Training Series #2 – 2: Model Validation & ITAM

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Today's Training Topic

- Model Validation

- ITAM

Typical Model Development Process

- Model Estimation
  - Use of statistical analysis techniques and observed data to develop model parameters or coefficients.

- Model Calibration
  - Adjustment of constants and other model parameters in estimated or asserted models in an effort to make the models replicate observed data for a base (calibration) year or otherwise produce more reasonable results.

- Model Validation
  - Application of the calibrated models and comparison of the results against observed data.

Observed data in the validation are not the same dataset used in the model estimation and calibration.

Typical Model Development Process
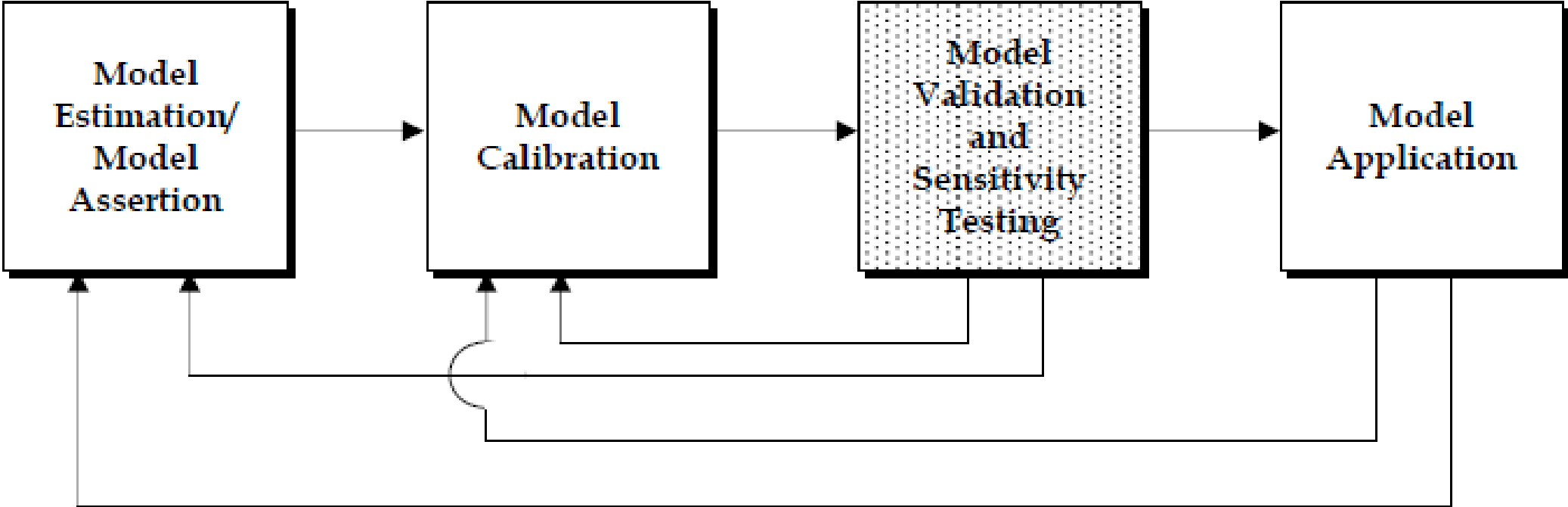
Types of Validation Checks

- **Comparisons of base year model results to observations**
  - Static validation
  - Compare model results to disaggregated data such as traffic counts or transit boardings
- Temporal validation
  - E.g., a model is estimated or calibrated using 2003 survey data, but validated against 2008 data.
- Model sensitivity testing
  - Dynamic validation to check the elasticities of the model to various parameters or inputs.
- Reasonableness and logic checks

Model Validation

- Validating the ability of a model to predict future behavior requires comparing its predictions with information other than that used in estimating.

