

Treasure Coast Regional Planning Model ABM Development (TCRPM4)

presented to
**Southeast Florida Model
Users Group**

presented by
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Group**

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TRCPM Model Structure

- Coordinated Travel – Regional Activity-based Modeling Platform Family of ABMs (CT-RAMP from PB)
- Concepts and structure similar to SERPM7
- Main features:
 - Explicit intra-household interactions
 - Continuous temporal dimension (one-hour time periods)
 - Subdivided TAZs but no micro-zones (989 internal TAZs)
 - Integration of location, time-of-day, and mode choice models
 - Java-based package for AB model implementation
 - Will run on a desktop/laptop computer

TCRPM4 Development Strategy

- Most model were transferred from the SERPM7 ABM
- Most TCRPM4 features are consistent with SERPM7
- TCRPM inputs
 - TAZs were split in transit service areas (no Micro-zones)
 - Socio-economic and employment data at TAZ-level
 - Transit access points and PT networks. Conventional transit network coding.
 - Other inputs (transit fares, ...)
- Calibration targets are based on NHTS
- All models transferred from SERPM, no re-estimation
- Auxiliary models are trip models (trucks, external trips, etc.), like SERPM
- Calibrate and validate (nearly complete)

1. Population Synthesis

2. Long-term

2.1. Usual workplace

2.2. Usual school

3. Mobility

3.1. Car ownership

3.2. Toll transponder

4. Daily

4.1. Person pattern type

Mandatory

Non-mandatory

Home

Individual mandatory tours

4.2.1. Frequency

4.2.2. Destination

4.2.3. TOD

Residual time

Available time budget

Individual non-mandatory tours

4.3.1. Frequency

4.3.2. Destination

4.3.3. TOD

At-work sub-tours

4.4.1. Frequency

4.4.2. Destination

4.4.3. TOD

5. Tour level

5.1. Tour mode

5.2. Stop frequency

5.3. Stop location

5.4. Stop departure

6. Trip level

6.1. Trip mode

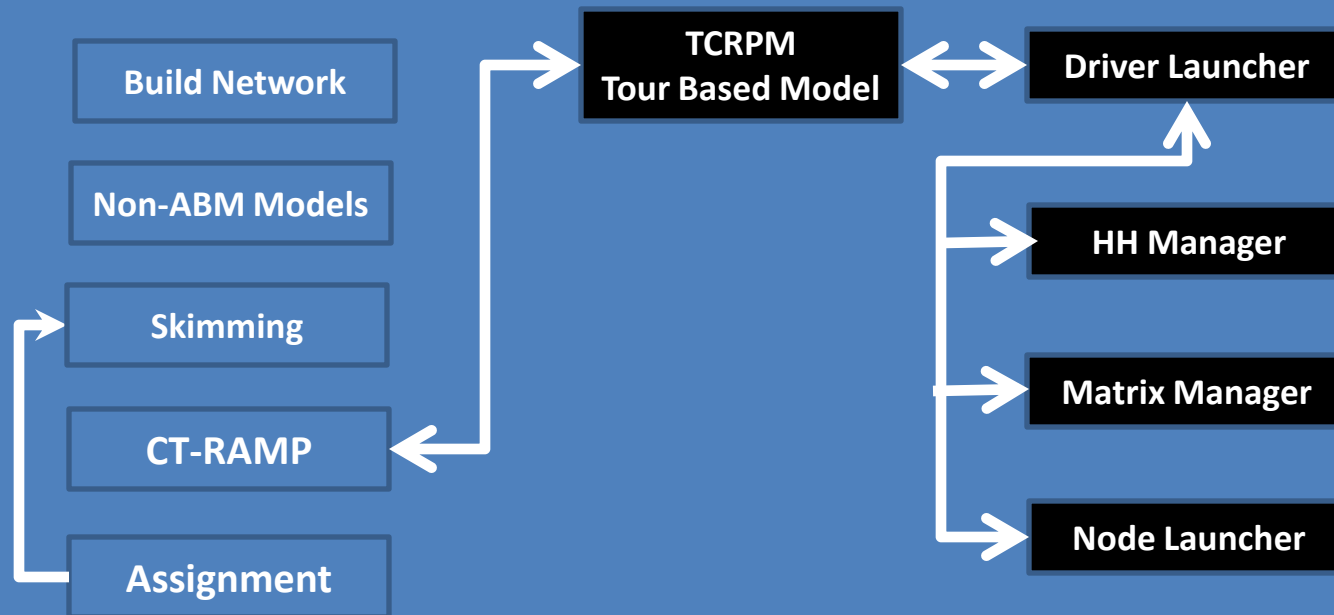
6.2. Assignment

Note: the toll transponder model is not used in TCRPM 4.

