

# SCAG Activity-based Model Update

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SCAG Modeling Task Force  
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# Outline

**Introduction**

**Tasks completed – Phase 1**

**Current status – Phase 2**

**Future tasks – Phase 3**

# Objectives



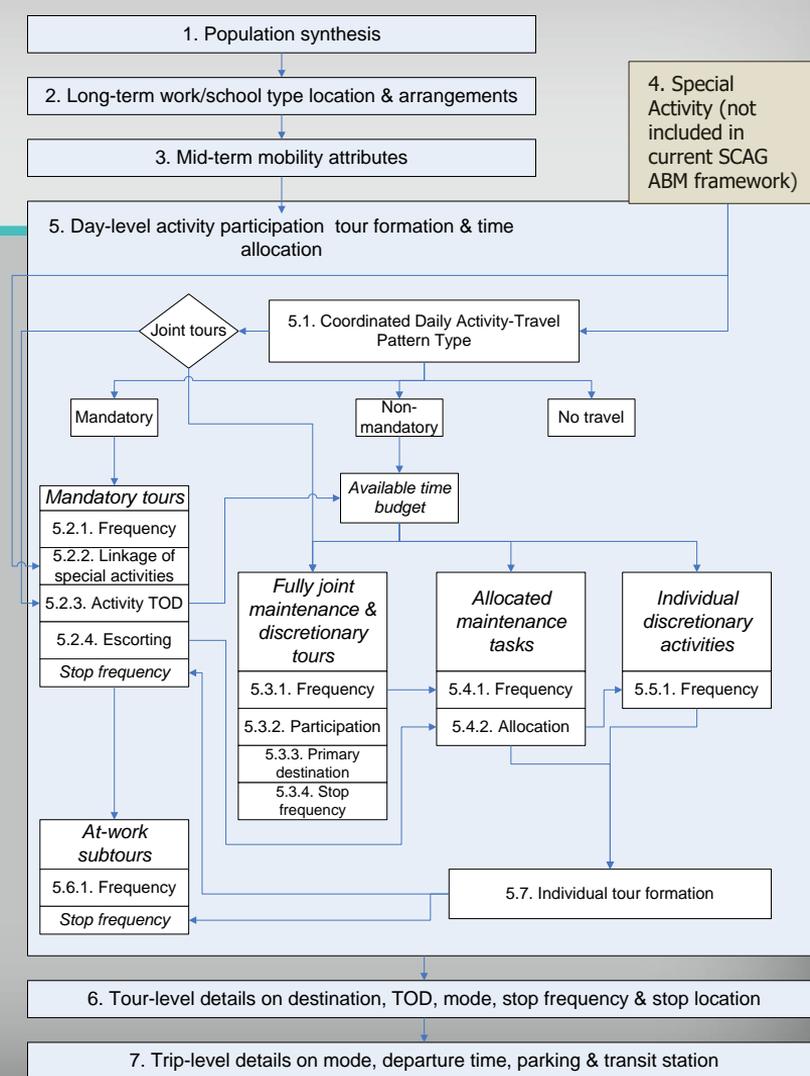
MTF meeting, March 29, 2018

# SCAG ABM

- Based on past works and analyses
- More than 40 sub-models
- Adopt CT-ramp platform and software
  - ❖ *Coordinated Travel -Regional Activity Modeling Platform*
- Integrate with TransCAD static assignment
  - ❖ *ABM will generate OD matrices as input for assignment procedure*
- Rich output data for policy analysis

# SCAG ABM Framework

- Population synthesis
- Long-term location & arrangements
- Mid-term mobility attributes
- Day-level activity, tour & time
- Tour-level details
- Trip-level details



# Project Plan and Schedule

## Phase 1

(03/17 ~ 12/17)

- Software enhancement and update
- Initial sub-model calibration and tests

## Phase 2

(01/18 ~ 06/18)

- System validation & calibration
- Optimize model run (hardware & software)

## Phase 3

(07/18 ~ 12/18)

- Peer review workshop
- Final improvement

# Phase 1 Development (03/17 ~ 12/17)

- ✓ Completed on schedule
- ✓ Software development
- ✓ Initial sub-model calibration and validation
- ✓ Software test with 20% sample
- ✓ Scenario test with 10% sample
- ✓ Initial test results are reasonable

# Software testing

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- ✓ Exposing and resolving run-time errors
- ✓ Testing model with :
  - different household samples
  - different random number seeds
  - different hardware environments
  - different scenario inputs

# Run Time for One Loop with 10% Sample

## TransCAD UI for RegMod v7.1

- Init
- Skim  
(hot start)

