An Assessment of Public Transportation Markets Using NHTS Data

- Xuehao Chu
- Center for Urban Transportation Research
Outline

- Source of information
- Motivation
- Objectives
- Data and methodology
- Results on market size
- Results on modal share
- Results on attitudes
- Results on socio-demographics of transit markets
- Results on trip characteristics of transit markets
- Conclusions
- Questions
Source of Information

- Based on *An Assessment of Public Transportation Markets Using NHTS Data*
- A recent report of the National Center for Transit Research at CUTR
- Funded by the Florida Department of Transportation
- Diane Quigley was the project manager
- Xuehao Chu was the principal investigator
- The report is available at:
  
Motivation
APTA’s 2007 Passenger Profile

- APTA’s 2007 report – A Profile of Public Transportation Passenger Demographics and Trip Characteristics Reported in On-board Surveys
- Tabulated data from 150 on-board surveys
- Collected by transit agencies during 2000-2005
- Defined several transit markets for each of 15 demographic & trip characteristics (e.g., trip purpose)
- Weighted by system-wide annual ridership
- Determined market size (i.e., the distribution of transit riders across the markets for each characteristic)
  - E.g.: 59.2% of the riders were on their way to work
Motivation

Concerns

- Results from the 2007 profile report are part of APTA’s annual Public Transportation Fact Book
- They are widely cited
  - Transit industry and government reports
  - Speeches of government officials
- They are used as important parameters in transportation studies, including Moving Cooler
- The data did not come from a uniform and statistically rigorous process
- The results are limited to information on the size of transit markets without their characteristics
Objectives

Study

- To assess transit markets from several perspectives:
  - Market size
  - modal share
  - Attitudes
  - Socio-demographics
  - Trip characteristics
- To use data based on a uniform and statistically rigorous process
- To present descriptive information about these markets
Objectives

Presentation

- To introduce basic information about the 2009 NHTS
- To show how the 2009 NHTS data were used in defining and assessing transit markets
- To highlight results from the assessment:
  - Market size
  - Modal share
  - Attitudes
  - Socio-demographics
  - Trip characteristics
Data and Methodology
The 2009 NHTS Sample

- 2009 National Household Travel Survey (NHTS)
- 150,147 households, including 15,884 for Florida
- Each sample household given a travel day
- Telephone interviews based on pre-mailed diaries
- All persons 5 years of age or older
- All travel on the travel day:
  - All modes
  - All purposes
  - All trip lengths, and
  - All areas of the country, urban and rural
- Weights to expand the sample to national totals
Data and Methodology

Unit of Travel Data

- Travel data were collected for individual *person-trips* made by sample households on their travel day.
- A person-trip is defined as any time a person went from one address to another for purposes other than changing the mode.
- A person-trip is a one-way trip from its origin to its destination.
- A person-trip is a linked trip for any mode, particularly for transit.
Data and Methodology

Relevant Data Content

- Household and locational characteristics
  - Annual household income, vehicle availability, race and ethnicity, housing density, urbanized area

- Personal characteristics
  - Person age, driver status, immigration status, existence of medical conditions

- Personal habits and attitudes
  - Monthly frequency of transit use during the month immediately before the travel day
  - Attitudes toward transportation issues

- General trip characteristics
  - Day of week, start time, distance, duration, purpose, main mode (the one used for most of the distance)
Data and Methodology
Transit Trips and Characteristics

- Transit modes – local public bus, commuter bus, commuter train, subway or elevated train, and street car or trolley
- Transit trips – person-trips whose main mode is one of these transit modes
- Transit-specific trip characteristics:
  - Wait time
  - Up to 5 access modes
  - Up to 5 egress modes
  - Total access time
  - Total egress time
### Data and Methodology

#### Data Quality

<table>
<thead>
<tr>
<th>Population Segments</th>
<th>Sampled Transit Trips</th>
<th>Estimated Annual Transit Trips (millions)</th>
<th>95% Margin of Error (millions)</th>
<th>Standard Error (millions)</th>
<th>Coefficient of Variation (COV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. total</td>
<td>8,521</td>
<td>7,520</td>
<td>493.4</td>
<td>251.7</td>
<td>3.3%</td>
</tr>
<tr>
<td>U.S. zero-vehicle households</td>
<td>3,532</td>
<td>3,612</td>
<td>371.7</td>
<td>189.6</td>
<td>3.5%</td>
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<tr>
<td>U.S. non-drivers</td>
<td>910</td>
<td>922</td>
<td>200.7</td>
<td>102.4</td>
<td>11.1%</td>
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<tr>
<td>U.S. non-drivers in zero-vehicle households</td>
<td>520</td>
<td>541</td>
<td>174.6</td>
<td>89.1</td>
<td>16.5%</td>
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<tr>
<td>Florida total</td>
<td>513</td>
<td>228</td>
<td>55.5</td>
<td>28.3</td>
<td>12.4%</td>
</tr>
</tbody>
</table>
### Data and Methodology

