Multi Resolution Modeling Case Study 2

Project Ranking and Prioritization
Using the Maryland Department of Transportation SHA's Multi Resolution Modeling System

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Project Overview

- New statutory requirements implemented in 2017 legislative session directing the Maryland Department of Transportation to develop by January 1, 2018 a project-based scoring model for evaluating major highway and transit capacity projects over $5 million in the Draft and Final CTP.
- Establishes nine goals and twenty-three measures in the law that each major transportation project shall be evaluated against in the project-based scoring model.
- The Chapter 30 Scoring Model is one of many tools utilized to select projects for funding in the CTP. However, all major transportation projects must be scored in order to be considered for funding in the CTP.

Project-Based Scoring System

- The Chapter 30 Scoring Model evaluates projects against the following nine statutory required goals:

- Each goal has 1-3 measures established by statute that define how the project should be evaluated against it.
- Scores are develop through an objective and transparent process by project application data, project location data, qualitative questionnaires, modeling and forecasting.

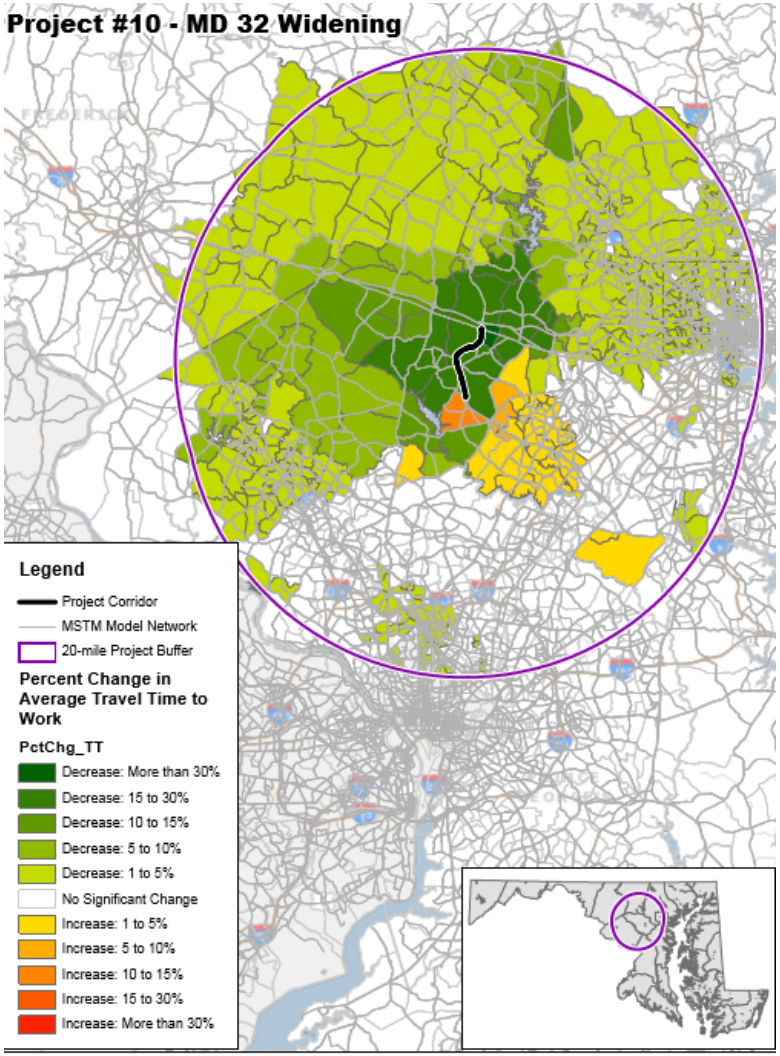
Required Data

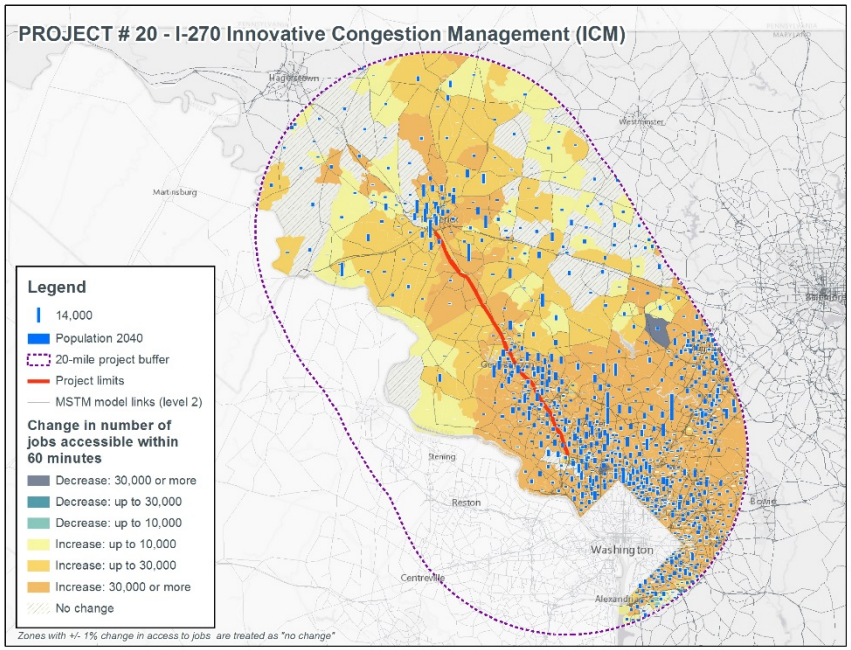
Goal	Measure	Job Accessibility	Fuel Savings	Travel Time Savings
3: Reducing Congestion	1: Increase in Job Accessibility	X		
3: Reducing Congestion	2: Increase In Travel Time Reliability			X
4: Environmental Stewardship	1: Limit or Reduce Harmful Emissions		X	
6: Economic Prosperity	1: Increase in Job Accessibility	X		
7: Equitable Access to Transportation	1: Increase in Job Accessibility	X		
8: Cost Effectiveness & Return on Investment	1: Estimated Travel Time Savings			X

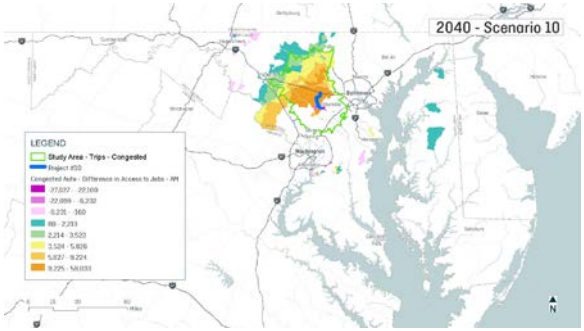
MSTM Chapter 30 Multi Resolution Framework

- Assumptions of Chapter 30
  - Fixed Demand
  - No Build Supply Assumption
  - Consistent Platform
    - Calculation of Metrics
    - Consistent approach for all projects (urban vs rural and improvement vs new facilities)
- Project Challenges
  - Time Constraint and Volume of Projects
  - Consistency in Approach: projects, mode and consultants
  - Resolution of performance measures

