Extracting Bicycle & Pedestrian Relationships from 2009 NHTS

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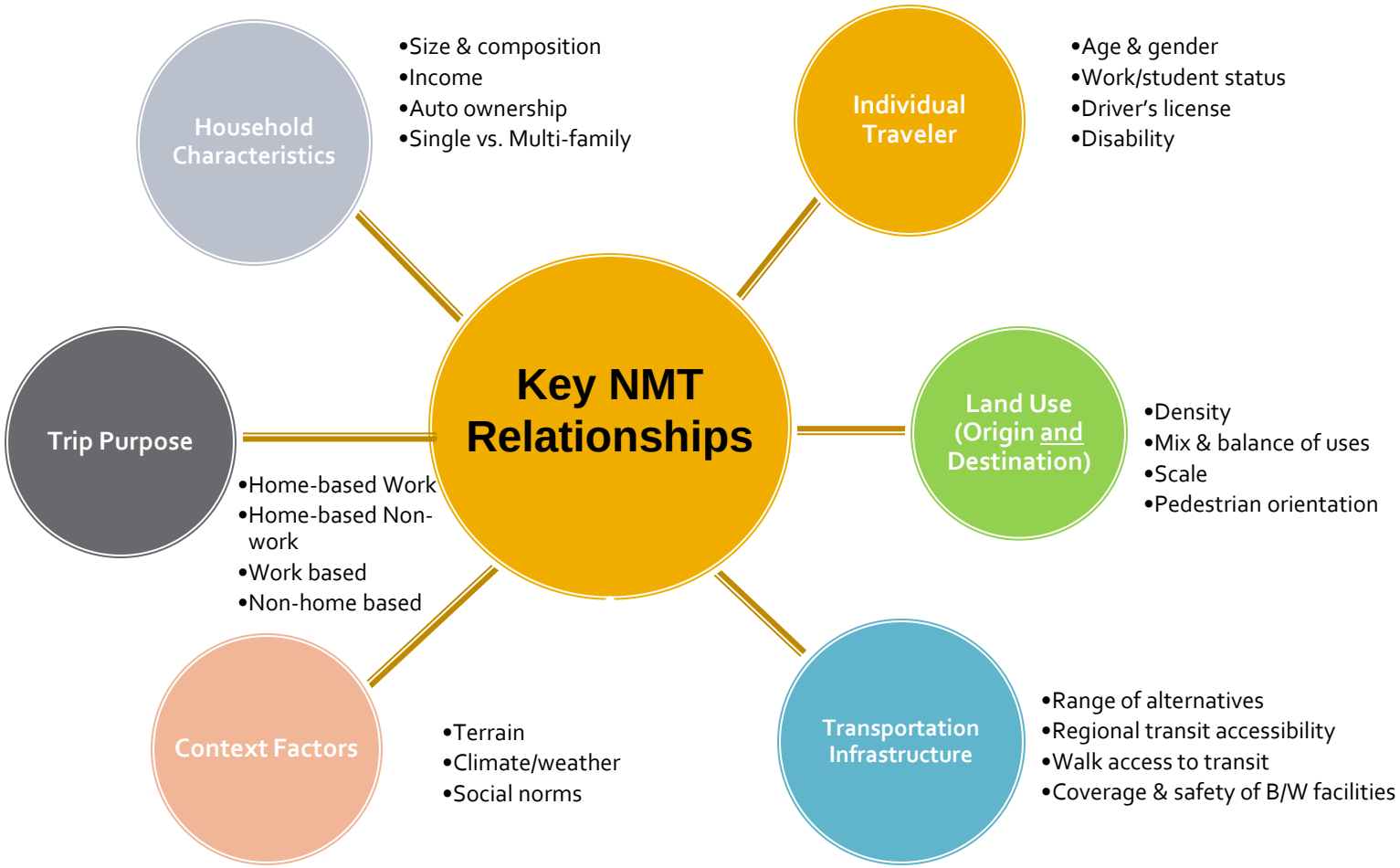
Context