**Characteristics for Defining Markets**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal</strong></td>
<td></td>
</tr>
<tr>
<td>Driver status</td>
<td>Whether one is at least 15 years old and, if so, whether one is a driver</td>
</tr>
<tr>
<td>Immigration status</td>
<td>Whether one is an immigrant and, if so, year entered the U.S.</td>
</tr>
<tr>
<td>Existence of medical conditions</td>
<td>Whether one has a condition that makes it difficult to travel outside of the home</td>
</tr>
<tr>
<td><strong>Household</strong></td>
<td></td>
</tr>
<tr>
<td>Household income</td>
<td>Ranges of annual household income</td>
</tr>
<tr>
<td>Vehicle availability</td>
<td>Number of vehicles for household use relative to number of workers</td>
</tr>
<tr>
<td>Race and ethnicity</td>
<td>Race and ethnicity of the householder</td>
</tr>
<tr>
<td><strong>Travel</strong></td>
<td></td>
</tr>
<tr>
<td>Frequency of transit use</td>
<td>Monthly number of times a person used transit</td>
</tr>
<tr>
<td>Trip purpose</td>
<td>Purpose of individual person-trips on the travel day</td>
</tr>
</tbody>
</table>
Data and Methodology
Criteria for Defining Markets

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Criteria</th>
<th>Segment 1</th>
<th>Segment 2</th>
<th>Segment 3</th>
<th>Segment 4</th>
</tr>
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<tbody>
<tr>
<td>Personal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver status</td>
<td></td>
<td>Children (under 15 years of age)</td>
<td>Drivers</td>
<td>Non-drivers</td>
<td></td>
</tr>
<tr>
<td>Existence of medical conditions</td>
<td></td>
<td>With conditions</td>
<td>Without conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household income</td>
<td></td>
<td>Under $15,000</td>
<td>$15,000-$49,999</td>
<td>$50,000-$99,999</td>
<td>$100,000+</td>
</tr>
<tr>
<td>Vehicle availability</td>
<td></td>
<td>Zero vehicles</td>
<td>Vehicles &lt; workers</td>
<td>Vehicles ≥ workers</td>
<td></td>
</tr>
<tr>
<td>Race and ethnicity</td>
<td></td>
<td>Hispanics</td>
<td>Non-Hispanic Whites</td>
<td>Non-Hispanic Blacks</td>
<td>Non-Hispanic Others</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of usage</td>
<td></td>
<td>30+/month</td>
<td>10–29/month</td>
<td>1–9/month</td>
<td>Non-users</td>
</tr>
<tr>
<td>Trip purpose</td>
<td></td>
<td>Work &amp; related</td>
<td>School</td>
<td>Medical &amp; dental</td>
<td>Others</td>
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</tbody>
</table>
# Data and Methodology
## Socio-Demographic Characteristics for Assessing Transit Markets

<table>
<thead>
<tr>
<th>Category</th>
<th>Characteristics</th>
<th>Segments</th>
<th>Category</th>
<th>Characteristics</th>
<th>Segments</th>
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</thead>
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<tr>
<td><strong>Personal</strong></td>
<td></td>
<td></td>
<td><strong>Location</strong></td>
<td>Housing density</td>
<td>0-999 units/square miles</td>
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<tr>
<td>Person age</td>
<td>Under 18</td>
<td></td>
<td></td>
<td>1,000-3,999 units/square mi.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>18 - 64</td>
<td></td>
<td></td>
<td>4,000+ units/square miles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>65+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver status</td>
<td>Under 15</td>
<td></td>
<td></td>
<td>Status and size of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Driver</td>
<td></td>
<td></td>
<td>urbanized areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non driver</td>
<td></td>
<td></td>
<td>(UZA)</td>
<td></td>
</tr>
<tr>
<td>Immigration</td>
<td>New immigrant</td>
<td></td>
<td></td>
<td>UZA 50,000-199,999</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td>Older immigrant</td>
<td></td>
<td></td>
<td>UZA 200,000-999,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non immigrant</td>
<td></td>
<td></td>
<td>UZA 1 million+</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Non UZA</td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>Having medical conditions</td>
<td></td>
<td></td>
<td>Travel</td>
<td></td>
</tr>
<tr>
<td>conditions</td>
<td>No medical conditions</td>
<td></td>
<td></td>
<td>Monthly frequency</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>of transit use</td>
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</tr>
<tr>
<td>Household</td>
<td></td>
<td></td>
<td></td>
<td>30+ times a month</td>
<td></td>
</tr>
<tr>
<td>Household</td>
<td>Under $15,000</td>
<td></td>
<td></td>
<td>10 - 29 times a month</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>$15,000 - $49,999</td>
<td></td>
<td></td>
<td>1 - 9 times a month</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$50,000 - $99,999</td>
<td></td>
<td></td>
<td>Non user</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$100,000+</td>
<td></td>
<td></td>
<td>Transit not available</td>
<td></td>
</tr>
<tr>
<td>Vehicles</td>
<td>Zero vehicle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>relative</td>
<td>Vehicles &lt; workers</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>to workers</td>
<td>Vehicles &gt;= workers</td>
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</tr>
<tr>
<td>Race and</td>
<td>Hispanic</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ethnicity</td>
<td>Non-Hispanic White</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Non-Hispanic Black</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Non-Hispanic Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data and Methodology
Trip Characteristics for Assessing Transit Markets