Resolution Requirement

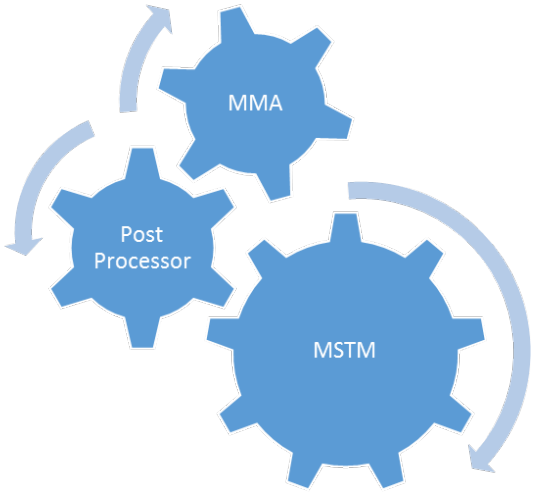


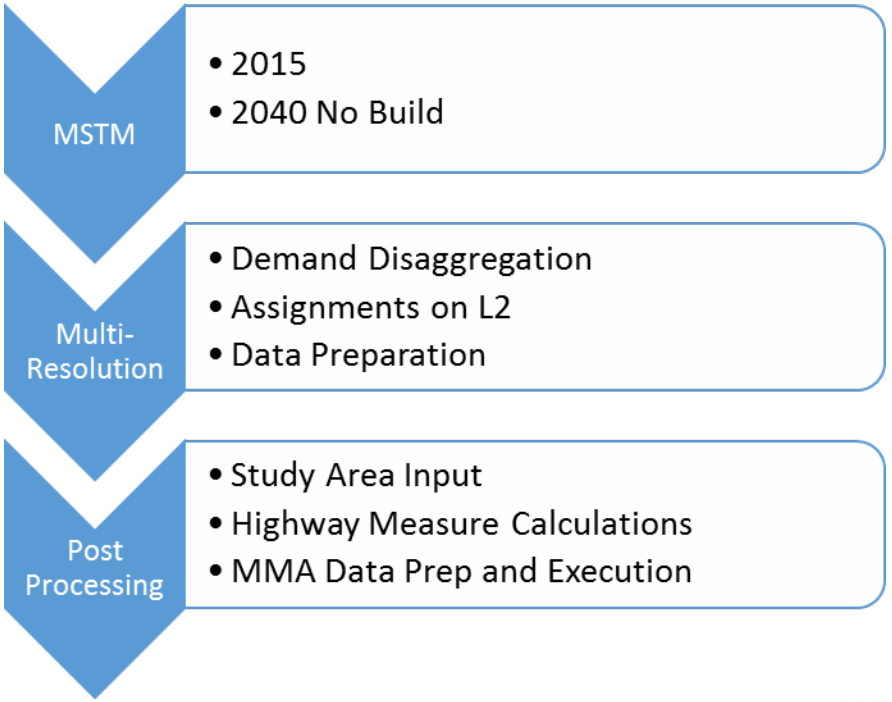




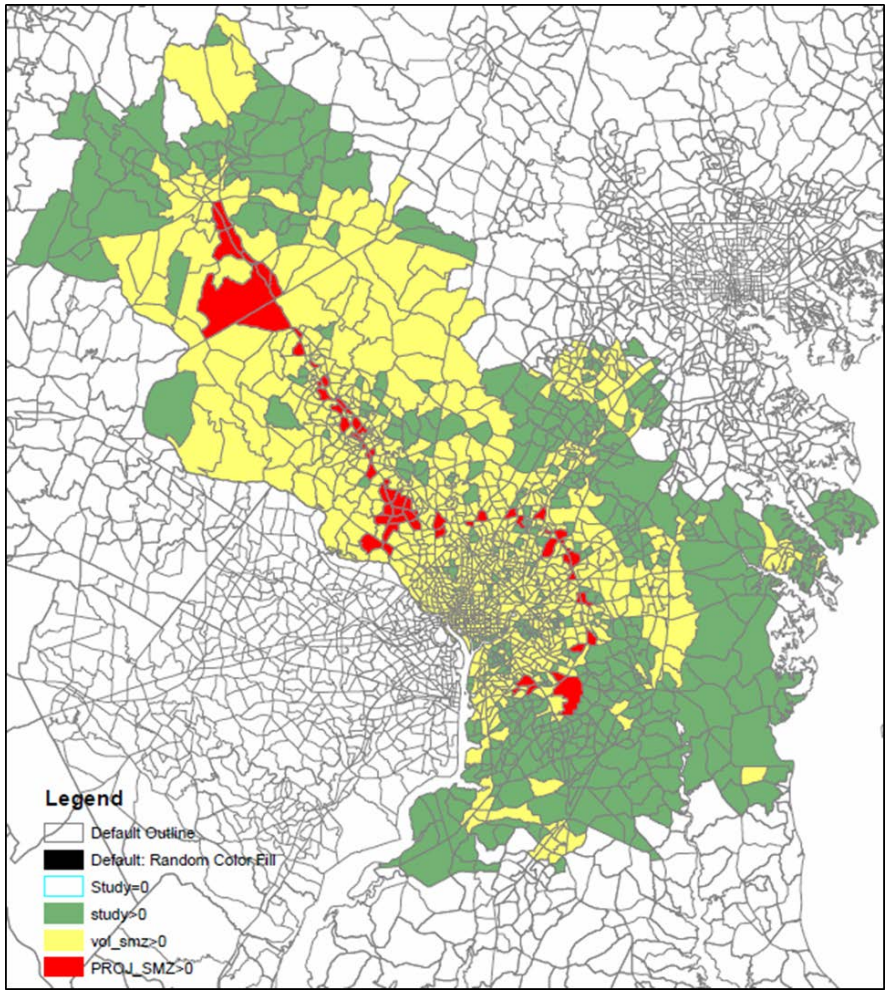
MSTM Chapter 30 Multi Resolution Framework

