RSG
the science of insight

NERPM-AB v1

Activity-Based Model User Training

North Florida TPO & Florida DOT District 2 – Jacksonville

June 4-5, 2015

At the End of These Two Days

We will have discussed …

- The NERPM-AB capabilities
- How to setup and run the common modeling analyses
- How to analyze the model results

We will not have discussed …

- The estimation or calibration of the model (see calibration report)
- The detailed mathematical inner workings of the model (another training if desired)

NERPM-AB Model Training Agenda: Day 1

Time	Activity
9:00 a.m. – 9:15 a.m.	Opening remarks and introductions
9:15 a.m. – 10:00 a.m.	Model Capabilities (Part 1)
10:00 a.m. – 10:15 a.m.	Break for coffee/refreshments
10:15 a.m. – 11:15 a.m.	Model Capabilities (Part 2)
11:15 a.m. – 12:00 p.m.	Disaggregate Modeling & Population Synthesis
12:00 p.m. – 1:00 p.m.	Lunch
1:00 p.m. – 2:00p.m.	NERPM-AB Setup in Cube
2:00 p.m. – 2:45 p.m.	Scenario Input Files
2:45 p.m. – 3:00 p.m.	Break for coffee/refreshments
3:00 p.m. – 3:30 p.m.	What's New with Highway Assignment
3:30 p.m. – 4:30 p.m.	Model Outputs and Visualization

NERPM-AB Model Training Agenda: Day 2

Time	Activity
8:30 a.m. – 8:45 a.m.	Summary of Day1 and Q & A
8:45 a.m. – 10:15 a.m.	Summarizing NERPM-AB Outputs
10:15 a.m. – 10:30 a.m.	Break for coffee/refreshments
10:30 a.m. – 11:15 a.m.	Creating New Scenarios
11:15 a.m. – 12:00 p.m.	Scenarios: Land Use Impacts
12:00 p.m. – 1:00 p.m.	Lunch
1:00 p.m. – 1:45 p.m.	Scenarios: Transit Systems Change
1:45 p.m. – 2:30 p.m.	Scenarios: Tolling and Managed Lanes
2:30 p.m. – 2:45 p.m.	Break for coffee/refreshments
2:45 p.m. – 4:00 p.m.	Wrap Up: Summary and Q & A

Model Capabilities

Comparing NERPM-AB with NERPM 4.2

- **Similarities:** Assignment & Interface
  - Cube framework, tools and user interface
  - Network methods and assumptions (assignment, skims)
  - Port Freight trips, External-to-External, local Trucks Trips

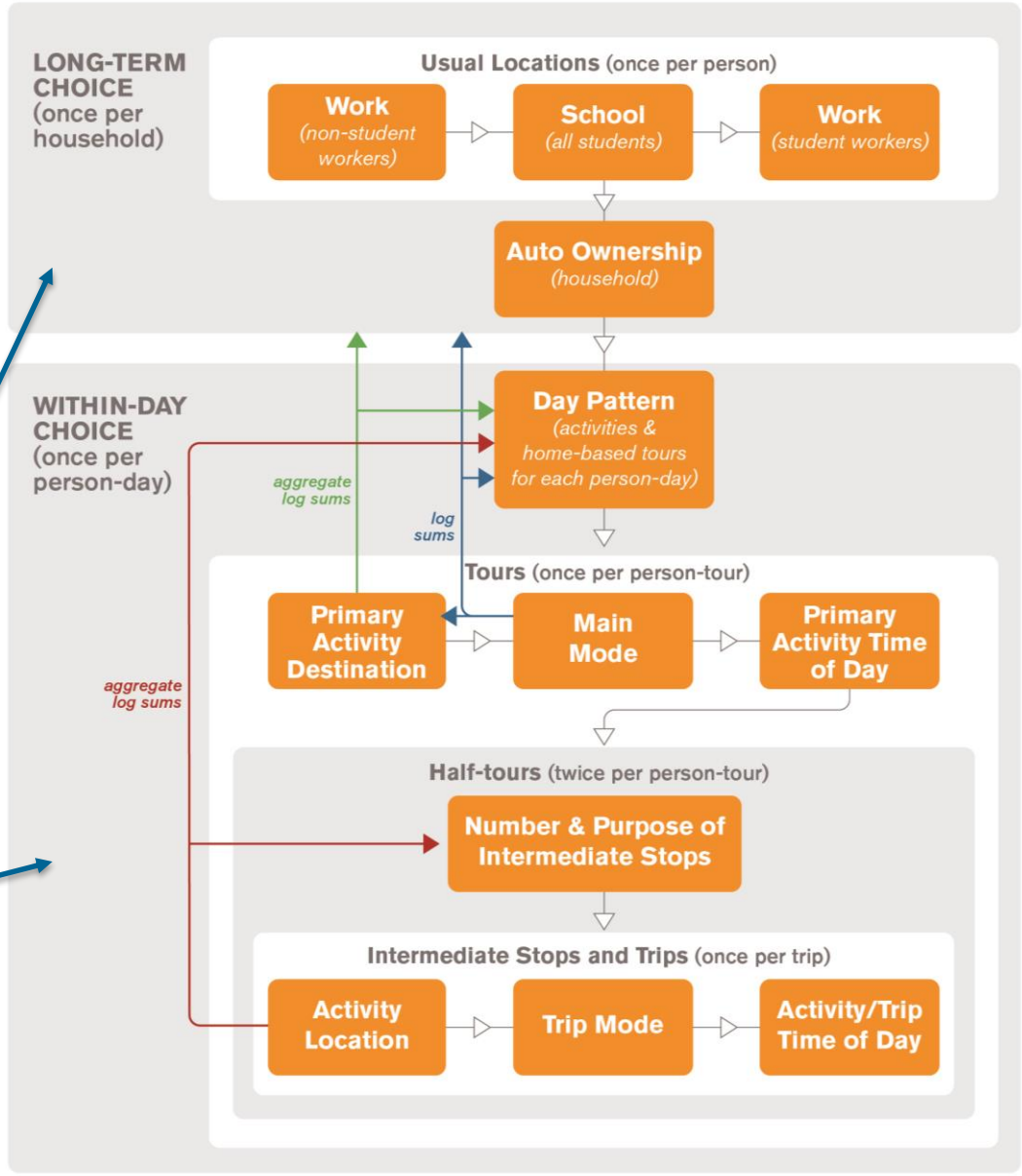
- **Differences:** DaySim replaces trip generation, distribution, mode choice, and time of day models
  - Behavioral differences
  - Spatial differences
  - Temporal differences

Behavioral Sensitivity

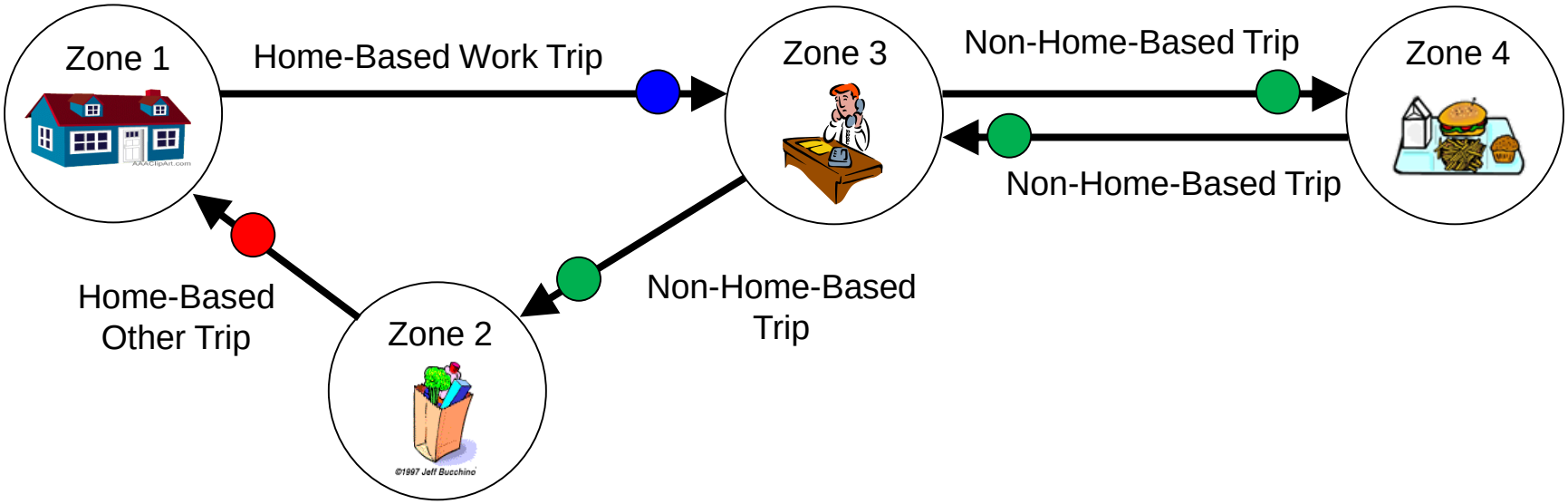
Travel choices are explicitly modeled

We start with long-term choices

Then model short-term choices

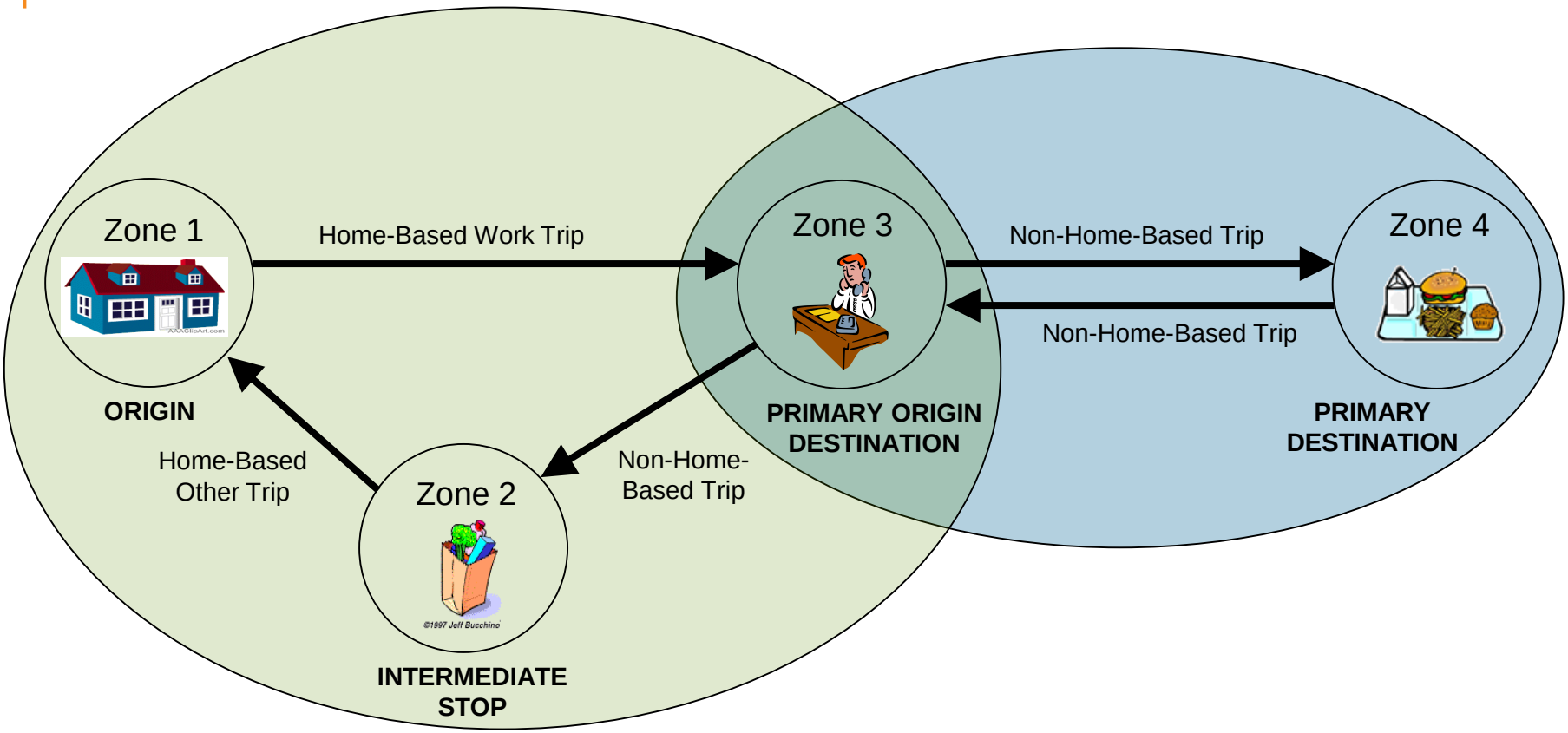


NERPM 4.2 Approach



	Home-Based Work (HBW)		Home-Based Other (HBO)		Non-Home-Based (NHB)	
Zone	Prod.	Attract.	Prod.	Attract.	Prod.	Attract.
1	1		1			
2				1		1
3		1			2	1
4					1	1
Total	1	1	1	1	3	3

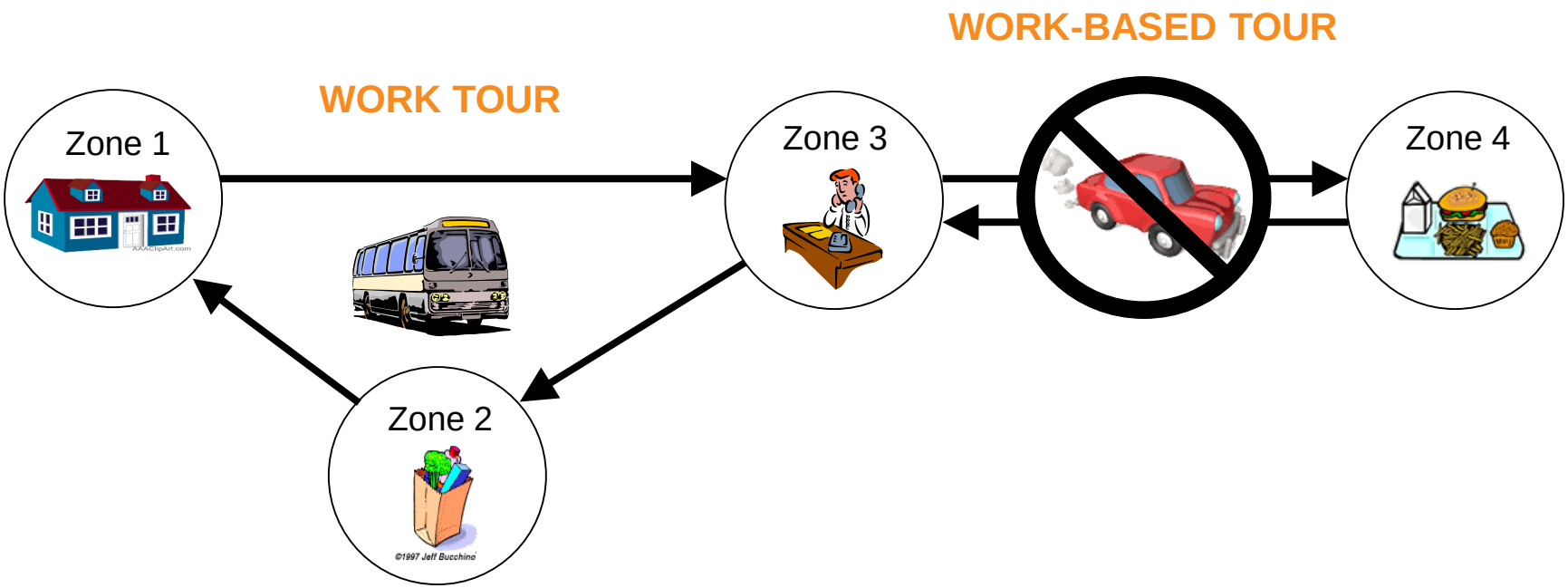
NERPM-AB Approach



Data View:

HH #	Per #	Tour #	Purp	Origin TAZ	Destin. TAZ	Outbound Stop1 TAZ	Return Stop1 TAZ	Mode	Sub-tour	Sub-Tour Destin.
1023	1	1	Work	1	3	0	2	Transit	Yes	4

Activity-Based Models: Mode Consistency



Bus to Work = Drive alone not available for lunch

Behavioral Sensitivity – Employment

DAYSIM SECTOR	2-DIGIT NAICS CODE
Industrial	22, 31-33, 42, 48-49
Retail Trade	44-45
Office	51-56
Educational Services	61
Health/Medical	62
Government	92
Food	72
Services	71, 81
Other	11, 21, 23

Behavioral Sensitivity – Households

DESCRIPTION
Household size
Vehicles available
Household workers
HH full time workers (type 1)
HH part time workers (type 2)
HH retired adults (type 3)
HH other adults (type 4)
HH college students (type 5)
HH high school students (type 6)
HH kids age 5-15 (type 7)
HH kids age 0-4 (type 8)
Household income ($)
Household own or rent
Household residence type

Behavioral Sensitivity – Persons

DESCRIPTION
Age in years
Gender
Worker type
Usual work parcel ID
Student type
Usual school parcel ID

Behavioral Sensitivity – Conclusions

- No more non-home-based trips!!
- Individuals within each family are explicitly modeled
- All important socio-economic characteristics are tracked throughout the day
- Consistent daily activity patterns that replicate survey data
- All trips are internally consistent throughout the day

Break

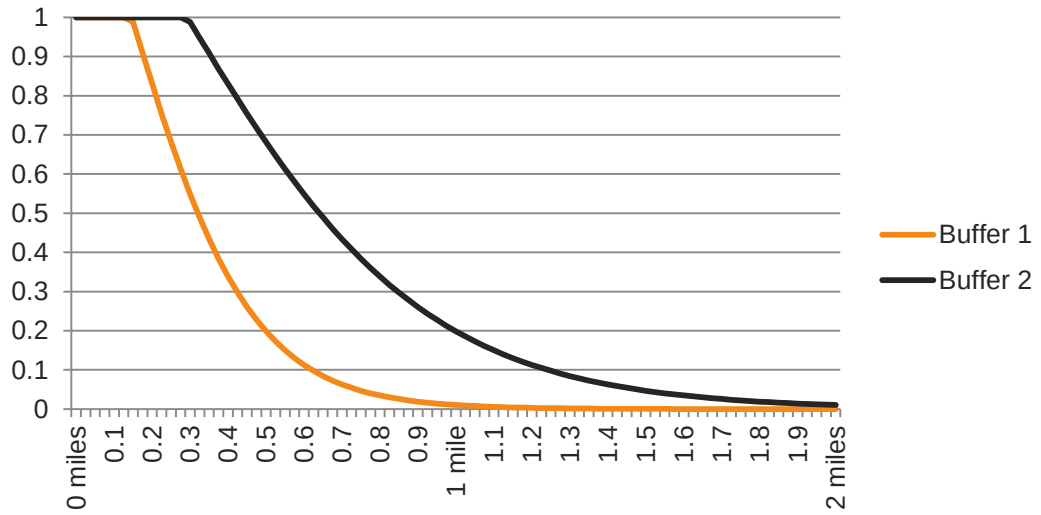
Spatial Sensitivity: Why the Activity Based Model Uses Parcels for Demand Estimation?

- Better representation of walk and bike modes
- Better representation of walk-to-transit distances
- Better representation of mixed use developments
- Easier to place DRI land uses accurately

Buffer Variables

- Land use surrounding a parcel matters in addition to that within the parcel
- Buffer variables created to support this concept
- Calculations performed for two “buffer zones” using distance decay weights

HMMMM



Spatial Sensitivity: Networks

- An “All Streets” network is used by DaySim to determine proximity to:
  - Transit stops
  - Parks & open space
  - The “walkability” of the area (road connectivity, etc.)
- Assignment continues to use a network similar to NERPM 4.2 and assigns trips at the TAZ level

Temporal Sensitivity

Demand

- Generates a list of trips (not a matrix)
- Simulates 24-hours of travel
- Trip start time estimated to 30-minute temporal resolution then distributed to the minute

Supply

- 24-hour assignment = sum of 4 time period volumes
- Time periods
  - AM Peak (6:00AM – 8:59AM)
  - Midday Off Peak (9:00AM – 3:59PM)
  - PM Peak (3:30PM – 6:29PM)
  - Evening Off Peak (6:30PM – 5:59AM)

Transit Assignment

- Same as NERPM 4.2
- Time Periods
  - Peak: based on AM Peak LOS
  - Off-Peak: based on Midday Off-peak LOS

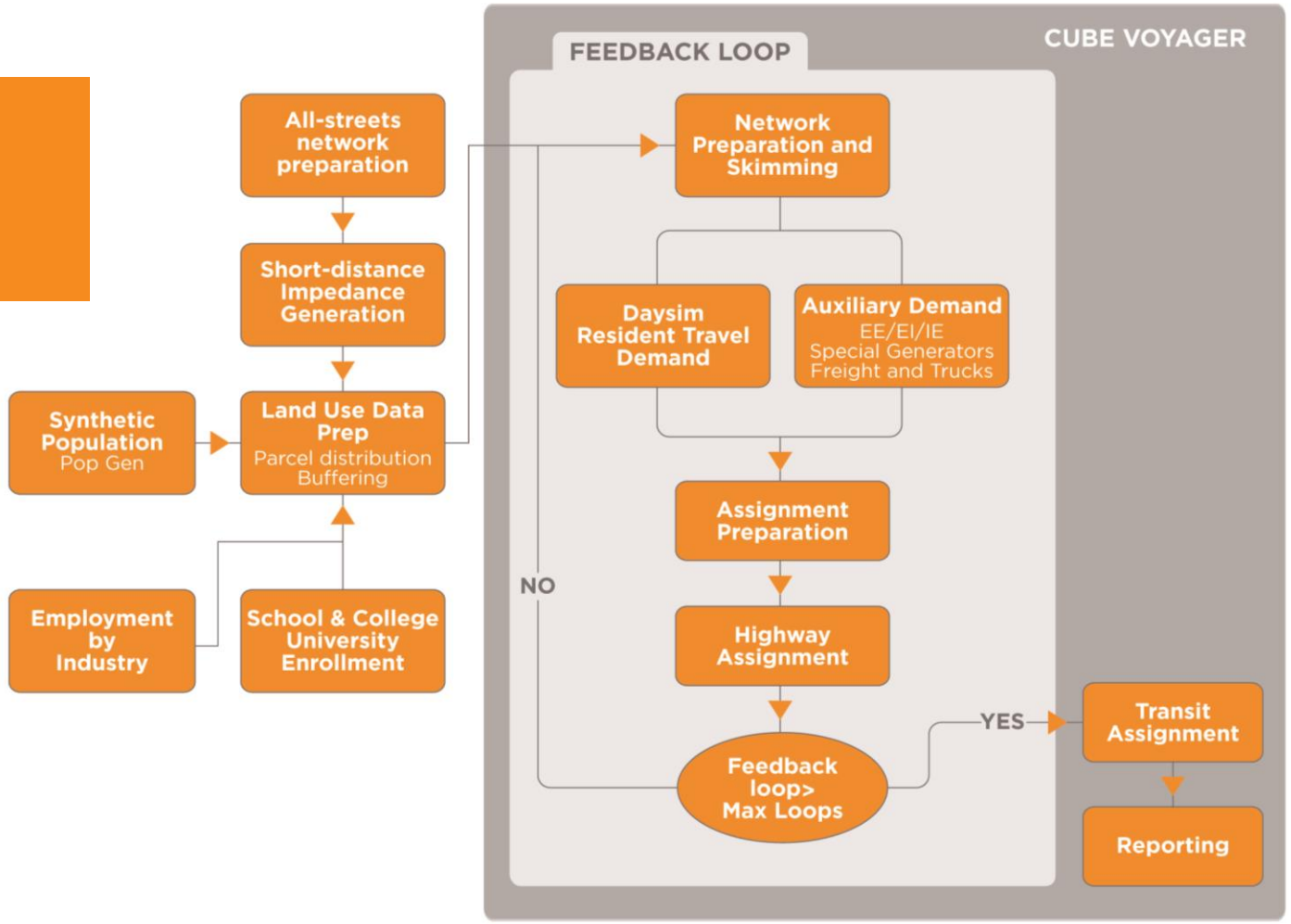
HMMMM

Spatial and Temporal Sensitivity – Conclusions

- Mixed use and walkable areas are better modeled providing policy options
- Peak shifting occurs within the model depending on congestion
- Time-of-day trip tables can be established for any desired period
- Output from demand easily used in microsimulation
- 4-period model better represents behavioral response to congestion than a daily model

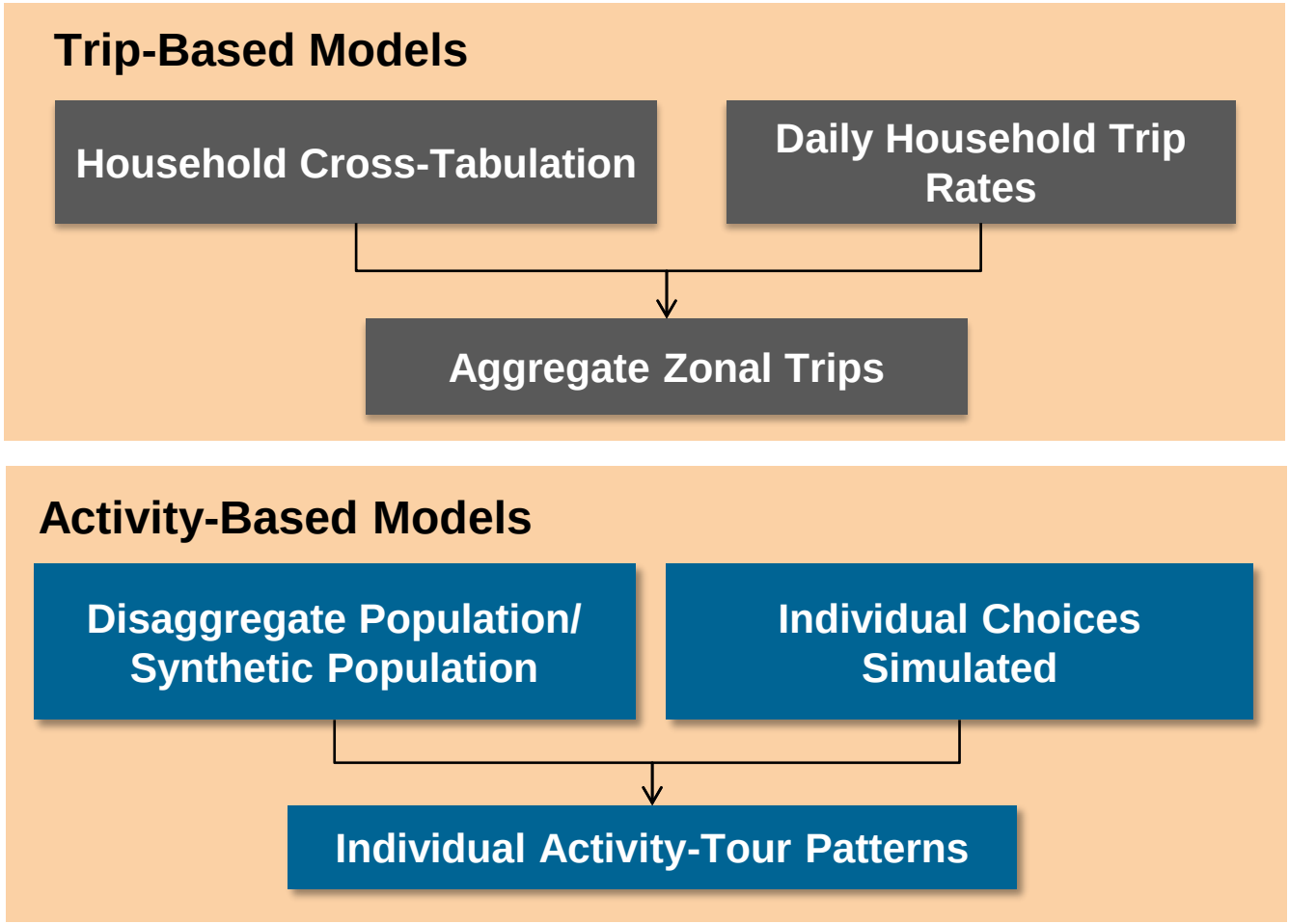
NERPM-AB System Functional Relationships

HMMMM



Disaggregate Modeling Using a Synthetic Population

Aggregate vs. Disaggregate Travel Representation



What Exactly is a Synthetic Population?

- It is simply a list of households and persons with corresponding attributes

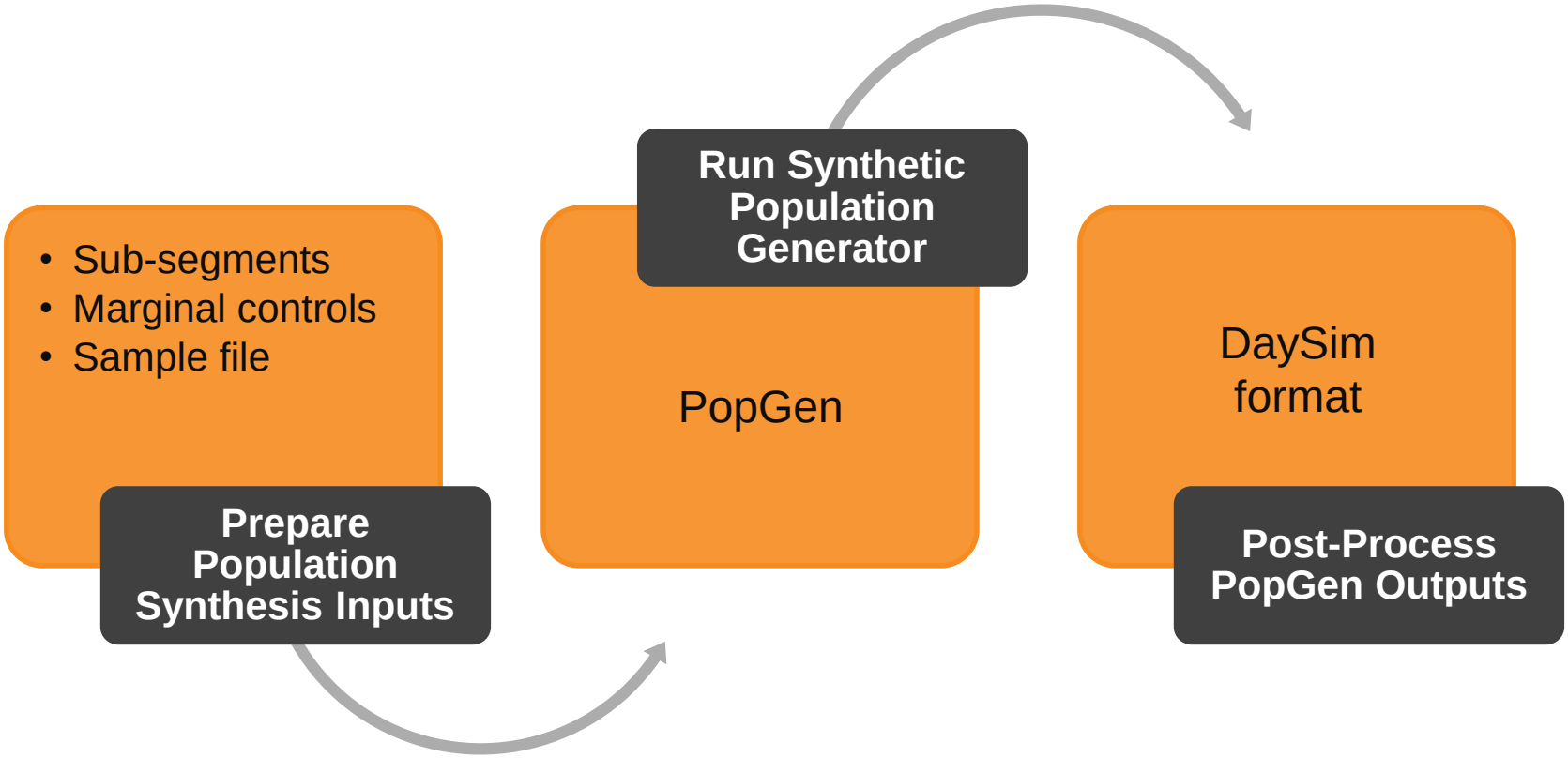
Household Records

TAZ	HHID	Age of Household Head	Number of Persons	Income Group	Presence of Children	Autos Owned	Number of Workers
1433	16670	1	2	1	1	0	1
1937	17392	1	2	2	1	0	1
77	232	1	3	3	1	2	2
18	5042	1	3	2	1	3	2

Person Records

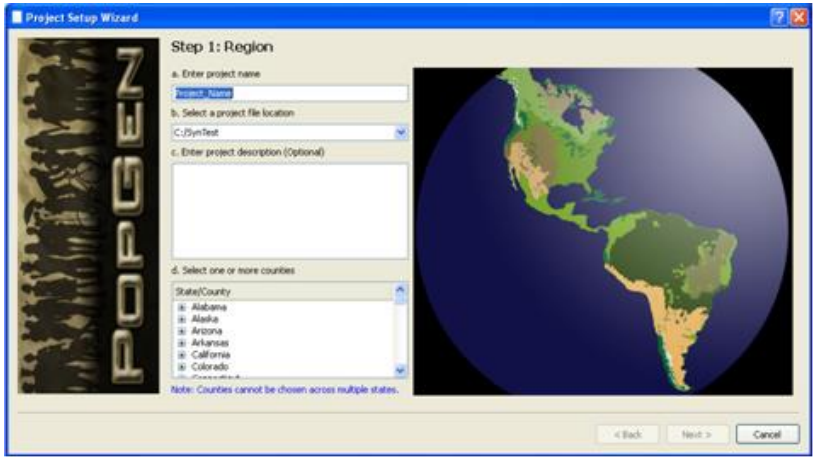
TAZ	Household ID	Person ID	Age	Works From Home	Employ-ment Status	Gender	Is Student	Hours Worked per Week
77	232	1	22	1	1	2	0	9
77	232	2	24	1	1	1	0	45
77	232	3	1	0	0	2	0	0

Steps in Creating a Synthetic Population



Synthetic Population Generator: PopGen

- Open source
- Supports use of person-level and HH-level controls
- Easy-to-use
  - Flexible
  - GUI
  - Output visualization
- Steps
  - Prepare Zonal (TAZ) control data
  - Prepare sample data from PUMS or Household Survey
  - Run PopGen to generate Synthetic population
  - Assign households to parcels



Population Sub-segments

Created to reflect differences in travel patterns

- Permanent
- Seasonal
  - Provides the ability to support seasonal analyses
  - Generally older and have lower workforce participation
- Non-institutional group quarters
  - College/university housing
  - Residential treatment facilities for adults
  - Religious group quarters

Marginal Control Data

- These are socio-demographic attribute totals that the synthetic population needs to match
- What are important HH and person characteristics for the model?

Household Marginals/Controls

TAZ	HHSize1	HHSize2	HHSize3+	Children Present	No Children
77	100	400	200	500	200

Person Marginals/Controls

TAZ	Age 0-17	Age 18-64	Age 65+	Male	Female
77	500	900	200	800	800

Sample Data

- This looks similar to synthetic population
- A synthetic population generator draws from this to match marginal control totals
- Data Sources
  - Permanent: 5-year ACS PUMS 2006-10 for FL
  - Seasonal: NHTS 2009 FL add-on sample
  - Group quarters: 5-year ACS PUMS 2006-10 for FL

Permanent Residents Control Attributes

- Household and person totals controlled by TAZ
  - Household Attribute Source: Census 2010 SF1 and ACS 2006-2010 5-year for income and number of workers

HH unit type (2)
- Single Family
- Multi-Family

Presence of children (2)
- Yes
- No

Householder age (5)
- 15-24 years
- 25-54 years
- 55-64 years
- 65-74 years
- 75+ years

HH income (5)
- Less than 20k
- [20k, 40k)
- [40k, 60k)
- [60k, 100k)
- 100k or more

Permanent Residents Control Attributes

- Household attributes (*continued*)

HH Size (7)

- 1 person
- 2 persons
- 3 persons
- 4 persons
- 5 persons
- 6 persons
- 7+ persons

Household Size and Number of Workers Joint Variable (13)

- 1 person, no worker
- 1 person, 1 worker
- 2 persons, no worker
- 2 persons, 1 worker
- 2 persons, 2 workers
- 3 persons, no worker
- 3 persons, 1 worker
- 3 persons, 2 workers
- 3 persons, 3 workers
- 4+ persons, no worker
- 4+ persons, 1 worker
- 4+ persons, 2 workers
- 4+ persons, 3+ workers

Permanent Residents Control Attributes

- Person attributes

Gender (2)

- Male
- Female

Age (9)

- Under 5 years
- 5-14 years
- 15-17 years
- 18-24 years
- 25-39 years
- 40-54 years
- 55-64 years
- 65-74 years
- 75 years and over

Seasonal Residents Control Attributes

- Household and person totals controlled by TAZ
  - Source: Identified part-year residents in the NHTS 2009 Florida add-on
  - Weighted to obtain percent distribution by household and person attributes
  - Applied to number of non-vacant seasonal housing units in each TAZ, as found in ZDATA
- All household attributes same as those in permanent population, except
  - Household Size (4 categories)
    - 1) One Person; 2) Two Persons; 3) Three Persons; 4) Four or more Persons

Seasonal Residents Control Attributes

Person Age (7)

- 0-17 years
- 18-24 years
- 25-39 years
- 40-54 years
- 55-64 years
- 65-74 years
- 75 years and over

Household Size and Number of Workers Joint Variable (12)

- 1 person, no worker
- 1 person, 1 worker
- 2 persons, no worker
- 2 persons, 1 worker
- 2 persons, 2 workers
- 3 persons, no worker
- 3 persons, 1 worker
- 3 persons, 2 workers
- 4+ persons, no worker
- 4+ persons, 1 worker
- 4+ persons, 2 workers
- 4+ persons, 3+ workers

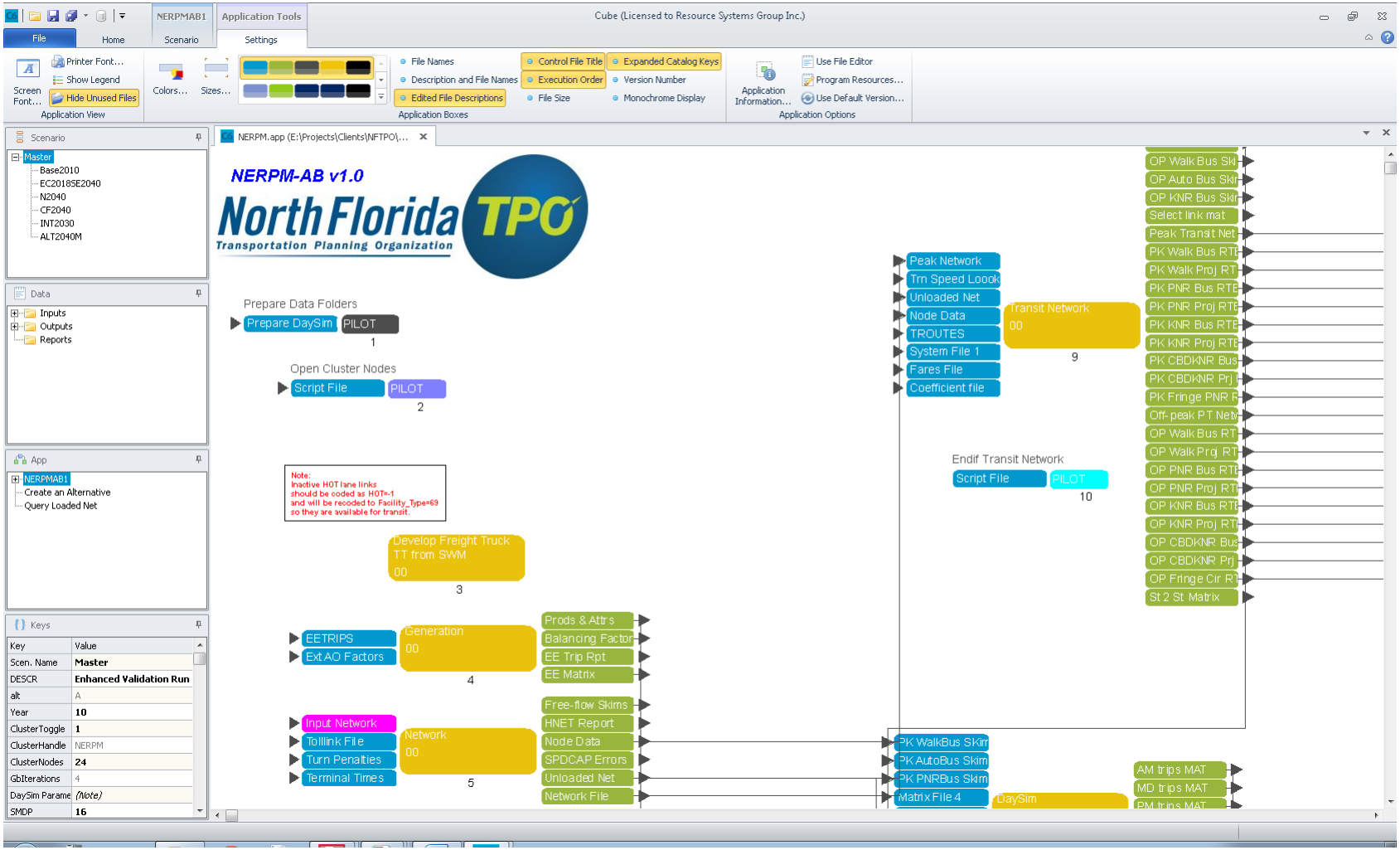
Group Quarters Control Attributes

- Each person is considered as one household
- Person totals controlled by TAZ
- Control Attributes (Source: Census 2010 SF1)
  - Gender (2 categories)
    1. Male
    2. Female
  - Age (3 categories)
    1. Under 18 years
    2. 18 to 64 years
    3. 65 years and over

