Data Analytics and Modeling Methods for Tracking and Predicting Origin-Destination Travel Trends based on Mobile Device Data

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Project Team

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• National Transportation Center
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Agency Partners

• Baltimore Metropolitan Council
• Maryland State Highway Administration

Subrecipients

• AirSage
• INRIX
• StreetLight
Project Objectives

- Produce origin-destination (OD) tables, at both national and metropolitan levels, using all three major sources of mobile device data (cell phone, GPS, and smartphone apps).

- The data products will be segregated by mode, purpose, time period, socio-economic and demographical variables.
## Summary of Research Products

<table>
<thead>
<tr>
<th>Mobile Device Data Source</th>
<th>Cell Phone</th>
<th>GPS</th>
<th>Smart Phone App</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Provider</td>
<td>AirSage</td>
<td>INRIX</td>
<td>Streetlight &amp; Cuebiq through INRIX</td>
</tr>
</tbody>
</table>

### National-Level OD Product*<sup>**</sup>

<table>
<thead>
<tr>
<th>National-Level Product Detail</th>
<th>Yes</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 year-long OD by mode, purpose, socio-demo., month of year, time of day, for MSA** zones</td>
<td>2017 year-long OD for driving mode*** only and by purpose, socio-demo., month of year, time of day, for MSA** zones</td>
<td>While multimodal OD tables can be provided, they are not included in the proposal due to budget limitation.</td>
<td></td>
</tr>
</tbody>
</table>

### MPO-Level OD Product*<sup>***</sup>

<table>
<thead>
<tr>
<th>MPO-Level OD Product Detail</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 year-long OD by mode, purpose, socio-demo., month of year, time of day, for BMC TAZs</td>
<td>2017 year-long OD for driving mode only and by purpose, socio-demo., month of year, time of day, for BMC TAZs</td>
<td>2017 year-long OD by mode, purpose, socio-demo., month of year, time of day, for BMC TAZs</td>
<td></td>
</tr>
</tbody>
</table>

### Micro-Level Location Data

<table>
<thead>
<tr>
<th>Micro-Level Data Detail****</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A simulated sample of location points and time stamps for cell phones in MD.</td>
<td>Original GPS location points for all trips in Maryland for one year</td>
<td>A simulated sample of location points from raw smart phone app location data.</td>
<td></td>
</tr>
</tbody>
</table>

### National-Level OD Prediction

The 2017 base year OD tables will be employed to calibrate a person-level microsimulation-based U.S. national travel demand model, that is capable of predicting future year OD tables.

*: All OD products will be made available in the public domain without usage restriction.

**: MSA-to-MSA OD tables.

***: INRIX will provide both passenger and trucking travel OD tables.

****: Original or simulated micro-level location data points will be used by UMD to develop mode, purpose, socio-economic and demographical information imputation algorithms. While computation algorithms developed in this project will be shared in the public domain, micro-level raw data will not.
2017 BMC Metropolitan OD Product

Study area
- 2922 TAZ covering study area of BMC’s travel model

Study period:
- Entire 2017

Time-of-day: selected to be compatible with BMC model
- Morning peak: 6 am to 10 am
- Mid-day: 10am to 3pm
- Afternoon peak: 3 pm to 7 pm
- Night: 7 pm to 6 am

Day types
- Average weekday: Monday to Friday
- Average weekend: Saturday and Sunday

Holidays are not excluded

OD tables are separated by trip purpose
OD tables are separated by socio-demographic groups
Thank You!

Your Comments and Questions are welcome

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