- Typical Dataset used in the Validation:
  - Household Travel Survey (HHTS)
  - Traffic Counts
  - Travel Time/Speed
  - Automated Passenger Counter (APC)
  - HPMS
  - Big Data - Traffic Speed, O/D Pattern, etc.
  - …

Model Validation

- Static Validation
  - Highway assignment
  - Transit assignment
- Reasonableness Checks and comparison
  - Highway/transit networks
  - Trip generation
  - Trip distribution
  - Vehicle availability
  - Mode Split
  - Assignment

Model Validation

- Dynamic Validation
  - Land Use:
    - + households or jobs, etc.
  - Highway Network
    - + lanes to a link
    - +/- a link
    - Change link speeds
    - Change link capacities,
    - +/- toll, etc.
  - Transit Assignment
    - +/- fares
    - + transit speeds
    - +/- headways, etc.

Example

ITAM

- Sub-regional model to OCTAM

- Folder Structure

```
1frat
2exp
3PAOD_GPFac
ITAM3
OCTAM
T1-2trips
working
```
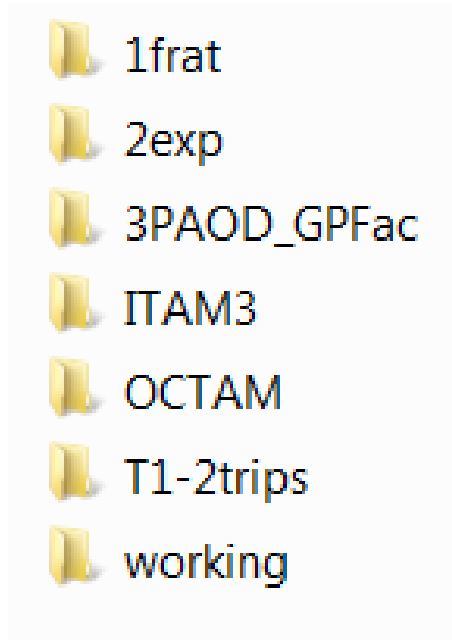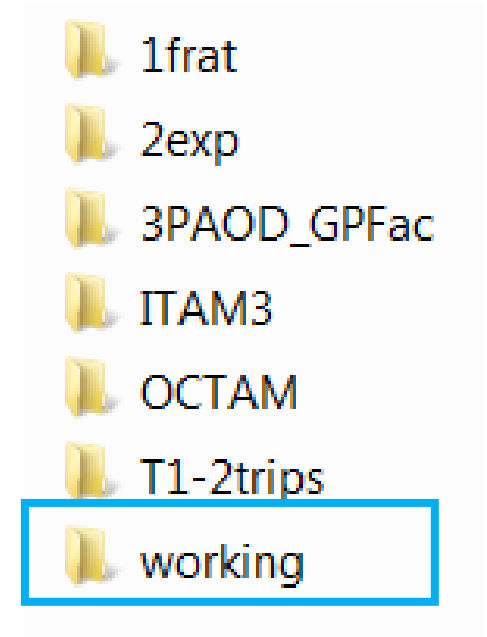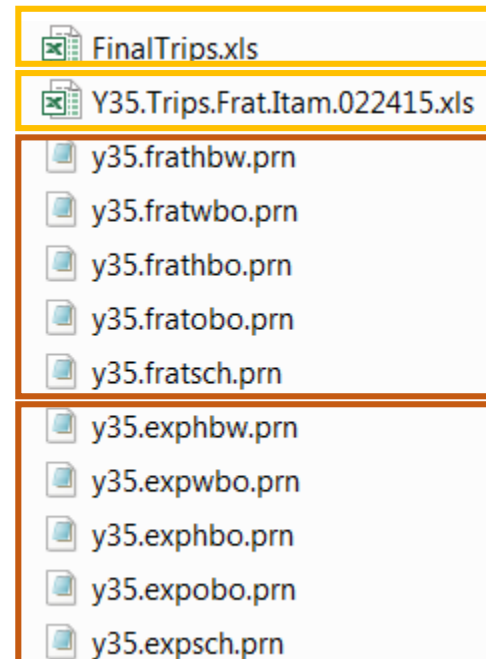
ITAM

