



CAMBRIDGE  
SYSTEMATICS

Think  Forward

# SERPM 8.0 Model Update

*Model Design Workshop*

*presented to*  
RTTAC-MS

*presented by*  
Cambridge Systematics, Inc.

December 8, 2016

# Agenda

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- Project Overview
  - » Schedule
  - » Risks
- Project Status and Next Steps
  - » Data Needs
  - » Interview/Survey Summaries
  - » Upcoming RTTAC-MS Decision Points
- Model Design

# Project Schedule / Risks

# Original Scope of Services Schedule

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- Complete by December 17, 2017
  - » Task 1: Model estimation, design and development;
  - » Task 2: Data collection, compilation, and development;
  - » Task 3: Model calibration, validation, and sensitivity testing.
- Complete by March 18, 2018
  - » Task 4.1: User workshop
- Warranty and support through December 31, 2019

# Initial Proposed Project Phases

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## ➤ Phase 1: Month 1-3

- » Model design and workshop
- » Input data validation and development

## ➤ Phase 2: Month 4-12

- » Model development and validation
  - **Assumed completed HH Survey by December 2016 (Month 3)**

## ➤ Phase 3: Month 13-15

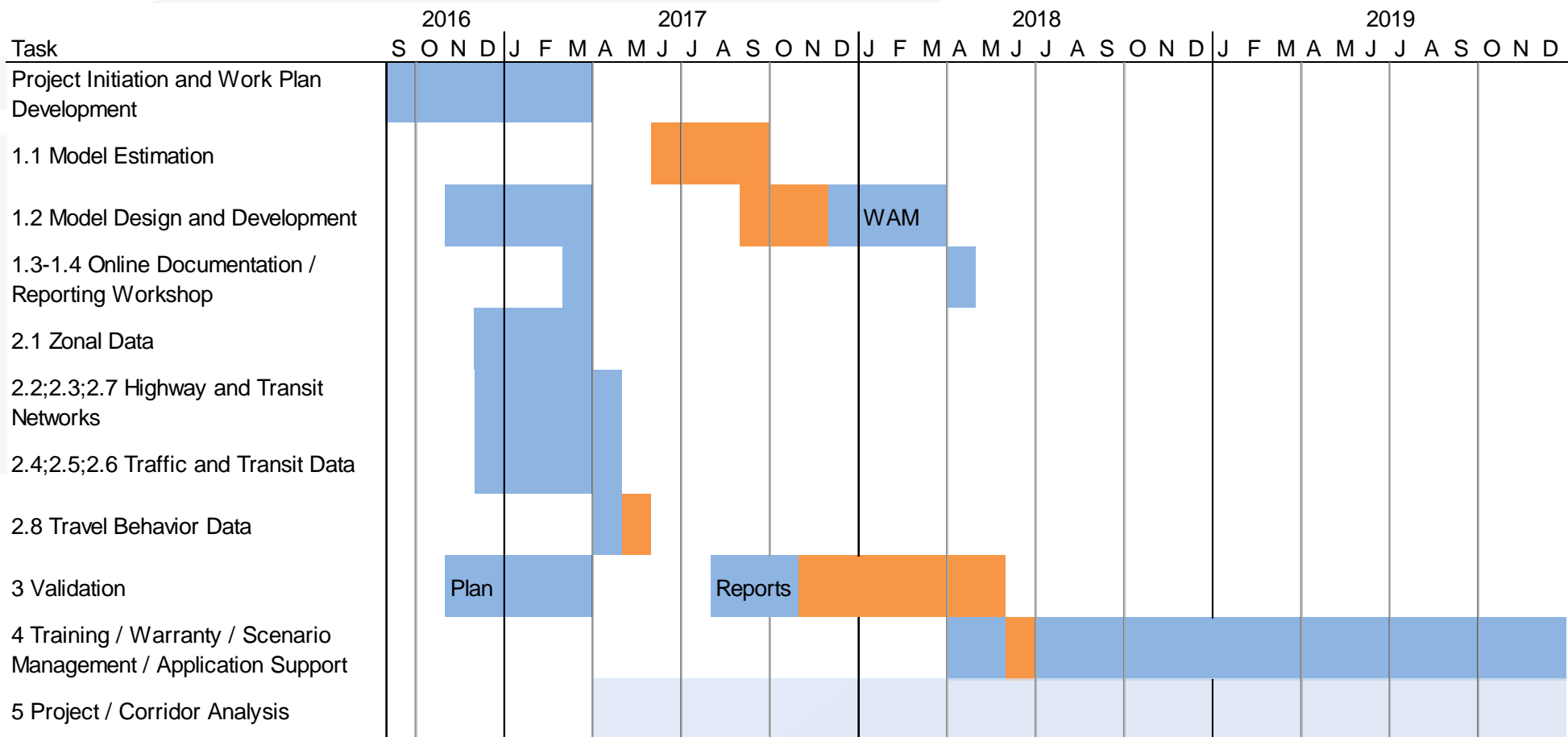
- » Sensitivity testing
- » Final validation

