

Comparing Transit Model Elasticities: ABM versus Trip Based Models

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June 4, 2019

17th TRB Transportation Planning Applications Conference



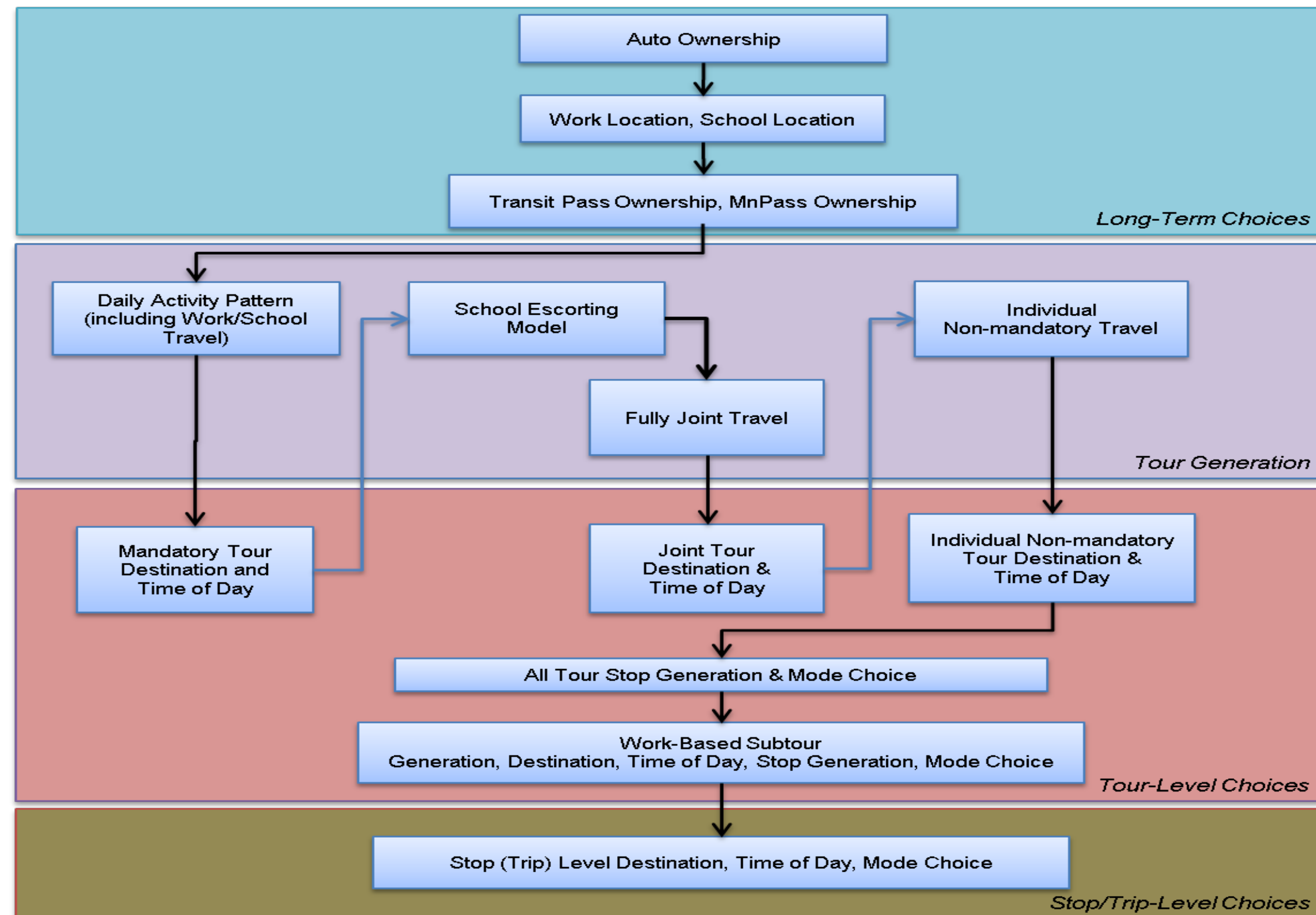
Overview

- Project Description
- Model Overview
- Tour versus Trip Based Forecast Example
- Elasticity Tests
- Findings

Project Description

- Test new ABM's ability to forecast projects
- Understand the differences forecasts between the ABM and older trip-based model
- 4 corridors compared
- Recommended changes to ABM to improve forecasts
- Worked closely with Model Developer
- Elasticity tests part of project

