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Making Every Mode Count in Washington State

Krista Nordback

Portland State University, nordback@pdx.edu

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MAKING EVERY MODE COUNT IN WASHINGTON STATE

A NITC project compared three different methods for computing pedestrian and bicycle miles traveled in Washington State.

The Issue

Vehicle miles traveled, or VMT, is an indicator of how many vehicles use a roadway system. In planning for automobile transportation, no policy or other decisions can be made without an estimate of VMT, since it measures the amount and distance a proposed project might cause people to drive. No similar metrics exist, however, for bicycle and pedestrian transportation. In order to appropriately plan investments in walking and bicycling infrastructure, planners need some indicator of how many people might walk and bike in a given area.

A NITC report by Krista Nordback of Portland State University offers a step toward establishing a performance metric by which statewide progress with respect to bicycling and walking can be evaluated. The Washington State Pedestrian and Bicycle Miles Traveled Project discusses the relative merits of three different methods which can be used to compute bicycle miles traveled (BMT) and pedestrian miles traveled (PMT).

The Research

The three methods investigated for Washington State were a survey-based method, a sample-based method, and an aggregate demand model. Due to data limitations, none of these methods could be properly implemented on the statewide level. Despite the data limits, the methods were implemented for one county (King County) in order to compare findings. The travel survey method estimated the lowest BMT and PMT, and the sample-based method estimated the highest.

THE ISSUE

To effectively plan for bicyclists and pedestrians, planners need estimates of bicycle miles traveled (BMT) and pedestrian miles traveled (PMT).

THE RESEARCH

This research evaluated three methods for calculating BMT and PMT:

- A survey-based method using NHTS data;
- A sample-based method using short-duration counts;
- An aggregate demand model.

IMPLICATIONS

Such data will help states quantify biking and walking to inform decision-making, facility design and planning, and safety analysis.

Photo: Continuous bicycle count station on Seattle's Fremont Bridge, installed in 2012.

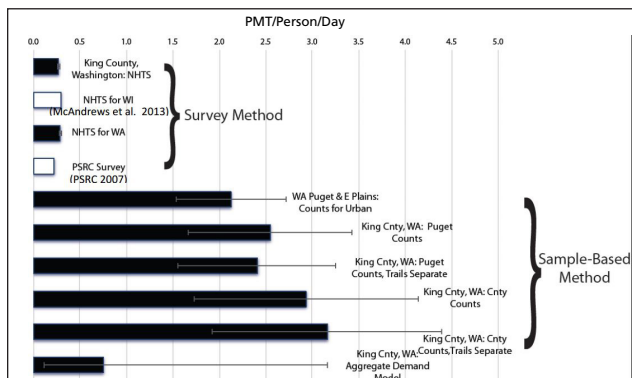
The first approach used data from the National Household Travel Survey (NHTS). Ideally, data from a Washington State travel survey would be used for this estimate, but no such household travel survey exists for the state. PMT and BMT estimates were produced by multiplying the average miles of cycling per person per year by the population. While these are national numbers, not specific to Washington, this method served as a comparison for other methods.

The second approach is sample-based, using pedestrian and bicycle count data sampled from 24 location types based on two levels of urbanity, four regions and three facility types. This method involves selecting sample sites randomly from each group and collecting short-duration counts at each site, then computing seasonal, daily and hourly adjustment factors based on continuous-count data. Once these factors are applied to short-duration counts, average annual daily bicycle (AADB) and pedestrian (AADP) traffic can be estimated at each site. The report demonstrates how to then use the AADB and AADP to arrive at estimates of annual BMT and PMT.

The third approach is an aggregate demand model approach, using demographic data combined with count data. This method also uses the AADB and AADP estimations calculated from manual and automated count data. It takes into account variables such as facility type, population density and certain demographic information, such as age and education, that has been previously found to be correlated with levels of bicycling and walking.

Implications

In order to directly compare the three methods, Nordback’s team tested each of them on the area of King County that lies within the Puget Lowland region of Washington State. This area was chosen since it had the necessary data to employ all three methods.



PMT Methods Comparison

This figure shows the estimates of pedestrian miles traveled for King County derived from the survey- and sample-based methods. Solid black bars are data from this report.

Gauging accuracy is difficult, because the actual values of BMT and PMT are unknown. Overall, while the count data are not representative of the state at large, the data do include a much more far-ranging sample of the state than data from a single municipality, county or region. Due to a lack of representative data, it is not possible to confidently estimate BMT or PMT for the state of Washington. The data sources for each method would need to be improved in order to obtain a more reliable estimate of bicycle and pedestrian miles traveled. Additional data sources, such as GPS data, could also enhance the two count-based methods discussed by filling in gaps in knowledge.

PROJECT INFORMATION

TITLE: Washington State Pedestrian and Bicycle Miles Traveled Project

LEAD INVESTIGATOR: Krista Nordback, Ph.D., Portland State University

PROJECT NUMBER: 2015-708

CONTACT: Justin Carinci, 503-725-2843 carinci@pdx.edu

MORE INFORMATION <http://nitc.trec.pdx.edu/research/project/708>