# Phase 2 Breakdown

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- Estimation – 4 months
- Implementation – 3 months (can begin 1 month prior to estimation completing)
- Validation (can begin 1 month prior to implementation completing)
  - » Single pass – 3 months
  - » Full feedback – 1 month
  - » Sensitivity testing – 3 months

**Updated schedule:** 6 month delay in HH Survey delays model delivery until June 2018  
*(exhausts original 3 month buffer)*



**Critical Path**

*WAM: Windowed Area Model*

*Plan: validation plan development*

*Reports: validation reporting development*

# Potential Project High Risks

Risk	Mitigation Strategy
Delay in availability of useful HH survey data	RTTAC-MS to decide whether to accept delays or develop a model independent of HH Survey results
Validation delays due to aggressive validation schedule with no slack	Generate validation reports with available data in advance (e.g. Transit boardings, Highway counts, screenlines) and summarize with SERPM 7 outputs
	Validate PopSyn output once 2015 control totals are available
Changes to input data after model estimation has begun	Finalize networks and officially accept in advance of model estimation start
	Finalize zonal data and officially accept in advance of model estimation start
Schedule delays	Set clear expectations with RTTAC-MS. Track against overall project schedule at each meeting.



# Current Efforts / Next Steps

# Early project milestones / efforts

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- Task Work Order 2: Model Design
  - » Model design plan
  - » Model validation plan
  - » Online documentation structure
  - » Initial Transit Model improvements
- Task Work Order 3: Data Assembly
  - » Zonal data
  - » Network data
  - » Count data
  - » Operational data

# Data Needs

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- Specified in DataAvailabilityNeeds\_SERPM8\_11212016.docx
  - » Sent to RTTAC-MS on 11/21/2016
- MPO Responsibilities
  - » Zonal data
  - » Traffic counts (non-state roads)
  - » Freight distribution centers
- FDOT Responsibilities
  - » Roadway data
  - » GIS data
  - » Freight
- Motion to approve

# Guidance from RTTAC-MS Interviews

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## ➤ Accuracy and Reliability

- » Highway
- » Transit

## ➤ Reporting

- » Beyond highway/transit link loads

## ➤ Represent new technology / travel behavior

## ➤ Model accessibility

- » Portability (assignment-only operation)
- » Easily presented reports
- » Documentation

## ➤ SERPM 8 Uses

- » LRTP: multimodal travel
- » Project-level studies

# Summary of Model User Survey Responses

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## ➤ Anticipated Projects

- » County / Regional transportation plans
- » PD&E planning
- » Corridor studies: transit and highway
- » Toll studies
- » Freight studies
- » Interchange access request

## ➤ Aspects to Improve

- » Reporting and data visualization
- » Validation
  - TOD validation
  - Transit
- » Subarea analysis
- » Model portability

## ➤ Documentation

- » Installation
- » Guidance for typical applications
  - Model assumptions and limitations
- » Model performance
- » Performance measures

# Upcoming RTTAC-MS Decision Points

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## ➤ Data Needs and Responsibilities

- » Ratify: December 2016

## ➤ Model Development and Design

- » Review / Ratify Model Design Plan: January / March 2017
- » Review / Ratify Model Validation Plan: January / March 2017

## ➤ Model Inputs

- » Review / Ratify new highway network attributes: February / March 2017
- » Review / Ratify traffic counts: February / March 2017
- » Review / Ratify traffic speed data: February / March 2017
- » Review / Ratify highway networks: March / April 2017
- » Review / Ratify transit validation data: March / April 2017
- » Review / Ratify transit networks: March / April 2017
- » Review / Ratify SE data: March / April 2017

