

**Inclusive Public Transit Toolkit to Assess Quality of Service  
Across Socioeconomic Status in Baltimore City**

**NSF 1951924**

**Vanessa Frias-Martinez, University of Maryland**

**IRG-1, FY2020**

**Principal Research Investigators (Name, Institution)**

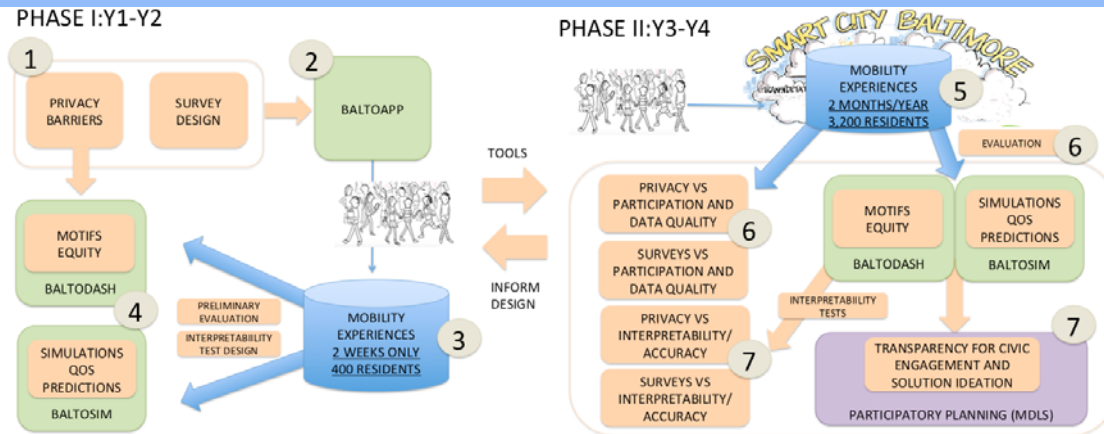
- . *Chris Antoun, University of Maryland*
- . *Celeste Chavis, Morgan State University*
- . *Sevgi Erdogan, University of Maryland*
- . *Vanessa Frias-Martinez, University of Maryland*
- . *Seema Iyer, University of Baltimore*
- . *Jessica Vitak, University of Maryland*

**Community Partners (Name, Institution)**

- Housing Authority of Baltimore City (HABC)
- Central Maryland Transportation Alliance (CMTA)
- Baltimore Transit Equity Coalition (BTEC)
- Baltimore City Department of Transportation (BCDOT)
- Maryland Transit Administration (MDOT MTA)

# Project Overview

## Visual Schematic



## Project Vision

**BALTO: Be and Advocate for public TransportatiOn**

- **Objective:**  
Identify the barriers faced by low income residents in Baltimore when using public transit
- **Approach:**  
Design, development, deployment and evaluation of a privacy-respectful toolkit to identify and characterize the challenges typical of complex trips endured by low-income residents; and use challenges to drive bottom-up, crowdsourced-informed actionable solutions via community conversations and a decision support system

# Project Overview

## Use-Inspired Research

- Access to reliable and efficient public transit is one of the most significant needs in Baltimore City. Our NSF planning grant revealed West Baltimore residents' frustration with the perceived low-quality of public transit that limited access to work and educational opportunities
- We focus on the identification of high value, small scale, community-led improvements in the quality of the current transit network via conversations among low income residents in Baltimore (HABC), transit advocacy groups (CMTA and BTEC) and transit agencies (BDOT and MTA).

## Fundamental Research Contributions

- Understand privacy barriers of low income residents with location data collection processes
- Design novel, interpretable ML methods to identify and characterize transit challenges from mobility data
- Identification of processes and tools needed to create democratic spaces where solutions to public transit challenges are identified via data-driven neighborhood conversations among residents, advocacy groups and decision makers
- A decision support system to simulate the impact of local solutions at city scale

# Project Update

- Analysis of privacy barriers around location data collection
  - Screener survey for participant recruitment in HABC locations and in Baltimore
  - Design protocol for online focus groups with residents
  - Findings will be used to offer privacy preferences in mobile app
- Mobile app development
  - Door-to-door trip data collection (GPS data)
  - Quality of service surveys (QoS) at transfers
  - Data upload to AWS (via CloudBank)

# Project Evolution

- Brainstorm about how to run recruitment and focus groups online
  - Recruitment can't be done at tabling events or in-person
  - Focus groups can't be done in person
  - Implications around low income and technology access when activities are moved online – who are we missing?
  - E.g., HABC staff fill out surveys for residents who couldn't do it for themselves

# Anticipated outcomes & success measures for next year

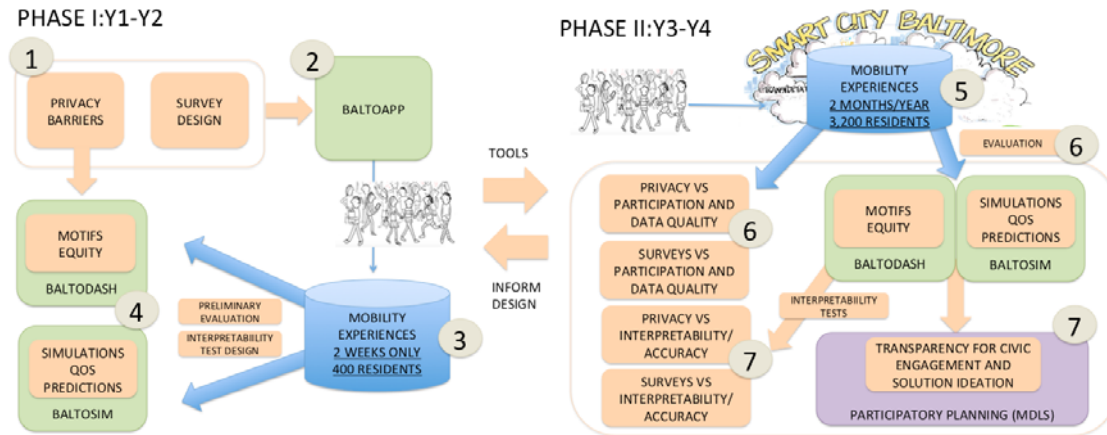
- Identification of privacy barriers
  - Run ~15-20 focus groups to identify location data collection concerns shared by low income residents
  - Provide recommendations for mobile app designers on privacy preference features
- Mobile app to collect door-to-door mobility experiences (GPS and QoS surveys)
  - Incorporate privacy preferences into the user interface of the mobile app
  - Alpha and beta testing with a small set of residents

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- A decision support system to simulate city-wide solution impact

Please organize the contents of slides (2) and (3) as a quad-chart using the template below. The quad chart should not be included in your lightning talks but should be submitted to NSF S&CC through an upload link that will be provided in the coming weeks.