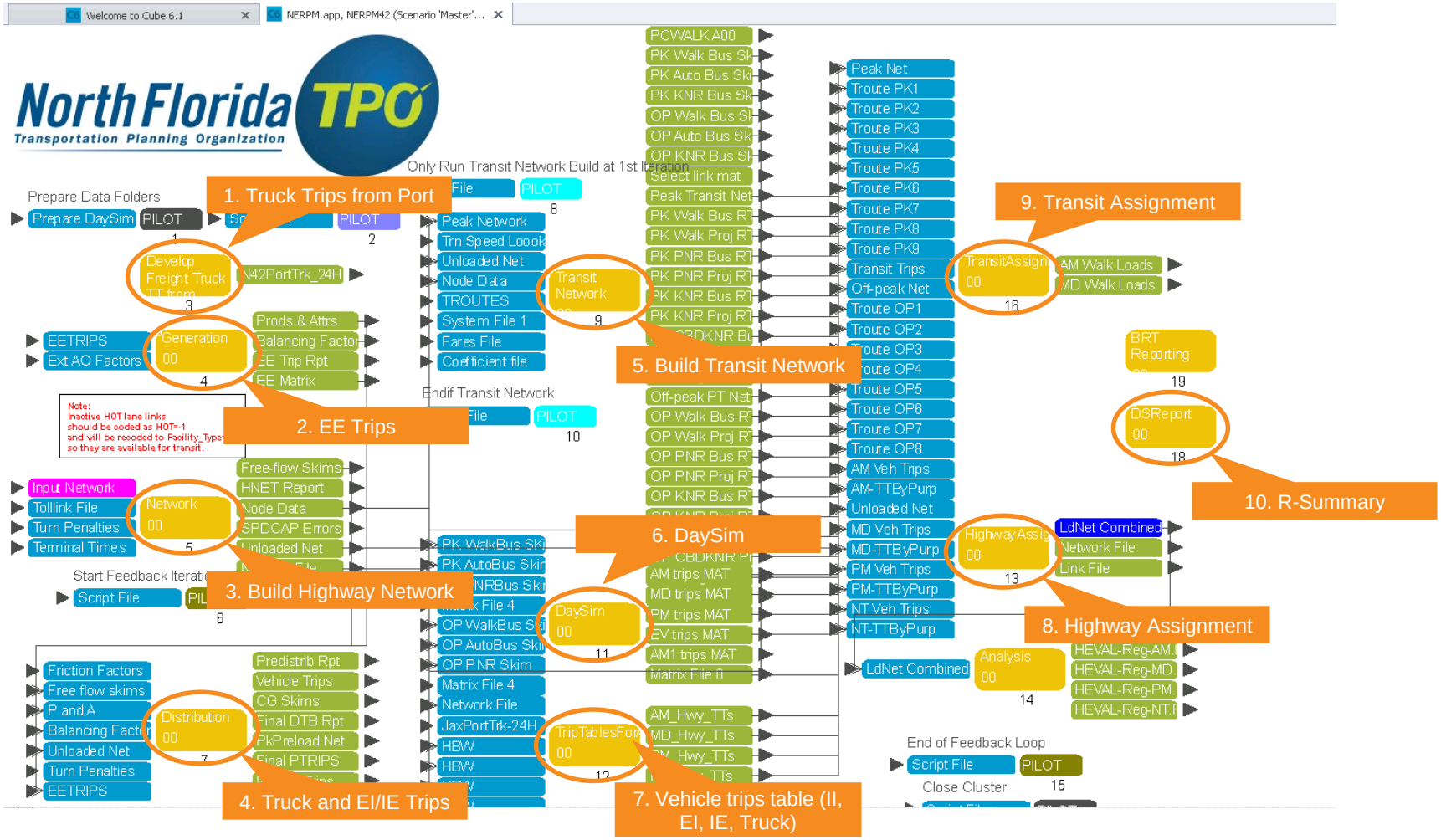
Lunch

NERPM-AB Setup in Cube

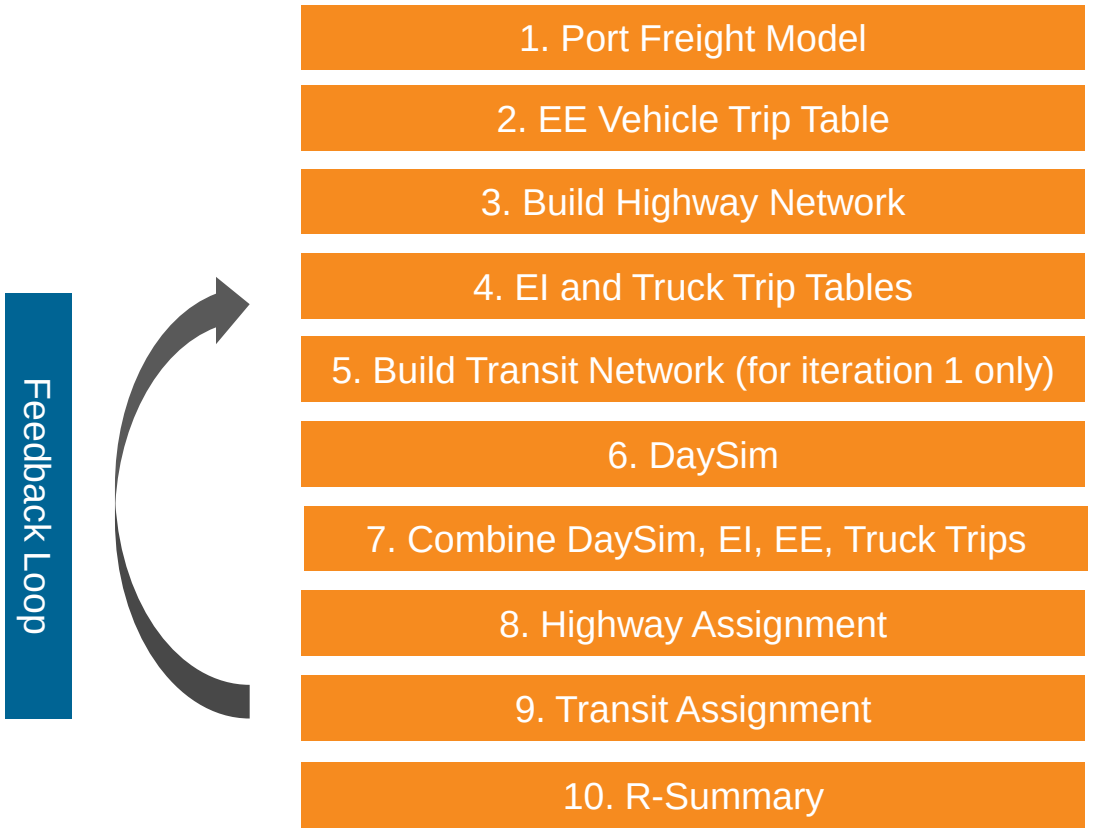
Cube Interface



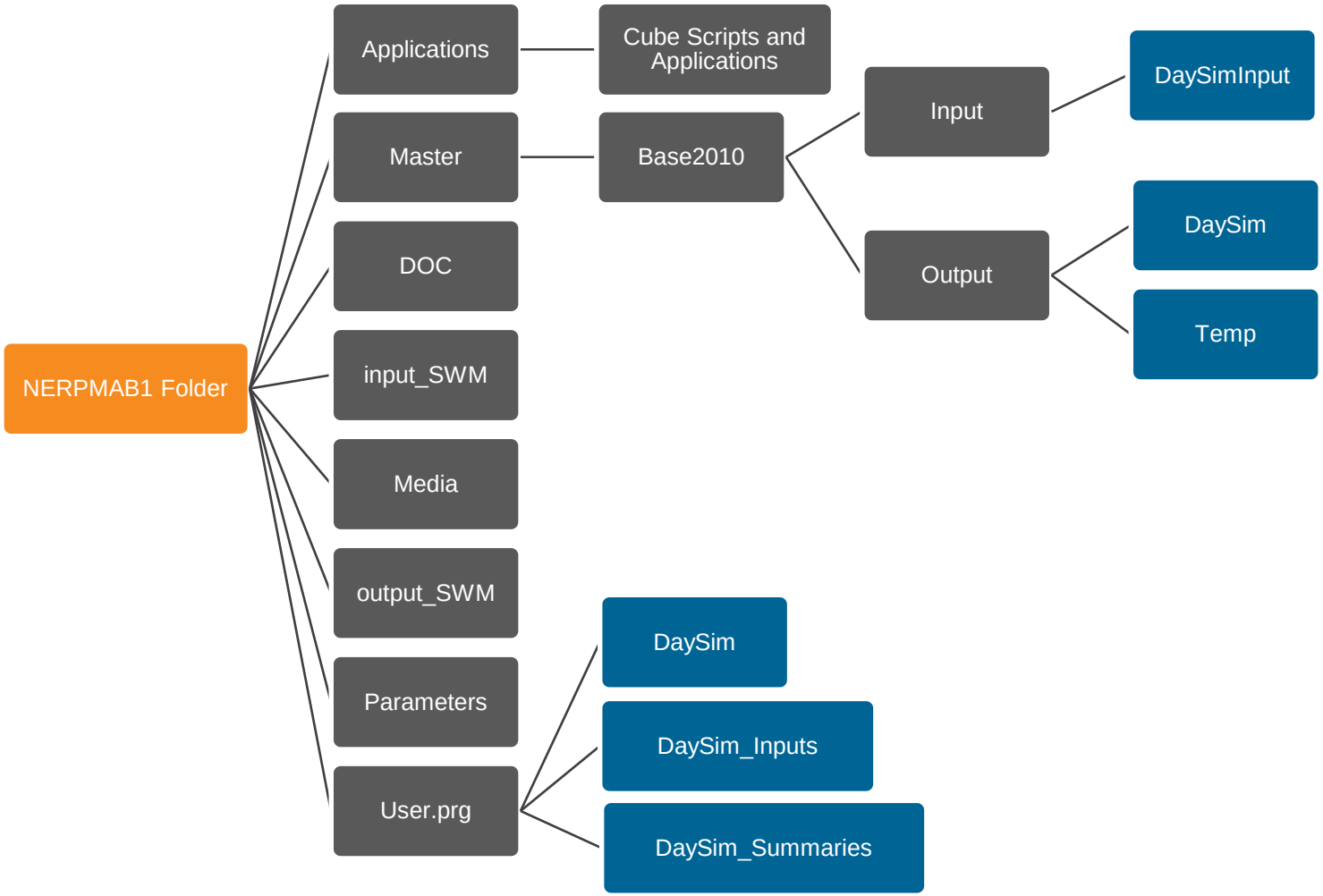
Cube Interface Main Sections



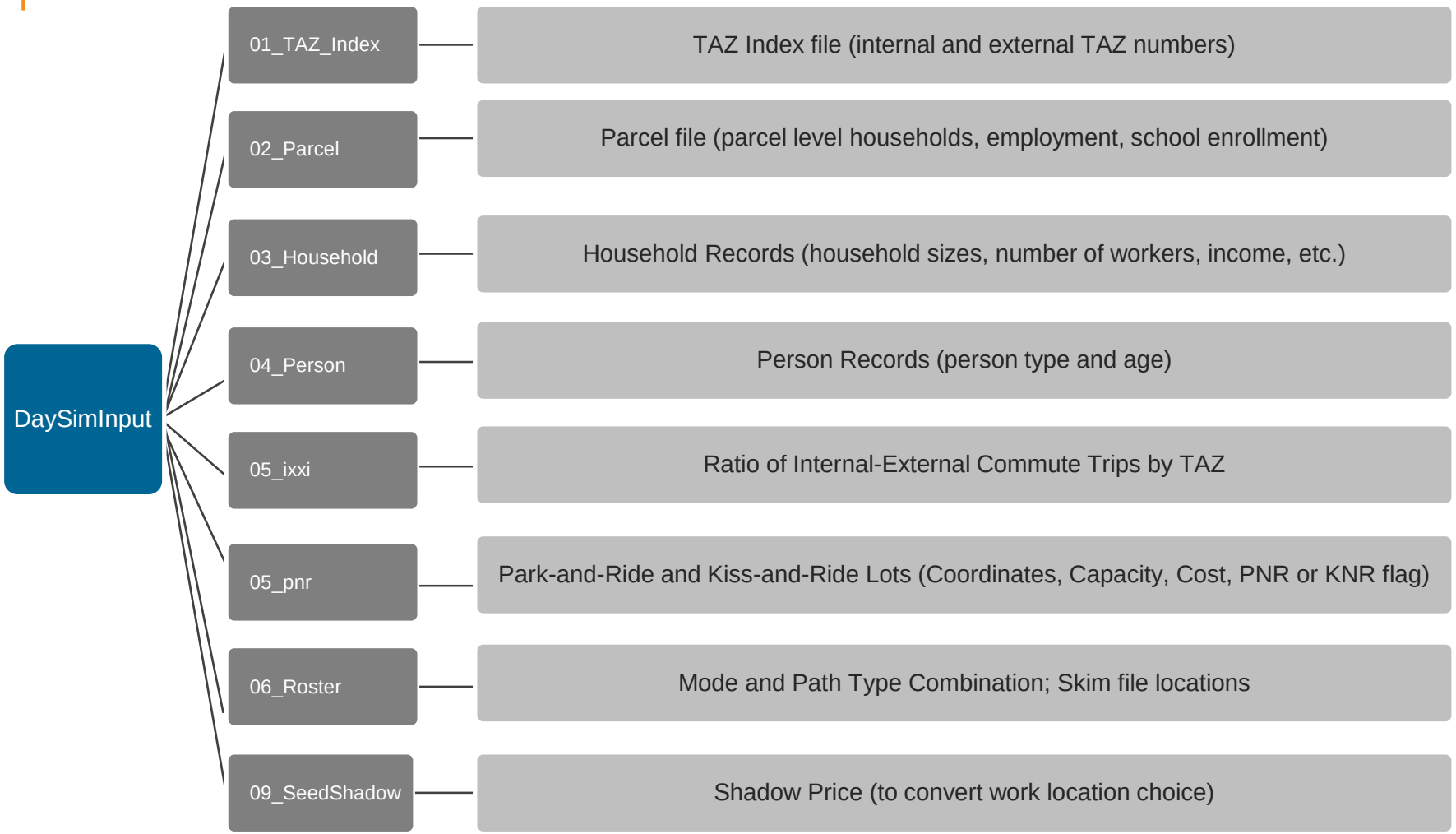
Cube Flow Chart and Feedback Loop



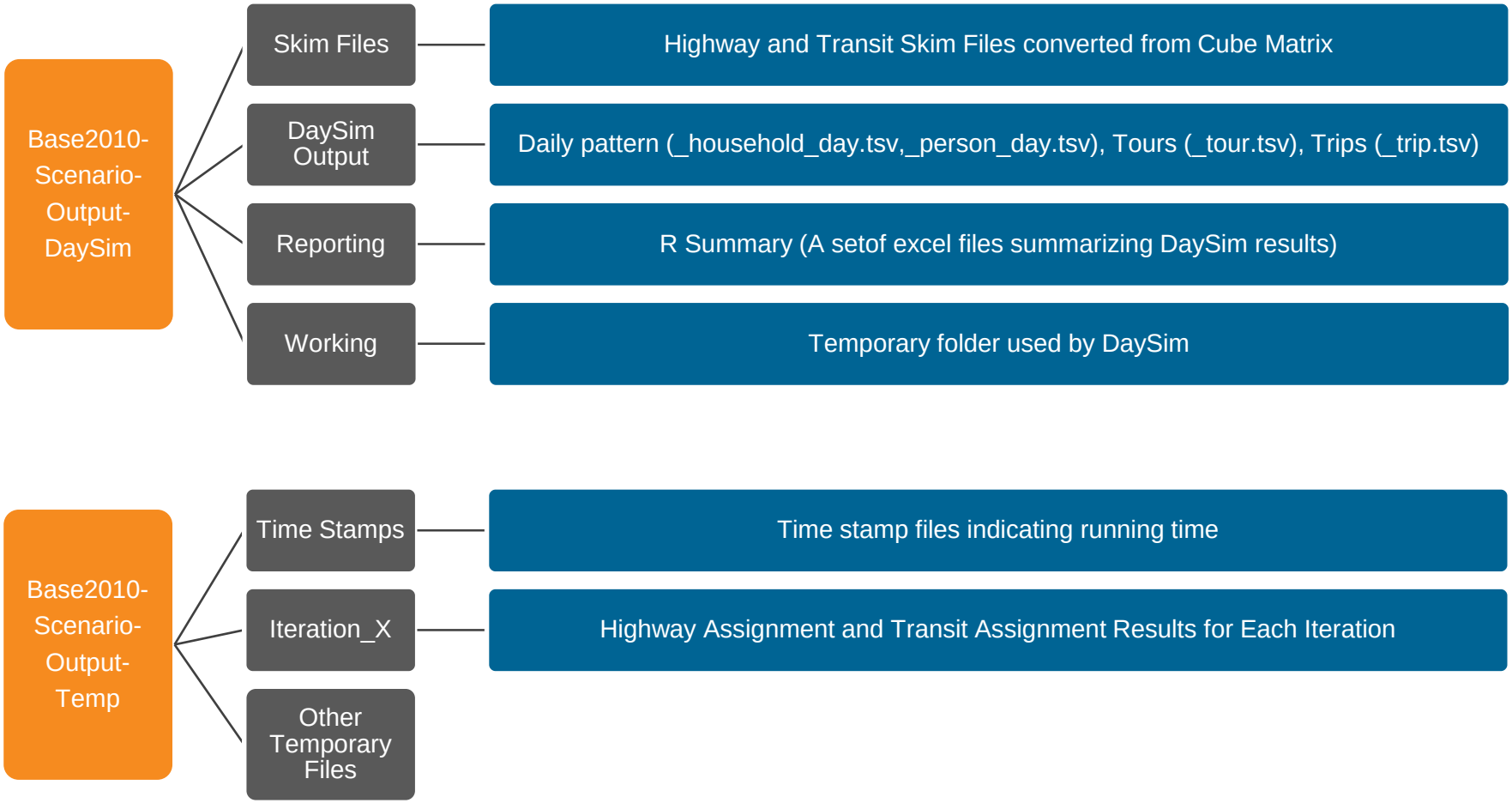
Folder Organization



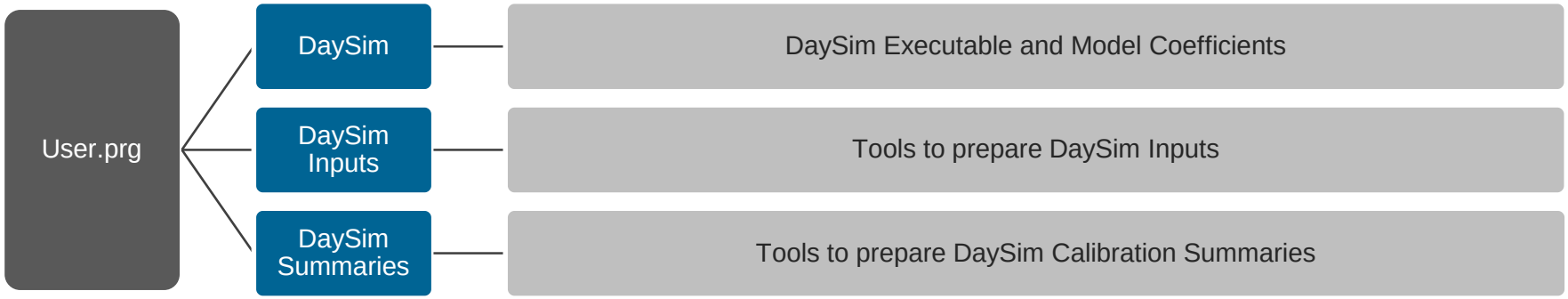
Folder Organization



Folder Organization



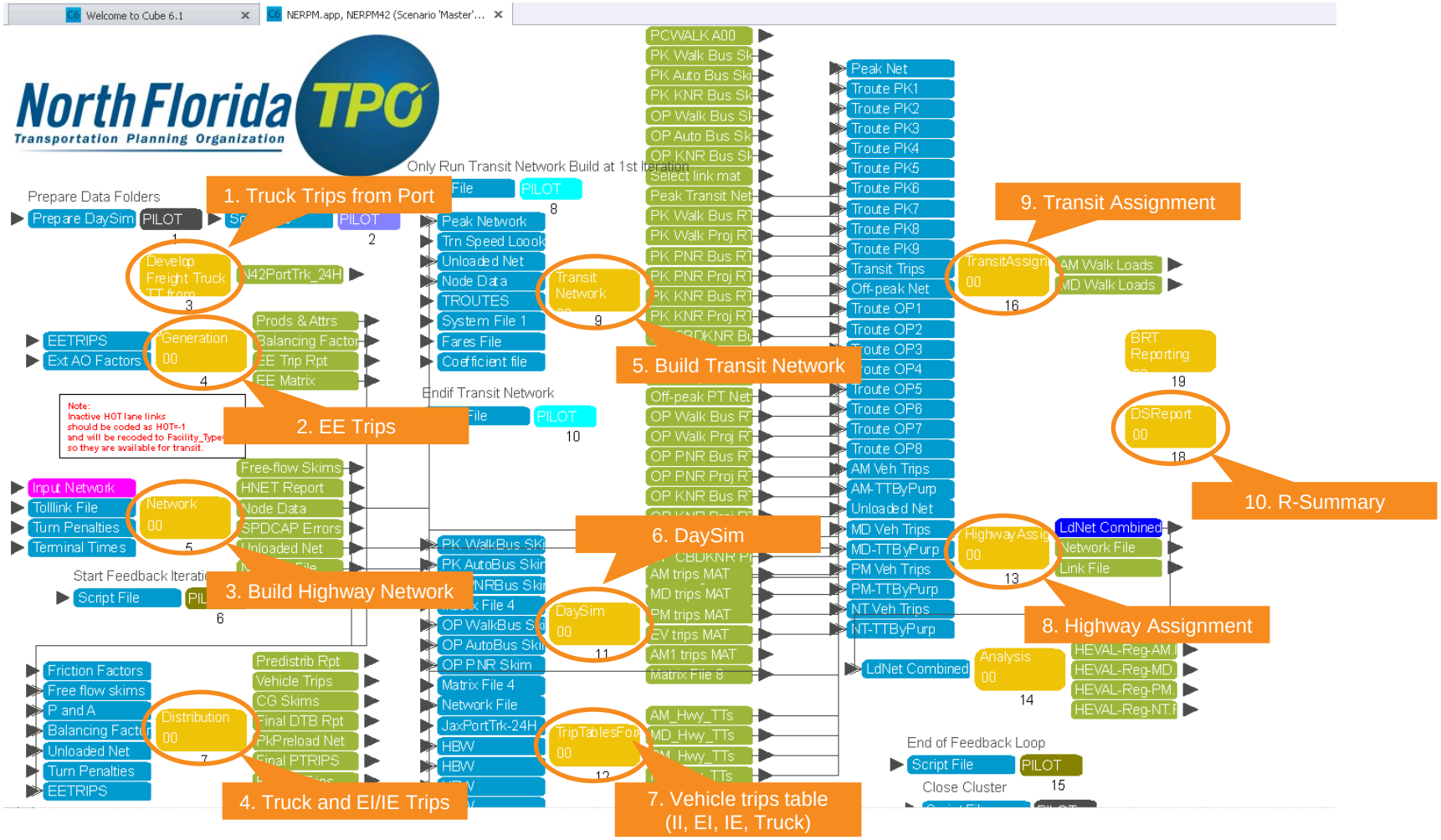
Folder Organization



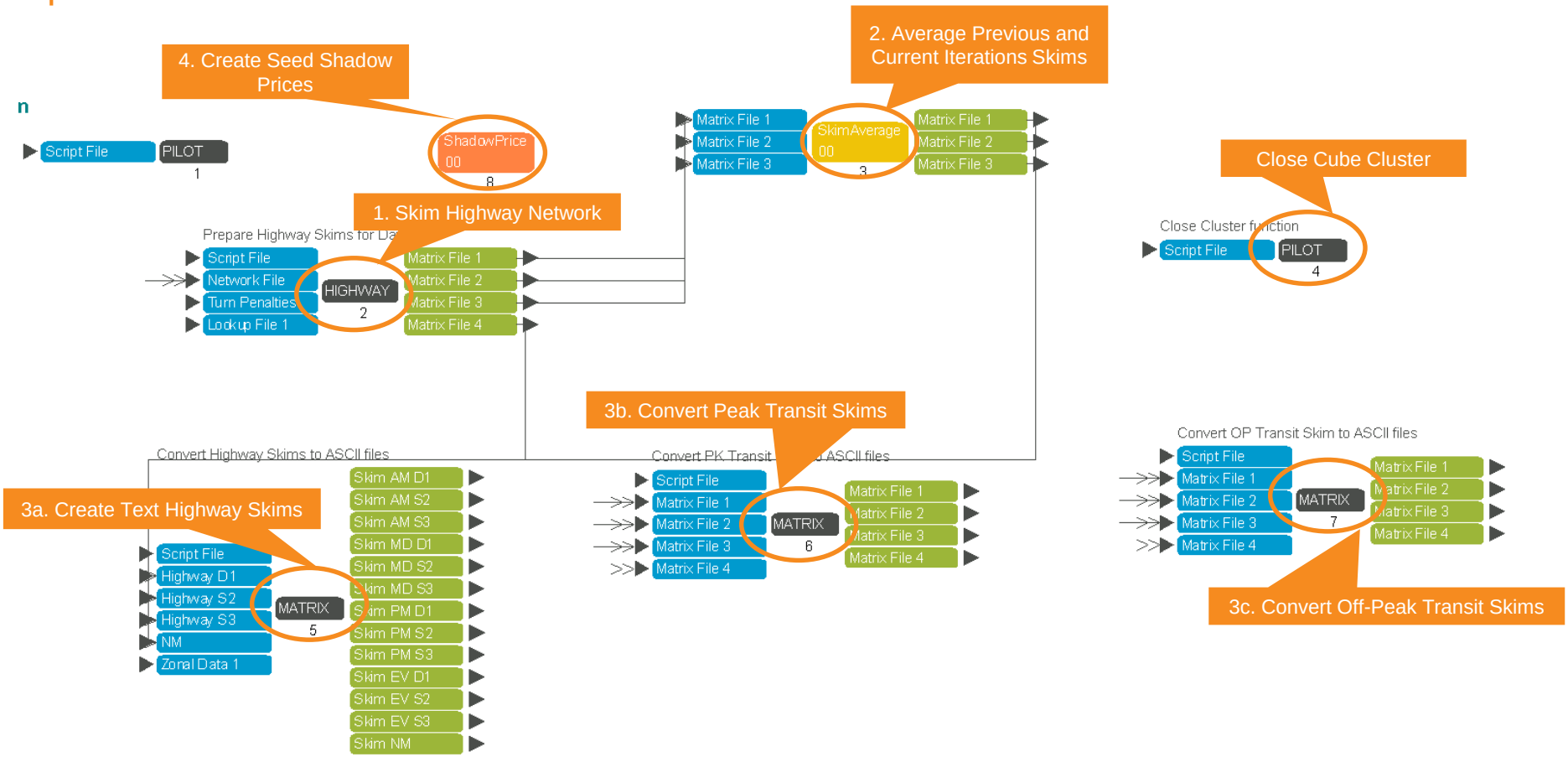
DaySim Executables Folder

COPYING	1/2/2013 3:31 PM
Daysim	3/13/2013 5:02 PM
Daysim.exe	1/2/2013 3:31 PM
Daysim.Framework.dll	3/13/2013 3:32 PM
Daysim.Framework.pdb	3/13/2013 3:32 PM
Daysim.pdb	3/13/2013 5:02 PM
Daysim.vshost	3/13/2013 4:11 PM
last-run	3/27/2013 2:26 AM
NDesk.Options.dll	1/2/2013 3:32 PM
Ninject.dll	1/2/2013 3:32 PM
Ninject.pdb	1/2/2013 3:32 PM
Ninject	1/2/2013 3:32 PM

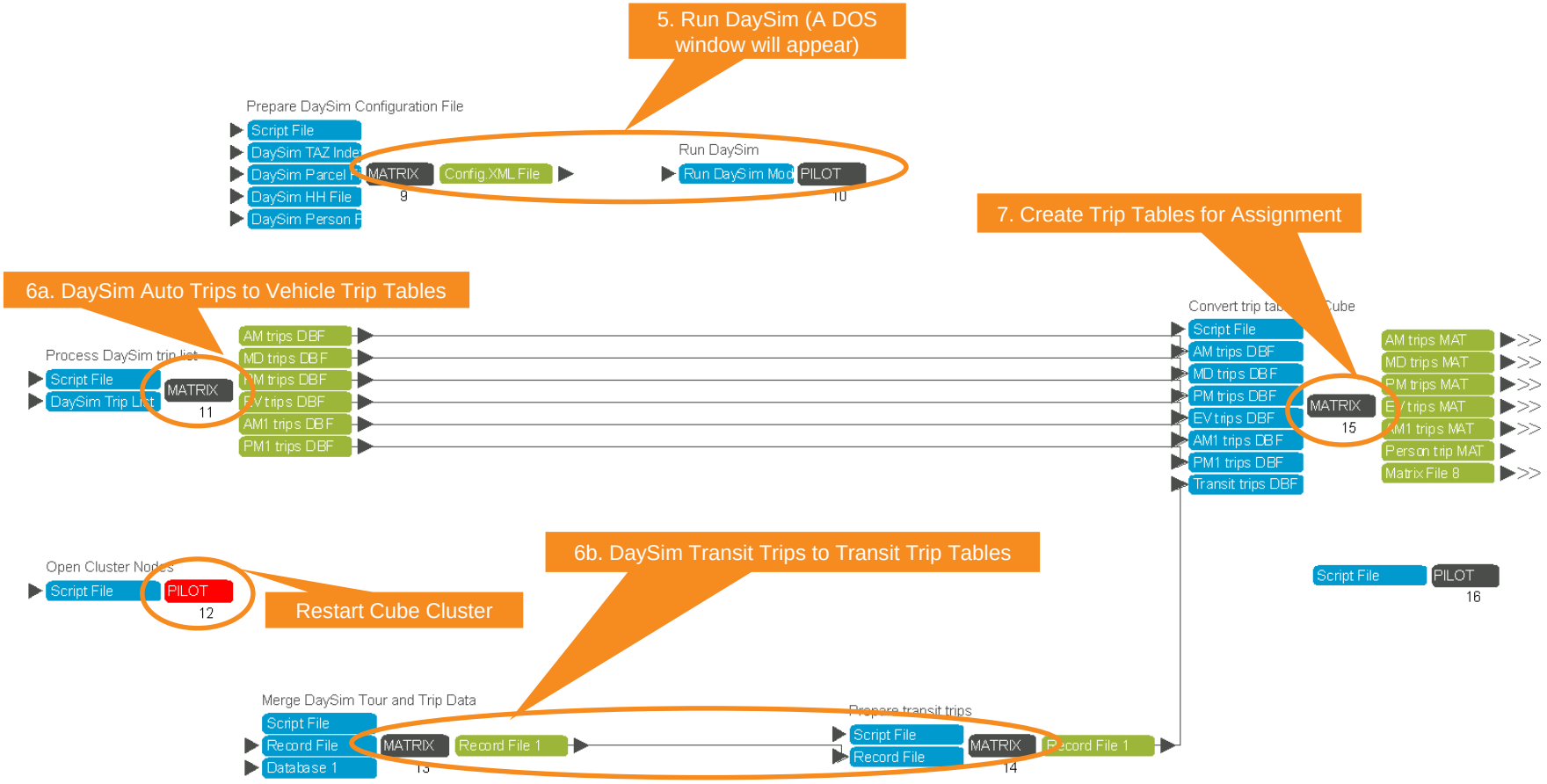
Cube Interface Main Sections



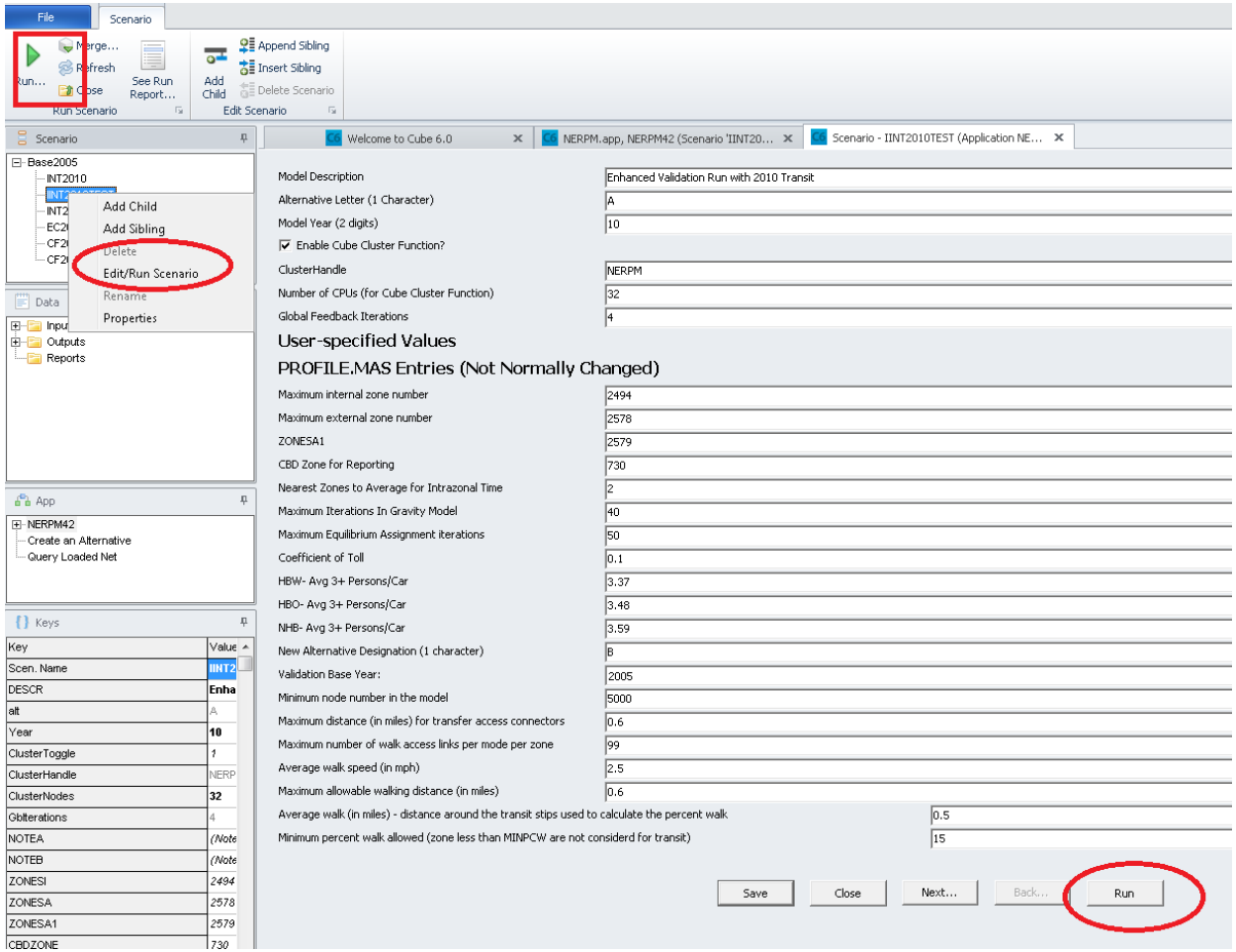
DaySim Application



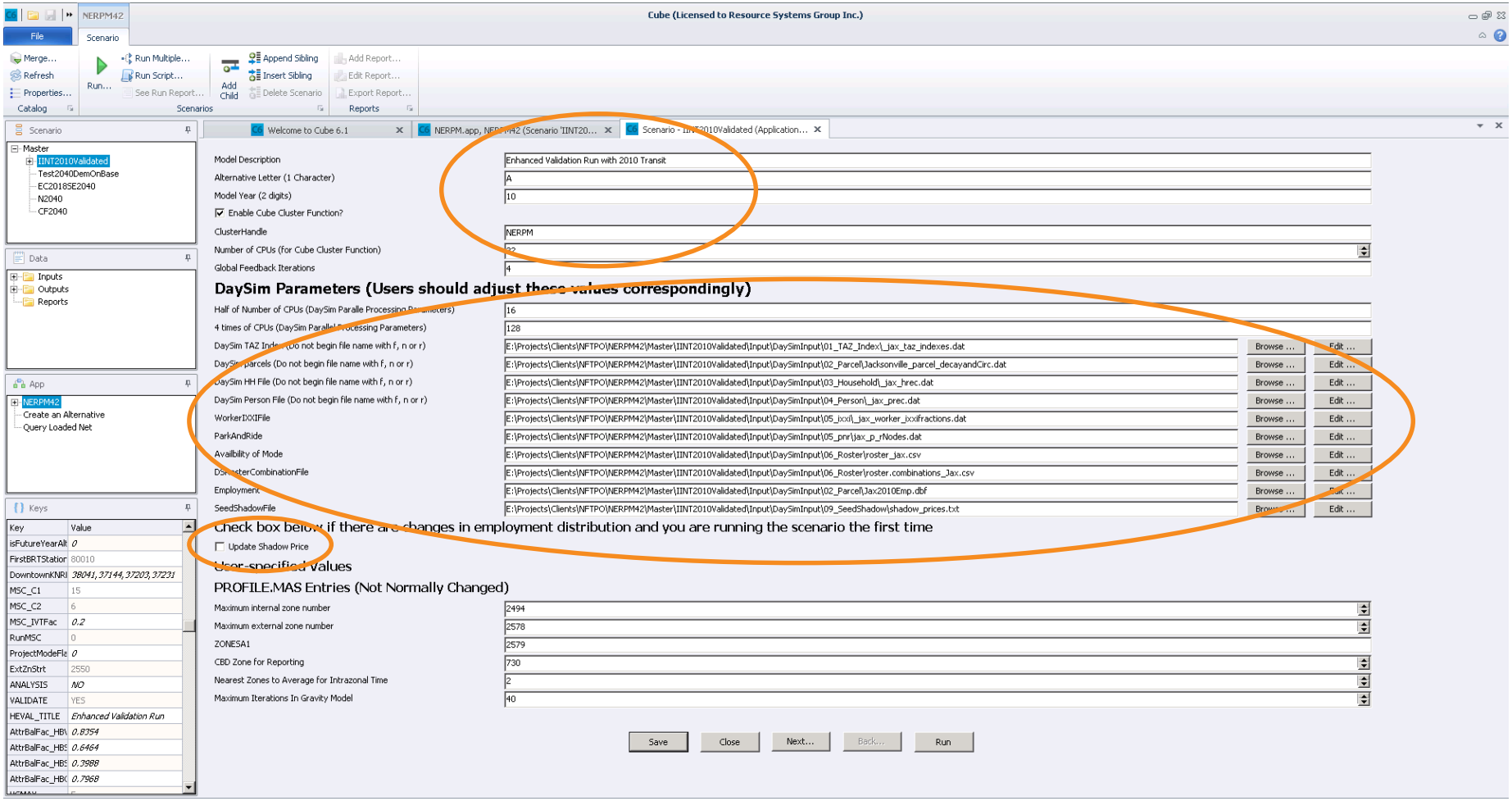
DaySim Application



Run Cube-DaySim Application for One Scenario



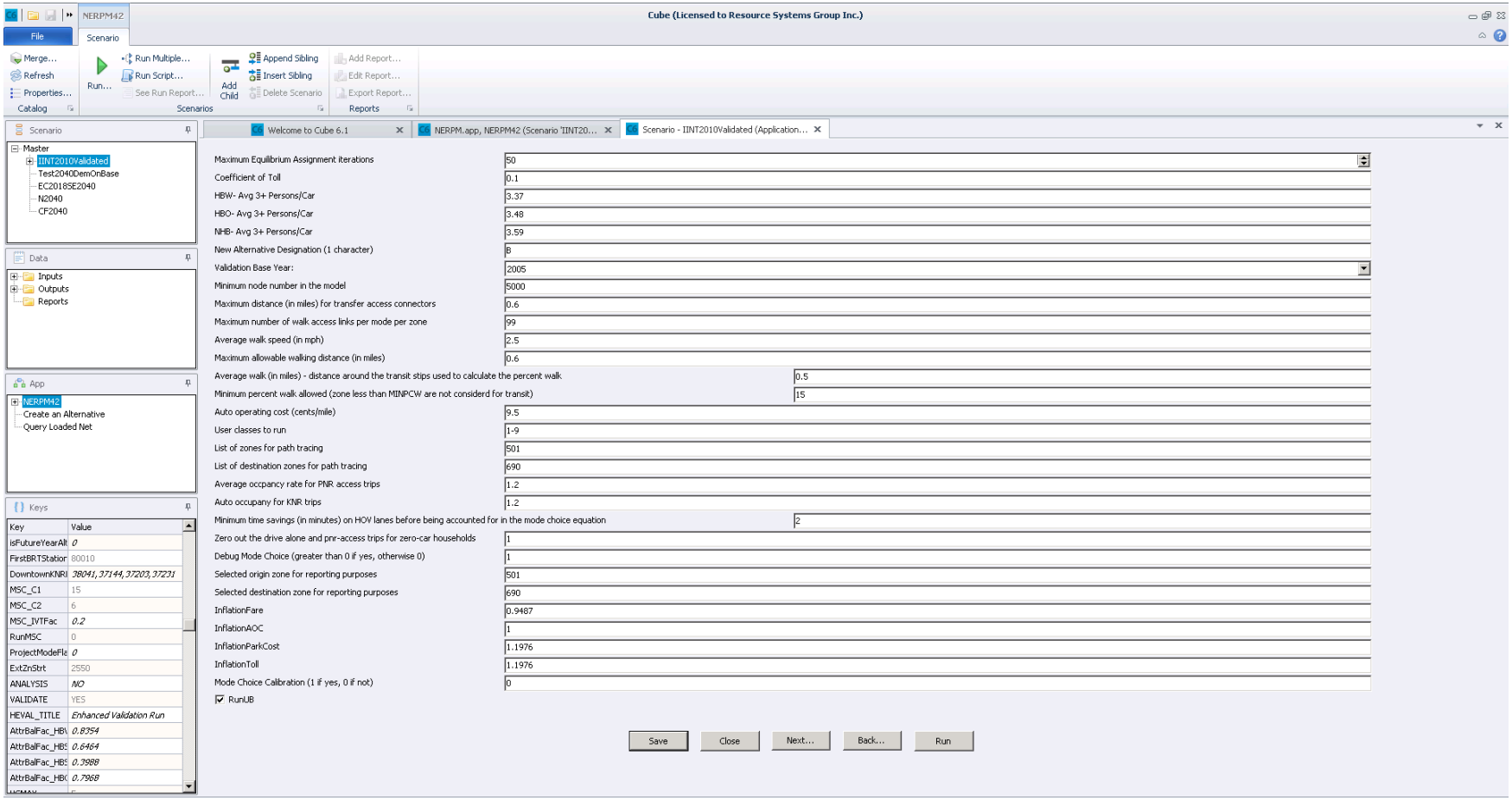
Scenario Editor #1:
Keys to Change for Each Scenario



