Planning, Policy, and Programming

Urban Spatial Structure, Employment Sub-Centers, and Passenger and Freight Travel

Analysis examining how freight traffic within the Los Angeles metropolitan area is elated to the region's employment sub-centers.

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Project Title:
Urban Spatial Structure, Employment Sub-Centers, and Passenger and Freight Travel

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WHAT IS THE NEED?

Freight traffic is an increasingly important transportation topic. California's urban areas have dispersed employment sub-centers that, theory suggests, may be nodes for freight flows. Yet there has been little research documenting how freight traffic relates to employment sub-centers. We believe it is vital for California's transportation professionals and land use planners to have information about how freight traffic is associated with employment sub-centers of different types and sizes. Such knowledge would facilitate transport modeling that could better predict freight traffic based on the location of employment sub-centers. This knowledge can inform land use planning and transportation policy-making.

WHAT WAS OUR GOAL?

The goal is to develop a rich description and understanding of the way that freight traffic relates to the geographic pattern of employment sub-centers in the greater Los Angeles region.

WHAT DID WE DO?

Our research starts with two important steps in data collection and data development. We are using the National Employment Time Series to identify employment sub-centers in the Southern California Association of Governments region. After searching for appropriate freight traffic data sources we have identified data developed by the Southern California Association of Governments as the best available information on truck traffic flows between small areas (called transportation analysis zones)

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Research Results

in the study area. We have analyzed the freight flow data, identified employment sub-centers in the SCAG region, and we have completed descriptive analysis of the geographic pattern of freight flows. We have completed preliminary regression analysis to further understand freight flows and their link to employment sub-centers.

WHAT WAS THE OUTCOME?

We have obtained employment sub-center definitions from the National Employment Time Series (NETS) data for the SCAG study region. We have used the NETS data to identify employment sub-centers for the SCAG region. We have examined available freight data and obtained the best available source of freight travel data, at small geographies, for the SCAG region. We have analyzed the freight flow data and have concluded that using truck trip counts and flow densities is preferred. We have identified highway network links with high truck flows and are examining how those relate to employment sub-centers. We have completed descriptive and regression analysis of the geographic pattern of freight flows. We presented this research in a poster session at the Transportation Research Board meetings in January, 2016, and we are close to completing a draft report on the research. The report is anticipated in January or February of 2016. We will present results of the research at the Western Regional Science Association meetings in February, 2016. Employment subcenters in the greater Los Angeles region were identified from the National Employment Time Series (NETS) data for the SCAG study region. Freight activities associated with subcenters were characterized using data from the Southern California Association of Governments (SCAG). Using the results from the employment subcenters and freight activities analyses, a regression model was developed. The regression model estimates freight activity as a function of geographic characteristics,

including whether a location is in an employment subcenter, measures of nearby employment, access to the highway network, and proximity to intermodal freight facilities. The results indicate that employment is an important driver of freight activity, and employment subcenters have an independent effect on freight activity. The results of this study suggest that further research on urban form and freight activity should assess the effects of employment subcenters and how their particular employment composition and characteristics are associated with freight activities at the metropolitan level. Such an approach would feed into and help refine transportation planning models and lead

WHAT IS THE BENEFIT?

This research provides Caltrans with the first statewide estimates of pedestrian exposure, which will allow Caltrans to improve the quality of their pedestrian safety analyses by evaluating risk. In addition, the identification of a pedestrian crash typology allows alternative crash frequency-based HCCL identification methods to be applied which can evaluate the statistical significance of the presence/absence of specific crash types.
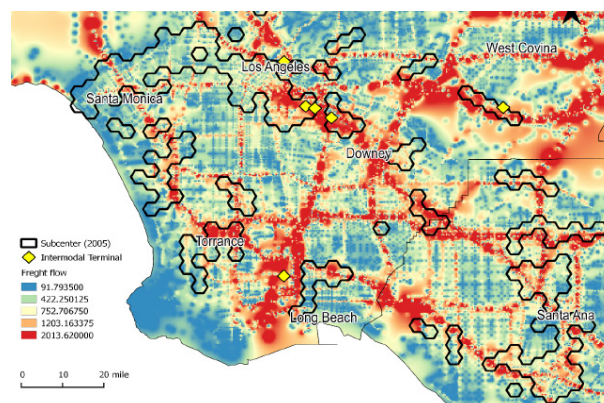
IMAGES

Figure 1. Heat map of freight flow using inverse distance weighting method