Presentation Overview

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- Analysis
- Methodology
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Project Overview

- Part of the Transit Cooperative Research Program (TCRP) Project B-36: *Methods for Forecasting Demand and Quantifying Need for Rural Passenger Transportation*.
- Identifying passenger transportation needs of residents of rural areas.
- Performed a mobility gap analysis for populations in rural households typically underserved by passenger transportation services.

Why Use NHTS Data?

• NHTS only source of national data on travel for households in rural areas.

NHTS National Household Travel Survey									
Home Online Analy	rsis Tools Publications Data C	enter Contact Us							
NHTS Data Center	NHTS Data Center								
2009 NHTS									
2001 NHTS	Citation								
2001 NHTS Transferability	To recognize the valuable role of National Ho	usehold Travel Survey (NHTS) data in the transportation	research process and to					
1995 NPTS	facilitate repeatability of the research, users of NHTS data are asked to formally acknowledge the data source. Where possible,								
1990 NPTS	this acknowledgement should take place in the form of a formal citation, such as when writing a research report, planning document, on-line article, and other publications. The citation can be formatted as follows:								
1983 NPTS									
Research Datasets	http://nhts.ornl.gov.	lighway Aurhinistration, 2005	National Household Haver	Sulvey. UKL.					
	2009 NH1S - Version 2.1, February 2011								
Also see 2009 Publications for documentation.									
Datasets									
	File Format	Download Size (MB)	Installed Size (MB)						
	SAS Windows Binary (.sas7bdat)	102	674						
	SAS Transport	98	598						
			1	1					

Need and Demand

• Need

- Relates to transportation that is required so that individuals can fulfill life needs and participate in society.
- Independent of the quality of available transportation.
- Measured in two ways: people and trips.

Demand

- Number of trips that will be made using a transportation service offered at a given price and level of service.
- Measured in trips.

Need – Population Based

 Number of persons residing in households with income below the poverty line

+

 Number of persons residing in households owning no vehicle

What is Mobility Gap?

 Mobility Gap - difference between the number of trips made by persons residing in households with access to a personal vehicle and those without.

Measured in trips per day.

- Represents the full unmet trip need compared to those with relatively free/unrestricted mobility.
- Can be used to estimate the proportion of unmet need that is served or to set goals based on proportion served.

Mobility Gap



Mobility Gap and Need

- **Mobility Gap** shows the transportation **needs** of individuals in the geographic locations analyzed.
- Need the number of people in a given geographic area likely to require passenger transportation service so they can fulfill life needs and participate in society.
- Mobility gap can be used to measure need.

Analysis

- Tested if vehicle ownership most appropriate measure of mobility gap.
- Examined trip rates for rural households:
 - All rural households.
 - Age of household residents.
 - Income (as a percent of poverty level).
 - Vehicle ownership.
 - Cross-tabulations age by income, age by vehicle ownership, etc.
- Nation and 9 Divisions.
- 2001 and 2009 data.

NHTS Data Sets Used

- Household file
- Person file
- Travel Day trips file

Data files	Information included	Record level	ID Variables	Weight variables ¹⁰
Household file	Data unique to a household, or questions isked once for each sample household. Questions from interview sections: Number of vehicles	One record per household	HOUSEID	WTHHFIN
	Person Data, Telephone Data, Type of Residence, Location of Home, Household Income, Education of Household Respondent.			
Person file	Pata determined once for each completed person interview. Questions from interview sections:	One record per person	HOUSEID and PERSONID	WTPERFIN
	Age, Driver Status, Race & Ethnicity of Household Respondent Travel to Work, Miles driven, Customer Satisfaction, Born in US, Education, Person Income, Medical Condition, Internet Use.			
Vehicle file	Data relating to each of the household's vehicles. Questions from interview section: Vehicle Data, Type of Residence, Verified Vehicle Data, Annualized Vehicle Miles, Household Income.	One record per vehicle	HOUSEID and VEHID	WTHHFIN
Travel day trip file	Data about each trip the person made on the household's randomly-assigned travel day. Questions from interview section Person Data, Travel Day Data.	One record per travel day person trip	HOUSEID, PERSONID, and TDTRPNUM	WTTRDFIN

Source: 2009 NHTS User's Guide

Methodology

- Used Microsoft Access to compile and analyze data.
- Used the query builder tool to create tables for each of the analysis categories.
- Applied appropriate weights.



