SERPM 8 Model Update Progress

presented to

RTTAC-MS

presented by

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Outline

➤ Status overview

➤ Confirm base year networks and SE data completed

➤ Validation update
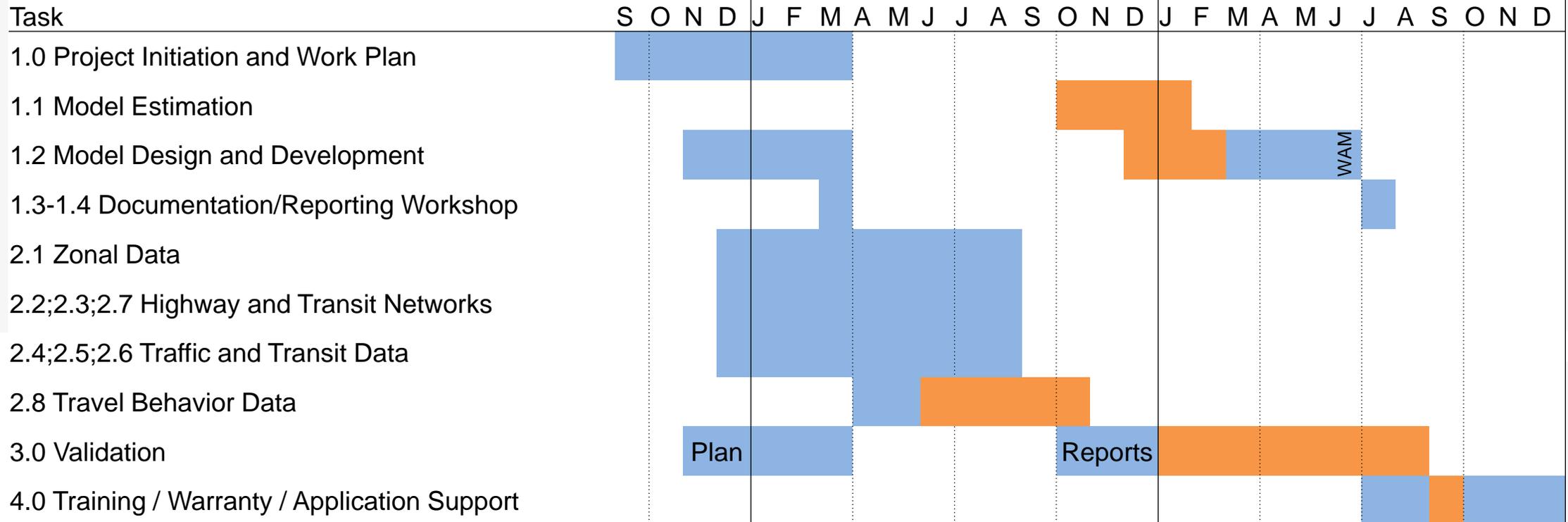
➤ Other implementation notes and next steps

Project status

- Input data nearly complete

- Model development complete

- Model validation in progress

- Validation data updates

- Next steps
  - » Sensitivity testing
  - » Model delivery and training – training schedule?

Project schedule

SERPM 8.0 Project Plan

Task	2016 S O N D	2017 J F M A M J J A S O N D	2018 J F M A M J J A S O N D

Task

1.0 Project Initiation and Work Plan

1.1 Model Estimation

1.2 Model Design and Development — WAM

1.3-1.4 Documentation/Reporting Workshop

2.1 Zonal Data

2.2;2.3;2.7 Highway and Transit Networks

2.4;2.5;2.6 Traffic and Transit Data

2.8 Travel Behavior Data

3.0 Validation — Plan — Reports

4.0 Training / Warranty / Application Support

Critical Path

WAM: Windowed Area Model

Version: 9/27/2017

Plan: validation plan development

Reports: validation reporting development

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Validation and delivery schedule

Week ending	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-O
Countdown to Model Training (RTTAC-MS in Green)	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1