- Transit-Specific Characteristics
  - Wait time
  - Last access mode
  - First egress mode
  - Total access time
  - Total egress time

- General Characteristics
  - Day of week
  - Start time
  - Purpose
  - Distance
  - Duration
  - Speed
Data and Methodology

Interpretation of Results

- Descriptive of the characteristics of transit markets, rather than presenting causal relationships
  - Transit modal share = 6.9% for persons under $15,000
  - Transit modal share = 1.2% for persons $100,000+
- Characteristics of trip markers, rather than persons
  - Similar to tabulated data from on-board surveys (riders not persons)
  - Persons making 4 times as many trips have 4 times as much influence on the results
Results on Market Size
Share of All Transit Trips vs. Share of Population for Selected Transit Markets

- Work trips: 36.3% Transit Trips, 43.4% Population
- Most frequent users: 6.1% Transit Trips, 11.7% Population
- Zero-vehicle households: 12.1% Transit Trips, 15.1% Population
- Income under $15,000: 28.9% Transit Trips, 32.2% Population
- Non-Hispanic Blacks: 29.0% Transit Trips, 32.2% Population
- Hispanics: 10.9% Transit Trips, 15.1% Population
- With medical conditions: 10.3% Transit Trips, 10.9% Population
- New immigrants: 8.2% Transit Trips, 2.8% Population
- Non-drivers: 12.4% Transit Trips, 10.8% Population

Categories: Non-drivers, New immigrants, Most frequent users, Work trips, Income under $15,000, Non-Hispanic Blacks, Hispanics, With medical conditions
Results on General Mobility
Ratio of Share of Travel by all Modes over Share of Population for Selected Markets

- Most frequent users: 1.07
- Zero-vehicle households: 0.61
- Income under $15,000: 0.74
- Non-Hispanic Blacks: 0.91
- Hispanics: 0.93
- With medical conditions: 0.62
- New immigrants: 0.93
- Non-drivers: 0.53

Lower mobility than average person
### Results on Modal Share
Transit’s Share of Person Trips by All Modes for Selected Markets

<table>
<thead>
<tr>
<th>Category</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>1.9%</td>
</tr>
<tr>
<td>Work trips</td>
<td>3.3%</td>
</tr>
<tr>
<td>Most frequent users</td>
<td>35.0%</td>
</tr>
<tr>
<td>Zero-vehicle households</td>
<td>26.7%</td>
</tr>
<tr>
<td>Income under $15,000</td>
<td>6.9%</td>
</tr>
<tr>
<td>Non-Hispanic Blacks</td>
<td>5.9%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>4.2%</td>
</tr>
<tr>
<td>With medical conditions</td>
<td>3.7%</td>
</tr>
<tr>
<td>New immigrants</td>
<td>6.5%</td>
</tr>
<tr>
<td>Non-drivers</td>
<td>4.5%</td>
</tr>
</tbody>
</table>
Results on Modal Share
Distribution of All Person Trips across Major Modes for Selected Markets

- Work trips
- Most frequent users
- Zero-vehicle households
- Income under $15,000
- Non-Hispanic Blacks
- Hispanics
- With medical conditions
- New immigrants
- Non-drivers

POV = privately operated vehicles

POV driving | POV riding | Transit | Walk | Bike | Other
Results on Attitudes
Distribution of Trip Makers by Their Most Important Issue for Each Major Mode

Of the following issues, please tell me which one is the most important to you:

- Safety concerns
- Aggressive & distracted drivers
- Price of travel
- Highway congestion
- Lack of walkways & sidewalks
- Access to & availability of transit

POV = privately operated vehicles
Results on Attitudes
Distribution of Transit Trip Makers by Their Most Important Issue for Selected Markets

- Safety concerns
- Aggressive & distracted drivers
- Price of travel
- Highway congestion
- Lack of walkways & sidewalks
- Access to & availability of transit
Results on Socio-Demographics