Ul Tables	• •	0	HH_Rural	Query: HH trips by	age and poverty	level 🛄 Avg trip	rs per HH
HH_Rural	2 .		HOUSEID .	HHSTATE .	CENSUS_D .	WTHHEIN .	SumOfWTTE •
HH_Rural : Table			20000017	IN	03	264.1947	897569.324
Query: Age groups by HH			20001603	TX	07	131.5992	633853.7734
Query: Ava tript per HH			20005807	CA	09	182.2331	387451.4819
			20006167	NY	02	51.0465	
11 Quere HH by income			20006390	TX	07	305.7642	771992.9888
Query: HH trips by vehicle ownersh	ip		20008264	CA	09	229.839	1012542.706
Query: Number of trips per HH ind	uđ		20009092	NY	02	50.9429	68659.422
PER_Rural	A		20010463	TX	07	216.7254	3441428.3188
PER_Rural : Table			20010687	NY	02	193.5038	419764.368
Query age groups			20010735	NY	02	82.3161	607208.9508
			20011590	TX	07	96.3586	201350.7111
I Query: Number of trips per person			20014135	OH	03	3319.2531	11581288.527
Query: Number of trips per person	in		20015141	SD	04	25.7444	174701.1757
Query: Person trips by age and HH	ve		20015196	NE	04	51.3978	26299.4384
DAY_Rural	2		20017761	FL	05	296.9765	385238.668
DAT_Rural : Table			20019121	GA	05	720.151	1142887.0976
Query Number of trips per HH			20020248	GA	05	1495.3939	23550794.033
. Second Humber of thiss are second			20021227	CA	09	2657.7426	31231639.8192
1 Query: number of trips per person			20022251	NC	05	36.876	66125.2962
VEH_Rural	*		20024947	VA	05	60.6185	160128.0031
Number of trips per HH	\$		20025784	CA	09	175.5434	110617.8656
Number of trips per HH including 0	-		20026482	FL	05	295.757	559069.7556
Avg this per HH	*		20027256	TX	07	113.5445	569383.163
Ages 65-60	*		20027621	NY	02	76.4682	117975.9969
Anas 20, 24			20027694	VA	05	22.7659	7299.3346
Ages 75-79	-		20027715	VA	05	158.8345	
Ages 80+	x		20031963	FL	05	184.4595	199466.3578
Age groups by HH	8		20032072	NY	02	82.5907	78582.1863
Poverty Level	¥		20032193	VA	05	52.2983	332384.8303
HH by Income	8		20034414	TX	07	138.264	265529.4378
HH trips by Poverty Level	¥.		20034955	TX	07	190.1061	938610.7732
HH trips by vehicle ownership	ă		20035569	FL	05	43.7022	179124.7308
Avg trips by HH by age groups	8		20035895	CA	09	426.5091	1905091.9564
HH trips by age and poverty level	¥.		20037563	IA	04	1386.162	
HH trips by age and vehicle ownership	5		20038841	FL.	05	43.5742	104752.6404
HH trips by poverty level and vehicl	\$		20040639	FL.	05	606.3868	1136197.017
HH trips by age, poverty level and v_	\$		20042204	NY	02	256.2368	581240.8776
Number of trips per person	\$		20042231	TX	07	200.6671	483513.2142
Number of trips per person includin		R	cord: H + 1 of 4	3583 > N H	K Na Fiber Se	arch	

Methodology

- Used rural data out of the NHTS data files (URBRUR = 02).
- Age ranges: 60-64, 65-69, 70-74, 75-79, 80+
- **Percent of Poverty** calculated separately:
 - Used Census poverty threshold by HH size.
 - Linked poverty threshold to each HH based on the HH size.
 - Percent of poverty = income/poverty level.
 - Imported back into Access to be incorporated with the other tables.
- Vehicle Ownership: 0, 1, 1+ vehicles per HH.

