

# An Evaluation of the 2009 NHTS Add-on Surveys in Texas

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# Overview

- TxDOT Travel Survey Program
- Texas NHTS Add-on Program
- Travel Profiles
- Conclusions



# TxDOT Travel Survey Program

- Formal program initiated in 2000
  - Comprehensive strategy for data collection
  - Consistent, comparable data
- Surveys designed for model support
  - Conducted in Fall and Spring
  - Target average weekday travel
- Coordinated with urban counts



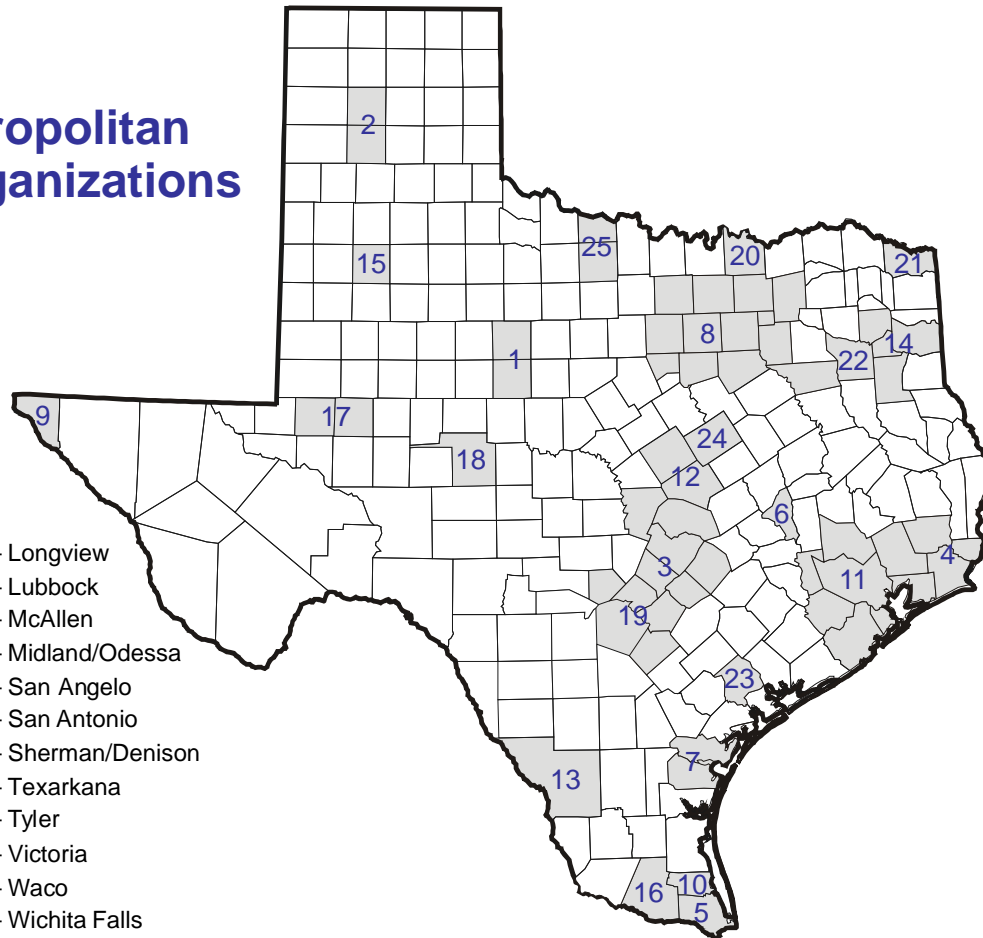


# Texas Travel Survey Activity

- 58 surveys since 2000
  - 17 HH, 8 WP, 10 CV, 21 EXT surveys
  - 2001 and 2007 Border Crossing surveys
- Currently underway
  - **HH**: Abilene, El Paso, Sherman-Denison, Wichita Falls
  - **WP and CV**: Abilene, El Paso, Houston, Wichita Falls
  - **EXT**: None
- 2011/2012 Surveys
  - 3 HH, 3 WP, 3 CV, 1 EXT (under discussion)

# Texas MPOs

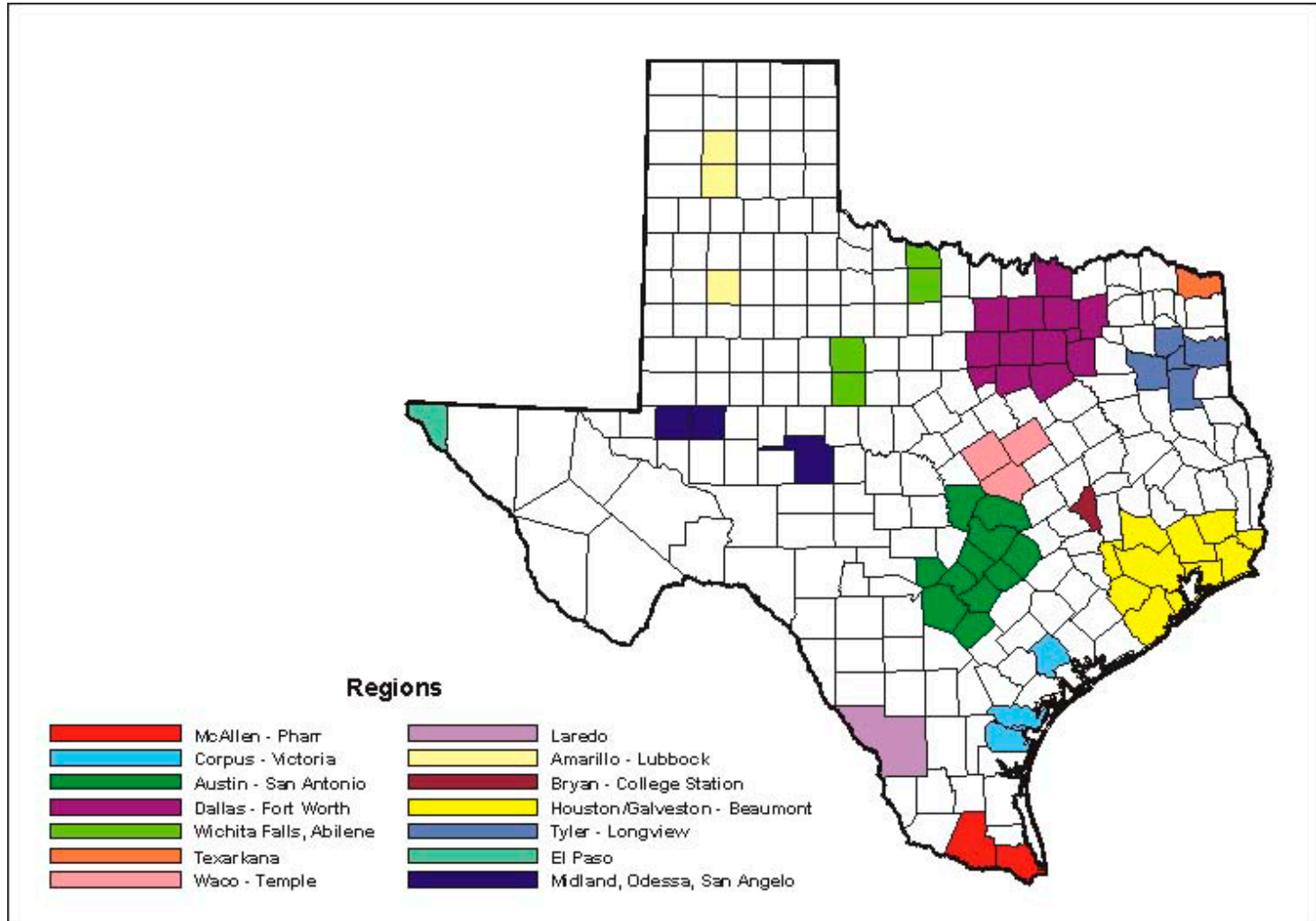
## Texas Metropolitan Planning Organizations



### Texas MPOs

- |                           |                      |
|---------------------------|----------------------|
| 1 – Abilene               | 14 – Longview        |
| 2 – Amarillo              | 15 – Lubbock         |
| 3 – Austin                | 16 – McAllen         |
| 4 – Beaumont              | 17 – Midland/Odessa  |
| 5 – Brownsville           | 18 – San Angelo      |
| 6 – Bryan/College Station | 19 – San Antonio     |
| 7 – Corpus Christi        | 20 – Sherman/Denison |
| 8 – Dallas/Ft. Worth      | 21 – Texarkana       |
| 9 – El Paso               | 22 – Tyler           |
| 10 – Harlingen/San Benito | 23 – Victoria        |
| 11 – Houston              | 24 – Waco            |
| 12 – Killeen/Temple       | 25 – Wichita Falls   |
| 13 – Laredo               |                      |