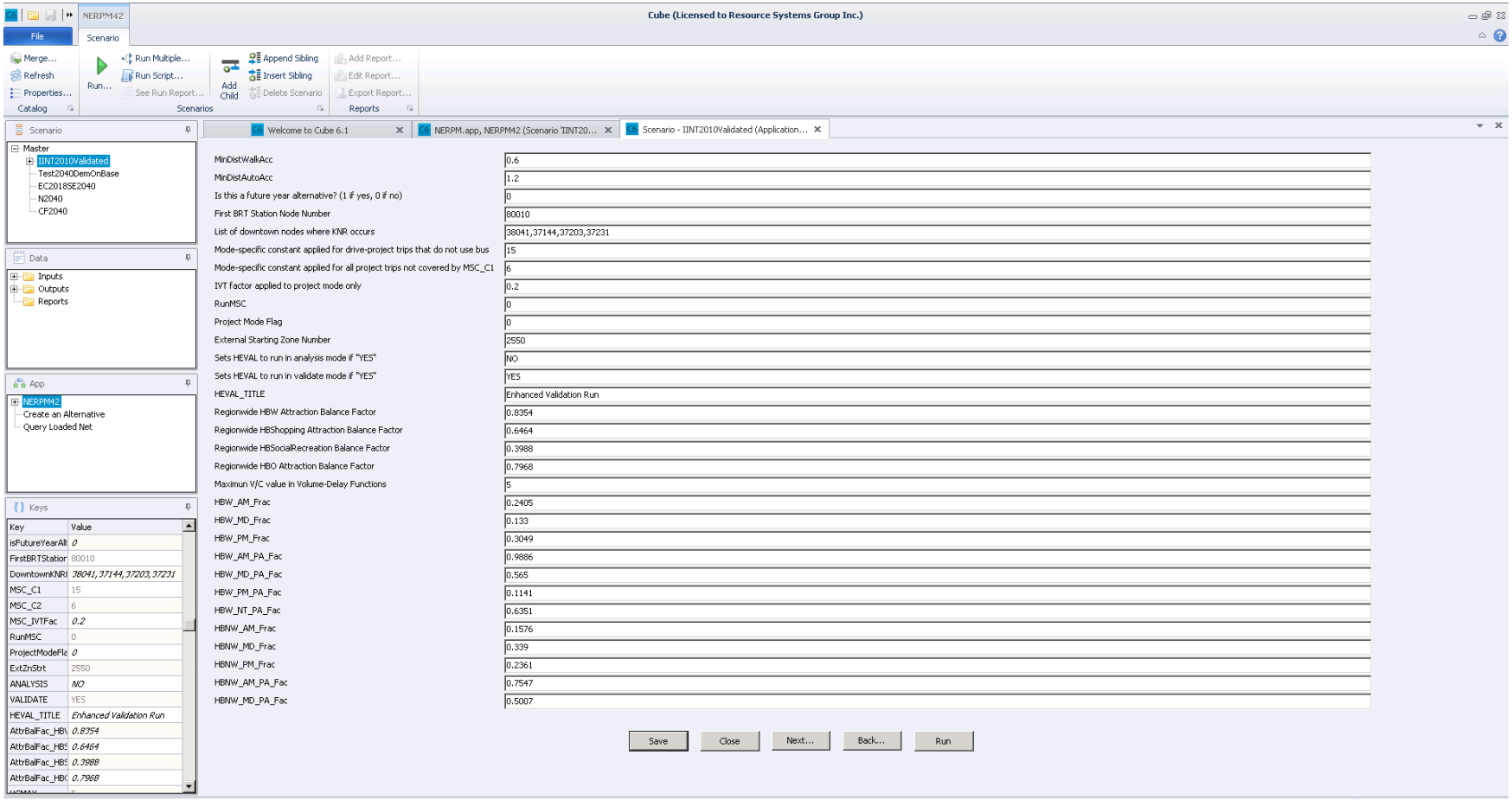
Scenario Editor Keys Likely to Need Updating

- Cube
  - Alternative letter
  - Model year
  - Number of CPUs to be used by Cube cluster (suggest use maximum)
  - Global feedback iterations (set as 4 by default)
- DaySim
  - DaySim parallel processing
    - “Half of CPUs” and “4 times of CPUs”
  - Beginning time of each period (24 hours format, BegPrd_AM, etc.)
  - DaySim Input files (if any changes)
    - TAZ Index
    - Parcel File
    - Household Records
    - Person Records
    - IXXI
    - PNR and KNR lots
    - Roster
    - Seed Shadow Price

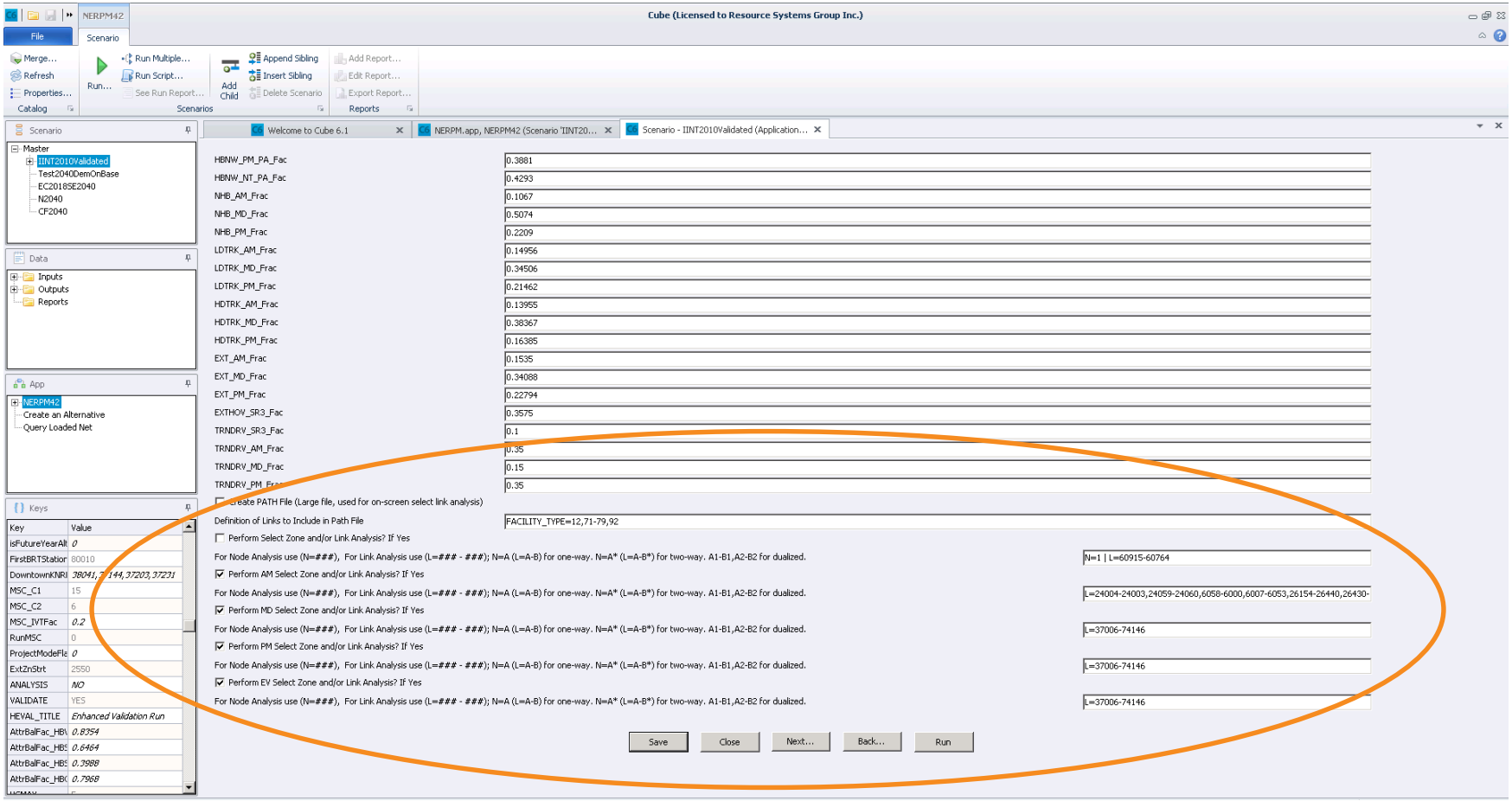
Scenario Editor #2:
No Changes in Most Cases



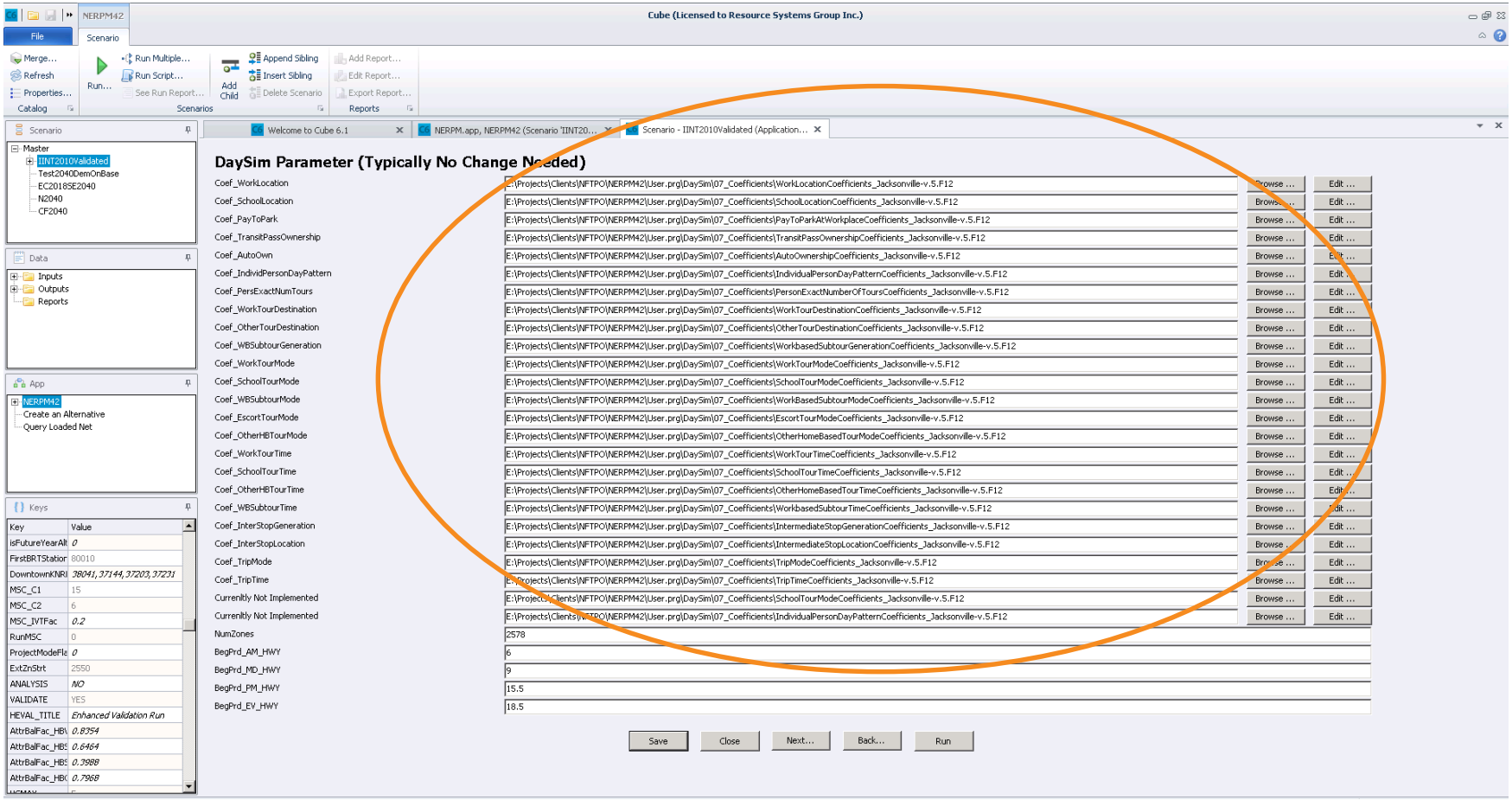
Scenario Editor #3:
No Changes in Most Cases



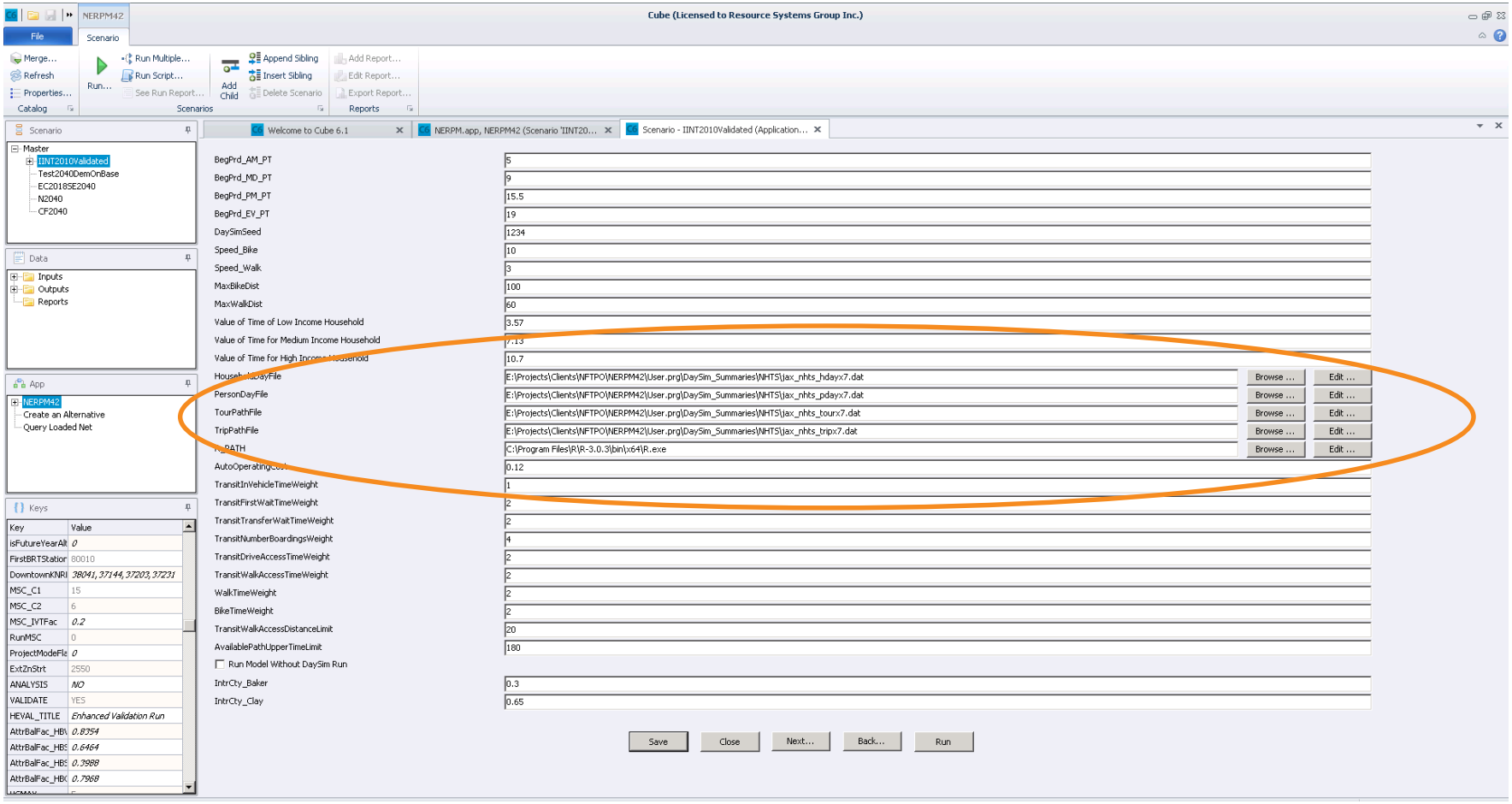
Scenario Editor #4:
Most Relevant for Select Link and Zone Analysis



Scenario Editor #5: DaySim Model Coefficient Files
typically no changes needed



Scenario Editor #6: DaySim File Templates – *do not change unless file path-name is missing*



Scenario Inputs and Configurations

Data Needs and Preparation

- DaySim Input
  - Zone Index
  - Parcel
  - Household Records
  - Person Records
  - PNR and KNR Stations
  - Roster and Roster Combination
  - Coefficients and Seed Shadow Price
- Cube Input
  - Zdata1

I. Zone Index

{CATALOG_DIR}\DaySimInput\01_TAZ_Index_jax_taz_indexes.dat

- No change required unless zone structure is changed
- Four Fields:
  - Zone_id: The TAZ index used in the NERPM network system
  - Zone_ordinal: A zone index number starting at 1 with no gaps
  - Dest_eligible: 0/1 - 1 indicates an internal zone that is eligible as a destination in DaySim
  - External: 0/1 - 1 indicates an external zone, not eligible as a destination in DaySim
- Space-delimited

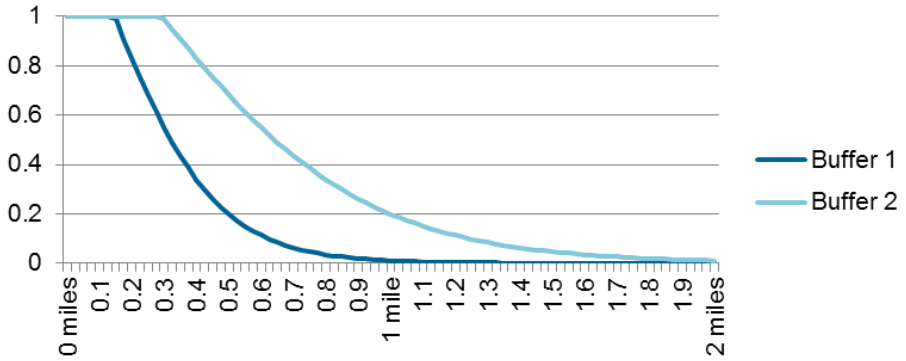
_jax_taz_indexes.dat

Zone_id	Zone_ordinal	Dest_eligible	External
1	1	1	0
2	2	1	0
3	3	1	0
4	4	1	0
5	5	1	0
6	6	1	0
7	7	1	0
8	8	1	0
9	9	1	0
10	10	1	0
11	11	1	0
12	12	1	0
13	13	1	0
14	14	1	0

II. Parcel

{CATALOG_DIR}\DaySimInput\02_Parcel\Jacksonville_parcel_decayandCirc.dat

- Parcel level land use details, ASCII format text file
- Generated through a multi-step "**buffering**" process
- All data preparation tools are under {CATALOG_DIR}\User.prg\DaySim_Inputs\1_Parcel
- Parcel files contain a fair amount of information
  - Parcel coordinates
  - Parking price and capacity information
  - Distance to nearest transit stop by mode
  - Housing units
  - Employment by industry
  - Enrollment by grade
  - Buffer variables



Parcel File Snapshot

parcelid	xcoord_p	ycoord_p	sqft_p	taz_p	lutype_p	hh_p	stugrd_p	stuhgh_p	stuuni_p	empedu_p	empfoo_p	empgov_p
1	257049	2263439	3243348	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
2	216768	2264485	545066	2401	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
3	218203	2264013	1255433	2401	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
4	241482	2262946	8733812	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
5	237554	2262613	10481813	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
6	198630	2264188	384170	2401	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
7	197011	2274988	181149	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	9.0
8	211882	2273487	5924288	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
9	254093	2259714	633494	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
10	196974	2273630	375603	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	5.
11	207548	2136312	25736	2404	1200304020	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
12	216507	2273106	6429848	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
13	221208	2272704	6153759	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
14	225808	2272298	6244229	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
15	230379	2271909	6163220	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
16	201960	2138743	106544	2429	1200304020	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.
17	254309	2152516	29405	2426	1200304020	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
18	254450	2152567	41138	2426	1200304020	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19	234952	2271555	5684006	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
20	211367	2272235	4489596	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
21	239511	2271209	5229843	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
22	215709	2272022	5049194	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
23	244083	2270869	4743857	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
24	220929	2271749	3168589	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
25	248656	2270531	4048326	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
26	225632	2271495	1167069	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
27	253221	2270200	3348306	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
28	226494	2268997	25033276	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	231822	2268987	22430154	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	199345	2271880	2488915	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
31	221813	2270131	6806510	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
32	219617	2270380	5149550	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
33	215867	2268913	26471740	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	257785	2269869	2661067	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
35	237083	2268794	21196734	2411	1200304020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Parcel File Field Definitions

FIELD	DESCRIPTION
id	Parcel/Microzone ID number
xcoord_p	X coordinate – state plane feet
ycoord_p	Y coordinate – state plane feet
sqft_p	Area – square feet
taz_p	TAZ number
lutype_p	land use type
hh_p	households on parcel
stugrd_p	grade school enrollment on parcel
stuhgh_p	high school enrollment on parcel
stuuni_p	university enrollment on parcel
empedu_p	educational employment on parcel
empfoo_p	food employment on parcel
empgov_p	government employment on parcel

FIELD	DESCRIPTION
empind_p	industrial employment on parcel
empmed_p	medical employment on parcel
empofc_p	office employment on parcel
empret_p	retail employment on parcel
empsvc_p	service employment on parcel
empoth_p	other employment on parcel
emptot_p	total employment on parcel
parkdy_p	offstreet daily parking on parcel
parkhr_p	offstreet hourly parking on parcel
ppricdyp	offstreet daily parking price
pprichrp	offstreet hourly parking price

Household Records File

{CATALOG_DIR}\DaySimInput\03_Household_jax_hrec.dat

FIELD	DESCRIPTION
HHNO	Household id
HHSIZE	Household size
HHVEHS	Vehicles available
HHWKRS	Household workers
HHFTW	HH full time workers (type 1)
HHPTW	HH part time workers (type 2)
HHRET	HH retired adults (type 3)
HHOAD	HH other adults (type 4)
HHUNI	HH college students (type 5)
HHHSC	HH high school students (type 6)
HH515	HH kids age 5-15 (type 7)
HHCU5	HH kids age 0-4 (type 8)
HHINCOME	Household income ($)
HOWNRENT	Household own or rent
HRESTYPE	Household residence type
HHPARCEL	Residence parcel id
HHTAZ	Residence TAZ index number
HHEXPFAC	HH expansion factor
SAMPTYPE	Sample type (permanent, seasonal, groupquarter)

Person Records File

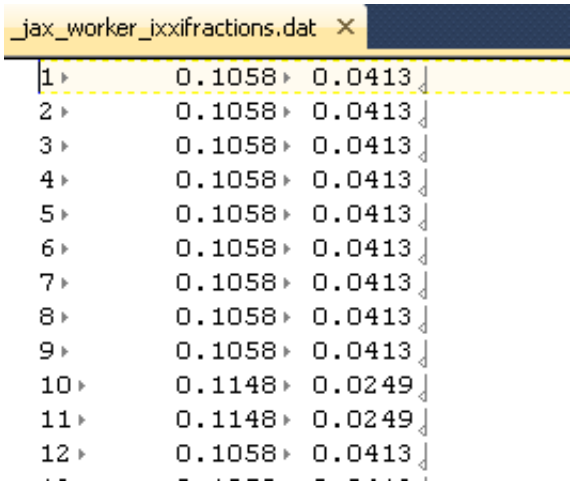
{CATALOG_DIR}\DaySimInput\04_Person_jax_prec.dat

FIELD	DESCRIPTION
HHNO	Household id
PNO	person sequential id number on file
PPTYP	person type
PAGEY	age in years
PGEND	gender
PWTYP	worker type
PWPCL	usual work parcel id
PWTAZ	usual work TAZ
PWAUTIME	auto time to usual work
PWAUDIST	auto distance to usual work
PSTYP	student type
PSPCL	usual school parcel id
PSTAZ	usual school TAZ
PSAUTIME	auto time to usual work
PSAUDIST	auto distance to usual work
PUWMODE	usual mode to work
PUWARRP	Usual arrival period to work
PUWDEPP	Usual depart period from work
PTPASS	0/1 - 1 indicates an transit pass
PPAIDPRK	0/1 - 1 indicates paid parking available at workplace
PDIARY	0/1 - 1 indicates Person used paper diary
PPROXY	0/1 - 1 indicates an proxy response
PSEXPFAC	Person expansion factor

DaySim: IXXI File

{CATALOG_DIR}\DaySimInput\05_ixxi_jax_worker_ixxifractions.dat

- Represents commute between internal and external TAZs
- Developed based on 2000 CTPP, need to be updated when 2010 CTPP at Census Tract/TAZ Level is available
- Three fields:
  - TAZ_ID
  - IE Ratio, fraction of internal workers chosen to work outside of region
  - EI Ratio, fraction of jobs set aside for external workers
- No change required unless there is reason to believe ratios would change
- EI ratio affects the number of jobs available for internal workers, which affects shadow pricing



DaySim: PNR & KNR File

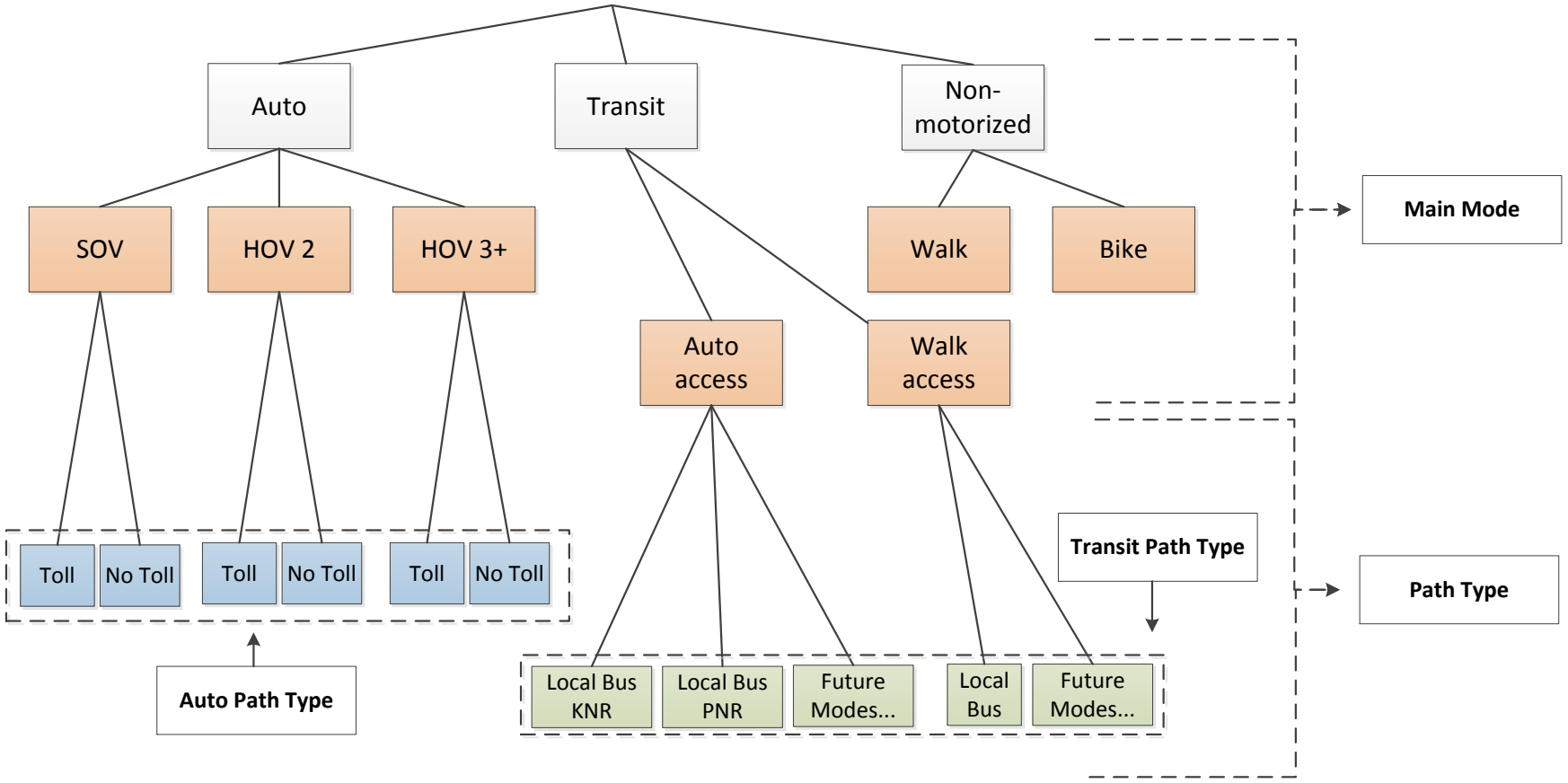
{CATALOG_DIR}\DaySimInput\05_pnr\jax_p_rNodes.dat

- List of Park and Ride and Kiss and Ride lots
- Eight fields:
  - NodeID: Lots index coded in network (currently not used by DaySim)
  - ZoneID: TAZ Index
  - Xcoord, Ycoord: Station Centroid Coordinate (State Plane FL-North, Feet)
  - Capacity: Available parking spaces
  - Cost: Parking cost in cents (if any)
  - PNR: Park and Ride dummy, 99/1, 1 if park and ride station, 99 if not a park and ride station
  - KNR: Kiss and Ride dummy, 99/1, 1 if kiss and ride station, 99 if not a kiss and ride station
- Needs to be updated if a scenario involved PNR/KNR changes

jax_p_rNodes.dat

NodeID	ZoneID	XCoord	YCoord	Capacity	Cost	PNR	KNR
88001	552	456512	2114239	200	0	1	99
88002	243	522461	2193355	200	0	1	99
88003	1952	492964	2187410	200	0	1	99

Mode Choice Structure



DaySim: Roster Combination File

{CATALOG_DIR}\DaySimInput\06_Roster\roster.combinations_Jax.csv
"2010 Base Year"

Mode → Path↓	walk	bike	sov	hov2	hov3	transit	park & ride	school bus	other
full-network	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
no-tolls	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
bus	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
project	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
pnr-bus	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
pnr-project	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
knr-bus	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
knr-project	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

- Combination of Mode Choice (columns) and Path Choice (rows)
- The cells are **TRUE** for valid combinations within DaySim
- If there is no school-bus skim provided, DaySim uses HOV3 skim
- Need to be consistent with Roster file
- No change required unless a new path added
- A copy should be saved to the scenario's "DaySim" folder automatically

DaySim: Roster File

{CATALOG_DIR}\DaySimInput\06_Roster\roster_jax.csv

#variable	mode	path-type	vot-group	start-minute	end-minute	length	file-type	name	field	transpose	blend-variable	blend-path-type	factor	scaling
time	bike	full-network	medium	0	1439	maxzone	Text_IJ	SKM_NM.TXT	3	FALSE	distance	null	null	TRUE
distance	bike	full-network	medium	0	1439	maxzone	Text_IJ	SKM_NM.TXT	4	FALSE	distance	null	null	TRUE
time	walk	full-network	medium	0	1439	maxzone	Text_IJ	SKM_NM.TXT	5	FALSE	distance	null	null	TRUE
distance	walk	full-network	medium	0	1439	maxzone	Text_IJ	SKM_NM.TXT	6	FALSE	distance	null	null	TRUE
ivtime	sov	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_D1.TXT	3	FALSE	distance	null	null	TRUE
distance	sov	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_D1.TXT	4	FALSE	distance	null	null	TRUE
ivtime	hov2	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S2.TXT	3	FALSE	distance	null	null	TRUE
distance	hov2	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S2.TXT	4	FALSE	distance	null	null	TRUE
ivtime	hov3	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S3.TXT	3	FALSE	distance	null	null	TRUE
distance	hov3	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S3.TXT	4	FALSE	distance	null	null	TRUE
ivtime	sov	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_D1.TXT	3	FALSE	distance	null	null	TRUE
distance	sov	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_D1.TXT	4	FALSE	distance	null	null	TRUE
ivtime	hov2	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_S2.TXT	3	FALSE	distance	null	null	TRUE
distance	hov2	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_S2.TXT	4	FALSE	distance	null	null	TRUE
ivtime	hov3	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_S3.TXT	3	FALSE	distance	null	null	TRUE

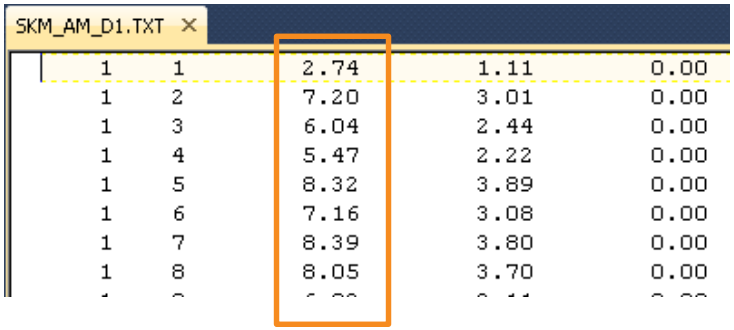
- ASCII comma-delimited with header (.csv)
- Provide travel cost to DaySim
  - Highway – distance, time, and toll
  - Transit – in-vehicle time, initial wait time, transfer wait time, fare, and number of transfer
- No change required unless a new path added
- A copy should be saved to the scenario's "DaySim" folder automatically

Understanding the Roster File

- **Mode**: Skim mode, valid values are walk, bike, sov, hov2, hov3, transit (walk-to-transit), and park-and-ride (drive-to-transit)
- **Path-type**: Path type, valid values are full-network, no-toll, bus, PNR bus, KNR bus
- **Vot-group**: Value of time range, valid values are very-low, low, medium, high, and very-high (if only one group is provided, DaySim will assume the same skims are used for all groups)
- **Start-minute**: First minute for which skim applies, in minutes past midnight (mpm)
- **End-minute**: Last minute for which skim applies, in minutes past midnight (if lower than start-minute, then period spans midnight)
- **Name**: Skim file name (assumes same directory as roster file, error would occur if not in same directory). Null is assumed for file type “null.”

DaySim Roster File: Highway Example

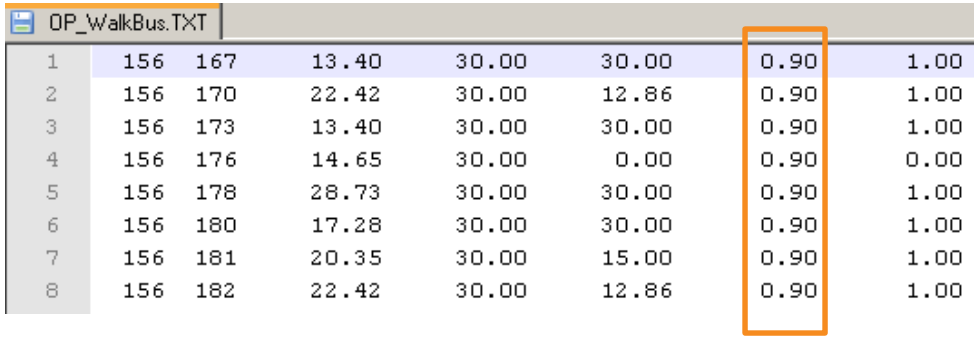
ivtime	sov	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_D1.TXT	3	FALSE	distance	null	null	TRUE
distance	sov	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_D1.TXT	4	FALSE	distance	null	null	TRUE
ivtime	hov2	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S2.TXT	3	FALSE	distance	null	null	TRUE
distance	hov2	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S2.TXT	4	FALSE	distance	null	null	TRUE



- Mode SOV in-vehicle time should read from file “SKM_AM_D1.TXT”, Column 3 (IVT)
- The roster file specifies this for period 6:00AM (360 mpm) to 8:59AM (539 mpm).

DaySim Roster File: Transit Example

ivtime	transit	bus	medium	540	959	maxzone	Text_IJ	OP_WalkBus.TXT	3	FALSE	null	null	null	TRUE
iwaittime	transit	bus	medium	540	959	maxzone	Text_IJ	OP_WalkBus.TXT	4	FALSE	null	null	null	TRUE
xwaittime	transit	bus	medium	540	959	maxzone	Text_IJ	OP_WalkBus.TXT	5	FALSE	null	null	null	TRUE
fare	transit	bus	medium	540	959	maxzone	Text_IJ	OP_WalkBus.TXT	6	FALSE	null	null	null	TRUE
nboard	transit	bus	medium	540	959	maxzone	Text_IJ	OP_WalkBus.TXT	7	FALSE	null	null	null	TRUE



OP_WalkBus.TXT

1	156	167	13.40	30.00	30.00	0.90	1.00
2	156	170	22.42	30.00	12.86	0.90	1.00
3	156	173	13.40	30.00	30.00	0.90	1.00
4	156	176	14.65	30.00	0.00	0.90	0.00
5	156	178	28.73	30.00	30.00	0.90	1.00
6	156	180	17.28	30.00	30.00	0.90	1.00
7	156	181	20.35	30.00	15.00	0.90	1.00
8	156	182	22.42	30.00	12.86	0.90	1.00

- Mode walk to bus fare should read from file “OP_WalkBus,” Column 6 (fare).
- The roster file specifies this for period 9:00AM (540 mpm) to 3:59PM (959 mpm).

