Motivation
The Maryland Statewide Transportation Model (MSTM) is the first statewide travel demand model developed for the Washington-Baltimore region.

The travel demand models of two MPOs (Baltimore and Washington) are well suited for their respective jurisdictions. However, there are issues that must be addressed in the context of a multi-state region. These include:

1. the interaction of travel at the boundary between the two MPOs,
2. modeling of transportation in regions outside the MPO boundaries such as Western Maryland or the Eastern Shore of the Chesapeake Bay,
3. estimating the impact of travel which passes through the multi-state area, particularly freight travel with heavy trucks that are often a large share of traffic on rural interstate highways,
4. on major functional highway classes out-of-state traffic contributes a large share of vehicle miles traveled
5. long distance travel is more significant in statewide travel and may have very different travel characteristics than urban area trips.

Model Structure

Following data sources are included in the study

- Household Travel Survey (HTS) data collected in the year 2007-2008 in Baltimore and Washington region by two MPOs:
  - National Household Travel Survey (NHTS) data for year 2002 and 2009 for long distance travel.
  - Census and ACS
- Bureau of Transportation Statistics (BTS) air travel data from 1993 to 2010 for long distance travel estimation.
- Freight Analysis Framework, Version 3 (FAF3) data.
- Maryland State Highway Administration (MSHA) traffic count data.
- Highway Performance Monitoring System (HPMS) 2007 data for Vehicle Miles of Travel (VMT) validation.

Study Area and Data

Model Performance

Table 2: VMT Results by Functional Class

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>VMT (million)</th>
<th>Error Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated</td>
<td>Observed</td>
<td>Difference</td>
</tr>
<tr>
<td>Intercities</td>
<td>42.02</td>
<td>43.35</td>
</tr>
<tr>
<td>Freeways</td>
<td>11.95</td>
<td>12.38</td>
</tr>
<tr>
<td>Major Arterials</td>
<td>36.76</td>
<td>38.47</td>
</tr>
<tr>
<td>Minor Arterials</td>
<td>22.24</td>
<td>23.18</td>
</tr>
<tr>
<td>Collectors</td>
<td>11.99</td>
<td>11.42</td>
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<tr>
<td>Other</td>
<td>17.83</td>
<td>16.79</td>
</tr>
<tr>
<td>Total</td>
<td>142.79</td>
<td>145.66</td>
</tr>
</tbody>
</table>
Development of the Maryland Statewide Transportation Model and its Application in Scenario Planning

by

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Scenario Analysis Results

- Highway Scenario: Expanding the CLRP scenario to incorporate all the proposed states “toll roads”
- Fuel Price Scenario: Increased auto operating cost to consider increasing fuel prices
- Transit Scenario: Increasing transit ridership with reduced single occupancy vehicle trips
- Increased Demand Scenario: Considering increasing travel through interstate and external-to-external trips.

Conclusions

- A significant innovation of this approach is a three-layer design, with a national layer for long-distance travel, an urban level for detailed short-distance analysis, and a statewide layer as the core of this model that merges information from the statewide and the urban layer.
- Overall, the MSTM has demonstrated reasonable performance, consistent with expectations, in the scenario planning exercise presented in this paper.
- The ability to function reasonably in scenario planning is a critical test in taking the MSTM from development to implementation and policy application.
- Further application of the model in scenario planning will be instrumental in increasing confidence in the model.