Distribution of Transit Trips Made by Non-Drivers
Results on Socio-Demographics

Distribution of Transit Trips Made by New Immigrants

- Non UZA: 4.4%
- UZA One Million+: 4.8%
- UZA 200,000-999,999: 4.1%
- UZA 50,000-199,999: 5.7%
- 4,000+ Units/SQ Miles: 17.0%
- 1000-3,999 Units/SQ Miles: 32.8%
- 0-999 Units/SQ Miles: 13.7%
- 1 - 9 Times/Month: 10.9%
- 10 - 29 Times/Month: 23.1%
- 30+ Times/Month: 31.2%
- Non-Hispanic Other: 4.2%
- Non-Hispanic White: 26.9%
- Hispanic: 45.7%
- Vehicles >= Workers: 4.1%
- Vehicles < Workers: 4.4%
- Zero Vehicle: 9.1%
- $100,000+: 26.9%
- $50,000 - $99,999: 37.1%
- $15,000 - $49,999: 31.2%
- Under $15,000: 31.2%
- No Medical Conditions: 8.1%
- Medical Conditions: 4.8%
- Non Driver: 4.8%
- Driver: 89.8%
- 65+: 86.8%
- 18 - 64: 45.8%
- Under 18: 37.1%

UZA = urbanized area

25
Results on Socio-Demographics
Distribution of Transit Trips by Persons with Medical Conditions

- Total Transit
- Medical Conditions

Non UZA
- UZA One Million+
- UZA 200,000-999,999
- UZA 50,000-199,999
- 4,000+ Units/SQ Miles
- 1000-3,999 Units/SQ Miles
- 0-999 Units/SQ Miles
- 1 - 9 Times/Month
- 10 - 29 Times/Month
- 30+ Times/Month
- Non-Hispanic Other
- Non-Hispanic Black
- Non-Hispanic White
- Hispanic
- Vehicles >= Workers
- Vehicles < Workers
- Zero Vehicle
- $100,000+
- $50,000 - $99,999
- $15,000 - $49,999
- Under $15,000
- Non Immigrant
- Older Immigrant
- New Immigrant
- Non Driver
- Driver
- 65+
- 18 - 64
- Under 18

0% 20% 40% 60% 80% 100%

UZA = urbanized area
## Results on Socio-Demographics

Distribution of Transit Trips Made by Persons with *Income under $15,000*

| Category                        | Non UZA | UZA One Million+ | UZA 200,000-999,999 | UZA 50,000-199,999 | 4,000+ Units/SQ Miles | 1000-3,999 Units/SQ Miles | 0-999 Units/SQ Miles | 1 - 9 Times/Month | 10 - 29 Times/Month | 30+ Times/Month | Non-Hispanic Other | Non-Hispanic Black | Non-Hispanic White | Hispanic | Vehicles >> Workers | Vehicles < Workers | Zero Vehicle | Medical Conditions | Medical Conditions | New Immigrant | Older Immigrant | Non Immigrant | Non Driver | Driver | Under 15 | 65+ | 18 - 64 | Under 18 |
|---------------------------------|---------|------------------|----------------------|--------------------|----------------------|-------------------------|------------------------|-------------------|-------------------|-------------------|----------------|----------------|------------------|--------------|------------------|------------------|--------------|----------------|-------------|----------|-----------|-------------|-----------|-------|
| Total Transit                   | 75.1%   |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Under $15,000                   |         |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Non UZA                         | 3.3%    |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| UZA One Million+                | 16.4%   |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| UZA 200,000-999,999             | 5.3%    |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| UZA 50,000-199,999              |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 4,000+ Units/SQ Miles           |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 1000-3,999 Units/SQ Miles       |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 0-999 Units/SQ Miles            |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 1 - 9 Times/Month               |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 10 - 29 Times/Month             |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 30+ Times/Month                 |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Non-Hispanic Other              |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Non-Hispanic Black              |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Non-Hispanic White              |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Hispanic                        |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Vehicles >> Workers             |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Vehicles < Workers              |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Zero Vehicle                    |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| No Medical Conditions           |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Medical Conditions              |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Non Immigrant                   |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Older Immigrant                 |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| New Immigrant                   |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Non Driver                      |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Driver                          |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Under 15                        |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 65+                             |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| 18 - 64                         |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
| Under 18                        |          |                  |                      |                    |                      |                         |                        |                   |                   |                   |               |                |                  |              |                  |                  |              |              |              |           |         |          |           |           |       |       |
Results on Socio-Demographics
Distribution of Transit Trips Made by Zero-Vehicle Households

<table>
<thead>
<tr>
<th>Category</th>
<th>Total Transit</th>
<th>Zero-Vehicle Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non UZA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UZA One Million+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UZA 200,000-999,999</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UZA 50,000-199,999</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,000+ Units/SQ Miles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000-3,999 Units/SQ Miles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-999 Units/SQ Miles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 9 Times/Month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 - 29 Times/Month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30+ Times/Month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$100,000+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$50,000 - $99,999</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15,000 - $49,999</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under $15,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Medical Conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Immigrant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older Immigrant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Immigrant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Driver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 - 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