SERPM 8 Validation and Delivery

Component Validation

System Validation

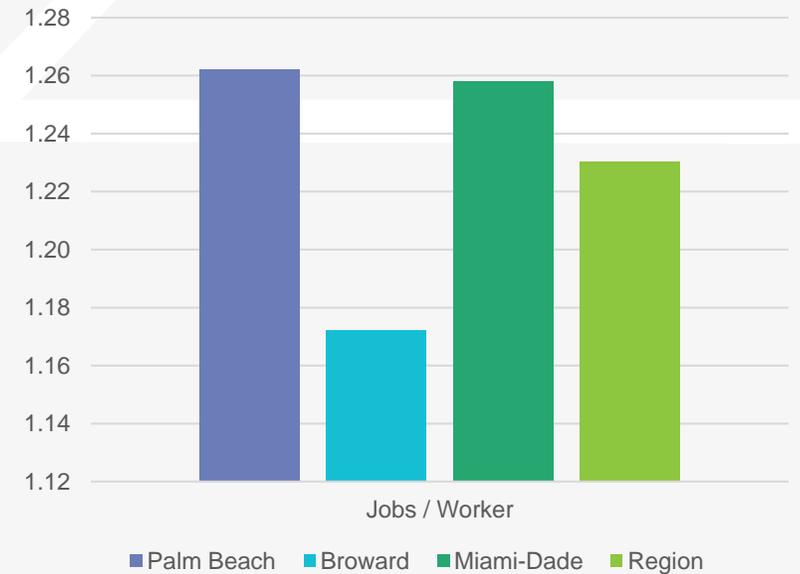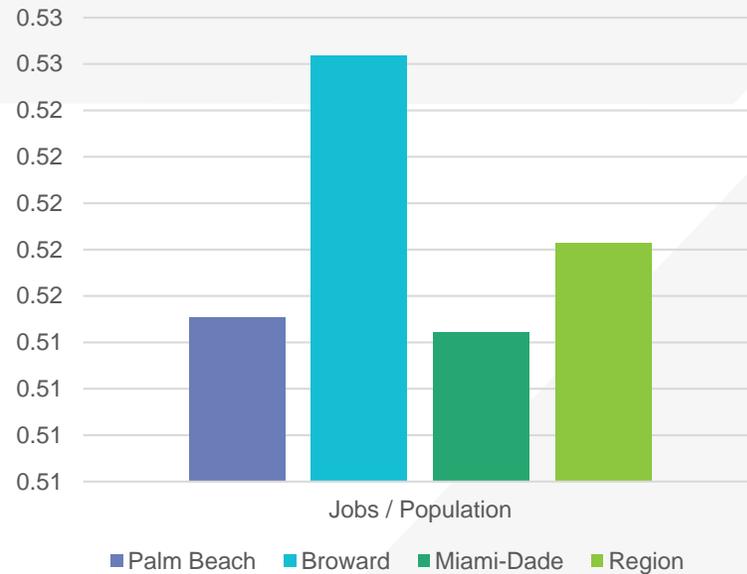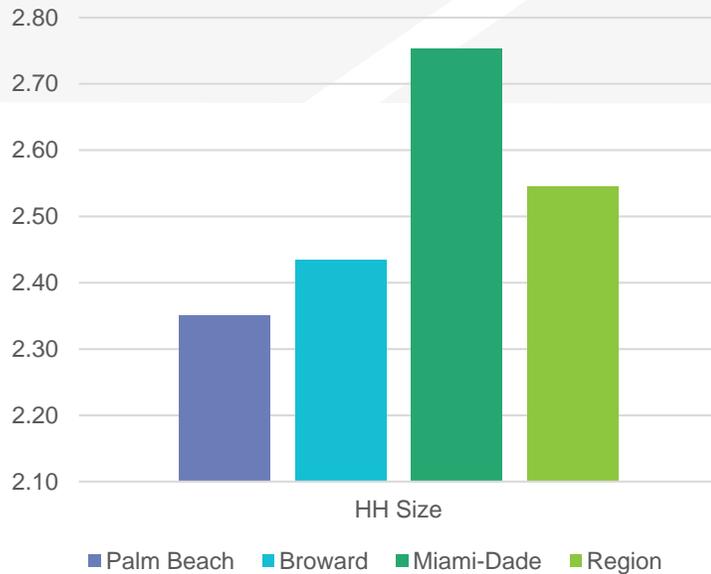**Sensitivity Testing**

Model Delivery

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Input data update request management

➤ Revisions will be applied in a periodic "batch" fashion to maintain focus on implementation and validation

➤ Outstanding requests:

  » Networks: none

  » SE data: none

  » Count data: screenline feedback

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SE Data Summary

County	Households	Population	Workers	Employment
Palm Beach	595,518	1,399,463	571,134	720,801
Broward	750,601	1,826,972	820,285	961,607
Miami-Dade	955,425	2,629,845	1,075,473	1,352,874
Region	**2,301,544**	**5,856,280**	**2,466,892**	**3,035,282**

