CAMBRIDGE SYSTEMATICS

Think Forward

ACTC and MTC Model Scripts

presented to

Caltrans District 4

presented by

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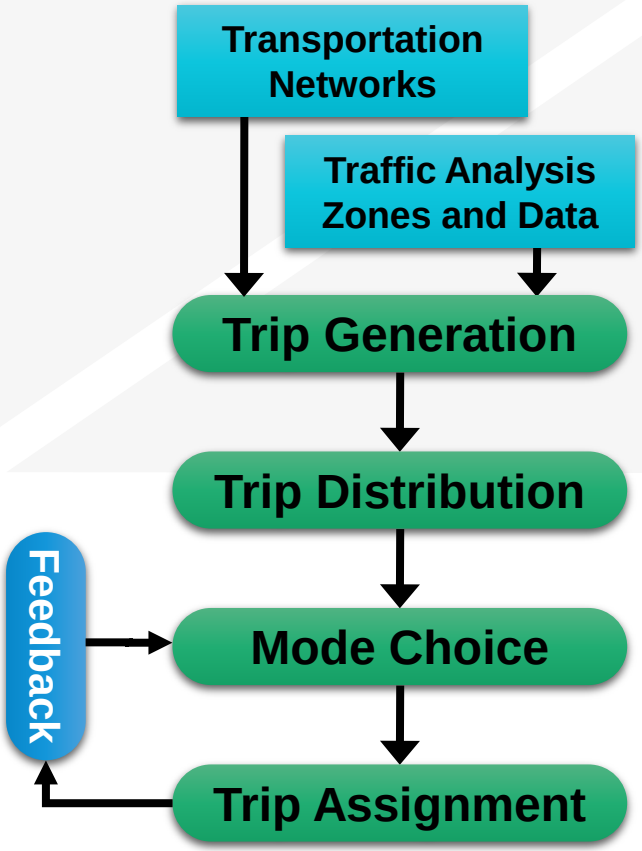
Agenda

- ACTC model overview
- ACTC model traffic assignment script with select link analysis
- MTC model overview
- MTC model highway assignment script with select link analysis
- 2-4 pm Post-processing of model results

ACTC Model



- Model is run a single long script
- Uses master network to build period-specific networks
- Runs peak periods, peak hours, and daily assignments

ACTC Model Highway Assignment

- Inputs and outputs
- Parameters including convergence criteria
- Restrictions on vehicle classes that can use each type of lanes (HOV2, HOV3)
- Trip tables assigned for each vehicle class
- Parameter to use when calculating shortest path (only time is considered in the ACTC model)
- Volume-delays functions (BPR for freeway and Akcelik for non-freeway)

ACTC Select Link Assignment

- Specify your select link

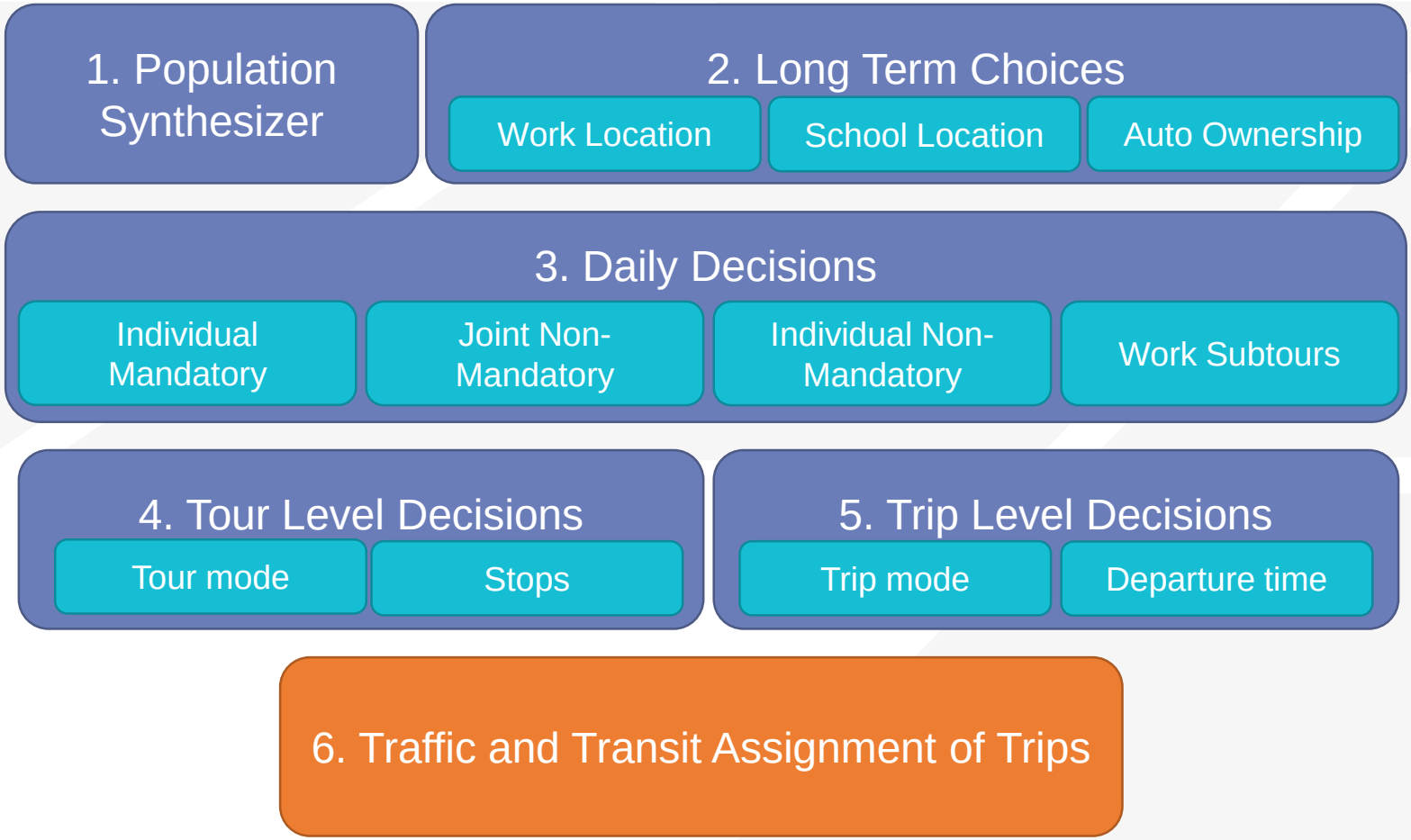
SEL_LINK='27658-33169'

