

MEMORANDUM

August 16, 2023

To: Keith Hamas

Organization: North Jersey Transportation Planning Authority

From: Joanna Wang and Michael Blau

Project: North Jersey Transportation Planning Authority Regional Active Transportation Plan

Re: Equity and High Crash Network Screening Analyses – FINAL REVISED (6/16/23)

Introduction

Toole Design performed Equity and High Crash Network Screening Analyses to identify overlaps between areas with high active transportation potential and those with regional safety and equity priorities. These analyses will inform the development of a conceptual, regional active transportation network.

Equity Analysis

Removing systemic transportation barriers to increase equitable outcomes for underserved communities is another key principle of the ATP. This evaluation helps to identify communities that have historically received lower levels of investment and have greater needs for safety improvements, particularly for people who are more likely to depend on active transportation to get to work, medical appointments, and other important destinations, as well as people who experience higher health burdens due to pollution.

High Crash Network Screening Analysis

Making streets safer for people walking and biking is a key principle of the NJTPA's ATP. Evaluating high crash locations helps identify areas that have the greatest need for safety improvements for vulnerable active transportation users. Crash analyses are especially important where New Jersey has nearly double the national average for fatal crashes involving people walking and bicycling. Conducting a network screening analysis – a method that considers crashes as well as other roadway factors that may contribute to future crashes – helped to identify locations in need of safety improvements.

Methodology

The Equity Analysis uses the New Jersey Department of Environmental Protection's (NJDEP) Overburdened Communities dataset (2020) developed under the New Jersey Environmental Justice Law,¹ which identifies Overburdened Communities (OBCs) at the census block group level using demographic information from 2020 Census Data.

The High Crash Network Screening Analysis uses the following traffic safety layers from the 2019 network screening analysis developed by the NJTPA:

- Local Pedestrian Intersections
- Local Pedestrian Corridors
- Pedestrian-Bicycle Intersections

Pedestrian and bicycle crash data from 2012 to 2016 were used to calculate crash frequency and crash severity to evaluate crash impact. The project team reviewed intersections and corridors ranked within the top 100 weighted crash scores to prioritize locations of high bicycle and pedestrian crash occurrences.

The project team overlaid OBCs and the network screening layers with the following datasets that were generated from previous trip potential and barrier analyses:

- High-stress travel barriers – top five percent of population and equity weighted county percentile scores.²
- High pedestrian trip potential – composite score for pedestrian trip potential in the range of 90-100, accounting for about 10 percent of the NJTPA area.³
- High Bicycle trip potential – composite score for bicycle trip potential in the range of 90-100, accounting for about five percent of the NJTPA area.⁴

Overlaying the overburdened community and crash data on the pedestrian and bicyclist trip potential and barrier data helps identify areas of high active transportation potential through equity and safety lenses, which are key focus areas of this project and the NJTPA overall.

Results

This section discusses the qualitative findings from overlaying the network screening and OBC data with the high-stress travel barriers and high trip potential layers.

Equity

Barriers

Figure 1 shows the spatial distribution of the top high-stress travel barriers in relation to OBCs as identified by NJDEP. The cluster of high-stress barriers around the northern border of Ocean County overlap with low-income OBCs in Lakewood. In addition, low-income and minority OBCs in Newark and Dover and minority OBCs in northern Middlesex County and southern Bergen County have some of the highest barriers for active transportation.

