![NJTPA — North Jersey Transportation Planning Authority]

North Jersey Regional Active Transportation Plan

JUNE 2023

Acknowledgments

Contents

1 Purpose

Background

Why does North Jersey need an active transportation plan?

Active transportation—or walking and biking—is essential to North Jersey's transportation system and to the region's economic vitality. There are multiple benefits to active transportation, which include improved health outcomes, lower environmental impact, more equitable outcomes for underserved communities, stronger economies, and more tightly knit communities. Walking and biking are part of an active and healthy lifestyle, providing physical and mental health benefits as well as preventing chronic illnesses, such as obesity, heart disease, and diabetes.[1] According to the New Jersey Department of Health, approximately one in four New Jersey adults (27 percent in 2017) were obese and nearly half of the state's adult population are projected to be obese by 2030.[2]

Additionally, walking and biking trips help ease congestion on roadways, reducing emissions and improving air quality for everyone. According to the New Jersey Department of Environmental Protection (NJDEP), on-road transportation accounts for more than 40 percent of greenhouse gas emissions and adds to other pollutants such as particulate matter and nitrous oxides.[3] With zero emissions, walking and biking help mitigate asthma and other health risks from poor air quality. The state's asthma rate is nine percent among both adults and children—higher than the national average of 7.5 percent. Additionally, minority populations in New Jersey suffer a disproportionately high asthma rate of 14 percent[4]—making safe and comfortable walking and biking opportunities especially critical in communities of color.

Active transportation choices are also valuable for people who do not drive, including young people walking to school, older adults trying to access healthcare, or people with low incomes traveling to work. Active transportation is vital to the economy, as it improves access to critical daily destinations (such as schools, employment centers, grocery stores, and medical services) as well as important recreational destinations (parks, open space, playgrounds, and shopping areas), both directly and through connections to public transportation. Walking and biking support local commerce, reduce health care costs, and improve outputs for employers through reduced sick days and increased employee retention. Safe street infrastructure for walking and biking helps reduce fatalities and serious injuries caused by vehicle crashes. New Jersey's percentage of fatal crashes involving people walking and bicycling (29 percent) is almost double the national average.[5]

As a coastal state, climate change is a major threat in New Jersey, and measures to improve active transportation can play a key role in climate resiliency and mitigation efforts by providing environmentally friendly alternatives to driving as well as incorporating stormwater infrastructure to reduce flood risk. Finally, remaking communities to encourage walking and biking over vehicle travel enhances quality of life and strengthens communities. NJTPA surveys and public outreach have consistently found that people value living in walkable places.[6] Many of the region's residents use active transportation for all or part of their commute to work, and many rely on it for recreation and short non-work trips.

North Jersey's active transportation strengths and challenges

North Jersey is uniquely situated among metropolitan regions nationwide to embrace the growing demand and need for active transportation. As the most densely populated state, much of the state's built environment and transportation network is naturally conducive to walking and bicycling. Historically compact development patterns that grew around rail stations, streetcar lines, and town centers continue to concentrate activity in areas across North Jersey. However, the region is not monolithic, and people walking and bicycling in less densely populated areas face distinct challenges from those in these denser areas. In some rural areas, long distances between destinations and auto-oriented transportation networks discourage the use of active transportation. In other parts of the region, low traffic

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1   NJTPA. (2020). Plan 2050 Background Paper: Active Transportation in the NJTPA Region. Retrieved from: https://www.njtpa.org/NJTPA/media/Documents/Planning/Plans-Guidance/Planning%20 for%202050/draft%20final/njtpa_activetransportation.pdf
2   Ibid
3   Ibid
4   Ibid
5   Ibid
6   Ibid

volumes, pastoral scenery, and moderate terrain make an ideal destination for recreational bicyclists. In short, there is no one size fits all approach to accommodating the region's diversity of active transportation users. From students walking to school in Jersey City to recreational riders on Monmouth County's Henry Hudson Bike Trail, North Jersey's active transportation network attracts a variety of people with different needs, comfort levels, abilities, and safety concerns.

However, the NJTPA's Level of Bicycle Compatibility and Connectivity Analysis showed that most roads in the region are stressful for less confident riders. Currently, less than five percent of commuters in the region travel by walking or biking (although the rate is above the national average), and walking and biking account for ten percent of non-commute trips.[7] Research also shows that 35 percent of transit users walk a significant amount (more than 30 minutes) to and from transit each day.[8] While the NJTPA's existing trail network (greater than

200 miles) serves valuable tourism and recreational uses, it could be expanded to better serve active transportation users. Compared to other metropolitan regions (such as Washington, DC and Philadelphia), the NJTPA region has fewer trail miles per capita.[9, 10, 11] However, walking and biking in the region will increase along with the need for public investment to support it over the next twenty years. Population is expected to grow to 7.7 million in 2045 (a 15 percent increase from 2015), putting more demand on all aspects of the transportation system and increasing the need for sustainable alternatives to private vehicle travel.[12] Demand for active transportation is also expected to continue growing, given broad public recognition of its many benefits.

Additionally, there is a clear and urgent need to better serve the region's underserved communities who face unique challenges while traveling. Nationwide, minority and low-income communities are exposed to more hazardous traffic conditions, increasing their risk of injury or death.[13]

Town of Clinton, Hunterdon County

7   Ibid

8   Ibid

9   Rails to Trails Conservancy. (2016). The Circuit Trails: 750-Mile Network Has Sparked a Greater Philly Transformation. Retrieved from: https://www.railstotrails.org/trailblog/2016/april/12/the-circuit-trails-750-mile-network-has-sparked-a-greater-philly-transformation/

10   Capital Trails Coalition. (2021). The Capital Trails Network Impact Report. Retrieved from: https://www.capitaltrailscoalition.org/wp-content/uploads/2021/04/CTC-Impact-Report-Web-4.28.pdf

11   United States Census Bureau. (2020). 2020 Population and Housing State Data: Metropolitan Statistical Areas. Retrieved from: https://www.census.gov/library/visualizations/interactive/2020-population-and-housing-state-data.html

12   NJTPA. (2020). Plan 2050 Background Paper: Active Transportation in the NJTPA Region. Retrieved from: https://www.njtpa.org/NJTPA/media/Documents/Planning/Plans-Guidance/Planning%20for%202050/draft%20final/njtpa_activetransportation.pdf

13   SRTS National Partnership. (2015). At the Intersection of Active Transportation and Equity. Retrieved from: https://www.apha.org/~/media/files/pdf/topics/environment/srts_activetranspequity_report_2015.ashx

City of Lambertville, Hunterdon County

# Building upon an active transportation movement

Many communities are already planning for a shift to more active transportation through Complete Streets and Vision Zero policies, and other initiatives that recognize the need to prioritize the safety and comfort of people walking and biking. The NJTPA and its subregions have collectively made great strides toward creating active transportation pathways and networks, including conducting Walkable Community Workshops; partnering with communities on Street Smart NJ Campaigns; creating data resources such as pedestrian counts; and partnering with NJDOT and NJ TRANSIT on Safe Routes to School, Complete Streets, and supporting Transit Villages. These complementary activities support the region's residents' desire for safer, more walkable streets and trails.

