

# Improving the regional TPB travel demand forecasting model

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Status report on short-term improvements to trip-based model

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TPB Technical Committee  
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# Topics

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- Recap of the Strategic Plan for TPB's travel forecasting methods
- Review of short-term enhancements undertaken in FY 2017
- Proposed plan for implementing enhanced travel model into production



Image source: Mark Moran



# TPB's travel model development

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- Oversight: Travel Forecasting Subcommittee (TFS)
  - State, local transportation agency representation
  - Consultant community supporting project planning
  - Others (public, research community)
- Supported with consultant assistance
  - Three-year, task-order contract regarding research, development, and improvement work
  - Current contractor: Cambridge Systematics, Inc.
- Focused on incremental and phased changes



# Strategic Plan Formulation

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- Input to the Plan
  - TPB policy reports
  - Regional stakeholder survey (Feb. 2015)
  - National survey of modeling practice and methods (Mar. 2015)
  - WMATA input
- Phases of the Plan
  1. Improve existing trip-based model (FY 16-17)
  2. Complete new generation (activity-based) model with existing data (FY 18-20)
  3. Update activity-based model with new data (FY 21-22)



# Phase 1, short-term improvements

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- Focused on improvements to the model's treatment of the following markets:
  - Non-motorized travel
  - Transit ridership by sub-mode
  - Managed lane vehicles

*Stakeholder's feedback pointed to these specific areas of improvement in the existing travel model*



# Non-Motorized modeling improvements

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Model Step(s): Trip Generation

Modeled variable: The “share” of total trips generated that are non-motorized (i.e., bike/ped.)

Improvement: A revised model specification that takes into account land activity density, land activity mix, and urban form variables

Benefits of the improvement: Model will use a more robust set of explanatory variables that will better respond to the connection between land development and non-motorized trip making



# Transit ridership modeling improvements

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Model Step(s): Mode Choice and Transit Assignment

Modeled variable(s): Transit “share” and transit ridership

Improvements: New transit path-building software; a new Mode Choice model and transit assignment process

Benefits of improvement:

- Improved representation of transit sub-modes (e.g., Metrorail vs. bus vs. streetcar vs. LRT etc.)
- Accomplished in transit assignment, not MC



# Managed lane improvements

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Model Step(s): Highway Assignment

Modeled Variable(s): Highway demand on HOV & HOT lanes

Improvements: Revised highway assignment process that distinguishes vehicles among value-of-time (VOT) markets; Refined volume-delay functions for freeways & expressways

Benefits of improvement: Assignment of vehicles to managed lanes facilities will more explicitly account for driver differences in the willingness to pay for time savings





# Challenges

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- Increased model complexity
- Increased model run times



Image source: Andreas Levers



# Next Steps

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- TPB staff will review CS's updated model application and documentation
- Staff will evaluate model:
  - Sensitivity testing
  - Comparisons with the existing travel model
  - Performance checks

Key Question: Is the new model's performance superior to the existing model?



# Looking ahead

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- Quadrennial update of the LRP
  - It is unclear at this point that the developmental model will be ready in time for the quadrennial update
  - Staff intends to running the developmental model “in parallel” with the existing application model as a means of evaluating its readiness for production
- Phase 2 of the Strategic Plan
  - Development of the ABM
  - Contract for FY 18 will be delayed



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