- Simply add a line to each pathload statement

PATHLOAD PATH= TIME, EXCLUDEGRP=23, VOL[1]=MI.1.D1, PENI=1,
MW[10]=MI.1.D1,selectlink=(L=@SEL_LINK@),vol[10]=mw[10]

- Note that SEL_LINK that we defined is a token that is referenced by @SEL_LINK@
- The select link volume will be available in the vol10 attribute

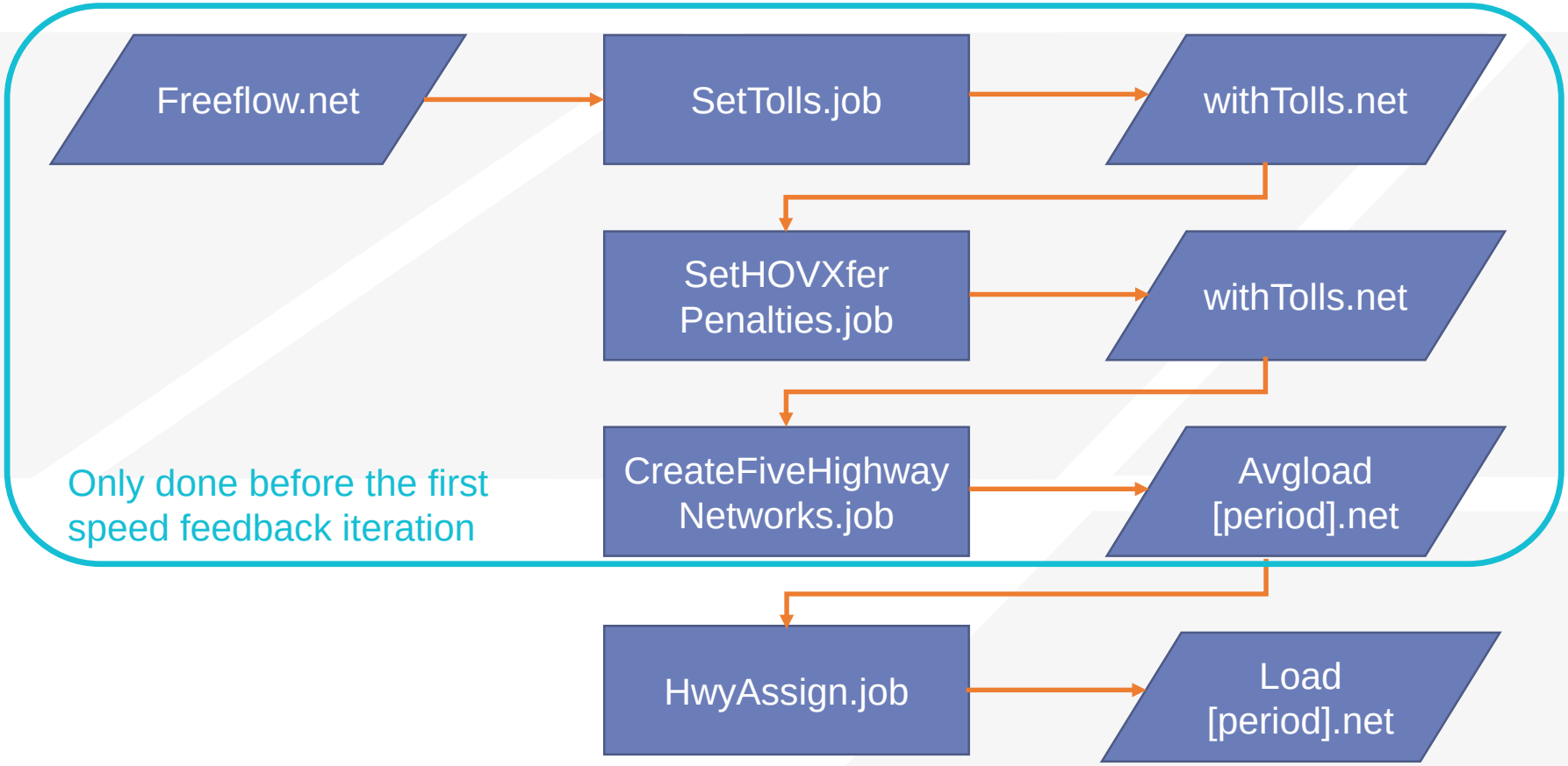
MTC Model


1. Population Synthesizer
2. Long Term Choices
Work Location
School Location
Auto Ownership
3. Daily Decisions
Individual Mandatory
Joint Non-Mandatory
Individual Non-Mandatory
Work Subtours
4. Tour Level Decisions
Tour mode
Stops
5. Trip Level Decisions
Trip mode
Departure time
6. Traffic and Transit Assignment of Trips

MTC Model Highway Assignment

- MTC model implemented using a bat file and multiple scripts for different steps
- The process first sets tolls on the highway networks (vary by time of day and location)
- HOV transfer penalties are set to 0.5 minutes for AM and PM peak periods
- Then, a network is built for each time period
- Lastly, a highway assignment similar to ACTC model is performed

Highway Assignment



Uses relative gap of 0.0005 for AM and PM peak periods

Highway Assignment Periods

- Early AM, 3 am to 6 am;
- AM peak period, 6 am to 10 am;
- Midday, 10 am to 3 pm;
- PM peak period, 3 pm to 7 pm;
- Evening, 7 pm to 3 am

Differences from ACTC Model

- Uses generalized cost in the path-building step
  - Includes toll cost and auto operating cost, not just travel time
  - Tolls costs converted to equivalent travel time in minutes
  - Note that costs are specified in cents per mile
- Reads some parameters from block files
  - FreeFlowSpeed.block
  - hwyparam.block