DaySim Roster File Tips

Keep time period consistent:

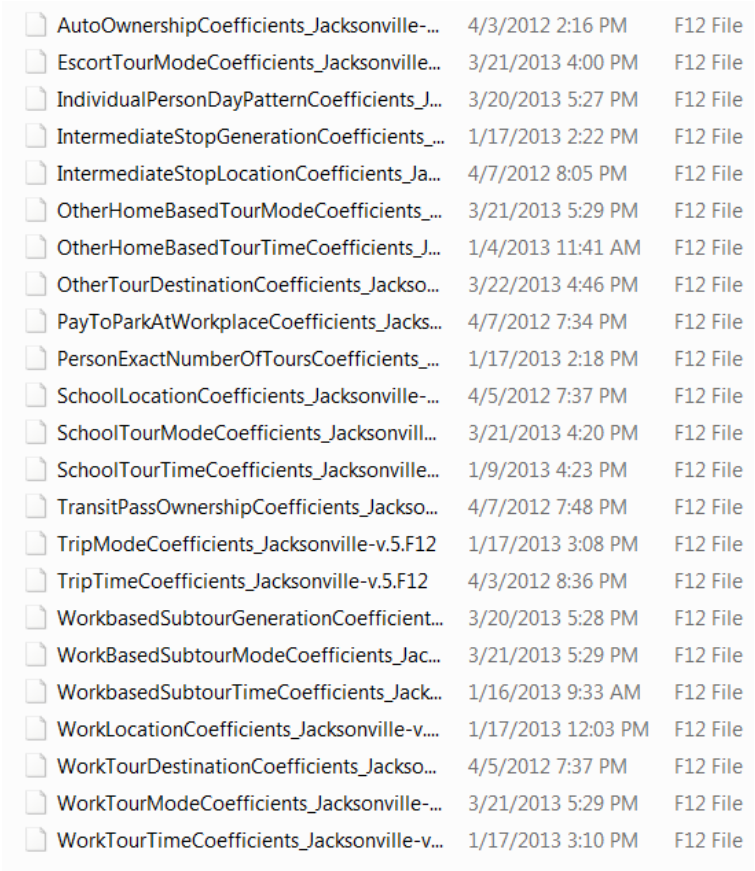
Time Period	Roster	Cube Keys
AM	360-539 => 6:00AM – 8:59AM	BegPrd_AM=6
MD	540-959 => 9:00AM – 3:59PM	BegPrd_MD=9
PM	960-1139 => 4:00PM – 6:59PM	BegPrd_PM=16
EV	1140-359 => 7:00PM – 6:00AM	BegPrd_EV=19

- Measurement units
  - Time is in minutes
  - Distance is in miles
  - Fare is in $ in DaySim skim text files (stored as cents in Cube)
- Specify walk-to-bus (and walk-to-project) skims for PNR and KNR path types
  - DaySim chooses the PNR/KNR station for drive-to-transit trips
  - DaySim obtains the auto portion of a drive-to-transit skim from highway skims

DaySim: Coefficients

{CATALOG_DIR}\User.prg\DaySim\07_Coefficients

- Typically no change required for any scenarios



AutoOwnershipCoefficients_Jacksonville-...	4/3/2012 2:16 PM	F12 File
EscortTourModeCoefficients_Jacksonville...	3/21/2013 4:00 PM	F12 File
IndividualPersonDayPatternCoefficients_J...	3/20/2013 5:27 PM	F12 File
IntermediateStopGenerationCoefficients_...	1/17/2013 2:22 PM	F12 File
IntermediateStopLocationCoefficients_Ja...	4/7/2012 8:05 PM	F12 File
OtherHomeBasedTourModeCoefficients_...	3/21/2013 5:29 PM	F12 File
OtherHomeBasedTourTimeCoefficients_J...	1/4/2013 11:41 AM	F12 File
OtherTourDestinationCoefficients_Jackso...	3/22/2013 4:46 PM	F12 File
PayToParkAtWorkplaceCoefficients_Jacks...	4/7/2012 7:34 PM	F12 File
PersonExactNumberOfToursCoefficients_...	1/17/2013 2:18 PM	F12 File
SchoolLocationCoefficients_Jacksonville-...	4/5/2012 7:37 PM	F12 File
SchoolTourModeCoefficients_Jacksonvill...	3/21/2013 4:20 PM	F12 File
SchoolTourTimeCoefficients_Jacksonville...	1/9/2013 4:23 PM	F12 File
TransitPassOwnershipCoefficients_Jackso...	4/7/2012 7:48 PM	F12 File
TripModeCoefficients_Jacksonville-v.5.F12	1/17/2013 3:08 PM	F12 File
TripTimeCoefficients_Jacksonville-v.5.F12	4/3/2012 8:36 PM	F12 File
WorkbasedSubtourGenerationCoefficient...	3/20/2013 5:28 PM	F12 File
WorkBasedSubtourModeCoefficients_Jac...	3/21/2013 5:29 PM	F12 File
WorkbasedSubtourTimeCoefficients_Jack...	1/16/2013 9:33 AM	F12 File
WorkLocationCoefficients_Jacksonville-v....	1/17/2013 12:03 PM	F12 File
WorkTourDestinationCoefficients_Jackso...	4/5/2012 7:37 PM	F12 File
WorkTourModeCoefficients_Jacksonville-...	3/21/2013 5:29 PM	F12 File
WorkTourTimeCoefficients_Jacksonville-v...	1/17/2013 3:10 PM	F12 File

Example Coefficient File: “Other” Home-based Tour Mode Choice Model (partial file)

	Label	Constraint	Coeff.	Alternative	Description
1	costutil	F	0.379106	All	Parking cost utility
2	timeutil	F	2.018691	All	Path type model logsum
20	wt-const	F	-4.42008	walk to transit	Constant
21	wt-nocars	F	4.945792	walk to transit	No cars in HH
30	s3-const	F	-0.8113	hov3	Constant
31	sr-hhcu5	F	0.598188	hov3,hov2	# HH children under age 5
32	sr-hh515	F	0.126346	hov3,hov2	#HH children age 5-15
34	sr-hhnwa	F	0.182457	hov3,hov2	#HH non-working adults
35	sr-lndist	F	0.225107	hov3,hov2	LN(hov path auto distance)
38	s3-onephh	F	-3.64495	hov3	One person HH
39	s3-twophh	F	-2.04564	hov3	Two person HH
40	s2-const	F	…	hov2	…

DaySim: Shadow Price

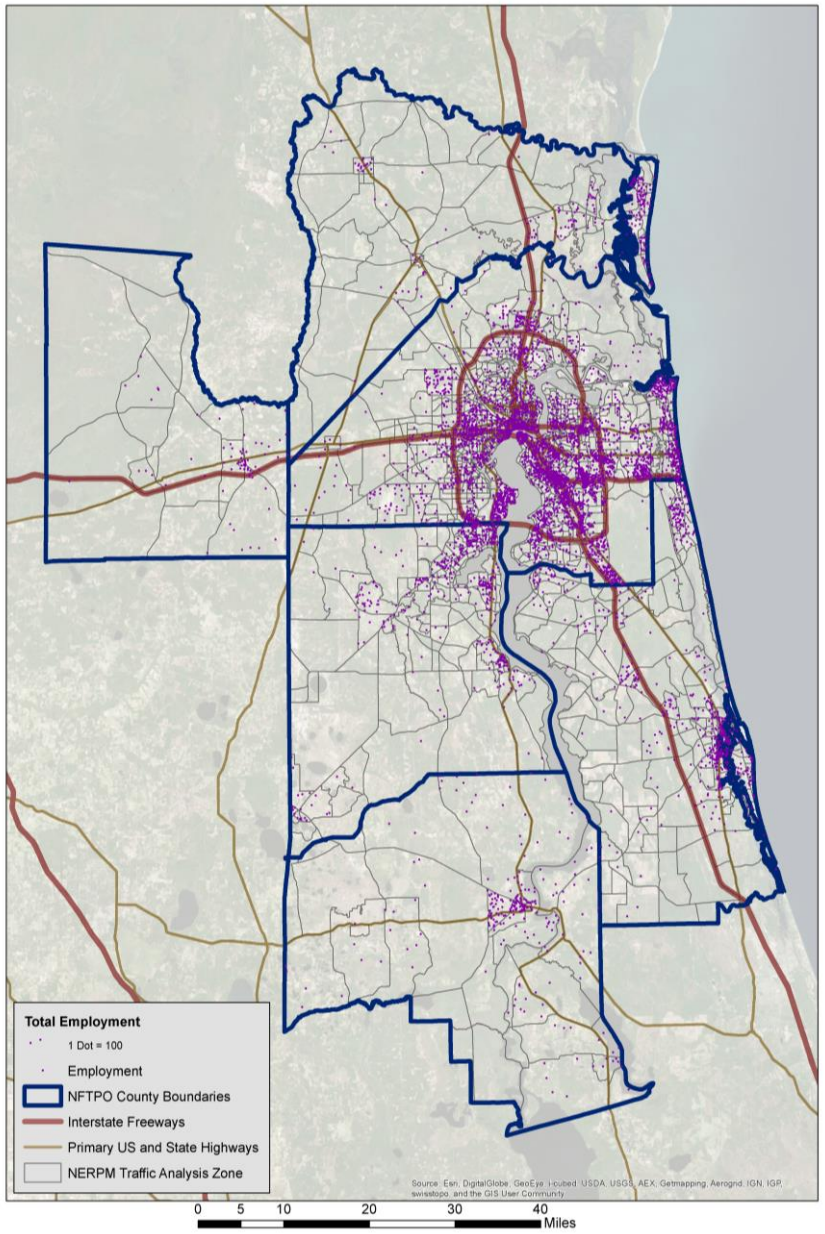
{CATALOG_DIR}\DaySimInput\09_SeedShadow

- What does it do?
  - Same effect as doubly-constraining a gravity model
  - Adds constants to parcels so result in a good match between:
    - Work location choices and employment
    - School location choices and enrollment
- Shadow price file need to be updated whenever there is change in employment or school enrollment
  - There is a major land use change in base year scenario
  - Future base scenario (e.g., 2040EC)
- How to update?
  - Check “Update shadow price” option in scenario editor

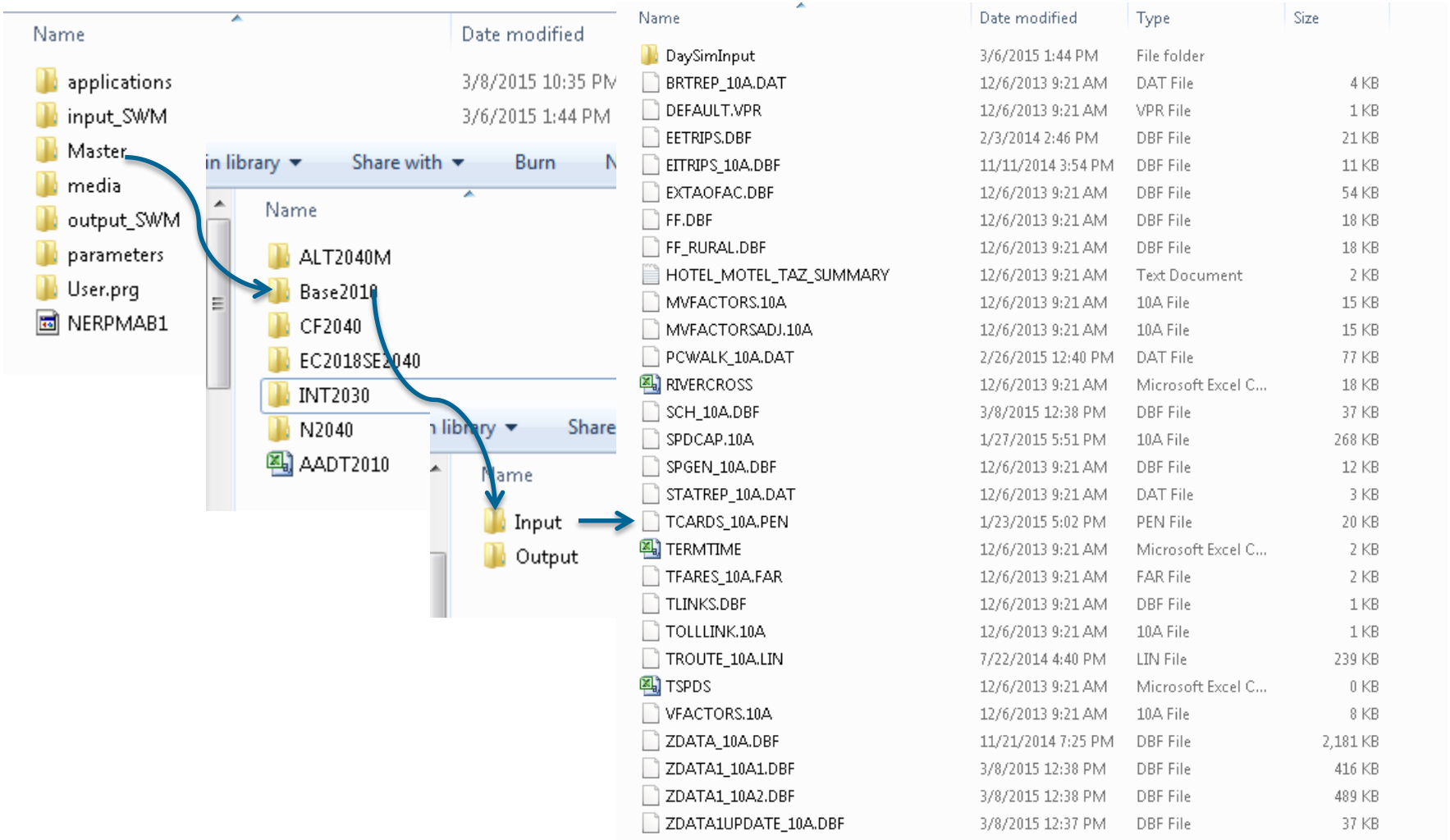
Cube Input: Zdata1

Zdata1 will be automatically updated from DaySim input

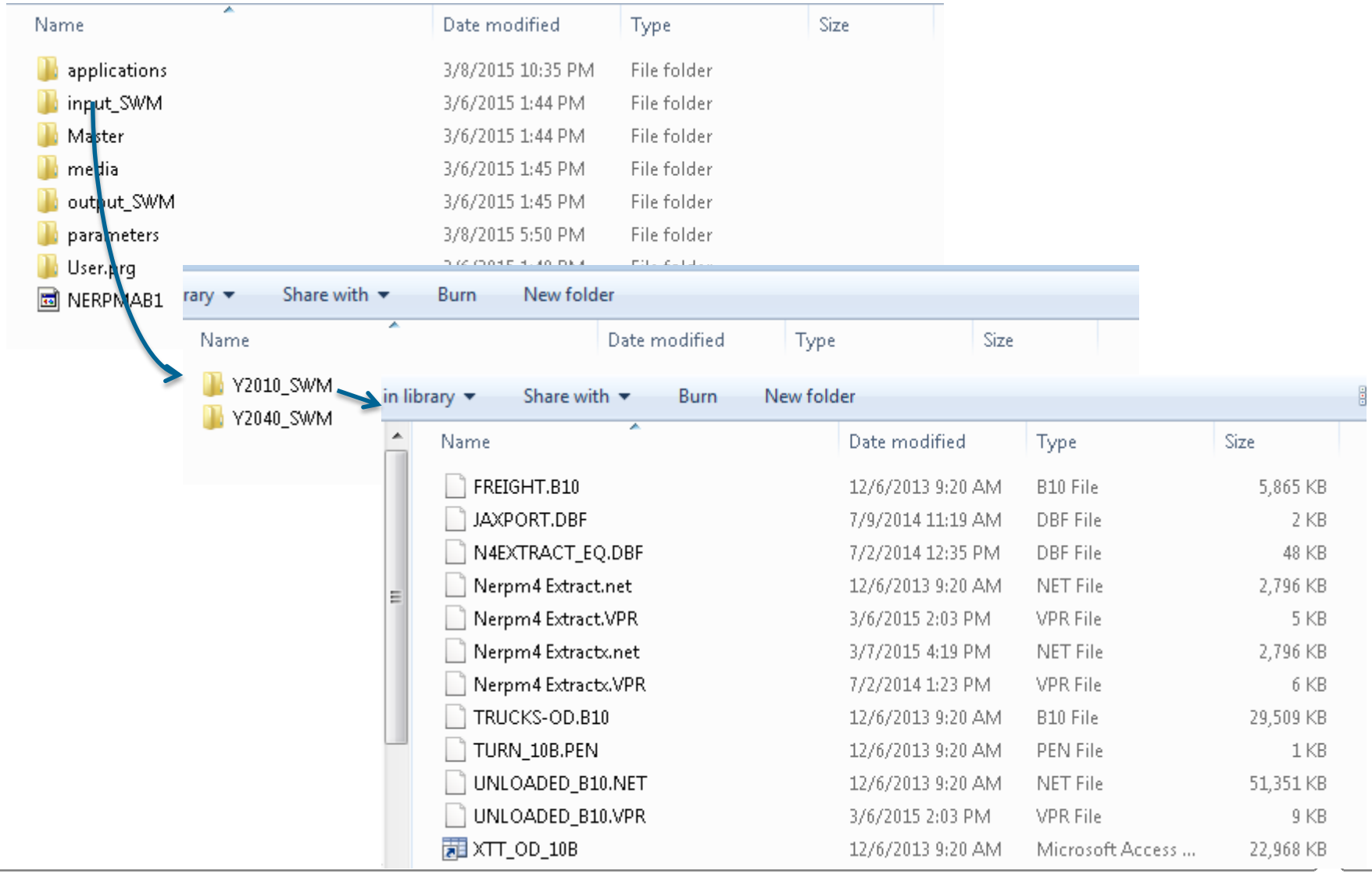
- **Total population** (TOTAL_POP, update from household records _jax_hrec.dat)
- **School enrollment** (SCHENR, update from parcel file Jacksonville_parcel_decayandCirc.dat)
- **Employment** by industry categories (update from DaySimInput\02_Parcel\Jax2010Emp.dbf)



Locations of Auxiliary Demand Files: EE/EI, Hotels/Motels, Special Generators, ZDATA



Locations of Auxiliary Demand Files: Trucks

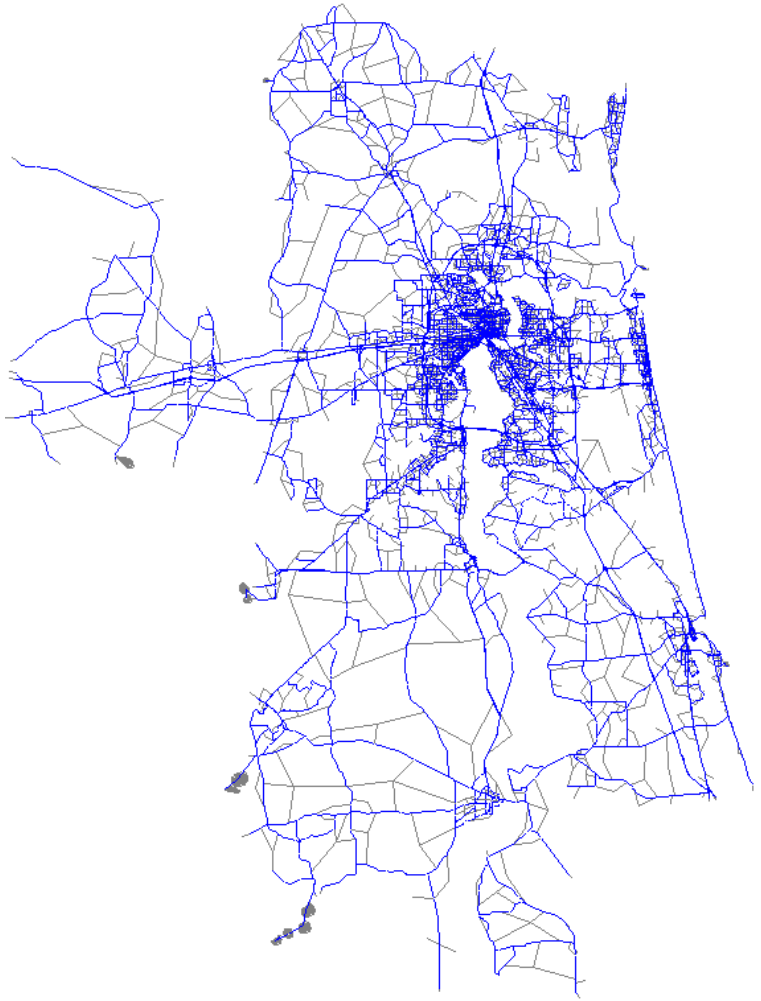


Break

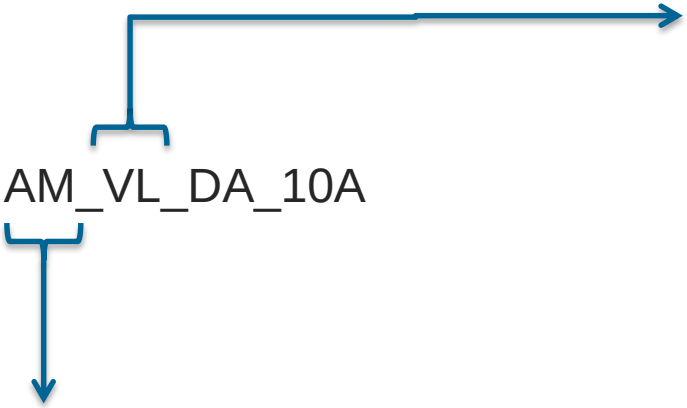
Highway Network

Important Highway Network Changes

- Additional fields have been added to links to represent four different time periods + the combined all-day assignment
- New scenario labeling for future-years
- HEVAL remains the main tool for producing output summaries—no changes



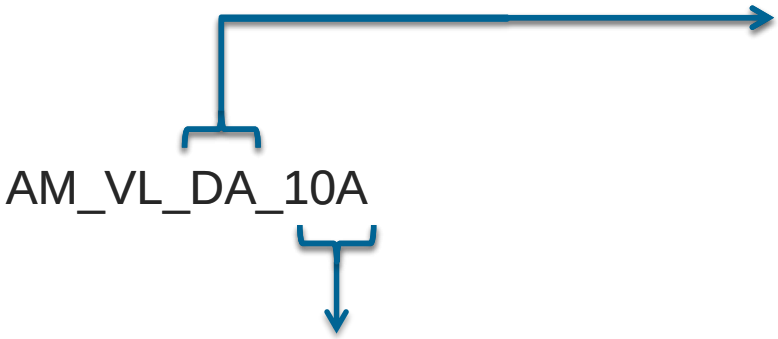
Combined Loaded Network Link Attribute Labeling



Time Period	Label
AM Peak (6:00AM – 8:59AM)	AM
Midday Off Peak (9:00AM – 3:59PM)	MD
PM Peak (3:30PM – 6:29PM)	PM
Evening Off Peak (6:29PM – 5:59AM)	NT
All Day (sum of 4 periods)	AL

Measure	Label
Volume (vehicles)	VL
Flow (vehicles)	F
Time (not used)	T
Congested Time (min.)	CGTIME
Congested Speed (mph)	CGSPEED
Vehicle Miles Traveled	VMT
Vehicle Hours Traveled	VHT
Volume-to-Capacity Ratio	VCCAPRTO
Volume-to-Count Ratio	VOLCNTRTO

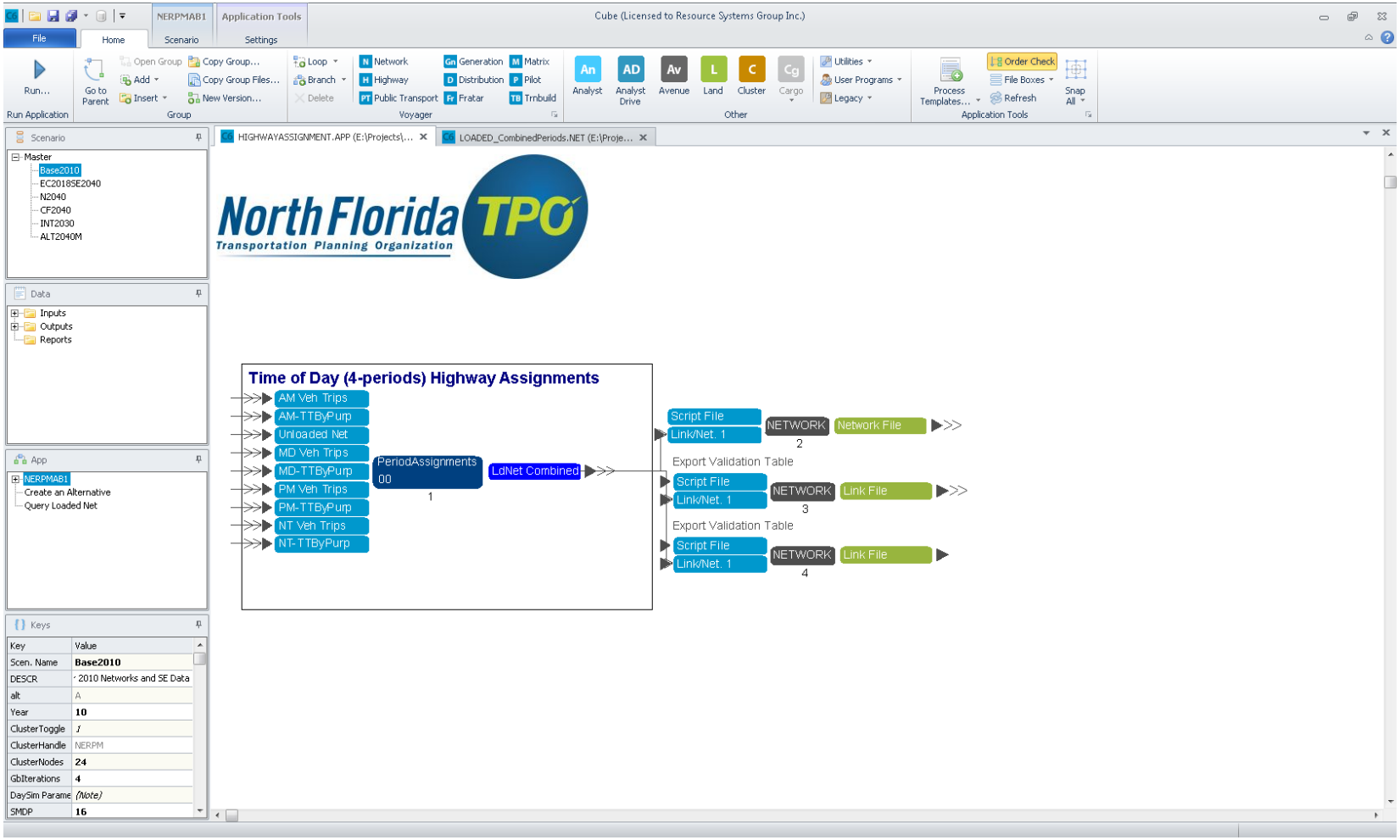
Combined Loaded Network Link Attribute Labeling



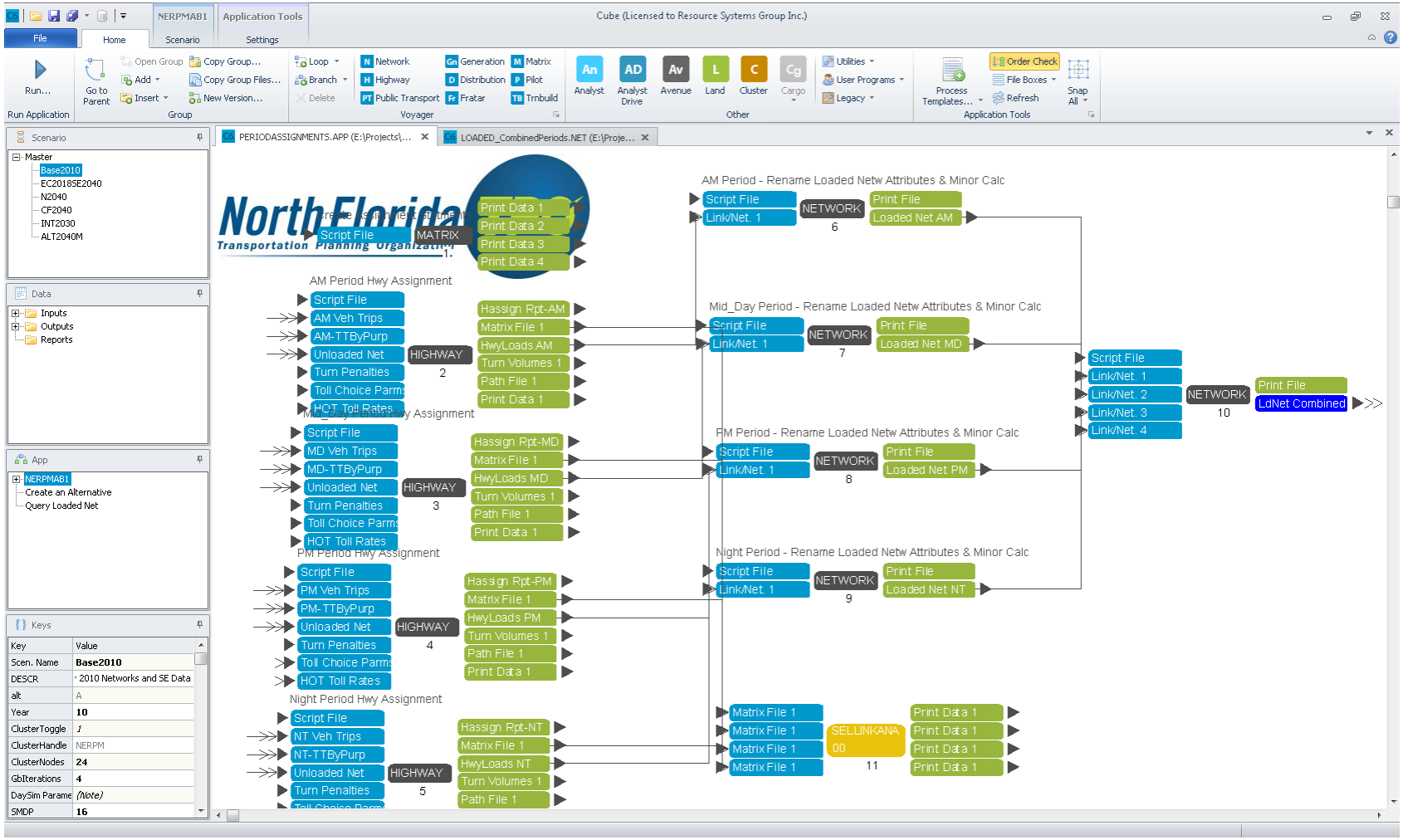
Scenario	Label
Base Year 2010 Networks and SE data	10A
Interim 2030 networks and data	30A
2018 E+C Network with 2040 SE data	40A
Cost Feasible 2040	40C
2040 Needs Plan	40N
2040 Needs network with alternate land use (employment)	40M

Mode Group	Label
Total	TOT
Drive Alone	DA
External Drive Alone	EDA
Shared Ride 2	SR2
External Shared Ride 2	ESR2
Shared Ride 3	SR3
External Shared Ride 3	ESR3
Trucks	TRK
Port-generated Trucks	PRTTK
All Externals	EXT

Highway Assignment Interface

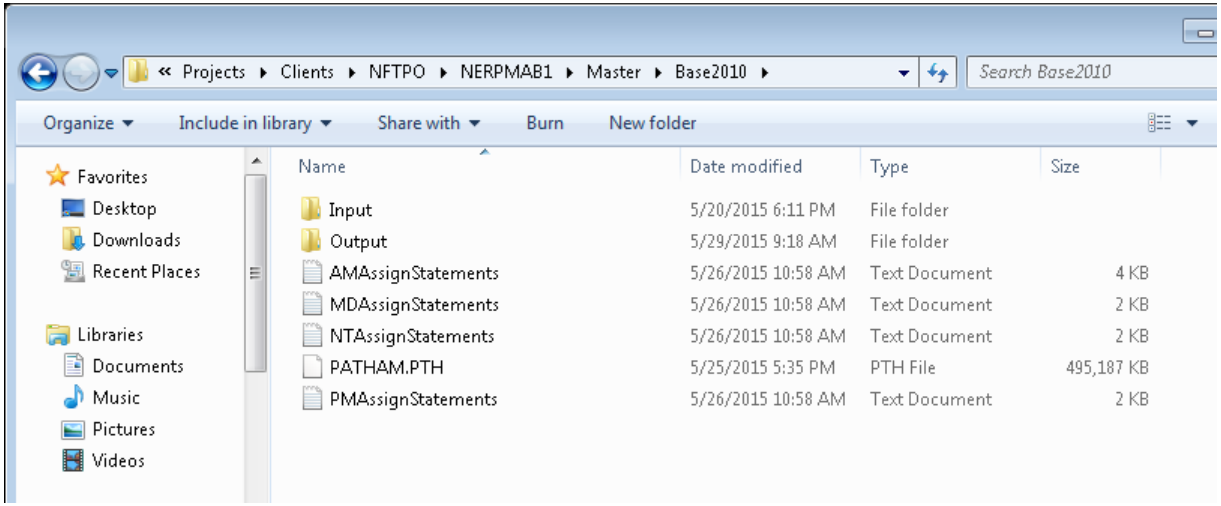


Highway Assignment Interface



Select Link and Zone Analysis

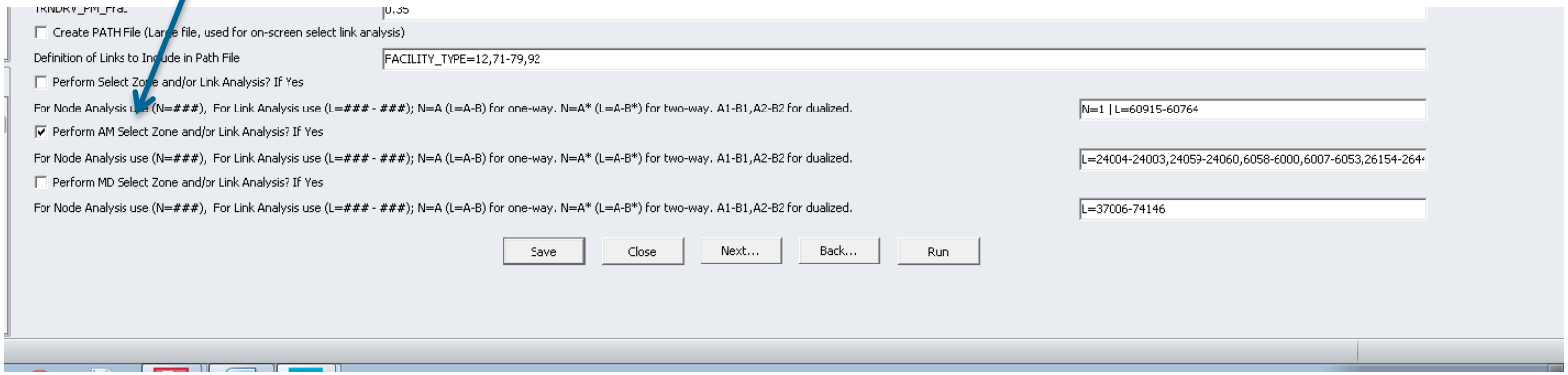
- Run just for time period of interest, or all 4 periods
- Lengthy run times (e.g. 1 hour per assignment period when saving paths)
- Separate assignment statements and path files for each period



Select Link and Zone Analysis

1. Run NERPM-AB to completion first, without Select Link and Zone Analysis checked, using Cube Cluster if available
2. When this has completed, check Select Link and Zone Analysis and run only the Highway Assignment period(s) of interest

Only the time period-specific check boxes are operational and will run Select Zone and/or Link Analysis



Model Output Files

DaySim Outputs

- Household output (vehicle choice)
- Person output (work and school location choice)
- Household day output
- Person day output (number of tours and stops by purpose)
- Tour output
- Trip output

DaySim Outputs: _household.tsv

HHNO	Household id
Fraction_with_jobs_outside	Residence zone worker IX fraction
HHSIZE	Household size
HHVEHS	Vehicles available
HHWKRS	Household workers
HHFTW	HH full time workers (type 1)
HHPTW	HH part time workers (type 2)
HHRET	HH retired adults (type 3)
HHOAD	HH other adults (type 4)
HHUNI	HH college students (type 5)
HHHSC	HH high school students (type 6)
HH515	HH kids age 5-15 (type 7)
HHCU5	HH kids age 0-4 (type 8)
HHINCOME	Household income ($)
HOWNRENT	Household own or rent
HRESTYPE	Household residence type
HHPARCEL	Residence parcel id
ZONE_ID	Internal id based on parcel id
HHTAZ	Based on parcel id
HHEXPFAC	HH expansion factor
SAMPTYPE	Sample type

DaySim Outputs: _household.tsv

hhno	fractior	hhsize	hhvehs	hhwkrs	hhftw	hhptw	hhret	hhoad	hhuni
249500	0	1	0	1	-1	-1	-1	-1	-1

hhhsc	hh515	hhcu5	hhincor	hownre	hrestyp	hhparce	zone_ic	hhtaz	hhexpfa	sampty
-1	-1	-1	37550	-1	2	107201	944	945	100	11

- Household # 249500 has 1 person and 0 vehicles (vehicle ownership model) and 1 worker.
- Household income is $37,550
- Household type is re-computed by DaySim (shown as -1)
- Home TAZ 945

_person.tsv

- Most of person file variables are from input person records
- DaySim updates work location/school location, travel time for work/school, transit pass ownership, paid parking at work place

PPTYP	
	1 Full time worker
	2 Part time worker
	3 Non working adult age 65+
	4 Non working adult age<65
	5 University student
	6 High school student age 16+
	7 Child age 5-15
	8 Child age 0-4

ID	internal daysim record ID
HHNO	hh id
PNO	person seq no on file
PPTYP	person type
PAGEY	age in years
PGEND	gender
PWTYP	worker type
PWPCL	usual work parcel id
PWTAZ	usual work TAZ
PWAUTIME	auto time to usual work
PWAUDIST	auto distance to usual work
PSTYP	student type
PSPCL	usual school parcel id
PSTAZ	usual school TAZ
PSAUTIME	auto time to usual work
PSAUDIST	auto distance to usual work
PUWMODE	usual mode to work
PUWARRP	Usual arrival period to work
PUWDEPP	Usual depart period from work
PTPASS	transit pass?
PPAIDPRK	paid parking at workplace?
PDIARY	Person used paper diary?
PPROXY	proxy response?
PSEXPFAC	Person expansion factor

_person.tsv

id	hhno	pno	pptyp	pagey	pgend	pwtyp	pwpcl	pwtaz	pwautir	pwaudis
608453	249500	1	1	29	2	1	153775	688	5.916139	2.938001

pstyp	pspcl	pstaz	psautim	psaudis	puwmo	puwarr	puwdep	ptpass	ppaidpr
0	-1	-1	-1	-1	-1	-1	-1	1	1

The person in household # 249500 is:

- Full-time worker
- 29 years old
- Female
- Work location is Parcel # 153775, TAZ 688 (work location choice)
- Commute time is 5.9 minutes (from SOV skim)
- Not a student, no school location (from school location choice)
- Has a transit pass

_person_day.tsv

id	person_	househ	hhno	pno	day	beghom	endhom
608453	608453	249500	249500	1	1	0	0

hbtours	wbtours	uwtours	wktours	sctours	estours	pbtours	shtours
2	1	1	1	0	1	0	0

mltours	sotours	retours	metour	wkstops	scstops	esstops	pbstops
0	0	0	0	0	0	1	0

shstops	mlstops	sostops	restops	mestop	wkatho	pdexpfa
1	1	0	0	0	0	100

The person made:

- Two home-based tours
- One work tour (to usually work place)
- One escort tour
- One work-based sub-tour
- One escort stop
- One meal stop

_tours.tsv

id	person_	person_	hhno	pno	day	tour	jtindex	parent	subtrs
6084532	608453	608453	249500	1	1	2	0	0	0
6084531	608453	608453	249500	1	1	1	0	0	1
60845303	608453	608453	249500	1	1	3	0	1	0

pdpurp	tlvorig	tardest	tlvdest	tarorig	toadtyp	tdadtyp	topcl	totaz	tdpcl
3	782	786	809	813	1	4	107201	945	346735
1	822	849	1404	1431	1	2	107201	945	153775
6	897	904	1015	1022	2	4	153775	688	90085

tdtaz	tmodet	tpathtp	tautotir	tautocc	tautodi	tripsh1	tripsh2	phtindx	phtindx
952	1	1	0.580162	0.02188	0.182337	1	1	0	0
688	6	3	5.92116	0.35256	2.938001	1	1	0	0
268	5	1	7.87	0.6066	5.055	1	1	0	0

1. Escort tour (pdpurp 3), left home (toadtyp 1, totaz 945) at 1:02 PM (tlvorig 782), arrived at destination (tdtaz 952) by 1:06 PM (tardest 786); left destination at 1:29 PM (tlvdest 809), and arrived at home by 1:33 PM (tarorig 813). Tour mode is walk (tmodetyp 1).
2. Work tour (pdpurp 1), left home (toadtyp 1, totaz 945) at 1:42 PM (tlvorig 822), heading to usual work place (tdadtyp 2, tdtaz 688), arriving at 2:09 p.m. (tardest 849). Left work place by 11:24 PM (tlvdest 1404). Tour mode is walk-to-transit (tmodetyp 6) and path type bus (tpathtp 3).
3. A work-based sub-tour (tour 3, parent id 1), meal purpose (pdpurp 6), from work place to TAZ 268, left work place at around 3:00PM (tlvorig 897) and got back to work by 4:55PM (tlvdest 1015). Tour mode is shared ride 3+ (tmodetyp 5)

Trip and Tour Event Codes

OPURP DPURP
0 'none/home'
1 'work'
2 'school'
3 'escort'
4 'pers.bus'
5 'shop'
6 'meal'
7 'social'
8 'recreational' (currently combined with sc
9 'medical' (currently combined with pers.b
10 'change mode inserted purpose'

DORP
1 Driver
2 Passenger
3 N/A
9 Missing

MODE
1 'walk'
2 'bike'
3 'sov'
4 hov2
5 hov3+
6 transit
{ drive-transit not a trip mode}
8 'school bus'
9 other

OADTYP DADTYP
1 Home
2 Usual workplace
3 Usual School
4 Other
5 Missing
6 Change mode inserted location

_trips.tsv

id	tour_id	hhno	pno	day	tour	half	tseg	tsvid	opurp
6.08E+08	6084532	249500	1	1	2	1	1	0	0
6.08E+08	6084532	249500			2	2	1	0	3
6.08E+08	6084531	249500			1	1	1	0	0
6.08E+08	6084531	249500	1	1	1	2	1	0	1
1.79E+09	60845303	249500	1	1	3	1	1	0	1
1.79E+09	60845303	249500	1	1	3	2	1	0	6

Work-based sub-tour

dpurp	oadtyp	dadtyp	opcl	otaz	dpcl	dtaz	mode	pathtyp	dorp
3	1	4	107201	945	346735	952	1	1	0
0	4	1	346735	952	107201	945	1	1	0
1	1	2	107201	945	153775	688	6	3	0
0	2	1	153775	688	107201	945	6	3	0
6	2	4	153775	688	90085	268	5	1	2
1	4	2	90085	268	153775	688	5	1	2

deptm	arrtm	endactt	travtim	travcos	travdist	vot	trexpfa
782	786	809	4.293199	0	0.182337	6.907367	100
809	813	822	4.293199	0	0.182337	6.907367	100
822	849	1404	27.41	0	2.964001	7.173965	10
1404	1431	179	27.41	0	2.964001	7.173965	100
897	904	1015	7.76	0.5952	4.96	0	100
1015	1022	179	7.73	0.5952	4.96	0	100

