ITEM 11 – Information
March 17, 2021

Regional Travel Survey: Change in Observed Trips Since 2007/08

Background:

As the culminating presentation on the findings from the 2017-2018 Regional Travel Survey, staff will brief the committee on the change in reported travel between 2007/08 and 2017/18, focusing on daily weekday trips, mode share of all trips, and commute trips. Staff will also share additional tabulations from 2017/18 on trip length by mode and purpose.

National Capital Region
Transportation Planning Board

MEMORANDUM

TO: Transportation Planning Board

FROM: Kenneth Joh, TPB Transportation Planner

SUBJECT: 2017-2018 Regional Travel Survey Briefing: Change in Observed Trips Since 2007/08

DATE: March 11, 2021

BACKGROUND

TPB has conducted a regional household travel survey approximately every ten years since 1968. The survey, which collects demographic and travel information from a randomly selected representative sample of households in the TPB region and adjacent areas, is the primary source of observed data used to estimate, calibrate, and validate the regional travel demand model. The model in turn is used for the travel forecasting and air quality conformity analysis of the region's long-range transportation plan as well as to support other key program activities. The survey data are also used by staff to analyze regional travel trends, and by TPB member jurisdictions and agencies to inform regional and sub-regional transportation studies and to conduct their own analysis for their areas of interest. The purpose of the survey is to better understand the characteristics of the households and persons in the region and to better understand daily travel and activities: how we travel, why we travel, where we go, how long it takes us, and what we do when we arrive. The survey seeks to obtain a complete picture of travel patterns in the region. As a result, the regional household travel survey is a critical and essential element of the TPB work program.

PROGRESS TO DATE

The 2017-2018 Regional Travel Survey (RTS) consisted of two key parts: Part 1 featured a recruitment questionnaire, which was completed by households who were invited and agreed to participate in the survey. These households completed the Part 1 questionnaire, which captured information on household, person, and vehicle characteristics as well as new questions on the use of alternative travel options. Approximately 23,000 households completed the recruitment questionnaire for Part 1. Part 2 consisted of a one-day travel diary, which survey participants completed to record details of every trip that household members took on their assigned travel day. Data collected in Part 2 constitutes actual observed trip information that will provide critical input for developing the regional travel demand model. Approximately 16,000 households completed both parts of the survey, well exceeding the survey goal of a representative sample of 15,000 households. Additionally, the RTS collected over 120,000 trip records from these households.

Since the fall of 2019, TPB staff has delivered a series of presentations based on key findings from the RTS to the TPB. The initial presentation in November 2019 focused on travel options that reduce single-occupancy vehicle (SOV) travel and capture recent trends since the 2007/2008 Household Travel Survey (HTS). These questions focused on typical weekday non-SOV travel and delivery services to home such as package and food deliveries. The last presentation in October 2020 focused on detailed observed trip information collected from the travel diary portion of the survey.

This presentation provided a cross-sectional snapshot of observed travel in the TPB region by sub-area, activity centers, and equity emphasis areas.

DESCRIPTION OF FILES

Data collection for the RTS concluded on December 31, 2018. TPB staff performed the data editing, processing, and weighting of the raw data provided by the survey contractor. Compared with the 2007/2008 HTS, the raw data was "messier" and required more extensive data processing. Editing the travel day diary information, which contained detailed trip records for each household member, was particularly labor-intensive because trip records needed to be reviewed and validated for logical consistency with other survey responses.

The RTS consists of four key data files that will be used in future analyses:

1. Household File: characteristics of households, including, among others, household size, income, number of licensed drivers, housing type, and number of vehicles and bicycles.

2. Person File: characteristics of individual persons, including, among others, demographic information, employment status, work location, and usual commute mode.

3. Vehicle File: characteristics of household vehicles, including make, model, year, fuel type, and automatic toll payment transponder information.

4. Trip File: recorded trip details, including origin/destination, start/end times, mode of travel, trip purpose, and transit access and egress.

CHANGE IN OBSERVED TRIPS SINCE 2007/08

As the culminating RTS presentation, this briefing provides a longitudinal comparison of observed travel from 2007/08 – 2017/18 for daily weekday trips, mode share of all trips, and commute trips. Additional tabulations from the 2017/18 RTS focusing on trip length by mode and purpose are also presented. Revised person and trip weights were applied to the RTS to adjust for the Census American Community Survey commuter distribution and 2018 Metrorail ridership estimates.

Survey findings for changes in weekday household and person trip rates are highlighted below:

- Households in the TPB region are taking fewer trips in 2017/18 compared with 2007/08. The decrease in trips per household is across all sub-regional areas, but more so in the inner and outer suburbs. This reflects the national trend in declining household trip rates over the past decade.
- The decrease in household trips is larger for 3 or more person households than 1 and 2 person households.
- The change in household trip rates varies by vehicle availability. Compared with 2007/08, households with no vehicles take more trips per household, while households with two or more vehicles take fewer trips per household.
- The decrease in weekday person trips is larger for younger age groups, especially persons under 35.

Survey findings for changes in mode share of weekday trips are summarized below:

- The share of all bicycle trips dramatically increased throughout the TPB region, doubling since 2007/08. Bicycle trip rates increased three-fold in the regional core.
- The share of rail transit trips declined across the TPB region, especially for non-commute trips.
- The share of bus transit, walk, bicycle, and taxi/ride-hail commute trips significantly increased in the region.
- In the regional core, the share of automobile commutes significantly decreased and the share of rail transit commutes significantly increased.

Overall, the highest shares of bus transit, rail transit, walk, bicycle, and taxi/ride-hail trips are in the core, while the outer suburbs have the highest shares of automobile trips. Since 2007/08, automobile commutes (drive alone, drive others, and auto passenger) have decreased in the TPB region; non-automobile commutes have increased with the exception of rail transit. Among all travel modes, the share of bicycle trips increased most significantly.

TPB staff also performed additional tabulations from the 2017/18 RTS for trip length by mode and purpose. The purpose of these tabulations is to compare the distribution of trip lengths by travel mode and demographic characteristics. Survey findings for trip length distributions are summarized below, based on median trip distances:

- For commute trips, drive alone and rail transit trips have the longest trip lengths. For non-commute trips, trip lengths are longest for rail transit.
- Trip length increases from the core to the outer suburbs. Commute trips are longer than non-commute trips across all sub-regions.
- Household with higher incomes tend to have further commutes with the longest trip lengths among households earning more than $150,000.
- African Americans have further commutes than other racial/ethnic groups.
- Trip lengths increase with vehicle availability; households with more vehicles take longer trips.
- Life stage influences the length of trips with persons between 35 to 74 having the furthest commutes.
- Trip length varies by gender; males have longer commute distances than females.
- Households with children have longer commute distances than households without children.
- For trip length by purpose, commute trips (i.e., trips to work) are longer than other trip purposes.

RTS PUBLIC FILE RELEASE

In addition to preparing the RTS data files for the regional travel demand model, TPB staff has prepared a public version of the RTS data files. The RTS data files are now available for public use by practitioners, researchers, and other stakeholders. The data files include household, person, vehicle, and trip information for the TPB model region, which includes the TPB planning region and adjacent counties. In addition to these files, the public file release will include technical documentation that focuses on survey data processing and survey expansion, and provides an overview of the data files.

The public file release will protect the confidentiality of survey participants by excluding census block groups and XY coordinates for home, school, and work locations, in addition to trip origins and destinations. The public use dataset can be requested from the RTS website (https://www.mwcog.org/transportation/data-and-tools/household-travel-survey/).

RTDC RTS TABULATIONS

TPB staff has also released a new resource to access data from the RTS, the Regional Transportation Data Clearinghouse (RTDC) RTS Tabulations. This resource provides descriptive summaries of variables in the RTS household, person, vehicle, and trip files. These are first level tabulations of the RTS dataset that can be quickly pulled from "off-the-shelf" when needed. The RTDC RTS Tabulations include tabulations for the entire RTS universe, which includes TPB member jurisdictions and neighboring jurisdictions in the TPB model region; tabulations were also prepared for Jurisdictions (County or Independent City), Subregional Areas (Core/Inner Suburb/Outer Suburb), Activity Centers (inside/outside), and Equity Emphasis Areas (inside/outside). This resource is available on the RTDC RTS website (https://rtdc-mwcog.opendata.arcgis.com/datasets/regional-travel-survey-rts-tabulations).

CONCLUSION

While the RTS provides the most recent and comprehensive picture of travel in the Washington metropolitan region, it reflects the region before the COVID-19 pandemic. However, it will provide a useful point of comparison with the "new normal" after the pandemic subsides. In addition, the RTS will help address questions about transportation equity by providing critical insights on access and opportunities for low income and communities of color.

2017-2018 REGIONAL TRAVEL SURVEY BRIEFING: CHANGE IN OBSERVED TRIPS SINCE 2007/08

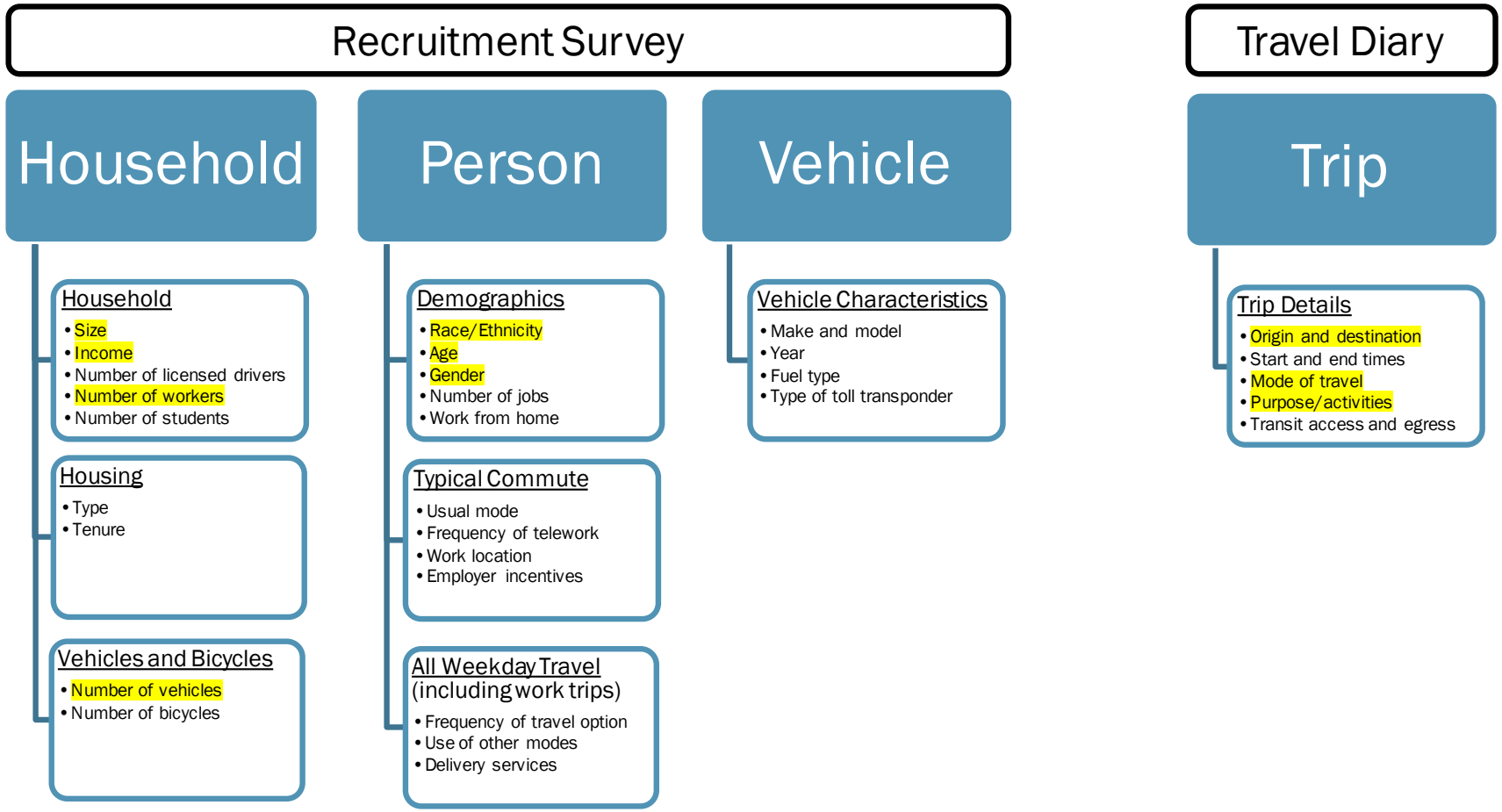
Kenneth Joh, Ph.D., AICP
TPB Transportation Planner