HH Size
■ Palm Beach ■ Broward ■ Miami-Dade ■ Region

Jobs / Population
■ Palm Beach ■ Broward ■ Miami-Dade ■ Region

Jobs / Worker
■ Palm Beach ■ Broward ■ Miami-Dade ■ Region

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Base year networks and SE data

➤ SE data pending Miami-Dade parking cost review and updates

➤ Highway counts

  » Screenline update requested

  » Turnpike count data balance

  » 2010 – 2015 count trends

2010 to 2015 count trend

➤ 7483 links with daily 2015 counts

➤ 5245 of those also have 2010 counts, BUT only 3300 have the same count station

Facility Type	Links	Daily count per Lane		Change
		2010	2015	
Freeway / Turnpike / HOT / HOV	262	17,255	18,779	8.8%
Ramp	459	8,338	9,263	11.1%
High Speed Arterial	2011	6,347	6,657	4.9%
Uninterrupted Road	49	3,739	4,036	7.9%
Low Speed Collector	519	3,992	4,398	10.2%
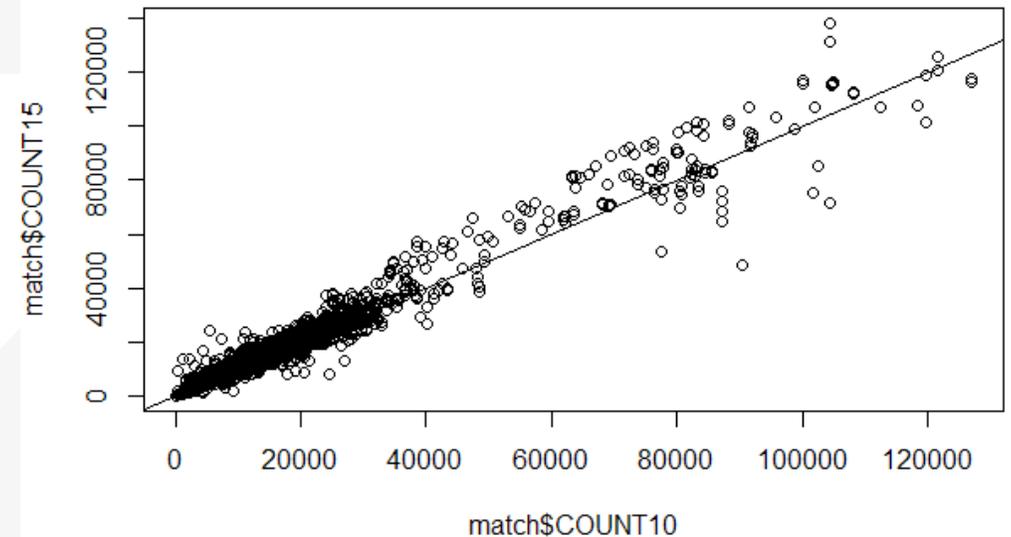
Investigation of counts with >30% and 1,000 negative difference

- 2010 counts are not by direction (872065, 872162)

- 2010 counts did not remove toll volumes from gp (872085, 872134)

- 2010 counts assume 50/50 directional split (862803)

- Ramp/mainline allocation differs (860579)

- 2011-2015 trend show a consistent switch to a lower count (876023, 876071, 869096)