# Texas Travel Survey Regions





# TxDOT NHTS Add-on Program

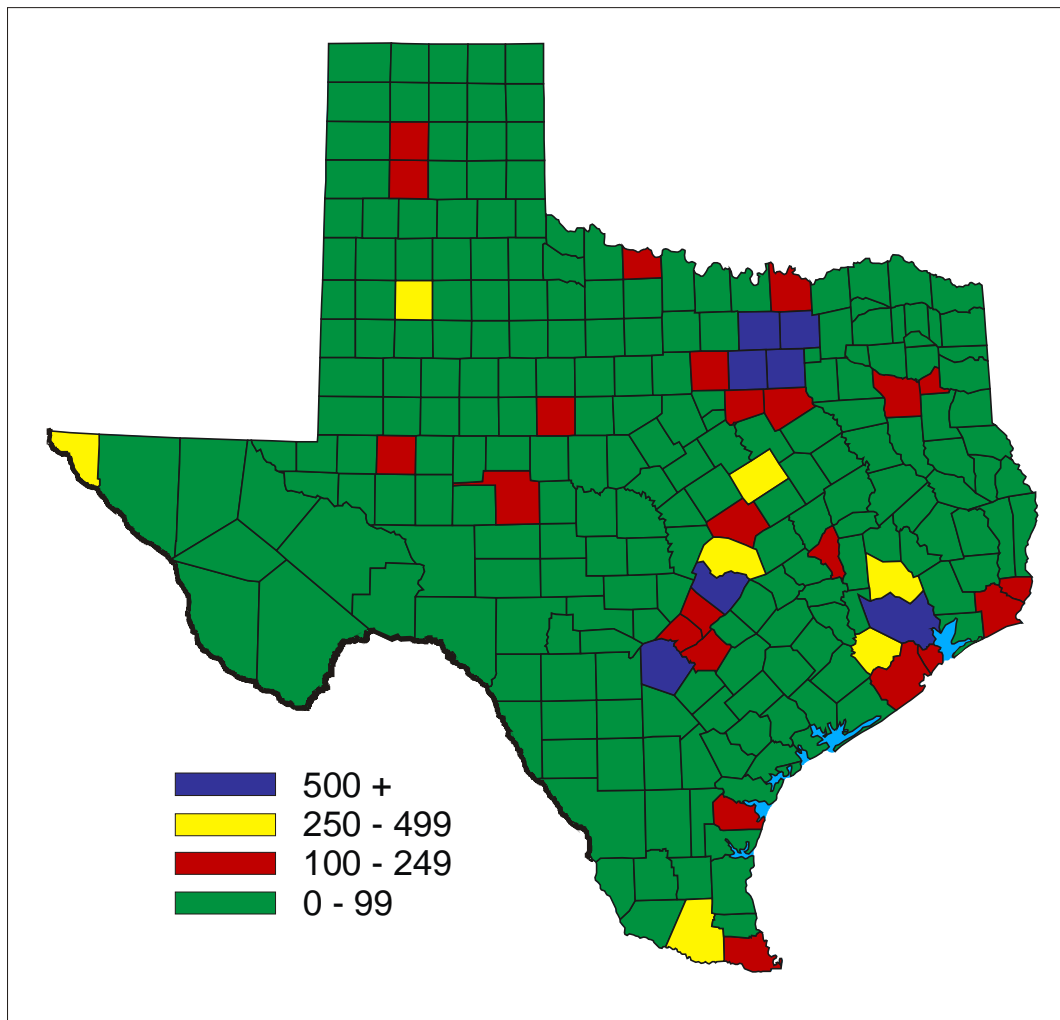
- Objectives

- Support TxDOT's statewide modeling efforts
- Provide information on rural travel in Texas

- 2009 Sample

- National sample of 2,255 households
- Add-on sample of 20,000 households

# TxDOT NHTS Add-on Sample







# Texas Statewide Analysis Model

- Estimates movement of vehicles into and out of Texas, through and within regions of the state
  - Passenger
  - Commodity/Freight
- Forecasts statewide traffic volumes by mode



[http://onlinemanuals.txdot.gov/txdotmanuals/pln/statewide\\_analysis\\_model.htm](http://onlinemanuals.txdot.gov/txdotmanuals/pln/statewide_analysis_model.htm)



