# SERPM 8.0 Model Estimation

*presented to*

SEFTC Regional Transportation Technical Advisory Committee (RTTAC)

*presented by*

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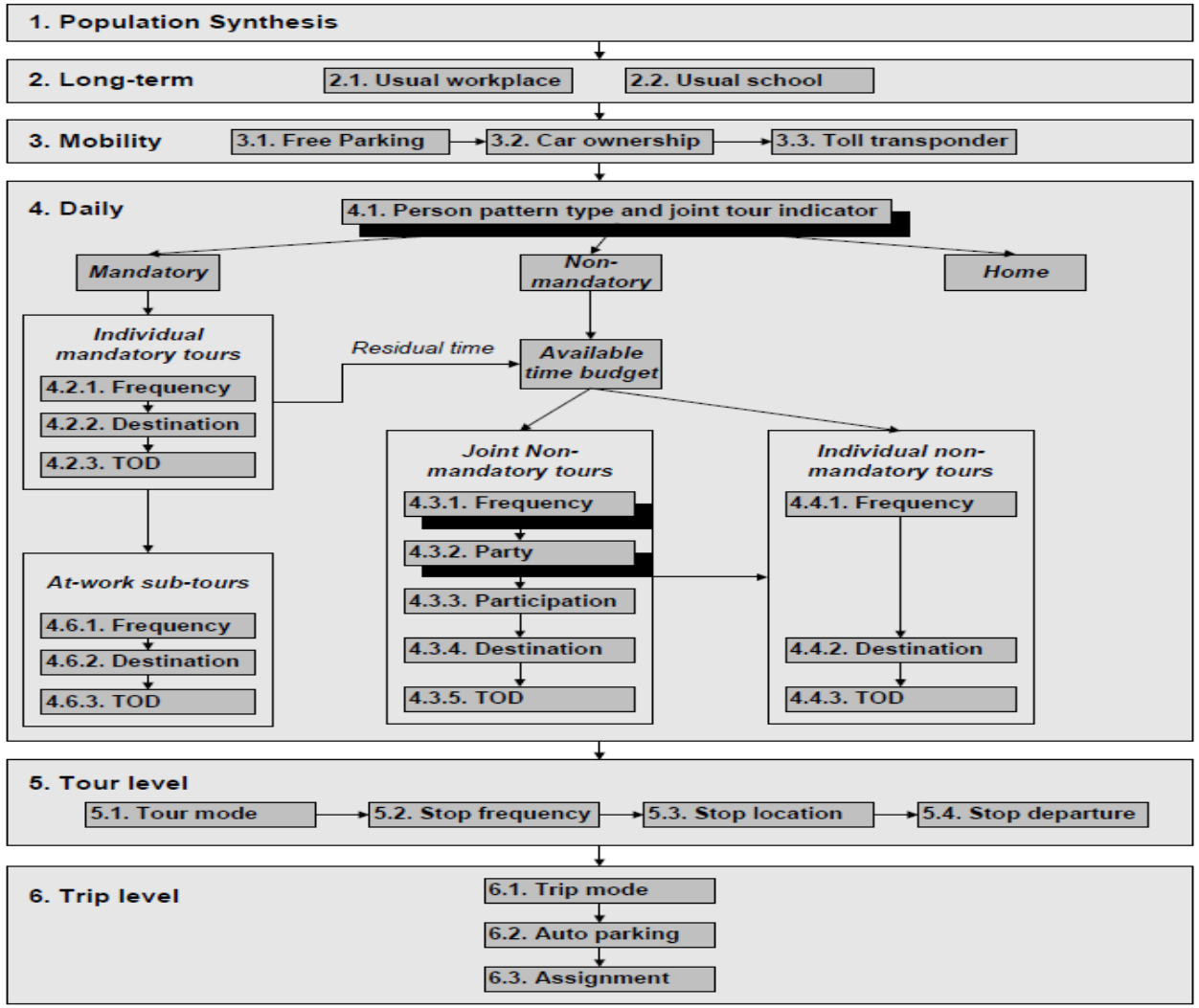
Think Forward

September 27, 2017

# Model Design Plan (Demand Components)

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# *Components Not Planned to Be Reestimated*

- Residential location choice
- Auto technology (new component)
- Willingness to ridesource
- Toll transponder ownership