Passenger

Tour Example #1

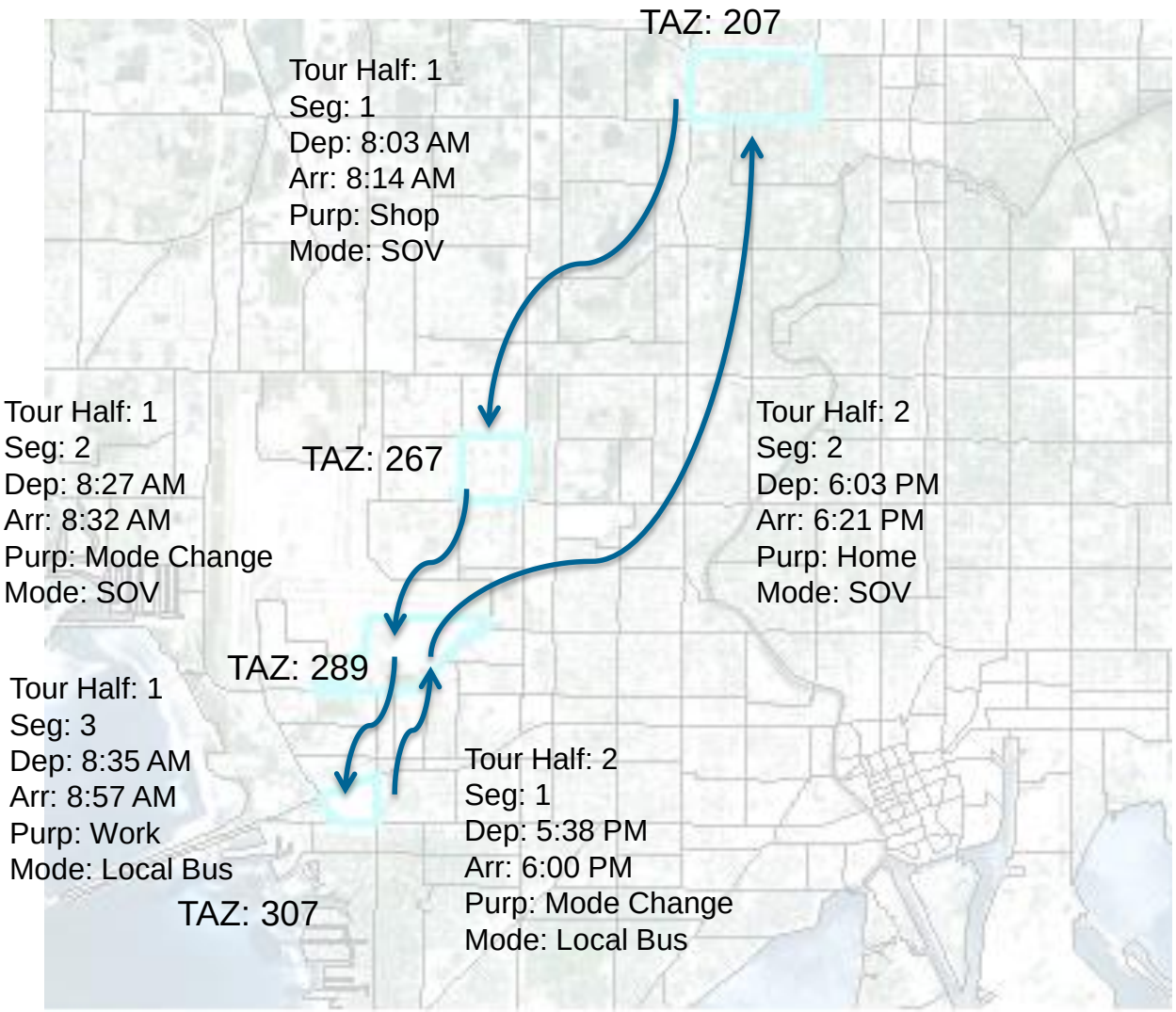
Tour Half: 1
Dep: 9:09 AM
Arr: 9:35 AM
Purp: Work
Mode: SOV

TAZ: 33

TAZ: 1100

Tour Half: 2
Dep: 3:41 PM
Arr: 4:07 PM
Purp: Home
Mode: SOV

Tour Example #2

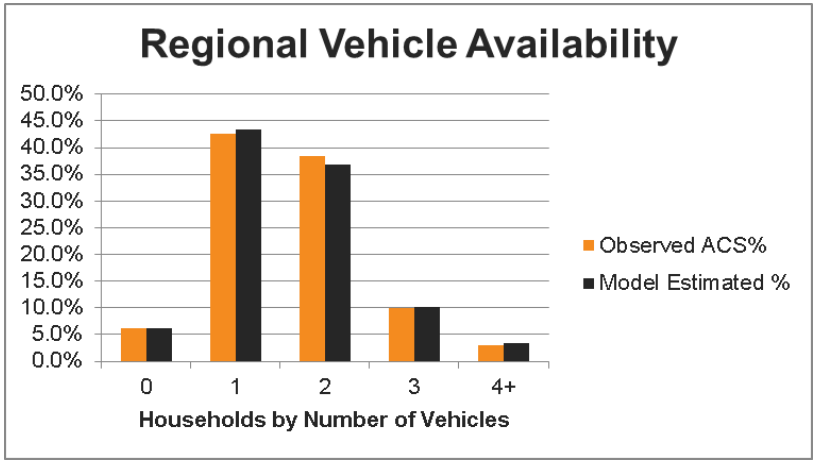


Summary of Day 1 and Q & A

Summarizing Results

Auto Ownership Model

HOUSEHOLDS BY COUNTY AND VEHICLES: EST-OBS						
	0	1	2	3	4+	Total
Citrus	-0.6%	1.8%	-0.6%	-0.6%	0.1%	0.0%
Hernando	-1.1%	-0.3%	0.7%	0.1%	0.6%	0.0%
Hillsborough	-0.6%	1.8%	-2.2%	0.2%	0.8%	0.0%
Manatee	-0.3%	4.4%	-3.5%	-0.8%	0.2%	0.0%
Pasco	-0.4%	-1.2%	-0.3%	0.9%	1.1%	0.0%
Pinellas	0.7%	1.3%	-1.9%	-0.3%	0.2%	0.0%
Total	0.0%	0.9%	-1.6%	0.1%	0.6%	0.0%



NUMBER OF VEHICLES						
HH Income	0	1	2	3	4+	Total
$0K-$15K	-1.1%	0.5%	0.7%	-0.1%	0.1%	0.0%
$15K-$50K	-1.5%	0.8%	-1.9%	1.1%	1.5%	0.0%
$50K-$75K	0.0%	-1.0%	0.7%	0.1%	0.1%	0.0%
>$75K	0.1%	0.0%	-0.3%	0.0%	0.1%	0.0%
Total	0.0%	0.9%	-1.6%	0.1%	0.6%	0.0%

Day Pattern Model

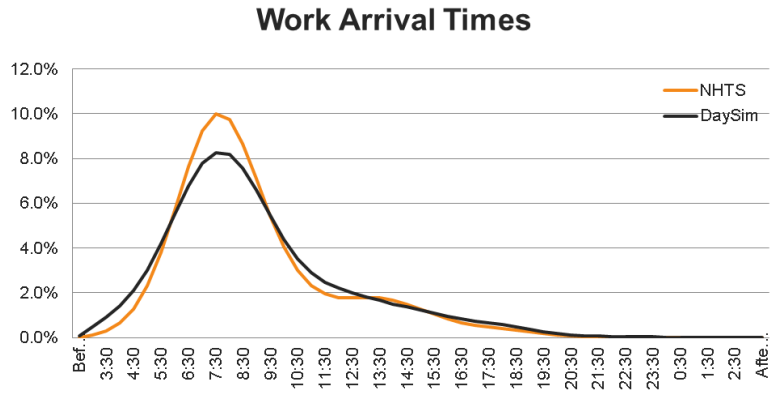
Tour Rates by Purpose

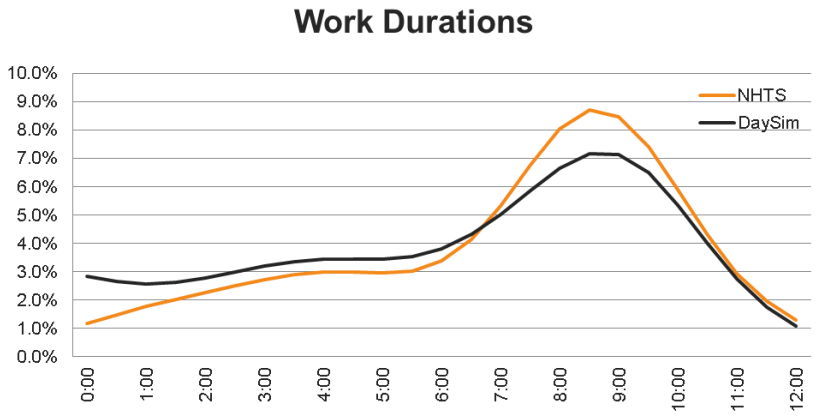
Purpose	Survey	DaySim	Diff	% Diff
work	0.35	0.35	0.00	-1%
school	0.14	0.14	0.00	2%
escort	0.13	0.11	-0.01	-10%
pers.bus	0.16	0.17	0.00	1%
shop	0.20	0.18	-0.02	-9%
meal	0.07	0.07	0.00	1%
soc/rec	0.26	0.27	0.01	3%
workbased	0.05	0.05	0.00	-2%
Total	1.36	1.34	-0.02	-2%

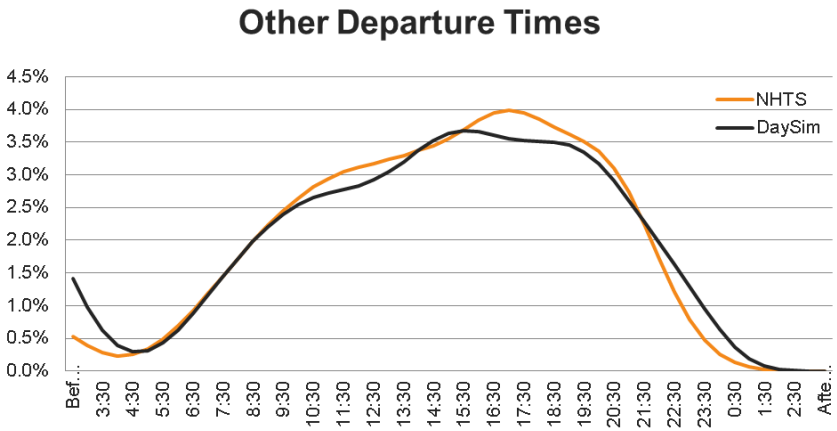
Person Level Tours/Stops

Work			
Tours/Stops	NHTS	Model	% Difference
0/0	67.22%	67.22%	0.00%
0/1+	0.07%	0.29%	0.23%
1+/0	29.88%	14.85%	-15.03%
1+/1+	2.83%	17.64%	14.80%
School			
Tours/Stops	NHTS	Model	% Difference
0/0	86.86%	86.46%	-0.40%
0/1+	0.31%	0.53%	0.22%
1+/0	12.25%	11.29%	-0.96%
1+/1+	0.58%	1.72%	1.14%
Escort			
Tours/Stops	NHTS	Model	% Difference
0/0	85.59%	88.31%	2.72%
0/1+	5.10%	3.10%	-2.00%
1+/0	6.69%	6.94%	0.26%
1+/1+	2.62%	1.65%	-0.98%
Personal Business			
Tours/Stops	NHTS	Model	% Difference
0/0	79.59%	80.46%	0.86%
0/1+	5.74%	4.57%	-1.17%
1+/0	12.64%	14.01%	1.37%
1+/1+	2.03%	0.97%	-1.06%

Tour Time of Day





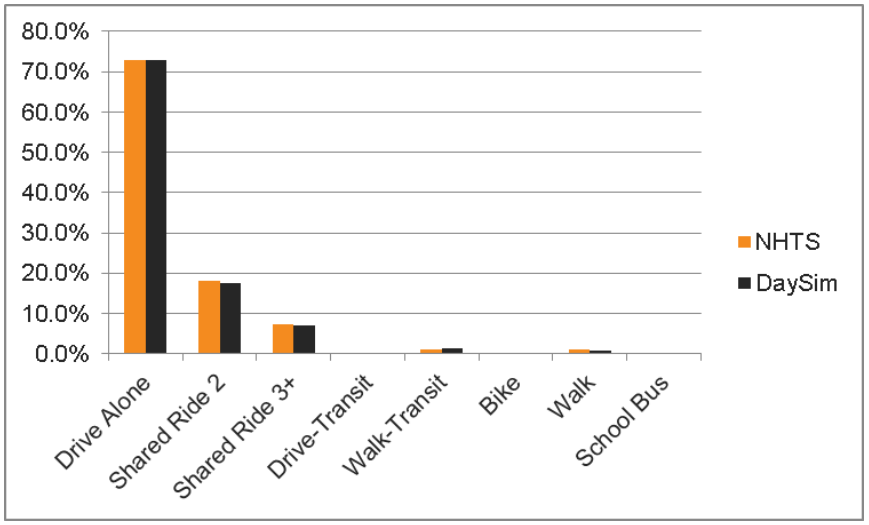


Tour Mode Choice

Tour Mode: All Purposes

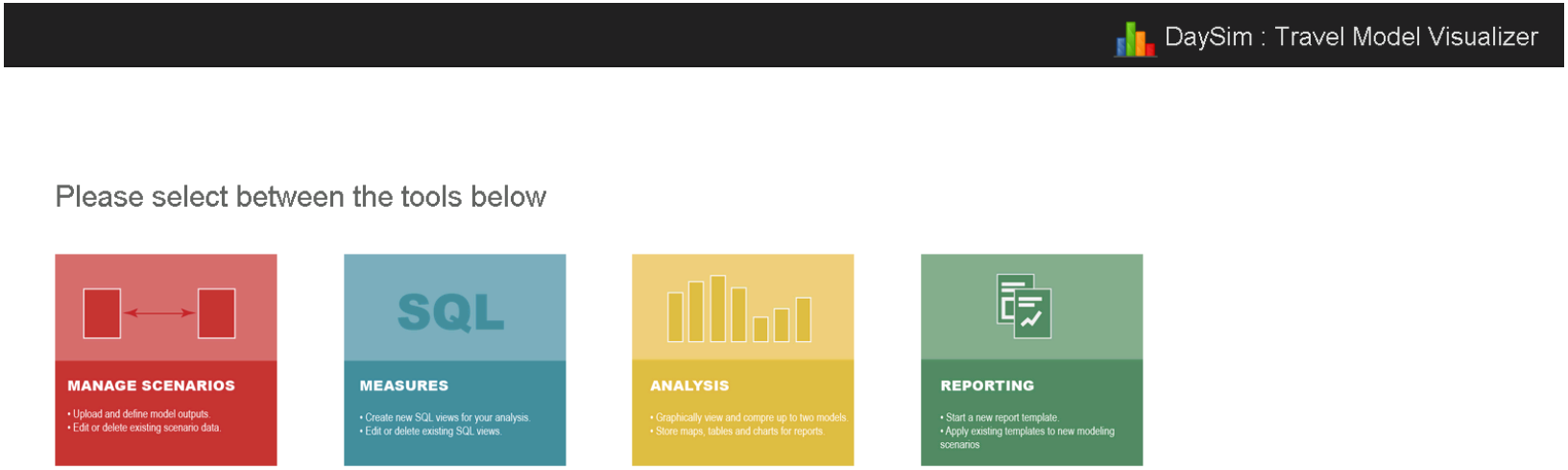
Mode	NHTS	DaySim	Diff
Drive Alone	41.6%	42.6%	1.0%
Shared Ride 2	23.1%	23.7%	0.6%
Shared Ride 3+	18.7%	19.5%	0.8%
Drive-Transit	0.0%	0.1%	0.1%
Walk-Transit	0.5%	0.7%	0.2%
Bike	1.8%	1.6%	-0.3%
Walk	11.4%	8.8%	-2.5%
School Bus	2.8%	3.0%	0.2%
Total	100.0%	100.0%	0.0%

Work Tour Mode Choice

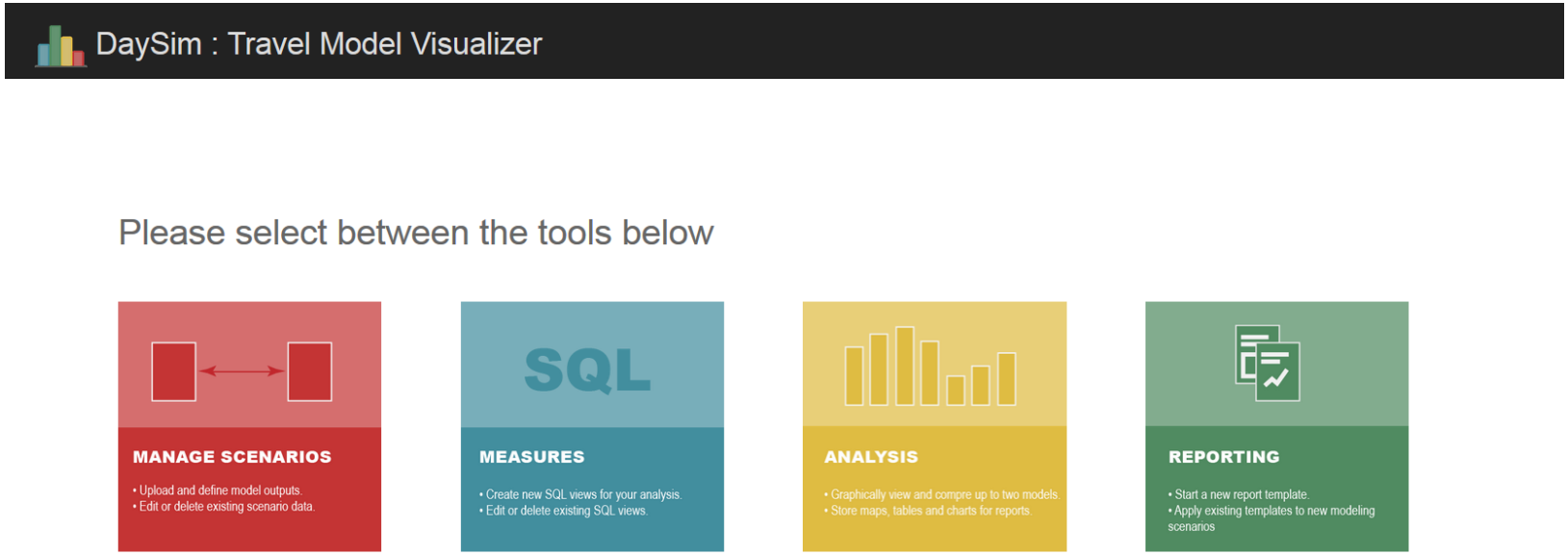


DaySim Visualizer

- A tool to visualize DaySim outputs
- Upload outputs from multiple scenarios
- Select or create travel characteristic measures
- Chart or map measures for one scenario or compare among two scenarios

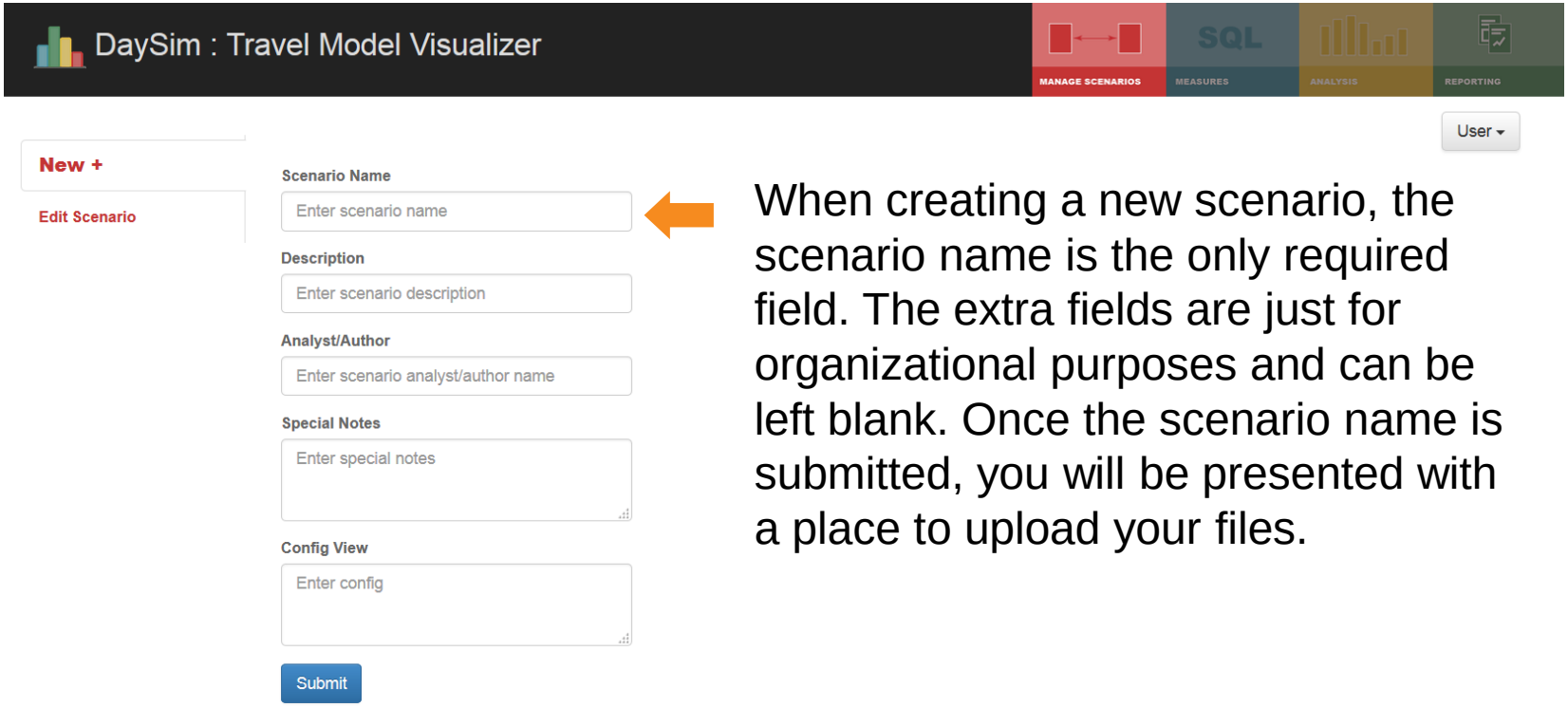


Dashboard



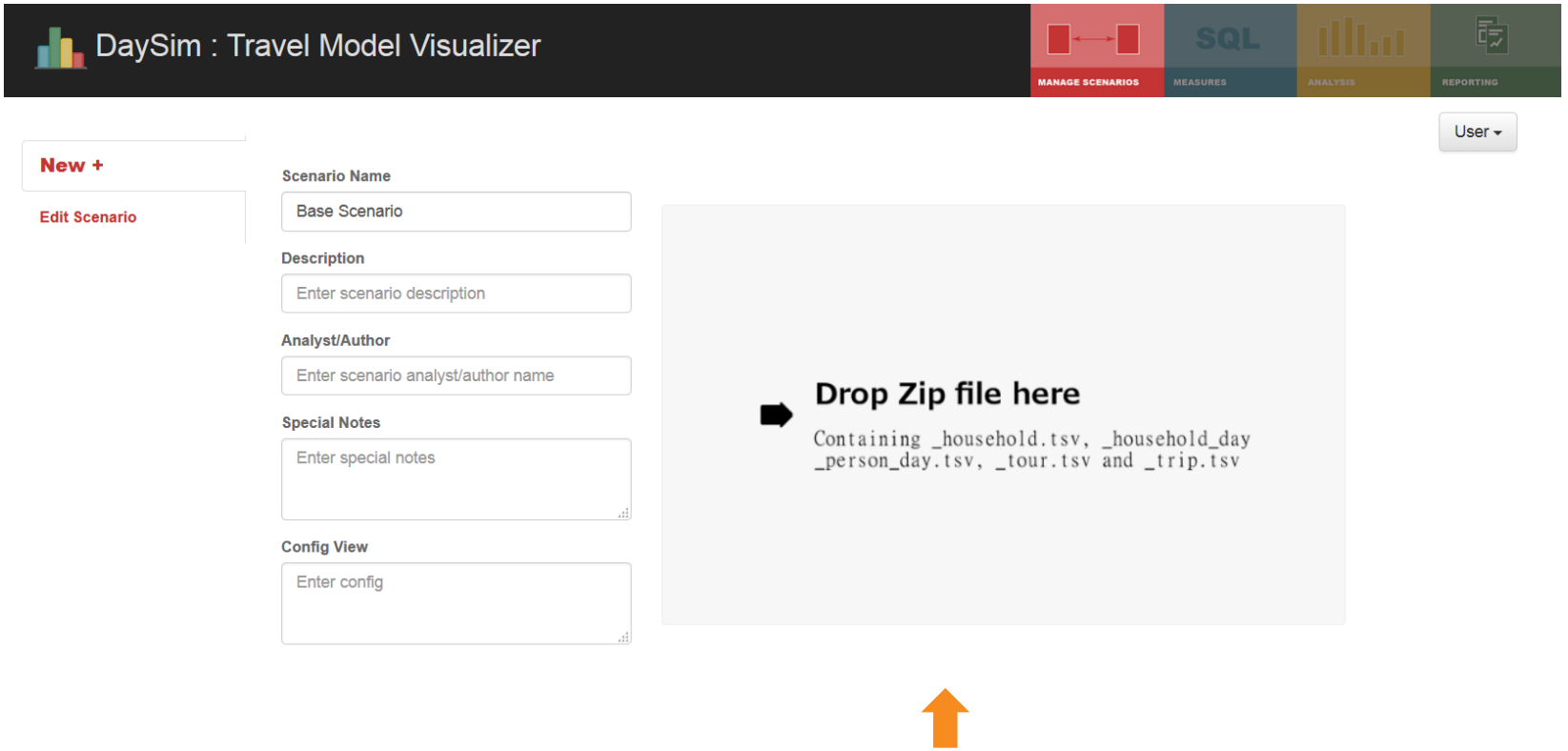
The dashboard allows you to select any one of the four main sections of the visualizer.

Scenario Creation



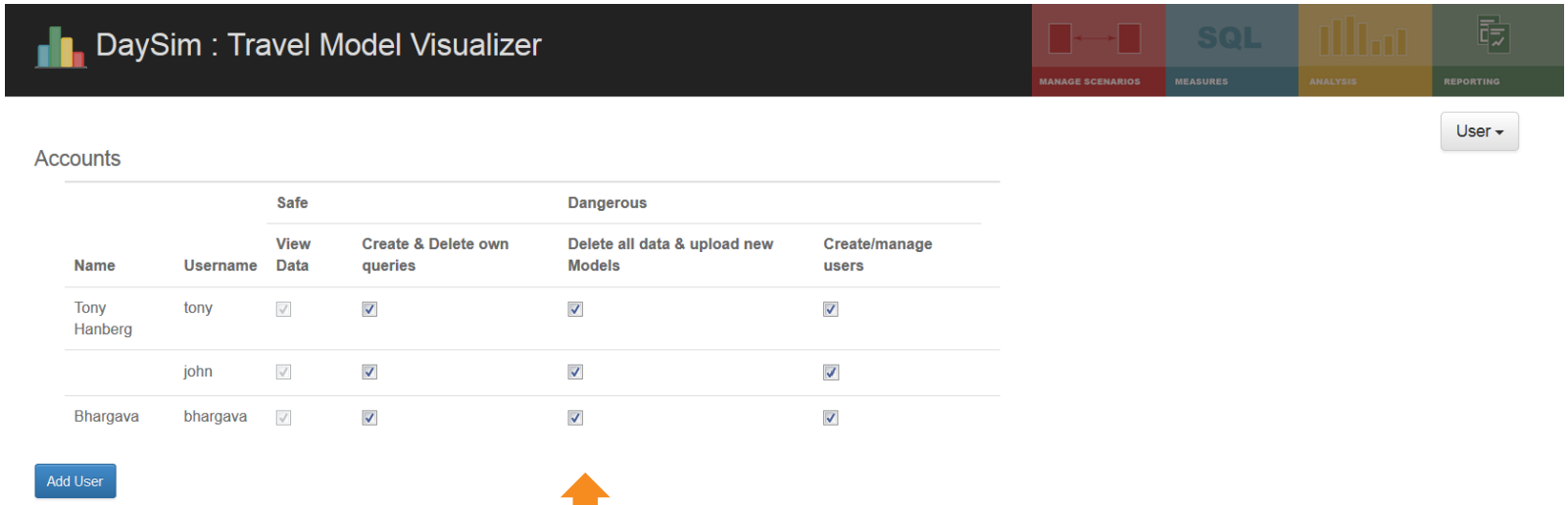
When creating a new scenario, the scenario name is the only required field. The extra fields are just for organizational purposes and can be left blank. Once the scenario name is submitted, you will be presented with a place to upload your files.

Scenario Creation



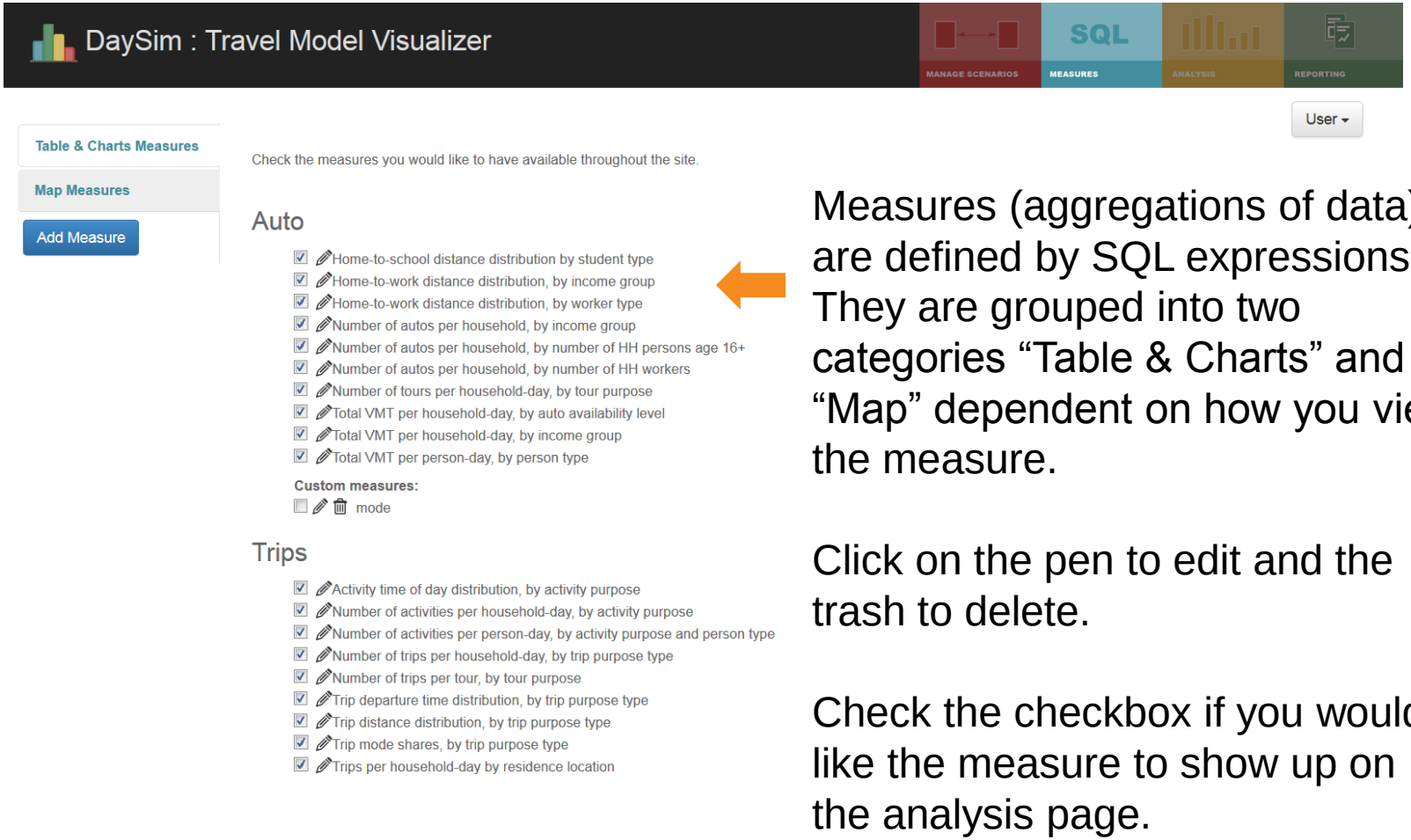
You will need to create a zip file containing the files specified above. You can either drag the zip file into the area or click on the area and browse to the file. It will take a while for the file to upload and the scenario and measures to be calculated.

User Setup



The permissions allow you to limit the functionality for specific users.

Measures

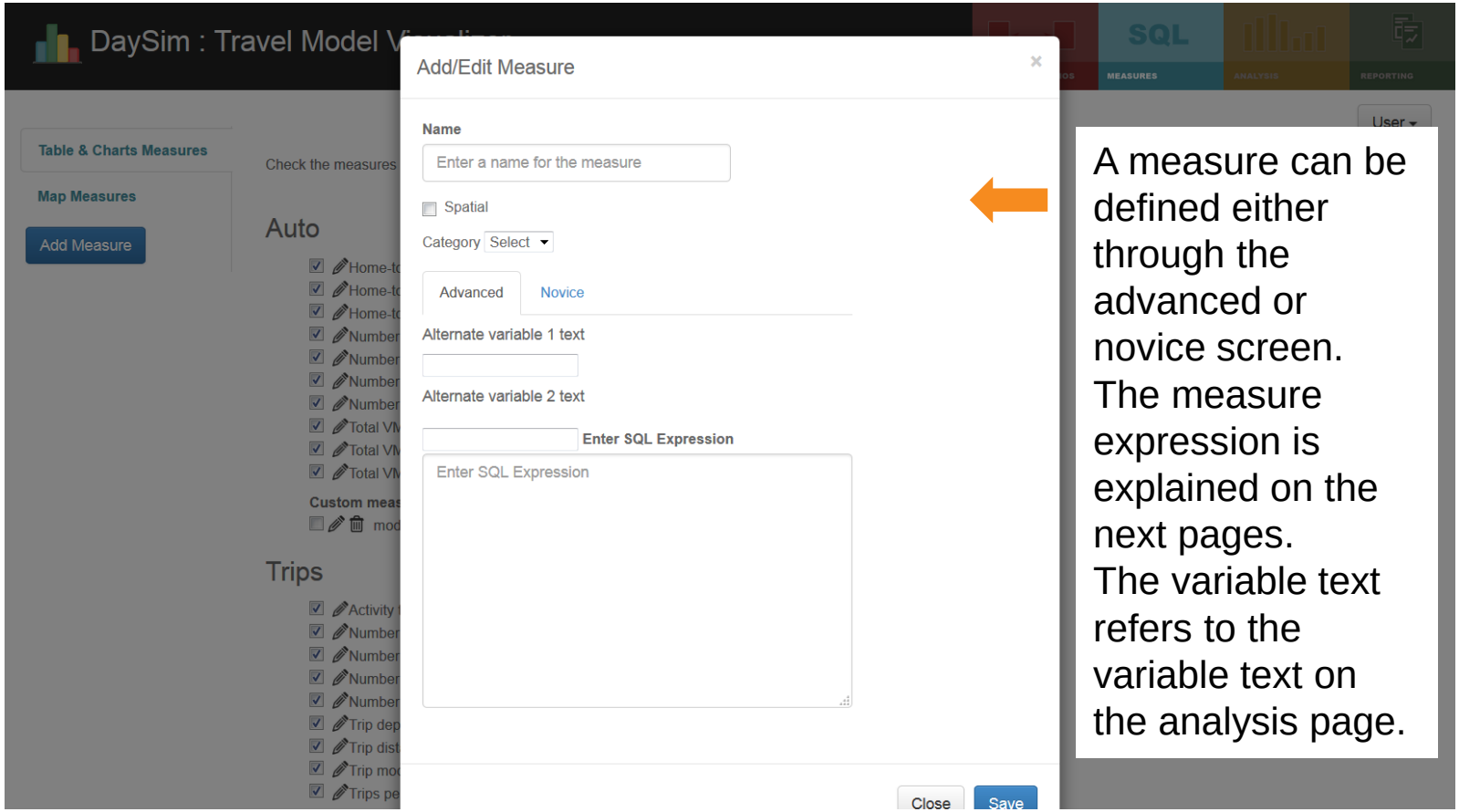


Measures (aggregations of data) are defined by SQL expressions. They are grouped into two categories “Table & Charts” and “Map” dependent on how you view the measure.

Click on the pen to edit and the trash to delete.

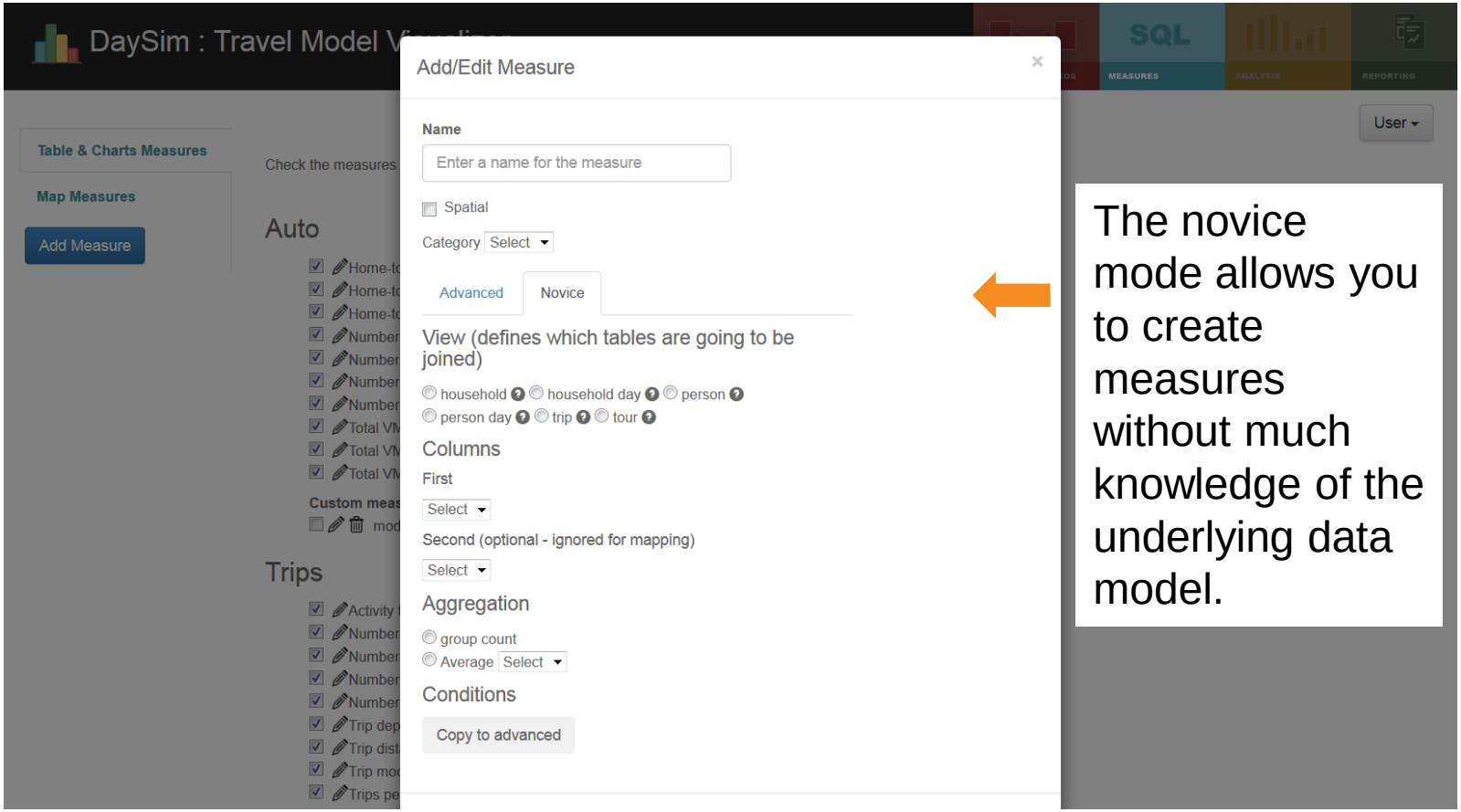
Check the checkbox if you would like the measure to show up on the analysis page.

New Measure



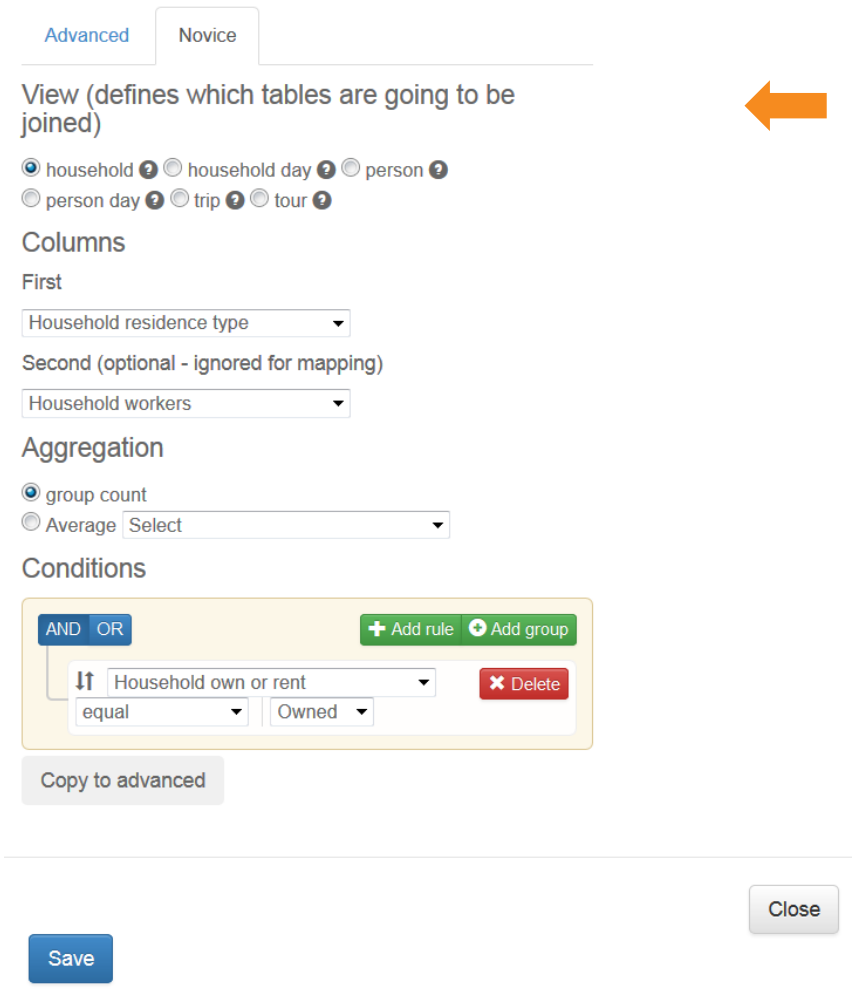
A measure can be defined either through the advanced or novice screen. The measure expression is explained on the next pages. The variable text refers to the variable text on the analysis page.