Yet, without a central inventory of existing and planned active transportation facilities, collaboration and coordination on building out a region-wide network is challenging. The Active Transportation Plan (ATP) articulates a broader and more cohesive vision around

which the NJTPA and local partners can rally to improve walking and biking conditions across North Jersey.

The NJTPA's ATP development process served as a forum to build consensus around active transportation goals and discuss solutions to the challenges. The ATP envisions a 1,700 mile network across North Jersey, creating safe, functional, and connected opportunities for walking and biking. The ATP also provides a strategy guide with a tailored set of recommendations on the implementation of the active transportation network, two corridor case studies for active transportation project planning and scoping within the NJTPA region, and an analysis of network overlaps with highway interchanges throughout the region and best practices for active transportation facility design at these locations. Data gathered and analyzed in developing the ATP is being provided on an ATP website. Through these resources, the ATP provides a path for implementation of active transportation projects and aims to inspire public support and demand for future development of walking and biking infrastructure. Fostering a community of active transportation users and public support for these projects is critical to moving the ATP forward.

Figure 1. Existing and Planned Active Transportation Network
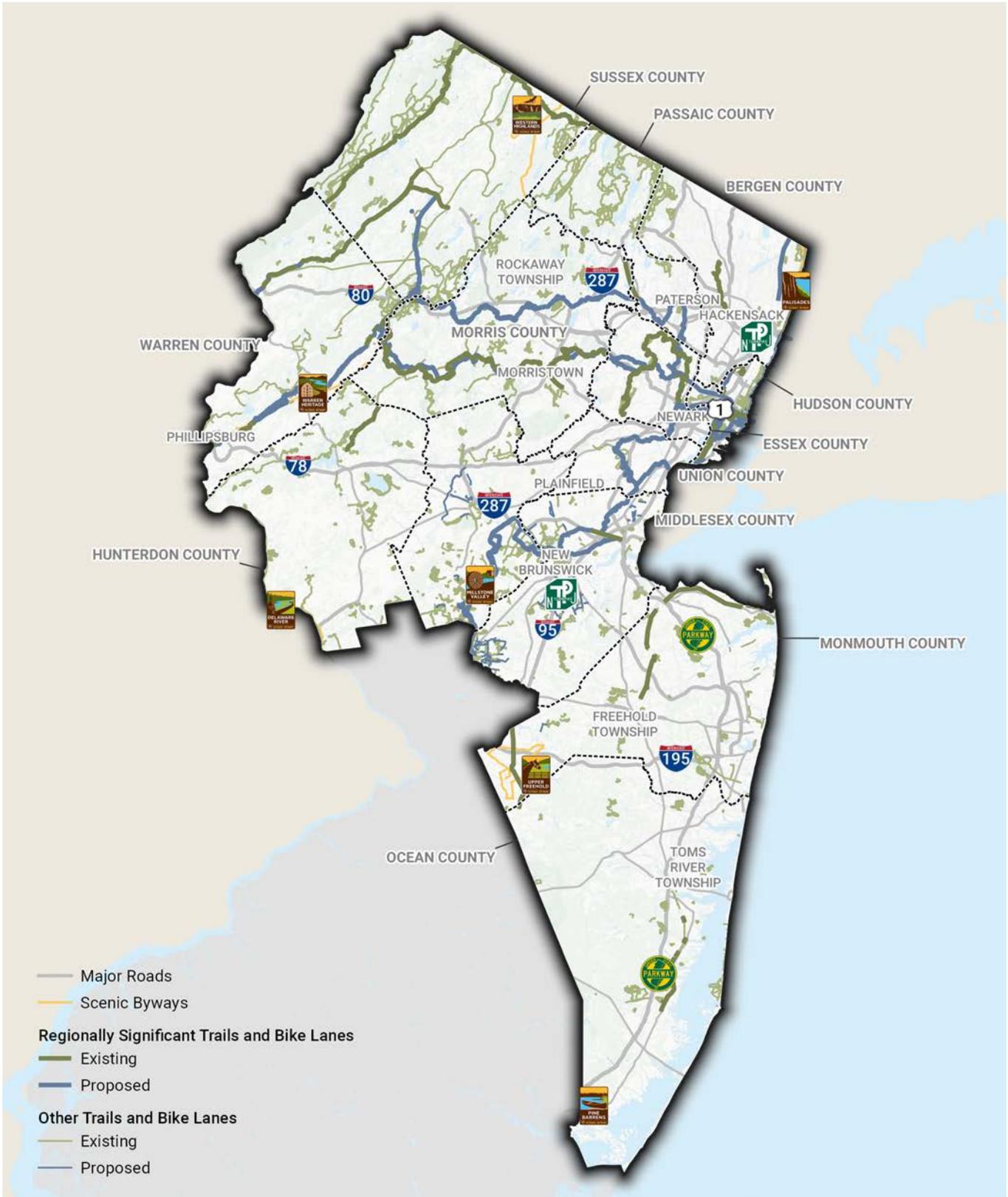
Map Legend:
- Major Roads
- Scenic Byways

Regionally Significant Trails and Bike Lanes
- Existing
- Proposed

Other Trails and Bike Lanes
- Existing
- Proposed

0   10   20 mi

NJTPA
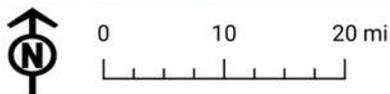
Plan Vision

Engagement with the project's Technical Advisory Committee (TAC) helped develop the ATP vision. Through a stakeholder meeting, the team held a discussion to define what a successful ATP would look like. These ideas were used as the framework for the principles and goals listed below. The vision was further developed to align with NJTPA long range plan goals, summarized in the following statement:

> The NJTPA envisions a safe, comfortable, and connected network for active transportation users that will promote equity and economic opportunity by providing a healthy lifestyle for the region's diverse residents and communities, while increasing mobility through resilient and environmentally friendly transportation options.