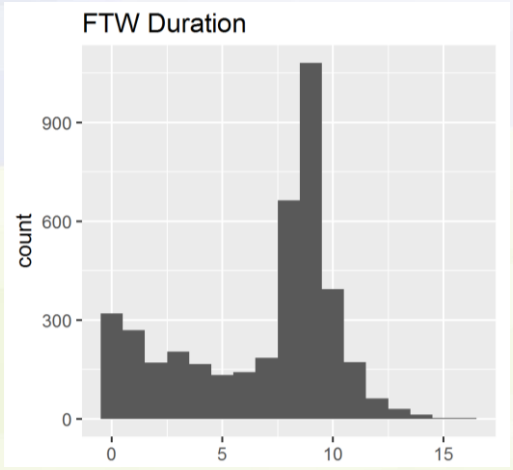
# *Summary of Survey Data Analysis*

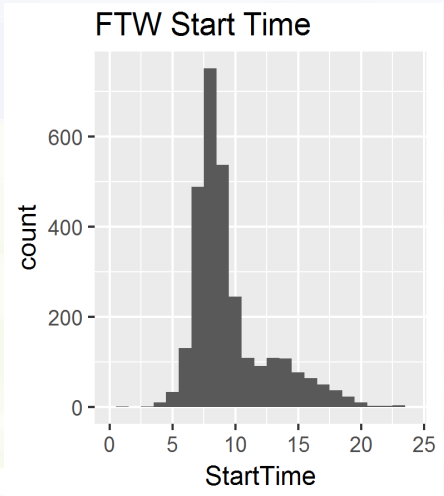
- Smaller than expected sample size
  - ~2,000 households, ~4,000 persons, ~20,000 trips
- Lower than expected trip rates
  - Consistently around 5 trips per household
  - Expected range was about 8 to 10 trips per household
  - Can be partially explained by low incidence of households with >2 persons
  - But, per person trip rates are around 2.5-2.7; also lower than expected
- Presents a challenge to continuity across SERPM versions to adapt these findings into model components that address tour or trip frequency; Instead, we are focused on using the survey for other components

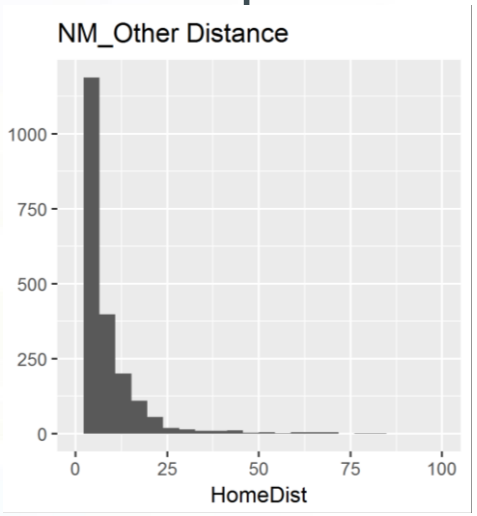
# *Summary of Survey Data Analysis*

- Tour summaries – reasonable distributions of:
  - Tour start/end times and durations
  - Tour lengths (distance between home and primary activity location)
  - Tour purposes

- So, we plan to try to use survey data to estimate tour and trip level models

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# Plan for Model Estimation

- Components that we will not reestimate, but that we will still validate
- Components we think we should try to estimate using the new survey data
- Model choice model development plan
- Model validation overview