# Travel Profiles

Texas



Summer vs. School Year



Rural vs. Urban



Houston

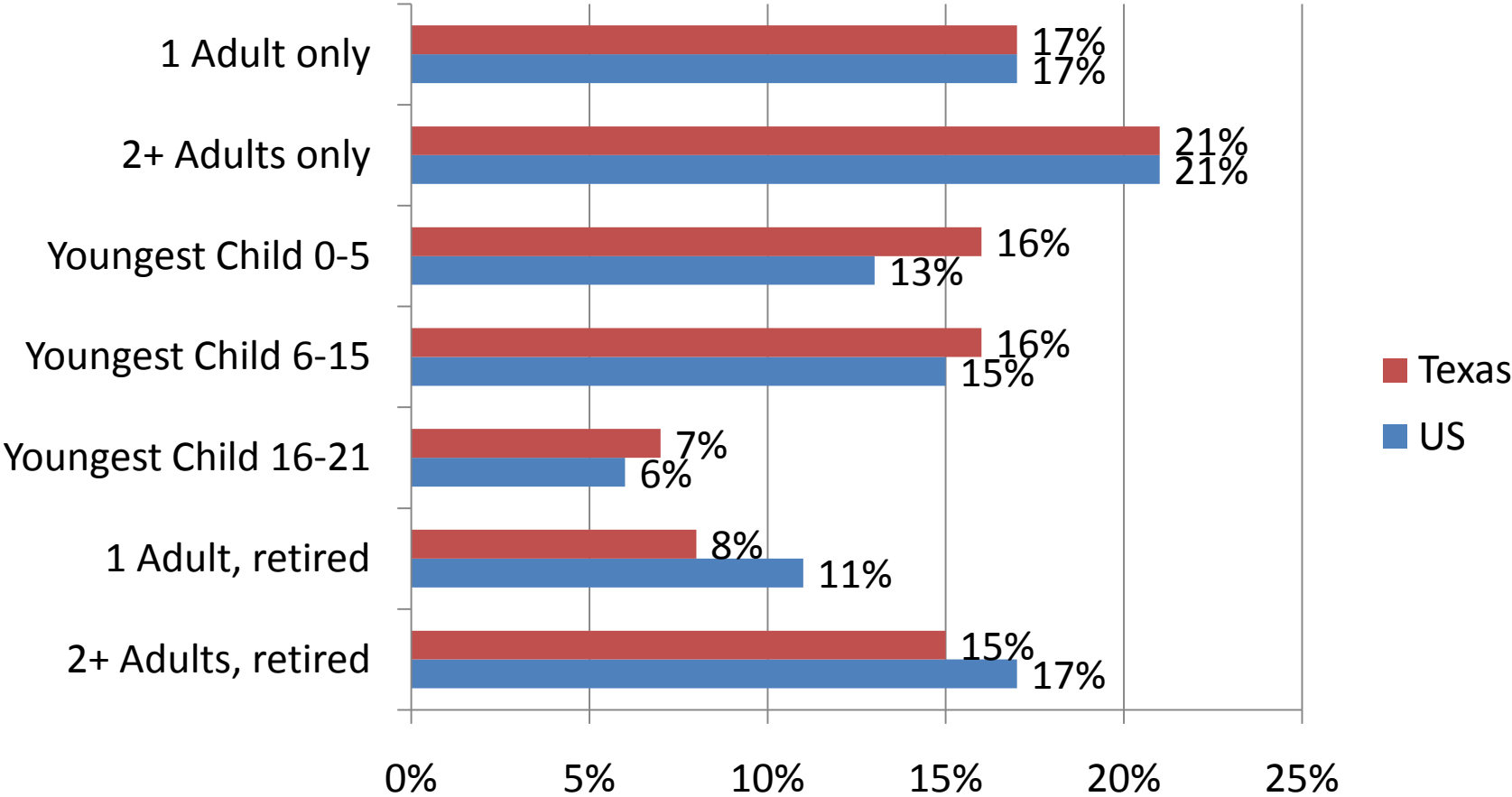


# Travel Profile: Texas

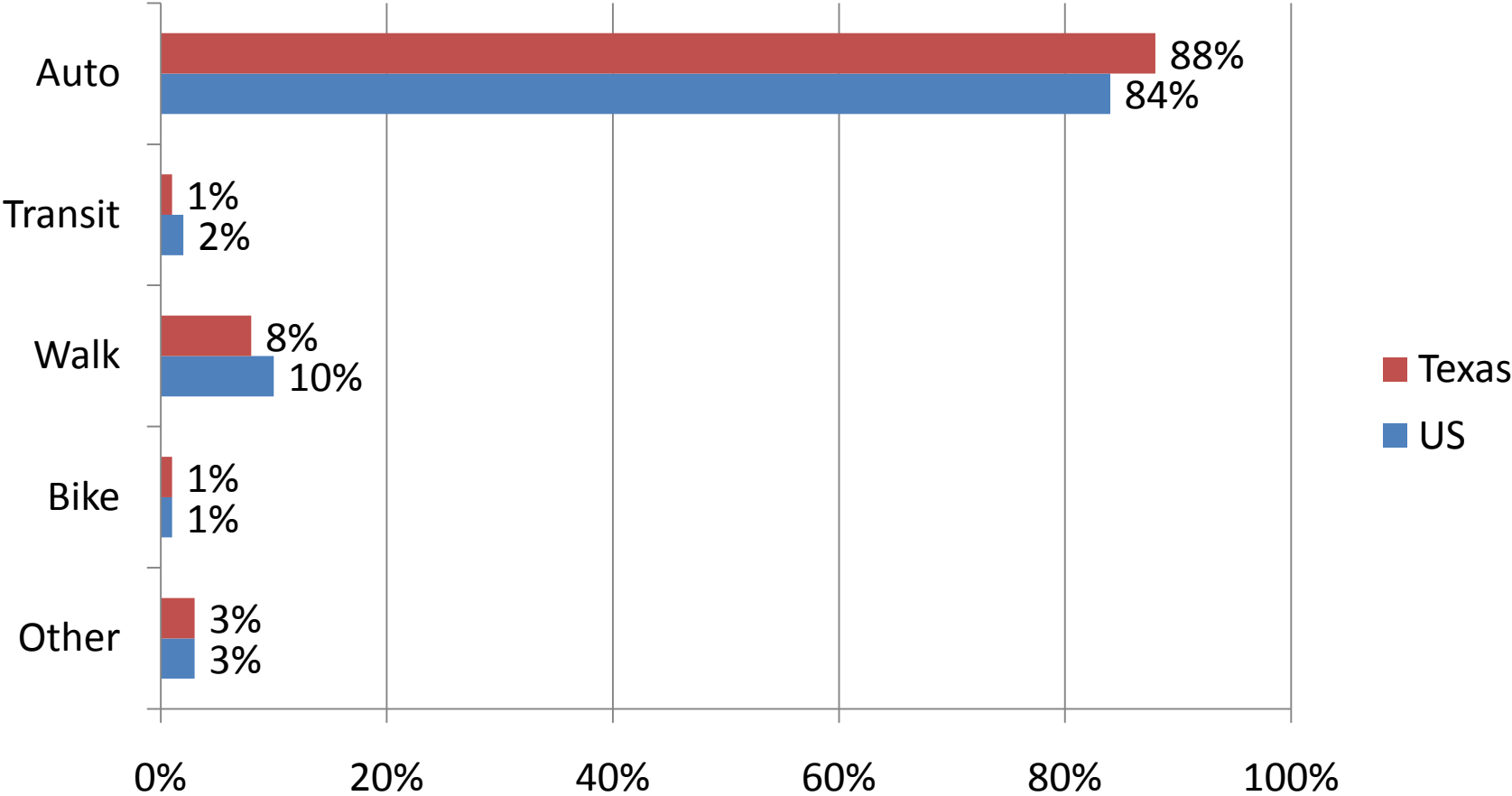
Key Variables	United States	Texas
Household Size	2.47 persons	2.62 persons
Household Workers	1.09 workers	1.12 workers
Household Vehicles	1.86 vehicles	1.88 vehicles

Vehicles-to-work	Key Variables	United States	Texas
Household Income	Age	40.1 years	37.6 years
Hispanic Status	Employed (16+)	54%	53%
	Born in US	72%	65%

# Household Composition

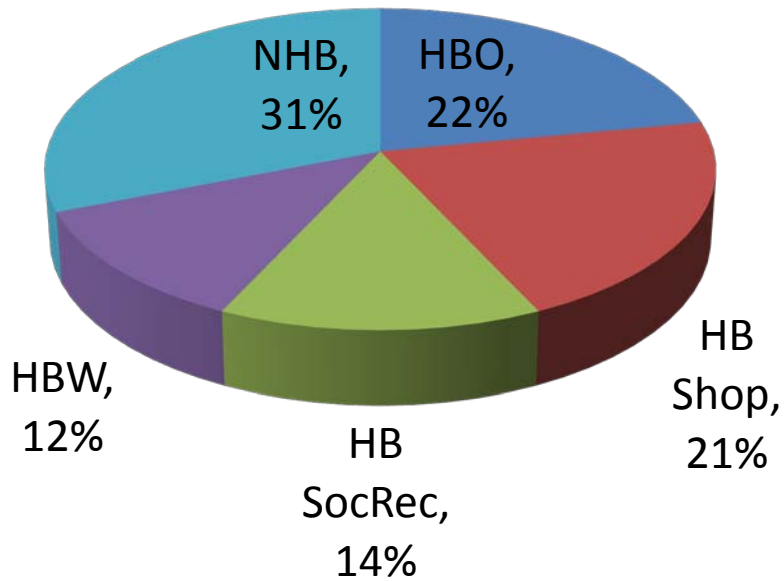


# Travel Modes

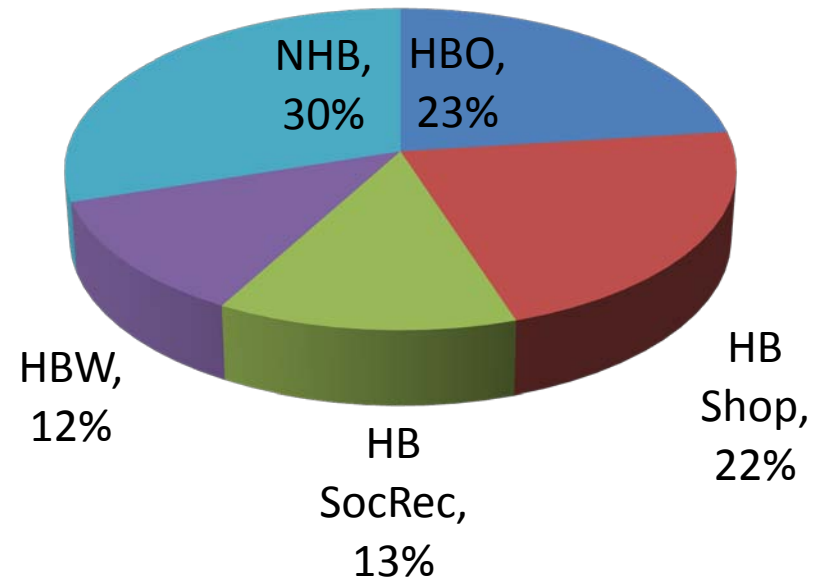


# Trip Purposes

## United States



## Texas





# Travel Profiles

- Summer vs. School Year
- Within School Year: Rural vs. Urban
- Houston: NHTS vs. TxDOT
  
- 100% complete HH
- Imputed travel for children 0-4
- Reweighted (size by income by workers)



# Travel Profile: Season

## NHTS – Summer Sample\*

- ❖ 2.28 persons per HH
- ❖ 0.96 workers per HH
- ❖ 1.93 vehicles per HH
- ❖ 2.01 vehicles/worker
- ❖ Mean Income \$50-\$54k
  
- ❖ Mean Age: 45-49 years  
(n=3,261 HH)