New Measure



The novice mode allows you to create measures without much knowledge of the underlying data model.

New Measure



When creating a new measure in the novice mode, you start by selecting the view containing the data you need in your query. The household view only contains elements from the household table, whereas the trip view contain data from all tables in the database (because of it's dependencies).

The Columns selected will be used for the grouping of data and the Aggregation settings for the values.

You can limit the selection with an unlimited number of conditions.

Analysis: Tables

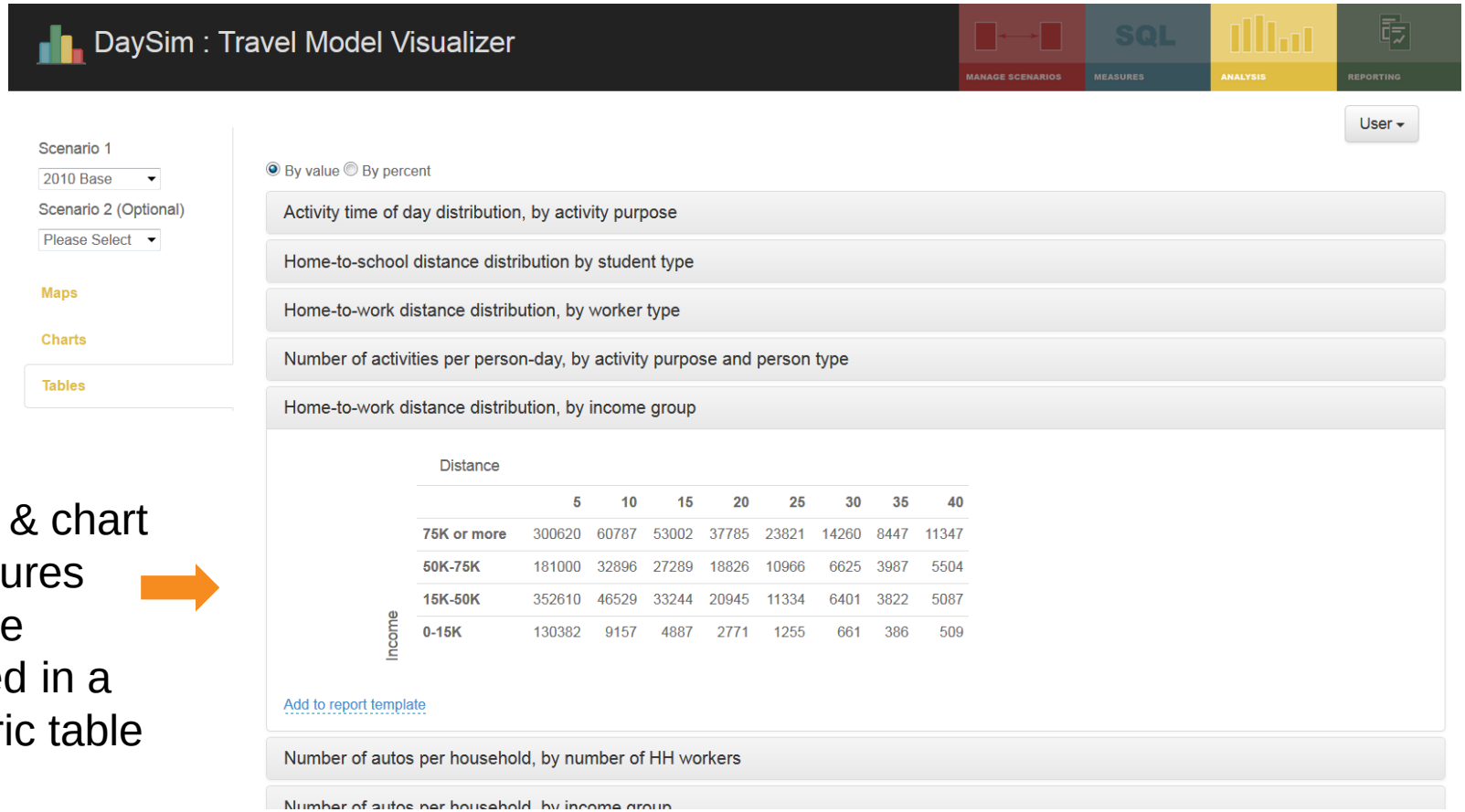
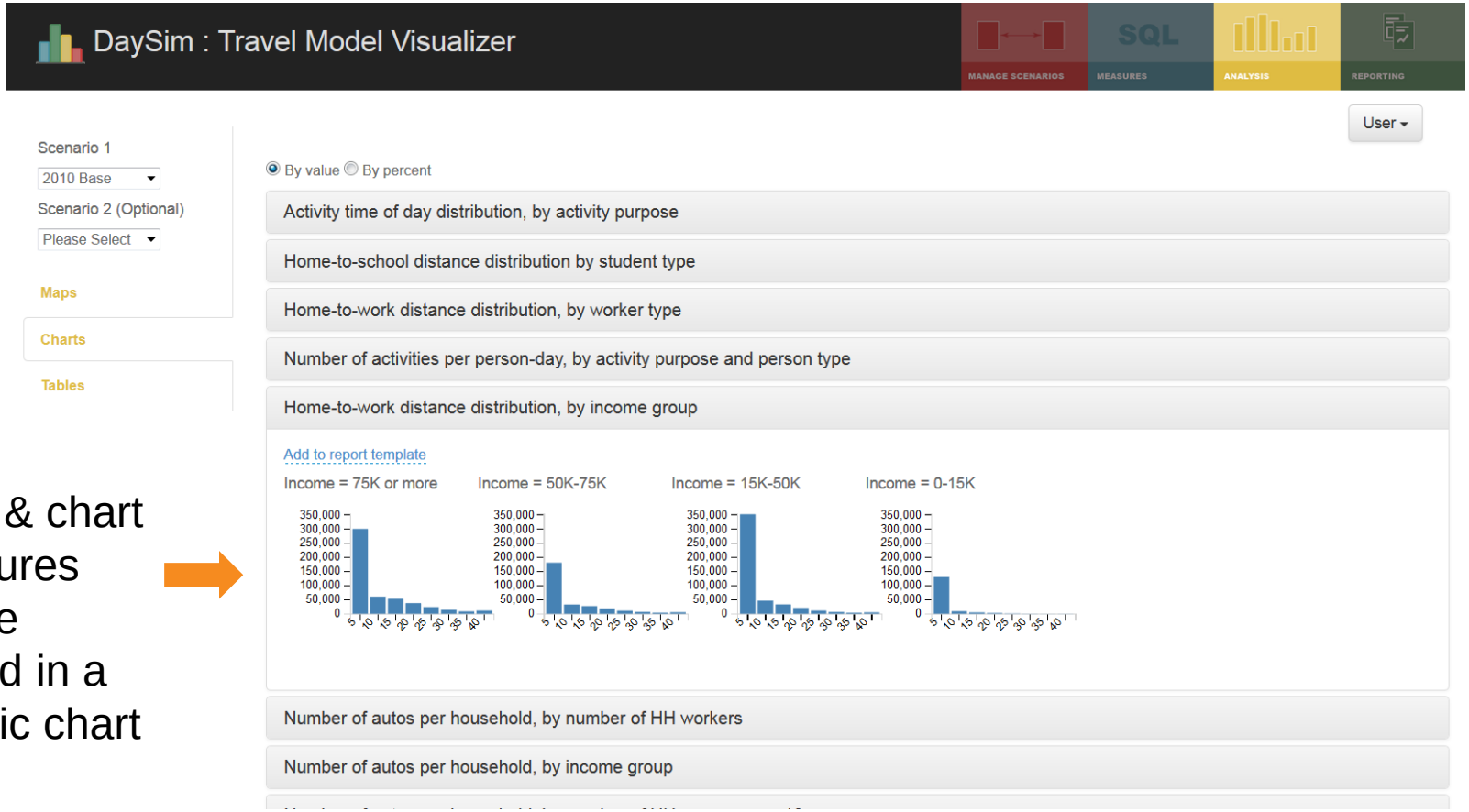


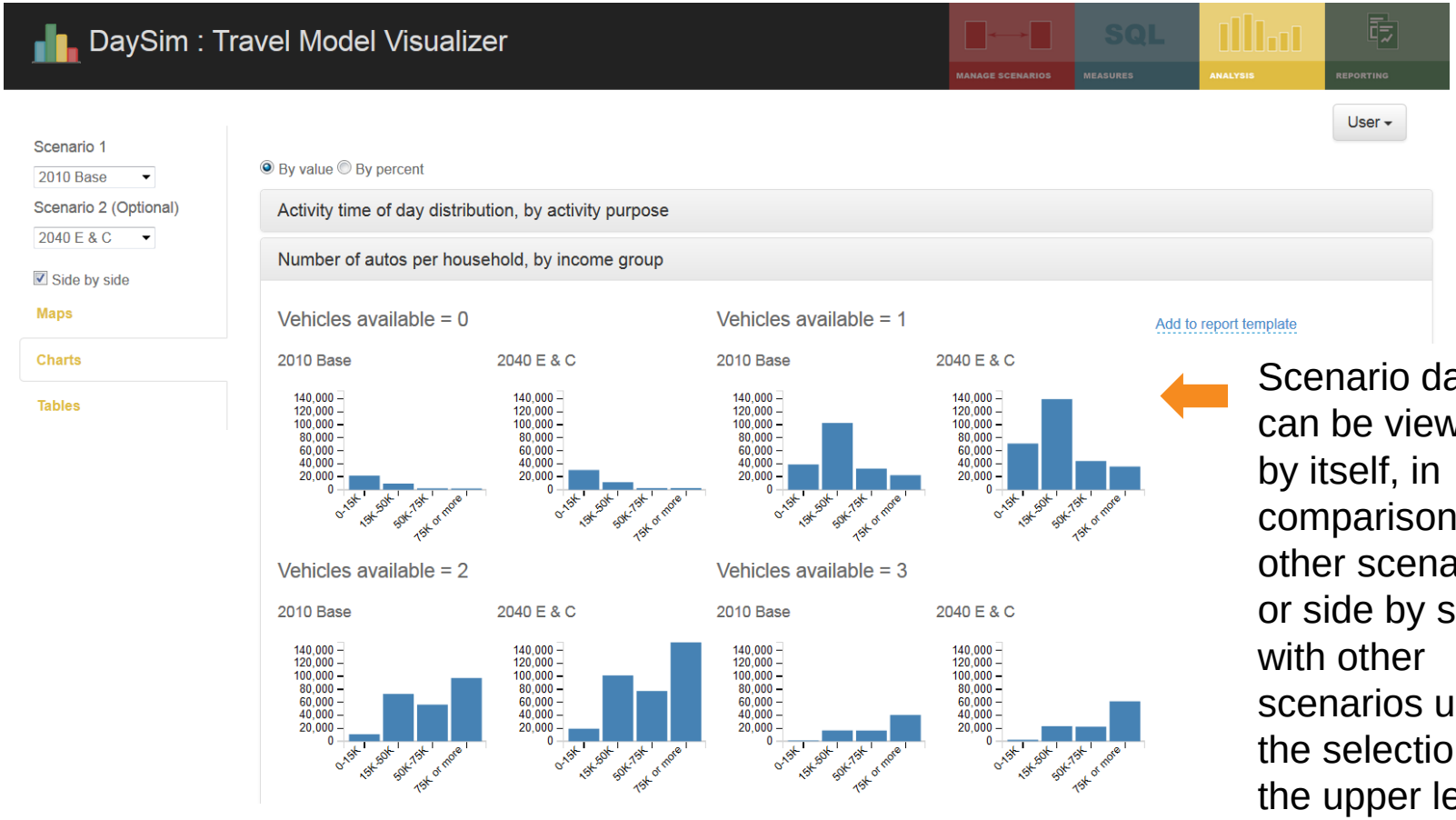
Table & chart measures can be viewed in a generic table

Analysis: Charts

Table & chart measures can be viewed in a generic chart

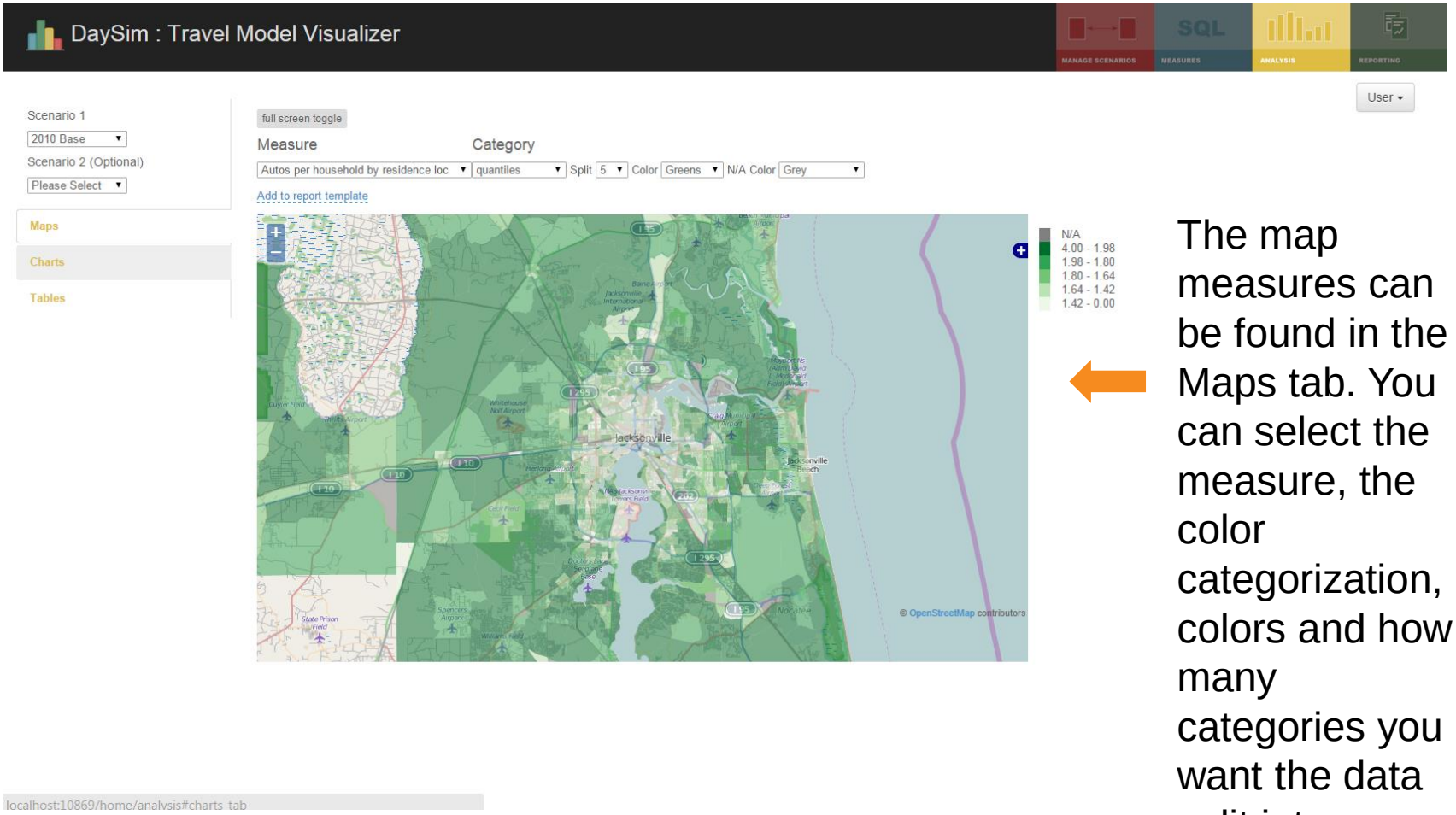


Analysis: Side by Side – Chart



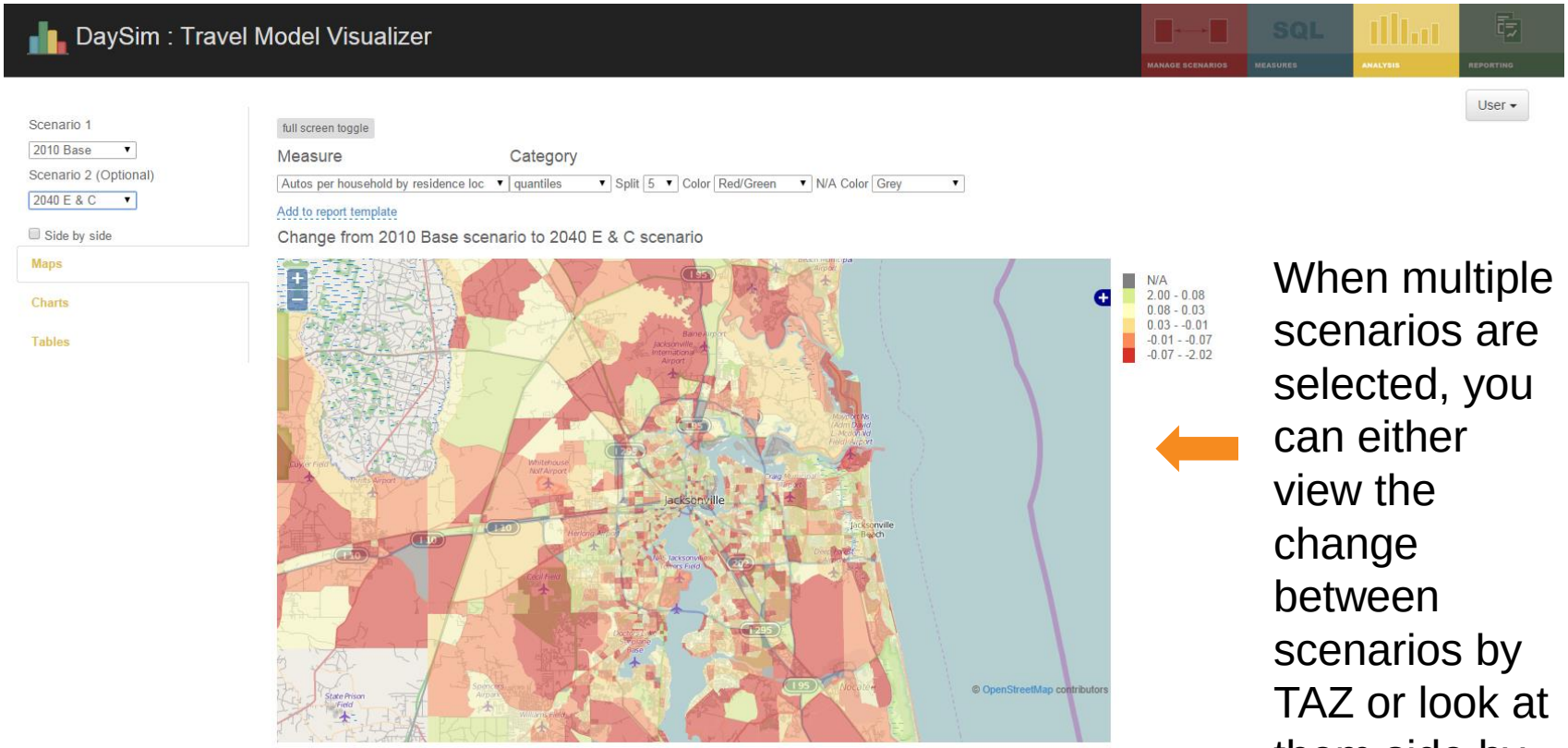
Scenario data can be viewed by itself, in comparison to other scenarios or side by side with other scenarios using the selection in the upper left.

Mapping



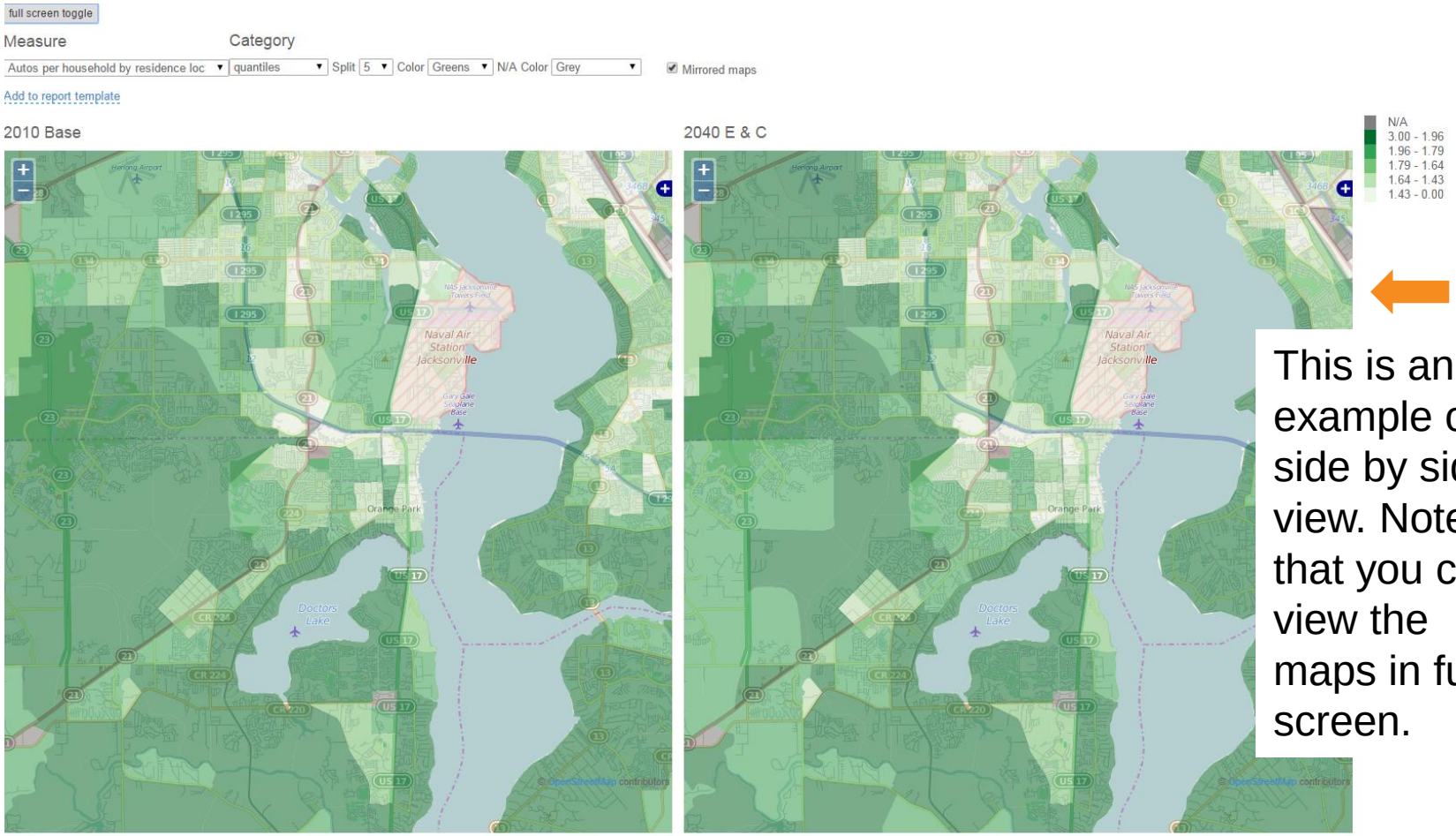
The map measures can be found in the Maps tab. You can select the measure, the color categorization, colors and how many categories you want the data split into.

Mapping: Change



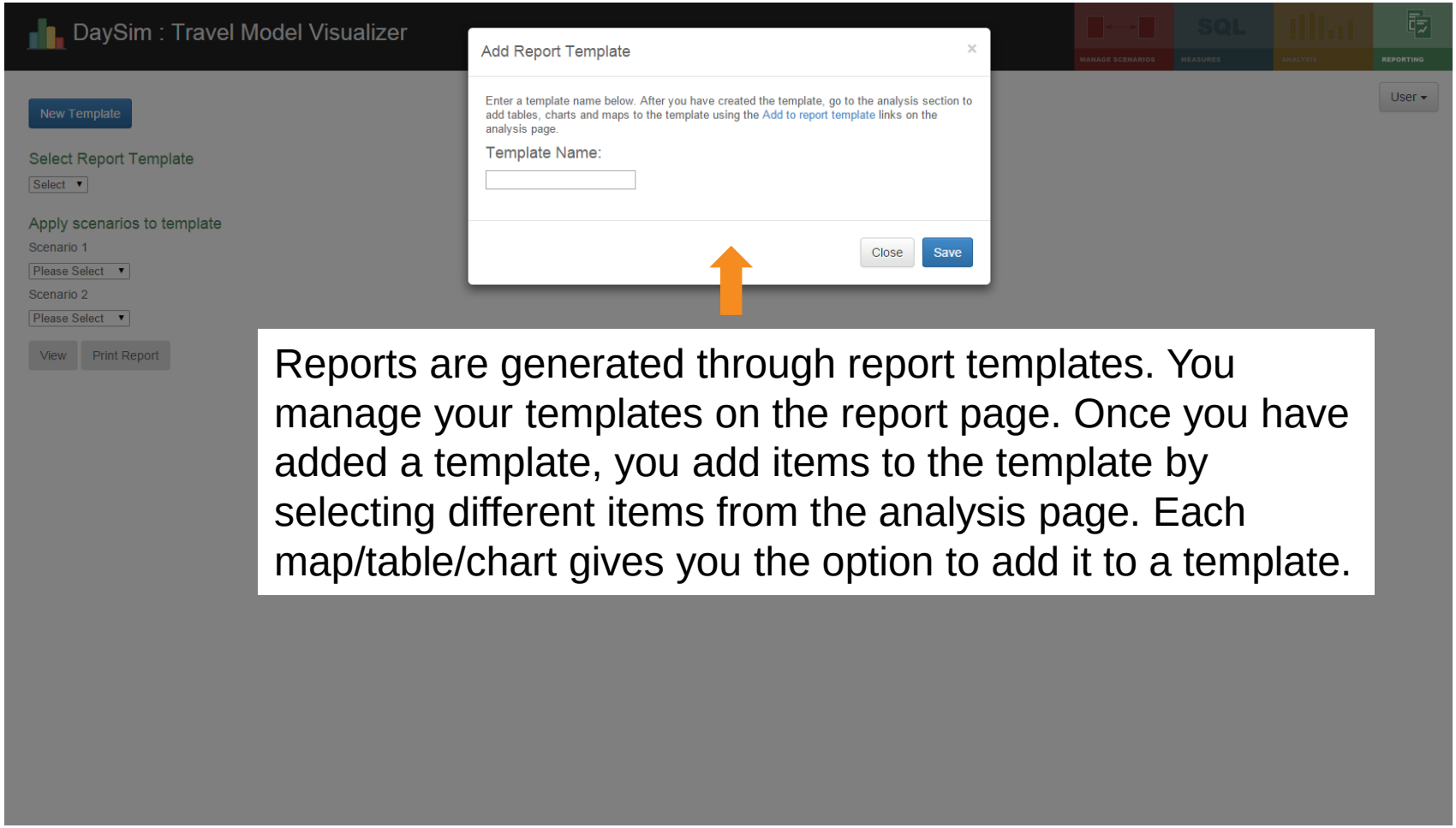
When multiple scenarios are selected, you can either view the change between scenarios by TAZ or look at them side by side.

Mapping: Side by Side – Full Screen



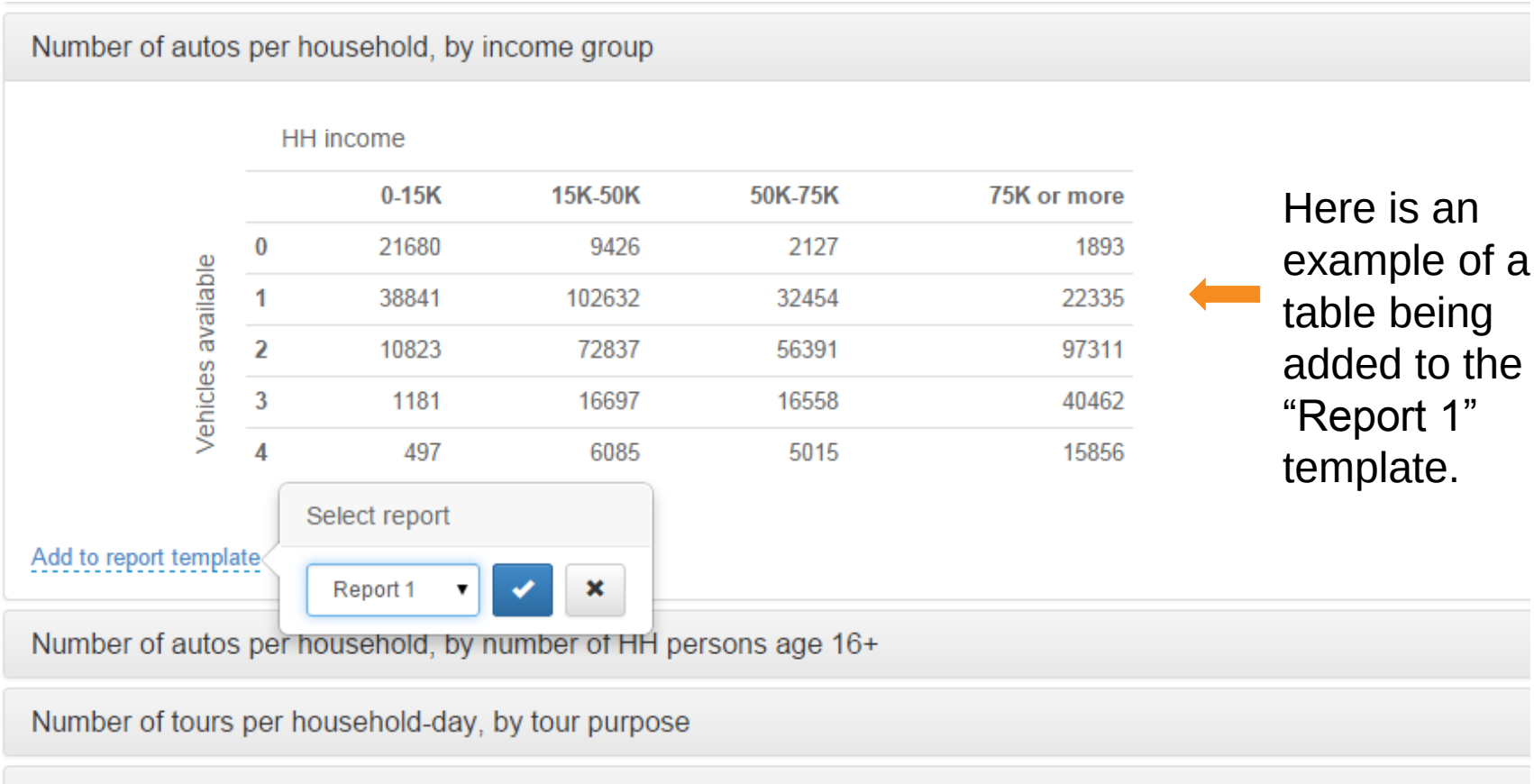
This is an example of a side by side view. Note that you can view the maps in full screen.

Reporting: Adding a Template



Reports are generated through report templates. You manage your templates on the report page. Once you have added a template, you add items to the template by selecting different items from the analysis page. Each map/table/chart gives you the option to add it to a template.

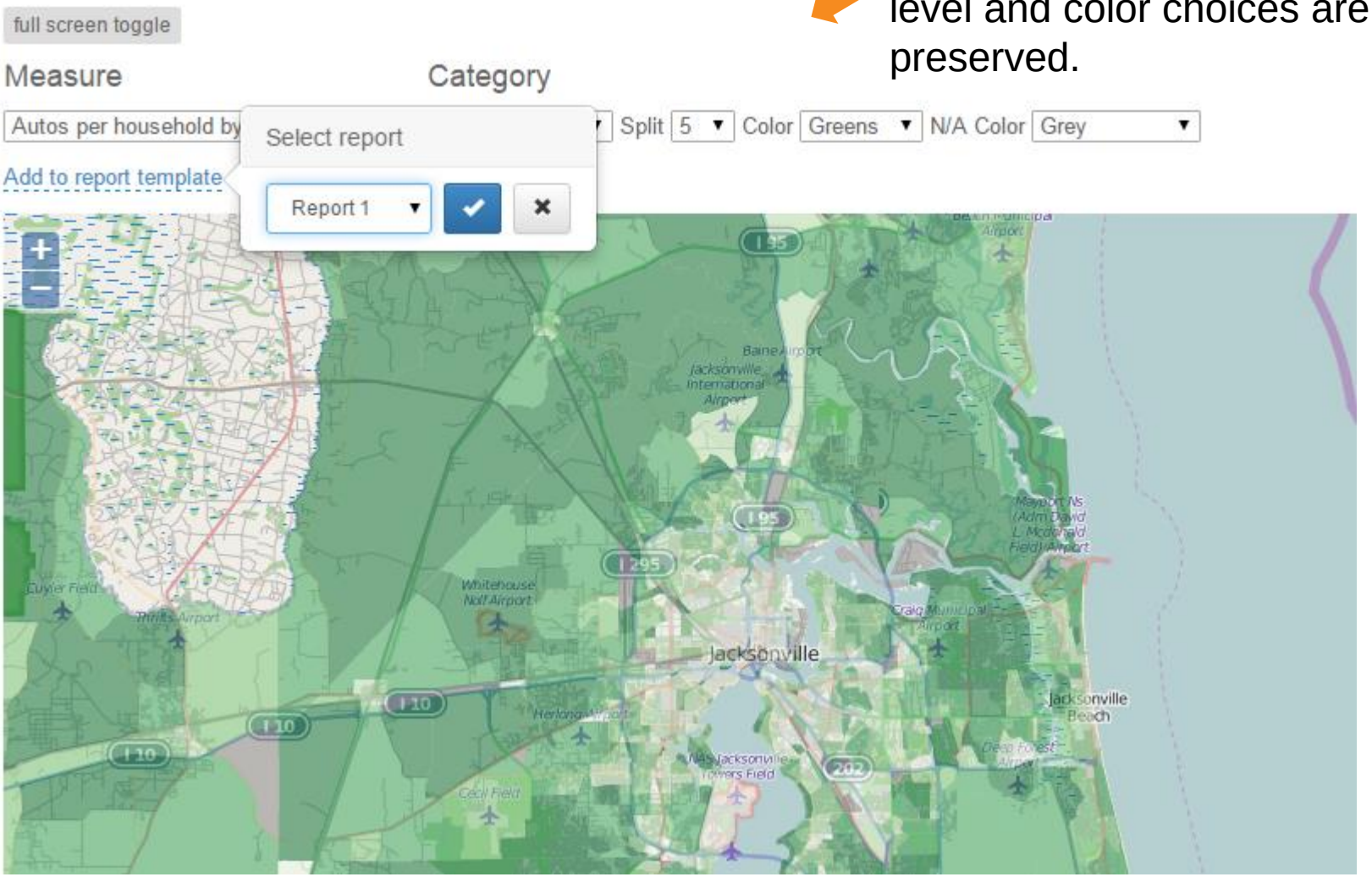
Reporting: Adding a Table



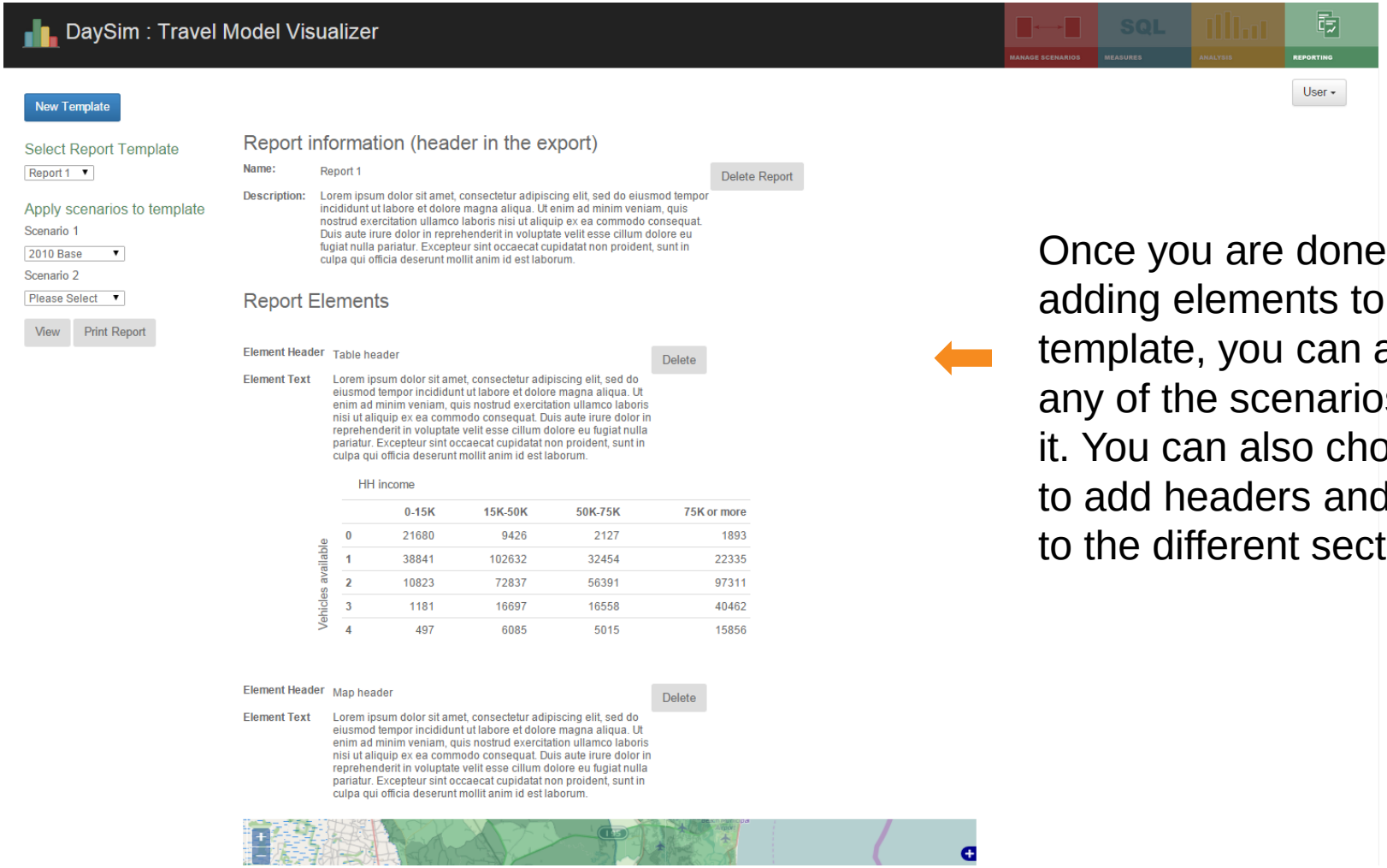
Here is an example of a table being added to the "Report 1" template.

Reporting: Adding a Map

Here is an example of a map being added to a template. Not that the map center, zoom level and color choices are preserved.

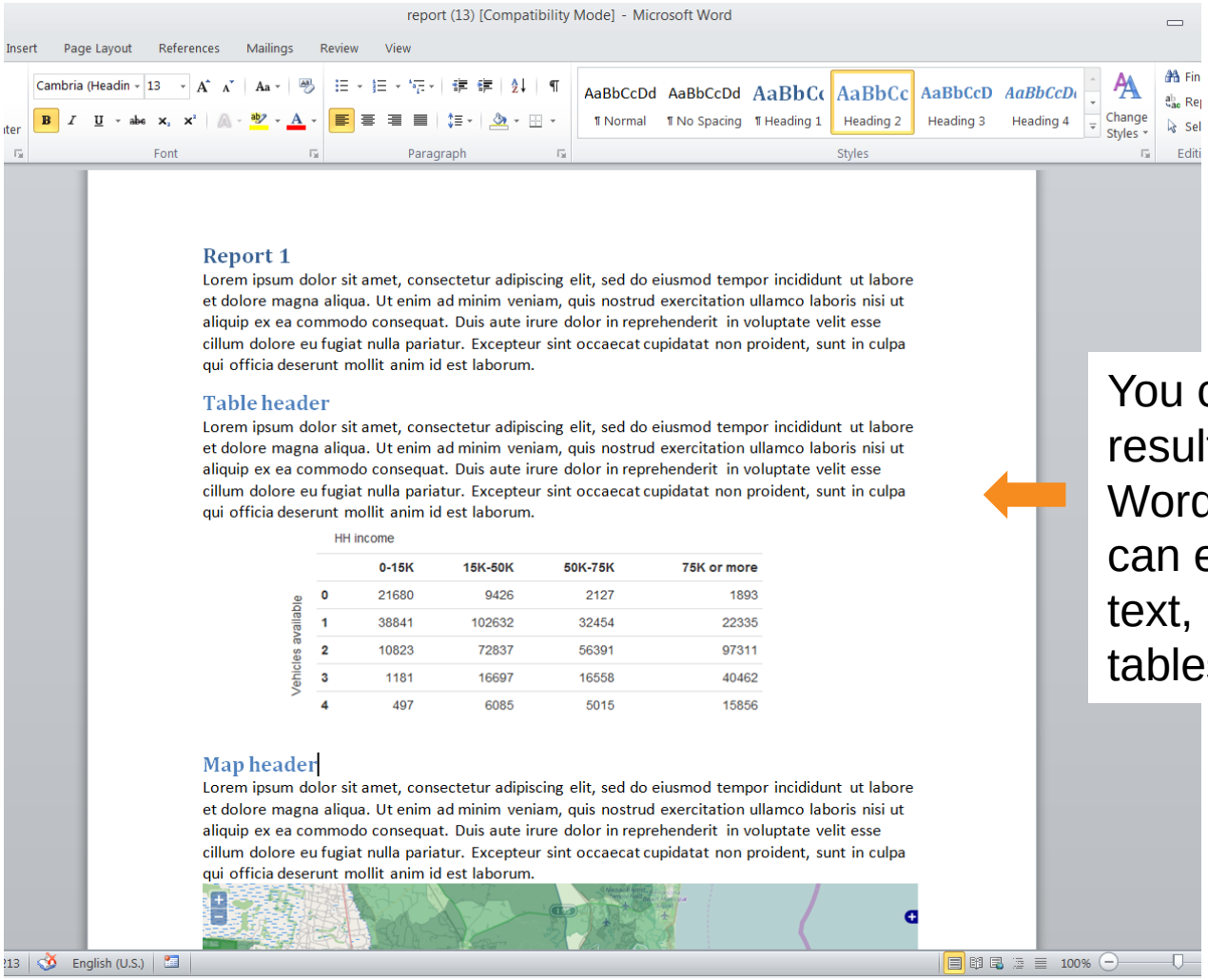


Reporting: Editing the Template



Once you are done adding elements to your template, you can apply any of the scenarios to it. You can also choose to add headers and text to the different sections.

