Center for Transportation Analysis

Non-Motorized Travel Study:

Identifying Factors that Influence Communities to Walk and Bike and to Examine Why, or Why Not, Travelers Walk and Bike in Their Communities

The idea of livable communities suggests that people should have the option to utilize non-motorized travel (NMT), specifically walking and bicycling, to conduct their daily tasks. Forecasting personal travel by walk and bike is necessary as part of regional transportation planning, and requires fine detail not only about individual travel, but also on transportation and neighborhood infrastructure. In an attempt to characterize the "market" potential for NMT, the Office of Planning, Federal Highway Administration (FHWA) funded the Center for Transportation Analysis (CTA) of the Oak Ridge National Laboratory (ORNL) to conduct this study.

This study relied on information collected under the 2009 National Household Travel Survey (NHTS) as the major source of data, and was supplemented with data from American Community Survey (ACS), educational survey, health, employment, and others. Initial statistical screening methods were applied to sort through over 400 potential predictor variables, and examined with various measures (e.g., walk trip per person, walk mileage per person, bike trip per person, bike mileage per person) as the dependent variables. The best geographic level of detail used in the modeling for this study was determined to be the Census block group level for walking and Census tract level for biking.

The need for additional supplemental private data (i.e., Walk Scores and Nielsen employment data), and geospatial information that reflects land use and physical environments, became evident after an examination of findings from the initial screening models. To be feasible, in terms of costs and time, the geographic scale of the study region was scaled down to nine selected NHTS add-on regions. These regions were chosen based on various criteria including transit availability, population size, and a mix of geographic locations across the nation. Given the similarities in modeling results from walk trips and walk mileages, additional modeling efforts conducted under the later part of this study were focused on walk trips per person.

Findings

Major Factors impacting walking include:

Household demographics: drivers, household/person counts, income, education, language and race, vehicle ownership, and gender

Employment variables: worker and job type, means of transportation to work, time leaving from home to work, trip length (in time) to work, total number of employment, as well as total retail employment

Activity measures: obesity and inactivity, as well as walkability and transit accessibility

Destination of travel: trip purpose in destination block group

Research Areas

Freight Flows

Passenger Flows

Supply Chain Efficiency

Transportation: Energy Environment

Safety Security

Vehicle Technologies

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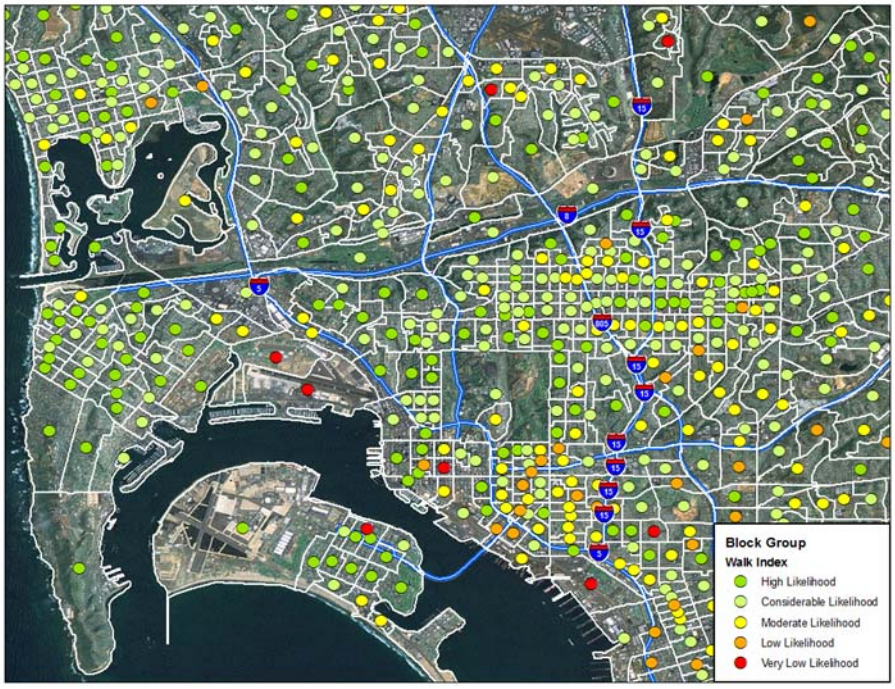
Other factors: land use and urban indicator

*Examination of the performance of this **discriminant function suggested promising results**.*

The final discriminant function with the final set of variables was developed using 75% of the records from the study data set (i.e., training data set). This function was then evaluated with the remaining 25% of the records from the study data (i.e., testing data set). Based on this result, the error rate on misclassifications was found to be about 30%.

Walk Indices

Walk indices were computed for block groups within the study region, using the discriminant function formulation as developed under this study.



Estimated walk indices for block groups in San Diego, CA.

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