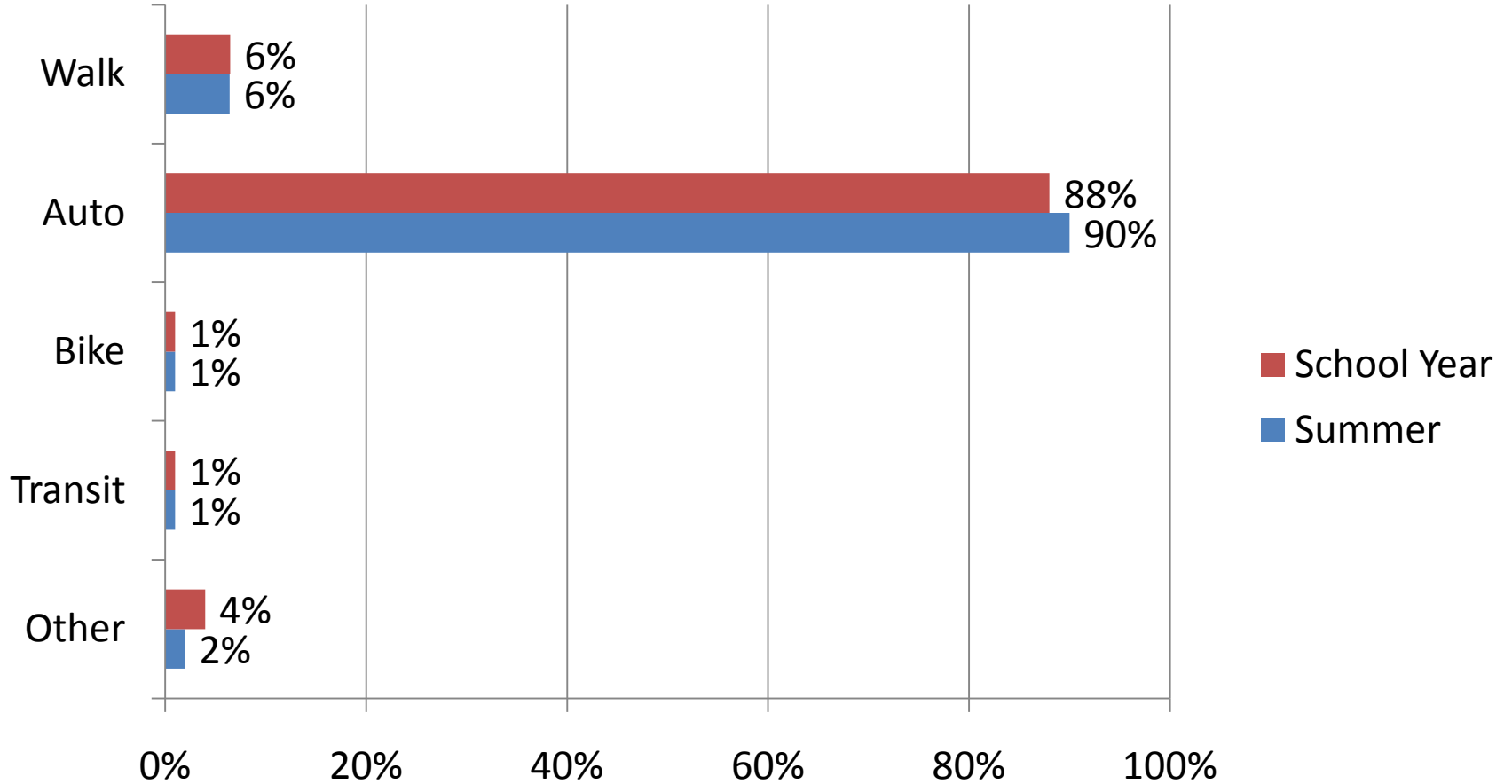
## NHTS – School-year Sample\*

- ❖ 2.32 persons per HH
- ❖ 1.00 workers per HH
- ❖ 1.97 vehicles per HH
- ❖ 1.96 vehicles/worker
- ❖ Mean income \$50-\$54k
  
- ❖ Mean Age: 45-49 years  
(n=8,102 HH)