**13 Hr**  
(12 Hr for tran skm)

- Logsum
- Accessibility

*Java*

**4.3 Hr**

CTRAMP

*Java*

**15 Hr**  
20%  
**7.5 Hr**  
10%

## TransCAD UI RegMod v6.3

Swap trips  
in master  
OD

Traffic  
Assign

Emission

**4 Hr**

**36.3 Hours (20%) / 28.8 Hours (10%)**

One pass. Not include time for HDT model (0.5 hr)

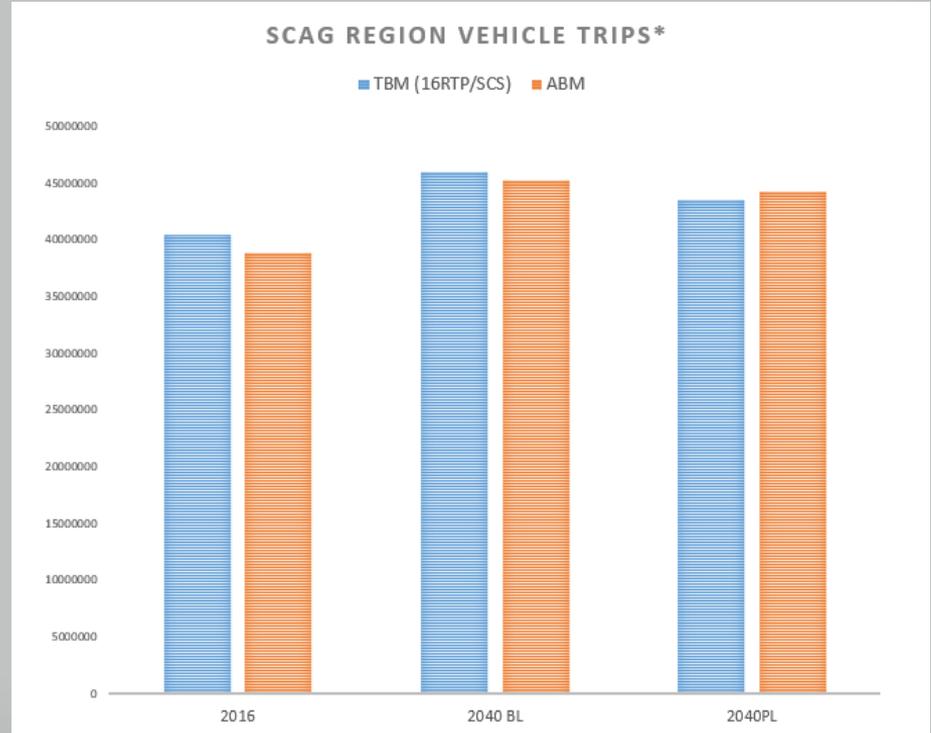
# Scenario Tests

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- Test whether the model generates reasonable output
- 2016 RTP/SCS scenarios: 2012, 2040 baseline, 2040 plan
- 2020 RTP/SCS scenario: 2016 (draft SED)
- Model output comparison: ABM vs. TBM
  - Regional VMT, VHT
  - Vehicle Trips, OD between SCAG counties
  - Average speeds