Transportation Planning Board
March 17, 2021

Agenda Item 11

National Capital Region
Transportation Planning Board

Overview of Regional Travel Survey Information



Taking a Deeper Dive into the Travel Diary

- The last briefing provided a **cross-sectional snapshot** of observed travel in the TPB region by sub-area, activity centers, and equity emphasis areas
  - Differences in household/person trip rates by demographic characteristics
  - Differences in commute/non-commute trip share
- Today's briefing will provide a **longitudinal comparison** of observed travel from 2007/08 – 2017/18

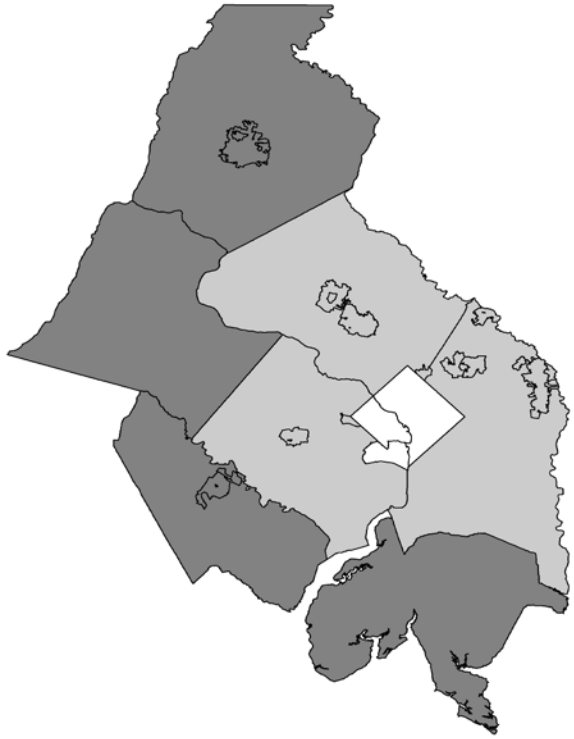
REGIONAL
TRAVEL SURVEY

Planning Our Future Together

- Change in reported travel between 2007/08 and 2017/18
  - Daily weekday trips
  - Mode share of all trips
  - Commute trips
- Additional 2017/2018 RTS tabulations
  - Trip length by mode
  - Trip length by purpose
- Revised person and trip weights applied to adjust for ACS commuter distribution and 2018 Metrorail ridership estimates

Sub-Regional Areas

Sub-Area	Jurisdiction
Core	District of Columbia
	Arlington County
	City of Alexandria
Inner Suburb	Montgomery County
	Prince George's County
	Fairfax County, including City of Fairfax and City of Falls Church
Outer Suburb	Charles County
	Frederick County
	Loudoun County
	Prince William County, City of Manassas, and City of Manassas Park



Households in the Region

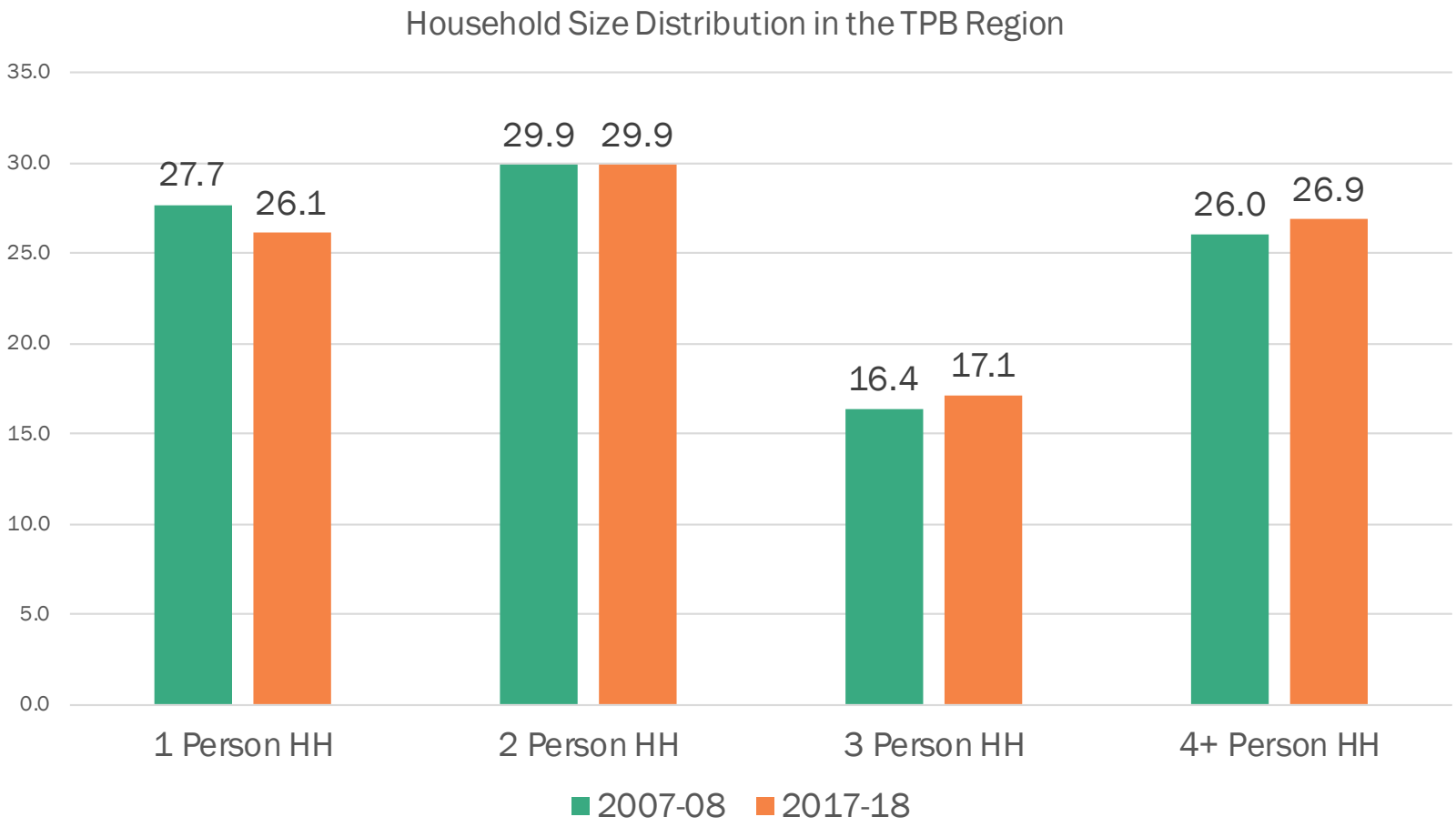
Image Credit: Kenneth Joh

The TPB region increased by 300,000 households since 2007/08

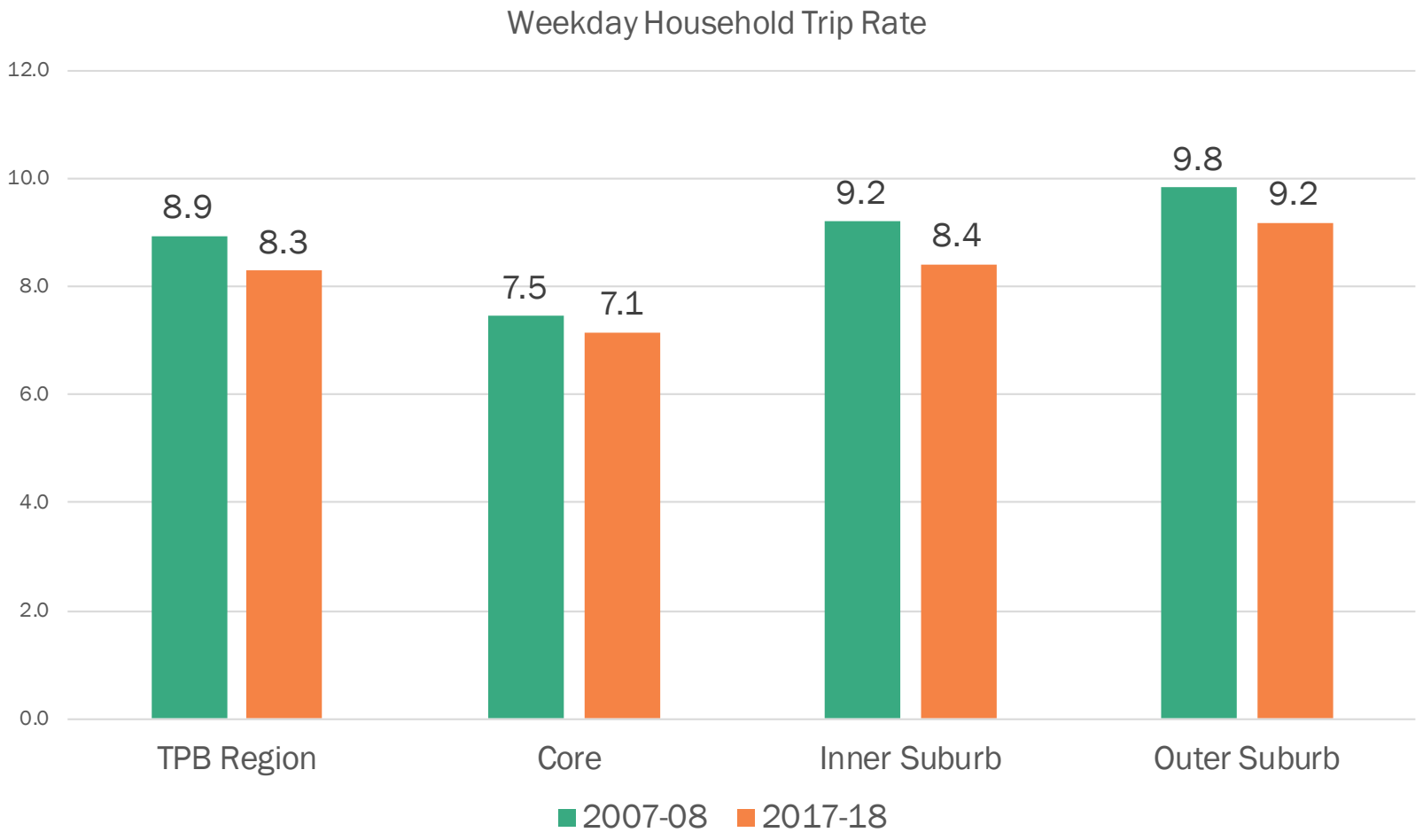
The region has added new transportation infrastructure