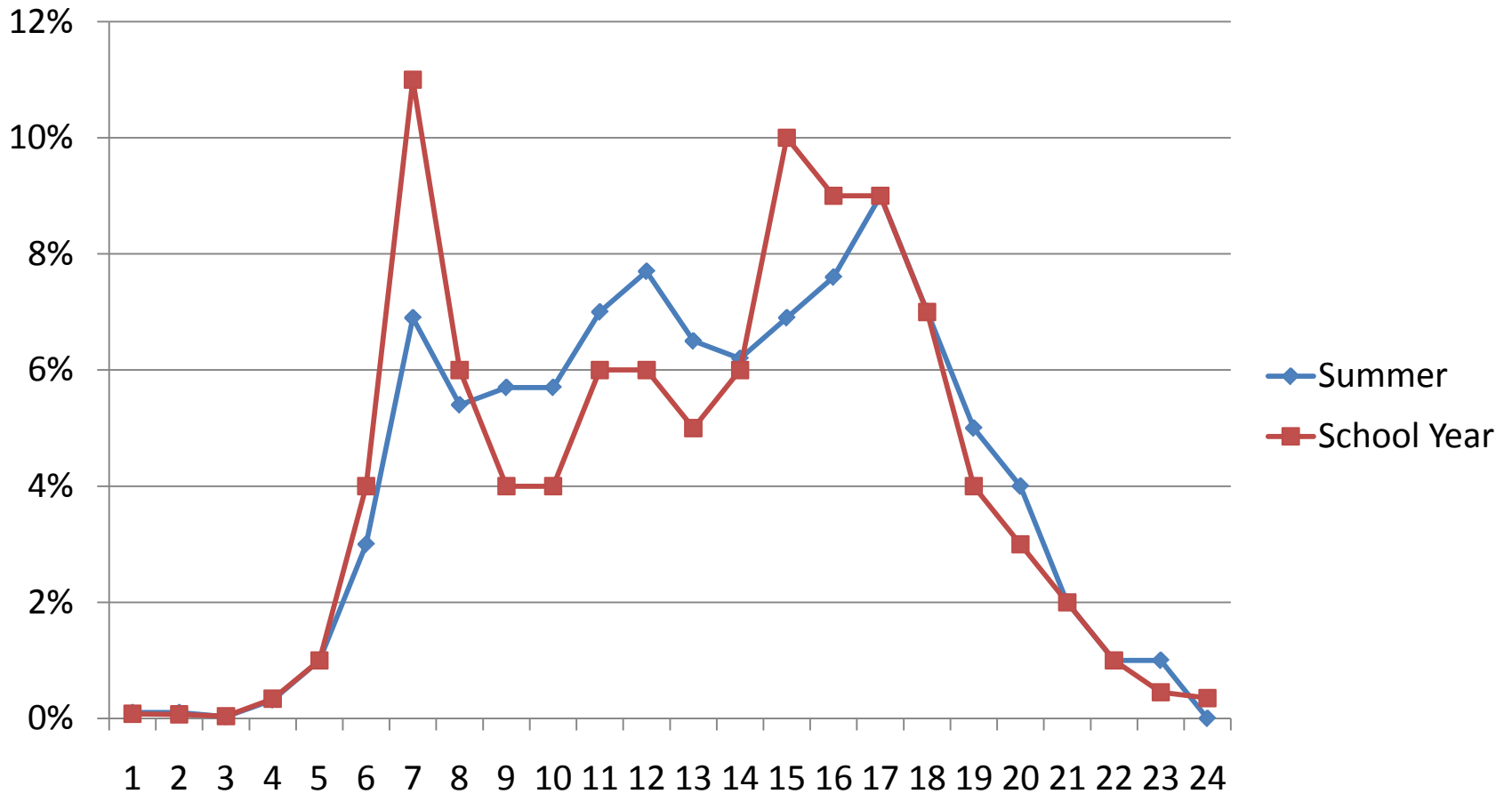
\*Data are unweighted



# Season: Travel Modes



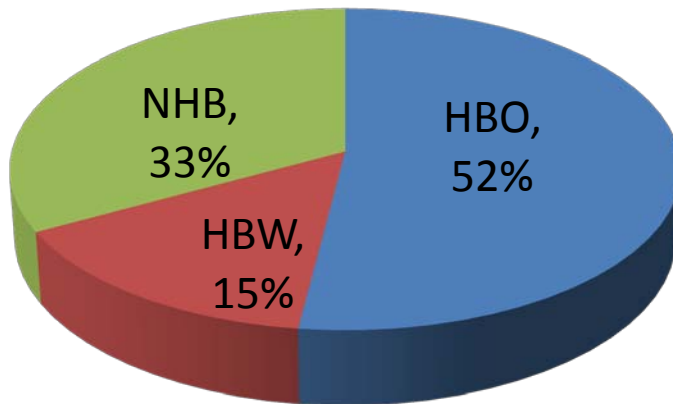
# Season: Time of Day



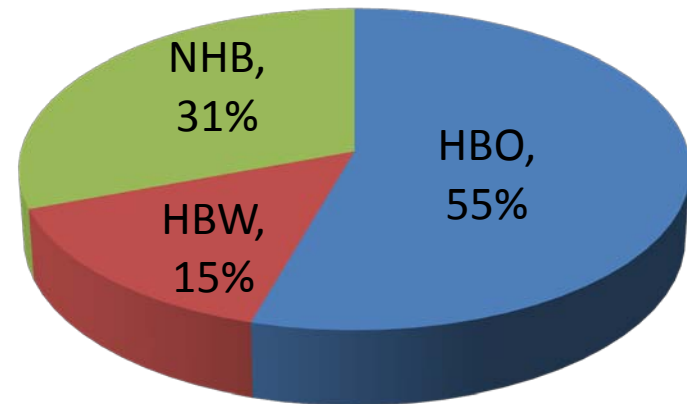


# Season: Trip Purpose

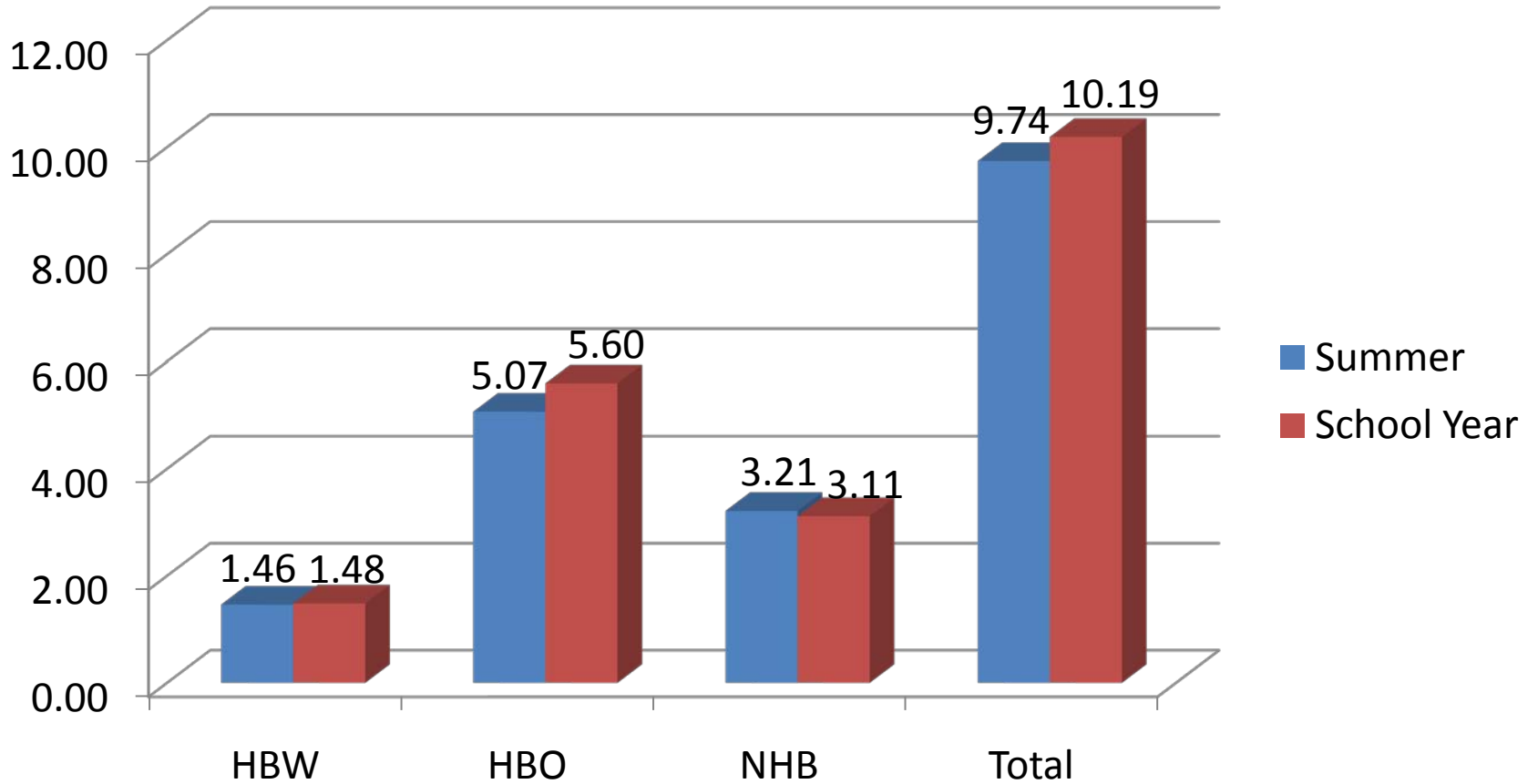
## Summer Sample



## School-Year Sample



# Season: Trip Rates





# Seasonal Sample Comparison

- ✓ Summer and School Year samples similar demographically
- ✓ Travel modes vary slightly by season
  - ✓ School Bus travel
  - ✓ Weather
- ✓ Significant differences in travel by Time of Day



# Travel Profile: Urban/Rural

## NHTS – Urban Sample\*

- ❖ 2.30 persons per HH
- ❖ 1.00 workers per HH
- ❖ 1.89 vehicles per HH
- ❖ 1.89 vehicles/worker
- ❖ Mean Income \$50-\$54k

❖ Mean Age: 40-44 years  
(n=5,900 HH)

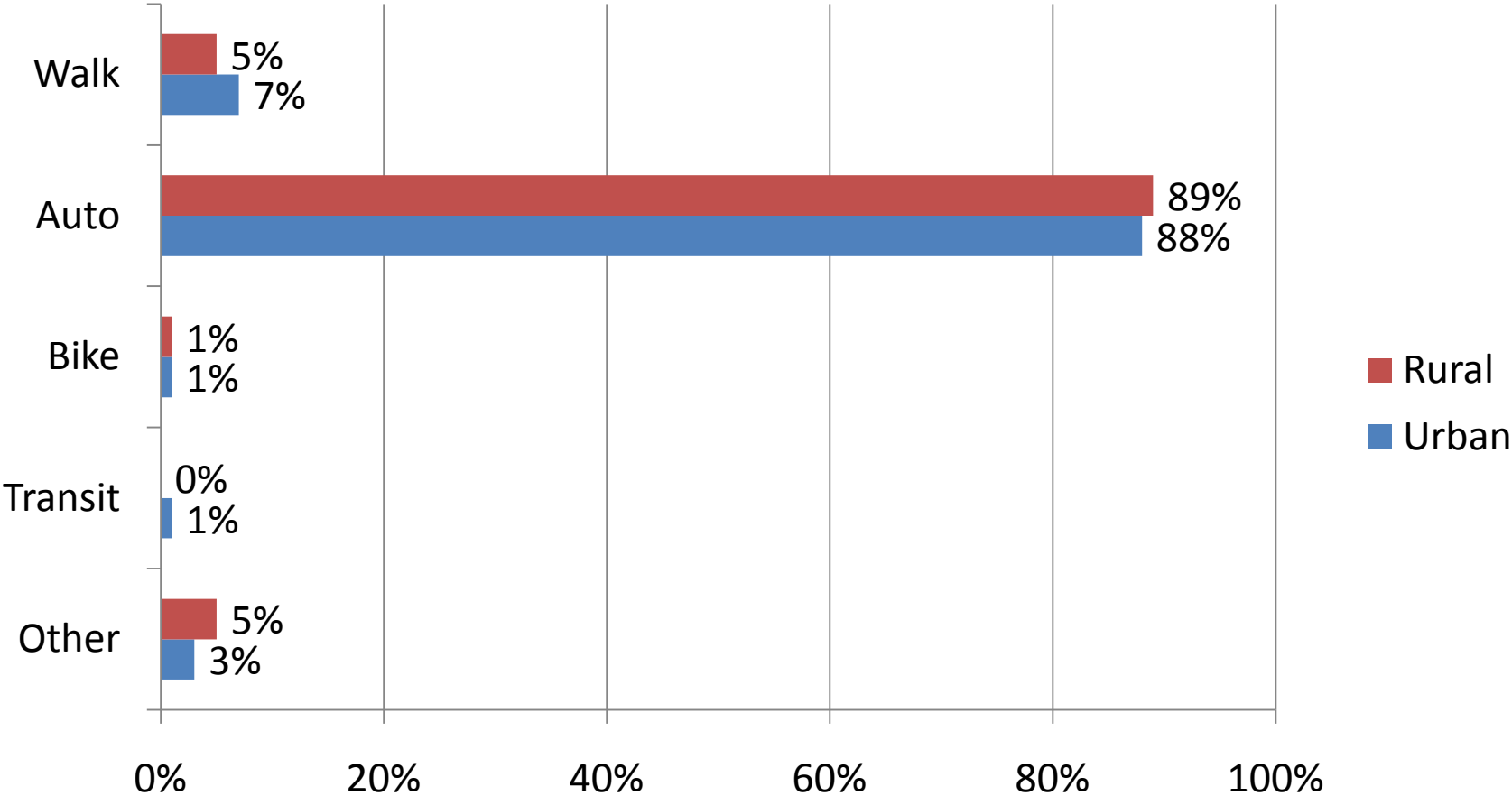
## NHTS – Rural Sample\*

- ❖ 2.37 persons per HH
- ❖ 1.02 workers per HH
- ❖ 2.19 vehicles per HH
- ❖ 2.14 vehicles/worker
- ❖ Mean income \$50-\$54k