- 2010 counts are much higher than 2011-2015 values (934093)
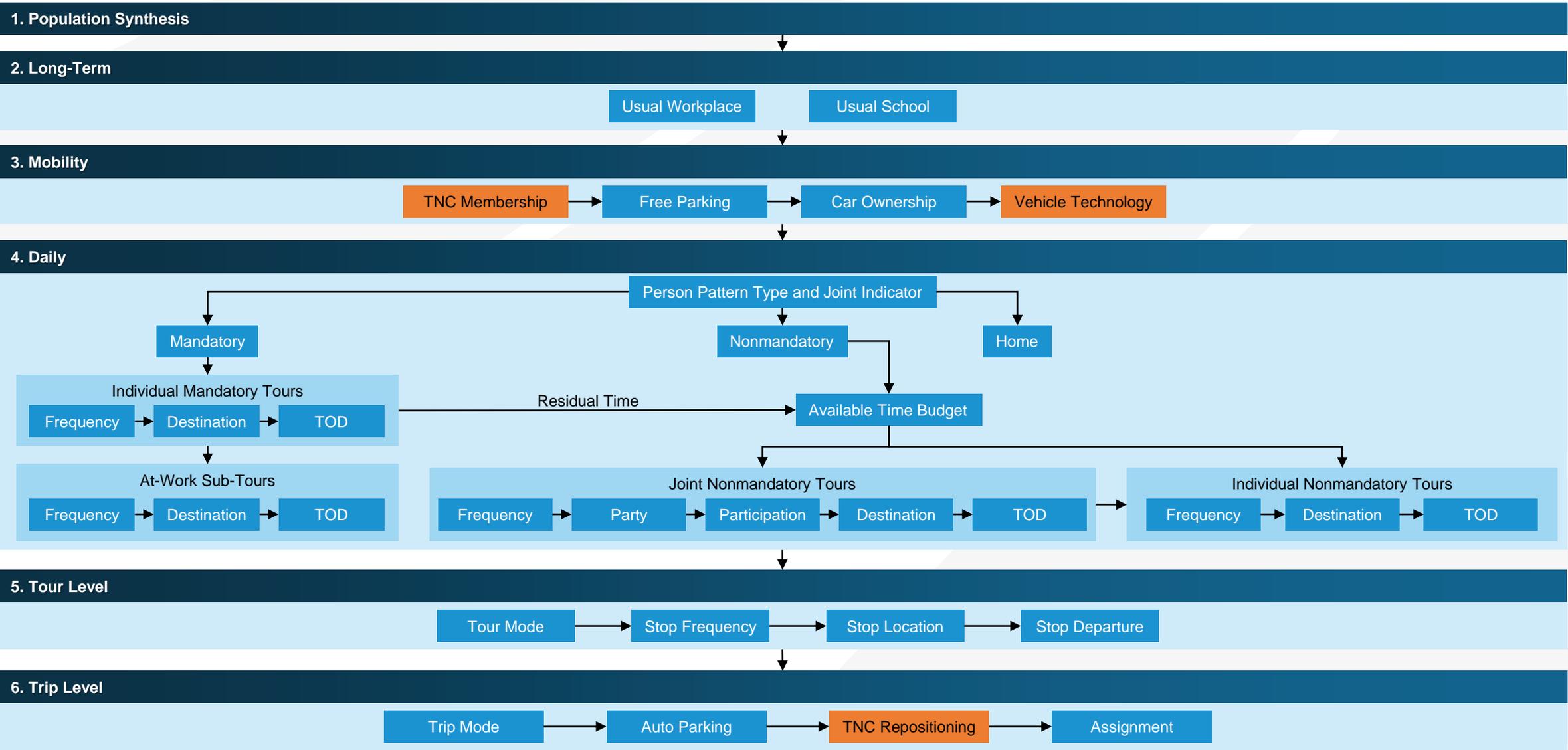
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Count recommendation