Model Overview



- Uses Tourcast suite of programs for long term, tour, and stop/trip level generation and choices
- CUBE used for path and network procedures
- “Consistent tours” procedure developed for transit forecasts

Tour vs. Trip Based Forecasts

	Trips on the Project	New Riders
Trip Based Model	5,200	2,300
ABM	2,000	400



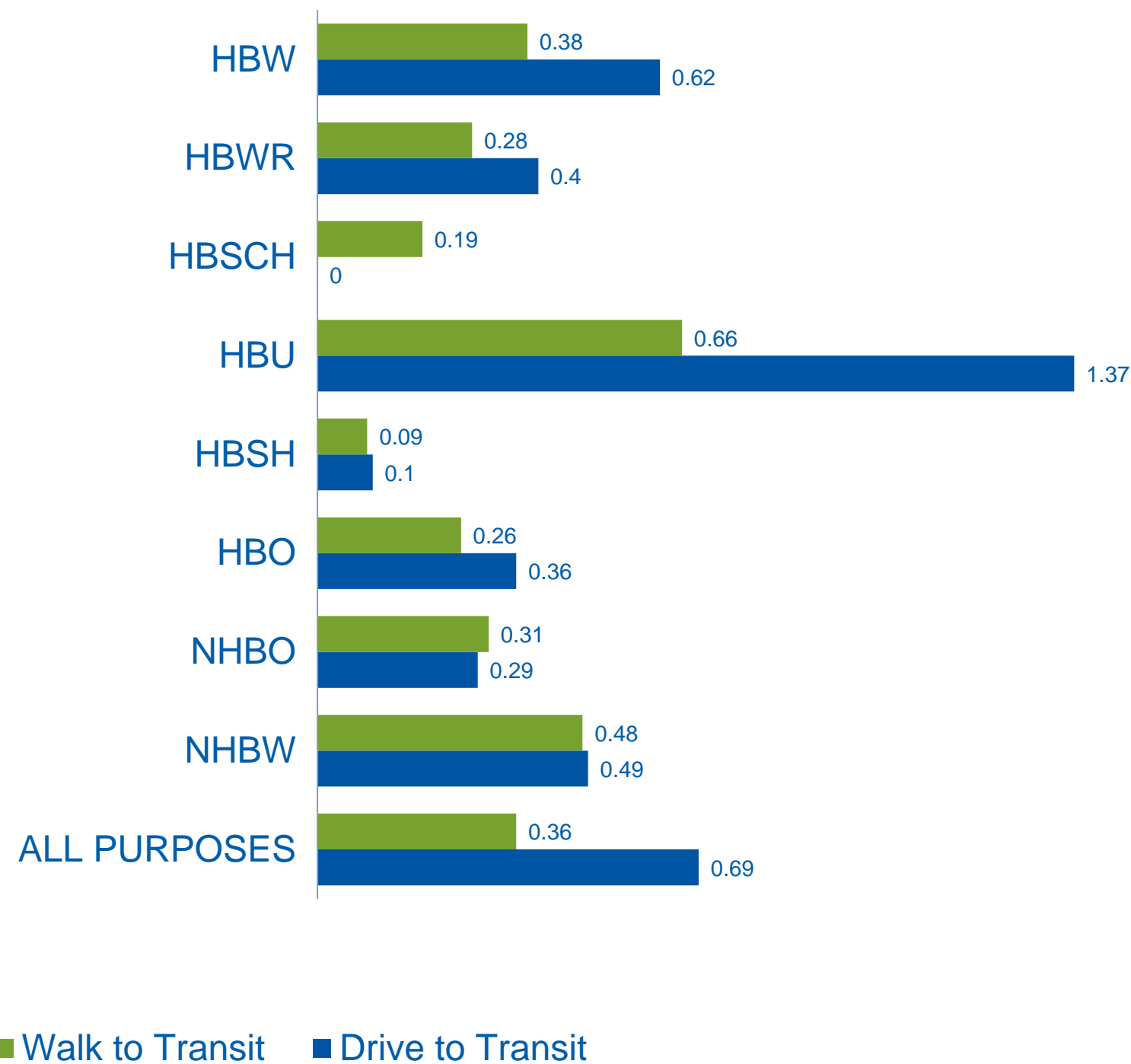
- Proposed “Robert Street” LRT Line from downtown St. Paul to the south