Image Credit: Washington Post

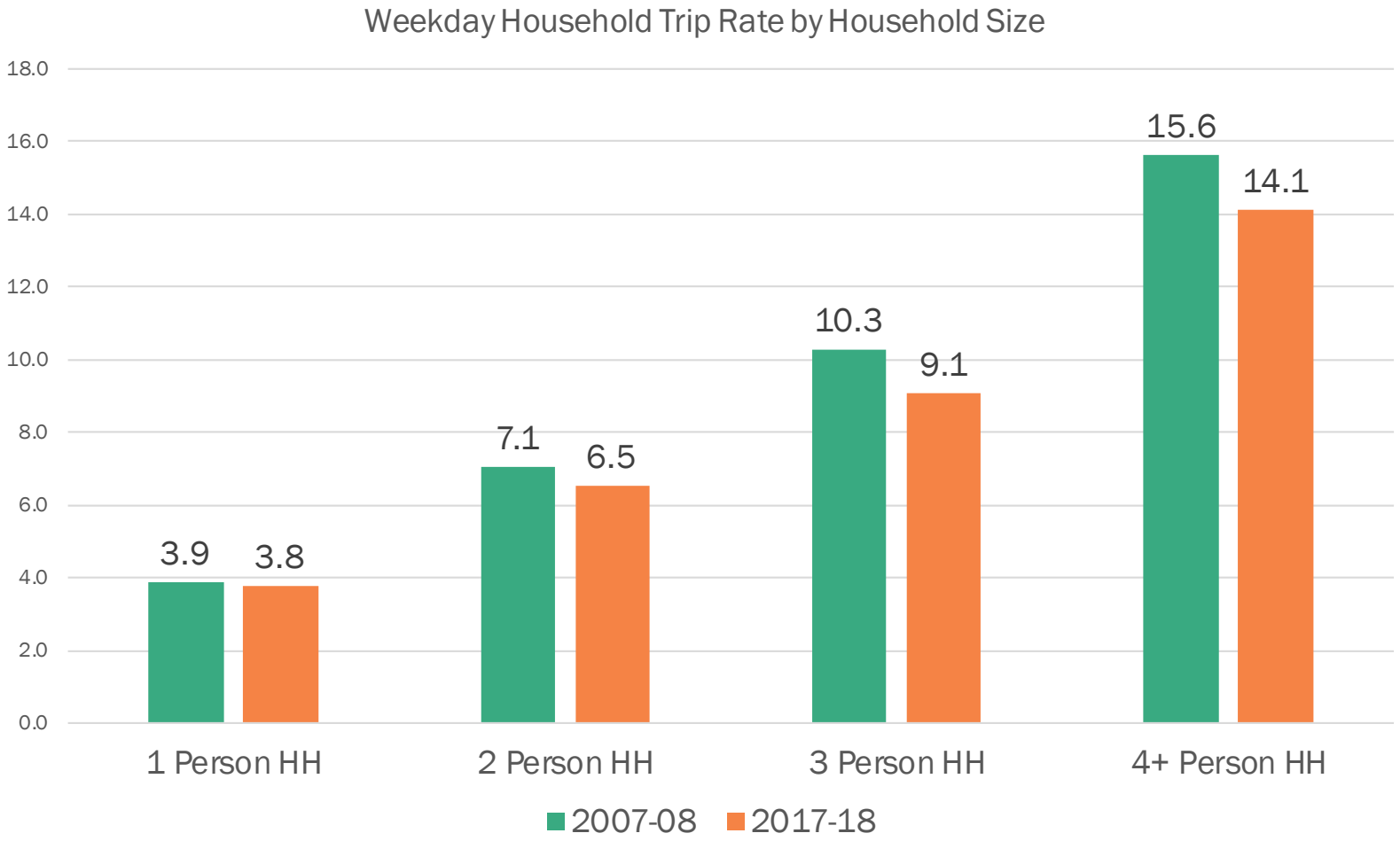
Household Sizes Have Slightly Increased



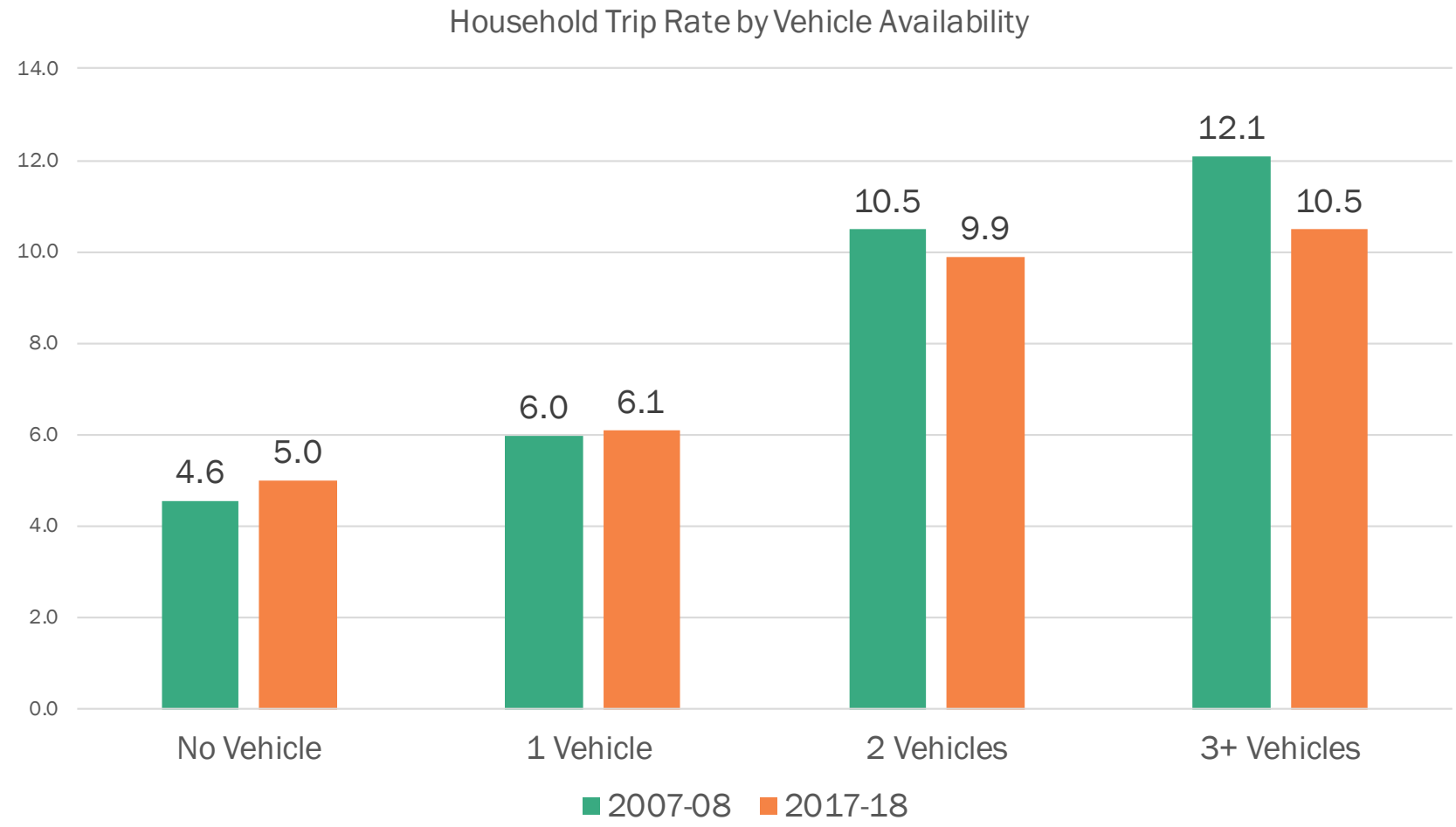
Households are Taking Fewer Trips in 2017/18



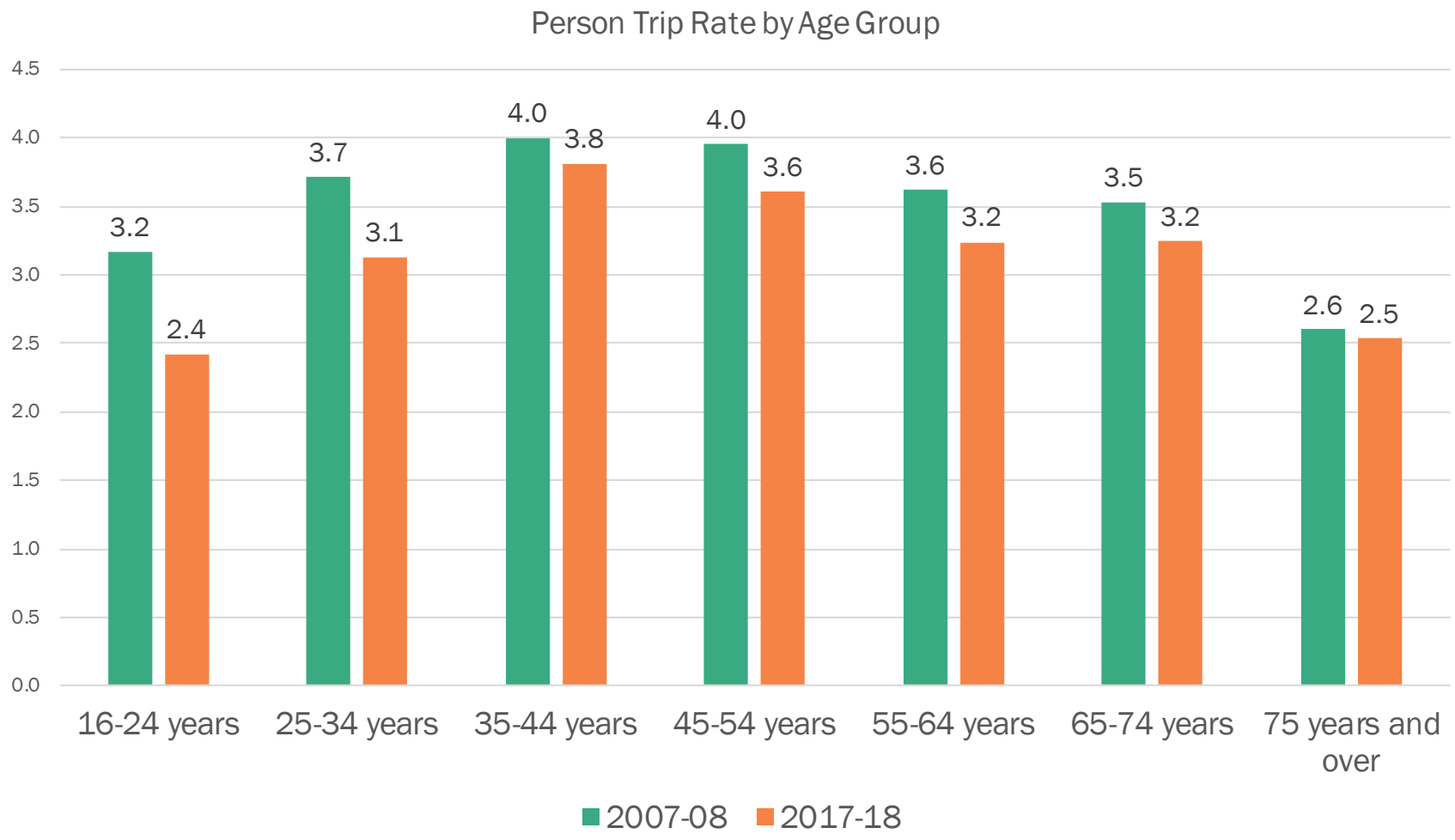
Larger Decrease in Household Trips for Larger Households



