Long Distance Travel Data: Challenges and Opportunities

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NHTS Workshop Session 7c
Outline

- Differences between daily and long-distance travel demand
- Challenge of defining long-distance travel
- Challenge of obtaining enough samples to estimate flows
- Importance of understanding the traveler
Difference Between Long-Distance and Daily Travel
Incidence Rate and Purpose Differences...

- 38 percent of people make no long distance travel in an average year
- 12 percent of people do not leave the house in an average day

Source: McGuckin’s analysis of ATS/NHTS
Day of Week and Seasonal differences

Source: McGuckin’s analysis of ATS/NHTS
Different Factors Correlated to Travel Demand...

Source: "Exploring the Full Continuum of Travel: Data Fusion by Recursive Partitioning Regression" Contrino, H., McGuckin, N, and Banks, D., IATBR, July 2000
Long-Distance Data: Focus on three challenges

- Defining Long-Distance Trips
- Obtaining Sufficient Samples
- Understanding the Context and Decision-maker
Defining ‘Long-Distance’ Travel
Challenge: Different trip definitions capture different kinds of trips...

- Pers/Fam or Medical
- Leisure
- Visit Friends/Rel
- Business and Bus/Pleas

Source: McGuckin’s analysis of 2001 NHTS Long Distance, one-way distance
Average one-way trip distance is between 300 and 500 miles across all purposes...

Source: McGuckin’s analysis of 1995 ATS and 2001 NHTS
Average trip length has remained relatively stable over time by mode...

Source: 1977 and 1995 ATS published figures (Henderson and Trani)  
2001 NHTS author’s analysis
Mid-range trips (300-1000 miles) are where the mode shift occurs...

Source: McGuckin's analysis of 1995 ATS, GCD one-way distance
Challenge: Understanding mid-range mode decisions...

Travel by Distance Pre-9/11

Travel by Distance After 9/11

Source: McGuckin’s analysis of 1995 ATS and 2001 NHTS (post 9/11) trips of 100 miles or more one way, POV plus Air only
Mode of access is needed to determine total travel time/cost

Source: McGuckin’s analysis of 1995 ATS

Mode of Access to Airport/Station (Non-POV)

- **Taxi**: Approximately 10%
- **Limo/Shuttle**: Approximately 6%
- **Subway/bus/rail**: Approximately 8%

Legend:
- Purple: Air
- Green: Bus/Train Sta.
Travel party size effects mode decisions...

Source: McGuckin's analysis of 1995 ATS
Challenge: The purpose of travel is needed to understand trends and changes over time...

![Graph showing travel purpose trends]

Source: 1977 ATS published figures, authors analysis of 1995 ATS and 2001 NHTS

2001 NHTS only trips of 100+ miles included

* Includes shopping
The Challenge of Sample Size
Challenge: We want to know how many people are travelling from each state...to every other state.
Challenge: We want to know how many people are travelling to each state...from every other state.
Challenge: Many people don’t make any long distance trips...

Percent of People by Travel Status

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Working full time</th>
<th>Retired</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero Long Distance</td>
<td>38%</td>
<td>30%</td>
<td>46%</td>
<td>42%</td>
</tr>
<tr>
<td>Travels Long Distance</td>
<td>62%</td>
<td>70%</td>
<td>54%</td>
<td>58%</td>
</tr>
</tbody>
</table>

McGuckin’s analysis of 1995 ATS
Challenge: Most long distance trips (100+) are within the same State...

Person Trips by Destination Type
- Same State: 45%
- Neighboring State (same Census Division): 21%
- Regional Trip (same Census Region): 13%
- Different State, division, and region: 11%

Person Miles by Destination Type
- Same State: 49%
- Neighboring State (same Census Division): 20%
- Regional Trip (same Census Region): 19%
- Different State, division, and region: 12%

Source: ATS 1995 (published)
Challenge: long distance trips (100 miles or more) are predominately private vehicle trips

Source: ATS 1977 and 1995 (published) and McGuckin’s analysis of NHTS 2001 Long Distance
Understanding the Traveler
As social networking increases, long-distance travel IRL may be increasing**

People in urban areas with many attractive destinations may travel less frequently*

People who have strong household ties, such as small children, may travel less*

Baby boomers in second life may increase frequency of recurring long trips to university and second homes

As social networking increases, long-distance travel IRL may be increasing**

The dispersion of treatment centers and specialists may increase recurring long trips for medical purposes

*Henderson and Trani, 2008  **Auxhuasen, 2008
Long-Distance travel behavior is about motivation, resources, constraints, obligations

- **Trip purpose is linked to travel party size** (sometimes the fun is in going together)

- **Travel party size effects mode choice** (bring the kids and we can’t afford to fly)

- **Mode choice can be made before destination choice** (where can we drive to this weekend?)
We also need to understand the effect of infrastructure and service....
Without *travel flow data* we can’t analyze the relationships that build the models that fuel the forecasts that help make good decisions ...
Joint Program in Survey Methodology expert panel design suggestions include:

**Suggestion:**

- Area probability sample to improve coverage and response rates
- Face-to-Face interviews in round 1 to improve panel response rates
- Panel design to collect one-year of travel reports from the same household
- One month reference period for trips between 50 and 100 miles, three month reference for 100 miles and longer to improve trip reporting

**Challenge:**

- How to draw a representative address sample (PSUs)
- How to conduct face to face interviews at a national scale with a large sample
- Non-response increases with multiple contacts, but we need one-year reports to make annual estimates
- Different trip definitions in the same survey can be confusing...people don’t know how far they’ve travelled

Cite: paper by Bose, Geisbrecht, Sharp?
Good data results from good research:

- What sample sizes are required for state to state and corridor level estimates?
- Can a national study be designed with an area-probability sample? (address-based?)
- Effect of the length of the recall period on reports of different kinds of trips
- Effect of different modes for responding: e.g. mail-back, web, phone
How can we use new technology to inform the process?

- Travel volumes can be counted through new technology such as BlueTooth: Challenge is identifying the traveler for follow-up.
- In-vehicle navigation systems (such as TomTom) may sell OD data: Challenge is determining representativeness.
- License plate capture can be used to re-identify long-distance traveler: Challenge is identifying vehicle owner for follow-up.
- Possibility of GPS base sample (huge) with web-based, incentivized prompted recall (for purpose, travel party size, demographics): Challenge is low response/participation.
Thank you!

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