Elasticity Test #1: In-Vehicle Time

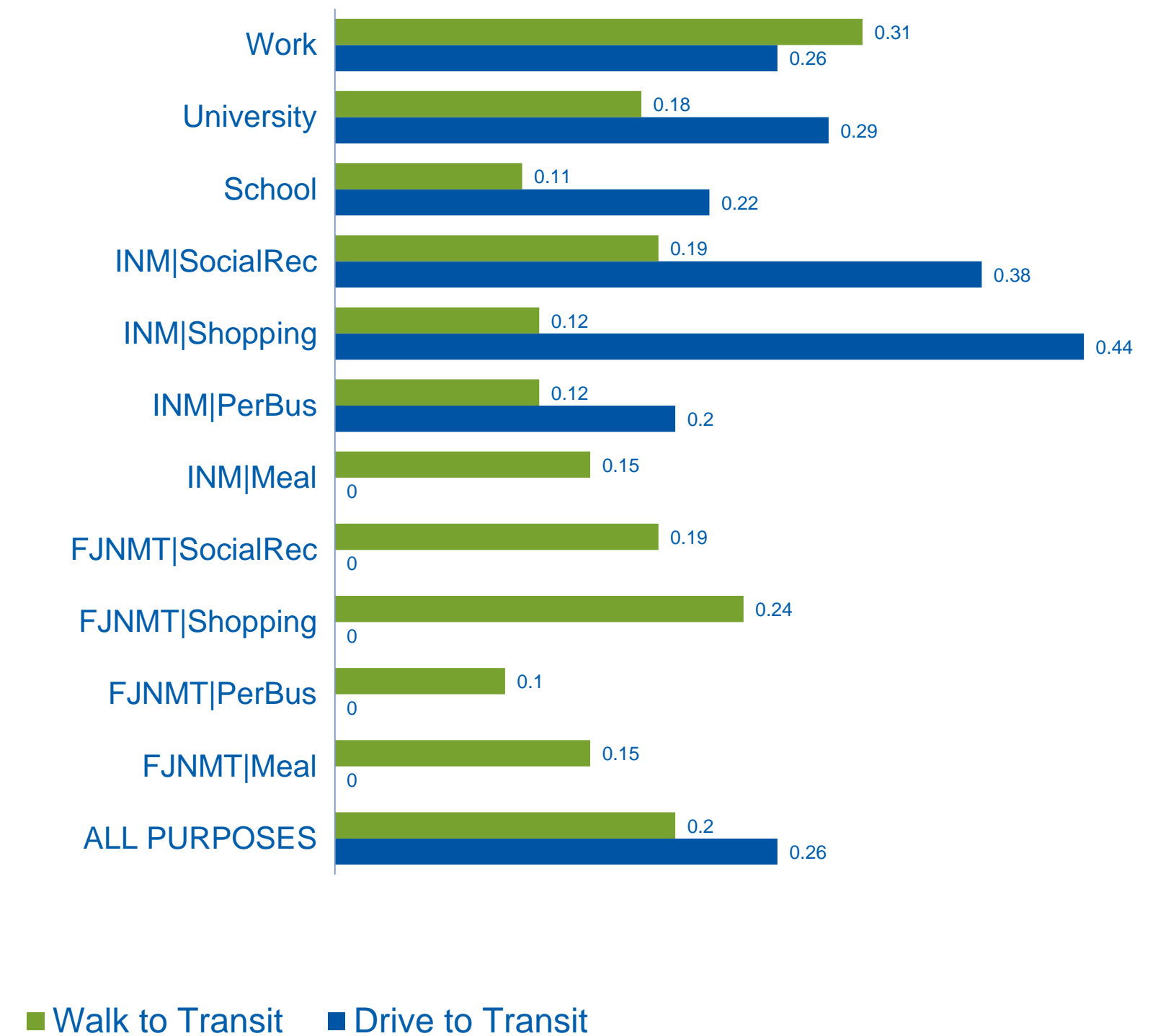
- Test elasticity of Trip-based versus ABM models
- Multiply the in-vehicle travel time in transit skims by a factor of 0.95 for walk to transit and drive to transit skims
- Elasticities determined using incremental change in transit trips (Trip-Based Model) or tours (ABM)
- Additional comparison made to a “benchmark model”
 - -0.025 in-vehicle time coefficient
 - 2.5 OVT/IVT ratio