Change in Household Trip Rate Varies by Vehicle Availability



Largest Decrease in Trips for Persons Under 35



Summary of Changes in Weekday Household/ Person Trip Rates

- Households in the TPB region are taking fewer trips in 2017/18 compared with 2007/08
- Larger decrease in daily weekday trips for households with 3 or more persons
- Decrease in daily weekday trips for households with 2 or more vehicles
- Larger decrease in daily weekday trips for persons under 35

Change in Mode Share of All Weekday Trips by Region and Sub-Area

Travel Mode	TPB Region 2007/08	TPB Region 2017/18	Core 2007/08	Core 2017/18	Inner Suburb 2007/08	Inner Suburb 2017/18	Outer Suburb 2007/08	Outer Suburb 2017/18
Drive Alone	41.2	41.0	33.1	27.9	42.7	43.7	44.0	45.6
Drive Others and Auto Passenger	38.6	38.0	26.2	25.5	40.2	39.7	44.9	44.5
Rail Transit	4.5	3.6	9.9	8.3	4.0	3.2	1.2	0.8
Bus Transit	1.8	2.0	5.2	5.1	1.2	1.4	0.4	0.5
Walk	9.1	9.3	21.9	24.6	6.9	6.3	4.0	3.4
Bicycle	0.6	1.3	1.3	3.8	0.5	0.9	0.2	0.3
Taxi/Ride-Hail	0.3	1.0	0.8	2.8	0.2	0.6	0.1	0.1
School Bus	3.8	3.5	1.2	1.2	4.1	3.8	4.9	4.6
Other	0.3	0.4	0.4	0.7	0.2	0.4	0.4	0.2

Note: Highlighted data points indicate differences (negative = yellow; positive = green) at the 95% confidence level

Change in Mode Share of Commute Trips by Region and Sub-Area

Commute Mode	TPB Region 2007/08	TPB Region 2017/18	Core 2007/08	Core 2017/18	Inner Suburb 2007/08	Inner Suburb 2017/18	Outer Suburb 2007/08	Outer Suburb 2017/18
Drive Alone	66.7	64.9	46.9	34.6	69.1	70.1	78.3	82.3
Drive Others and Auto Passenger	11.4	7.4	7.8	4.1	11.9	7.4	13.2	11.0
Rail Transit	14.2	15.5	25.0	29.8	13.9	14.6	4.9	3.2
Bus Transit	3.3	4.3	7.7	9.1	2.4	3.2	1.7	2.2
Walk	2.7	3.8	8.5	10.8	1.3	2.3	1.0	0.5
Bicycle	1.1	2.5	2.9	7.6	0.8	1.3	0.3	0.4
Taxi/Ride-Hail	0.3	1.3	0.7	3.4	0.3	1.0	0.0	0.1
Other	0.4	0.3	0.5	0.7	0.2	0.2	0.7	0.2

Note: Highlighted data points indicate differences (negative = yellow; positive = green) at the 95% confidence level

Summary of Changes in Mode Share

- Dramatic increase in bicycle trips throughout the region
- Decline in rail transit trips across the region, especially for non-commute trips
- Significant increases in bus transit, walk, bicycle, and taxi/ride-hail commute trips in the region
- In the regional core, a significant decrease in automobile commutes and an increase in rail transit commutes

Trip Length Distribution by Mode in Miles – All Trips (2017/2018)

Travel Mode	25th Percentile	Median	75th Percentile	90th Percentile
Drive Alone	1.7	4.3	10.2	19.4
Drive Others and Auto Passenger	1.3	3.1	6.4	13.4
Rail Transit	4.9	8.6	14.9	23.2
Bus Transit	1.8	3.3	6.0	12.8
Walk	0.1	0.3	0.5	1.0
Bike	0.8	1.6	2.9	5.6
Taxi/Ride-Hail	1.9	3.6	6.8	10.6

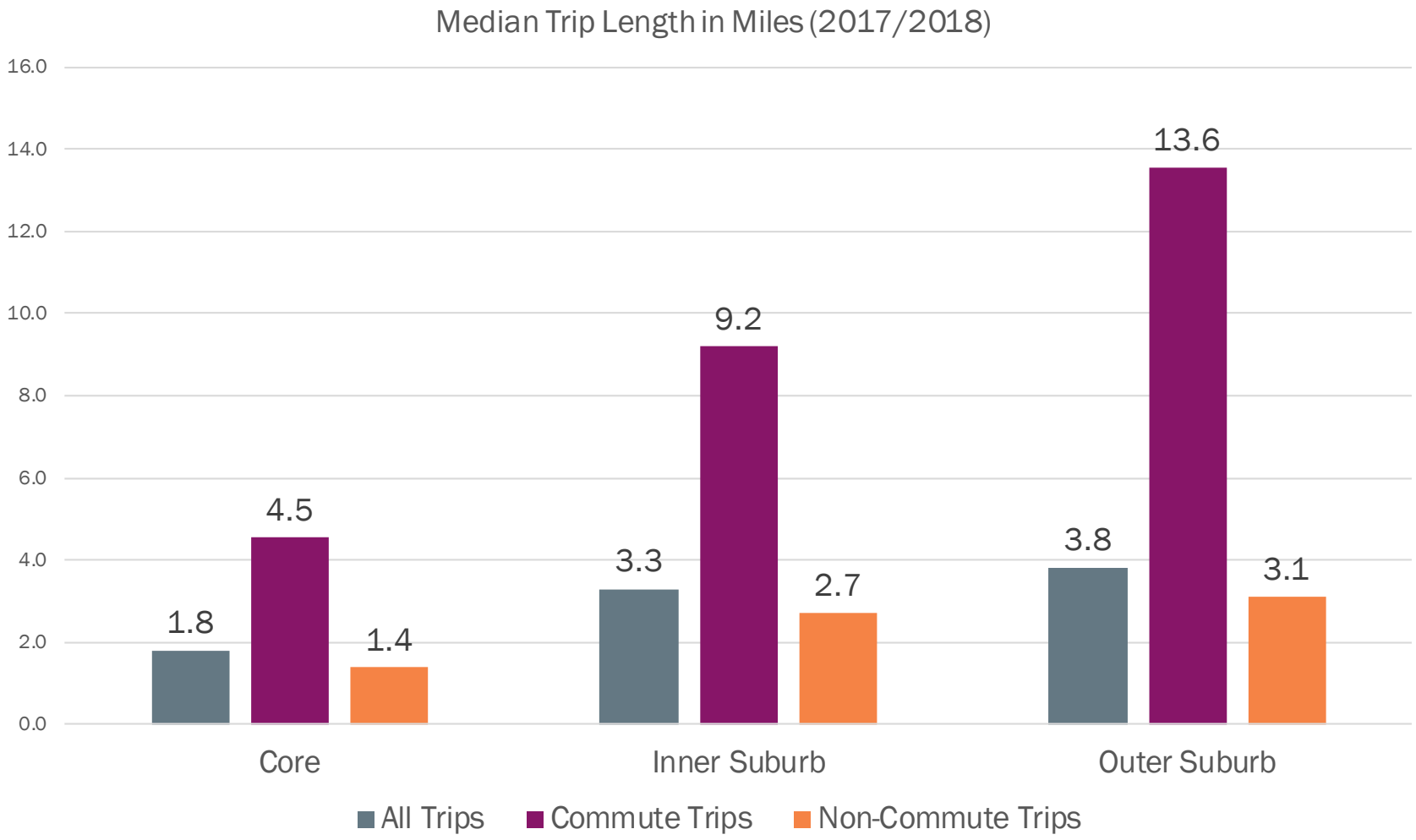
Trip Length Distribution by Mode in Miles – Commute Trips (2017/2018)

Commute Mode	25th Percentile	Median	75th Percentile	90th Percentile
Drive Alone	4.8	9.3	17.0	26.3
Drive Others and Auto Passenger	3.5	7.8	15.2	27.7
Rail Transit	5.6	9.3	15.9	23.2
Bus Transit	2.4	4.5	10.0	26.5
Walk	0.4	0.7	1.3	1.9
Bike	1.9	3.0	5.5	8.5
Taxi/Ride-Hail	2.5	4.6	6.6	10.4

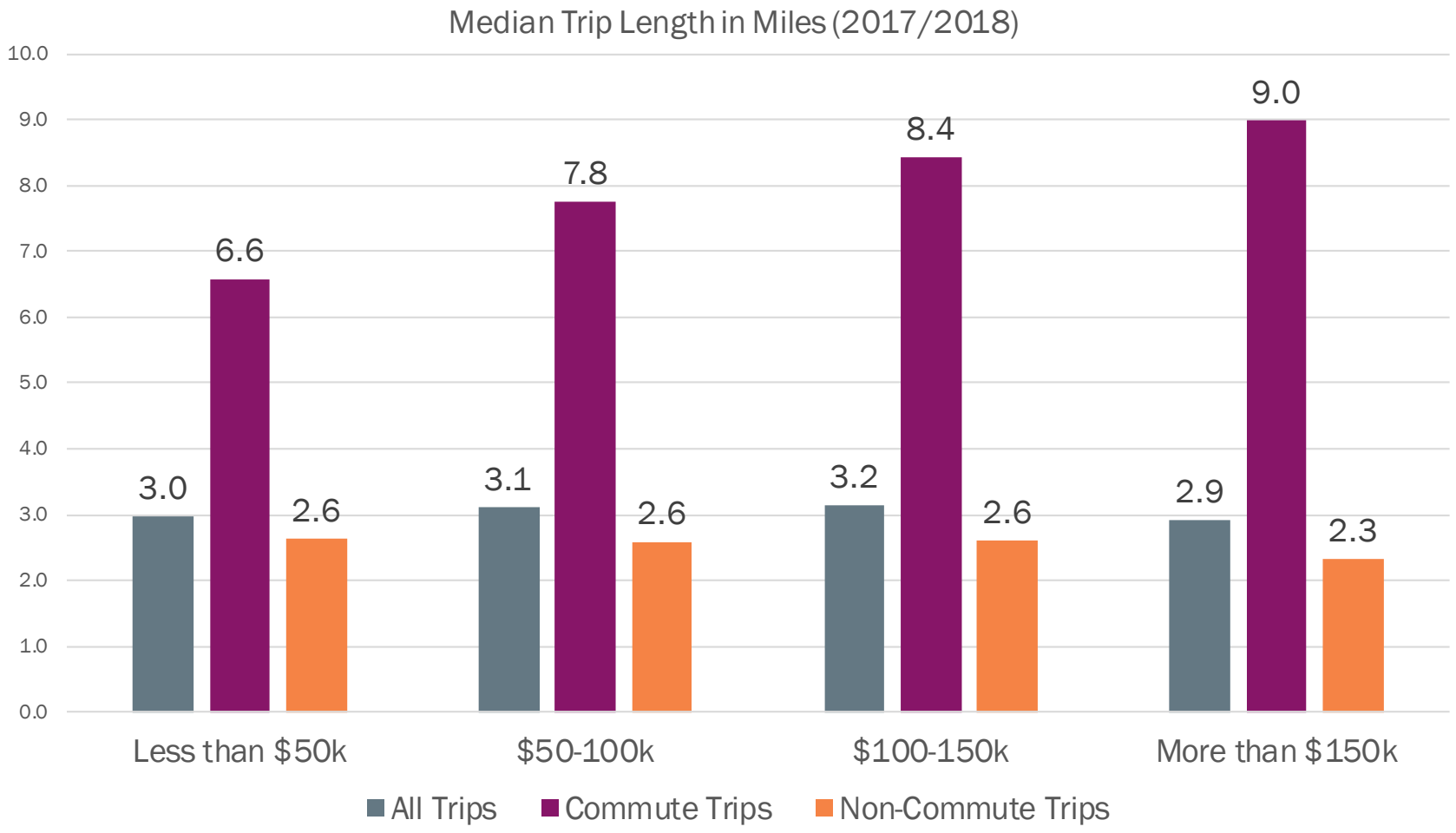
Trip Length Distribution by Mode in Miles – Non-Commute Trips (2017/2018)

