

THE UNIVERSITY OF CONNECTICUT

CIVIL & ENVIRONMENTAL ENGINEERING

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Market Segmentation of Travel Mode Choice with an Alternative Source of Travel Time Data

ABSTRACT

Transit ridership has been declining in the United States and is losing market share to private automobiles (Taylor, 2013). Moreover, transportation is now the largest contributor of GHG emissions in the country (EPA, 2018), the bulk of which comes from private automobiles. One effective strategy to reduce GHG emissions from this sector is to nudge people to use public transportation. This is a nontrivial task as the literature on the factors affecting transit usage is surprisingly uneven. It is therefore important to study the characteristics of the travelers in a particular region and understand what influences their travel choices to find possible ways to increase transit mode share. The objective of this thesis is to investigate this topic using an advanced modeling framework and an alternative source of travel time data. Firstly, this thesis explores the use of travel times retrieved from Google Maps over the traditionally used highway and transit skims retrieved from regional travel demand models. It was shown that Google Maps API provides a more accurate representation of the network and result in better choice sets for individuals. Secondly, the concept of market segmentation was applied for investigating travel mode choice in the Hartford metropolitan area using a Latent Class Choice Model (LCCM). Latent classes are formed based on the characteristics of the travelers and choice models are estimated to model their choice behavior. A model with four classes was estimated for this study where only one of segments was multimodal in their choice of travel mode, the rest being auto-dependent. But they're distinguishable by their sensitivity to transit level of service, as one auto-dependent segment is highly sensitive to transit service whereas others are not. It was found that some segments of the population are likely to respond to transit service improvements, and some segments are unlikely to respond. This thesis examines the characteristics of these segments to understand their choice behavior. Insights from the study can be used to develop strategies to increase public transit mode share.