Rethinking the Future of Alternative Transportation in Light of Millennial Usage

A study by Robert Case and Seth Schipinski

Presented to TPRAC
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• Recently Published Reports:
  Millennials use alternative transportation

  “Millennials”: born 1982 thru 2000 (age 15-33 today)

• Ensuing Question:
  Given these reports, should we plan for higher demand for alternative transportation in the future?
• **Initial Finding**
  In the U.S., **Millennials** use alternative transportation more than others:  
  11% vs. 8%.

• **Research Question**
  Will usage of alternative transportation increase proportionately in the future?

![Mode Share Chart](chart.png)

Source: HRTPO staff analysis of 2009 NHTS data (PER2PUB- key columns- wrks & others.xlsx)

• **Research**
  What’s causing current difference?
  
  - **Generation**? (static)
  - **Age**? (changes)
  - **Income**? (changes)
Data

• 1983, 1995, and 2009 National Household Travel Surveys (NHTS)
  – multiple eras needed to separate age and generation

• Coverage: U.S.
  – not enough HR data in pre-2009 surveys

• Records: 170,947 person records

• Modal Statistics:
  – 6% of (working) persons used alternative means to get to work
    • 0.5% biked
    • 2.3% walked
    • 3.5% used public transportation
Multiple Regression Analysis

- **Performance Measure:**
  - usage of alt trans (yes:1, no:0)

- **Factors** related to mode choice:
  - Age
  - Generation
  - Era (multiple eras needed to separate age and generation)
  - Gender
  - Income
  - Location (degree of urbanization)

- **Type:** Logistic (due to performance measure being binary [0,1])
• Usage of alternative trans being binary (0,1), regression results are “odds factors”.

• “Odds”:
  – e.g. 4:1 odds (no:yes) -> 1yes / 5total or 20% chance

• “Odds Factors” increase odds
  – e.g. (4:1 odds) * (odds factor 2.0) -> 4:2 odds or 33% chance
All other things being equal (income, age, etc.), living in a large MSA gives a worker higher odds of using alternative transportation.

Note: Bars show 95% confidence interval.

Source: HRTPO Staff analysis of NHTS data (results charts- 170k records- alt trans.xlsx)
Living in an Urbanized Area gives a worker much higher odds of using alternative transportation.

Note: Bars show 95% confidence interval.

Source: HRTPO Staff analysis of NHTS data (results charts- 170k records- alt trans.xlsx)
Other than the teenage category, being in a particular age group does not affect the odds of using alternative transportation.

Note: Bars show 95% confidence interval.

Source: HRTPO Staff analysis of NHTS data (results charts- 170k records- alt trans.xlsx)
**Findings**

**Being male** gives a worker slightly higher odds of using alternative transportation.

Note: Bars show 95% confidence interval.

Source: HRTPO Staff analysis of NHTS data (results charts- 170k records- alt trans.xlsx)
Living in a **low-income** household gives a worker much higher odds of using alternative transportation.

![Graph showing odds factor by total annual household income](chart.png)

Note: Bars show 95% confidence interval.

Source: HRTPO Staff analysis of NHTS data (results charts- 170k records- alt trans.xlsx)
All other things being equal (income, generation, location, etc.), living in recent decades gives workers lower odds of using alternative transportation.

Note: Bars show 95% confidence interval.

Source: HRTPO Staff analysis of NHTS data (results charts- 170k records- alt trans.xlsx)
There appears to be a small **Millennial** generational effect. All other things being equal (income, location, etc.), being a member of the **Millennial** generation was **positively related** to usage of alternative transportation in the data set.

Note: Bars show 95% confidence interval.

![Graph showing generational effects](chart.png)
Source: HRTPO Staff analysis of NHTS data (results charts- 170k records- alt trans.xlsx)
Staff used the model to prepare a **forecast** of usage of alternative transportation in Hampton Roads (HR):

**Assumption:** HR workforce of the future is same as today except for generation

- We gave all future workers the Millennial factor (1.2 odds ratio)

**Result:**

<table>
<thead>
<tr>
<th>Year 2010 based on Census</th>
<th>Year 2050 based on model</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3%</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

Hampton Roads (7 cities)
Conclusion
The Millennial generational effect appears to be a positive factor concerning usage of alternative transportation.

Under one scenario, HRTPO staff would expect usage of alternative transportation for commuting in Hampton Roads to increase from 5.3% (2010) to 5.7% (2050).

Implementation
HRTPO staff is considering all seven factors when planning alternative transportation infrastructure.

 e.g. current Signature Paths project
• **Scoring candidate rail-trails** in Hampton Roads
  – Measure of effectiveness:
    • usage of active transportation (biking and walking only)
      – Model based on income categories of households in vicinity

• **Presentation at TRB** of Future of Alternative Transportation in Light of Millennials