Principles and Goals

Safety

- Reduce risks and barriers to walking and biking, so residents feel safe using active transportation modes.

Equity

- Provide underserved communities equitable access to mobility so that every person in the NJTPA region is able to get to where they need to go—regardless of gender, race, income, age, or ability.
- Improve air quality, expand access to greenspace, and increase climate resilience to enhance quality of life for underserved communities.

Connectivity

- Connect residents to their neighbors in the next town over as well as across the region by creating opportunities to walk and bike as part of daily life.
- Foster vibrant community centers by providing multiple options to access community destinations.

Economy

- Generate more tourism, recreation, and economic opportunity with a safe, well-connected, and inviting transportation network.

Sustainability

- Focus on a resilient transportation system that reduces environmental impacts.
- Aim for adaptability to serve the changing needs of communities and the environment.

City of Jersey City, Hudson County

2 Methods

> This section provides an overview of the data collection methods for the network development, policy and program recommendations, and corridor case studies used to work toward these goals.

Data Collection Methods

The ATP used qualitative and quantitative methods to inform the network and strategy recommendations. A data-driven process assessed needs objectively across the 13-county region. However, while it was important to have a data-informed network, it was also valuable to engage stakeholders and the community in the assessment of the active transportation system and development of recommendations.

Throughout the ATP development process, the NJTPA held two virtual meetings with a TAC made up of representatives from local and regional agencies, advocacy organizations, and other stakeholders who possess on-the-ground knowledge of the region's active transportation conditions, challenges, and opportunities. This group provided input to guide plan development, gather bike and trails facility datasets, offer feedback on technical memos and drafts, and help to promote public engagement opportunities.

At the start of the process, a plan and policy review informed a fuller and deeper understanding of the NJTPA region and ATP best practices from other regions. Research into existing NJTPA and state active transportation programs and documents contributed to development of the Strategy Guide to tailor the strategies for the NJTPA region and its member jurisdictions as well as build upon previous work.

Before developing the network recommendations, NJTPA staff collected available bike and trails facility datasets from member subregions and used them to develop an inventory of active transportation facilities. The inventory was used to create a basemap of existing and planned active transportation facilities. The Findings section describes the contribution of several existing NJTPA, state, and other external datasets for various analyses (that provided the basis of the proposed network):

- NJTPA Equity Analysis Tool
- NJTPA Level of Bicycle Compatibility analysis
- NJTPA Network Screening Lists
- NJDEP Overburdened Communities (OBC) dataset
- NJDEP Parks
- NJDEP Statewide Trails Layer
- NJ TRANSIT lines
- NJ TRANSIT rail stops
- NJTPA Bus terminals
- NJTPA residential land use data
- Several census datasets (ACS)
- Longitudinal Employer Household Dynamics (LEHD) data
- OpenStreetMap data

Additionally, soliciting input from local governments and the public on routes that need improvement, specific project priorities, and locations of safety concerns for walking and bicycling helped inform the proposed network. This was accomplished through pop-up tabling at several major events throughout the region as well as an interactive webmap (See the Public Engagement section for more details).

Prioritizing people's lived experiences was especially crucial in the development of the Strategy Guide. The project team gathered input through a series of focus groups with community members from underserved demographic groups to elevate their perspectives (people with disabilities, minority residents) and small group interviews with municipal, regional, and community representatives (from the NJTPA and municipal and county staff focused on planning, policy, engineering, and public works).

Conducting site visits for the ATP's case studies helped capture roadway characteristics (such as road widths, lanes, speed limits, and daily vehicle volumes) as well as observing pedestrian and bicycle activity, walking and biking infrastructure, accessibility infrastructure, and street crossings.

Broad Street, City of Newark, Essex County

Centering Equity

Historically, transportation investments and programs have not benefited individuals and communities equally or equitably. These inequitable outcomes are evident in many ways, particularly as they relate to safe infrastructure for people that walk and bike. Both historically and presently, minority and low income populations experience a disproportionate amount of severe pedestrian and bicycle crashes. Race, as well as gender, also significantly impact perceptions of and engagement in active transportation. Minorities, youth, older adults, people living in poverty, adults with no high school education, residents with limited English proficiency, and households without access to a motor vehicle are often more likely to rely on walking, biking, and transit. Active transportation plays a vital

role in low-wealth communities; nationally, low-income individuals are bicycling more than higher earners. The bottom quartile of workers by income accounts for 39 percent of bicycle commuting in the U.S., compared to only 20 percent for the wealthiest quartile.

Planning for and implementing active transportation facilities is essential to reduce the disproportionate health burdens and mobility challenges that North Jersey's most vulnerable residents experience. Active transportation plans and projects play an important role in advancing equitable systems. They provide affordable travel options, support improved health outcomes, and address safety disparities. Disparate access to mobility perpetuates inequities in access to food, healthcare, recreation, education, employment, and other essential needs and opportunities.

The NJTPA put equity at the center of the ATP development process using several strategies:

- The TAC participants voiced support for centering equity in the outreach and engagement approaches and in developing the network.

- Using geospatial and quantitative data analysis helped determine where active transportation facilities would be most vital and beneficial. The network development process included an equity analysis that identified Environmental Justice or Overburdened Communities (low-income households, minority residents, and/or limited English proficiency households), a Trip Potential Analysis that accounted for households living below poverty and households without vehicle access, and a barrier analysis that included equity-focused weighted

scores using data from the NJTPA's Equity Analysis Tool that includes a variety of demographic factors (race, income, English proficiency, disability, age, foreign-born, sex, number of vehicles in household, and educational attainment).

- The NJTPA focused a significant portion of engagement at elevating the voices of underserved groups. Additionally, NJTPA staff and the project team conducted on-the-ground outreach across the region at major events to hear from people with diverse perspectives who either are not able to or typically do not choose to participate in traditional planning processes. Their perspectives helped to shape the ATP recommendations.

City of Englewood, Bergen County

3 Findings

This chapter provides an overview of the various analyses that informed the ATP recommendations, including a review of best practices and New Jersey plans and policies, several data-driven analyses that identified areas in need of active transportation infrastructure, and a summary of public engagement efforts.