- Top 10 differences did not show any issues with 2015 count data

- Remove 2010 count values from next version of the network

Model development status

- Catalog development

- ABM functionality

- Reports
  - » HEVAL
  - » R-based summaries

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1. Population Synthesis

2. Long-Term

Usual Workplace   Usual School

3. Mobility

TNC Membership → Free Parking → Car Ownership → Vehicle Technology

4. Daily

Person Pattern Type and Joint Indicator

Mandatory   Nonmandatory   Home

Individual Mandatory Tours
Frequency → Destination → TOD

Residual Time → Available Time Budget

At-Work Sub-Tours
Frequency → Destination → TOD

Joint Nonmandatory Tours
Frequency → Party → Participation → Destination → TOD

Individual Nonmandatory Tours
Frequency → Destination → TOD

5. Tour Level

Tour Mode → Stop Frequency → Stop Location → Stop Departure

6. Trip Level

Trip Mode → Auto Parking → TNC Repositioning → Assignment
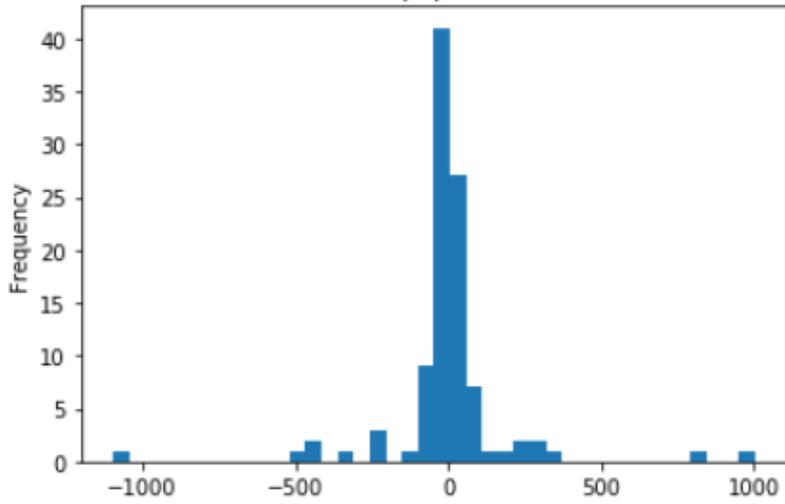
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PopSyn Verification

- Validation previously completed at county and super-district level (11/2017 RTTAC-MS)
  - » Control totals calibrated to better match ACS targets

- RTTAC-MS requested verification at TAD-level to ensure correct PopSyn operation
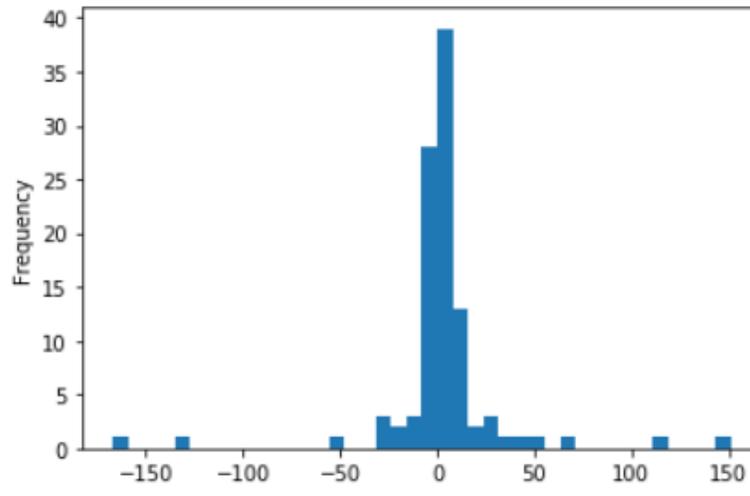
PopSyn TAD-Level Comparison

	Total households	Total population	Worker households	Total children
mean	0.00%	0.03%	0.01%	0.11%
min	0.00%	-1.89%	-1.23%	-2.51%
25%	0.00%	-0.04%	-0.02%	-0.04%
50%	0.00%	0.00%	0.00%	0.09%
75%	0.00%	0.04%	0.04%	0.24%
max	0.00%	3.56%	1.24%	3.39%

