ABSTRACT

This research implements an additive travel cost model to calculate and compare the perceived cost of commuting by transit and driving at a disaggregated level. The model uses open source General Transit Feed Specification (GTFS) data and "Yay Transit!," an ArcGIS tool developed by Melinda Morang and Patrick Stevens of Esri, to create a transit network for the Washington DC metropolitan area. Departure sensitive route paths and travel times on transit are solved through the Route Tool of the ArcGIS Network Analyst Extension and compared to travel data calculated using Waze for driving between similar origins and destinations. Additional travel cost components are plugged into additive cost formulas designed to resemble the mode choice modeling formulas created by MWCOG (Metropolitan Washington Council of Governments) in order to compare the perceived cost of one mode over the other.

Results from this model suggest that taking transit is in general less cost effective than driving for even some of the most transit advantageous commutes. Transportation Demand Management opportunities to most effectively "balance" the perceived cost of transit and driving are identified through assessing variable sensitivity of the additive formula. This research provides a methodology that could be reproduced in mass in order to gage the complex interconnectivity of an urban transportation network. The author suggests hosting this information in an online tool which will assist government and the public in understanding the cost effectiveness of transit versus driving for any given commute situation.