Reporting: Exporting a Document



You can export the resulting report in Word format. You can edit the report text, but not the tables/charts/maps.

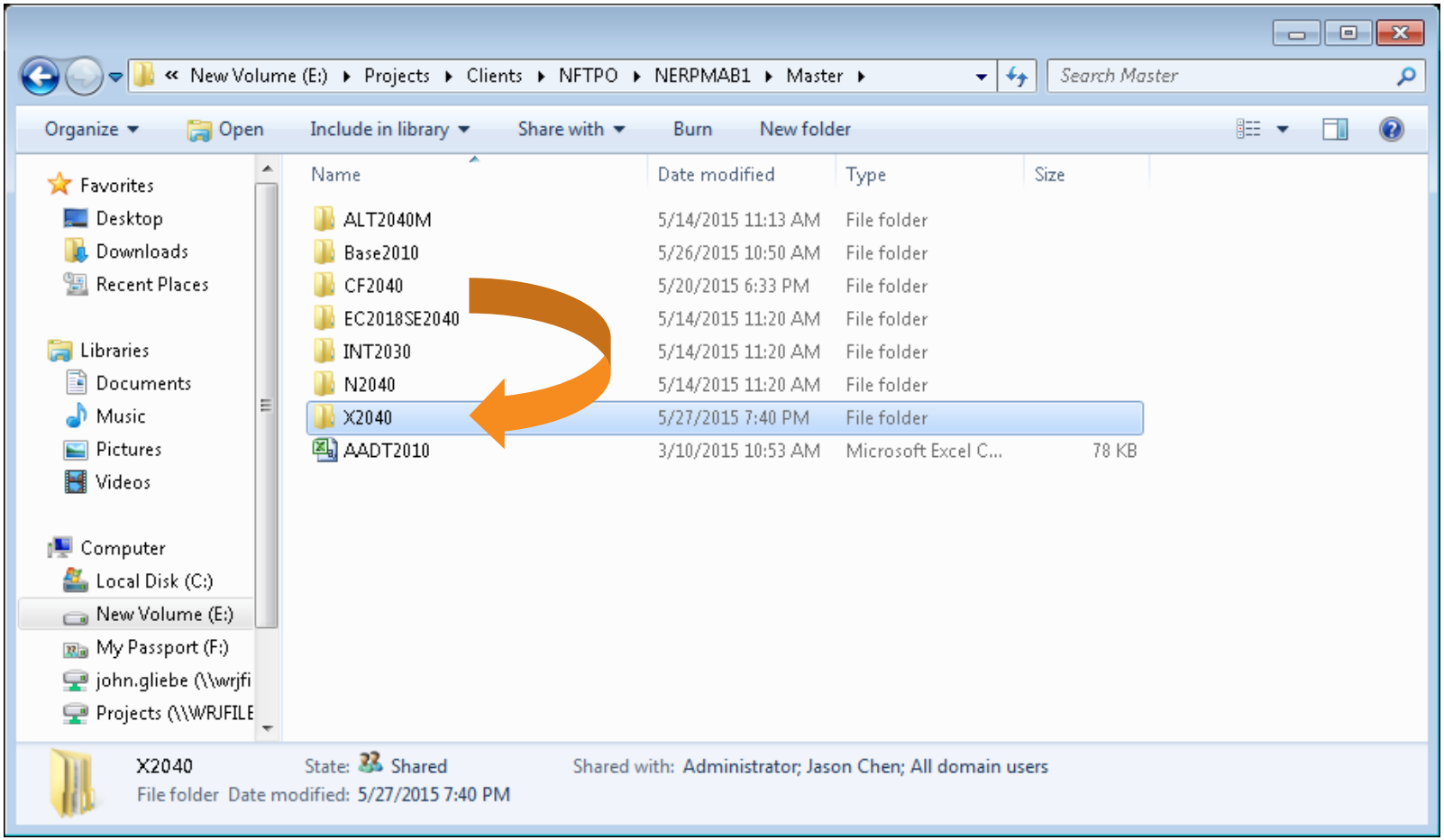
Break

Creating New Scenarios

Basic Steps in Creating New Scenarios

1. Identify the analysis year and the baseline scenario (e.g., 2010, 2030EC, 2040CF)
2. Create a new folder in the Master directory to represent your new scenario by copying a baseline scenario as a starter
3. Insert/replace any inputs to the scenario that you have created to represent your new scenario
4. In Cube, create a new “child” under Master or “sibling” from the baseline scenario you have chosen to copy
5. Update the key fields in the Cube catalog to point to the proper input files/paths (first screen in editor)

Create a New Folder in the Master Directory to Represent Your New Scenario by Copying a Baseline Scenario as a Starter

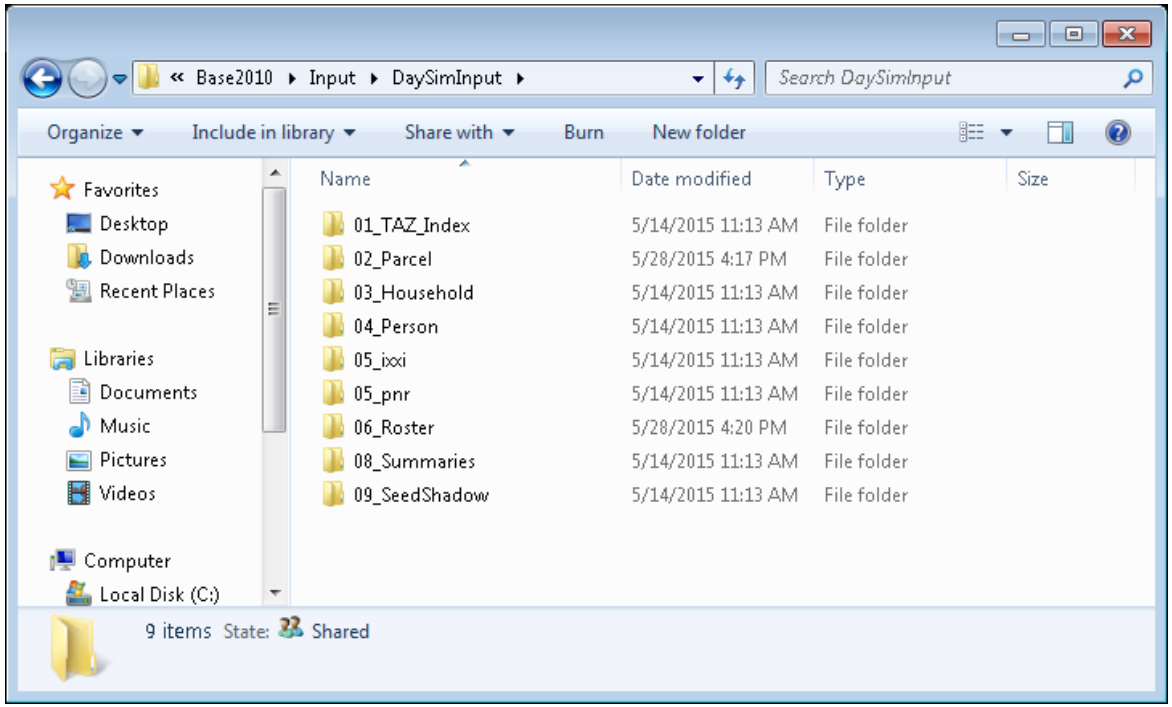


Insert/Replace any Inputs to the Scenario that you to Represent your new Scenario

- Depends on what is different from baseline
- Likely candidates for change:
  - SocEc & Land-use inputs
    - Parcel file with updated…
      - households, employment, transit distances
    - Zonal employment
    - Synthetic households
  - Highway and/or transit networks with coded changes
  - Mode-path rosters specifying which skims to use

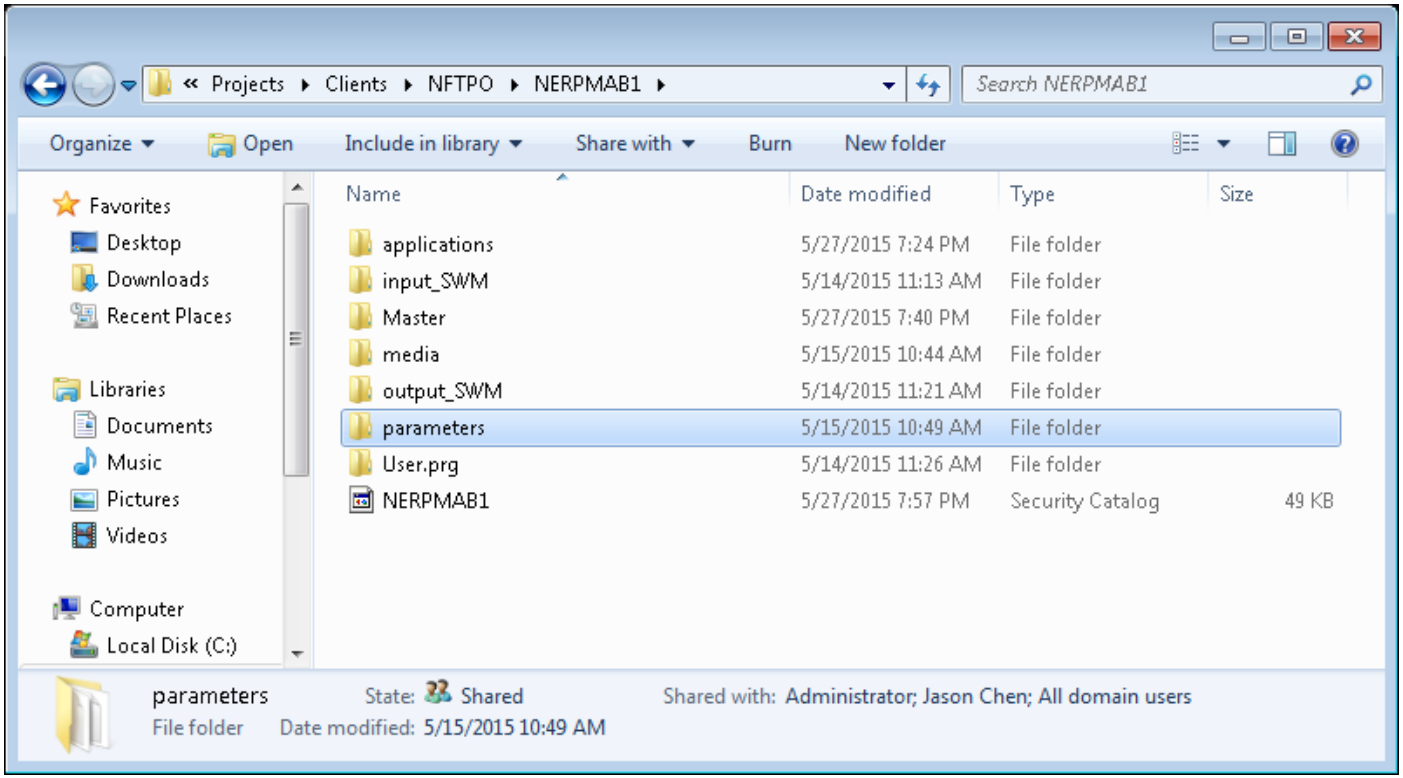
DaySim Input File Folders

- Copy from a baseline scenario, choosing the appropriate year and network assumption (base-year, existing & committed, cost-feasible, etc.)



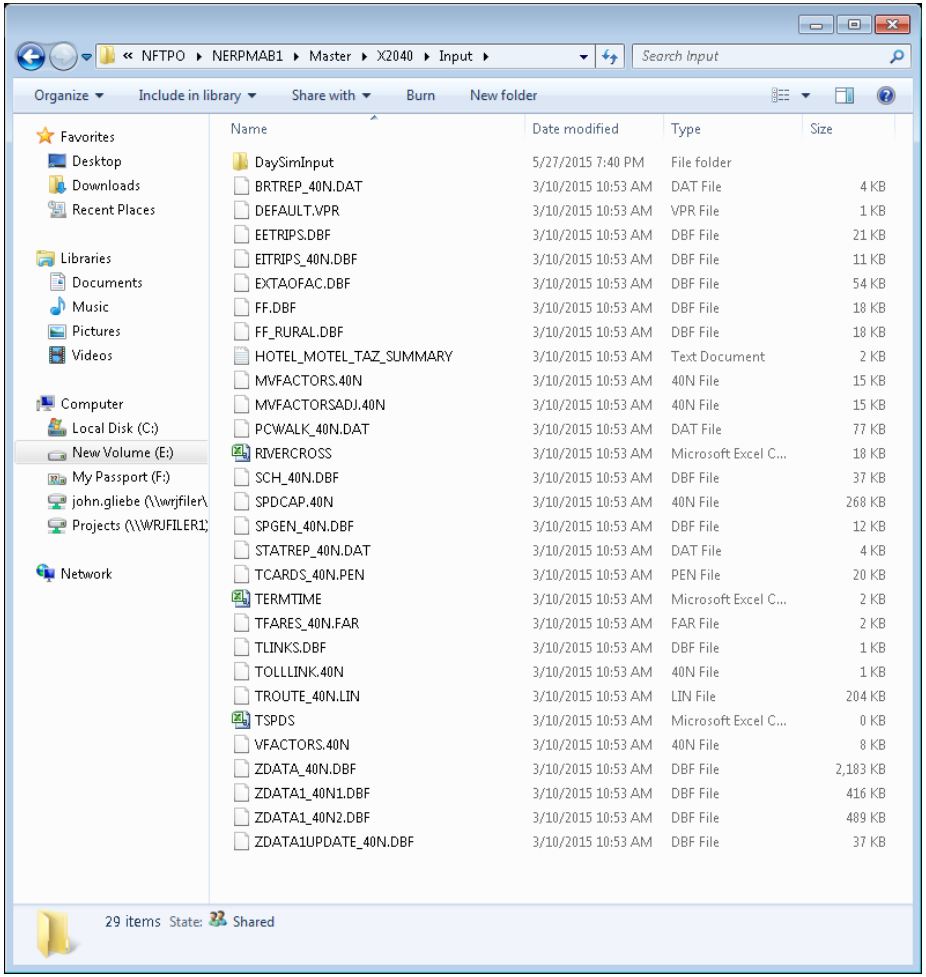
Generic Inputs

- Master micro-coded network and other files used by multiple scenarios are in familiar folders (NERPM 4.2)

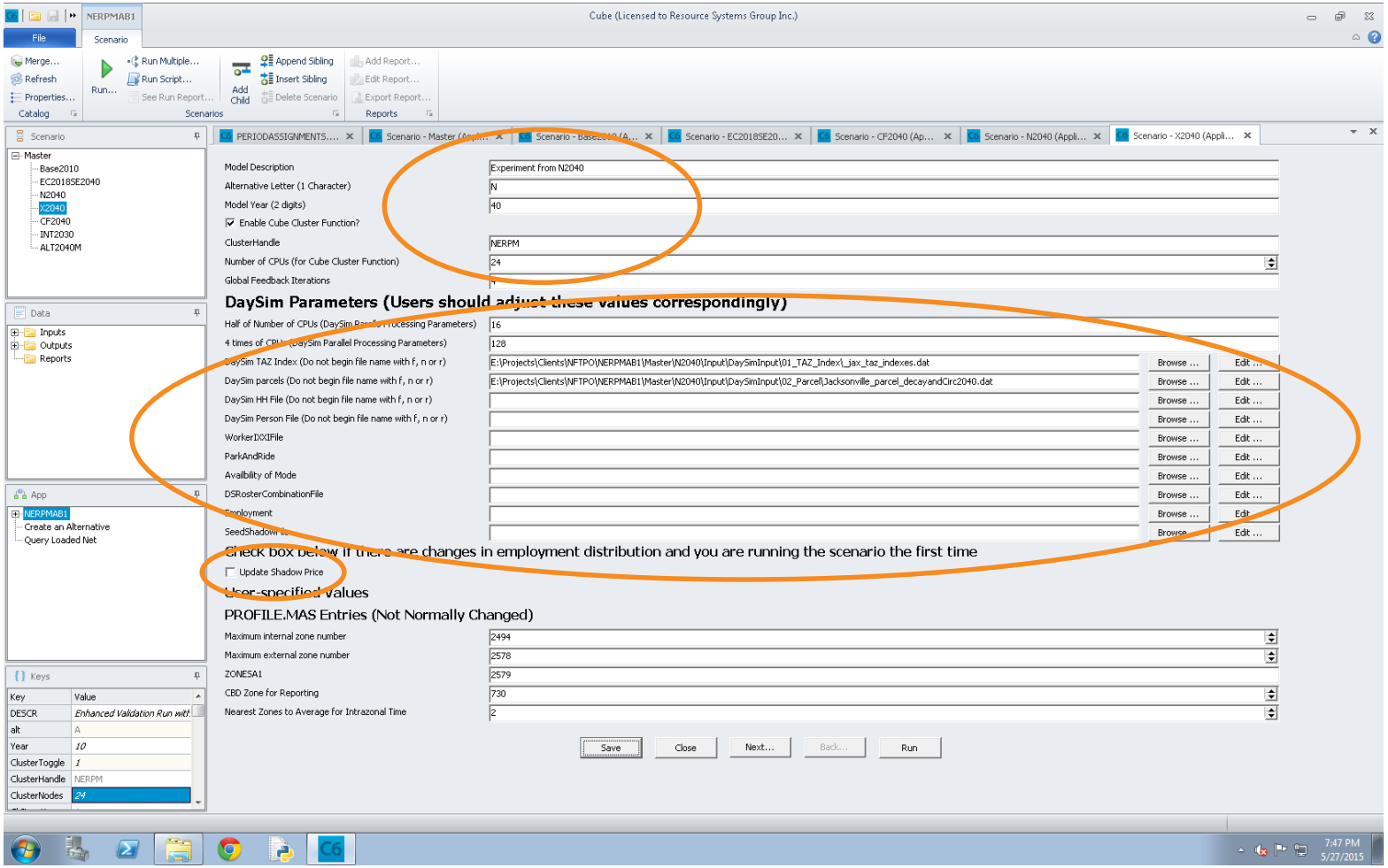


Non-DaySim Inputs Specific to Scenarios

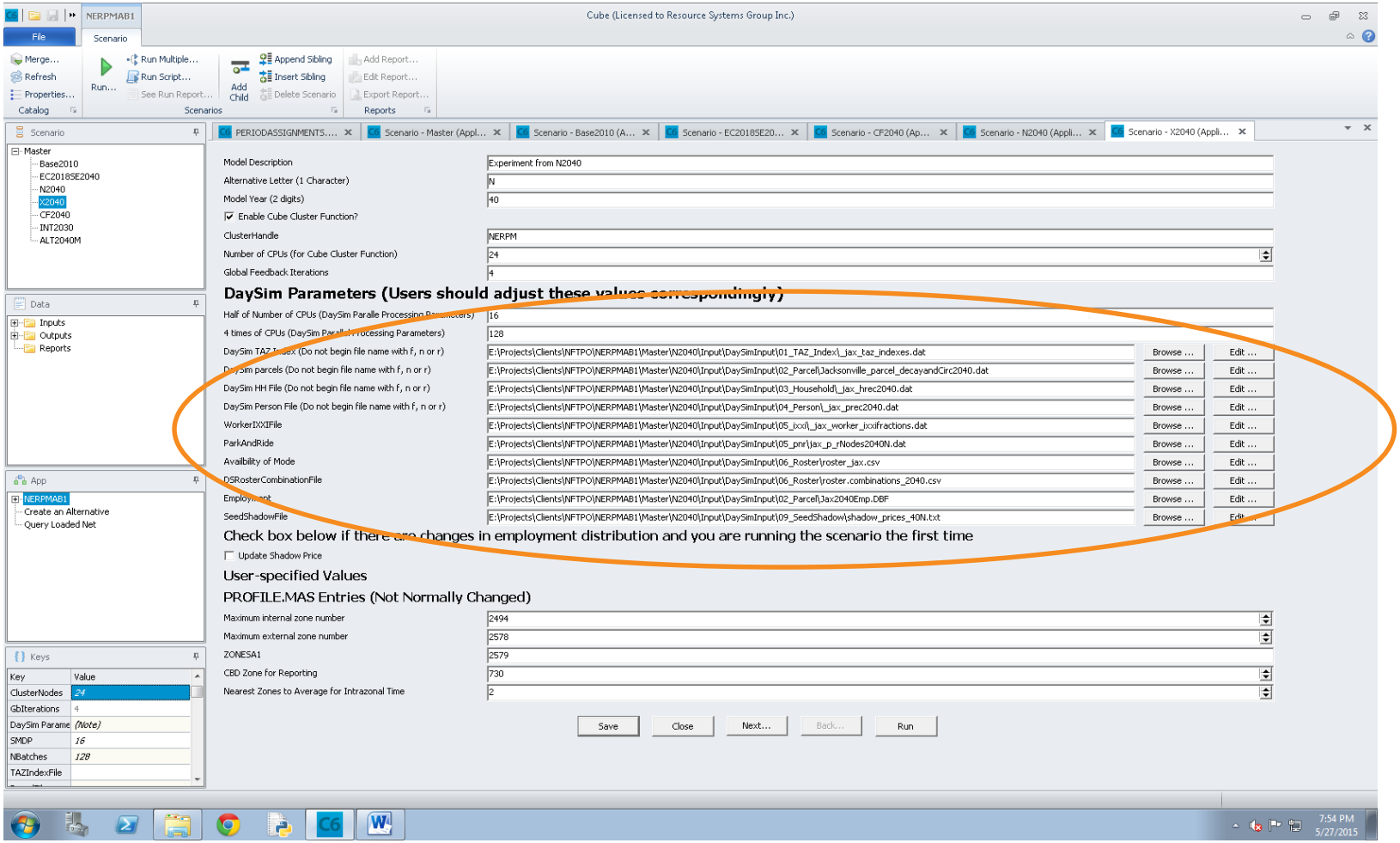
- Make sure other inputs copied from baseline scenario are relevant to the analysis



Update Key Fields in the Cube Catalog to Point to the Proper Input Files/Paths



Update Key Fields in the Cube Catalog to Point to the Proper Input Files/Paths



General Time Saving Tips

- Do **not** need to run the population synthesizer unless introducing a region-wide alternative land use scenario
- Do **not** need to update employment and enrollment shadow prices unless introducing an region-wide alternative land use scenario, or a very large commercial development that would be expected to have a regional impact on commuting patterns
- Do **not** need to run buffering tools to update parcel buffer variables unless an analysis objective is to evaluate walkability, bikeability, or transit access
- Cube Cluster is recommended for faster highway assignment with multi-processing. Currently, Cluster seems to have problems with select link/zone path saving, so use these features only when needed

Scenarios: Land Use Impacts

How is Land Use Impact Analysis different with NERPM-AB?

- Use of parcel files for direct input of proposed developments—more precise local impacts
- Network assigned volumes created for four time periods—more precise estimates
- New procedures:
  - Use baseline land use-parcel file for year(s) of analysis
  - Update of parcel file to add households and employment
  - If new households, update synthetic population

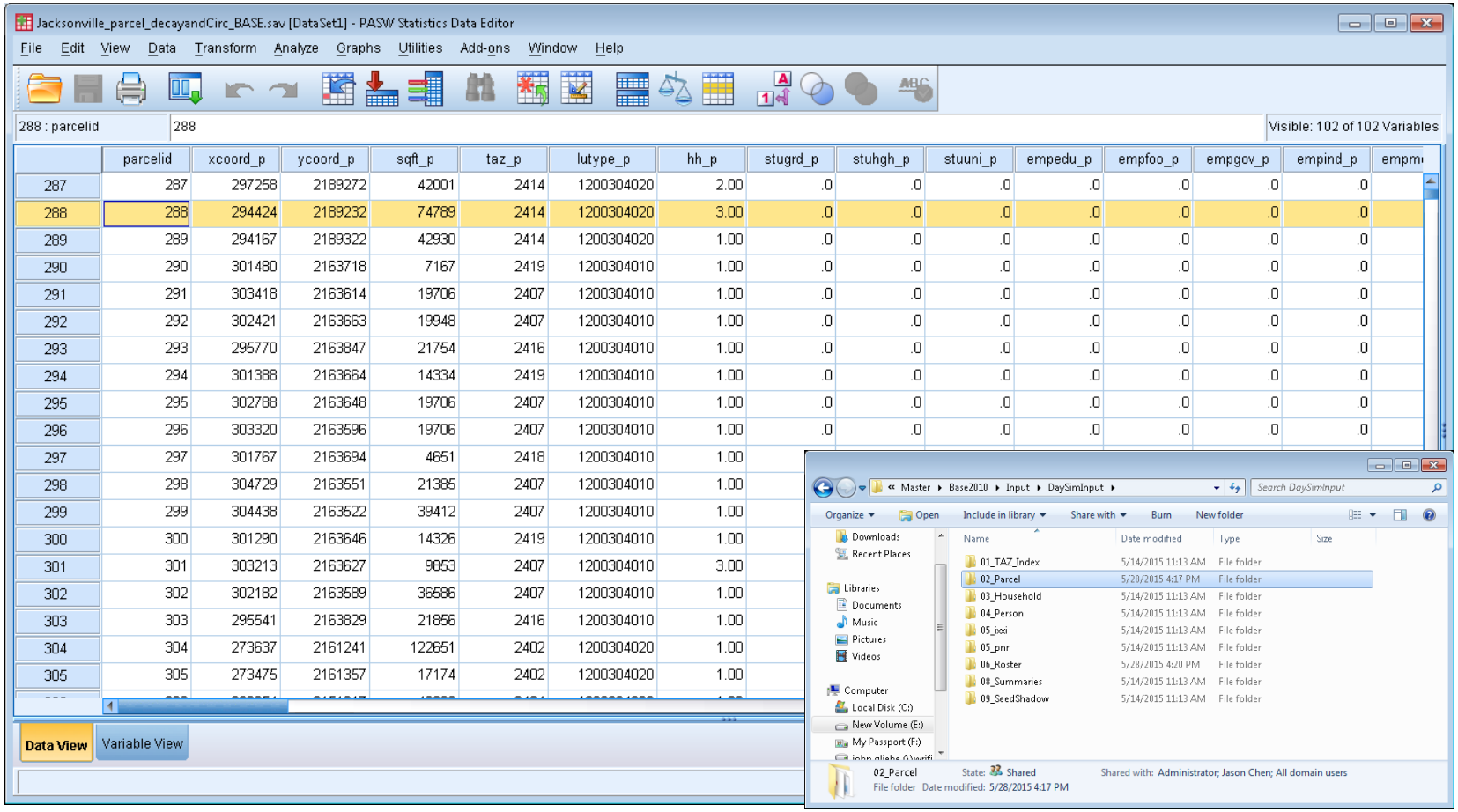
What to Consider

- What to do if you don’t have a future base run?
- What is the base year of your analysis?
- How many employees and in what categories are in the proposed project?
- What is the assumed population change and demographic assumptions
- What parcel(s) are impacted by the development?
- Are there any roadway changes?

If Adding Households…

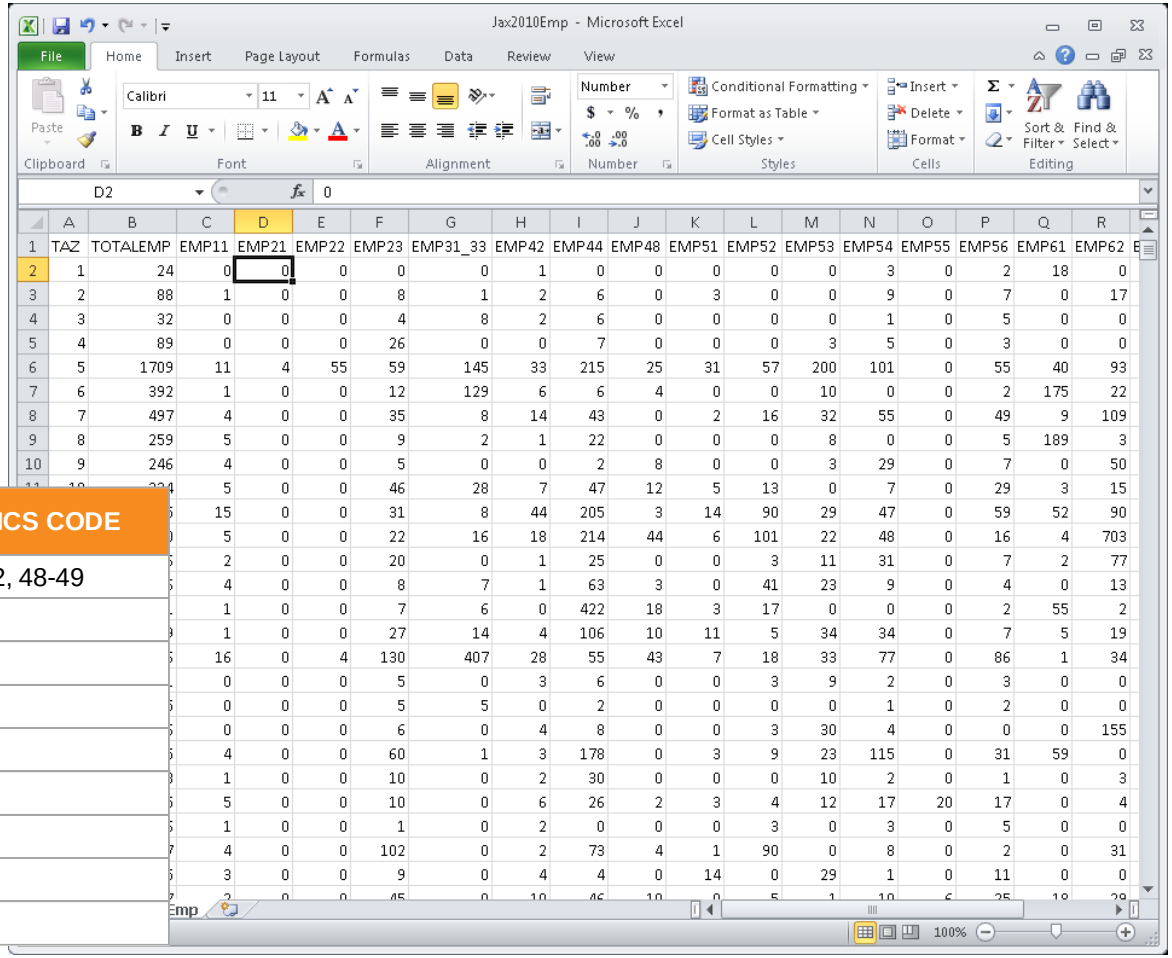
1. Identify affected parcels (or nearest parcel) in the DaySim parcel file
   - For 2010: Jacksonville_parcel_decayandCirc.dat
   - For 2040: Jacksonville_parcel_decayandCirc2040
   - Interim years to be made available
   - Add number of *households* based on the expected *occupied* housing units
2. Update the Synthetic Population
   - Use baseline household and person files for the year of analysis. Currently, 2010 and 2040 files for:
     - _jax_hrec.dat
     - _jax_prec.dat
   - Interim years to be made available

Parcel File


Jacksonville_parcel_decayandCirc_BASE.sav [DataSet1] - PASW Statistics Data Editor
File Edit View Data Transform Analyze Graphs Utilities Add-ons Window Help
288 : parcelid
288
Visible: 102 of 102 Variables
parcelid xcoord_p ycoord_p sqft_p taz_p lutype_p hh_p stugrd_p stuhgh_p stuuni_p empedu_p empfoo_p empgov_p empind_p
287 287 297258 2189272 42001 2414 1200304020 2.00 .0 .0 .0 .0 .0 .0 .0
288 288 294424 2189232 74789 2414 1200304020 3.00 .0 .0 .0 .0 .0 .0 .0
289 289 294167 2189322 42930 2414 1200304020 1.00 .0 .0 .0 .0 .0 .0 .0
290 290 301480 2163718 7167 2419 1200304010 1.00 .0 .0 .0 .0 .0 .0 .0
291 291 303418 2163614 19706 2407 1200304010 1.00 .0 .0 .0 .0 .0 .0 .0
292 292 302421 2163663 19948 2407 1200304010 1.00 .0 .0 .0 .0 .0 .0 .0
293 293 295770 2163847 21754 2416 1200304010 1.00 .0 .0 .0 .0 .0 .0 .0
294 294 301388 2163664 14334 2419 1200304010 1.00 .0 .0 .0 .0 .0 .0 .0
295 295 302788 2163648 19706 2407 1200304010 1.00 .0 .0 .0 .0 .0 .0 .0
296 296 303320 2163596 19706 2407 1200304010 1.00 .0 .0 .0 .0 .0 .0 .0
297 297 301767 2163694 4651 2418 1200304010 1.00
298 298 304729 2163551 21385 2407 1200304010 1.00
299 299 304438 2163522 39412 2407 1200304010 1.00
300 300 301290 2163646 14326 2419 1200304010 1.00
301 301 303213 2163627 9853 2407 1200304010 3.00
302 302 302182 2163589 36586 2407 1200304010 1.00
303 303 295541 2163829 21856 2416 1200304010 1.00
304 304 273637 2161241 122651 2402 1200304020 1.00
305 305 273475 2161357 17174 2402 1200304020 1.00
Data View
Variable View
Master ▸ Base2010 ▸ Input ▸ DaySimInput ▸
Search DaySimInput
Organize Open Include in library Share with Burn New folder
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Computer
Local Disk (C:)
New Volume (E:)
My Passport (F:)
Name Date modified Type Size
01_TAZ_Index 5/14/2015 11:13 AM File folder
02_Parcel 5/28/2015 4:17 PM File folder
03_Household 5/14/2015 11:13 AM File folder
04_Person 5/14/2015 11:13 AM File folder
05_ixxi 5/14/2015 11:13 AM File folder
05_pnr 5/14/2015 11:13 AM File folder
06_Roster 5/28/2015 4:20 PM File folder
08_Summaries 5/14/2015 11:13 AM File folder
09_SeedShadow 5/14/2015 11:13 AM File folder
02_Parcel State: Shared Shared with: Administrator; Jason Chen; All domain users
File folder Date modified: 5/28/2015 4:17 PM

TAZ Employment File

Update total employment and employment by industry group (2-digit NAICS)



DAYSIM SECTOR	2-DIGIT NAICS CODE
Industrial	22,31-33, 42, 48-49
Retail Trade	44-45
Office	51-56
Educational Services	61
Health / Medical	62
Government	92
Food	72
Services	71, 81
Other	11, 21, 23

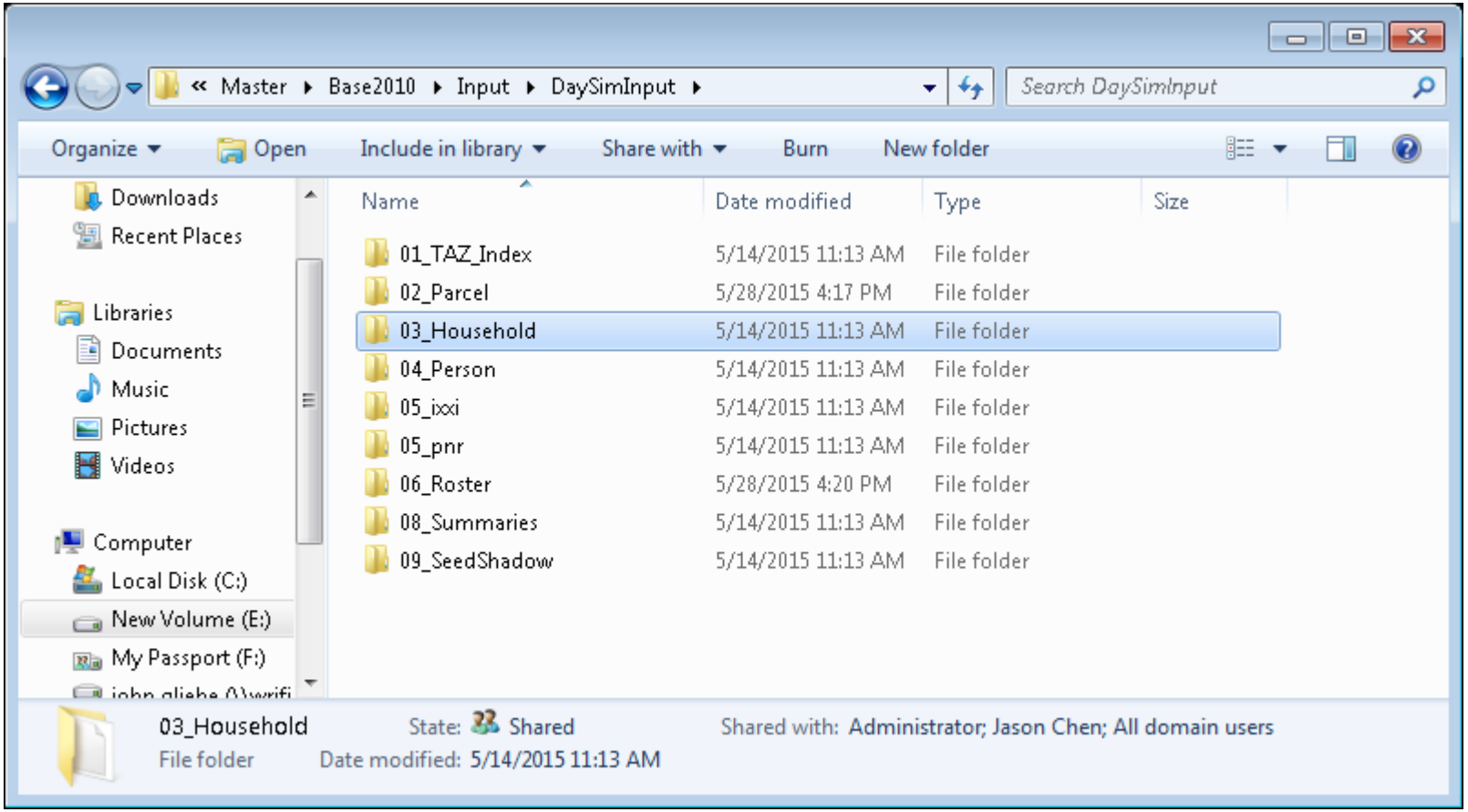
Adding Synthetic Households and Persons to Represent the Proposed Development

- Do you know what the demographic characteristics of the households should be? (e.g., retirement community)
  - ***YES*** → create synthetic household records using a representative household type (age, number of persons, workers, students, and income); add person records based on this type for each household
  - ***NO*** → sample households that are assigned to other parcels in the same TAZ or adjacent TAZs; select the person records that belong to each sampled household
    - Add household records to _jax_hrec.dat
    - For each household, add person records to _jax_prec.dat

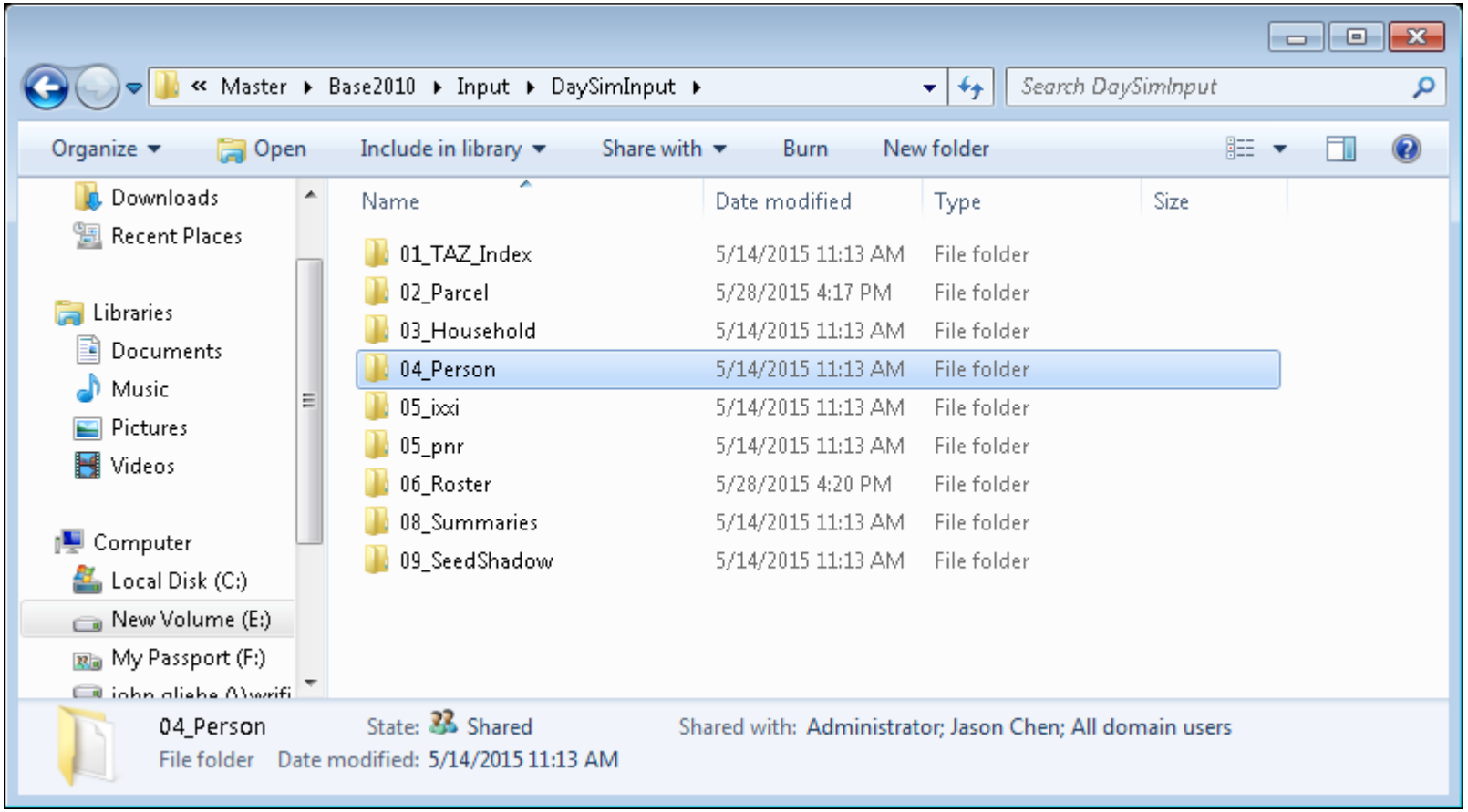
If Adding Non-Residential Development…

- Identify affected parcels (or the nearest parcel) in the DaySim parcel file
- Add employment to parcel files
  - Determine how many employees there will be based on land use type (e.g., retail, service, manufacturing, etc.)
  - Add the number of jobs by industry group to the parcel records
  - For 2010: Jacksonville_parcel_decayandCirc.dat
  - For 2040: Jacksonville_parcel_decayandCirc2040.dat
- Update the TAZ employment file
  - For 2010: Jax2010Emp.dbf
  - For 2040: Jax2040Emp.dbf
  - Interim years to be made available

Household File



Person File


« Master ▸ Base2010 ▸ Input ▸ DaySimInput ▸
Search DaySimInput
Organize
Open
Include in library
Share with
Burn
New folder
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Computer
Local Disk (C:)
New Volume (E:)
My Passport (F:)
Name
Date modified
Type
Size
01_TAZ_Index 5/14/2015 11:13 AM File folder
02_Parcel 5/28/2015 4:17 PM File folder
03_Household 5/14/2015 11:13 AM File folder
04_Person 5/14/2015 11:13 AM File folder
05_ixxi 5/14/2015 11:13 AM File folder
05_pnr 5/14/2015 11:13 AM File folder
06_Roster 5/28/2015 4:20 PM File folder
08_Summaries 5/14/2015 11:13 AM File folder
09_SeedShadow 5/14/2015 11:13 AM File folder
04_Person State: Shared Shared with: Administrator; Jason Chen; All domain users
File folder Date modified: 5/14/2015 11:13 AM

What can one expect from the model?