UZA = urbanized area
Results on Socio-Demographics
Distribution of Transit Trips Made by Hispanics

- Non UZA: 3.4%
- UZA One Million+: 10.9%
- UZA 200,000-999,999: 2.5%
- UZA 50,000-199,999: 3.7%
- 4,000+ Units/SQ Miles: 14.0%
- 1,000-3,999 Units/SQ Miles: 28.9%
- 0-999 Units/SQ Miles: 19.6%
- 1 - 9 Times/Month: 28.9%
- 10 - 29 Times/Month: 36.2%
- 30+ Times/Month: 29.7%
- Vehicles >> Workers: 50.6%
- Zero Vehicle: 2.6%
- Vehicles < Workers: 9.5%
- Under $15,000: 33.3%
- $15,000 - $49,999: 54.5%
- Under $15,000: 54.5%
- No Medical Conditions: 33.3%
- Medical Conditions: 54.5%
- Non Immigrant: 10.4%
- Older Immigrant: 16.9%
- New Immigrant: 16.9%
- Non Driver: 22.0%
- Driver: 41.1%
- Under 15: 42.0%
- 16 - 64: 22.0%
- Under 15: 22.0%
- Under 18: 22.0%

0% 20% 40% 60% 80% 100%
Results on Socio-Demographics
Distribution of Transit Trips Made by *Non-Hispanic Blacks*

<table>
<thead>
<tr>
<th>Category</th>
<th>Non UZA</th>
<th>UZA One Million+</th>
<th>UZA 200,000-999,999</th>
<th>UZA 50,000-199,999</th>
<th>4,000+ Units/SQ Miles</th>
<th>1000-3,999 Units/SQ Miles</th>
<th>0-999 Units/SQ Miles</th>
<th>1 - 9 Times/Month</th>
<th>10 - 29 Times/Month</th>
<th>30+ Times/Month</th>
<th>Vehicles &gt;&gt; Workers</th>
<th>Vehicles &lt; Workers</th>
<th>Zero Vehicle</th>
<th>$100,000+</th>
<th>$50,000 - $99,999</th>
<th>$15,000 - $49,999</th>
<th>Under $15,000</th>
<th>No Medical Conditions</th>
<th>Medical Conditions</th>
<th>Non Immigrant</th>
<th>Non Driver</th>
<th>Under 15</th>
<th>18 - 64</th>
<th>Under 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic Blacks (%)</td>
<td>0.6%</td>
<td>12.2%</td>
<td>62.3%</td>
<td>85.4%</td>
<td>30.4%</td>
<td>6.0%</td>
<td>46.3%</td>
<td>84.8%</td>
<td>81.6%</td>
<td>83.0%</td>
<td></td>
<td></td>
<td>81.6%</td>
<td></td>
<td>84.8%</td>
<td>87.3%</td>
<td>80.8%</td>
<td>82.3%</td>
<td>83.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*UZA = urbanized area*
Results on Socio-Demographics
Distribution of Transit Trips Made by the Most Frequent Users

- Non UZA: 3.6%
- UZA One Million+: 8.8%
- UZA 200,000-999,999: 1.4%
- UZA 50,000-199,999: 6.9%
- 4,000+ Units/SQ Miles: 6.6%
- 1000-3,999 Units/SQ Miles: 8.6%
- 0-999 Units/SQ Miles: 32.5%
- Non-Hispanic Other: 36.7%
- Non-Hispanic Black: 29.9%
- Non-Hispanic White: 24.2%
- Hispanic: 18.4%
- Vehicles >= Workers: 20.0%
- Vehicles < Workers: 16.1%
- Zero Vehicle: 51.7%
- $100,000+: 6.6%
- $50,000 - $99,999: 23.2%
- $15,000 - $49,999: 40.7%
- Under $15,000: 91.9%
- No Medical Conditions: 46.9%
- Medical Conditions: 53.1%
- Non Immigrant: 8.1%
- Older Immigrant: 9.1%
- New Immigrant: 7.4%
- Non Driver: 24.0%
- Driver: 66.9%
- 65+: 92.6%
- 18-64: 89.2%
- Under 18: 5.2%

UZA = urbanized area
Results on Socio-Demographics

Distribution of Transit Trips Made for Work Purposes

- Non UZA: 85.0%
- UZA One Million+: 8.4%
- UZA 200,000-999,999: 3.1%
- UZA 50,000-199,999: 3.2%
- 4,000+ Units/SQ Miles: 33.2%
- 1000-3,999 Units/SQ Miles: 4.5%
- 0-999 Units/SQ Miles: 10.7%
- 1 - 9 Times/Month: 4.7%
- 10 - 29 Times/Month: 10.2%
- 30+ Times/Month: 26.6%
- Driver: 54.5%
- Non Driver: 37.3%
- Total Transit: 54.5%
- Work: 37.3%

