Transit Equity & Environmental Health in Baltimore

One Page Summary

Introduction
Public transit provides relatively low-cost access to jobs, food, and healthcare, while also reducing pollution and greenhouse gas emissions by taking cars off the roads and increasing physical activity. Despite these benefits, public transit in Baltimore often fails to get people to their destinations in a reasonable amount of time. This is especially concerning since low-income people of color represent the majority of transit-users in Baltimore, many of whom during the COVID-19 pandemic were classified as “essential workers”.

This project, a collaboration between Johns Hopkins University, the Baltimore Transit Equity Coalition, and Baltimore community members, aims to better understand the relationship between the public transit system, air pollution, and health impacts in the Baltimore region. We hope the information can be used to determine which areas would benefit the most from investments in transit. Our first step was to create maps which describe current inequities with regards to transit and social vulnerability, summarized below.

Methods
Each theme had indicators drawn or derived from the U.S Census Bureau (including American Community Survey and LEHD Origin-Destination Employment Statistics data), the Centers for Disease Control and Prevention, and the Maryland Transit Authority (including their General Transit Feed Specification data). For each, we calculated a percent rank (0-100) relative to other Baltimore geographies, so that a higher rank indicated an area more in need compared to the rest of the city. Each theme’s score was the average of all its indicators. The analysis focused on people living and working in Baltimore (about 40% of whom are considered “essential”). Future efforts should include the entire metropolitan area.

Indicators
Transit indicators were separated into access and system performance metrics. Access measures included:
- Number of transit stops in the census tract
- Distance over a half mile to high frequency transit routes
- % of workforce commuting by public transit

The system performance sub-theme included:
- Estimated average commute time
- Estimated difference in average commute comparing public transit versus car
- % of population commuting by transit with a commute >45min

Communities’ ability to access resources and opportunities not only relates to local infrastructure but is also impacted by factors such as poverty, which can impose drastic hardships on individuals living in those places. To better understand the social vulnerability of these communities, the research team used CDC’s Social Vulnerability Index (see box above).
**Results and Recommendations**

In all the maps, darker color indicates areas of greater need. For the transit score, many indicators appear to increase further away from the city center: average commute time, % of public transit users with commute >45 minutes, difference in average commute time between public transit and personal vehicle use, and distance to high frequency transit stops. However, some tracts closer to the city center have a disproportionate need for investment. The social vulnerability map reflects the notorious white ‘L’ and black ‘butterfly’ associated with Baltimore, with more low-income, minority-populated areas residing in the darker areas and wealthier, white-populated areas residing in the lighter middle of the map.

In combination with the transit maps, it is clear that neighborhoods in the “black butterfly” with higher social vulnerability have greater need. This calls for greater investment in transit in neighborhoods such as the ones identified in the Overall Transit Investment Need map below.