CAMBRIDGE SYSTEMATICS

UPDATING NHTS WITH ACS DATA

TO PROVIDE ANNUAL TRAVEL BEHAVIOR DATA FOR TRANSPORTATION DECISION-MAKING

presented at

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Motivation

Understanding of travel behavior shifts and trends is limited by the available data!

Capturing recent demographic, behavioral, and technological trends would require more frequent data than NHTS cycles!



Interpolate NHTS data for those time periods where only ACS data are available.



Approach

Literature Review

Data Sources Determine Travel Behavior Indicators for Interpolation

Model Development Compile 2009 NHTS and 2009 ACS Data Segment Population Estimate Models

Validation Backcast to 2001 Use 2000 Census PUMS Predict Travel Behavior Indicators



Recommendations

Short Term Long Term

Model Development

- To predict number of household and person trips, and amount of person and vehicle travel, linear regression models were developed.
- To predict travel behavior for different portions of the population, the models for the entire population were fully segmented.
- To predict departure times, multinomial logit models were estimated.
- Independent variables with significant explanatory power included the following:
 - » HH size
 - » Vehicles in the HH
 - » Workers in the HH
 - » Household income
 - » Gender
 - » Age (65+)

- » Education
- » Employment status
- » Retired HH member
- » Licensed driver
- » Population density

- » Urban/rural
- » Availability of heavy rail







Model

Apply Models to Backcast Travel Behavior Measures to 2001

Predict

Compare Predictions to 2001 NHTS Estimates



Results

Aggregate Measueres of Fravel Behavior	Household Vehicle Trips Household Vehicle Miles Traveled Person Trips Person Miles of Travel			=					Aggregate Measures
Distribution of Person Trips by Start Time of Trip	1 AM - 6 AM 6 AM - 9 AM 9 AM - 1 PM 1 PM - 4 PM 4 PM - 7 PM 7 PM - 10 PM 10 PM - 1 AM			_	•	•			Person Trips by Time of Day Periods
Annual Person Trips per Household by Income	Annual Household Trips Less than \$10,000 \$10,000 to \$20,000 \$20,000 to \$30,000 \$30,000 to \$40,000 \$40,000 to \$50,000 \$50,000 to \$60,000 \$60,000 to \$70,000 \$70,000 to \$80,000								Household Trips Rates by HH Income
Daily Trip Rates per Person by Trip Purpose	Person Trip Rates To or From Work Family/Personal Errands Social and Recreational School/Church Other								Daily Trip Rates by Trip Purpose
Daily Have haves per Person by Trip Purpose Person Miles of Travel Per Day)	Daily Person Miles of Travel To or From Work Family/Personal Errands Social and Recreational School/Church Other								Daily Travel Rates (PMT) by Purpose
	-3	5% -25%	-15%	-5%	5%	15%	25%	35%	

Recommendations

Short Term

- Removing outliers in the comparison NHTS dataset.
- Test models by inputting comparison NHTS demographics.
- Test the revised models with the 2016 NHTS data

Long Term

- Synthesize population for more accurate joint distributions.
- Segment the analysis to explore and incorporate causal relationships between life cycle, life style and travel.