## ➤ Model Approach

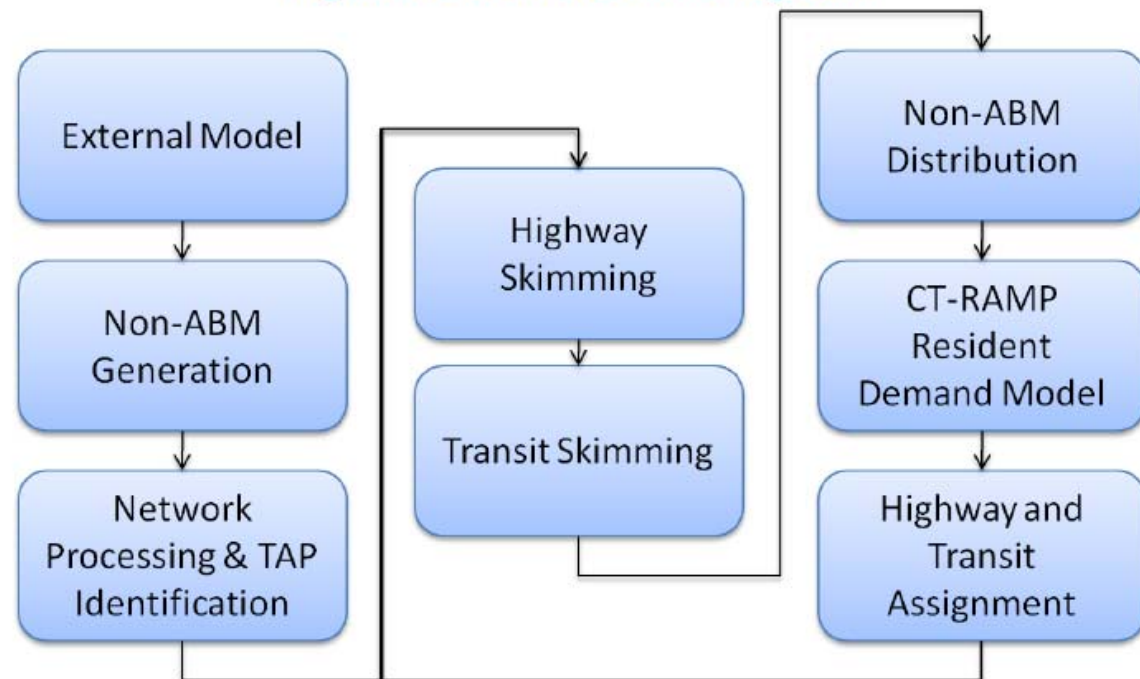
- » Usability of HH Survey data in model development: May 2017

