Effects of Road Vehicle Automation on Intercity Travel Mode Choices

April 24, 2014

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Longitudinal Survey of Overnight Travel (LSOT)

- Unique dataset, compared to ‘95 ATS
- Feb ‘13 – Jan ‘14
- 1200-630 respondents, across country
- 9000 completed overnight trips
- Planned and completed trips
Types of Intercity Travel

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Pct Change 1977-2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shopping</td>
<td>636%</td>
</tr>
<tr>
<td>Personal Business and Medical</td>
<td>142%</td>
</tr>
<tr>
<td>Sightseeing, vacation and relaxation</td>
<td>606%</td>
</tr>
<tr>
<td>Entertainment</td>
<td>95%</td>
</tr>
<tr>
<td>Outdoor Recreation</td>
<td>-19%</td>
</tr>
<tr>
<td>Business or Convention</td>
<td>142%</td>
</tr>
<tr>
<td>Visit Friends and Family</td>
<td>67%</td>
</tr>
</tbody>
</table>
Intercity Travel Mode Choices

- **1977 ATS**: 80% of person trips
- **1995 ATS**: 80% of person trips
- **2001 NHTS 100+**: 80% of person trips

The chart illustrates the percent of person trips for intercity travel mode choices over the years 1977, 1995, and 2001.
Factor 1: Travel Time & Costs

• Major Trends
  – Six hour or more travel time ... non auto modes
  – Expense of multiple travelers ... auto modes

• Potential AV Influence
  – More overnight AV travel
  – Now includes quality together time
Factor 2: Mobility at Destination

• Major Trends
  – Frequent travel around destination ... auto modes
  – Multiple destinations ... auto mode

• Potential AV Influence
  – Flexibility at destination, like other shared vehicles
  – Semiautonomous may be supported locally
Factor 3: First/Last Mile Problem

• Major Trends
  – Ease of getting to/from terminals ... non auto modes
  – Means strong infrastructure in places

• Potential AV Influence
  – Good for areas without strong infrastructure
  – Less impact on already developed areas
Factor 4: Distance Traveled

• Major Trends
  – Travel within region ... auto modes
  – Travel beyond region ... non auto modes

• Potential AV Influence
  – Like cost, may see increase in overnight trips
  – Also issues of navigating new destinations
Factor 5: Length of Stay

• Major Trends
  – Longer stays ... auto modes
  – Shorter stays ... non auto modes
  – Tied to distance and travel times

• Potential AV Influence
  – Relatively minor influence
Factor 6: Productivity / Comfort

• Major Trends
  – Travelers needing productivity ... non auto modes
  – Travelers needing comfort ... auto modes

• Potential AV Influence
  – The ability to relinquish control offers many opportunities to convert travelers to AV
Factor 7: Travel Party Composition

• Major Trends
  – Families with younger children ... auto modes
  – Many non-related people ... non auto modes

• Potential AV Influence
  – Relatively minor influence
Factor 8: Origins & Destinations

• Major Trends
  – Travel from rural areas ... auto modes
  – Travel from urban areas ... non auto modes

• Potential AV Influence
  – Shared AV beneficial within urban areas
  – Opportunity within rural areas, support paratransit
  – Relatively minor influence on intercity travel
Factor 9: Tripmaking Types & Frequency

• Major Trends
  – Travelers who make many trips ... auto modes
  – Work trips ... auto modes / non auto modes
  – Leisure trips ... non auto modes
  – Tied to trip distance and length of stay

• Potential AV Influence
  – Work/ frequent trips will benefit from AVs
Factor 10: AV Ownership (& HH Characteristics)

• Major Trends
  – Those who own AVs are more likely to use them!
  – Income, education, number of vehicles, time constraints all considerations

• Potential AV Influence
  – Those that can afford AVs will most likely take shares from air and rail
Implications for Data Collection

• Focus on sensitivities
• Comparison of AV trips vs. traditional trips
• Stated preference surveys
  – Between O-D travel
  – Within destination travel
• Links with daily travel patterns
Implications for Modeling

• Models should...
  – Consider longer timeframes (e.g. year)
  – Incorporate past behavior
  – Jointly model daily and intercity travel
  – Segment by trip type and scale
  – Tier between & within mode choices