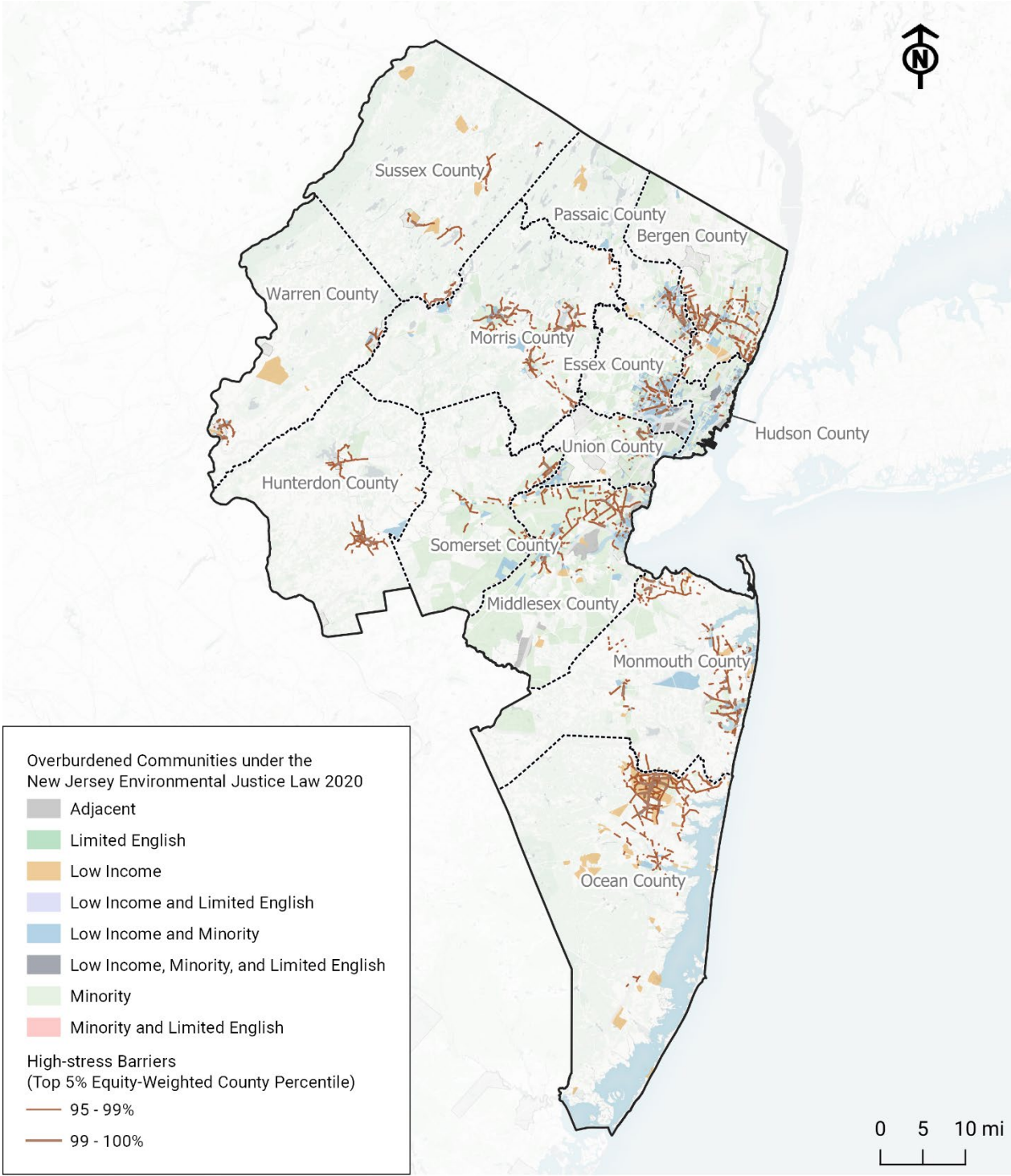
¹ New Jersey Department of Environmental Protection, Office of Environmental Justice. (2022). What are Overburdened Communities (OBC)? <https://www.nj.gov/dep/ej/communities.html>

² See August 12, 2022 Final Barrier Analysis Memo.

³ See August 12, 2022 Final Trip Potential Analysis Memo.

⁴ Ibid

Figure 1: Overburdened Communities Overlaid with Top Five Percent High-Stress Barriers



Trip Potential

Most of the areas with high bike trip potential, shown in purple hatches, are within overburdened communities, as displayed in Figure 2. In Essex, Passaic, Bergen, Hudson, and Union counties, high bike trip potential areas overlap with low-income and minority OBCs and some minority OBCs. Clusters of high bike trip potential areas overlap mainly with low-income OBCs in Ocean County, low-income and minority OBCs in Monmouth County, and minority OBCs in Middlesex and Somerset counties.