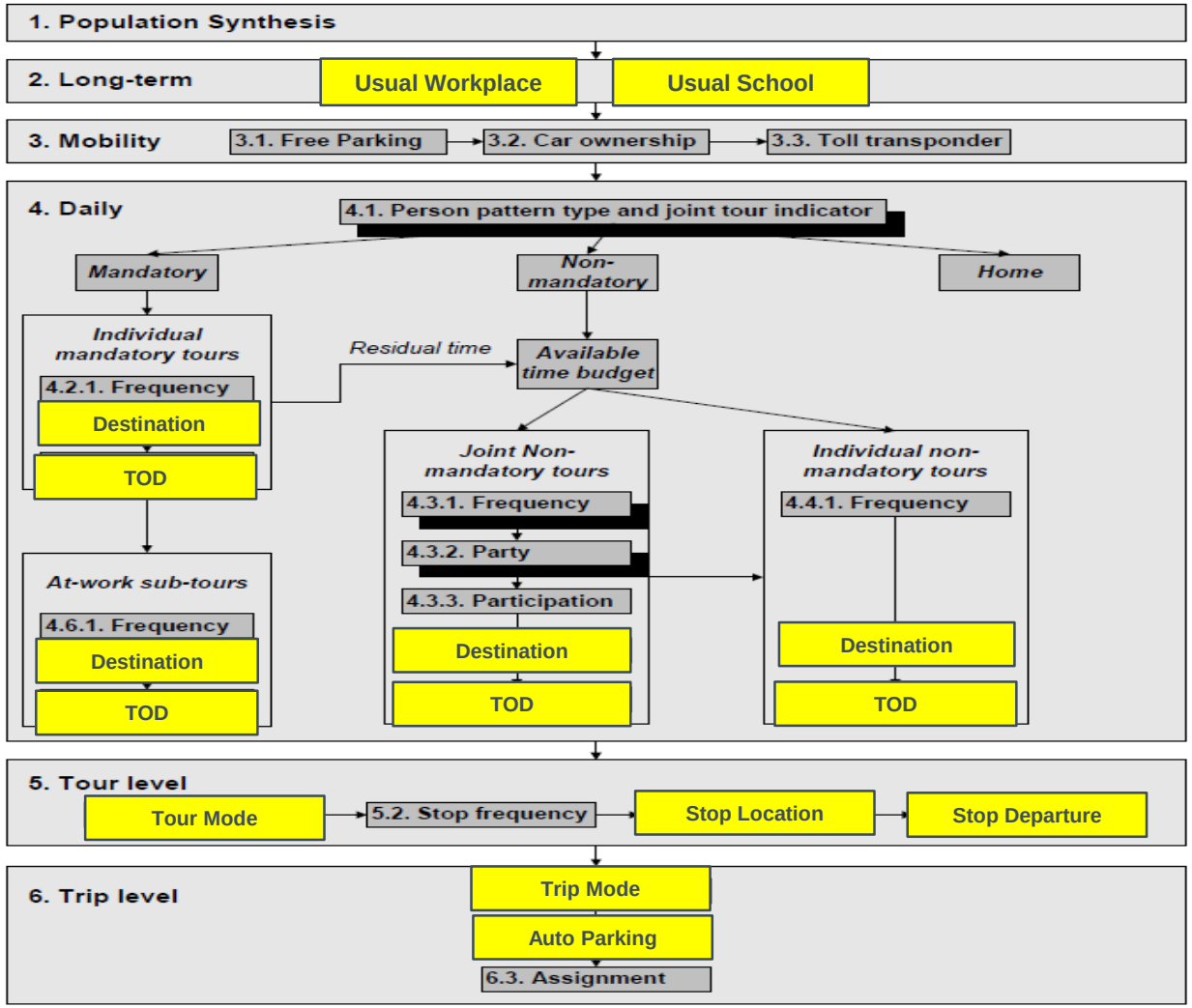
# *Components Whose Parameters Will Be Recalibrated Only (No Reestimation)*

- Work from home
- Employer parking
- Auto availability
- School location choice
- Daily activity pattern
- Tour frequency (mandatory, non-mandatory, at-work, joint)
- Joint tour composition/participation
- Intermediate stop frequency/purpose

# *Components That We Will Try to Estimate*

- Workplace location choice
- Tour time of day choice (mandatory, non-mandatory, at-work, joint)
- Tour destination choice (non-mandatory, at-work, joint)
- Tour mode choice
- Stop location choice
- Stop departure choice
- Trip mode choice
- Parking location choice

# Summary of Components to Be Reestimated




Yellow color highlights components we will try to reestimate

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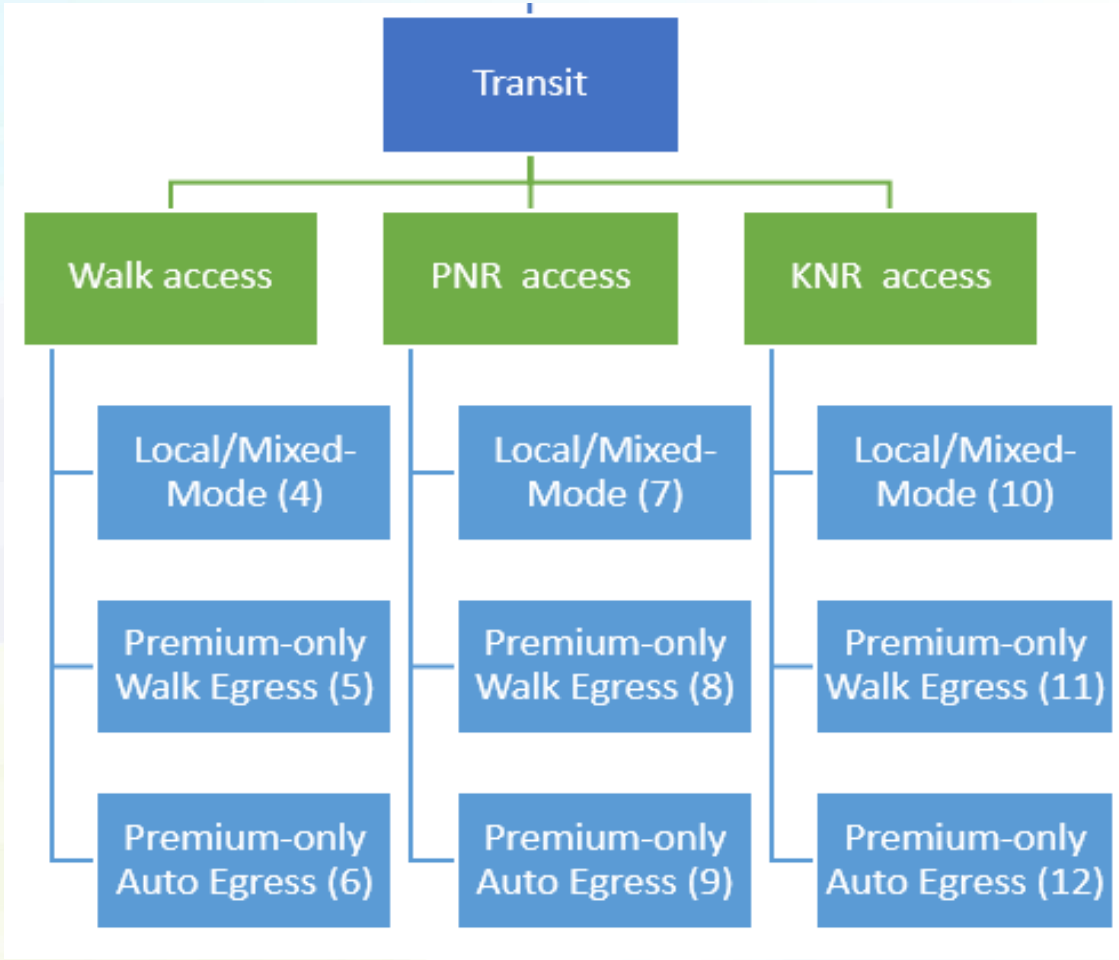
# Mode Choice Model