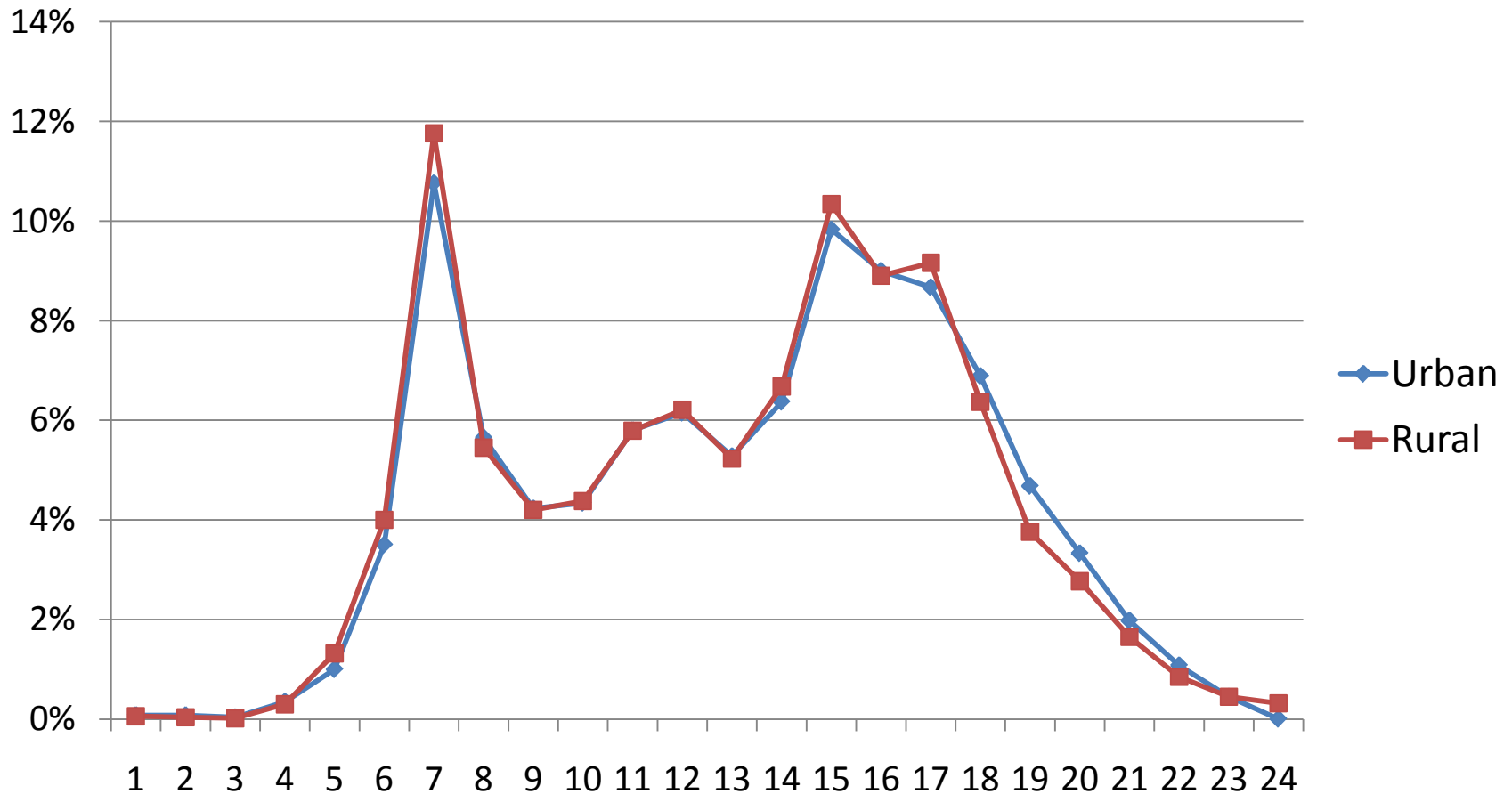
❖ Mean Age: 40-44 years  
(n=2,202 HH)