Travel Mode	25th Percentile	Median	75th Percentile	90th Percentile
Drive Alone	1.3	3.1	7.5	15.0
Drive Others and Auto Passenger	1.3	3.0	6.3	12.6
Rail Transit	3.6	6.9	12.4	23.2
Bus Transit	1.6	2.9	4.9	8.5
Walk	0.1	0.3	0.5	0.9
Bike	0.6	1.0	2.3	3.3
Taxi/Ride-Hail	1.8	3.3	6.8	10.6

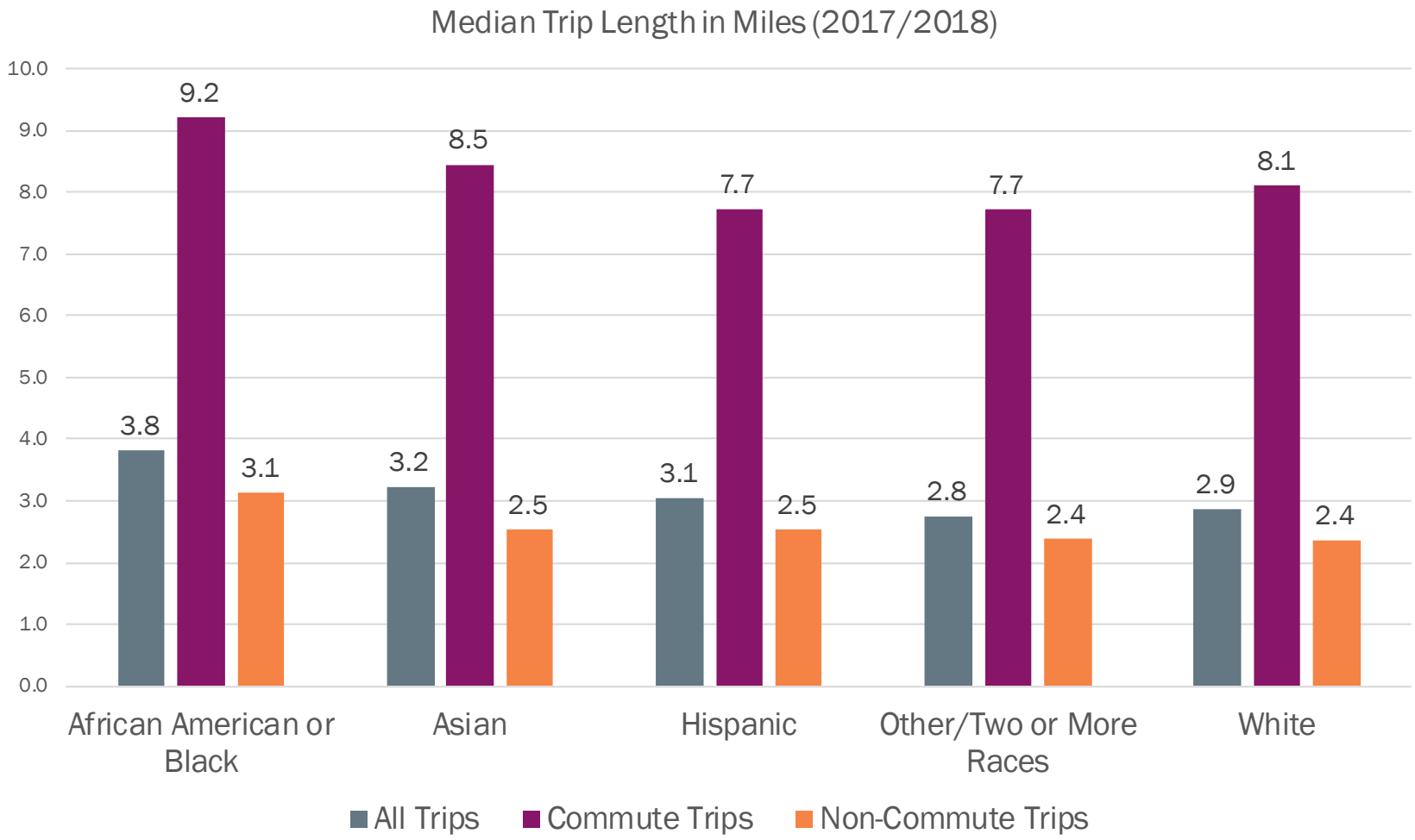
Trip Length Increases from Core to Suburbs



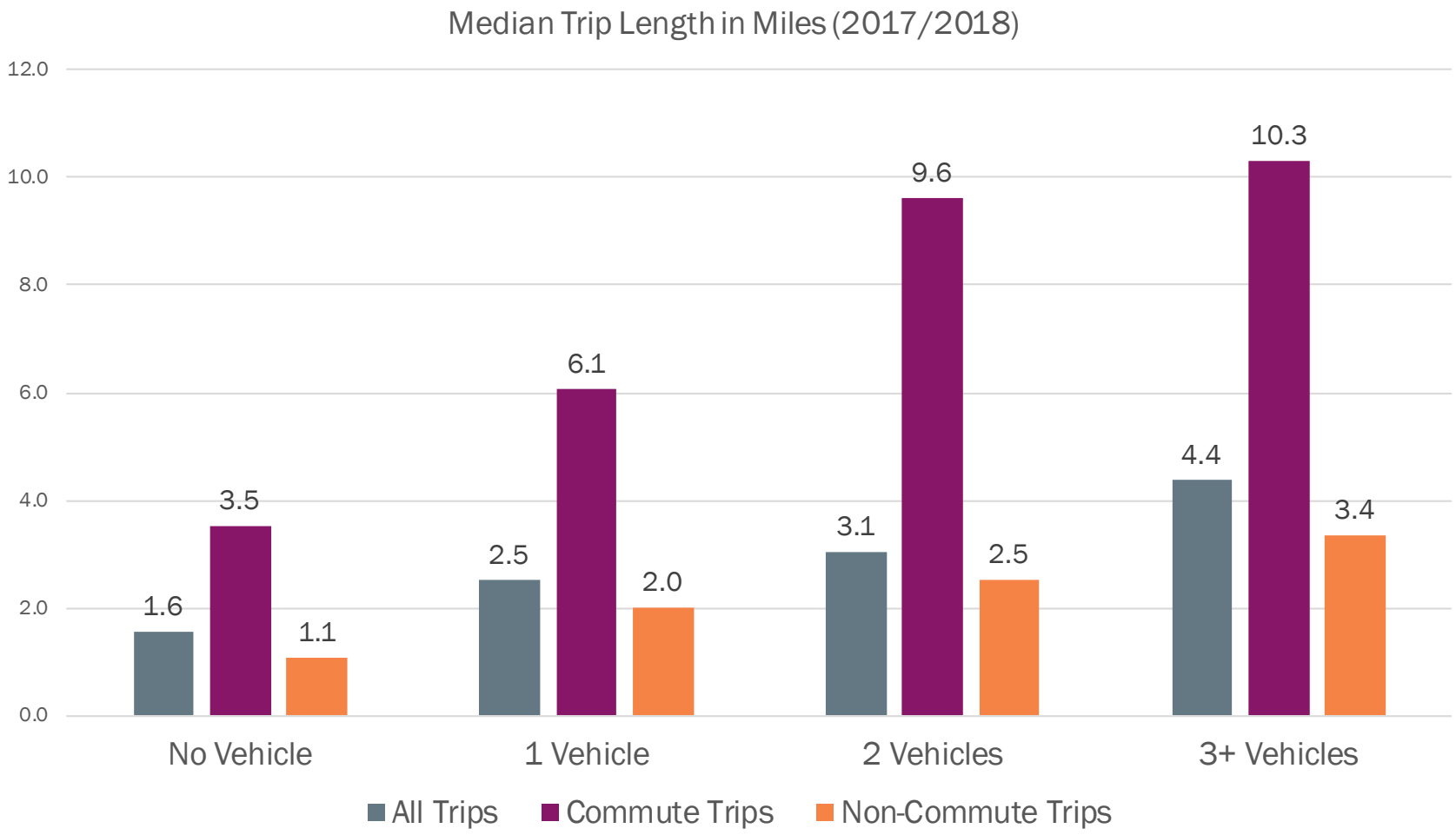
Commute Trip Lengths Increase with Income



