EXPLORING THE RELATIONSHIP BETWEEN VEHICLE TYPE CHOICE AND DISTANCE TRAVELED

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ACKNOWLEDGEMENTS

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National Science Foundation (NSF)
VEHICLE OWNERSHIP AND UTILIZATION
LONG TERM CHOICE DECISIONS
VEHICLE OWNERSHIP AND UTILIZATION
SHORT-TERM CHOICE DECISIONS
SHORT-TERM DECISION

Vehicle Type

Distance
DISTANCE AFFECTS VEHICLE TYPE CHOICE
VEHICLE TYPE CHOICE AFFECTS DISTANCE
DATA AND SAMPLE COMPOSITION

2009 Survey Data for Dallas-Fort Worth
DATA RESTRICTIONS

Auto

Van

SUV

Truck
## Household Vehicle Ownership Versus Utilization

<table>
<thead>
<tr>
<th>Vehicle Types Owned</th>
<th>Vehicle Types Used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1551</td>
</tr>
<tr>
<td>3</td>
<td>128</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Methodology

Vehicle Choice
– Categorical
– Multinomial Logit Model

Distance
– Continuous
– Linear Regression Model
METHODOLOGY (2)

There are different ways to model:

• Analyze both variables simultaneously
• Analyze variables sequentially
• *Latent segmentation model*
**METHODOLOGY (3)**

Individuals choice of the interrelationship (binomial logit)

- Vehicle Type Affects Distance
  - Choice of distance (linear regression)
  - Vehicle Type Choice (multinomial logit)

- Distance Affects Vehicle Type
  - Vehicle Type Choice (multinomial logit)
  - Choice of distance (linear regression)
To estimate the latent segmentation model, several variables were used:

- Socio-Economic
- Demographic
RESULTS

Both interrelationships are plausible!

Vehicle Type Affects Distance → 89%
Distance Affects Vehicle Type → 11%
**Vehicle Type Affects Distance**

- Auto: ↑ Distance
- SUV: ↓ Distance
- Newer Vehicles: ↑ Distance
- Large Households: ↓ Auto
RESULTS (3)

Distance Affects Vehicle Type

- Distance: ↓ Auto, Van, and SUV
- Number of Occupants: ↑ SUV
CONCLUSION

Latent Segmentation Works!

Vehicle Type <-> Distance
FUTURE WORK

How do these results vary...

By region?

And by Time Period?
THANK YOU!