Classifications:
- Under 18
- 18 - 64
- 65+
- Medical Conditions
- No Medical Conditions
- No Immigrant
- New Immigrant
- Older Immigrant
- Hispanic
- Non-Hispanic White
- Non-Hispanic Black
- Non-Hispanic Other
- Under $15,000
- $15,000 - $49,999
- $50,000 - $99,999
- $100,000+
- Zero Vehicle
- Vehicles < Workers
- Vehicles >= Workers
- 0-999 Units/SQ Miles
- 1000-3,999 Units/SQ Miles
- 4,000+ Units/SQ Miles
- UZA 50,000-199,999
- UZA 200,000-999,999
- UZA One Million+
- Non UZA
- Urbanized Area
- Non Urbanized Area

UZA = urbanized area
Results on Trip Characteristics

Percent of Transit Trips for Work Purposes

- 1 to 9 Times a Month: 12.4%
- 10 to 29 Times a Month: 42.2%
- 30+ Times a Month: 45.5%
- Non-Hispanic Other: 49.2%
- Non-Hispanic Black: 30.0%
- Non-Hispanic White Hispanic: 42.0%
- Vehicles >= Workers: 32.6%
- Vehicles < Workers: 39.2%
- Zero-Vehicle Households: 57.1%
- $100,000+: 55.6%
- $50,000 - $99,999: 42.4%
- $15,000 - $49,999: 32.8%
- Under $15,000: 26.0%
- No Medical Conditions: 42.1%
- With Medical Conditions: 17.1%
- Non Immigrant: 32.4%
- Older Immigrant: 47.7%
- New Immigrant: 37.4%
- Non Driver: 9.7%
- Driver: 43.1%

Overall: 36.3%
Results on Trip Characteristics
Distribution of Transit Trips by Wait Time for Selected Transit Markets

- Non-drivers
- New Immigrants
- Income under $15,000
- Zero-vehicle households
- Hispanics
- Non-Hispanic Blacks
- Most frequent users
- Work trips
- Total

Wait Time:
- 15+ minutes
- 10 - 14 minutes
- 5 - 9 minutes
- Under 5 minutes

- 34.4%
- 21.5%
- 44.4%
- 30.1%
- 31.5%
- 33.1%
- 21.5%
- 25.7%
- 0%
Results on Trip Characteristics
Distribution of Transit Trips by Door-to-Door Speed for Selected Transit Markets

<table>
<thead>
<tr>
<th>Speed Range</th>
<th>Non-drivers</th>
<th>New Immigrants</th>
<th>With Medical Conditions</th>
<th>Income under $15,000</th>
<th>Zero-vehicle Households</th>
<th>Hispanics</th>
<th>Non-Hispanic Blacks</th>
<th>Most Frequent Users</th>
<th>Work Trips</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 3 mph</td>
<td>16.4%</td>
<td>12.6%</td>
<td>18.7%</td>
<td>0%</td>
<td>23.2%</td>
<td>19.1%</td>
<td>18.7%</td>
<td>19.1%</td>
<td>18.7%</td>
<td>100%</td>
</tr>
<tr>
<td>3 - under 5 mph</td>
<td>31.7%</td>
<td>23.1%</td>
<td>21.3%</td>
<td>30.4%</td>
<td>16.3%</td>
<td>19.3%</td>
<td>16.3%</td>
<td>16.3%</td>
<td>16.3%</td>
<td>100%</td>
</tr>
<tr>
<td>5 - under 10 mph</td>
<td>15.2%</td>
<td>21.1%</td>
<td>21.1%</td>
<td>19.2%</td>
<td>21.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>100%</td>
</tr>
<tr>
<td>10 - under 15 mph</td>
<td>17.6%</td>
<td>12.6%</td>
<td>21.1%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>100%</td>
</tr>
<tr>
<td>15 - under 25 mph</td>
<td>0%</td>
<td>21.1%</td>
<td>21.1%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>19.3%</td>
<td>100%</td>
</tr>
<tr>
<td>25+ mph</td>
<td>14.4%</td>
<td>31.7%</td>
<td>12.6%</td>
<td>18.7%</td>
<td>18.7%</td>
<td>18.7%</td>
<td>18.7%</td>
<td>18.7%</td>
<td>18.7%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Results on Trip Characteristics
Distribution of Transit Trips by Door-to-Door Distance for Selected Transit Markets