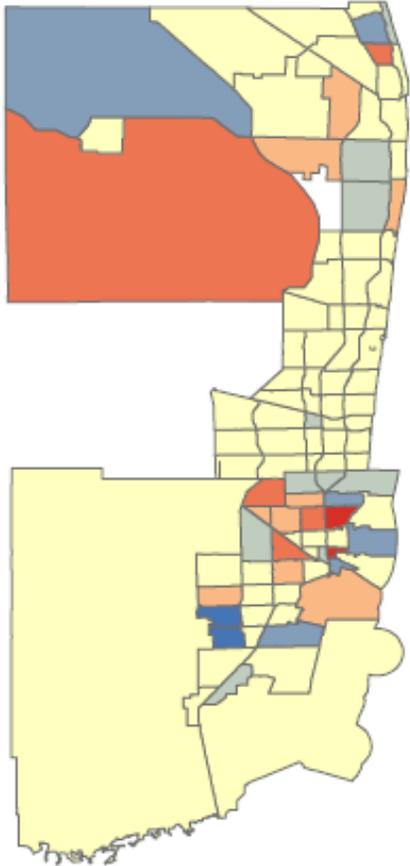CAMBRIDGE SYSTEMATICS
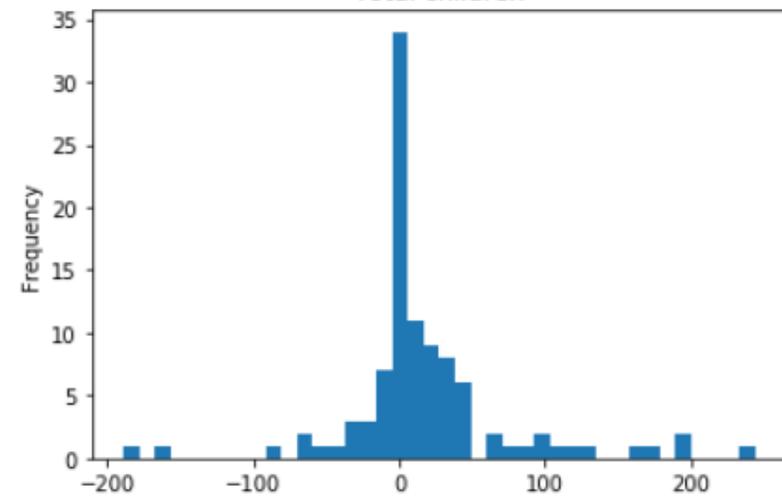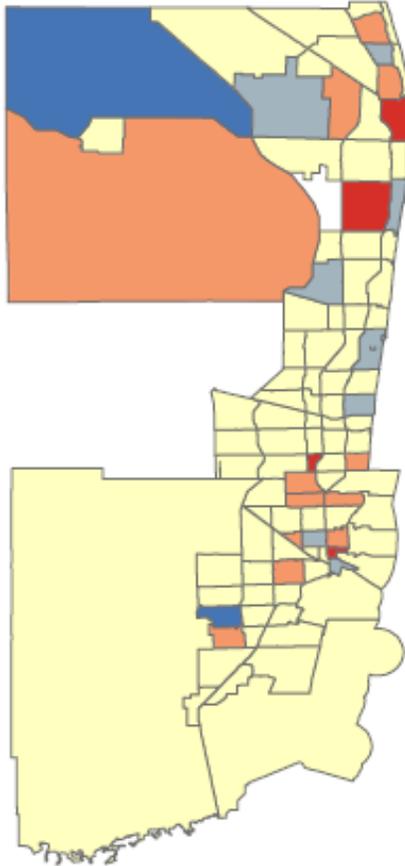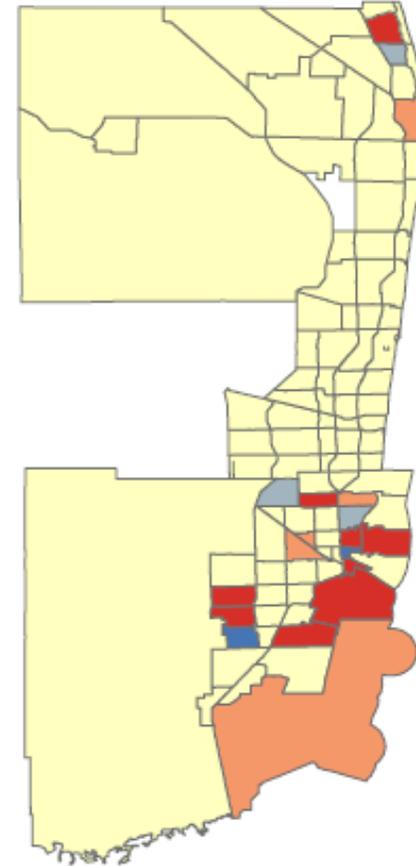
Population (abs dev. from control)
- > 500 lower (2 counts)
- 200 - 500 lower (6 counts)
- 50 - 200 lower (10 counts)
- +/- 50 (67 counts)
- 50 - 200 higher (9 counts)
- 200 - 500 higher (5 counts)
- > 500 higher (2 counts)

Worker Households (abs dev. from control)
- >50 lower (2 counts)
- 10 - 50 lower (8 counts)
- +/- 10 (75 counts)
- 10 - 50 higher (12 counts)
- >50 higher (4 counts)

Children (abs dev. from control)
- > 100 lower (2 counts)
- 50 - 100 lower (3 counts)
- +/- 50 (82 counts)
- 50 - 100 higher (5 counts)
- >100 higher (9 counts)

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ABM Component Validation: Usual Workplace Location

➤ **SEFTC HH Survey data**

» Work at Home

» Distance distribution

» Average distance by segment

» County to county flows

➤ **CTPP 2006-2010 Journey to Work data**

» Super-district to super-district flows

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Full-time worker	SERPM8 2015	SEFTC HH Survey
Total Workers	2,041,900	1,604,448
Work at Home	135,192	109,659
Work at Home Share	7%	7%

