Model Architecture Checklist

# Model Coverage Questions

* Model Base Year, Milestone Year and Forecast Year(s)
* Study area
* Sub areas of interest

# Existing Data Resources Questions

* Traffic counts – (classification, time of day, factors for converting AADT)
  + Classification counts
  + Time of day counts
  + ATR station counts for factors to convert AADT to average weekday
  + HPMS data
* Parameters from previous model
  + Traffic Analysis Zone geography
  + Traffic Analysis Zone attributes (base year and forecast year population, employment, income, area type, etc;)
  + Highway Network Geography
  + Highway Network Attributes (base year functional class, lanes, speed, capacity, etc;
  + External Station Volumes
  + EE / EI trip tables / trip length frequencies
* GIS and Imagery
  + DOQQ
  + Aerial photography
  + Transit System route layers
  + Signalized intersection layer (turn penalties / prohibitors)

# What information will the model need to produce?

* Analysis of Alternatives
  + Candidate transit modes
  + HOV
  + Toll
  + HOT Lanes
  + Freeway bypasses
* Time of Day – What time periods (AM, PM, Midday, Overnight?)

# What model parameters will the surveys be used to estimate?

* Diurnal Distribution for time of day stratification
* Trip purposes
* Trip production and attraction rates
* Trip length frequency distribution curves (gamma functions) by trip purpose
* Socioeconomic Market stratification (auto ownership, income, etc.)
* Mode choice sensitivities
* Travel speeds and volume delay function parameters (GPS sample)

# Trip Generation Structure

* Trip productions and attractions by time period
* Balance daily productions and attractions
* Trip purposes
  + Home based work
  + Home based non-work
  + Home based school
  + Non-home based
  + Additional stratification based on survey results
* Home based productions (cross class by HH characteristics)
* NHB productions (regression based on home based attractions)
* NHB attractions (regression based on employment and households)
* Special generator model (airport, hospitals, universities/colleges, other)
* Special Markets

# Trip Distribution Structure

* Destination choice versus gravity model
* Highway Paths consistent with mode choice model utilities
* Consider use of exponentiated utilities for travel impedances

# Mode Choice Structure

* Automated access market calculation
* Socio-economic market segment
* Nested Logit model estimation and calibration
* Candidate non-motorized modes (bicycle, pedestrian)
* Candidate auto modes (SR2, SR3)
* Candidate transit modes (existing and new)
* Create FTA standard input file
* Implement FTA Summit capability
* Implement QA/QC requirements
* Diagnostic and user benefit reports by market segment and subarea

# Highway Assignment

* Equilibrium Assignment
* Generalized Cost function (composite of time and cost)
* Feedback loop from assignment back to distribution (Method of successive averages)
* Volume delay functions (By functional class? By time of day?)
* Highway assignment reports and exhibits

# Transit Assignment

* Transit capacity restrained assignment
* Equilibrating transit supply and demand
* Transit reports and exhibits

# Additional Components

* Freight Model
  + Cube Cargo
  + Freight Quick Response Manual
* Air Quality Reports (post processor?)

# Model Validation

* Validation criteria (highway, transit) (RMSE, confidence levels, %error, etc.)
* Validation methodology and its effect on mode choice
* Screen lines, cut lines etc
* VMT (HPMS or count based)

# Defining Future Year Scenarios

* Source of project alternative definition, limits, and scope
* Source of future year transit build and no-build network data
* Source of future year transit build and no-build highway data