\*Data are unweighted for School-Year travel days only

# Urban/Rural: Travel Modes



# Urban/Rural: Time of Day

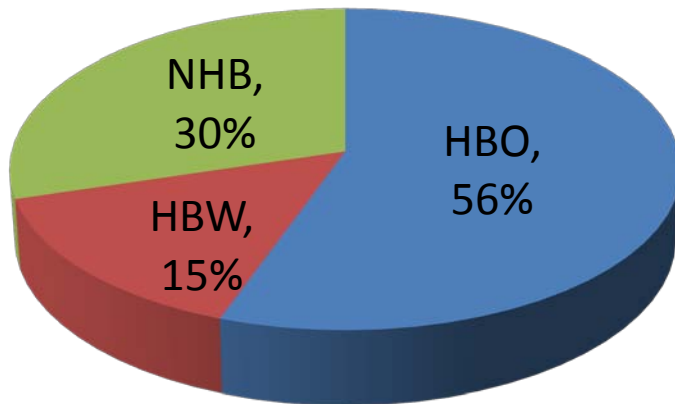




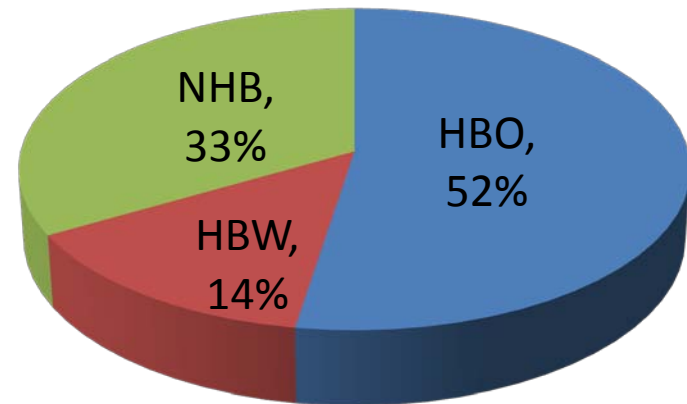


# Urban/Rural: Trip Purpose

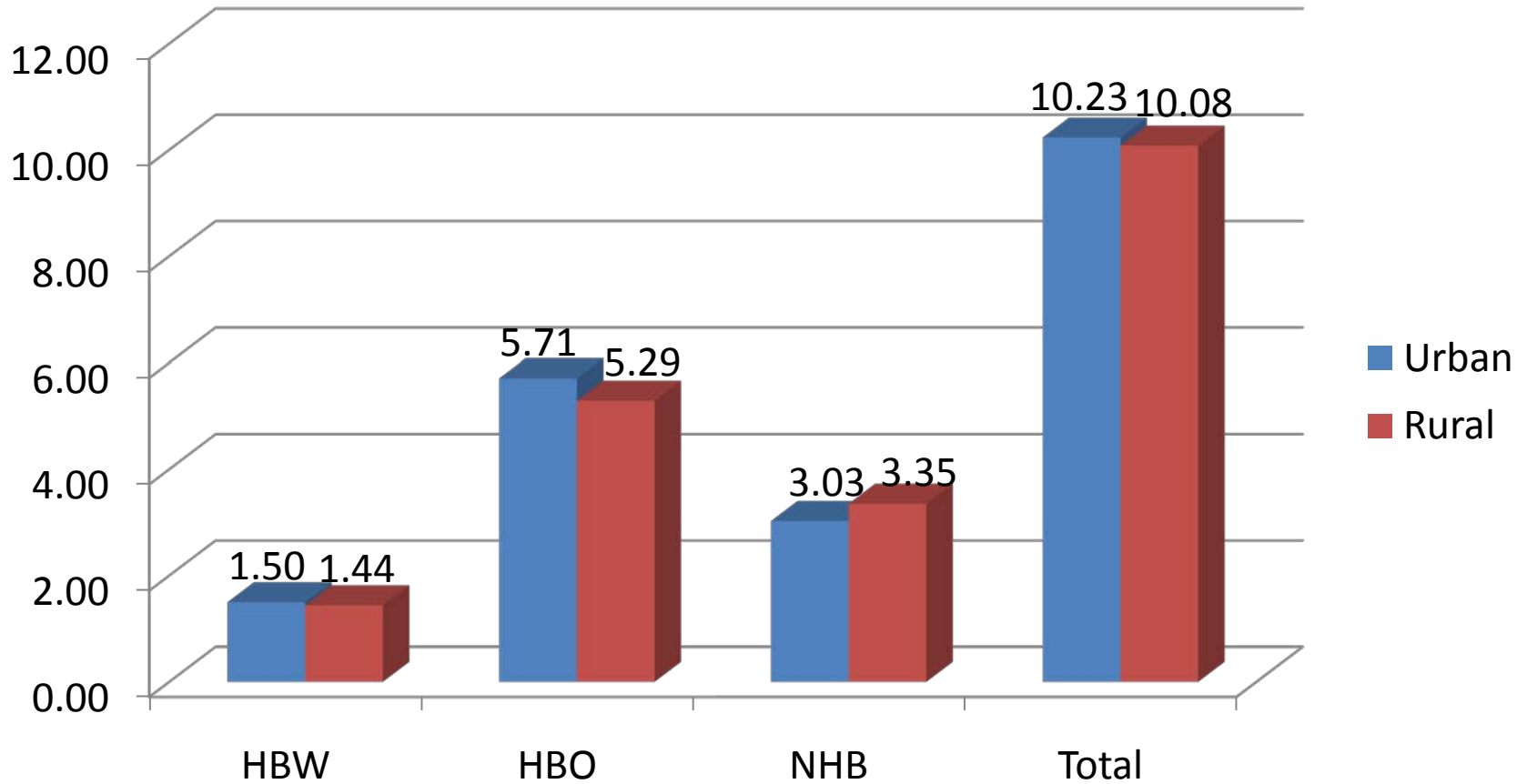
## Urban Sample



## Rural Sample



# Urban/Rural: Trip Rates





# Urban/Rural Sample Comparison

- ✓ Rural HH are larger and own more vehicles
- ✓ Travel modes vary slightly by geography
  - ✓ Urban areas report more walk
  - ✓ Rural areas report more school bus trips
- ✓ Similar reporting in travel by Time of Day



# Travel Profile: Houston

## TxDOT Survey Methods

- ✓ Conducted 2008/9
- ✓ Random address-based sample
- ❖ Typical average weekday travel
- ❖ 100% of HH members
- ❖ All ages surveyed
- ❖ Stratified by HH Size, Income, and # Workers

## NHTS Methods

- ✓ Conducted 2008/9
- ✓ Random landline sample
- ❖ Daily travel
- ❖ Partial HH allowed
- ❖ Age 5+ surveyed
- ❖ Not Stratified



# Travel Profile: Houston

## NHTS – Houston Sample\*

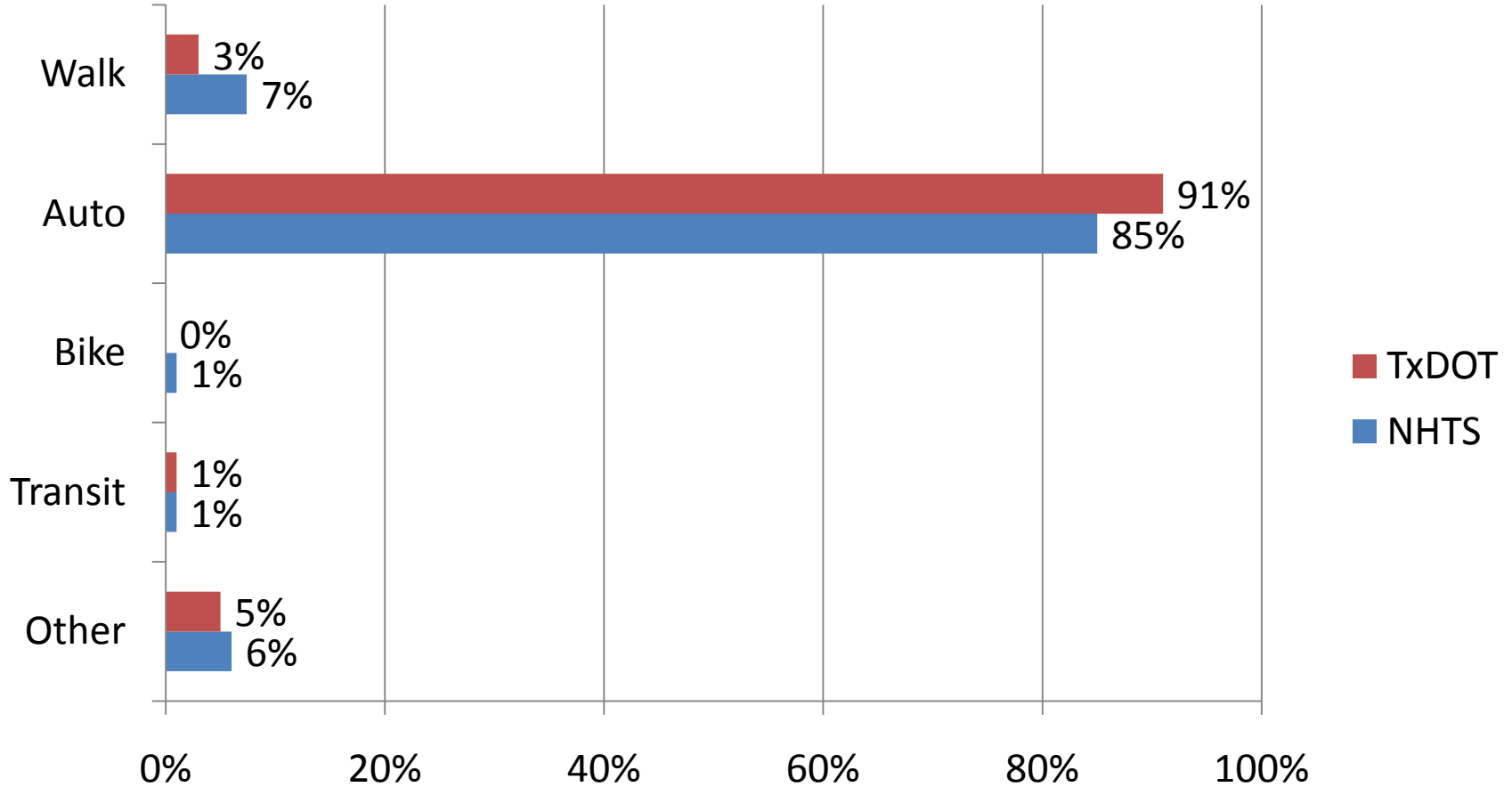
- ❖ 2.44 persons per HH
- ❖ 1.10 workers per HH
- ❖ 1.96 vehicles per HH
- ❖ 1.78 vehicles/worker
- ❖ Mean Income \$55-\$59k
  
- ❖ Mean Age: 40-44 years  
(n=1,389 HH)