Similar patterns hold for areas with high walk trip potential in Figure 3. In Essex, Bergen, Union, and Hudson counties, high walk trip potential areas mostly fall in low-income and minority OBCs and some minority OBCs. In other counties, high walk trip potential areas are scattered but overlap with low-income and minority OBCs and minority OBCs.

Figure 2: Overburdened Communities Overlaid with High Bike Trip Potential

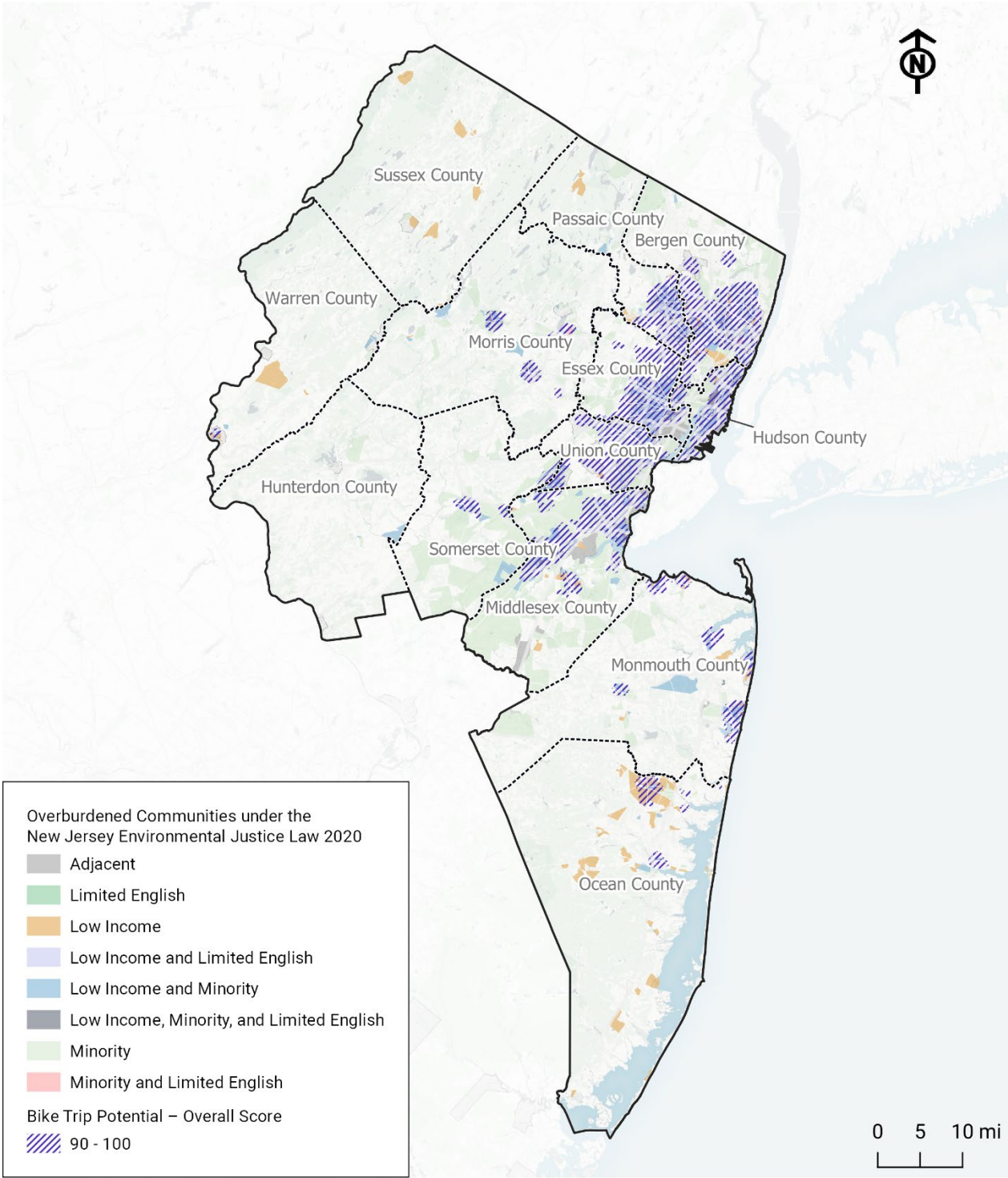
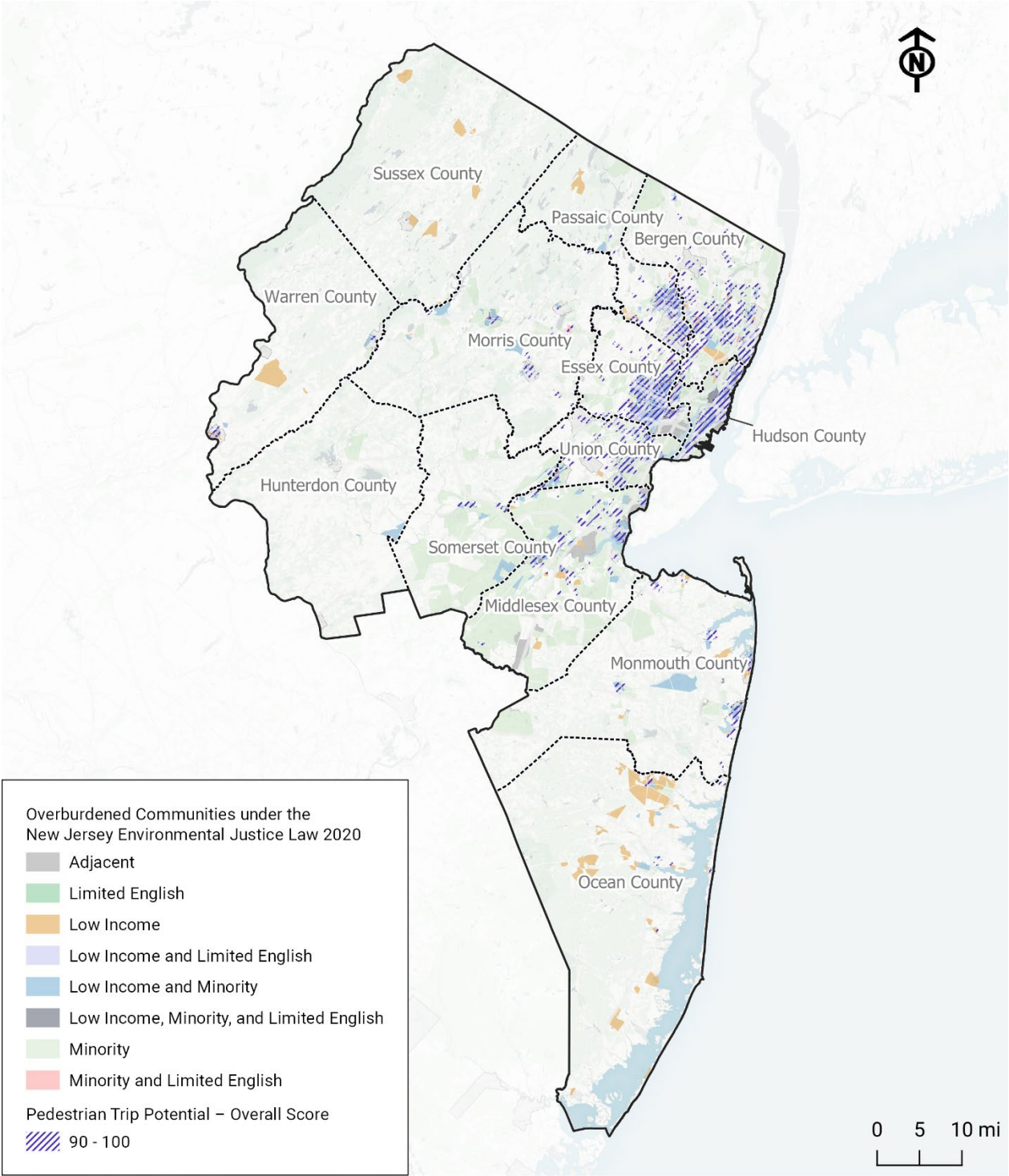