Test #1 : In-Vehicle Time

Trip-Based Model



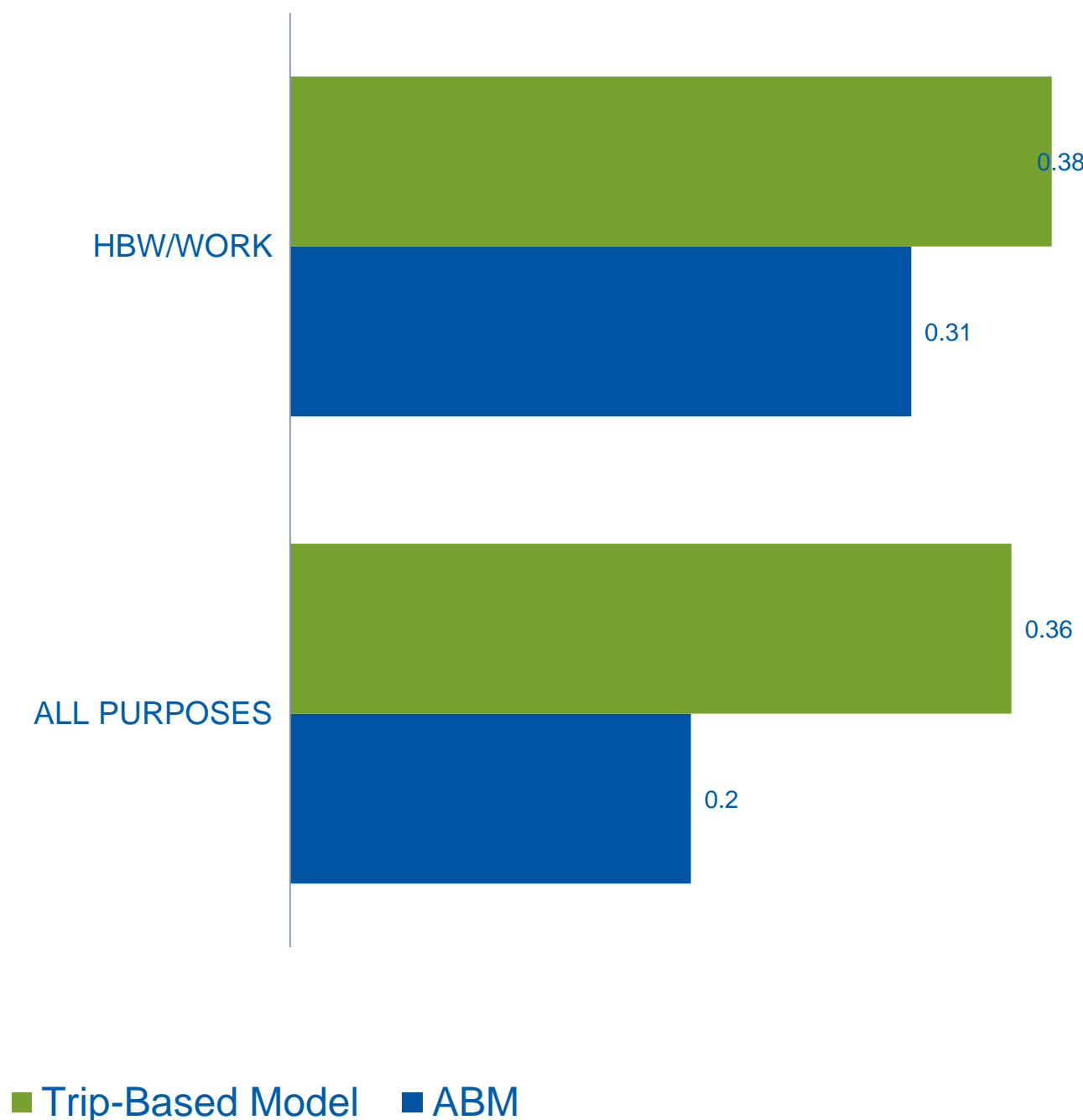