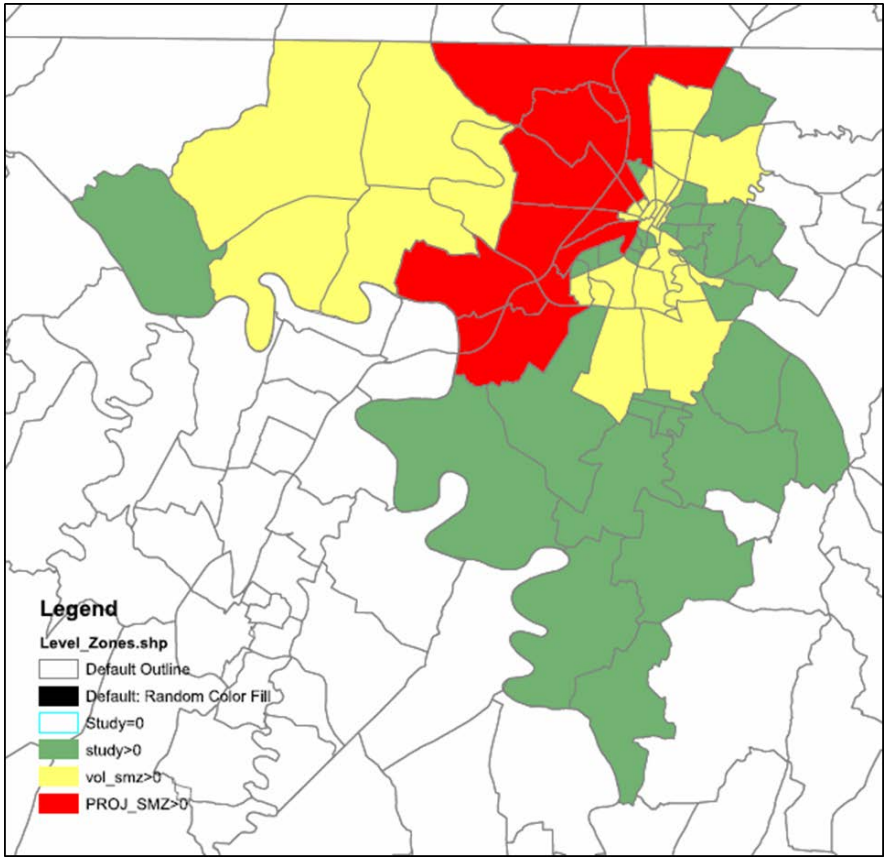
- Builds upon MSTM
  - Use of Trip Tables and Network Structure
- Consistent methodology
  - Speed and Capacity logic
  - Assignment methodology (trip purposes, tolling, period definitions)
- Flexibility in resolution
- Focused to network changes
- Linkage to Chapter 30 Scoring
- Multi Resolution Framework brings
  - Sensitivity to the network
  - Impacts of land use by smaller TAZs
  - Resolution of the performance measures





MSTM Chapter 30 Multi Resolution Framework





Resolution to Support Scoring

- Vehicle Miles Traveled
  - Link level calculation and aggregation of auto and truck VMT across a consistent study area under build and no build conditions
- Travel Time Savings
  - Calculation of vehicles hours traveled
    - By Auto and Truck
    - By Purpose
    - By Period Congestion
  - Delay: Congested VHT – Free Flow VHT
  - Build Delay – No Build Delay
- Fuel Savings
  - Vehicle Miles Traveled by Speed
  - Auto and Truck
  - Aggregated across a consistent study area for build and no-build conditions

Meeting the Challenges

- Even playing field for Transit projects
- Operational projects in context of macro assignment
  - Capacity adjustments
  - Roadway functional class improvements
- Consistency!
  - 42 projects
  - 6 consultants
  - 3 week analysis period

Proven Benefits and Innovation

- Multi-Resolution Processing
  - Significantly expedites development of models
  - Significantly reduces run-time
  - Accounts for detailed information where it exists
  - Answers the detailed questions being asked efficiently
- Efficient for Exploratory Modeling
  - Can test alternate futures efficiently
  - Consistent performance results
- Success with client: able to answer questions, explainable to management and stakeholders.
- Transferable
  - Going to have several TID models across the state with feedback to the statewide model (land use changes and projects)
  - Provide consistent framework for transferable tools

Questions?

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