Figure 3: Overburdened Communities Overlaid with High Walk Trip Potential



Network Screening

Barriers

Figure 4 shows the overlap between high-stress barriers for active transportation and high pedestrian and bicycle crash intersections and corridors. In Essex County, high crash intersections occur on high-stress barriers like Springfield Avenue and Bloomfield Avenue. High pedestrian crash corridors overlap with high-stress barriers on Central Avenue, South Orange Avenue, and Bloomfield Avenue. In Passaic and Bergen counties, high-stress barriers including Main Avenue, Degraw Avenue, and Essex Street overlap with high crash intersections and high pedestrian crash corridors; high crash segments on Broadway, Teaneck Road, and Fair Lawn Avenue partially overlap with high-stress barriers. Finally, segments of County Road (CR) 527 in Somerset County, and CRs 604 and 514 in Middlesex County are identified as both high-stress barriers and high pedestrian crash corridors.

Trip Potential

Figure 5 shows high bike trip potential areas that overlap with high bicycle crash intersections. About half of the top 100 pedestrian/bicyclist crash intersections are within Essex County. They are clustered in areas with high bike trip potential, including west Newark, Orange, and along Bloomfield Avenue, Central Avenue, and South Orange Avenue. In addition, these high injury intersections also fall into the high bike trip potential areas in Hudson County along JFK Boulevard, and along Main Avenue in Passaic County.

Figure 6 shows areas with high pedestrian trip potential in relation to intersections and corridors with high pedestrian crashes. About half of the top 100 local pedestrian crash intersections are within Essex County. They are clustered in areas with high pedestrian trip potential, including Newark, East Orange, and along Bloomfield Avenue and Springfield Avenue. In Hudson County, all high pedestrian crash intersections and corridors are located on the east side of the County within high walk trip potential areas, including seven segments of CR 501 and eight intersections along CR 501. In addition, 19 of the 25 high pedestrian crash corridors identified in the high walk trip potential areas in Hudson County are along the northwest – southeast corridors, including Broadway, Bergenline Avenue, CR 501, Avenue C, and Palisade Avenue. Apart from Essex County and Hudson County, other overlaps between high crash areas and pedestrian trip potential results are in Bergen County (Hackensack and Englewood) and Passaic County (Clifton, Paterson, and Passaic). Most of the top 100 pedestrian crash corridors are concentrated in the high pedestrian trip potential areas in Essex County along CRs 510, 506, and 508, and in Hudson County along north/south corridors like CR 501.