- Use SERPM 6.7 mode choice structure
- Estimate parameters using household survey data
- Validate/calibrate (in conjunction with transit assignment validation) using various data sources
  - Household survey
  - Various transit on-board surveys
  - Transit ridership counts

# SERPM 6.7 Mode Choice Model Structure



# *Model Validation Overview*

- Will be done according to model validation plan
- All demand components validated by running model and comparing results to best observed data sources
  - Components not reestimated
  - Components newly estimated
- Highway and transit assignment validation
- Sensitivity and temporal validation

# Component Validation Example

**Expanded Household Survey**

| HHSize \ HHIncome | Total | <$20000 | 20,000-$39,999 | $40,000-$69,999 | $70,000-$99,999 | >$100,000 |
|---|---|---|---|---|---|---|
| Total | 2.05 | 1.35 | 1.88 | 2.37 | 2.52 | 2.64 |
| HHSize 1 | 1.10 | 0.88 | 1.19 | 1.29 | 1.43 | 1.48 |
| HHSize 2 | 2.05 | 1.59 | 1.93 | 2.16 | 2.33 | 2.31 |
| HHSize 3 | 2.57 | 1.86 | 2.29 | 2.82 | 3.00 | 3.01 |
| HHSize 4+ | 2.54 | 1.79 | 2.37 | 2.80 | 2.80 | 2.92 |

**Model**

| HHSize \ HHIncome | Total | <$20000 | 20,000-$39,999 | $40,000-$69,999 | $70,000-$99,999 | >$100,000 |
|---|---|---|---|---|---|---|
| Total | 2.05 | 1.20 | 1.73 | 2.15 | 2.40 | 2.59 |
| HHSize 1 | 1.13 | 0.85 | 1.13 | 1.33 | 1.39 | 1.47 |
| HHSize 2 | 2.12 | 1.51 | 1.88 | 2.15 | 2.27 | 2.39 |
| HHSize 3 | 2.23 | 1.43 | 1.88 | 2.30 | 2.47 | 2.65 |
| HHSize 4+ | 2.59 | 1.61 | 2.15 | 2.66 | 2.85 | 3.00 |

**Percentage Difference (model – survey)/survey**

| HHSize \ HHIncome | Total | <$20000 | 20,000-$39,999 | $40,000-$69,999 | $70,000-$99,999 | >$100,000 |
|---|---|---|---|---|---|---|
| Total | 0% | -15% | -15% | -22% | -12% | -5% |
| HHSize 1 | 3% | -3% | -6% | 4% | -3% | -1% |
| HHSize 2 | 7% | -8% | -5% | -1% | -6% | 8% |
| HHSize 3 | -34% | -43% | -41% | -52% | -53% | -35% |
| HHSize 4+ | 5% | -18% | -22% | -15% | 5% | 8% |

- Stratified by
  - County
  - HH size
  - HH income
  - HH size/income
  - Workers
  - Workers/income
  - Children
  - Workers/children
  - Accessibility

# *Questions?*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