ABM



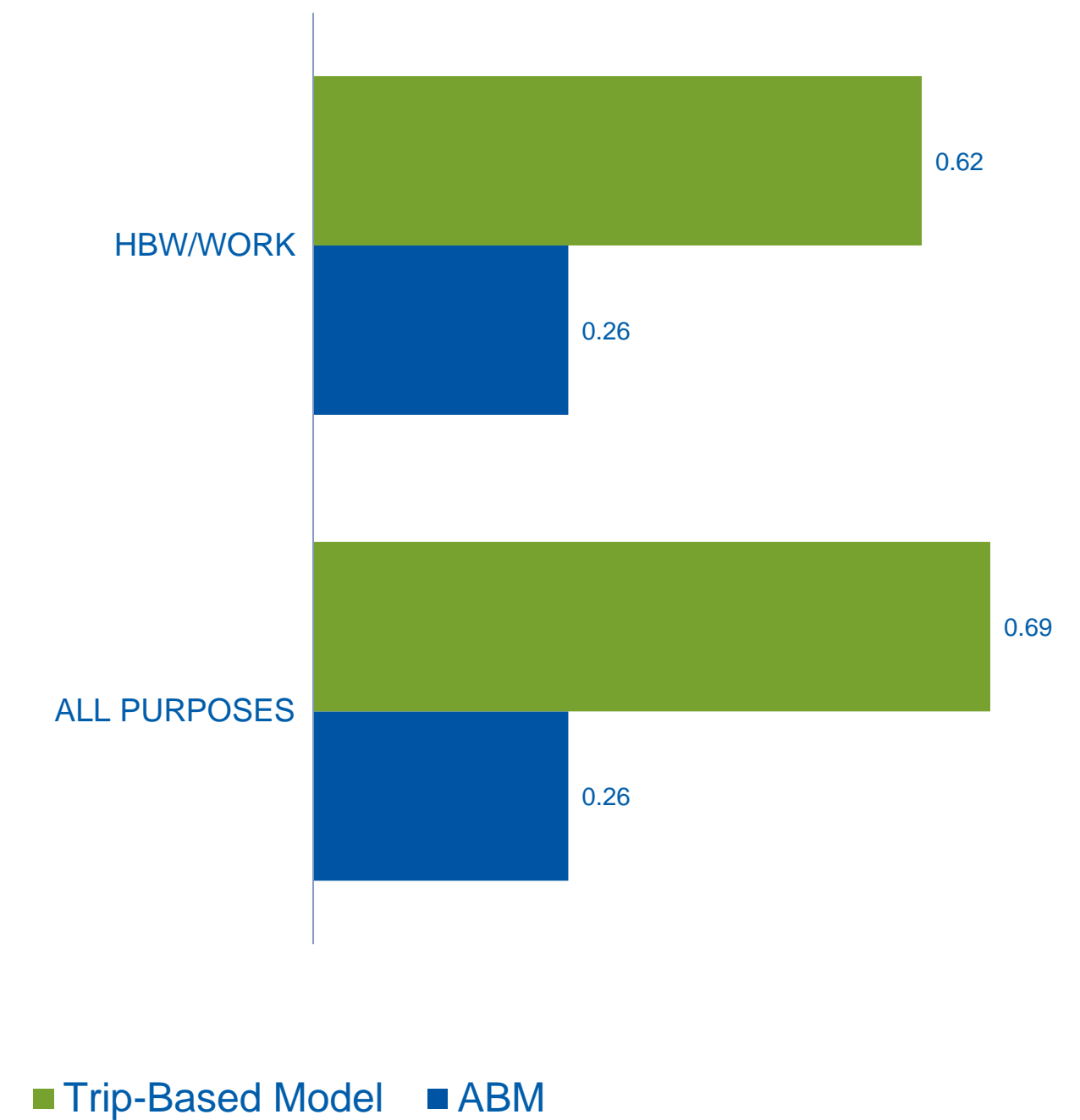
(Absolute Values)

