Public Transportation Decision Making

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Public Transportation Decision Making
Ben Warner, mentored by Sven Wilson
Master's of Public Policy Program

Introduction
People make decisions regarding whether they will use public transportation based on many factors. I create a logistic binary response model where one’s decision about whether to use public transportation is a function of the size of a city that the person lives in, number of vehicles the person’s household has available, household income, working status, and day of the week. Workers may find public transportation more convenient if the transportation is close to their home. This is more likely to occur in an area with high population density.

Hypothesis
My hypothesis is that a person living in a higher population density area will be more likely to use public transportation than a person living in a less densely populated area.

Data
My data comes from the 2009 National Household Travel Survey. People in the survey recorded all their trips on a given day and also answered questions about themselves and their family.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Effect</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan area population category</td>
<td>.01</td>
<td>1%</td>
</tr>
<tr>
<td>Worker status</td>
<td>-.004</td>
<td>1%</td>
</tr>
<tr>
<td>Vehicles available</td>
<td>-.007</td>
<td>1%</td>
</tr>
<tr>
<td>Household income</td>
<td>0</td>
<td>Not significant</td>
</tr>
<tr>
<td>Weekend travel day</td>
<td>-.017</td>
<td>1%</td>
</tr>
</tbody>
</table>

People living in a metropolitan area with a large population are more likely to use public transportation than those living in a small area. Because the results measure the likelihood of an individual using public transportation, rather than simply total ridership, this suggests that population density is a major determinant of public transportation usage. Also, people are 1.7% less likely to use public transportation on a weekend, workers are .4% less likely to use public transportation, and for each extra vehicle that a person’s household has available, that person is .7% less likely to use public transportation. Household income has little effect on one’s decision to use public transportation.

Conclusion
When making decisions about how much public transportation a city needs, planners can take into account city size. A higher population city will have a higher demand per person for public transportation than a lower population city.