Plan and Policy Review

Regional Active Transportation Planning Best Practices Review

The ATP included a review of existing plans to identify active transportation planning principles and best practices for regional active transportation planning that are relevant to the NJTPA region's transportation system, built environment, and regulatory context. The review focused on regional active transportation plans (or alternatively, long range transportation plans) and/or resources established by other states, MPOs, and regional planning authorities, and the most pertinent peer organizations.

The MPOs and plans reviewed include:

- Atlanta Regional Commission (ARC): Walk, Bike, Thrive! (2020)
- Capital Area Metropolitan Planning Organization (CAMPO): Regional Active Transportation Plan (2017)
- Chicago Metropolitan Agency for Planning (CMAP): ON TO 2050 (2018)
- City/County Association of Governments of San Mateo County (C/CAG): C/CAG San Mateo County Comprehensive Bicycle and Pedestrian Plan (2021)
- Delaware Valley Regional Planning Commission (DVRPC): Connections 2050* (2021)

- Denver Regional Council of Governments (DRCOG): Denver Regional Active Transportation Plan (2017)
- The Metropolitan Council: 2040 Transportation Policy Plan (2020)
- Metropolitan Transportation Commission (MTC): Regional Active Transportation Plan, a part of Plan Bay Area 2050
- New York Metropolitan Transportation Council (NYMTC): Moving Forward 2050 Appendix B: Pedestrian and Bicycle Plan Element (2021)
- Southern California Association of Governments (SCAG): CONNECT SOCAL 2024

The NJTPA used many of the best practices identified during the review in the ATP development process, including:

- Engagement strategies that included online and in-person engagement opportunities, pop-up events, focus groups to engage underserved groups, and advisory committee meetings.
- Data-driven methodologies including the use of crash data, transit data, regionally significant trails, level of traffic stress analysis, walking and biking travel demand analysis, population and employment density, intersection density, and locations of Environmental Justice (EJ) communities.
- Strategies for removing systemic transportation barriers for EJ communities by ensuring their inclusion in the planning process, as well as ensuring emphasis on equitable distribution of active transportation projects in suburban, rural, and urban areas.

New Jersey Plan and Policy Review

The ATP also included a plan and policy review of the critical active transportation planning work completed within the region and state, identified overlaps in objectives between the region and state, and determined what gaps remain to be filled. The documents reviewed are listed below.

- NJTPA Plan 2050 (2021) and Plan 2050 Background Paper (2020)
- City of Newark Pedestrian and Bicycle Safety Action Plan (2016)
- Jersey City Pedestrian Enhancement Plan Final Report (2018)

- [Keyport Complete Streets Policy and Implementation Plan (2021)](#)
- [Let's Ride JC Bicycle Master Plan (2019)](#)
- [NJ TRANSIT Bicycle and Pedestrian Access Study (2016)](#)
- [NJDOT Statewide Bicycle and Pedestrian Master Plan: Phase 2 (2019)](#)
- [NJTPA Morris Canal Greenway Corridor Study (2018)](#)
- [Ocean County Bicycle and Pedestrian Linkages from the Barnegat Branch Trail, Northern Section (2019)](#)
- [The Central Bergen Bicycle & Pedestrian Plans (2015)](#)
- [The Heritage Tourism Element of the Passaic County Master Plan (2013)](#)
- [Together North Jersey Middlesex Greenway Access Plan and Health Impact Assessment (2014)](#)
- [Walk Bike Hike Somerset County (2019)](#)

The following were included as part of the New Jersey plan and policy review:

- Goals or recommendations for active transportation or related topics.
- Data-driven methodologies for evaluating and prioritizing active transportation projects.
- Recommendations that aim to remove systemic transportation barriers for EJ communities.
- Strategies for procuring funding assistance.

While the contexts differed across each of the documents reviewed, there was overall consistency in active transportation-related goals and recommendations. Collectively, there was a strong focus on safer people, safer places, safer roads, healthier environments, equitable communities, and strong economies. Most of the documents also highlighted the extent to which local jurisdictions incorporated data-driven methodologies into their active transportation plans throughout the region.

Slightly more than half of the documents either mentioned equity, EJ, or traditionally underserved communities explicitly; however, much of this content pertained to improved stakeholder, resident, and non-English engagement. To truly start to remove systemic transportation barriers for traditionally undeserved and under-resourced communities, it became apparent that there is a strong need to prioritize the funding and maintenance of new and existing active transportation infrastructure in these communities within the ATP. Lastly, with a few exceptions, most local agencies appeared adept in project funding mechanisms via philanthropic, local, regional, state, and federal sources. However, the plans did not explain the extent to which local agencies have been successful in procuring funding for the implementation of active transportation-related projects, particularly in traditionally underserved communities. The recommendations in the Strategy Guide address this with strategies to incorporate equity and EJ into project prioritization and funding (as well as all aspects of active transportation projects), build capacity for local and subregional jurisdictions, and encourages interjurisdictional collaboration.
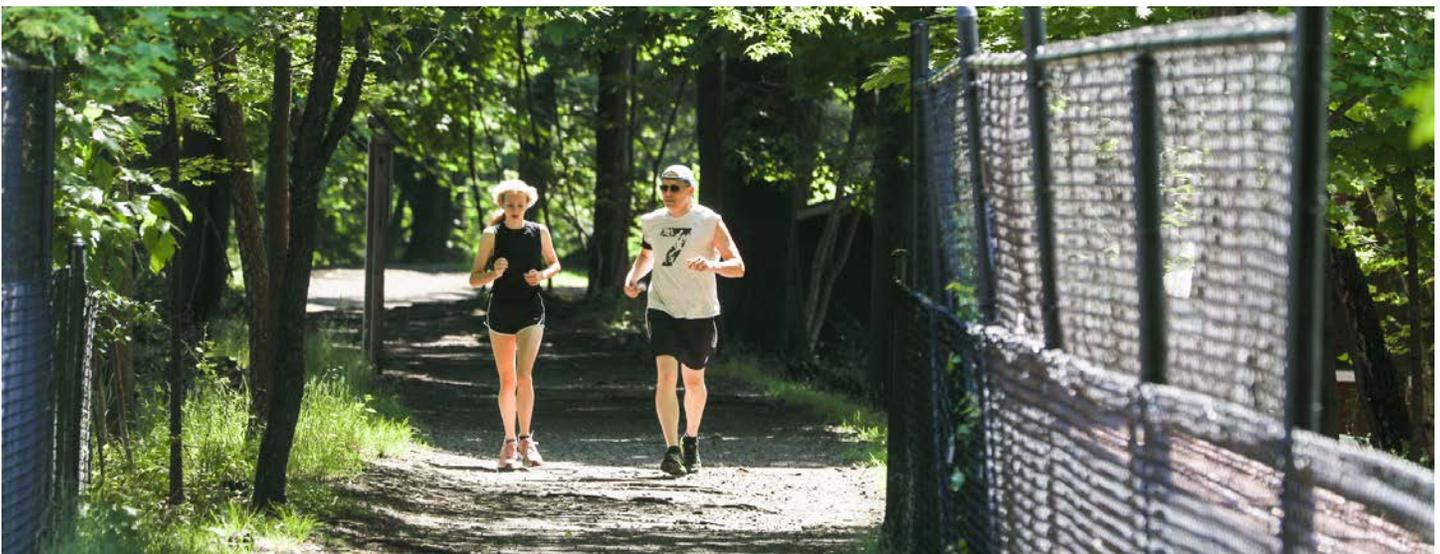
Cedar Grove Township, Essex County