TCRPM4 ABM Structure

Model Implementation

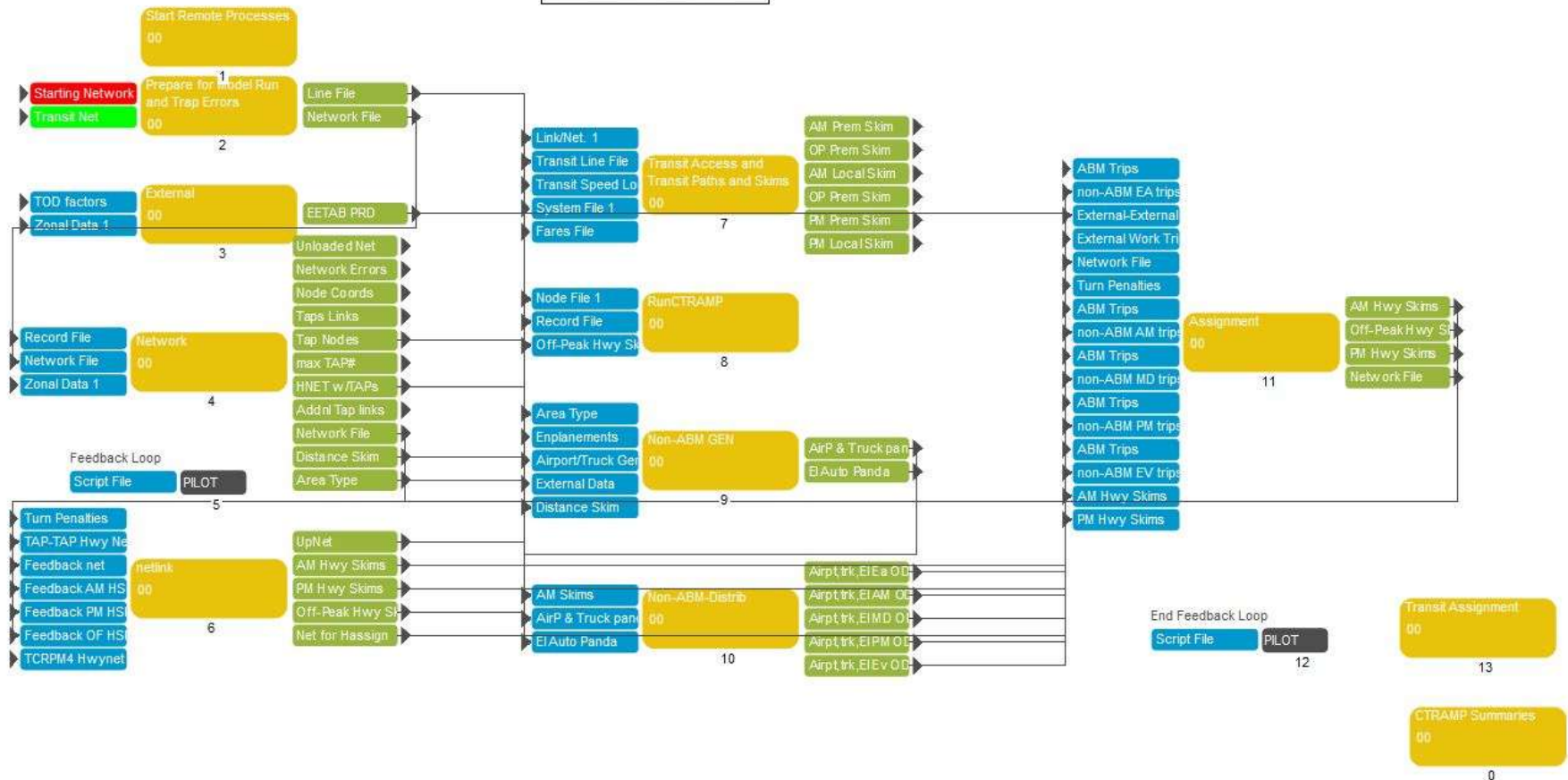
Desktop Computer



TCRPM Cube Flow Chart

TCRPM4

TCRPM NODES:
TAZ=1-1171
TAPS=2001-2999 (2259)
Nodes=3000-450000



Similarities to SERPM7

- Same overall CT-RAMP structure
- Same time periods (early, AM peak, midday, PM peak, evening)
- Same modes, although some are not currently used
- Same non-ABM components
 - EE, EI/IE trips, trucks, airport
- Same network coding conventions
- Same highway and transit skimming and assignment procedures
- Generally same zonal data requirements

Differences from SERPM7

- No micro-zones
- Next generation of POPSYN
- Simplified transit and mode choice structure
- No transponder model
- Temporal resolution of one hour instead of 30 minutes
- No explicit representation of joint travel
- No parking cost elements
- Addition of external workplace model –Treasure Coast resident working outside the 3 counties

Input Data

Data Needs	Sources
TAZ delineation	Census blocks, MPO
Household and population, socio-economic attributes	Census, American Community Survey
Employment by ~ 16 sectors	InfoUSA, ES-202, PUMS
School and University enrollment	Florida DOE, MPO Staff
Transit access points	Transit operators GIS data
Transit operation attributes	Transit agencies
Highway attributes	GTCRPM
Calibration targets	NHTS, ACS, LEHD

Population Synthesizer

- Inputs
 - TAZ control total
 - TCRPM control total
 - 2007-2011 ACS 5-year PUMS Household table for the region
 - 2007-2011 ACS 5-year PUMS Person table for the region
- Outputs – inputs to CT-RAMP