- Trips are generated from households and attracted to TAZs and parcels based on destination employment and/or households
  - Synthetic households generate trips
  - Parcel values used for destination choice (attractions)
  - Zone data files still used for external and truck trip ends
- Highway network loading at the TAZ level, similar to NERPM 4.2
- Analysis methods for highway assignment results and trip distributions should be the same as with NERPM 4.2
  - Now have AM, MD, PM, and NT periods
  - Also have daily assignment—sum of each period

What's special about this?

- NERPM-AB may respond to heavy congestion by…
  - Shifting routes
  - Shifting destinations
  - Shifting trips by time period of day
  - Longer trip chains
  - Suppressing demand
- The trips list (_trips.tsv) produced by DaySim will include trips produced and attracted to the project site with every synthetic person/household identified
  - Use to link back to person and household attributes and home origins—even for non-home based trips!
  - Use to show non-auto modes, and time of day—useful if a development is supposed to be transit-oriented

Lunch

Scenarios: Transit System Change

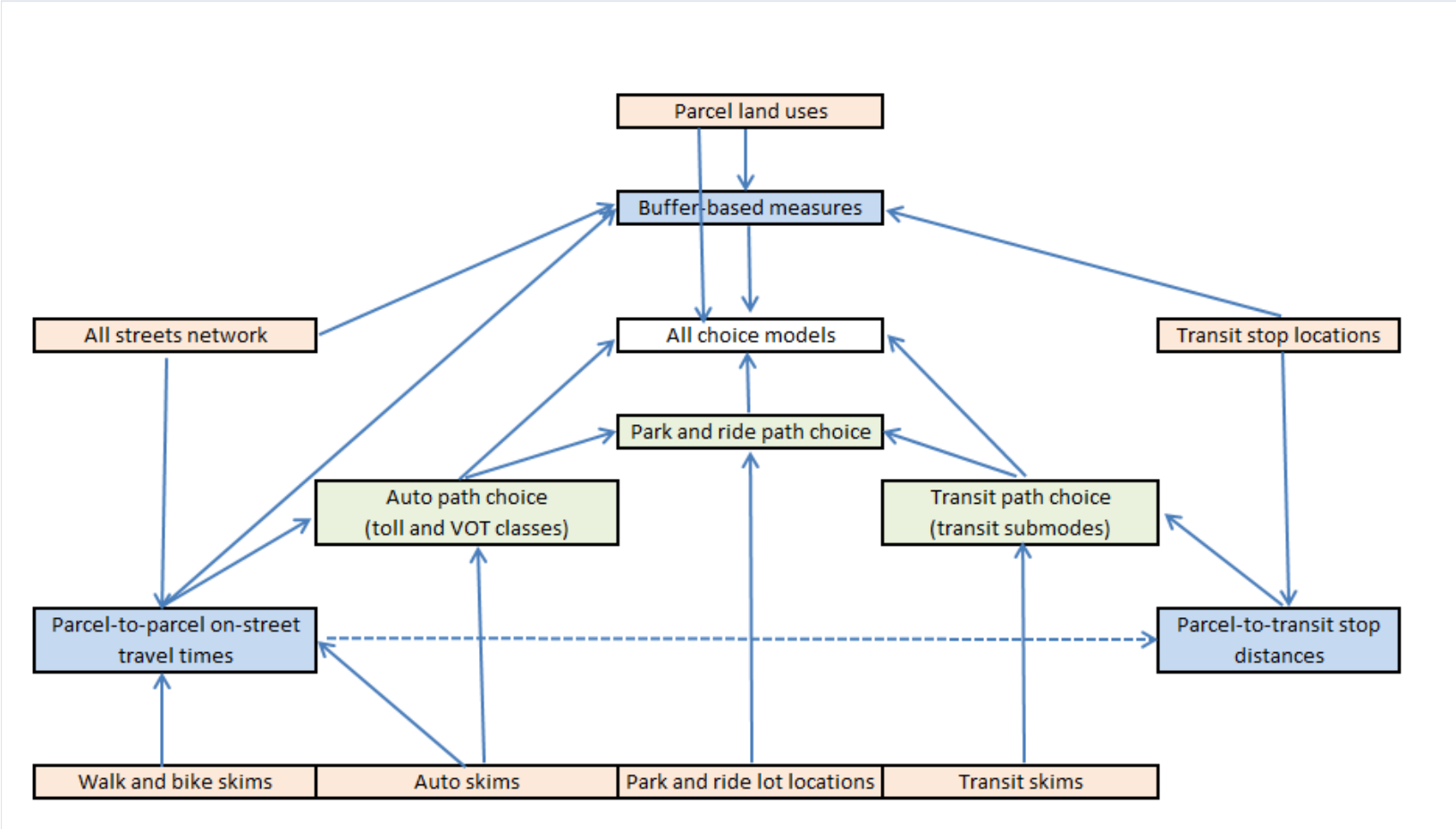
How is Transit System Change Analysis different with NERPM-AB?

- Walk access distances calculated from parcel to transit stop-more precise estimates of accessibility
- PNR lots are chosen by DaySim
  - Capacity constrained by hour of day (shadow pricing)
- New procedures:
  - Update or changed transit stop locations
    - Requires running buffering tools to create parcel attributes, or careful manual manipulation of distances to nearest stop
  - If new PNR lot, updating lot file
  - If this is a new service (e.g. BRT, Commuter rail)
    - Update mode roster file
    - Update roster combinations file

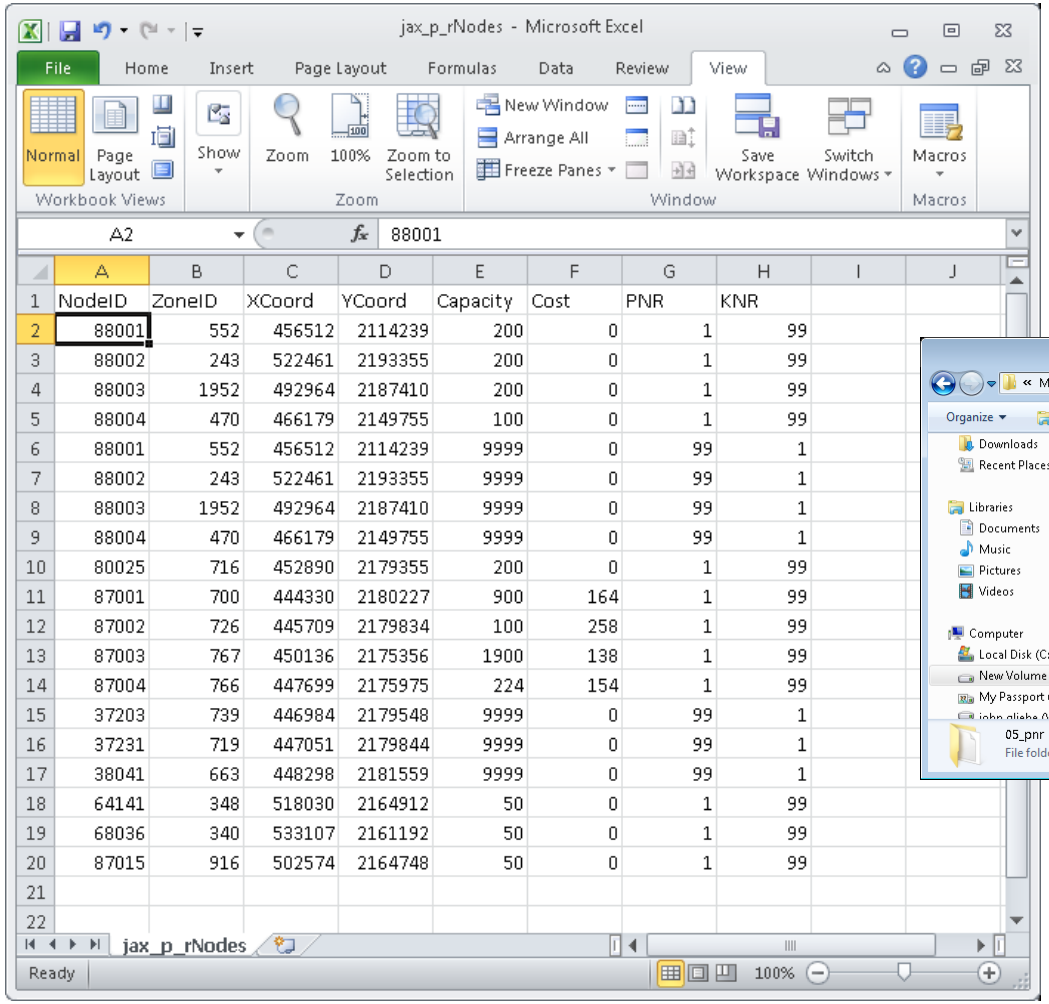
What to Consider

- Does the new transit service require changes or additions to stop locations, or just changes to route and line files?
- Is this a new mode for the region?
- What times of day are affected?
- Is a new park-and-ride lot being considered?

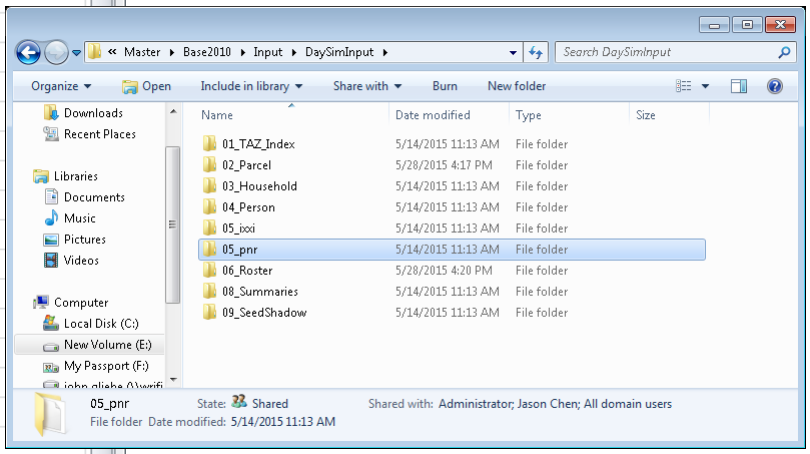
Relationship between Land Use, Buffer Variables, and Mode-Paths in DaySim



Park-and-Ride Lots File



	A	B	C	D	E	F	G	H	I	J
1	NodeID	ZoneID	XCoord	YCoord	Capacity	Cost	PNR	KNR		
2	88001	552	456512	2114239	200	0	1	99		
3	88002	243	522461	2193355	200	0	1	99		
4	88003	1952	492964	2187410	200	0	1	99		
5	88004	470	466179	2149755	100	0	1	99		
6	88001	552	456512	2114239	9999	0	99	1		
7	88002	243	522461	2193355	9999	0	99	1		
8	88003	1952	492964	2187410	9999	0	99	1		
9	88004	470	466179	2149755	9999	0	99	1		
10	80025	716	452890	2179355	200	0	1	99		
11	87001	700	444330	2180227	900	164	1	99		
12	87002	726	445709	2179834	100	258	1	99		
13	87003	767	450136	2175356	1900	138	1	99		
14	87004	766	447699	2175975	224	154	1	99		
15	37203	739	446984	2179548	9999	0	99	1		
16	37231	719	447051	2179844	9999	0	99	1		
17	38041	663	448298	2181559	9999	0	99	1		
18	64141	348	518030	2164912	50	0	1	99		
19	68036	340	533107	2161192	50	0	1	99		
20	87015	916	502574	2164748	50	0	1	99		
21										
22										

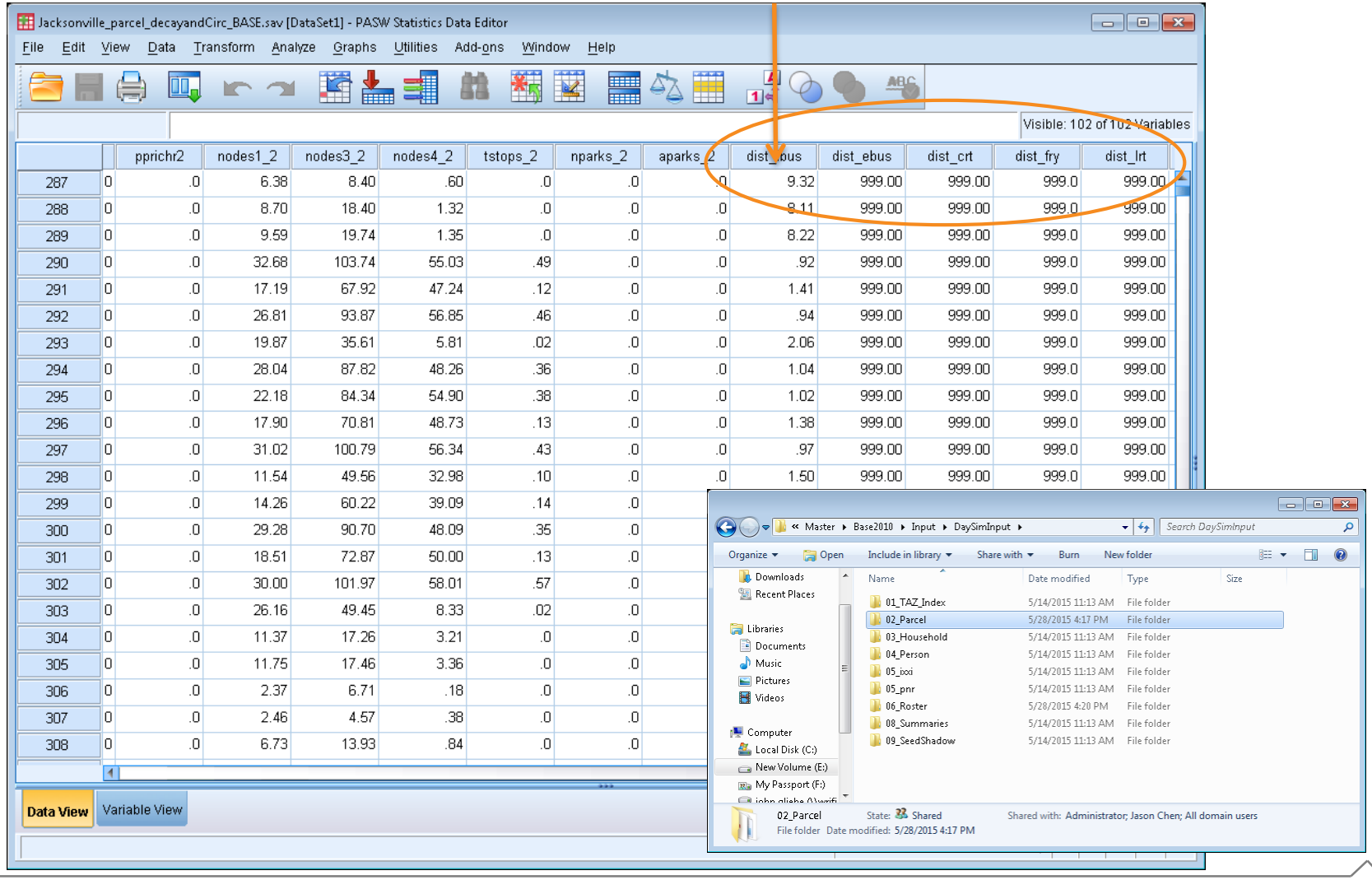


Updating Distance to Nearest Stop without Running Buffering Tool

- For scenarios with few new stops
- For each new stop (by mode), determine whether it is closer to any parcels than existing stops. In other words, for these parcels, does it decrease the distance to the nearest transit stop for that mode?
- If so, update the distance for that parcel

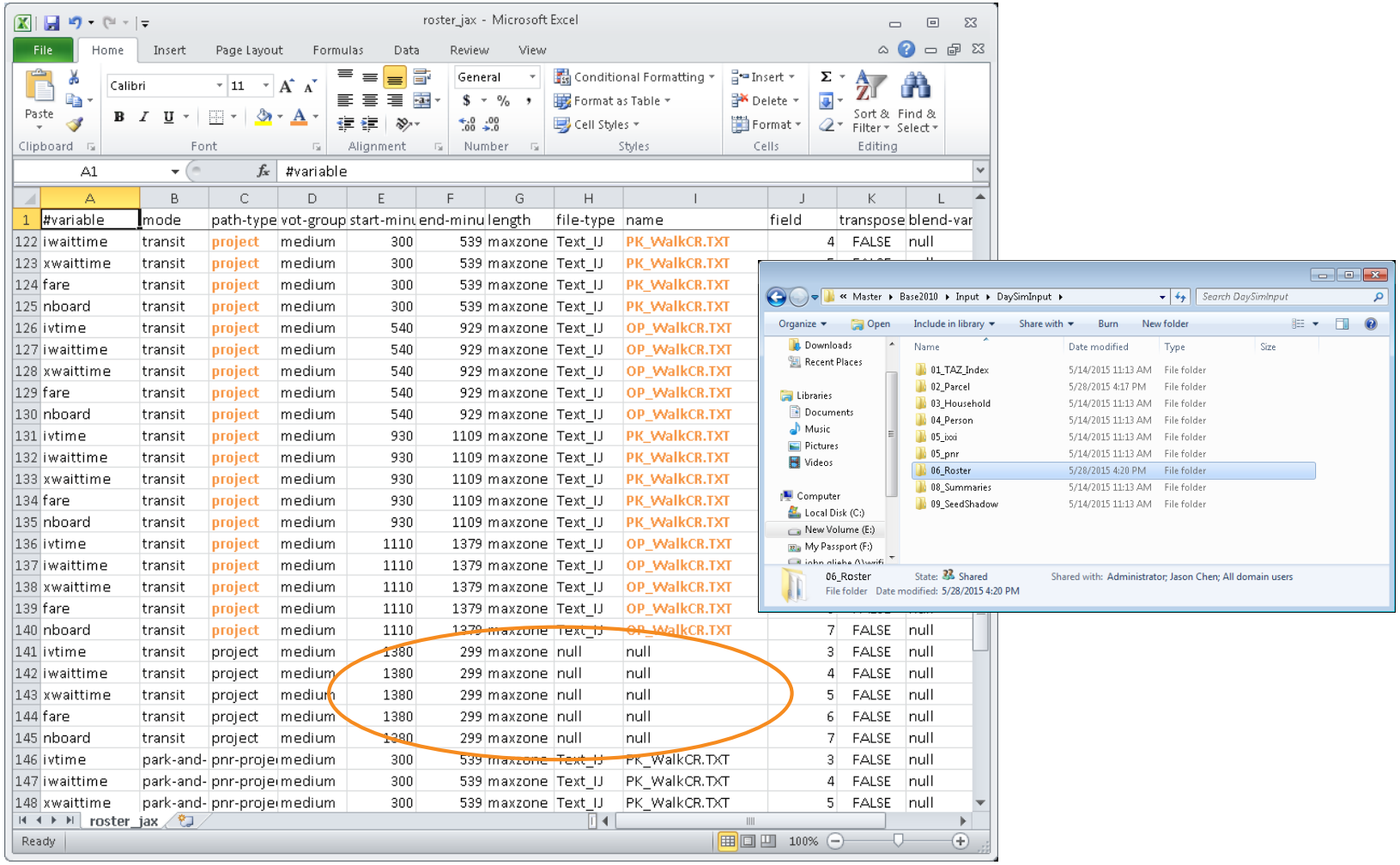
Transit Stop Distances in Parcel File

Local Bus



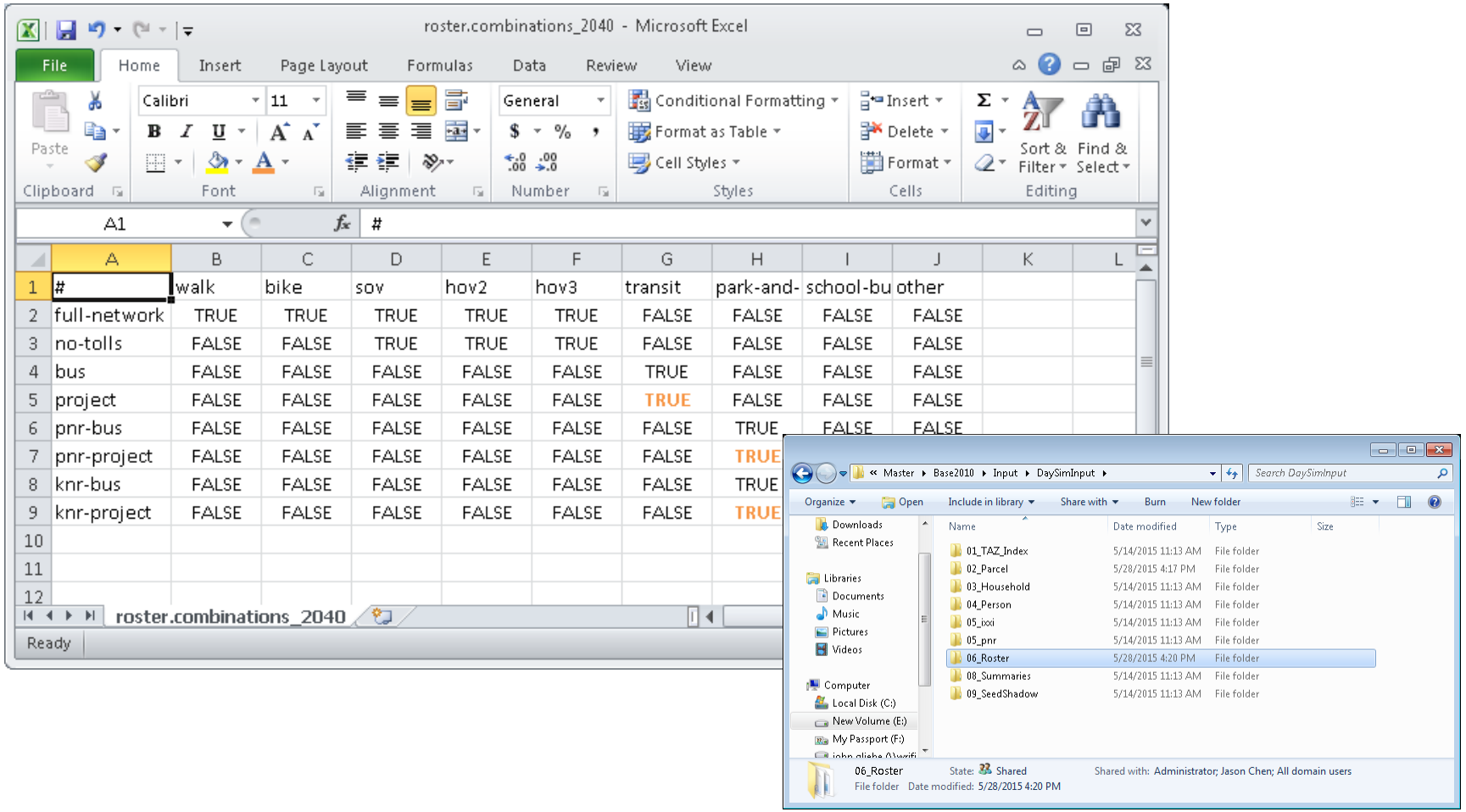
	pprichr2	nodes1_2	nodes3_2	nodes4_2	tstops_2	nparks_2	aparks_2	dist_bus	dist_ebus	dist_crt	dist_fry	dist_lrt
287	0 .0	6.38	8.40	.60	.0	.0	.0	9.32	999.00	999.00	999.0	999.00
288	0 .0	8.70	18.40	1.32	.0	.0	.0	8.11	999.00	999.00	999.0	999.00
289	0 .0	9.59	19.74	1.35	.0	.0	.0	8.22	999.00	999.00	999.0	999.00
290	0 .0	32.68	103.74	55.03	.49	.0	.0	.92	999.00	999.00	999.0	999.00
291	0 .0	17.19	67.92	47.24	.12	.0	.0	1.41	999.00	999.00	999.0	999.00
292	0 .0	26.81	93.87	56.85	.46	.0	.0	.94	999.00	999.00	999.0	999.00
293	0 .0	19.87	35.61	5.81	.02	.0	.0	2.06	999.00	999.00	999.0	999.00
294	0 .0	28.04	87.82	48.26	.36	.0	.0	1.04	999.00	999.00	999.0	999.00
295	0 .0	22.18	84.34	54.90	.38	.0	.0	1.02	999.00	999.00	999.0	999.00
296	0 .0	17.90	70.81	48.73	.13	.0	.0	1.38	999.00	999.00	999.0	999.00
297	0 .0	31.02	100.79	56.34	.43	.0	.0	.97	999.00	999.00	999.0	999.00
298	0 .0	11.54	49.56	32.98	.10	.0	.0	1.50	999.00	999.00	999.0	999.00
299	0 .0	14.26	60.22	39.09	.14	.0						
300	0 .0	29.28	90.70	48.09	.35	.0						
301	0 .0	18.51	72.87	50.00	.13	.0						
302	0 .0	30.00	101.97	58.01	.57	.0						
303	0 .0	26.16	49.45	8.33	.02	.0						
304	0 .0	11.37	17.26	3.21	.0	.0						
305	0 .0	11.75	17.46	3.36	.0	.0						
306	0 .0	2.37	6.71	.18	.0	.0						
307	0 .0	2.46	4.57	.38	.0	.0						
308	0 .0	6.73	13.93	.84	.0	.0						

Mode-Path Roster File



	#variable	mode	path-type	vot-group	start-minu	end-minu	length	file-type	name	field	transpose	blend-var
122	iwaittime	transit	project	medium	300	539	maxzone	Text_IJ	PK_WalkCR.TXT	4	FALSE	null
123	xwaittime	transit	project	medium	300	539	maxzone	Text_IJ	PK_WalkCR.TXT			
124	fare	transit	project	medium	300	539	maxzone	Text_IJ	PK_WalkCR.TXT			
125	nboard	transit	project	medium	300	539	maxzone	Text_IJ	PK_WalkCR.TXT			
126	ivtime	transit	project	medium	540	929	maxzone	Text_IJ	OP_WalkCR.TXT			
127	iwaittime	transit	project	medium	540	929	maxzone	Text_IJ	OP_WalkCR.TXT			
128	xwaittime	transit	project	medium	540	929	maxzone	Text_IJ	OP_WalkCR.TXT			
129	fare	transit	project	medium	540	929	maxzone	Text_IJ	OP_WalkCR.TXT			
130	nboard	transit	project	medium	540	929	maxzone	Text_IJ	OP_WalkCR.TXT			
131	ivtime	transit	project	medium	930	1109	maxzone	Text_IJ	PK_WalkCR.TXT			
132	iwaittime	transit	project	medium	930	1109	maxzone	Text_IJ	PK_WalkCR.TXT			
133	xwaittime	transit	project	medium	930	1109	maxzone	Text_IJ	PK_WalkCR.TXT			
134	fare	transit	project	medium	930	1109	maxzone	Text_IJ	PK_WalkCR.TXT			
135	nboard	transit	project	medium	930	1109	maxzone	Text_IJ	PK_WalkCR.TXT			
136	ivtime	transit	project	medium	1110	1379	maxzone	Text_IJ	OP_WalkCR.TXT			
137	iwaittime	transit	project	medium	1110	1379	maxzone	Text_IJ	OP_WalkCR.TXT			
138	xwaittime	transit	project	medium	1110	1379	maxzone	Text_IJ	OP_WalkCR.TXT			
139	fare	transit	project	medium	1110	1379	maxzone	Text_IJ	OP_WalkCR.TXT			
140	nboard	transit	project	medium	1110	1379	maxzone	Text_IJ	OP_WalkCR.TXT	7	FALSE	null
141	ivtime	transit	project	medium	1380	299	maxzone	null	null	3	FALSE	null
142	iwaittime	transit	project	medium	1380	299	maxzone	null	null	4	FALSE	null
143	xwaittime	transit	project	medium	1380	299	maxzone	null	null	5	FALSE	null
144	fare	transit	project	medium	1380	299	maxzone	null	null	6	FALSE	null
145	nboard	transit	project	medium	1380	299	maxzone	null	null	7	FALSE	null
146	ivtime	park-and-	pnr-proje	medium	300	539	maxzone	Text_IJ	PK_WalkCR.TXT	3	FALSE	null
147	iwaittime	park-and-	pnr-proje	medium	300	539	maxzone	Text_IJ	PK_WalkCR.TXT	4	FALSE	null
148	xwaittime	park-and-	pnr-proje	medium	300	539	maxzone	Text_IJ	PK_WalkCR.TXT	5	FALSE	null

Roster Combinations File



#	walk	bike	sov	hov2	hov3	transit	park-and-	school-bu	other
full-network	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
no-tolls	FALSE	FALSE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
bus	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
project	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
pnr-bus	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
pnr-project	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE		
knr-bus	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE		
knr-project	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE		

What can one expect from the model?

- DaySim will use the distance to the nearest transit stop as calculated from parcel-to-stop for walk access time when evaluating mode choices
- DaySim will choose drive-transit paths by choosing PnR and KnR lots (mode change purpose)
  - Drive skims + Transit-walk access skims
- Analysis methods for transit assignment results and trip distributions should be the same as with NERPM 4.2 for Peak and Off-Peak periods
  - Transit skims are created for all four time periods for use in DaySim

What's special about this?

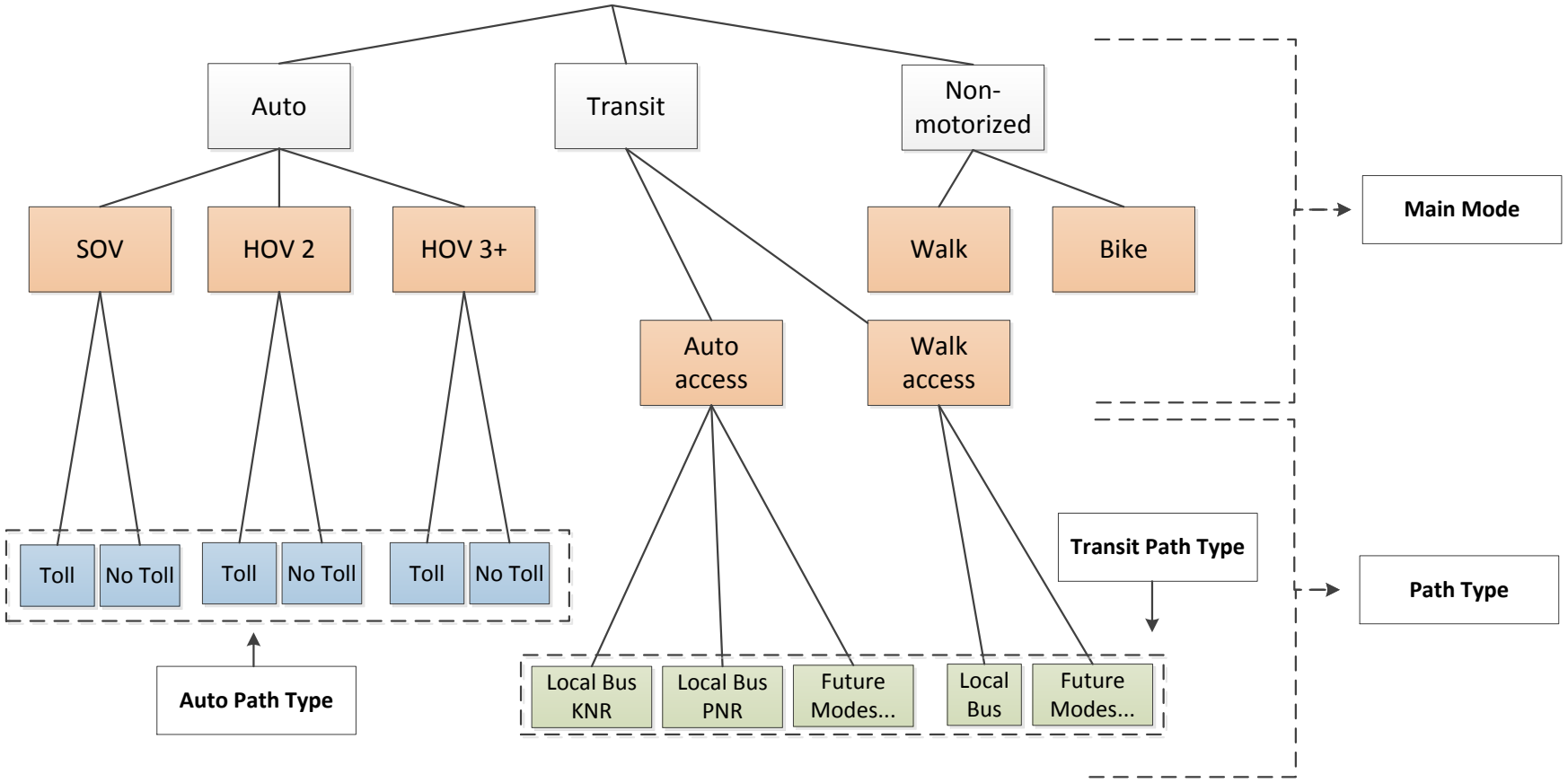
- NERPM-AB may respond to a change in transit service by…
  - Changes in mode usage in the affected corridor
  - Some changes in trip chaining and daily tour patterns may occur
  - Some changes in destinations may occur
- The trips list (_trips.tsv) produced by DaySim will include transit trips, with every synthetic person/household identified
  - Use to link back to person and household attributes and home origins—even for non-home based trips!
  - This can be summarized to show user benefits by any available socio-economic group, by time of day and purpose

Scenarios: Tolling and Managed Lanes

How is Tolling and Managed Lane Analysis different with NERPM-AB?

- Toll vs. No-Toll Choice handled in mode-path choice models
- Ability to vary by time of day
- Distributed values of time by individual
- New procedures:
  - Need to add separate skimming procedures to exclude tolled links for non-toll users
  - Need to add Separate skimming procedures for managed lanes that vary by time of day
  - Specification of skims in DaySim roster files

Mode and Path Choice Structure



What to Consider

- Coding links on the network in Cube (same as before)
- Will there be managed lanes that function differently at different times of day?
- Will there be different tolls for different time of day?
- If managed lanes and/or tolls will vary by time of day, may require special network coding (toggle links on/off) in the Micro-coded network (MicroCodedHnet42.net)
- Managed lane and tolled facilities have already been coded as part of the LRTP analysis

DaySim Roster File: Tolling Example

- Objective: charge tolls from 7:30AM to 9:30AM (wherever they are coded on network links)
- Generate Skims according to toll plan, Skm_Toll_D1, Skm_Toll_HOV
- Adjust Roster File to used these skims for the time periods of the toll (450 to 570 mpm)

#variable	mode	path-type	vot-group	start-minute	end-minute	length	file-type	name	field	transpose	blend-variable	blend-path-type	factor	scaling
toll	sov	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	sov	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	sov	full-network	medium	960	1139	maxzone	Text_IJ	SKM_PM_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	sov	full-network	medium	1140	359	maxzone	Text_IJ	SKM_EV_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	960	1139	maxzone	Text_IJ	SKM_PM_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	1140	359	maxzone	Text_IJ	SKM_EV_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	360	539	maxzone	Text_IJ	SKM_AM_S3.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	540	959	maxzone	Text_IJ	SKM_MD_S3.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	960	1139	maxzone	Text_IJ	SKM_PM_S3.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	1140	359	maxzone	Text_IJ	SKM_EV_S3.TXT	5	FALSE	distance	null	null	TRUE

#variable	mode	path-type	vot-group	start-minute	end-minute	length	file-type	name	field	transpose	blend-variable	blend-path-type	factor	scaling
toll	sov	full-network	medium	360	449	maxzone	Text_IJ	SKM_AM_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	sov	full-network	medium	450	569	maxzone	Text_IJ	Skm_Toll_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	sov	full-network	medium	570	959	maxzone	Text_IJ	SKM_MD_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	sov	full-network	medium	960	1139	maxzone	Text_IJ	SKM_PM_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	sov	full-network	medium	1140	359	maxzone	Text_IJ	SKM_EV_D1.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	360	449	maxzone	Text_IJ	SKM_AM_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	450	569	maxzone	Text_IJ	Skm_Toll_HOV.TX	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	570	959	maxzone	Text_IJ	SKM_MD_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	960	1139	maxzone	Text_IJ	SKM_PM_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov2	full-network	medium	1140	359	maxzone	Text_IJ	SKM_EV_S2.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	360	449	maxzone	Text_IJ	SKM_AM_S3.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	450	569	maxzone	Text_IJ	Skm_Toll_HOV.TX	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	570	959	maxzone	Text_IJ	SKM_MD_S3.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	960	1139	maxzone	Text_IJ	SKM_PM_S3.TXT	5	FALSE	distance	null	null	TRUE
toll	hov3	full-network	medium	1140	359	maxzone	Text_IJ	SKM_EV_S3.TXT	5	FALSE	distance	null	null	TRUE

Distributed Values of Time

- Calculated for each tour as a function of…
  - Household income
  - Auto occupancy
  - Main stop purpose (work vs. non-work)
  - Random component

What can one expect from the model?

- DaySim will choose DA vs SR and Toll vs. Non-Toll in Tour and Trip Mode Choice Models
  - Drivers who choose a non-toll path option will only use network facilities without tolls
  - Drivers who choose the toll path option will have the entire network available, but may or may not select tolled paths depending on the generalized cost of competing paths (user equilibrium assignment)
- Analysis methods for highway assignment results and trip distributions should be the same as with NERPM 4.2
  - Now have AM, MD, PM and NT periods
  - Also have daily assignment—sum of all four periods

What's special about this?

- NERPM-AB may respond to managed lanes and tolling by…
  - Allocating between toll and non-tolled, between DA and SR
  - Shifting routes
  - Shifting trips by time period of day
  - Some shifting of destinations may occur
- The trips list (_trips.tsv) produced by DaySim will include the modeled value of time group for each trip
  - Use to link back to person and household attributes and home origins—even for non-home based trips!
  - Ability to evaluate equity questions based on income, or identifying who toll and managed lane users are likely to be

Break

Wrap up:
Q & A and Open Discussion

Contacts

www.rsginc.com

JOHN GLIEBE
RSG
John.Gliebe@rsginc.com
240.283.0633

STEPHEN LAWE
RSG
Stephen.Lawe@rsginc.com
802.359.6452