Trip Potential Analysis

A Trip Potential Analysis determined where people would be most likely to walk and bike in the NJTPA region based on factors that typically are positively associated with more walking and biking trips. The purpose of this analysis was to help identify areas of high trip potential (or demand) that were included as part of the conceptual network as well as areas that may require infrastructure improvements for safer and more comfortable walking and biking.

Selecting a combination of factors related to development patterns and socioeconomic characteristics as the primary elements helped to estimate a location's trip potential. The factors included population, employment, intersection density, poverty, vehicle access, transit stops, and land use mix. The trip potential value was calculated using a hexagonal grid, with cells that were 500 feet across.

The land use mix factor was included because land uses and zoning regulations can encourage active transportation by making it safe, easy, and comfortable to walk or bike for both transportation and recreation. Effective active transportation networks create pedestrian and bicycle connections to important destinations within a reasonable distance (typically a quarter mile for walking and one mile for bicycling) from home. Multiple destination types within the same neighborhood, such as shops, grocery stores, job centers, public services, and schools, allow for more active transportation trips for different purposes. The land use mix score was a combination of factors in itself, including retail locations, large employment centers, community health and welfare locations, residential areas, and park space. Using percentile scaling enabled comparisons between different land-use types.

The composite results show the weighted average of all variables calculated for each hex cell. Trip potential scores range from 0 to 100, with yellow areas showing the lowest trip potential values (0-10) and black areas representing the highest trip potential values (90-100). Higher scoring locations have the most potential to support active transportation trips (though they do not necessarily indicate higher estimated bicycle and pedestrian volumes). Figure 2 shows the results of the composite score for pedestrian trip potential and Figure 3 shows the results of the composite score for bicycle trip potential.

Overall potential for both pedestrian trips and bicycle trips in the NJTPA region followed a markedly similar pattern, with some exceptions. The intersection density variable was not included in the bicycle Trip Potential Analysis, since it has a negligible impact on biking trips. While large numbers of intersections enhance network connectivity for people walking because it makes the network more permeable, they can be a deterrent to people bicycling (especially for recreational riding) because intersections create more conflict points. The net effect of intersection density on people's willingness to bike is not always positive, as it tends to be for walking.

The influence of transit also varies between walking and biking trips. For bike trip potential, the transit variable only included train stops, regional express bus stops, and ferry stops (and not regular bus stops). While almost every transit trip begins and ends with a walk, first and last mile bike trips to or from local bus stops are less common. The analysis reflects these differences, which led to some expected, and minor, variation in the results.

See the Trip Potential Analysis for more information.

Figure 2. Pedestrian Trip Potential - Overall Score

Legend:

Major Roads

Ped Trip Potential - Overall Score
- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100

Counties shown: SUSSEX COUNTY, PASSAIC COUNTY, BERGEN COUNTY, WARREN COUNTY, MORRIS COUNTY, HUDSON COUNTY, ESSEX COUNTY, UNION COUNTY, MIDDLESEX COUNTY, HUNTERDON COUNTY, MONMOUTH COUNTY, OCEAN COUNTY
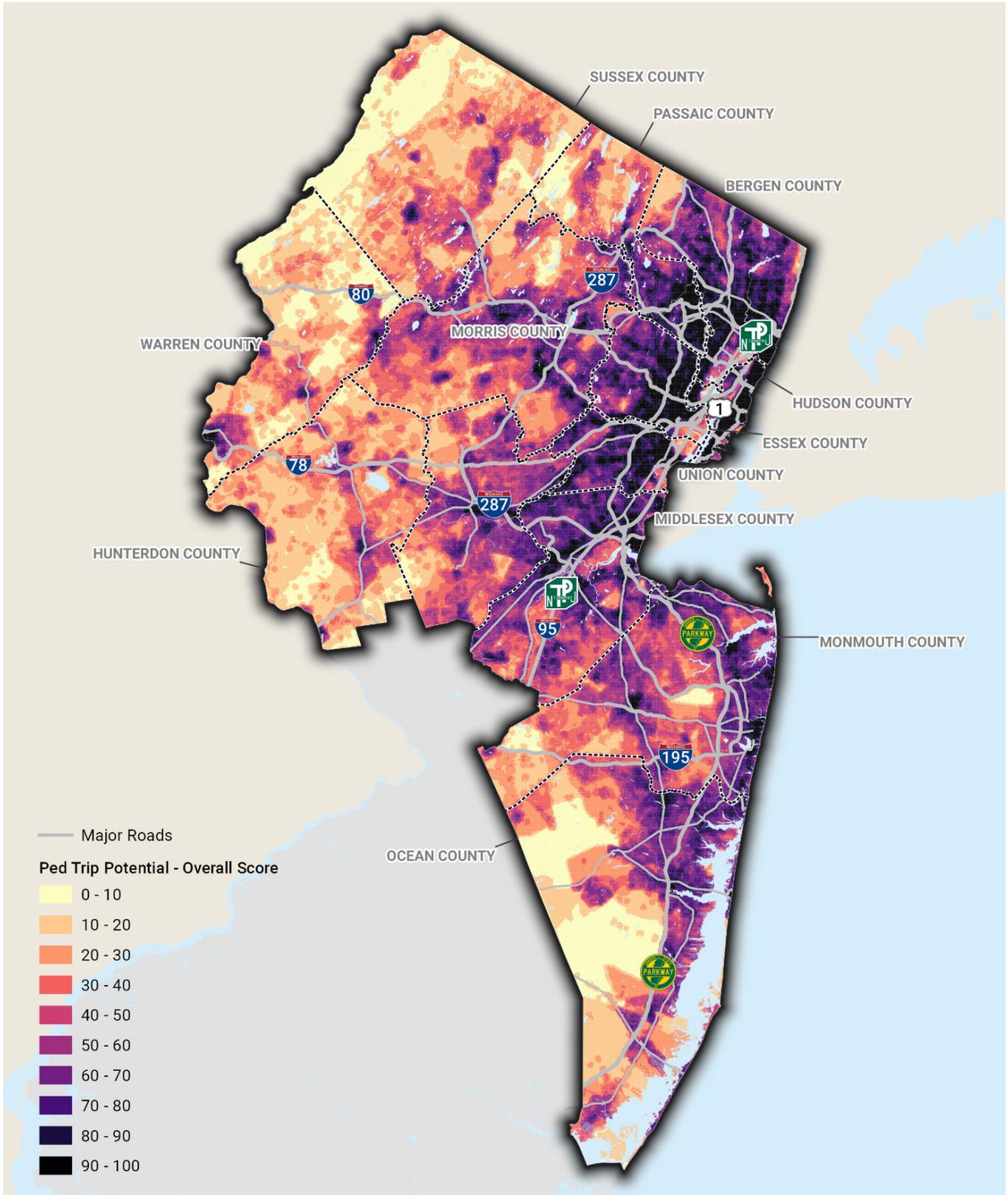
Scale: 0 — 10 — 20 mi

