

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

National Transportation Center  
Maryland Transportation Institute  
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# Project Team



## University of Maryland

- Project PI

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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

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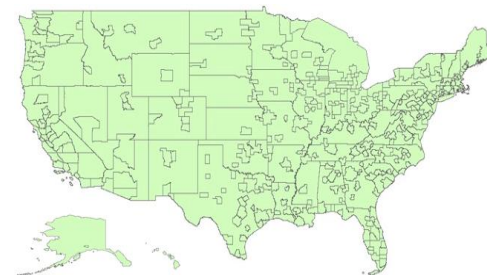


- **Produce origin-destination (OD) tables, at both national and metropolitan levels, using all three major sources of mobile device data (cell phone, GPS, and smartphone apps).**
- **The data products will be segregated by mode, purpose, time period, socio-economic and demographical variables.**

# Summary of Research Products



Mobile Device Data Source	Cell Phone	GPS	Smart Phone App
Data Provider	AirSage	INRIX	Streetlight & Cuebiq through INRIX
<b>National-Level OD Product*</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
National-Level Product Detail	2017 year-long OD by mode, purpose, socio-demo., month of year, time of day, for MSA** zones	2017 year-long OD for driving mode*** only and by purpose, socio-demo., month of year, time of day, for MSA** zones	While multimodal OD tables can be provided, they are not included in the proposal due to budget limitation.
<b>MPO-Level OD Product*</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
MPO-Level OD Product Detail  BMC: Baltimore Metropolitan Council is selected for case study in this project.	2017 year-long OD by mode, purpose, socio-demo., month of year, time of day, for BMC TAZs	2017 year-long OD for driving mode only and by purpose, socio-demo., month of year, time of day, for BMC TAZs	2017 year-long OD by mode, purpose, socio-demo., month of year, time of day, for BMC TAZs
<b>Micro-Level Location Data</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Micro-Level Data Detail****	A simulated sample of location points and time stamps for cell phones in MD.	Original GPS location points for all trips in Maryland for one year	A simulated sample of location points from raw smart phone app location data.
<b>National-Level OD Prediction</b>	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.		



National MSA Shapefile



BMC Model's Shapefile

\*: 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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