Step 1. MS Access file for Trip Generation

Access2003_1_StudyAreaLandUse_P2035Base.mdb

Access2003_2_SedConversion_P2035Base.mdb

Access2003_3_TripGeneration_P2035Base.mdb

Access2003_4_PostProcessing_P2035Base.mdb

1frat

2exp

3PAOD_GPFac

ITAM3

OCTAM

T1-2trips

working

ITAM

Step 2. Based on the vehicle trips estimated from MS Access files, create the inputs used in the following fratar and expansion processes.
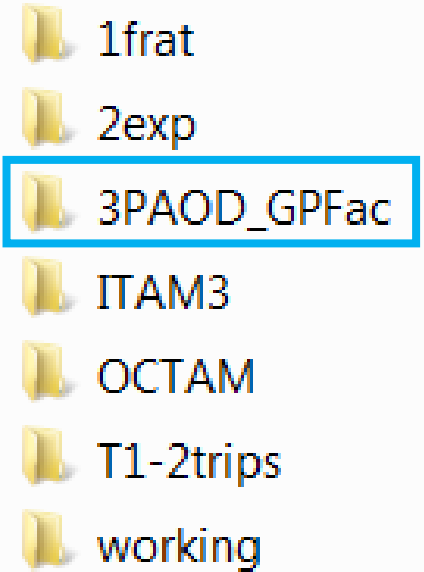
ITAM

Step 3. Fratar Process to adjust the OD trip tables from OCTAM to match the vehicle trips estimated from MS Access files.

Step 4. Expand the fratared matrices to match the ITAM Zone Structure

- 1frat
- 2exp
- 3PAOD_GPFac
- ITAM3
- OCTAM
- T1-2trips
- working
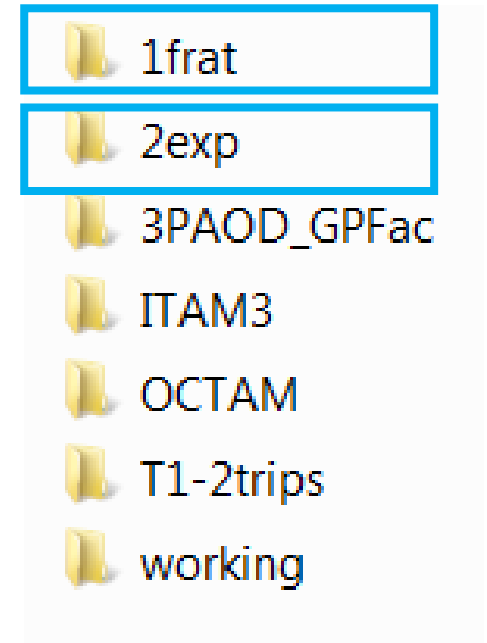
ITAM

Step 5. PA to OD process to finalize the vehicle trip tables for each time period.

1frat

2exp
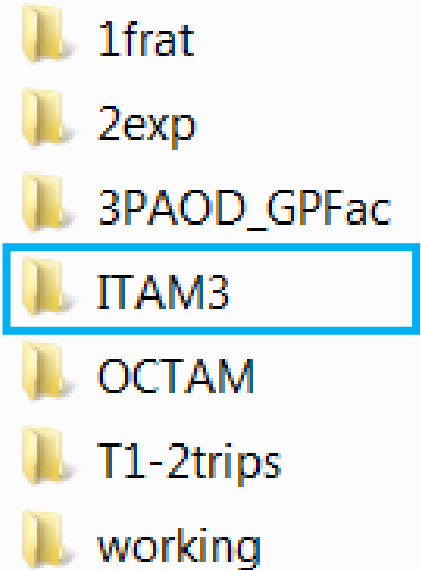
3PAOD_GPFac

ITAM3

OCTAM

T1-2trips

working

ITAM

Step 6. Highway Assignment
    Loaded network, select link analysis,
    turning movement, etc.

Step 7. ICU Process

1frat

2exp

3PAOD_GPFac

ITAM3

OCTAM

T1-2trips

working

Q & A