Figure 3. Bicycle Trip Potential - Overall Score

Major Roads

Bike Trip Potential

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100

0   10   20 mi
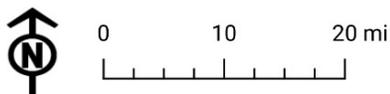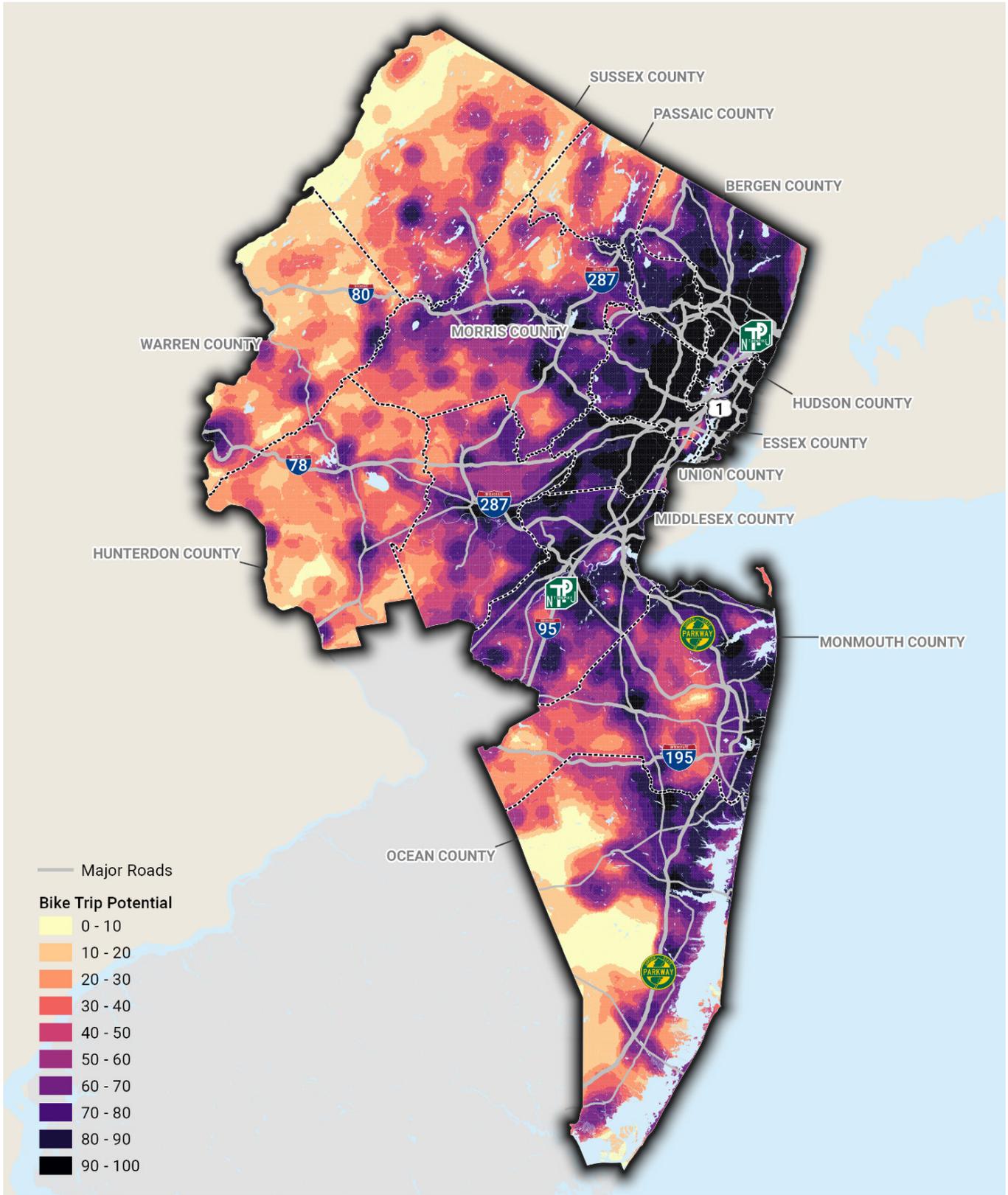
Barrier Analysis

The NJTPA's Level of Bicycle Compatibility (LBC) analysis was the central input for the barrier analysis. Bicycle level of traffic stress was derived from the LBC analysis as the first step to identify barriers. Additional inputs were layered on subsequently, such as equity, population, and connectivity data, described in more detail below.

A barrier analysis identified street segments that are high-stress for bicyclists and detrimental to active transportation network connectivity, as well as low-stress street segments that would lead to better connectivity if nearby high-stress streets were converted to low-stress instead, with treatments such as separated bike lanes or neighborhood greenways. While bicyclists are legally allowed to use most of the street network (except for freeways and other access-controlled segments), bicyclists experience a high level of stress on many of those road segments due to high vehicle volumes, high speeds, multiple lanes, and other roadway characteristics. Most adults are not willing to ride in high-stress areas, resulting in those roads creating significant barriers to connectivity on a regional active transportation network.