 - Households.csv – one record per HH
 - Persons.csv – one record per person
- Run independently from the Cube application

Land Use / Employment Inputs

- School Enrollment, by grade level
- Employment by industrial category
 - Agriculture, Mining, Forestry, Fishing
 - Construction
 - Utilities
 - Manufacturing
 - Wholesale Trade and Warehousing
 - Transportation
 - Retail Activity
 - Professional and Business Services
 - Education (Elementary K-12, Post-Secondary)
 - Personal Services
 - Amusement Services
 - Hotels and Motels
 - Restaurants and Bars
 - Health Services
 - Federal, State and Local Government

Ancillary Models

- Adapted from GTCRPM and/or newly developed:
 - External trips
 - External-external
 - External-internal
 - Non-work Internal-external
 - Truck trips
 - Visitor trips (activity-based from SERPM7)
- Implemented in Cube script and integrated with ABM inputs and outputs

Remaining Work

- External workplace model nearly complete
- Finalize validation
- Future year and sensitivity tests
- Complete documentation

Running TCRPM4

- The biggest difference the user will note is the requirement for more detailed TAZ data as an input to POPSYN.
- Will run on a typical laptop (10% sample runs ~4 hours on this mobile i7 at 2 GHZ with 8GB ram)
- POPSYN requires Microsoft SQL Server 2012 (Express) and Java. These are free downloads.
- CT-RAMP runs under Java.
- TCRPC requires Cube/Voyager. Developed under Cube 6.1.1.

Example TCRPM4 Daily Load



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Questions

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