- Performing NCHRP Project 08-78: *Estimating Bicycle and Pedestrian Demand for Planning and Project Development*
- Purpose: Develop more robust methods to estimate walking and bicycle activity for:
  - Smart growth planning/land use policy evaluation
  - Improved multimodal transportation planning & project prioritization
- Product: Practitioner guidebook

Background Research

- Review & assess domestic & international research and state of the practice
  - Delineate key factors/variables to be considered and the methods/models that address them
  - Explicitly recognize differences between walking and biking
  - Identify & assess data sources to support methods
  - Identify gaps in understanding, methods and data that must be addressed

Myriad of Factors Influencing Biking and Walking Behavior



Data Sources

- Empirical research and modeling studies
- Large scale and site-project scale user surveys
- Regional household travel surveys
- National Bicycle Pedestrian Documentation Project
- National Household Travel Survey

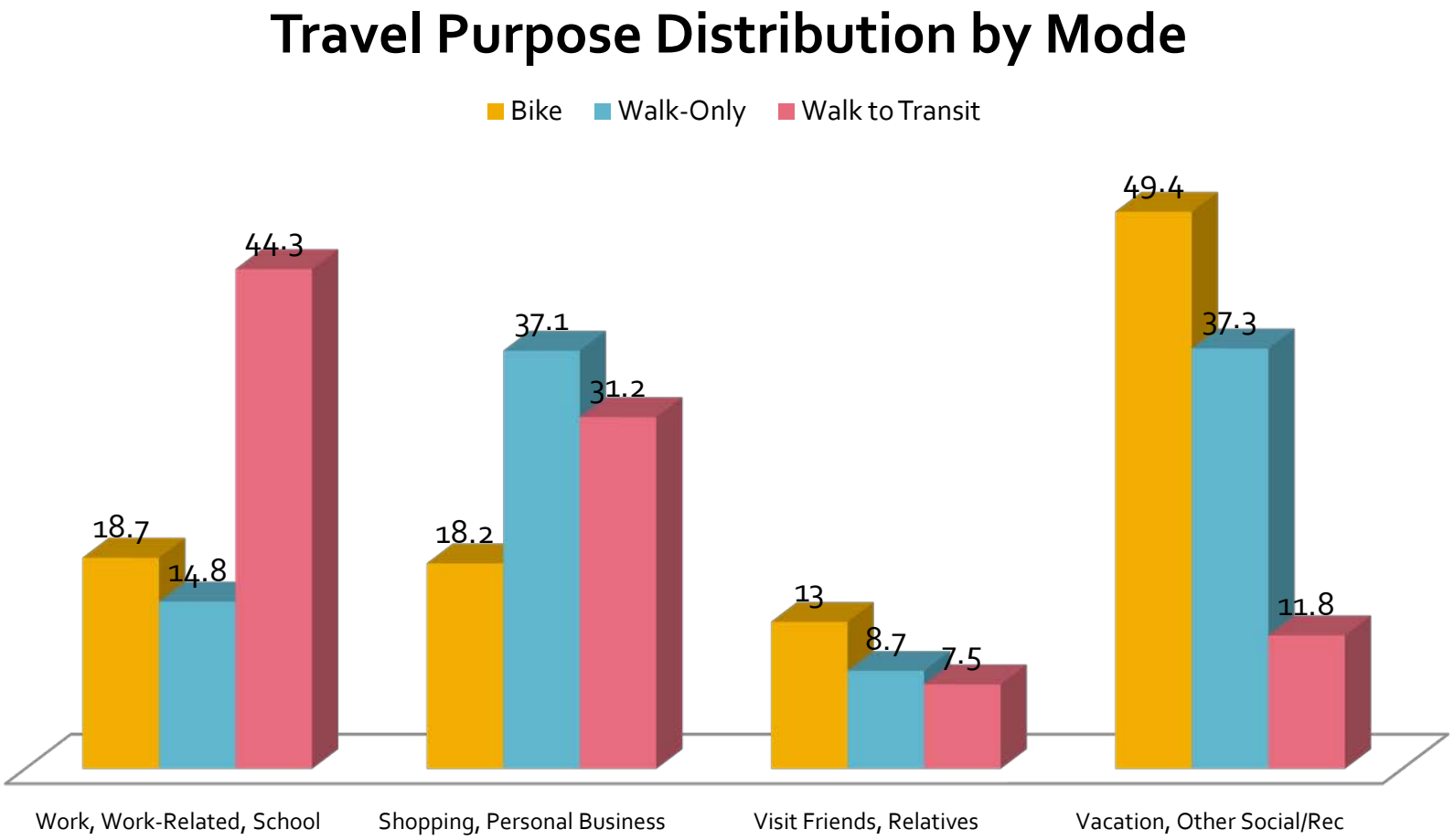
Using NHTS

- Great source for:
  - Rates of walking and biking and trends over time
  - Trip lengths and travel times, by trip purpose
  - Socioeconomic characteristics, some geographic context
- Initial reliance on 2001 NHTS
  - Excellent work by Weinstein & Shimek (2005), Shimek (2008)
  - Set stage for many key relationships
- Switched to 2009 NHTS survey in December
  - 150,000 households (vs. 69,000 in 2001 NHTS)
  - 100,400 walk trips and 9400 bicycle trips
  - Identifiable subsamples for 49 major metropolitan areas

Major Findings: 2009 NHTS

- Rates of Walking and Biking:
  - Walk only: 10.1% of all trips, 0.7 miles, 14.9 minutes
  - Walk to transit: 1.67% of all trips (mileage, duration unknown)
  - Bike: 1.01% of all trips, 2.26 miles, 19.4 minutes
- Persons NOT making at least 1 walk or bike trip last week
  - Walk: 32%
  - Bike: 87%
- Trends between 1977 and 2009
  - Walk, all purposes: 9.3% to 8.7%
  - Bike, all purposes: 0.7% to 1.0%
  - Travel to school: Walk – 22.5% to 9.5%; Bike – 1.0% to 0.7%