Distance
- 15+ miles
- 10 - under 15 miles
- 5 - under 10 miles
- 3 - under 5 miles
- 2 - under 3 miles
- 1 - under 2 miles
- Under 1 miles
Results on Trip Characteristics
Distribution of Transit Trips by Time of Day for Selected Transit Markets

- 3 PM - 6 PM
- 6 AM - 9 AM
- Night
- Midday

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>3 PM - 6 PM</th>
<th>6 AM - 9 AM</th>
<th>Night</th>
<th>Midday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-drivers</td>
<td>49.2%</td>
<td>33.5%</td>
<td>47.8%</td>
<td>42.7%</td>
</tr>
<tr>
<td>Seniors</td>
<td>54.4%</td>
<td>36.3%</td>
<td>30.0%</td>
<td>23.7%</td>
</tr>
<tr>
<td>Natives</td>
<td>47.8%</td>
<td>42.7%</td>
<td>42.0%</td>
<td>36.8%</td>
</tr>
<tr>
<td>New Immigrants</td>
<td>53.4%</td>
<td>47.8%</td>
<td>42.0%</td>
<td>36.8%</td>
</tr>
<tr>
<td>Income under $15,000</td>
<td>47.8%</td>
<td>42.7%</td>
<td>42.0%</td>
<td>36.8%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>42.7%</td>
<td>36.3%</td>
<td>30.0%</td>
<td>23.7%</td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>36.3%</td>
<td>30.0%</td>
<td>23.7%</td>
<td>36.8%</td>
</tr>
<tr>
<td>Most frequent users</td>
<td>30.0%</td>
<td>23.7%</td>
<td>16.8%</td>
<td>43.5%</td>
</tr>
<tr>
<td>Work Trips</td>
<td>23.7%</td>
<td>16.8%</td>
<td>36.8%</td>
<td>43.5%</td>
</tr>
<tr>
<td>Total</td>
<td>36.3%</td>
<td>23.7%</td>
<td>36.8%</td>
<td>43.5%</td>
</tr>
</tbody>
</table>
Results on Trip Characteristics
Distribution of Transit trips by Day Type for Selected Transit Markets

Day Type
- Weekdays
- Sundays/Holidays
- Saturdays

<table>
<thead>
<tr>
<th>Group</th>
<th>Weekdays</th>
<th>Sundays/Holidays</th>
<th>Saturdays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-drivers</td>
<td>69.3%</td>
<td>0%</td>
<td>92.6%</td>
</tr>
<tr>
<td>New Immigrants</td>
<td>84.4%</td>
<td>0%</td>
<td>95.1%</td>
</tr>
<tr>
<td>With medical conditions</td>
<td>83.7%</td>
<td>0%</td>
<td>92.6%</td>
</tr>
<tr>
<td>Income under $15,000</td>
<td>79.8%</td>
<td>0%</td>
<td>81.9%</td>
</tr>
<tr>
<td>Zero-vehicle households</td>
<td>74.4%</td>
<td>0%</td>
<td>85.1%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>76.4%</td>
<td>0%</td>
<td>85.1%</td>
</tr>
<tr>
<td>Non-Hispanic Blacks</td>
<td>81.9%</td>
<td>0%</td>
<td>85.1%</td>
</tr>
<tr>
<td>Most frequent users</td>
<td>85.1%</td>
<td>0%</td>
<td>85.1%</td>
</tr>
<tr>
<td>Work trips</td>
<td>92.6%</td>
<td>0%</td>
<td>82.7%</td>
</tr>
</tbody>
</table>

Total: 100%
Results on Trip Characteristics
Distribution of Transit Trips by Wait Time for Income-Based Markets

<table>
<thead>
<tr>
<th>Wait Time</th>
<th>Under $15,000 (low-income)</th>
<th>$15,000-$49,999 (middle low-income)</th>
<th>$50,000-$99,999 (middle high-income)</th>
<th>$100,000+ (high-income)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15+ minutes</td>
<td>12.0%</td>
<td>18.5%</td>
<td>32.4%</td>
<td>32.2%</td>
</tr>
<tr>
<td>10 - 14 minutes</td>
<td>23.4%</td>
<td>31.1%</td>
<td>38.8%</td>
<td>34.0%</td>
</tr>
<tr>
<td>5 - 9 minutes</td>
<td>26.4%</td>
<td>24.0%</td>
<td>17.9%</td>
<td>21.3%</td>
</tr>
<tr>
<td>Under 5 minutes</td>
<td>41.4%</td>
<td>24.0%</td>
<td>11.0%</td>
<td>12.4%</td>
</tr>
</tbody>
</table>

Income brackets:
- Under $15,000 (low-income)
- $15,000-$49,999 (middle low-income)
- $50,000-$99,999 (middle high-income)
- $100,000+ (high-income)
Results on Trip Characteristics
Distribution of Transit Trips by Door-to-Door Speed for Income-Based Markets