## TxDOT – Houston Sample\*

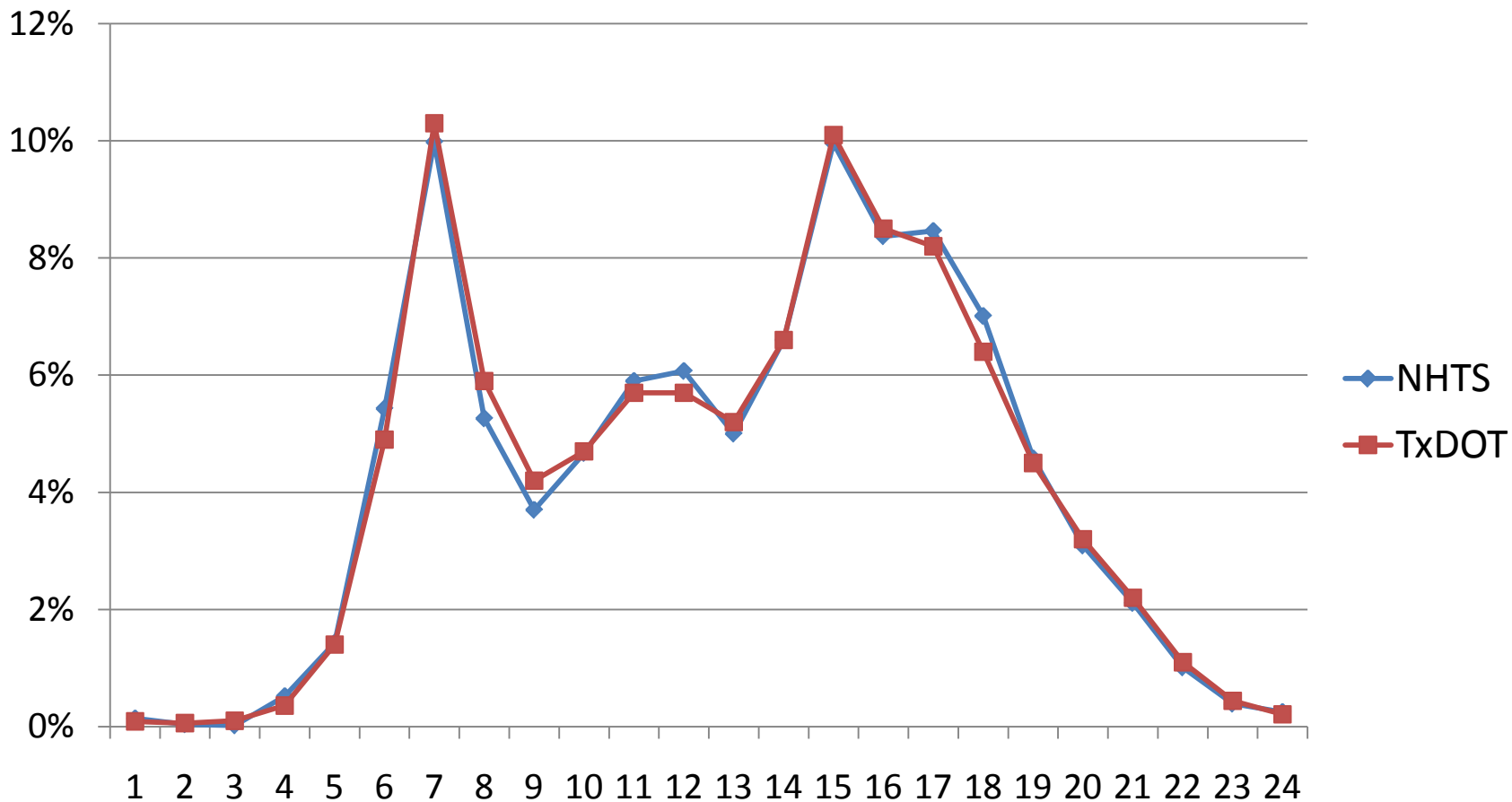
- ❖ 3.19 persons per HH
- ❖ 1.35 workers per HH
- ❖ 2.18 vehicles per HH
- ❖ 1.62 vehicles/worker
- ❖ Mean income \$50-\$54k
  
- ❖ Mean Age: 35-39 years  
(n=5,807 HH)

\*Data are unweighted

# Houston: Travel Modes



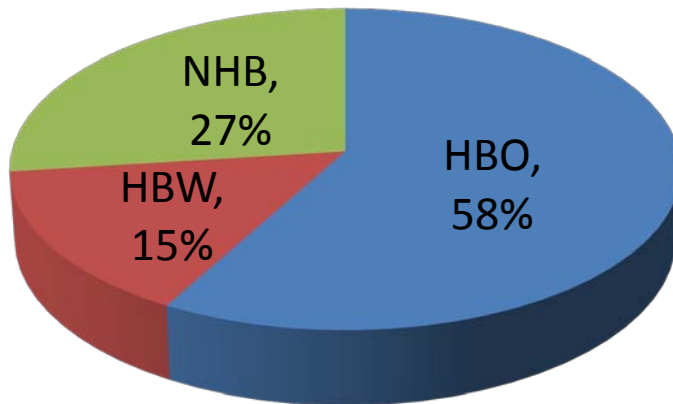
# Houston: Time of Day



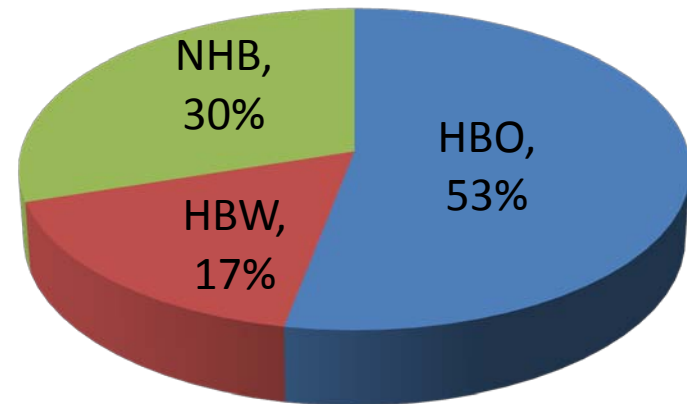


# Houston: Trip Purpose

## NHTS Sample

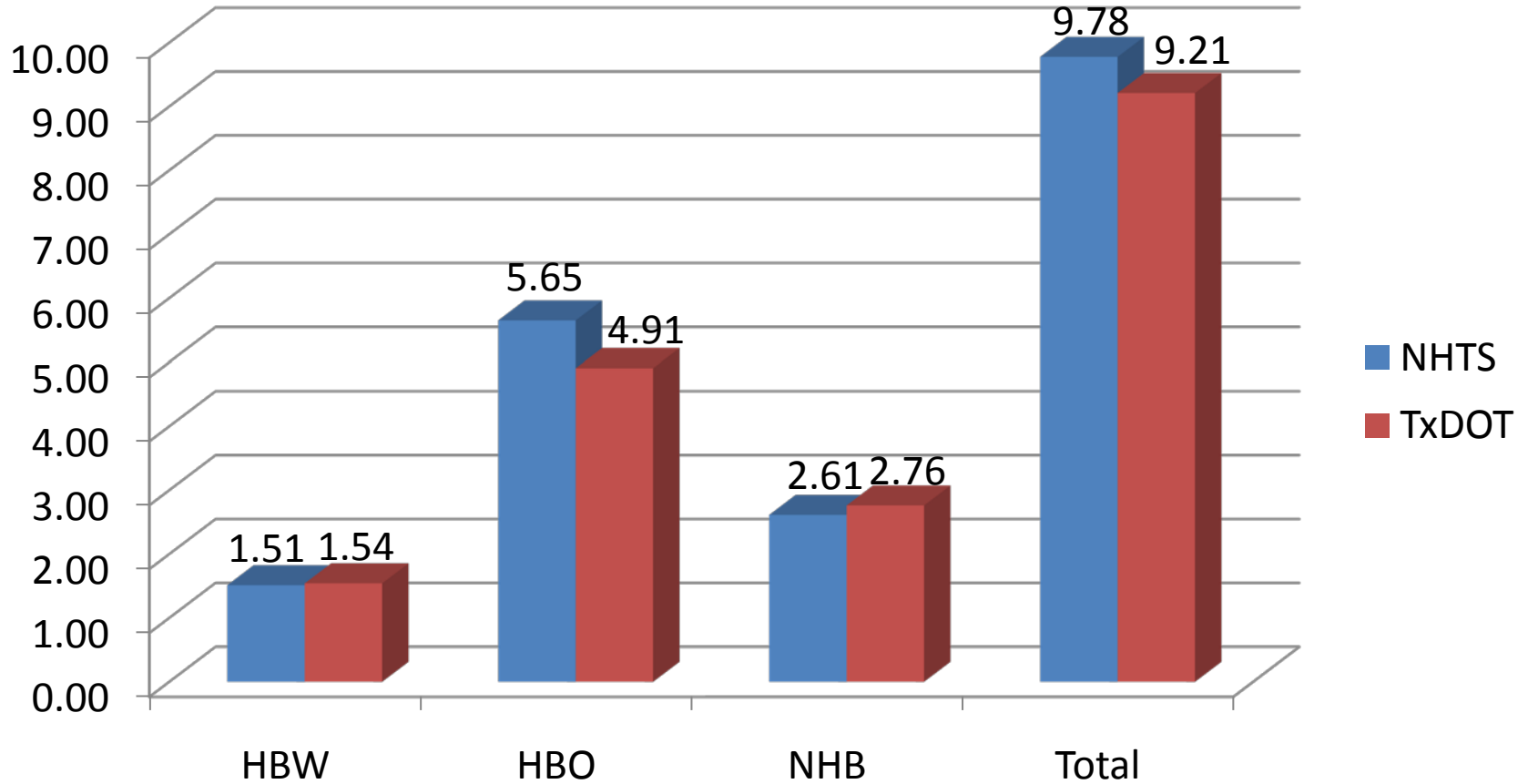


## TxDOT Sample





# Houston: Trip Rates





# Houston Sample Comparison

- ✓ NHTS HH tend to be smaller and older, with higher vehicle availability and higher income
- ✓ NHTS captured more diversity in travel mode (less auto, more walk)
- ✓ NHTS trips show a slightly higher mid-day peak



# Conclusions

- Profile Analysis
  - Demographic differences (unweighted)
  - General consistency in travel
  - Trip chaining is needed
    - Trip purpose
    - Trip rates
- Differences in survey methods impacts results
  - NHTS more elderly → Time of day and mode
- NHTS Add-on suitable for use in SAM with adjustments

# Questions?



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