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...

Incidence

- 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

Purpose

- Visit Frnds/Rel: 20 percent of daily, 30 percent of long distance
- Other (inc Shop): 10 percent of daily, 40 percent of long distance
- Leisure: 15 percent of daily, 35 percent of long distance
- Business alone: 15 percent of daily, 25 percent of long distance

Source: McGucken's analysis of ATS/NHTS
Day of Week and Seasonal differences

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

![Bar chart showing different factors correlated to travel demand, with categories such as Family Type, Education, Marital Status, Income, Geographic Area, Household Size, Age, Sex, Number of Vehicles, Worker, and Race. The chart indicates the percent explanatory power for each factor, with some factors more strongly correlated to daily travel than leisure travel.](chart.png)
Long-Distance Data: Focus on three challenges

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

![Bar chart showing different trip purposes and their distribution by distance.]

- **Pers/Fam or Medical**
  - 100 miles and more: 10%
  - 50-99 miles: 20%

- **Leisure**
  - 50-99 miles: 20%

- **Visit Friends/Rels**
  - 100 miles and more: 30%
  - 50-99 miles: 20%

- **Business and Bus/Pleas**
  - 100 miles and more: 40%
  - 50-99 miles: 10%

**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...

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)

Percent

<table>
<thead>
<tr>
<th>Mode of Access</th>
<th>Air</th>
<th>Bus/Train Sta.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Limo/Shuttle</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Subway/bus/rail</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: McGuckin's analysis of 1995 ATS
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...

Visit relatives or friends  
Business or convention  
Vacation, recreation, entertainment  
Personal/family affairs or medical*

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...

McGuckin’s analysis of 1995 ATS

Percent of People by Travel Status

- Total: 38% Zero Long Distance, 62% Travels Long Distance
- Working full time: 30% Zero Long Distance, 70% Travels Long Distance
- Retired: 46% Zero Long Distance, 54% Travels Long Distance
- Other: 42% Zero Long Distance, 58% Travels Long Distance
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: 12%

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 predominantly 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**

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

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

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

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 Tom-Tom) 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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