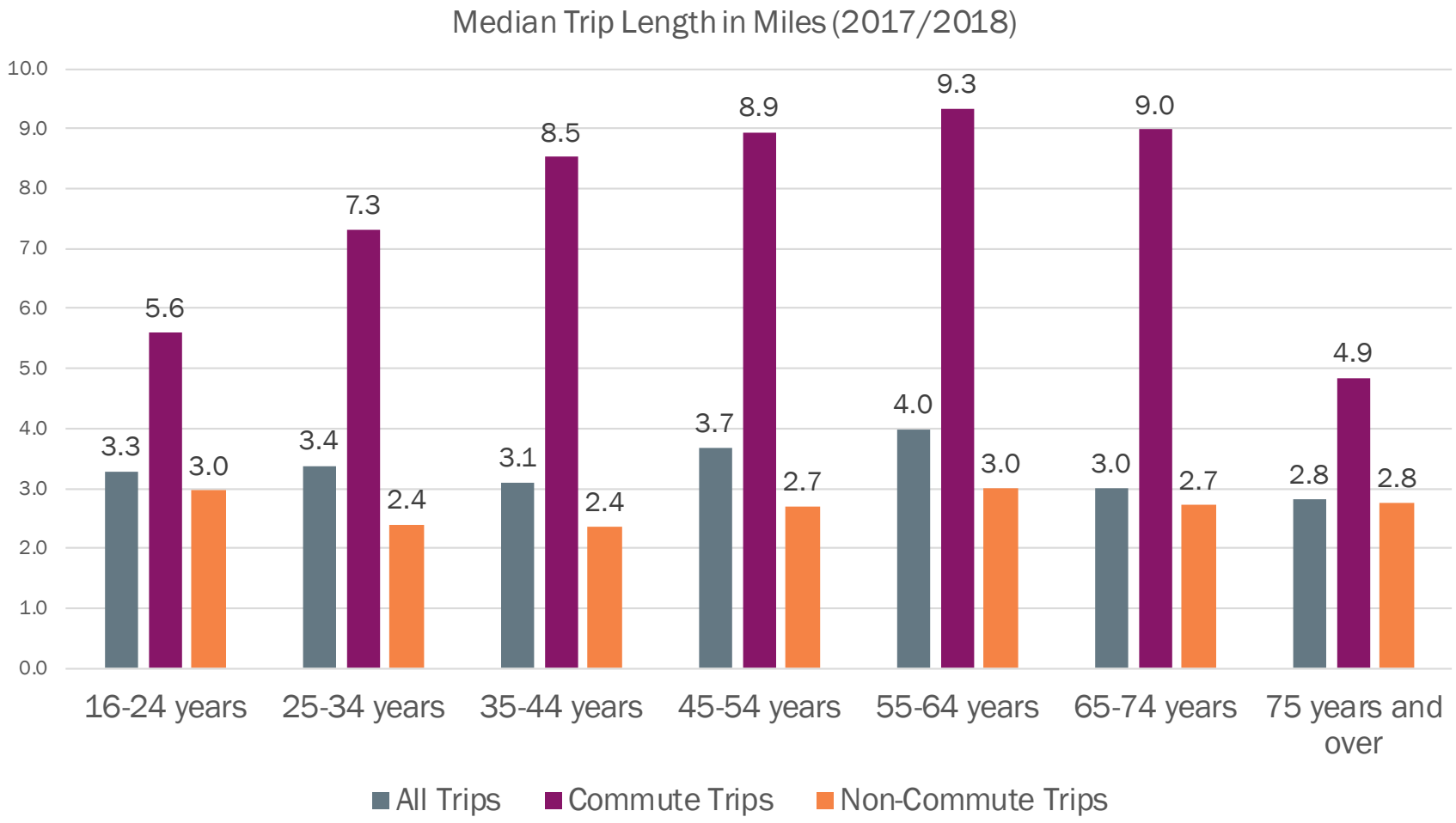
Trip Length Varies by Race/Ethnicity



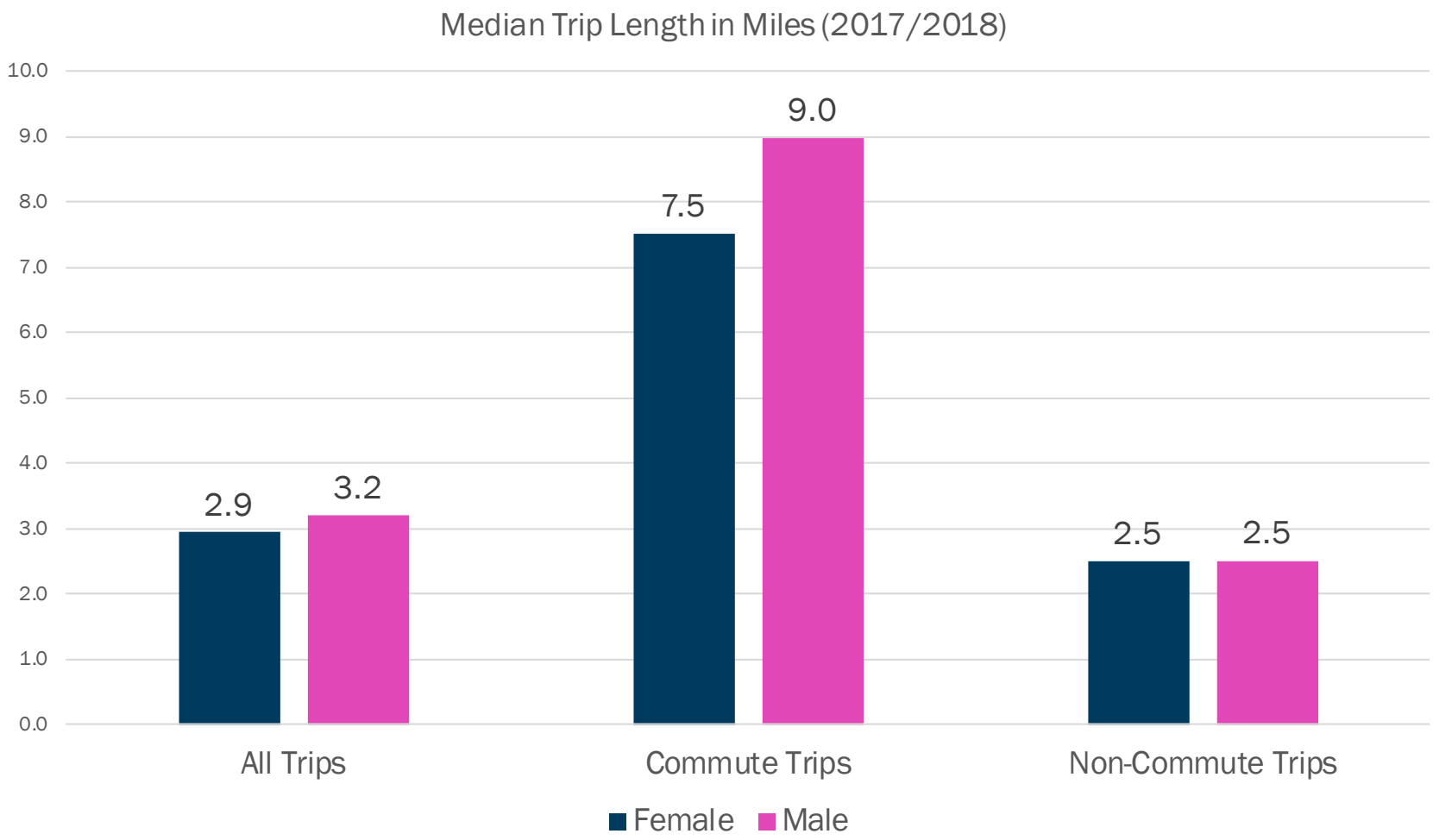
Trip Lengths Increase with Vehicle Availability



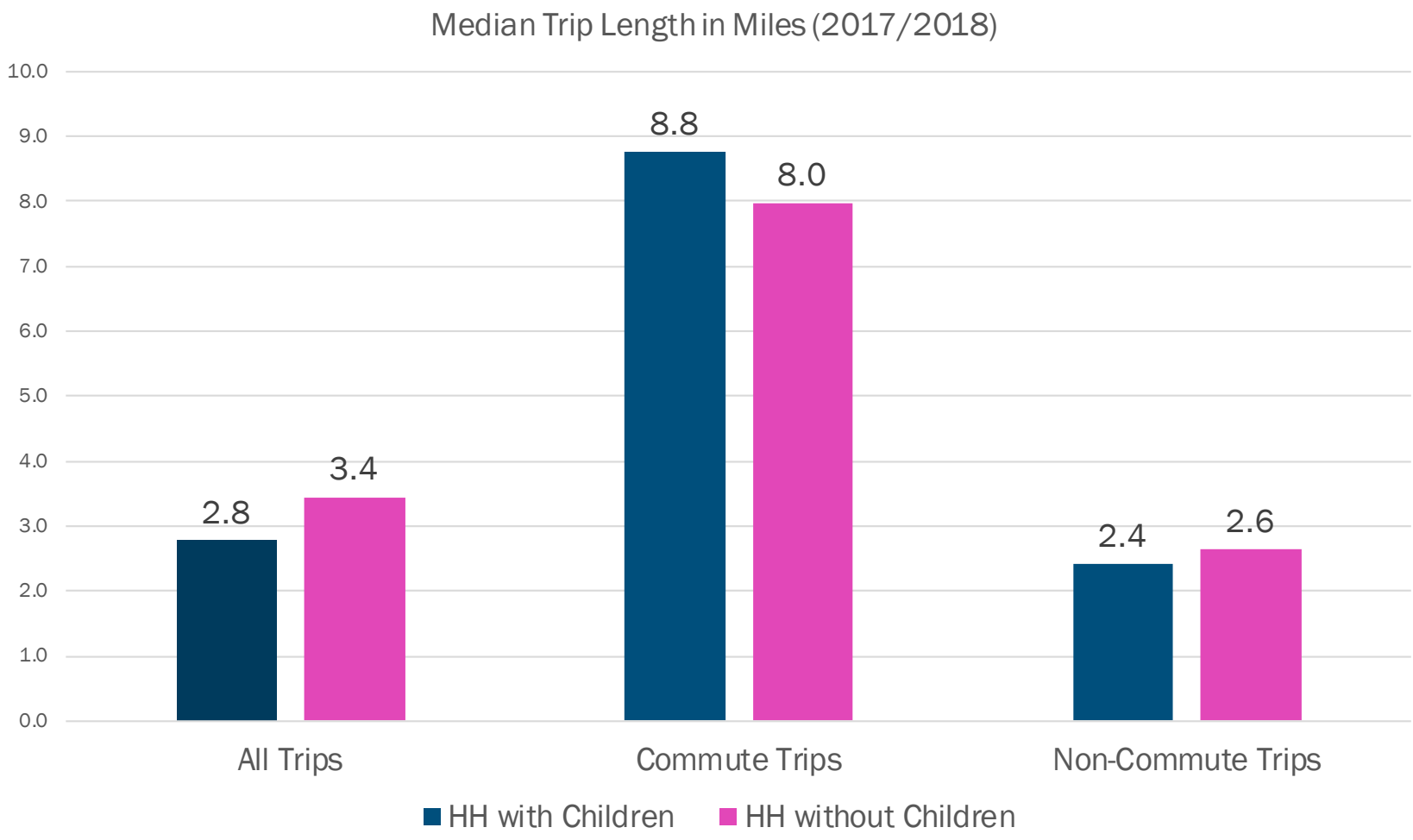
Life Stage Influences Trip Length



Trip Length Varies by Gender



Households with Children Travel Further to Work



Trip Length by Purpose – All Trips (2017/2018)

Trip Purpose	25th Percentile	Median	75th Percentile	90th Percentile
Commute	2.3	6.7	13.7	23.2
Work-Related	1.4	4.1	10.5	21.9
Drop Off/Pick Up	0.9	2.4	5.7	10.6
School	0.9	2.0	4.7	9.6
Personal Business	1.1	2.8	6.8	13.9
Shop/Meal	0.7	2.1	4.9	10.5
Social/Recreation	1.1	2.9	7.0	14.4

Summary of Trip Length Distributions

- Longest commutes for drive alone and rail transit trips
- Trip length increases from the core to the outer suburbs
- Higher income households have further commutes
- African Americans have further commutes than other racial/ethnic groups
- Households with more vehicles take longer trips
- Persons between 35 and 74 have the furthest commutes
- Males have longer commute distances than females
- Households with children travel further to work

RTS Public File Release

- The RTS data files are now available for public use by practitioners, researchers, and other stakeholders
- The data files include household, person, vehicle, and trip information for the TPB model region
- The public file release will include technical documentation that provides an overview of the data files
- The public file release will protect the confidentiality of survey participants
- For more information about the RTS and to request data, go to: https://www.mwcog.org/transportation/data-and-tools/household-travel-survey/

RTDC RTS Tabulations

- The Regional Transportation Data Clearinghouse (RTDC) RTS Tabulations provide descriptive summaries of variables in the RTS household, person, vehicle, and trip files
- These are first level tabulations of the RTS data that can be quickly pulled from “off-the-shelf”
- Tabulations for the entire RTS universe, as well as county-level jurisdictions, subregional areas, activity centers, and equity emphasis areas are included
- This resource is available on the RTDC: https://rtdc-mwcog.opendata.arcgis.com/datasets/regional-travel-survey-rts-tabulations

Some Final Thoughts about the RTS

- The RTS provides the most recent and comprehensive picture of travel in the Washington metropolitan region before the COVID-19 pandemic
- It will be a baseline to compare with a post-COVID "new normal"
- The RTS will help address questions about transportation equity by providing critical insights on access and opportunities for low income and communities of color

Kenneth Joh, Ph.D., AICP

Senior Statistical Survey Analyst
Department of Transportation Planning
202.962.3276
kjoh@mwcog.org

mwcog.org/tpb

Metropolitan Washington Council of Governments
777 North Capitol Street NE, Suite 300
Washington, DC 20002