Major Findings: 2009 NHTS



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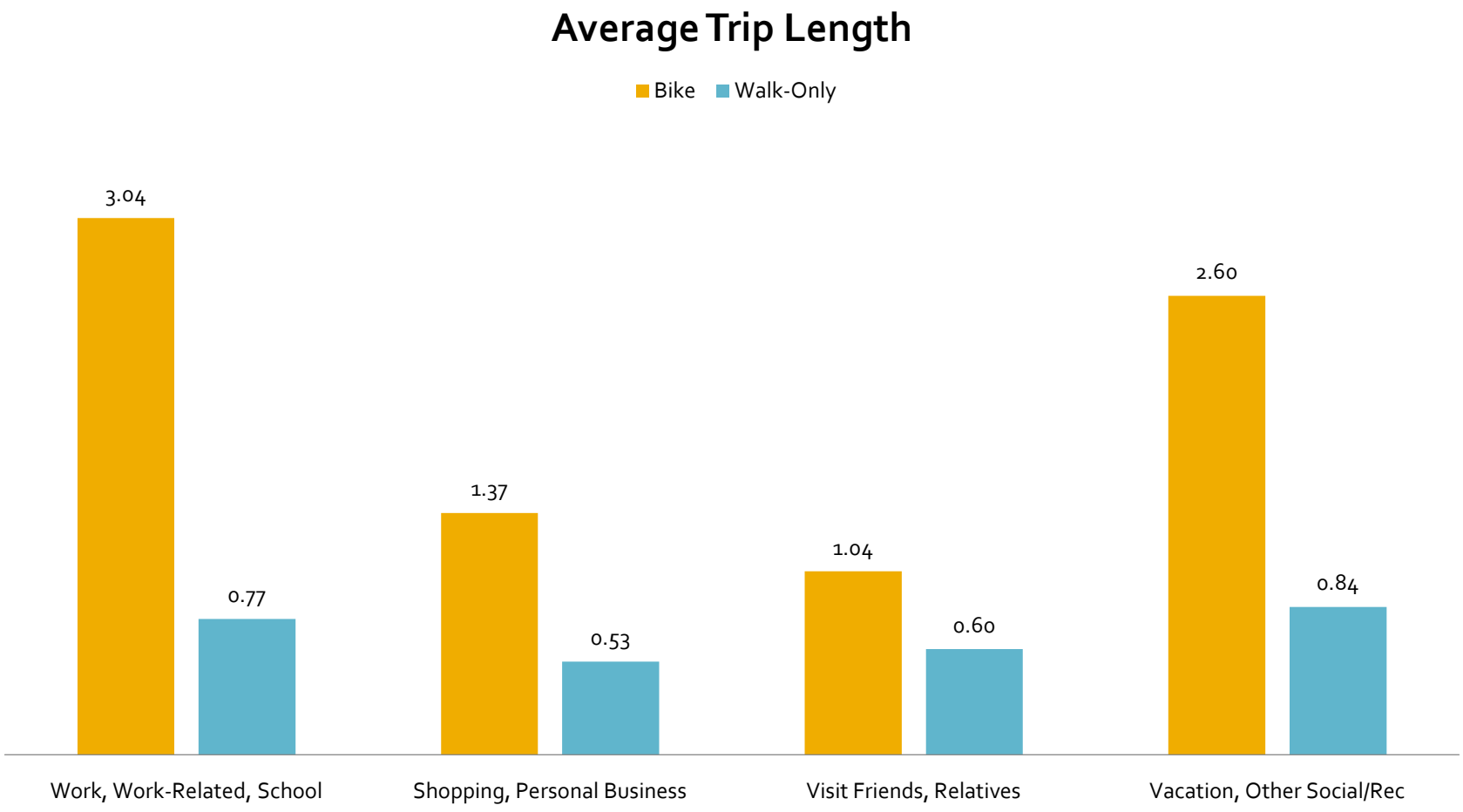

