Using measures from various sources, we are able to estimate both bicycle and pedestrian miles traveled in Washington State. This is done by investigating alternative methods for determining how many people use various transportation methods, and how these numbers can be aggregated to estimate statewide totals. We will investigate:

- The various data sources used,
- The limitations of each method,
- And conclude with some recommendations for future research and study.

DATA SOURCES

National Household Travel Survey
Estimates (All of Washington)

Count-Based Estimates
(Puget and Eastern Regions)

Aggregate Demand Estimates
(King County)

DATA SOURCES

National Household Travel Survey estimates for statewide bicycle and pedestrian miles traveled (BMT and PMT) are based on two methods: a ‘back of the envelope’ computation was made using the 2001 National Household Travel Survey, and the National Household Travel Survey in combination with UDOT data. BMT and PMT estimates were then compared (Puich et al. 2011). In order to compare the count-based and aggregate methods more directly, we will use:

- A national survey method
- A statewide survey method
- Counts

METHODS

Count-Based

This method uses survey data from automated and manual counts. Count locations are divided into groups:

- Two groups of counties:
  - Urban/rural
  - Metropolitan

- Three groups of roads:
  - Freeway
  - Arterial
  - Local

- Three groups of pedestrian types:
  - Urban
  - Rural
  - Trails

- Three groups of land-use categories:
  - Commercial
  - Industrial
  - Residential

The equation for the bicycle volume model is:

\[
\log(AADB + 1) = 0.620 + (1.766 \times 10^{-5})x_1 + (0.0036)x_2 + (0.0043)x_3 + (0.0002)x_4 + (0.0001)x_5
\]

The equation for the pedestrian volume model is:

\[
\log(AADP + 1) = 1.342 + (3.784 \times 10^{-5})x_1 + (0.0036)x_2 + (0.0043)x_3 + (0.0002)x_4 + (0.0001)x_5
\]

- \(x_1\) = Percent of the population between 18 and 54 years old
- \(x_2\) = Percent of households in metropolitan areas
- \(x_3\) = Percent of trips made by public transit
- \(x_4\) = Percent of trips made by bicycle
- \(x_5\) = Percent of trips made by pedestrian

Aggregate Demand

This method uses the AADB and AADP estimates calculated from manual and automated count data. Each AADB and AADP estimate was then associated with the variable found in the following equation:

\[
AADB = 0.620 + (1.766 \times 10^{-5})x_1 + (0.0036)x_2 + (0.0043)x_3 + (0.0002)x_4 + (0.0001)x_5
\]

\[
AADP = 1.342 + (3.784 \times 10^{-5})x_1 + (0.0036)x_2 + (0.0043)x_3 + (0.0002)x_4 + (0.0001)x_5
\]

In order to estimate the AADB and AADP estimates for Washington State, we used the AADB and AADP estimates for the Puget Sound and Eastern Regions, and then applied the same model to the Washington State data.

RESULTS

While these methods of calculating BMT and PMT have the potential to provide rough estimates, much more data is necessary in order to accurately estimate these statewide measures. It is recommended that WSDOT broaden their count program geographically, randomly select count locations, and use more permanent automated bicycle counters to these facilities as a result of this research.

NEXT STEPS

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