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REGIONAL
TRAVEL SURVEY
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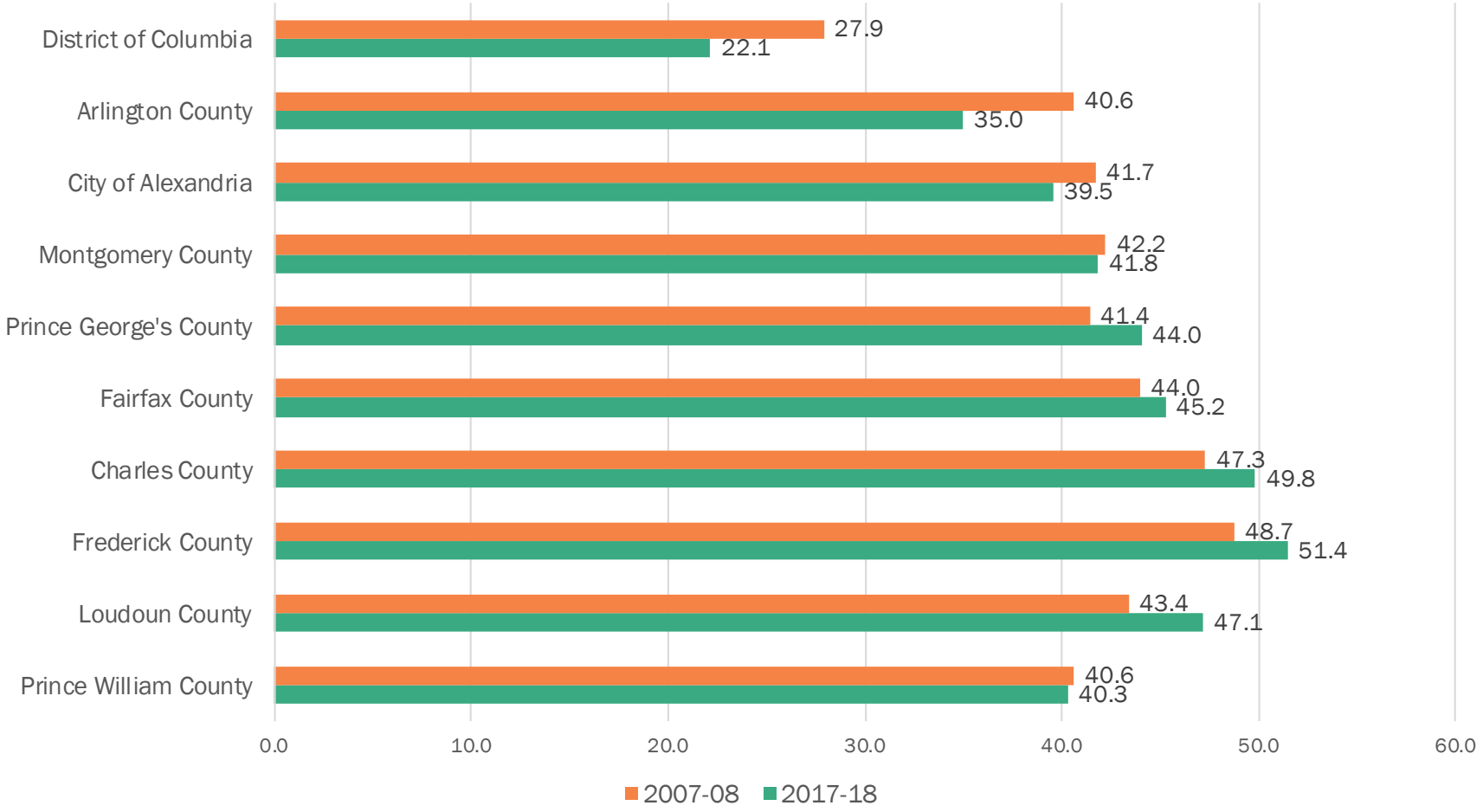
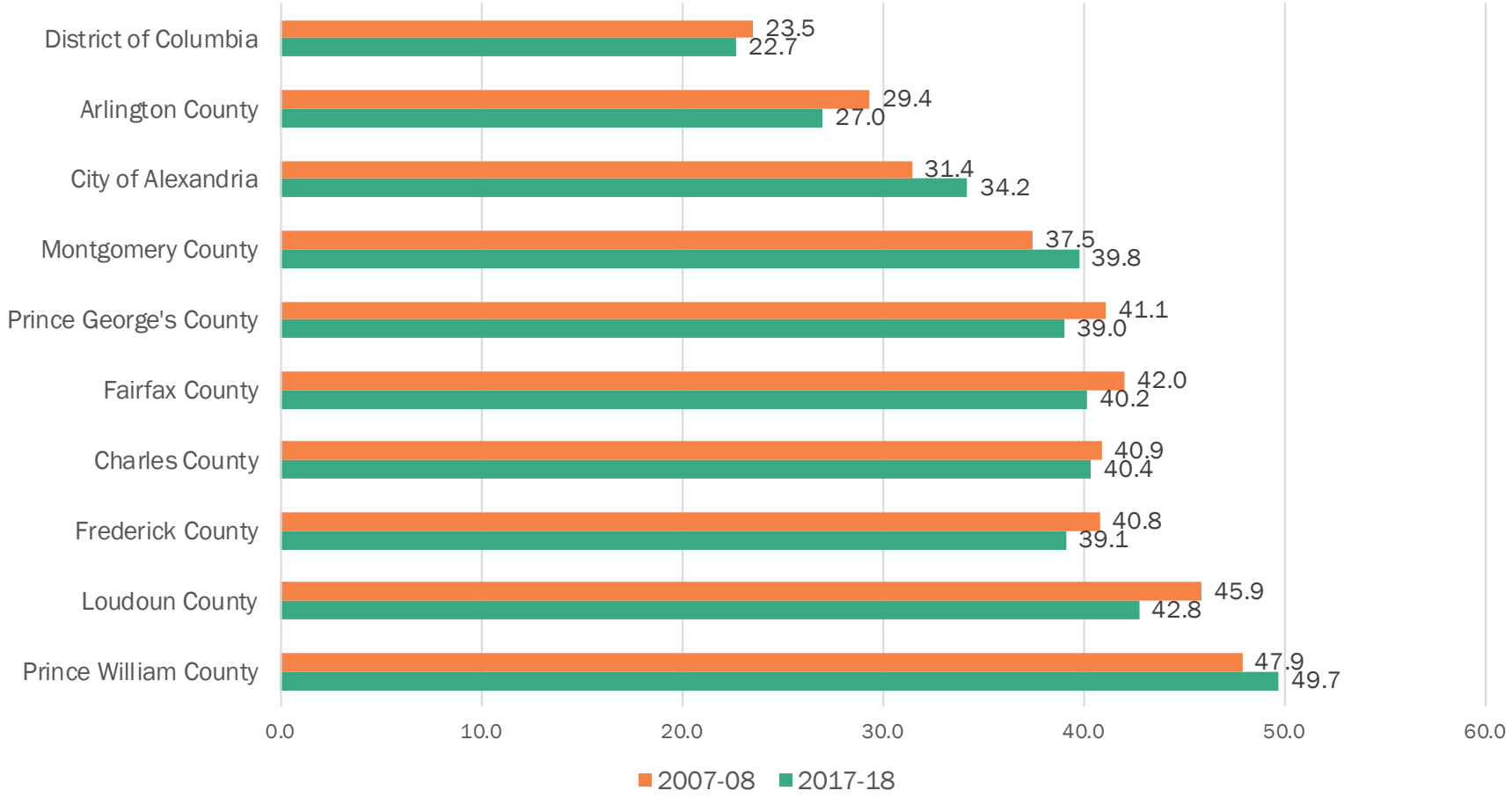
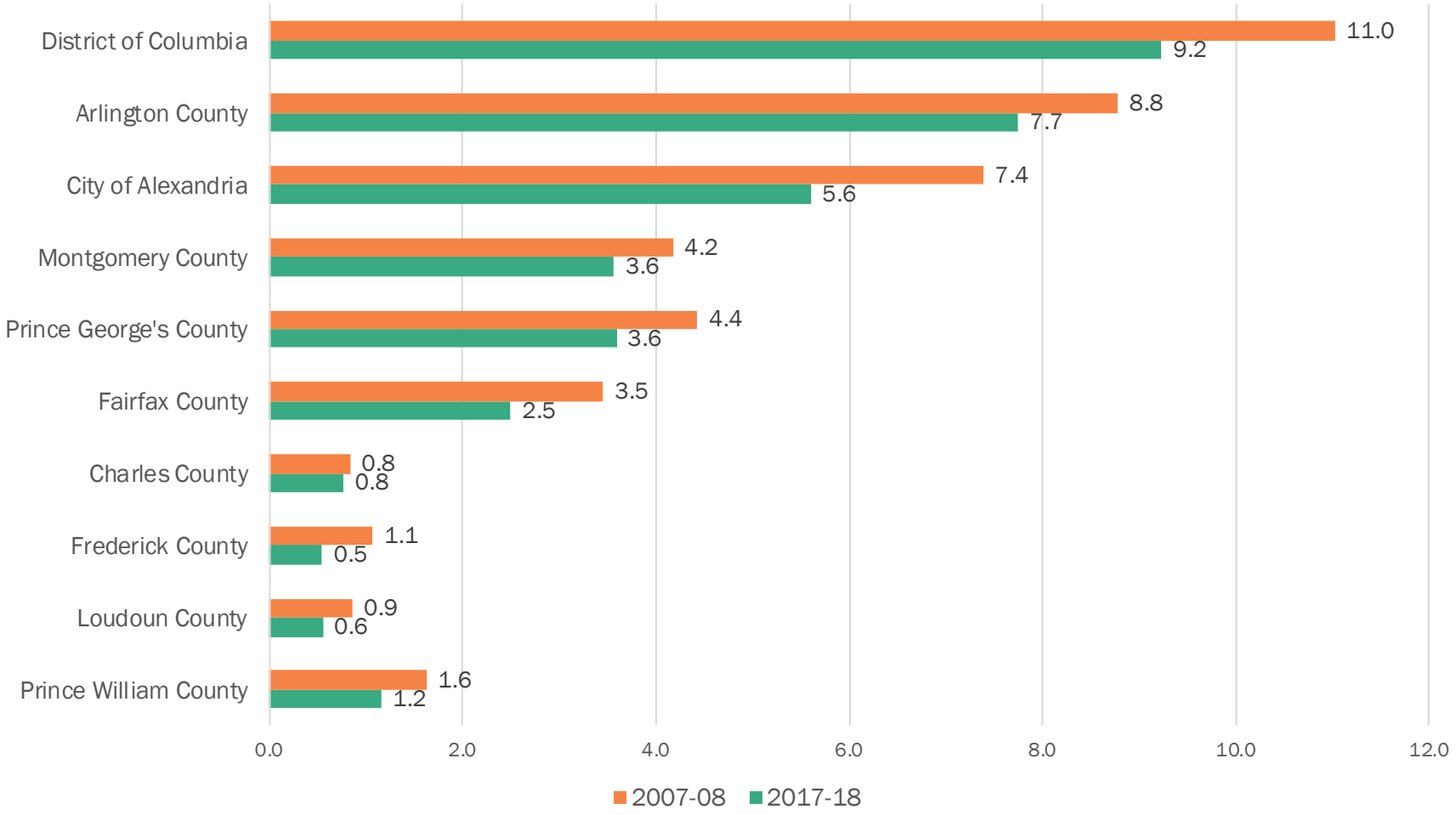
Mode Share for All Trips – Drive Alone (2007/08 – 2017/18)