Evaluating individual street segments helped identify potential improvements along specific segments to maximize bicycle connectivity. The barrier analysis scored street segments based on population data, connectivity, and level of stress (or comfort level for biking). The technical analysis involved assigning each street segment a score using the following steps:

- Calculating the population weight for each intersection using census data and the overlap with the intersection's "area of influence," where any point inside each area is closer to the intersection than any other intersection.

- A connectivity analysis using the shortest paths between all intersections within five miles. Selection of the shortest path was based on length as well as level of stress for bicyclists (segments with higher levels of stress incurred a penalty of a 20 percent longer length, since research has shown that people are willing to go 15-30 percent out of their way for a low-stress path).[14] [15] Level of stress was derived from the NJTPA's LBC analysis.

- Assigning each street segment, a value based on population weight of adjacent intersections.

Through this method, street segments received higher scores based on higher connectivity as well as being in more densely populated areas. A segment could get a higher score if it is part of multiple shortest paths between intersections, and/or if there is a larger population around the segment that may use it.

The analysis also incorporated an equity-focused weight (using data from the NJTPA's Equity Analysis Tool), which helps gauge where underserved populations are within the region based on a composite score of multiple factors including race, income, limited English proficiency, disability, age, foreign-born status, female population, zero-vehicle households, and educational attainment. The equity-focused weight was calculated by multiplying the population weight of each segment with an equity index value. The barrier analysis created four different outputs:

- Raw Centrality Score—Population Weighted
- Raw Centrality Score—Equity Focus Weighted
- County Percentile Score—Population Weighted
- County Percentile Score—Equity Focus Weighted

The raw centrality scores may be used to compare street segments across the region while county percentile scores are used to compare street segments only within a county (and should not be used to compare across multiple counties). The county percentile scores can differ significantly from the raw scores, and this difference is especially pronounced for segments in rural counties, which do not have high raw centrality scores compared to segments in more urbanized counties.

Figure 4 shows the highest five percent and lowest five percent stress street segments with equity-weighted county percentile scores. The red lines represent high-stress segments while the blue lines represent low-stress segments (taken from the NJTPA's LBC analysis). The thicker red lines represent larger barriers to connectivity while the thicker blue lines show the low-stress links that would likely become well-traveled if the connecting high-stress links were converted to low-stress.

14   Broach, Joseph & Dill, Jennifer & Gliebe, John. (2012). Where do cyclists ride? A route choice model developed with revealed preference GPS data. Transportation Research Part A: Policy and Practice. 46. 1730-1740. 10.1016/j.tra.2012.07.005.

15   Furth, P. G., Putta, T. V., & Moser, P. (2018). Measuring low-stress connectivity in terms of bike-accessible jobs and potential bike-to-work trips: A case study evaluating alternative bike route alignments in northern Delaware. Journal of Transport and Land Use, 11(1). https://doi.org/10.5198/jtlu.2018.1159

Belmar Borough, Monmouth County

Several conclusions can be drawn from the analysis:

- Top percentile street segments[16] are almost exclusively confined to the most densely populated communities in each county (a function of the population weight). The equity weight likely plays a role as well, since many of the region's larger and more densely populated communities have a high composite equity score based on the NJTPA's Equity Analysis.

- With some exceptions, major roads form the most stressful barriers in the region. There are some smaller collectors and residential streets that are also barriers, but these are likely a function of the county percentile scores, which show the relative importance of segments within their counties. In rural counties without major high-stress roads, the county percentile scores boost smaller but still stressful segments to the top of the list.

- Residential streets have the potential to significantly improve low-stress connectivity if certain barriers were removed. Most larger communities feature a few (or in some cases, many) low-volume residential streets in the top five percent of low-stress links. These low-stress streets have the potential to be important connections within the ATP network and the barrier analysis can help local and subregional jurisdictions identify these locations when doing further planning for and implementation of the network.

- Separated bicycle facilities play an important role in creating continuous low-stress networks. Adding protected bicycle facilities on existing barrier segments or creating new separated trails parallel to major barriers can dramatically improve connectivity. This is the case for the Monmouth County Henry Hudson Bike Trail.

Detailed results as well as data limitations may be found in the Barrier Analysis technical memorandum. The memo also includes a table of the top 10 highest stress links for each county by street name.

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16   These segments are mostly in densely populated areas because the centrality score is calculated using population density. If the top percentile links also happen to be high-stress, then they form barriers to connectivity.

Figure 4: Barrier Analysis Results: Top County Percentile Scores[17]

