Challenge 6: Freight Modeling: Florida's Next Generation Freight Model

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Abstract

Freight movement has a major impact on the mobility and economy of the State of Florida. The state's seaports, airports, and railroads have long been major cornerstones of economic prosperity. Freight shipments through these facilities continue to increase at a rapid pace. Florida is poised to become a major player in the international shipping arena because of its unique geographic location. The continued success of freight transportation facilities depends on the interconnectivity of all modes of transportation throughout the state to effectively meet state, regional, and world market needs.

The Florida Department of Transportation has begun development of a freight forecasting process that combined tour-based truck models and logistics supply chain models to estimate statewide multimodal goods movements. The project applies a model framework that simulates shipments across the U.S., and then focuses on calibrating and validating goods movements by mode (truck, rail, water, and air) within Florida. The statewide model focuses on logistics supply chain models by synthesizing a population of firms, modeling the supplier – buyer relationships between then and the commodity flows that are generated by these relationships, simulating a set of individual shipments that travel through different supply chains, estimating shipment size and frequency (annually), and simulating mode and path choice including transfer facilities in Florida. The freight models are applied using R programs, integrated within the Florida Standard Urban Transportation Model Structure (FSUTMS) modeling system in Cube.

Data for model calibration, validation and forecasting is being developed from national and state sources, including freight facilities, goods movements, economic relationships, modal networks, modal costs, air and sea port operations, truck count and weight data, and truck probe data. The freight models will produce individual shipments of goods annually, as well as daily truck, rail, air and water volumes.

Key Words

Statewide, multimodal, freight forecasting, supply chain models, tour-based freight models, goods movement