  - SpeedCapacity_1hour.block

MTC Select Link Assignment

- Similarly to the ACTC model, just add a line to the pathload statement

mw[1] = mi.1.da + mi.2.da + mi.4.da, vol[1]=mw[1],

mw[11]=mw[1], selectlink=(L=@SEL_LINK@), vol[11]=mw[11]

- The select link volume will be stored in attribute vol11

MTC Combine Networks Script

- MTC model produces 5 peak period networks, which need to be combined to compare to the daily ACTC model network
- The AddPeakVolumes.s script reads the networks and combines the select link volumes
- Daily select link volume stored in an attribute called TOTALSELVOL

In Class Assignment

- Copy the ACTC directory and rename ACTC_test
- Modify the ACTC AM peak highway assignment to include PNR and KNR select link volumes as vol18 and vol19
- Modify the ACTC AM peak highway assignment to only run 5 iterations
- Run the select link assignment
- Display the select link volumes as a bandwidth plot and label select link volumes

In Class Assignment 2

- Copy the MTC directory to MTC_test
- Change the script to only run early AM peak period (period=1)
- Run the script
- Display the volumes as a bandwidth plot and label select link volumes

Homework Assignment

- Determine number of pass-through vehicles that are using San Pablo Ave between Grand Ave and Solano Ave
  - Identify the links
  - Add the select link statement to the ACTC script and MTC script that includes the identified links
  - In order to include multiple links all of which have to be traversed use the following command:

    SEL_LINK=(L=27642-27643 && L=27492-33034)
  - Run ACTC daily assignment and MTC 5-peak period assignment
  - Compare number of vehicles from the two models