# Scenario test results\* – Vehicle Trips

Total vehicle trips  
within 4% of trip-  
based model estimate

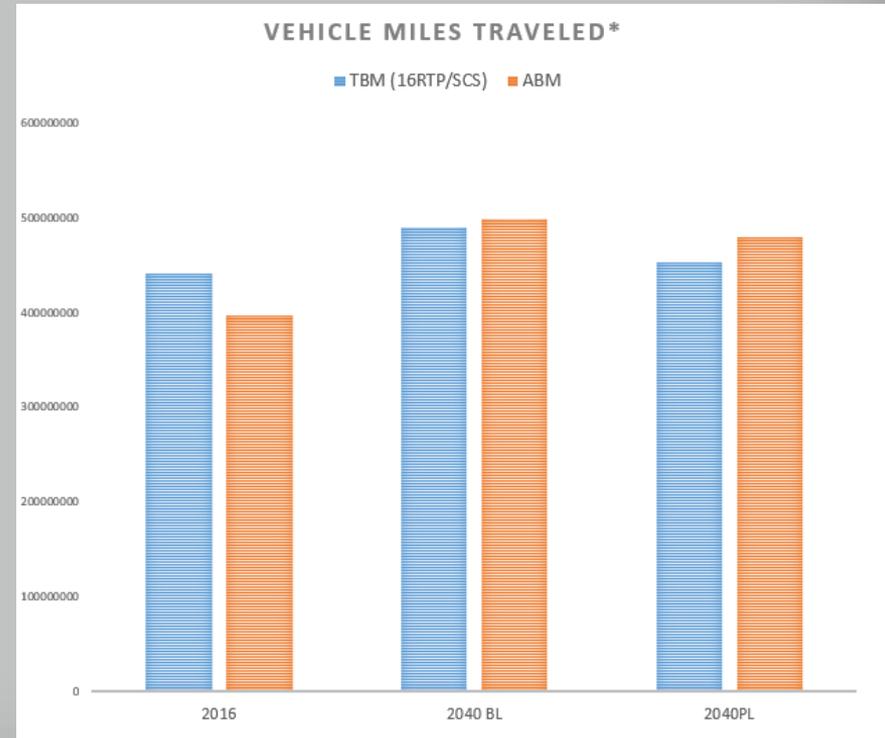


- *Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation*

# Scenario test results\* - VMT

Vehicle-miles travelled for light and medium-duty vehicles

- 2016 – within 10%
- 2040B – within 2%
- 2040P – within 6%



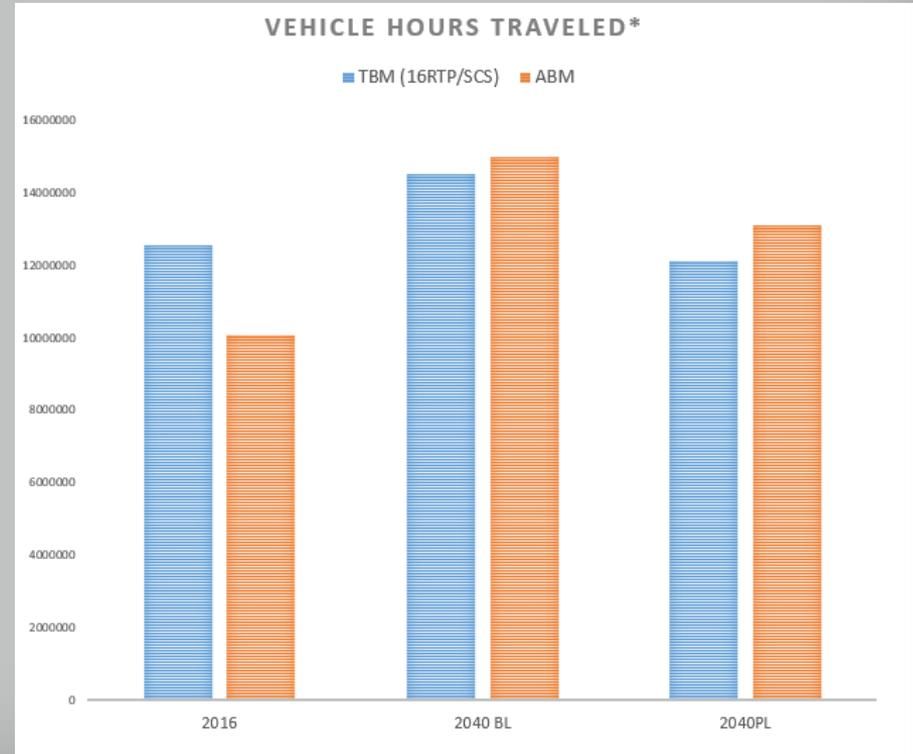
\* Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation

# Scenario test results\* - VHT

Vehicle-hours travelled for light and medium-duty vehicles:

- 2016 – within 20%
- 2040B – within 5%
- 2040P – within 10%

Deviation due to incomplete time of day model calibration

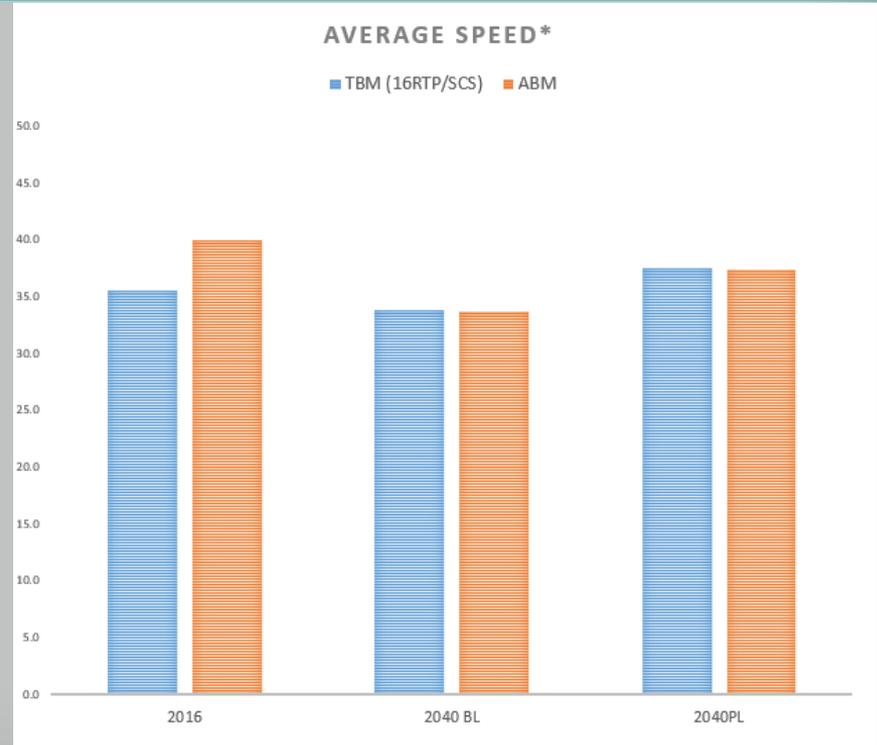


\* Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation

# Scenario test results\* - Speed

## Average speed

- 2016 – 12% difference
- 2040 – within 5%



*\* Model results are preliminary and the model used from Phase I work for the runs requires further calibration and validation*

# Scenario test results\* - OD

ABM - 2016							
CNTY	IM	LA	OR	RV	SB	VC	Sum
IM	97%	0%	0%	3%	0%	0%	100%
LA	0%	92%	5%	0%	2%	1%	100%
OR	0%	13%	84%	2%	1%	0%	100%
RV	0%	2%	3%	87%	8%	0%	100%
SB	0%	8%	2%	8%	81%	0%	100%
VC	0%	14%	0%	0%	0%	86%	100%

TBM - 2016							
CNTY	IM	LA	OR	RV	SB	VC	Sum
IM	98%	0%	0%	2%	0%	0%	100%
LA	0%	92%	5%	1%	2%	1%	100%
OR	0%	13%	83%	2%	1%	0%	100%
RV	0%	3%	3%	86%	9%	0%	100%
SB	0%	9%	2%	9%	80%	0%	100%
VC	0%	12%	0%	0%	0%	87%	100%

## ABM - 2040 Baseline

CNTY	IM	LA	OR	RV	SB	VC	Sum
IM	95%	0%	0%	4%	1%	0%	100%
LA	0%	93%	4%	0%	2%	1%	100%
OR	0%	12%	85%	2%	1%	0%	100%
RV	1%	2%	2%	88%	7%	0%	100%
SB	0%	8%	2%	9%	81%	0%	100%
VC	0%	11%	0%	0%	0%	88%	100%

## TBM - 2040 Baseline

CNTY	IM	LA	OR	RV	SB	VC	Sum
IM	97%	0%	0%	2%	0%	0%	100%
LA	0%	92%	4%	1%	2%	1%	100%
OR	0%	12%	84%	2%	1%	0%	100%
RV	0%	2%	2%	88%	8%	0%	100%
SB	0%	7%	2%	9%	82%	0%	100%
VC	0%	11%	0%	0%	0%	88%	100%

## ABM - 2040 Plan

CNTY	IM	LA	OR	RV	SB	VC	Sum
IM	95%	0%	0%	4%	1%	0%	100%
LA	0%	93%	4%	1%	2%	1%	100%
OR	0%	12%	85%	2%	1%	0%	100%
RV	1%	2%	2%	88%	7%	0%	100%
SB	0%	8%	2%	9%	81%	0%	100%
VC	0%	11%	0%	0%	0%	88%	100%

## TBM - 2040 Plan

CNTY	IM	LA	OR	RV	SB	VC	Sum
IM	98%	0%	0%	2%	0%	0%	100%
LA	0%	92%	4%	1%	2%	1%	100%
OR	0%	12%	85%	2%	2%	0%	100%
RV	0%	2%	2%	88%	8%	0%	100%
SB	0%	7%	2%	9%	82%	0%	100%
VC	0%	10%	0%	0%	0%	89%	100%

\* Model results are preliminary and the model used from Phase I work for the run requires further calibration and validation

# Phase 2 (01/2018 ~ 06/2018)

## Model software enhancement

- Run-time optimization
- Automated error checking and model output reporting

## System-wide model validation

- 2017 RTP Guideline
- Highway & Transit

## Graphic user interface

## Sensitivity Test

## Model output analysis

## Model documentation and user training

# Phase 3 (07/2018 ~ 12/2018)

Peer review  
workshop  
Fall, 2018

Continue model  
enhancement  
and testing

Continue model  
software  
enhancement

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# Thank you.

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