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Speed Range</th>
<th>Under 3 mph</th>
<th>3 - under 5 mph</th>
<th>5 - under 10 mph</th>
<th>10 - under 15 mph</th>
<th>15 - under 25 mph</th>
<th>25+ mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $15,000</td>
<td>low-income</td>
<td>21.3%</td>
<td>16.5%</td>
<td>15.2%</td>
<td>11.3%</td>
<td>4.9%</td>
<td>5.7%</td>
</tr>
<tr>
<td>$15,000-$49,999</td>
<td>middle low-</td>
<td>21.5%</td>
<td>16.5%</td>
<td>15.2%</td>
<td>11.3%</td>
<td>4.9%</td>
<td>5.7%</td>
</tr>
<tr>
<td>$50,000-$99,999</td>
<td>middle high-</td>
<td>19.3%</td>
<td>21.5%</td>
<td>35.2%</td>
<td>17.0%</td>
<td>17.5%</td>
<td>10.1%</td>
</tr>
<tr>
<td>$100,000+</td>
<td>high-income</td>
<td>11.6%</td>
<td>11.5%</td>
<td>13.5%</td>
<td>17.5%</td>
<td>17.0%</td>
<td>6.6%</td>
</tr>
</tbody>
</table>
Results on Trip Characteristics
Distribution of Transit Trips by Door-to-Door Distance for Income-Based Markets

<table>
<thead>
<tr>
<th>Distance</th>
<th>Under $15,000 (low-income)</th>
<th>$15,000-$49,999 (middle low-income)</th>
<th>$50,000-$99,999 (middle high-income)</th>
<th>$100,000+ (high-income)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15+ miles</td>
<td>9.8%</td>
<td>11.6%</td>
<td>17.5%</td>
<td>30.4%</td>
</tr>
<tr>
<td>10 - under 15 miles</td>
<td>12.8%</td>
<td>8.7%</td>
<td>12.1%</td>
<td>11.1%</td>
</tr>
<tr>
<td>5 - under 10 miles</td>
<td>24.2%</td>
<td>22.9%</td>
<td>24.5%</td>
<td>24.6%</td>
</tr>
<tr>
<td>3 - under 5 miles</td>
<td>16.8%</td>
<td>18.0%</td>
<td>19.9%</td>
<td>14.4%</td>
</tr>
<tr>
<td>2 - under 3 miles</td>
<td>14.4%</td>
<td>15.7%</td>
<td>18.9%</td>
<td>14.4%</td>
</tr>
<tr>
<td>1 - under 2 miles</td>
<td>12.5%</td>
<td>12.8%</td>
<td>13.2%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Under 1 mile</td>
<td>9.5%</td>
<td>10.3%</td>
<td>6.7%</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

Income Levels:
- Under $15,000 (low-income)
- $15,000-$49,999 (middle low-income)
- $50,000-$99,999 (middle high-income)
- $100,000+ (high-income)
Results on Trip Characteristics

Distribution of Transit Trips by Time of Day for Income-Based Markets

- Under $15,000 (low-income)
- $15,000-$49,999 (middle low-income)
- $50,000-$99,999 (middle high-income)
- $100,000+ (high-income)

Time of Day:
- 3 PM - 6 PM
- 6 AM - 9 AM
- Night
- Midday
Results on Trip Characteristics

Distribution of Transit Trips by Last Access Mode for Income-Based Markets

- 94.2% of trips are under $15,000 (low-income)
- 90.7% of trips are $15,000-$49,999 (middle low-income)
- 88.0% of trips are $50,000-$99,999 (middle high-income)
- 78.9% of trips are $100,000+ (high-income)

Last Access Mode:
- Other
- Bike
- POV
- Transit
- Walk

POV = privately operated vehicles
Results on Trip Characteristics
Distribution of Transit Trips by First Egress Mode for Income-Based Markets

<table>
<thead>
<tr>
<th>Income Level</th>
<th>First Egress Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $15,000 (low-income)</td>
<td>Walk: 90.5%</td>
</tr>
<tr>
<td>$15,000-$49,999 (middle low-income)</td>
<td>Bike: 8.1%</td>
</tr>
<tr>
<td>$50,000-$99,999 (middle high-income)</td>
<td>Walk: 86.1%</td>
</tr>
<tr>
<td>$100,000+ (high-income)</td>
<td>Walk: 77.6%</td>
</tr>
</tbody>
</table>

POV = privately operated vehicles
Conclusions

- The 2009 NHTS provides rich and statistically more reliable data for assessing transit markets.
- The results help us understand not only the significance of each transit market (its market size), but also its many characteristics, including general mobility, reliance on transit and each other major mode, attitudes toward transportation issues, socio-demographic characteristics, and trip characteristics.
- The presentation highlighted some of the results. For more information, please refer to the report at:
THANK YOU!

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