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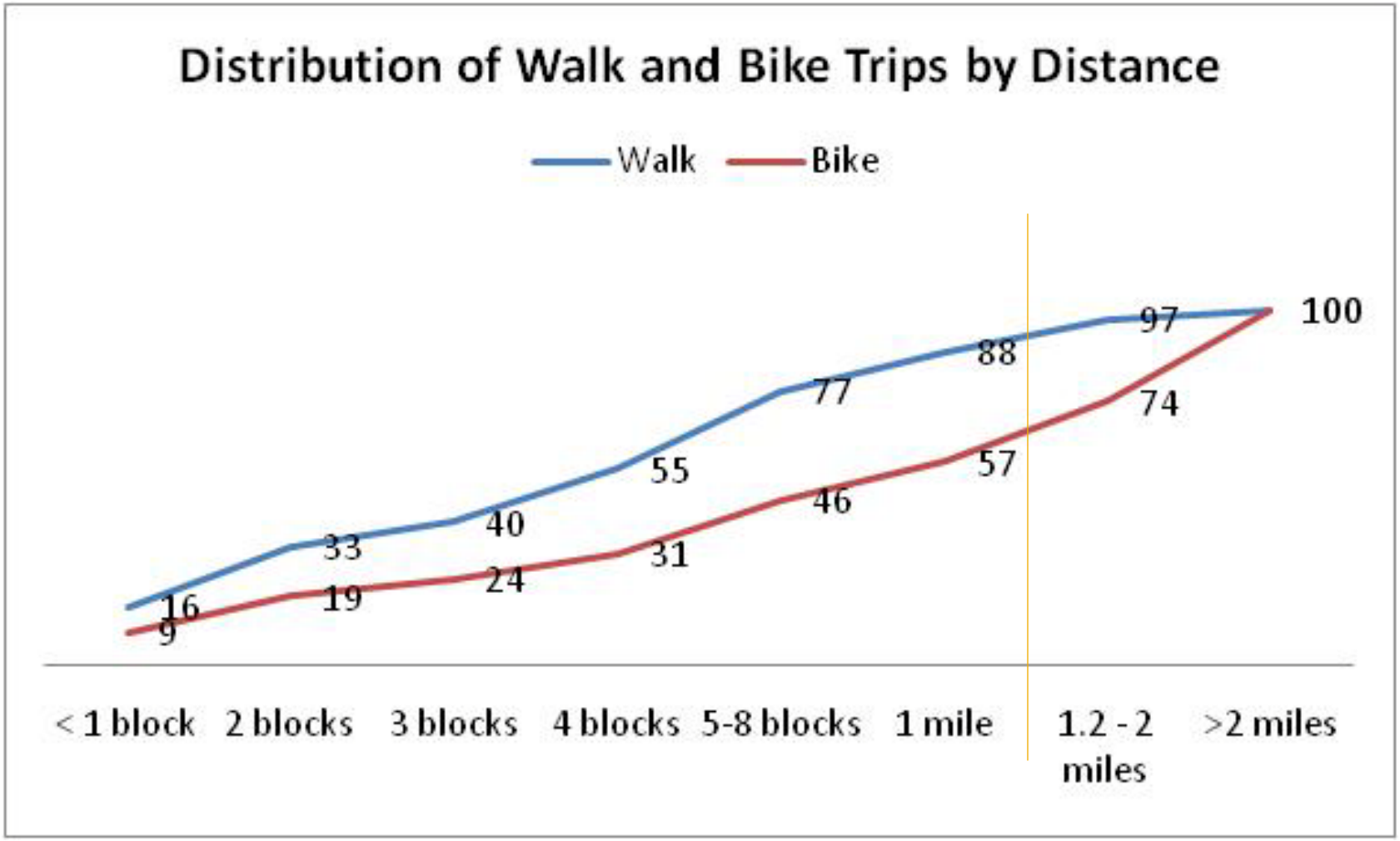
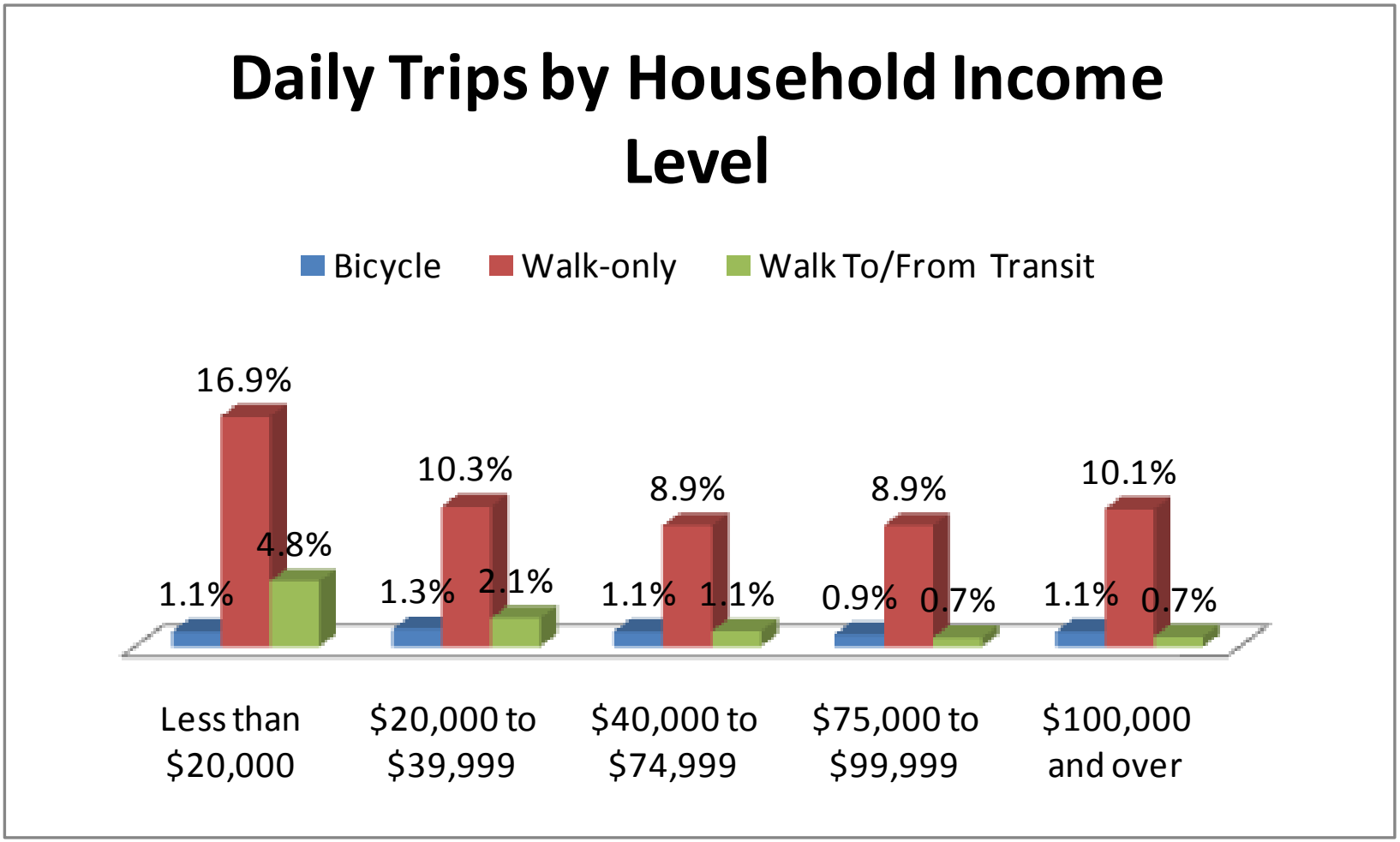