Test #1 : In-Vehicle Time

Walk to Transit



Drive to Transit



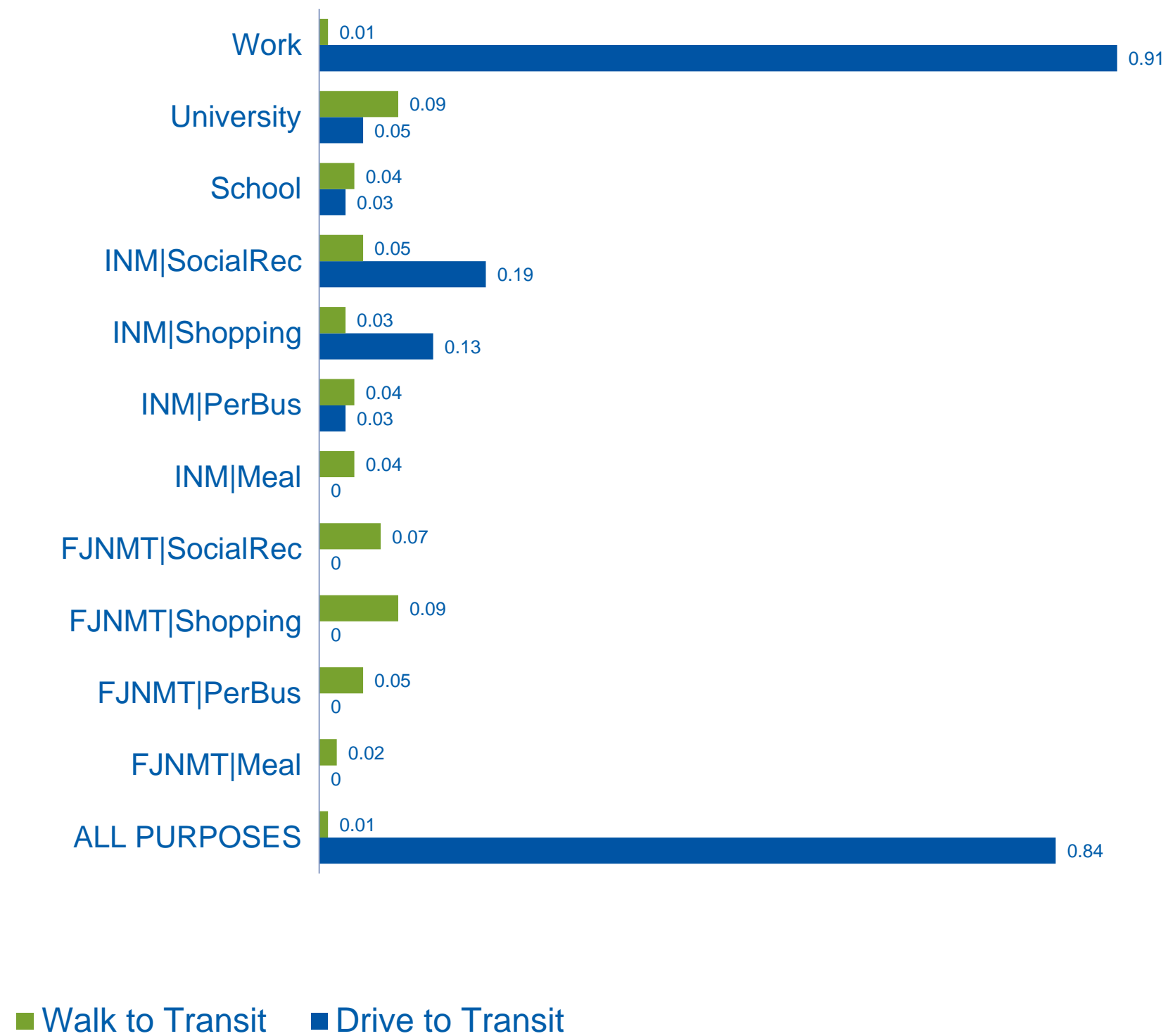
BENCHMARK MODEL ELASITICITY IS 0.4
(Absolute Values)

Elasticity Test #2 : Headways

- 75% reduction in LRT headways
- Reduced coded headway (0.25 x headway) in line file
- Elasticities determined using incremental change in transit tours (ABM)
- Only tested for ABM as an attempt at modal bias

Test #2 : Headways

ABM



(Absolute Values)

Findings

- ABM's ability to generate new transit trips is limited by:
 - Shallow transit nests in the tour and trip mode choice models (only walk and drive to transit)
 - Run time factors in path building being the primary way to differentiate transit modes
 - Large constants further contributed to lower elasticities
- Elasticity tests confirmed findings

Thanks!

- **Project Management Team:** Mark Filipi, Rachel Wilken, Mike Mechtenberg, Kyle Burrows, Jim Henricksen
- **Project Advisory Panel:** Ken Cervenka, Joe Castiglione, Lee Cryer, Guy Rousseau
- **Model Developer:** Cambridge Systematics
- **Other Project Team Members:** Andrew Walker, Dave Schmitt, Srikanth Neelisetty

Thanks!

Questions?