

RESEARCH SUMMARY

DEVELOP A MODE CHOICE MODEL TO ESTIMATE WALK AND BIKE TRIPS IN THE STATEWIDE MODEL

WHAT WAS THE NEED?

The walking and biking traffic environment has faced significant challenges due to the increased number of vehicles, traffic speed, and safety risks. A good non-motorized mode choice could accurately estimate walking and biking demand and support infrastructure planning and policies of active transportation. Current mode choice on biking and walking has two limitations: lack of information on all alternative travel modes for non-motorized trips; and Level of Traffic Stress (LTS), one of the influential factors, is not incorporated in the non-motorized choice model. Maryland currently does not have a statewide non-motorized model choice model.

WHAT WAS THE GOAL?

This research aims to estimate a state-wide mode choice model in Maryland including biking, walking, transit, and private vehicles, using a comprehensive LTS dataset and trip-level information of all alternative travel modes requested from Google Maps. The choice model can be applied to develop active transportation policies.

WHAT DID THE RESEARCH TEAM DO?

The research team applied a unique real-world dataset which contains the LTS for over 140 thousand roads in Maryland. In addition, for more than 50,000 trips collected from the Maryland statewide household travel survey, the research team acquired

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trip-level information (i.e., distance, cost and time) of all four modes, private driving, public transit, walking and biking, from Google Maps API. The research team chose Google Maps because it has a large historical route choice dataset and provides multiple routes for each travel mode as close as to real-world travels. The research team constructed a multinomial logit model to estimate the effects of all influential factors on residents' mode choices in Maryland. A case study was developed to explore the LTS impact on changes in mode share of walking and biking across different infrastructure and travelers' characteristics.

WHAT WAS THE OUTCOME?

The results showed that LTS plays an important role in improving the model performance. LTS has a significant and negative correlation with walking and biking. LTS impact on biking and walking is heterogenous across different travelers. Transportation planners and engineers should prioritize strategies, such as traffic calming measures, to create a low-stress travel environment to encourage the use of active travel modes. The choice model demonstrates that LTS improvement projects should be strategically prioritized in specific

locations and supported by targeted policies to maximize their impact

HOW WILL MDOT SHA USE THE RESULTS?

The Technical Lead or the Project Champion will add this information.

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