Major Findings: 2009 NHTS

- Age and Gender:
  - Kids (age 5-15) walk & bike the most
  - Highest walk-only among adults: ages 25 to 34
  - Walk rates stable until age 65, then drop quickly
  - Women walk at higher rates than men after age 25
  - Women walk to transit at higher rates, at all age levels
  - Walk to transit highest for ages 16 to 24 in both genders
  - Males bike at rates 3 to 4 times greater than females at all ages
  - All bike rates fall with age; Highest adult rates ages 16-24, then 35-44

Major Findings: 2009 NHTS



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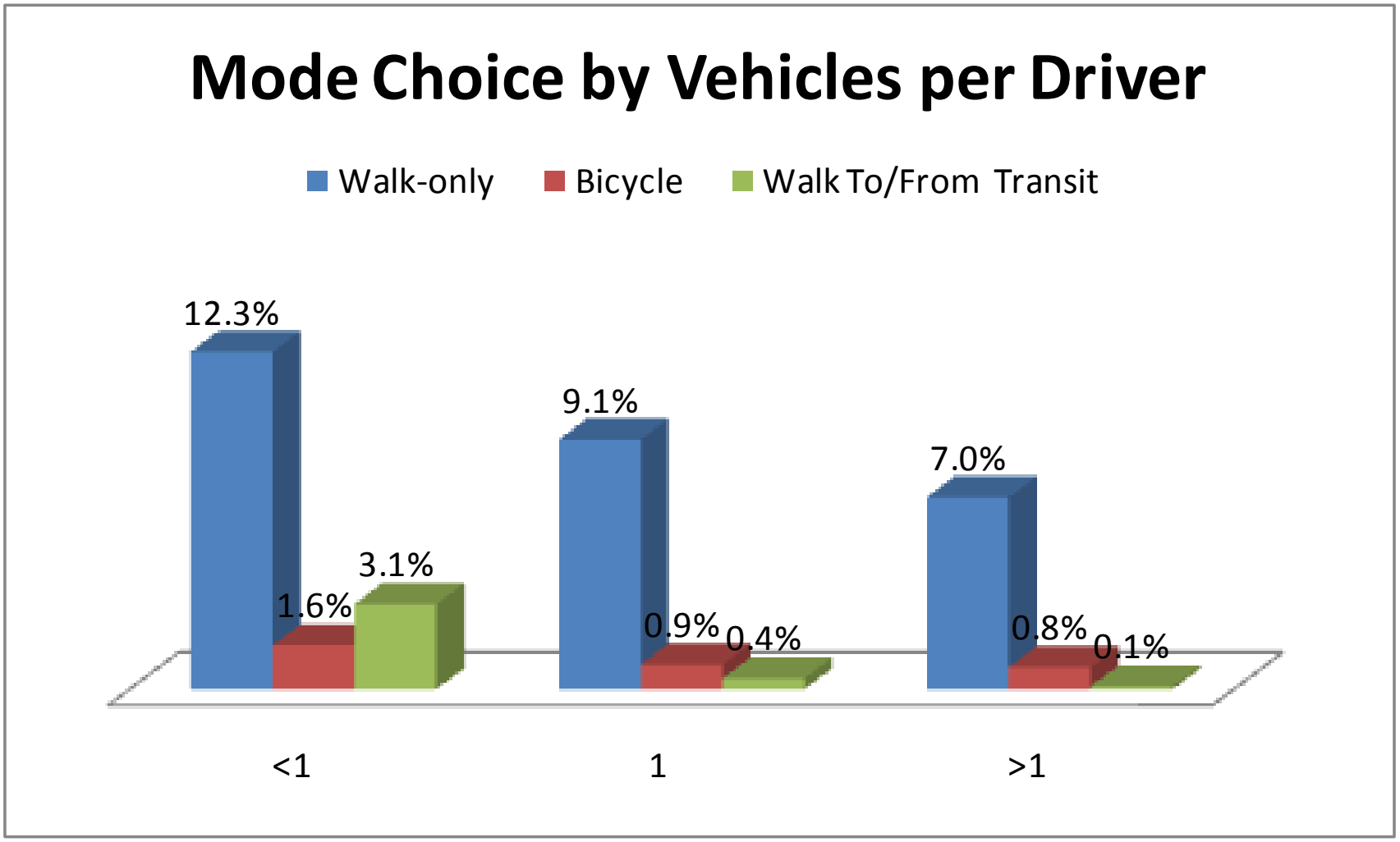

Major Findings: 2009 NHTS

- Race/Ethnicity:
  - Pacific Islanders: highest rates of walking (21.9%), including transit access (6.1%); whites have lowest rates (9.7% and 0.8%)
  - Whites have highest rates of biking (1.1%)
- Education
  - Highest rates of walk-only and bike for lowest (< high school) and highest (graduate degree) levels of education
  - Lowest rates for high-school or some college level of attainment
- Metropolitan Area Size
  - Highest rates of walk-only (15.4%) and walk to transit (3.8%) in areas of 1 million + with subway or rail transit
  - Biking highest (1.2-1.3%) in areas of 200,000 to 1 million

Observations, Thoughts, Recommendations

- Very comprehensive source, larger sample size gives more confidence & capability
- Sample size for about 20 urban areas may be large enough for detailed analysis (2,000 or more households)
  - Would need to supplement with transportation system & built environment measures
- Limitations:
  - Linked trip purposes based on 1990 definitions
  - Difficulty deriving information on transit access

Observations, Thoughts, Recommendations

- Still a lot of untapped information in database
  - Cross-sectional analysis of different socio-demographic characteristics with usage patterns
  - Time series analysis with 2001
- User interface could be more friendly
  - Learning curve for initial, basic use
  - Need some experience for more detailed analyses
- Appreciation to those who succeeded!
  - Susan Liss (NHTS “emeritus”!)
  - Tim Dietrich (Univ. of Texas at Austin)
  - Sudeshna Sen (NuStats)