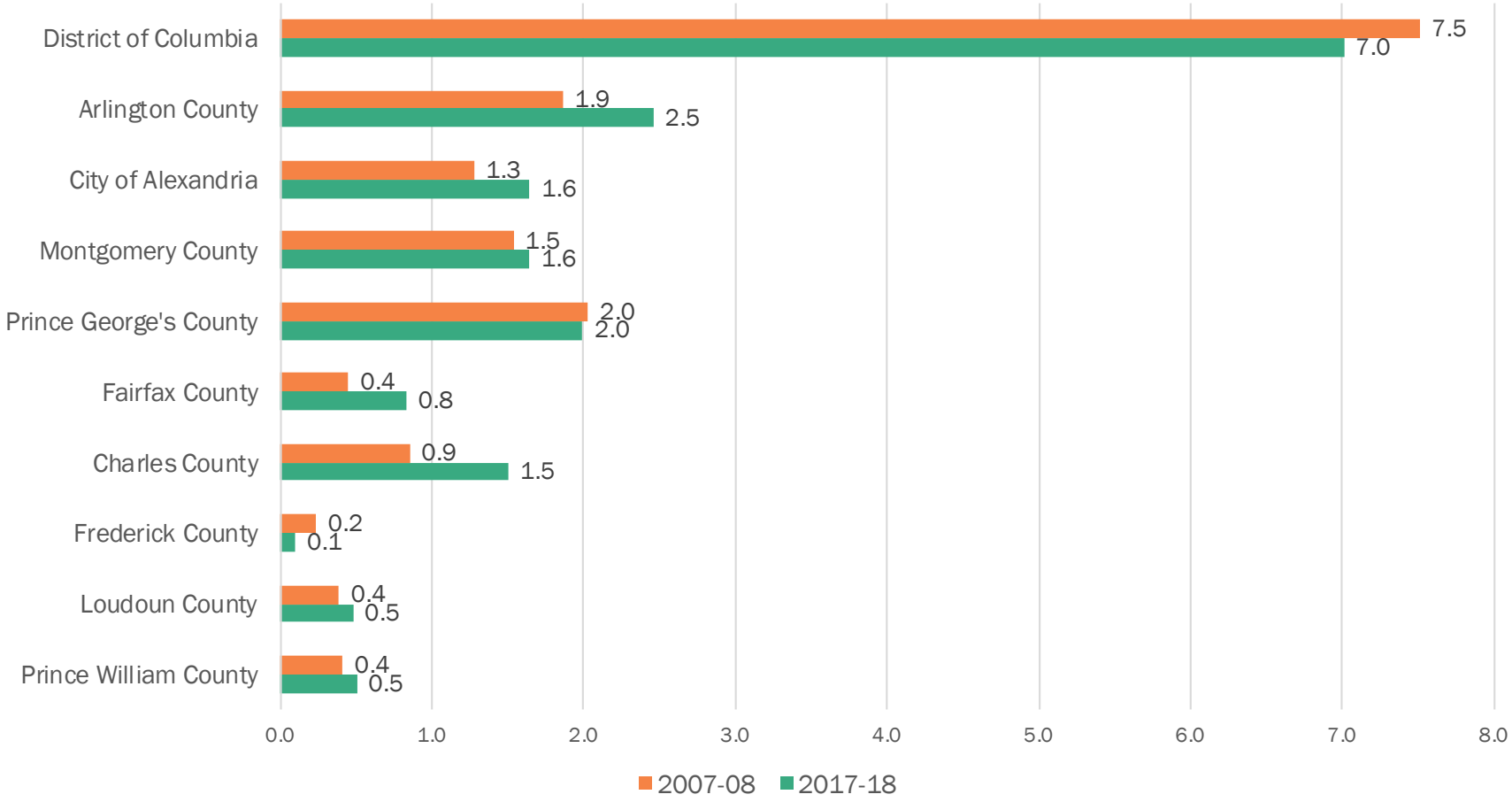
Mode Share for All Trips – Drive Others and Auto Passenger (2007/08 – 2017/18)



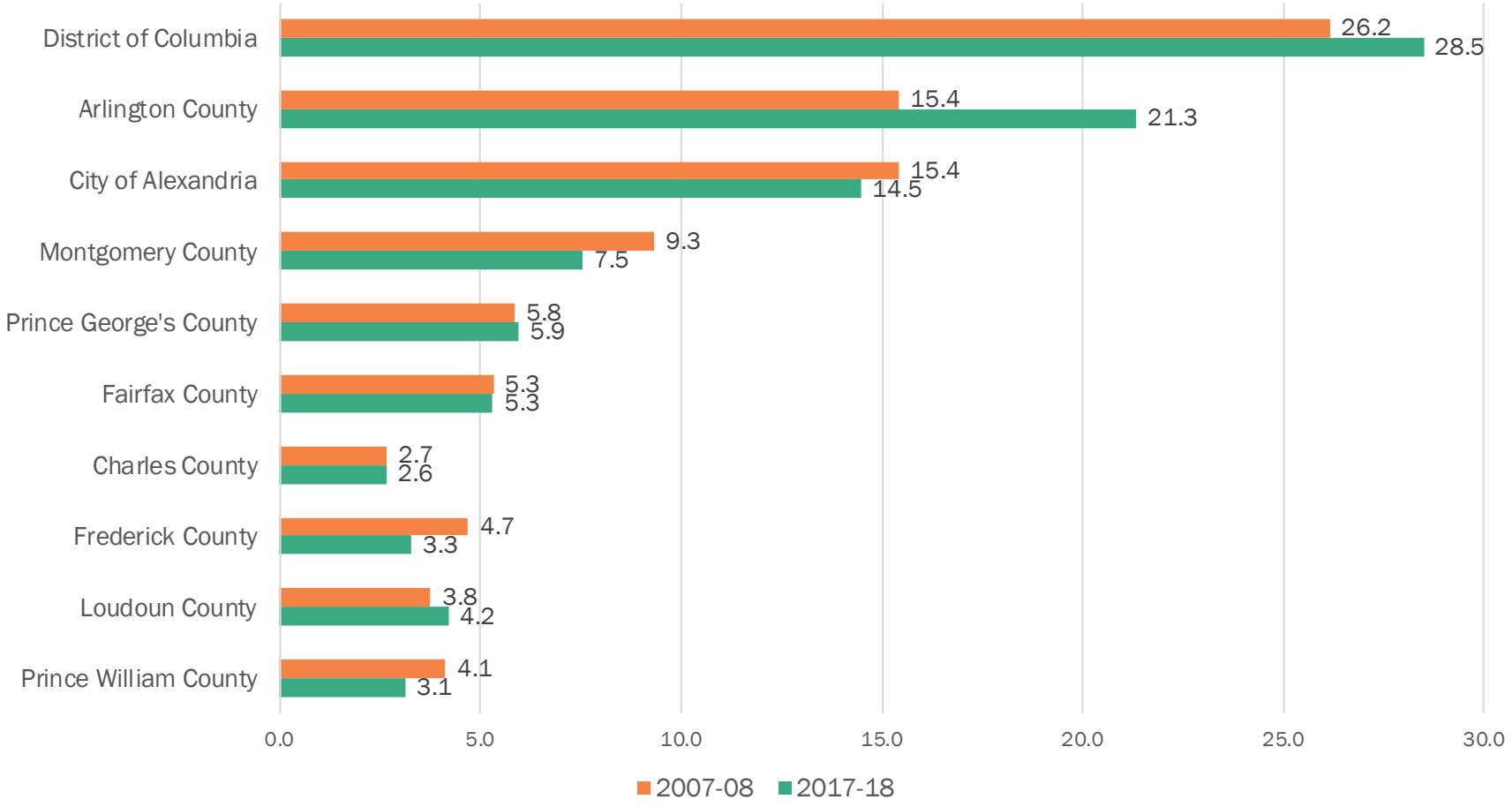
Mode Share for All Trips – Rail Transit (2007/08 – 2017/18)



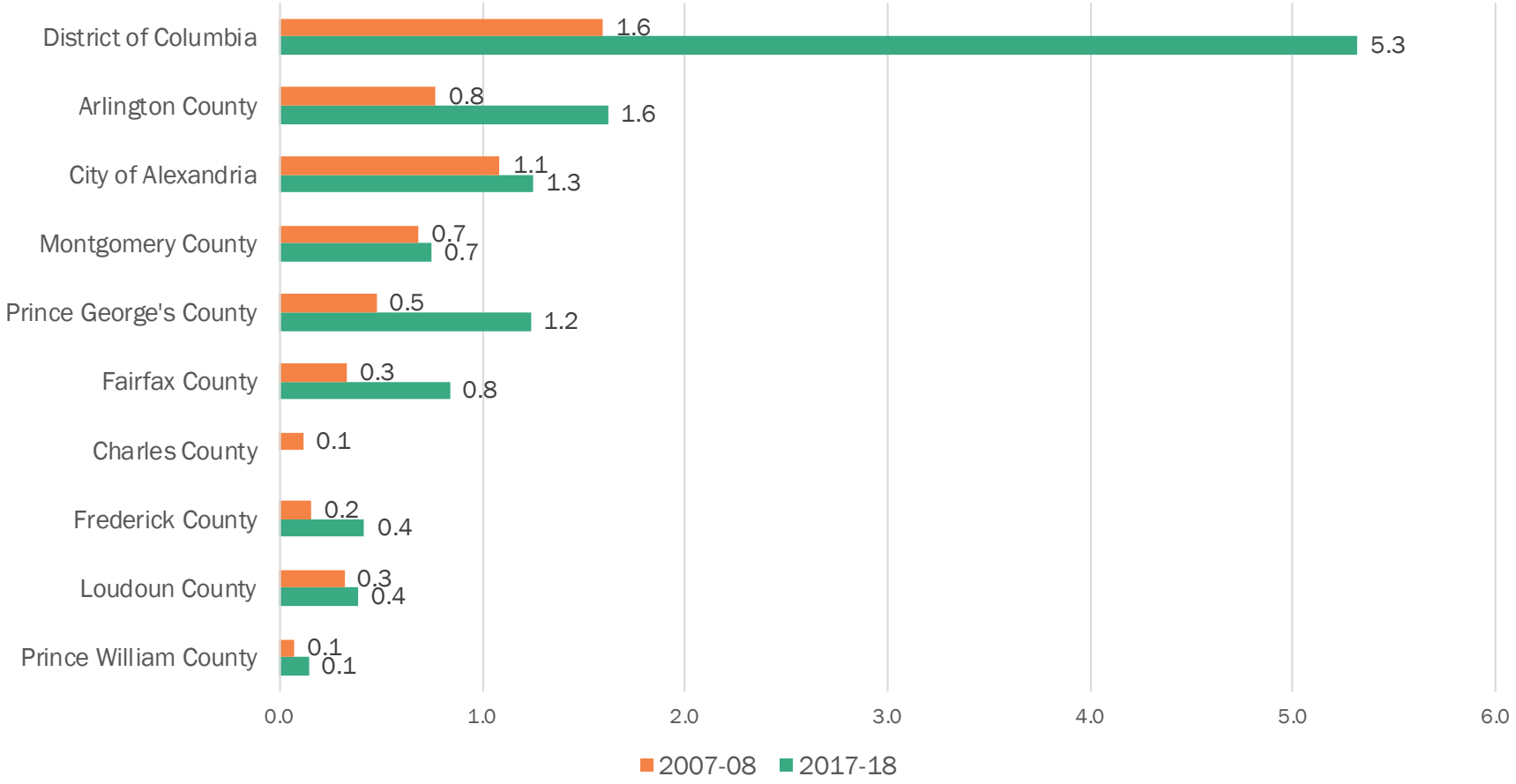
Mode Share for All Trips – Bus Transit (2007/08 – 2017/18)



Mode Share for All Trips – Walk (2007/08 – 2017/18)



Mode Share for All Trips – Bicycle (2007/08 – 2017/18)



Mode Share for All Trips – Taxi/Ride-Hail (2007/08 – 2017/18)