Results – Trips by Age by Vehicle Ownership

Vehicle Ownership is more important than age when assessing need



Source 2001 NHTS data

Results – 2001 Data

		Trips per Rural Household Per Day			
Division	States	Vehicles	Available 1	Gap	
National		3.3	5.4	2.1	
Division 1:	ME, VT, NH, MA, CT, RI	*	5.3	*	
Division 2: Middle	NJ, NY, PA	3.1	5.9	2.7	
Division 3: East North Central	WI, MI, OH, IN, IL	3.3	4.9	1.6	
Division 4: West North Central	ND, SD, NE, KS, MO, IA, MN	2.3	5.1	2.8	
Division 5: South Atlantic	MD, DE, WV, VA, NC, SC, GA, FL	3.1	5.5	2.4	
Division 6: East South Central	KY, TN, AL, MS	3.1	4.9	1.8	
Division 7: West South Central	OK, AR, TX, LA	3.7	5.2	1.5	
Division 8: Mountain	ID, MT, WY, CO, UT, NE, AZ, NM	5.2	6.4	1.2	
Division 9: Pacific	WA, OR, CA, AK, HI	3.3	5.8	2.5	

Results – 2009 Data

		Trips per Rural Household Per Day			
Division.	States	Vehicles Available		Can	
		0	1	Jah	
National		3.2	4.7	1.5	
Division 1:	ME, VT, NH, MA, CT, RI	3.3	5.0	1.7	
Division 2: Middle	NJ, NY, PA	3.5	4.8	1.3	
Division 3: East North Central	WI, MI, OH, IN, IL	2.7	4.1	1.4	
Division 4: West North Central	ND, SD, NE, KS, MO, IA, MN	2.4	4.5	1.7	
Division 5: South Atlantic	MD, DE, WV, VA, NC, SC, GA, FL	3.2	4.5	1.2	
Division 6: East South Central	KY, TN, AL, MS	2.7	4.1	1.4	
Division 7: West South Central	OK, AR, TX, LA	2.9	4.9	2.0	
Division 8: Mountain	ID, MT, WY, CO, UT, NE, AZ, NM	5.2	6.0	0.8	
Division 9: Pacific	WA, OR, CA, AK, HI	3.8	4.9	1.1	

Results – 2001 vs. 2009 Data

		Trips per Rural Household Per Day			
Division	States	Ga	Change		
		2001	2009	Change	
National		2.1	1.5	-0.6	
Division 1:	ME, VT, NH, MA, CT, RI	*	1.7	*	
Division 2: Middle	NJ, NY, PA	2.7	1.3	-1.4	
Division 3: East North Central	WI, MI, OH, IN, IL	1.6	1.4	-0.4	
Division 4: West North Central	ND, SD, NE, KS, MO, IA, MN	2.8	1.7	-1.1	
Division 5: South Atlantic	MD, DE, WV, VA, NC, SC, GA, FL	2.4	1.2	-1.2	
Division 6: East South Central	KY, TN, AL, MS	1.8	1.4	-1.4	
Division 7: West South Central	OK, AR, TX, LA	1.5	2.0	-0.5	
Division 8: Mountain	ID, MT, WY, CO, UT, NE, AZ, NM	1.2	0.8	-0.4	
Division 9: Pacific	WA, OR, CA, AK, HI	2.5	1.1	-1.4	

Conclusions

- Data confirm there is a decline in the daily trip rate for individuals as they age
 - However, the data do not fully support the use of age as a primary indicator of need.
- Poverty and the lack of auto ownership are the more significant indicators of need.

Conclusions

- The NHTS provides data that can be used to assess travel needs for specific populations across the nation and for subregions
- The daily trip rate for rural households lacking cars appears to have been stable between 2001 and 2009
- The daily trip rate for rural households with one car appears to have declined between 2001 and 2009

Questions?

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Thank you!