# Model Design

# Model Design Decisions

- Demand
- Supply
- Usability
- Validation
- Training

Figure 4: SERPM ABM Model System





# Demand Decisions

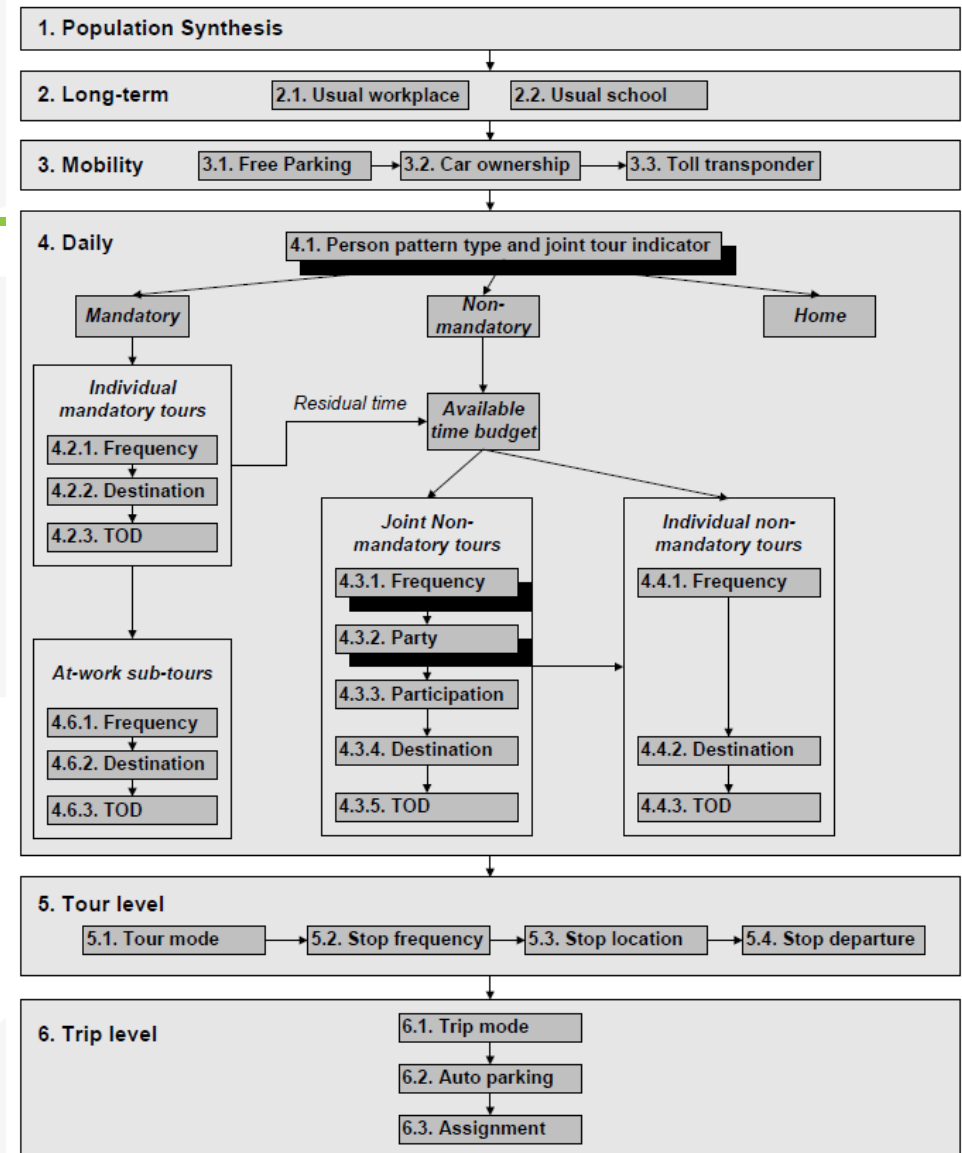
## ➤ Tune-up to the existing model demand components

### » Re-estimation within functional form

- Long-term
- Mobility
- Daily
- Tour
- Trip

### » Future Mobility

- Ridesourcing as a new mode
- Zero-occupancy vehicles:
  - post-processing factors
- Auto ownership by vehicle technology



# Supply

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- Current time periods
  - » 5 Highway (EA, AM, MD, PM, EV)
  - » 3 Transit (AM, PM, OP)
- Transit mode segmentation
  - » Verify coding and labels
- Highway Improvements
  - » Dynamic tolling
- Transit Improvements
  - » Address outstanding issues

# Usability

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## ➤ Installing/Running

- » Key software requirements:  
Cube, Java
- » Key hardware requirements: > 100GB RAM
- » Task 2: Assessing feasibility of cloud solutions
- » Improve installation process / documentation

## ➤ Scenario Development

- » Input data verification
  - Network connectivity
  - SE data visualization
- » Updating true-shape layer with network changes

## ➤ Interface

- » Cube Catalog clean up

## ➤ Reporting

- » Replace SQL Server reporting with R

# Validation

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- Determined by Validation Plan
- Multi-level validation of all components
  - » Single pass
  - » Feedback
  - » Sensitivity Tests
- Transit
- Highway
  - » Time of day
  - » Toll links
  - » Travel Time / Speed

# Training / Documentation

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- Video tutorials
  - » Running the model and reports
  - » Modifying inputs
- Online documentation
  - » Wiki site: hover-text / mouse-over tips
  - » FAQs
- Standard reports
  - » Easily modifiable -> demonstrate network attribute attributes

# Next Steps

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- Draft Model Design – next RTTAC-MS
- Draft Model Validation Plan – next RTTAC-MS