Part-time worker	SERPM8 2015	SEFTC HH Survey
Total Workers	425,332	382,090
Work at Home	54,900	49,345
Work at Home Share	13%	13%
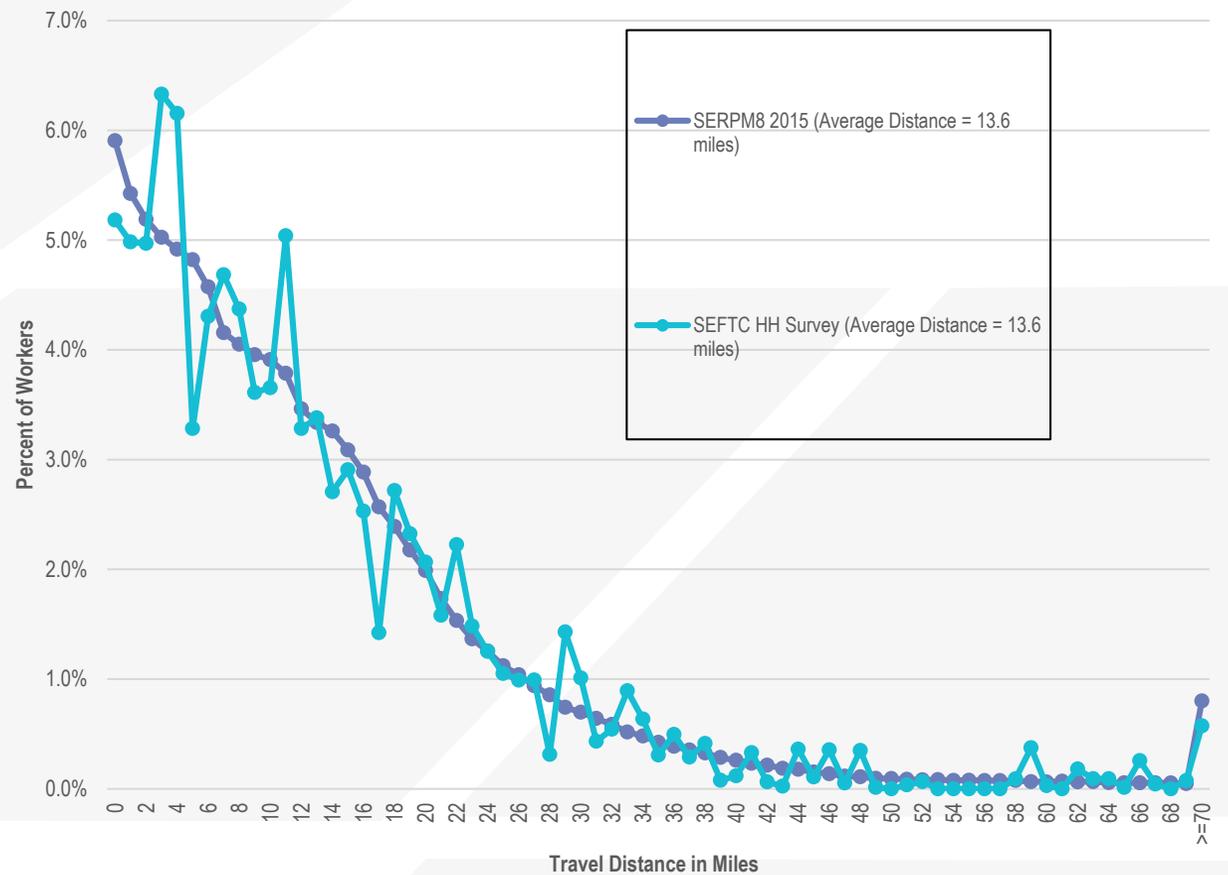
Worker Status	Average Distance in Miles	
	SERPM8 2015	SEFTC HH Survey
Full-time worker	14.2	14.3
Part-time worker	10.4	10.2
Total	13.6	13.6

Income Group	Average Distance in Miles	
	SERPM8 2015	SEFTC HH Survey
Low (<$25K)	10.4	10.8
Low-Middle ($25K-$49.99K)	11.9	11.4
Middle ($50K-$74.99K)	13.6	12.4
Upper-Middle ($75K-$99.99K)	14.6	14.9
Upper (≥$100K)	15.4	16.3
Total	13.6	13.6

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Interchange Percents 2015 Full Run Development Scenario

From / To	Palm Beach	Broward	Miami-Dade	Total
Palm Beach	20%	3%	1%	23%
Broward	3%	24%	6%	33%
Miami-Dade	1%	5%	38%	44%
Total	24%	32%	45%	

