Civil Engineering, University of Puerto Rico – Mayaguez Campus  
yesenia.rivera7@upr.edu

Frequent coastal and inland flooding, including storm surges, tidal inundation, and heavy rainfall, can easily disrupt transportation services in Puerto Rico. The primary airport and main ports in Puerto Rico are situated along the coastline, rendering them particularly susceptible to natural disasters. For instance, flooding during Hurricane Fiona (2022) caused road closures and infrastructure damage throughout southern and central Puerto Rico, highlighting the need for resilient alternate routes (FEMA, 2022). Flooding causes significant economic losses by damaging transportation infrastructure and disrupting essential services such as freight movement. In the United States, the annual financial impact of flooding is estimated to range from \$180 billion to \$496 billion (US Congress JEC, 2024). Consequently, the efficiency of freight corridors is imperative for regional productivity and competitiveness. This project aims to assess freight transportation across Puerto Rico by developing a GIS-based dashboard that visualizes connectivity within the transportation network and displays concentration areas of cargo flow. The current phase focuses on mapping connectivity among ports, highways, secondary roads, and distribution centers, emphasizing freight activity in the primary ports of San Juan and Ponce, as well as the airports of San Juan (SJU) and Aguadilla (BQN). The study integrates multiple spatial datasets, including road networks, census demographics, municipal boundaries, and terminal locations. These mapping tools will serve as a foundation for informed decision-making and help enhance connectivity among regions of economic activity.