



Project Number

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Freight Data Fusion from Multiple Data Sources for Freight Planning Applications in Florida

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Current Situation

Almost everything we buy, whether for home or business, arrives by freight, whether truck, train, or plane. Efficient freight movement is critical for the economic health of communities and regions. But as communities grow and populations shift, patterns of consumption change, and the patterns of freight movement must follow. Planning for, and responding to, these changes is a challenge because the data needed are often inadequate. There are numerous collections of data related to freight movements, but they often do not contain the type of data at the level of geographic detail that planners need.

Research Objectives

University of Central Florida researchers developed freight movement data with a fine geographic resolution and more detailed freight measurements by fusing data from existing sources. The fused database provided a basis for advanced modeling of freight flows.

Project Activities

The researchers conducted a review of available datasets related to freight movement, examining in detail six datasets: Freight Analysis Framework (FAF); Transearch (TS); a set of data products from American Transportation Research Institute (ATRI); Weigh-in-Motion (WIM); Vehicle Class Data (VCD); and Parcel Level Land Use Data (LUD). For each dataset, the researchers examined the information it included and the geographic basis for the data collection.

The researchers then reviewed methods of fusing datasets. A major challenge for any fusion effort is placing data from different databases in the same geographic framework. For example, FAF collects data for five multicounty regions in Florida, mostly labeled with the major city in the region whereas TS records information based on points of origin and destination. The researchers fused these datasets based on a maximum likelihood approach that allowed estimation of county-level freight flows. The fused dataset was then used with an economic model that shows how freight flows impact local economies. This capability was demonstrated using a scenario in which changes in freight flows were predicted for ten selected counties based on estimated increases in population and employment in those counties. The model demonstrated how freight flows of 13 commodities, such as agricultural products, paper, petroleum products, and even waste, would change.

In a second part of the project, the researchers used fused truck origin-destination flows estimated from ATRI data with commodity flows from TS to produce a dataset that shows the origin-destination flow tonnages for specific commodities within, into, and out of a study region. WIM data was used to validate the fused data for a Florida case study.

Project Benefits

An improved and more detailed understanding of freight flows is a valuable tool for transportation planners in a highly populated and rapidly growing state like Florida.

For more information, please see www.fdot.gov/research/.



Thousands of trucks a day use I-75 to carry freight throughout Florida.