Figure 4: Network Screening Overlaid with Top Five Percent High-stress Barriers

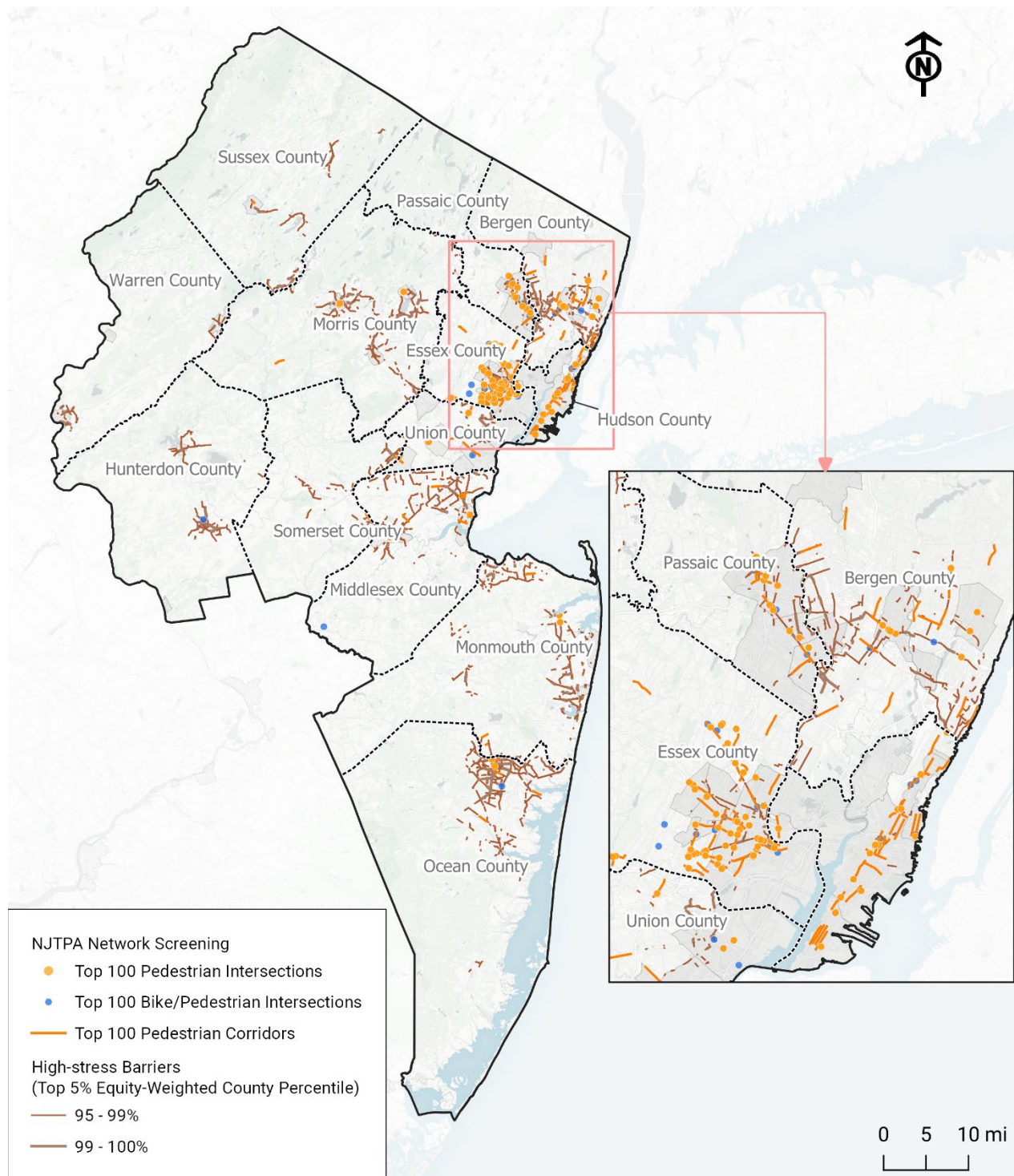


Figure 5: Network Screening Overlaid with High Bike Trip Potential

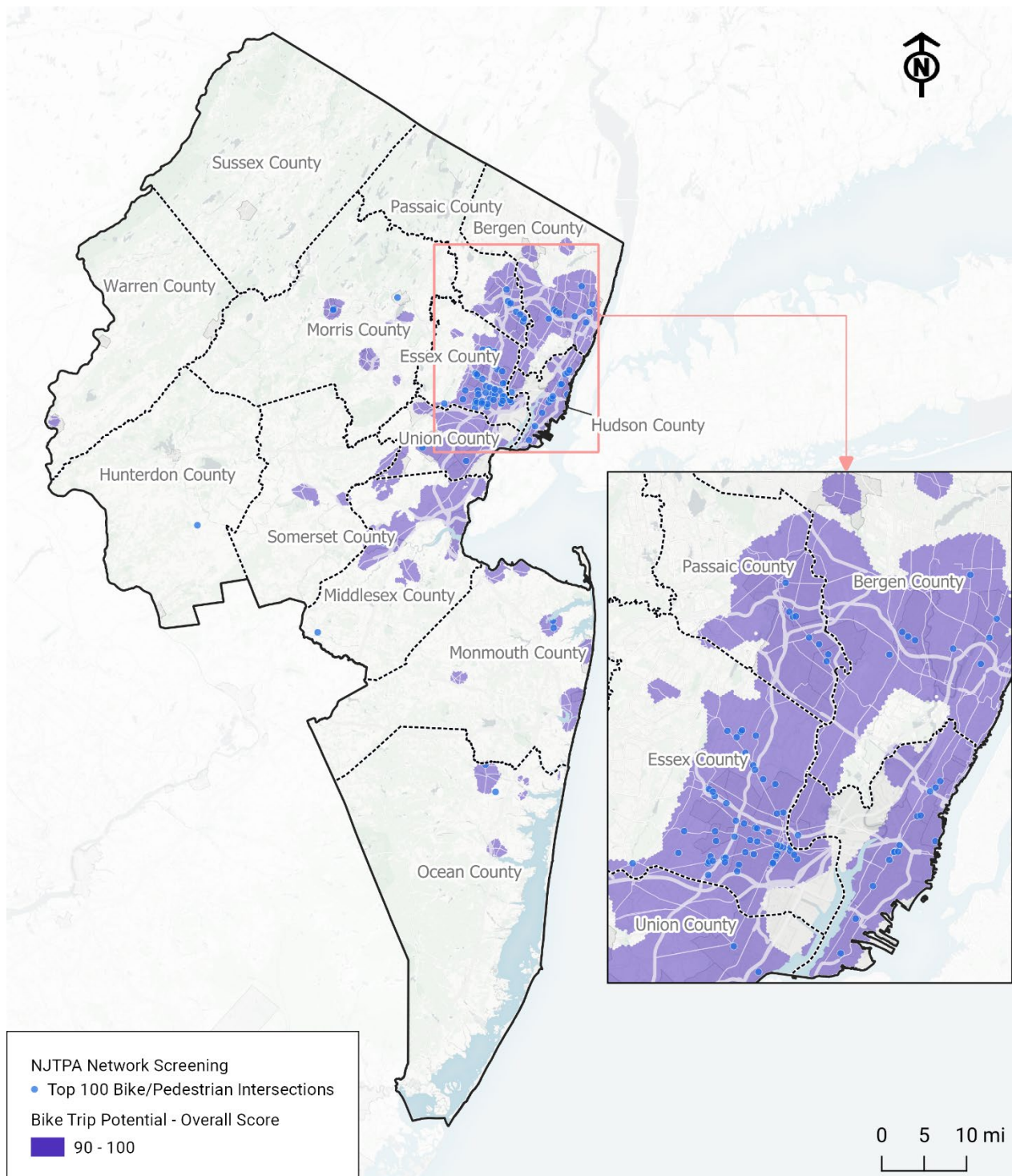
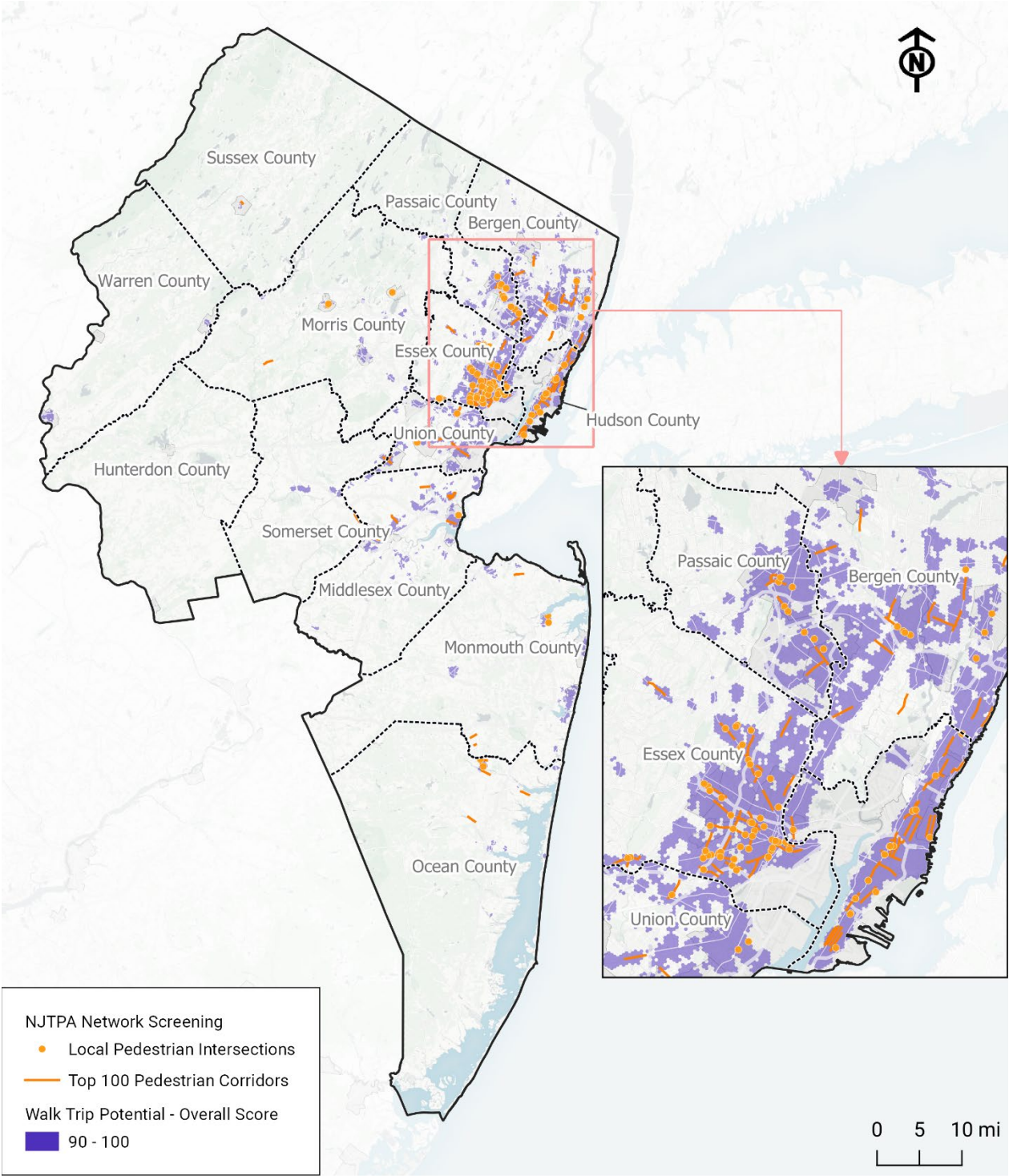


Figure 6: Network Screening Overlaid with High Walk Trip Potential



Conclusion and Next Steps

The project team identified the following key patterns from the results of the Equity and Network Screening Analyses:

- High-stress barriers in Bergen, Passaic, Morris, Middlesex, and Ocean counties are usually also in low-income and minority OBCs.
- Areas of high walk and bike trip potentials are usually also in low-income and minority OBCs.
- In Essex, Hudson, Bergen, and Passaic counties, areas with high walk and bike trip potentials are also likely to experience more crashes.
- In most counties except for lower Passaic and Essex counties, high-stress barriers are not strongly associated with high crash locations.

These analyses were the first step in developing a conceptual, regional active transportation network. By overlaying different datasets, the project team began to identify areas of need that would benefit from active transportation improvements. Using professional expertise and local knowledge, the project team then manually drew routes between high need areas, with input from the TAC and NJTPA staff; for example, OBCs with high-stress barriers and areas with high trip potential. These corridors formed the building blocks of a network that connects important destinations throughout the NJTPA region.