

# Fusing Passive Data for Transportation Planning: Studies in Atlanta and Seattle

## How NHTS Data are Used in a Data Synthesis and Fusion Process

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### CONTEXT

To date, the collection of comprehensive household travel data through surveys has been challenging (e.g., high costs, nonresponse).

Many have investigated other **passive location data** options including: GPS WiFi positioning Bluetooth triangulated mobile phone signals but these typically **lack information about the tripmaker**.

Meanwhile, consumer data firms have been compiling extensive information about individuals and households for decades, typically selling the inexpensive, up-to-date data for marketing, but **passive consumer data** generally **lack trip-making behavior**.

By **combining** these types of **passive data with NHTS data** using a data synthesizing and fusion process, we **create localized, synthetic household travel data**.

Travel diaries from the NHTS are used in the data synthesis and fusion process to inform the relationship between time of day and types of tours, the number of activity locations on each tour, and the duration spent at each location between travel.

**This poster illustrates findings of prototype studies in Atlanta and Seattle.** The NHTS data are compared here against the Atlanta and Seattle household travel surveys (HHTS) with respect to the statistics used for the synthesizing process.

### DEFINITIONS

#### Tour Classification

Description	Definition (Regular Expression)	Simpliest Example
Simple work	h-w-h	h-w-h
Multi-part work	h-w-(w-)+h	h-w-w-h
Simple non-work	h-o-h	h-o-h
Multi-part non-work	h-o-(o-)+h	h-o-o-h
Composite to work	h-o-([wo]-)*w-h	h-o-w-h
Composite from work	h-w-([wo]-)*o-h	h-w-o-h
Composite to and from work	h-o-([wo]-)*w-([wo]-)*o-h	h-o-w-o-h
Composite at work	h-w-([wo]-)*o-([wo]-)*w-h	h-w-o-w-h

Simplified version of the tour classification system developed by O'Fallon, Carolyn, and Charles Sullivan. 2009. Trends in Trip Chaining and Tours: Analyzing Changes in New Zealanders' Travel Patterns Using the Ongoing New Zealand Household Travel Survey (Research Report 373). NZ Transport Agency.

### CONCLUSIONS

**The simulation engine creates a reasonable synthetic travel diary using NHTS data with multiple passive data sets.**

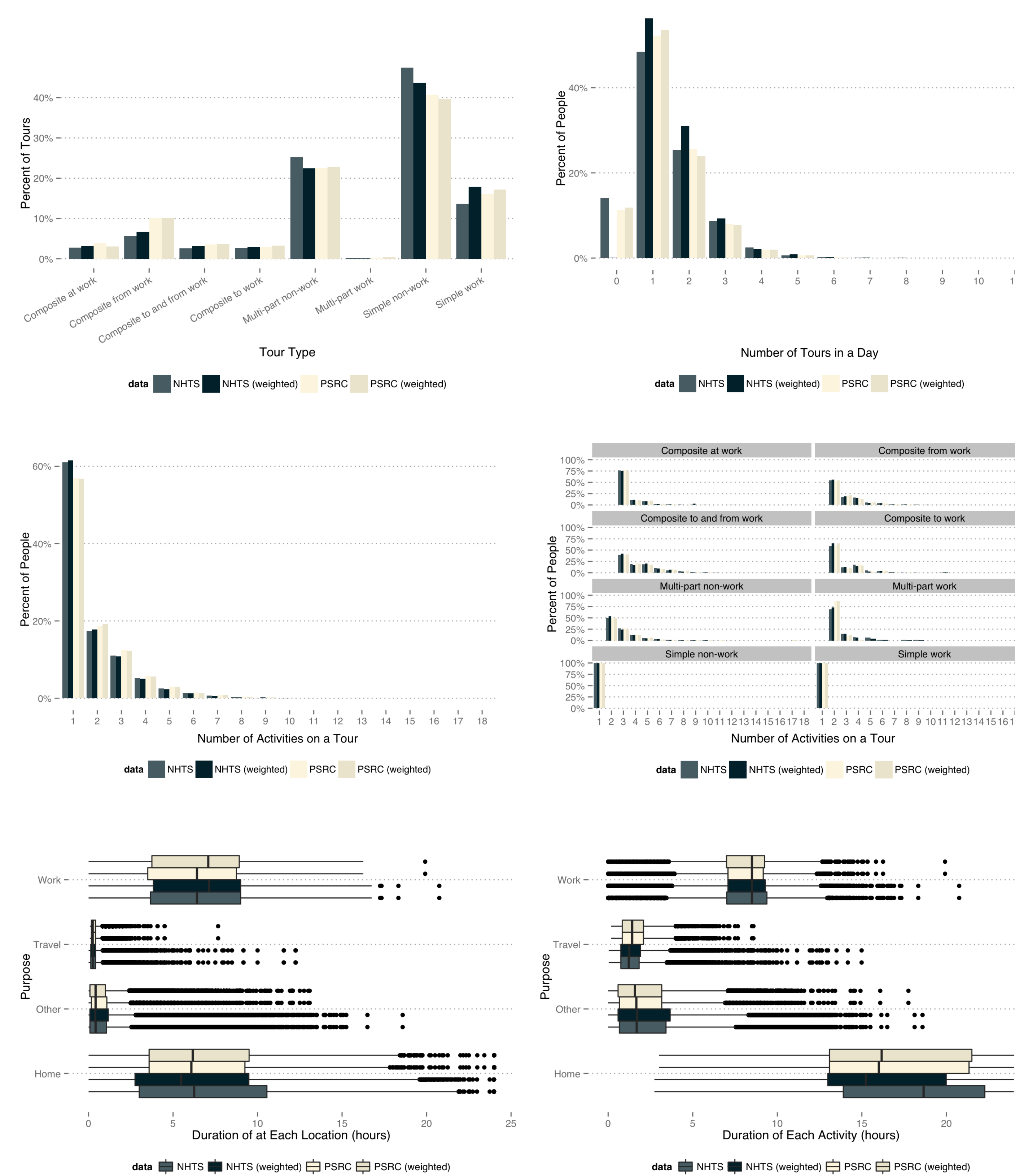
Extensive validation is ongoing for other aspects of the synthetic diaries. Implementation with an assignment model will allow further analyses.

TRANSPORT  
FOUNDRY

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### SEATTLE

2009 NHTS vs. 2014 Seattle HHTS  
Puget Sound Regional Council (PSRC)



### ATLANTA

2009 NHTS vs. Atlanta Synthetic HHTD