Interchange Percents CTPP 2006-2010

From / To	Palm Beach	Broward	Miami-Dade	Total
Palm Beach	21%	2%	0%	23%
Broward	2%	27%	5%	34%
Miami-Dade	0%	3%	39%	42%
Total	24%	32%	44%	

Difference in Interchange Percents

SERPM8 2015		Palm Beach					Broward					Miami-Dade						Total
		North	CBD	Central	West	South	North	CBD	Central	South-West	South-East	North	CBD	NorthWest	Central	West	South	
Palm Beach	North	0.2%	-0.1%	0.0%	0.0%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
	CBD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Central	0.1%	-0.3%	0.0%	0.0%	-0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%
	West	0.0%	0.0%	-0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.1%
	South	0.0%	0.0%	0.1%	0.0%	-1.6%	0.4%	0.3%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	-0.4%
Broward	North	0.0%	0.0%	0.1%	0.0%	0.2%	-1.2%	0.5%	-0.3%	-0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	-0.5%
	CBD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	-0.1%	0.0%	-0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
	Central	0.0%	0.0%	0.0%	0.0%	0.2%	-0.5%	0.1%	-0.5%	-0.2%	0.0%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	-0.5%
	South-West	0.0%	0.0%	0.0%	0.0%	0.1%	-0.1%	0.1%	0.0%	-0.6%	-0.2%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	-0.2%
	South-East	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	-0.1%	-0.2%	-0.3%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%
Miami-Dade	North	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.3%	0.1%	0.1%	0.1%	-0.1%	-0.4%	0.0%	-0.2%	-0.1%	-0.1%	0.1%
	CBD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.3%	1.0%	0.2%	0.3%	0.0%	0.0%	2.3%
	NorthWest	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.1%	0.2%	0.1%	0.1%	-0.1%	-0.5%	-0.3%	-0.1%	0.0%	-0.1%
	Central	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.1%	0.1%	-0.1%	-0.5%	0.0%	-0.9%	0.0%	0.1%	-0.9%
	West	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.2%	-0.1%	-0.6%	0.1%	0.2%	-0.7%
	South	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.3%	-0.3%	0.2%	0.1%	0.3%	0.6%	0.9%
Total		0.5%	-0.3%	0.4%	0.3%	-1.3%	-1.0%	1.9%	-0.4%	-0.6%	-0.1%	0.4%	-0.3%	0.4%	-1.1%	0.3%	1.0%	0.0%

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Auto Ownership – PUMS data

Auto Ownership	Households		Auto Ownership Share	
	SERPM8 2015	PUMS	SERPM8 2015	PUMS
0	197,342	183,140	9%	9%
1	948,548	843,781	41%	41%
2	846,052	743,274	37%	36%
3	233,078	205,849	10%	10%
4	76,524	69,034	3%	3%
Total	2,301,544	2,045,078	100%	100%
Auto/HH	1.58	1.58		

Average Auto Ownership by Household Income	Average Auto Ownership	
	SERPM8 2015	PUMS
Low (<$25K)	0.97	0.99
Low-Middle ($25K-$49.99K)	1.49	1.46
Middle ($50K-$74.99K)	1.81	1.75
Upper-Middle ($75K-$99.99K)	2.02	1.97
Upper (≥$100K)	2.19	2.20
Total	1.58	1.59

	Households by Auto Sufficiency	
Auto Sufficiency	SERPM8 2015	PUMS
0 Autos	9%	9%
Autos < Drivers	26%	28%
Autos = Drivers	60%	56%
Autos > Drivers	5%	7%

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Validation next steps

➤ Tour level validation

» Destination

» TOD

» Mode

➤ Trip level

» Stop location

» Mode

➤ Visitor calibration

» Mode share

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System level validation

- ABM component validation to be revisited in system-level
  - » Screenlines for county-county destination choice
  - » Transit feeds back to mode share

- Assignment summaries to do
  - » Update/confirm screenline locations
  - » Build speed comparison summary (NPMRDS data)
  - » Organize transit data

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Sensitivity tests

➤ Specific tests to be defined during next RTTAC-MS

» SE changes (2045 inputs)

» Auto parameters (e.g. auto operating cost)

» New highway projects

» New transit projects

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Model delivery

- Setup support for RTTAC-MS Members

- LRTP Consultant training – schedule?

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Questions

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