Major Roads

Top Centrality Percentile Ranks

High-Stress Links

—— 0.95 - 0.99

—— 0.99 - 1

Low-Stress Links

—— 0.95 - 0.99

—— 0.99 - 1

0   10   20 mi

NJTPA
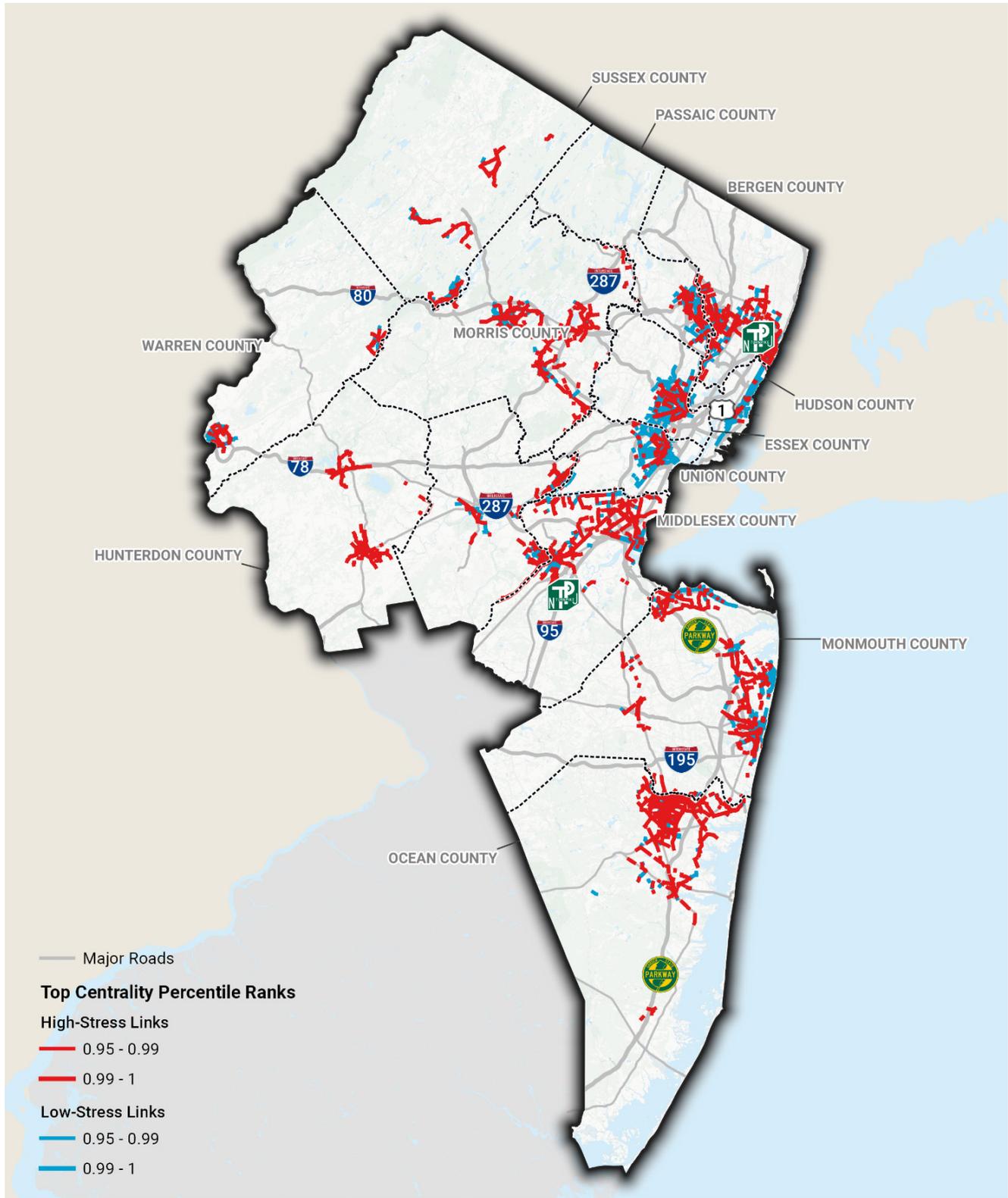
17   Blue lines indicate the top low-stress street segments in each county, and red lines indicated the top high-stress segments.

NJTPA REGIONAL ACTIVE TRANSPORTATION PLAN | FINDINGS

High Crash Network Screening and Equity Analyses

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 as 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.

The analysis used the NJTPA's Network Screening Lists made available through its Local Safety Program (and developed by NJDOT). The analysis incorporated three 2012-2016 crash layers developed in 2019:

- Pedestrian-Bicycle Intersection Top 100
- Pedestrian Intersection Top 100
- Local Pedestrian Corridor Top 100

Top locations were ranked based on weighted crash scores by crash frequency and crash severity. This analysis included an overlay of high pedestrian and bicycle crash locations with high-stress travel barrier locations (from the barrier analysis) as well as locations with high pedestrian and bicycle trip potential (scores of 90-100, which accounted for about 90 percent of the region with pedestrian trip potential and about five percent for bicycle trip potential).

See the results in Figure 5 and Figure 6. In Bergen, Essex, Hudson, 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.

Refer to the technical memorandum Equity and Network Screening Analyses for more information.

Westwood Borough, Bergen County
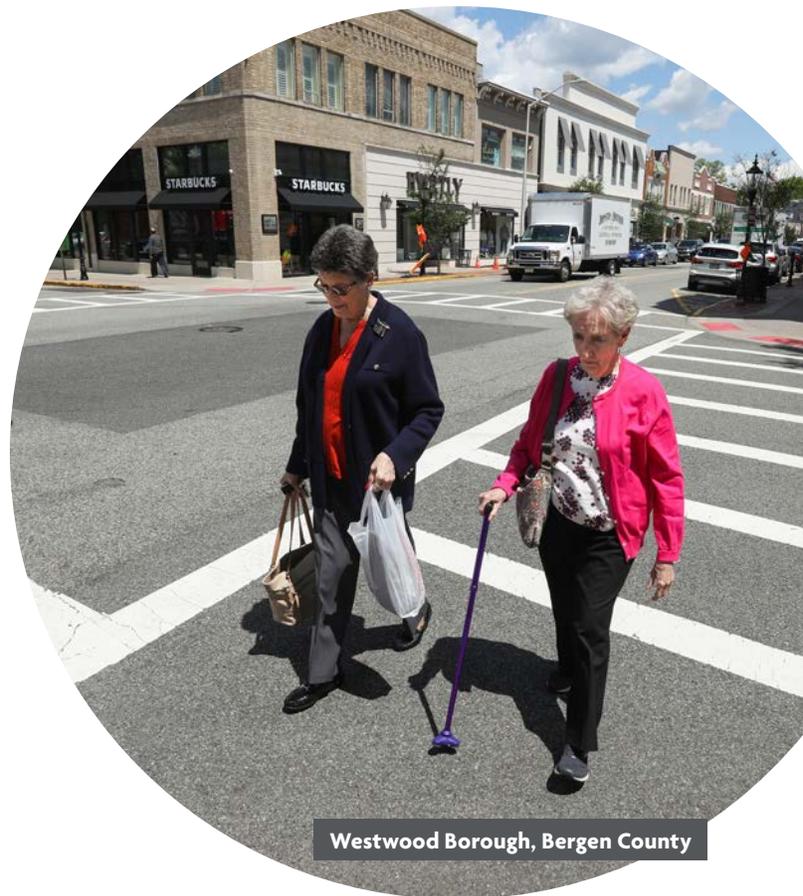
Figure 5: Network Screening Overlaid with High Bike Trip Potential

SUSSEX COUNTY
PASSAIC COUNTY
BERGEN COUNTY
WARREN COUNTY
MORRIS COUNTY
HUDSON COUNTY
ESSEX COUNTY
UNION COUNTY
HUNTERDON COUNTY
MIDDLESEX COUNTY
MONMOUTH COUNTY
OCEAN COUNTY

Major Roads
High Bike Trip Potential (90+)
Network Screening
Top 100 Bike/Pedestrian Crash Intersections

0   10   20 mi

NJTPA
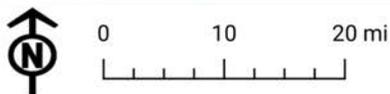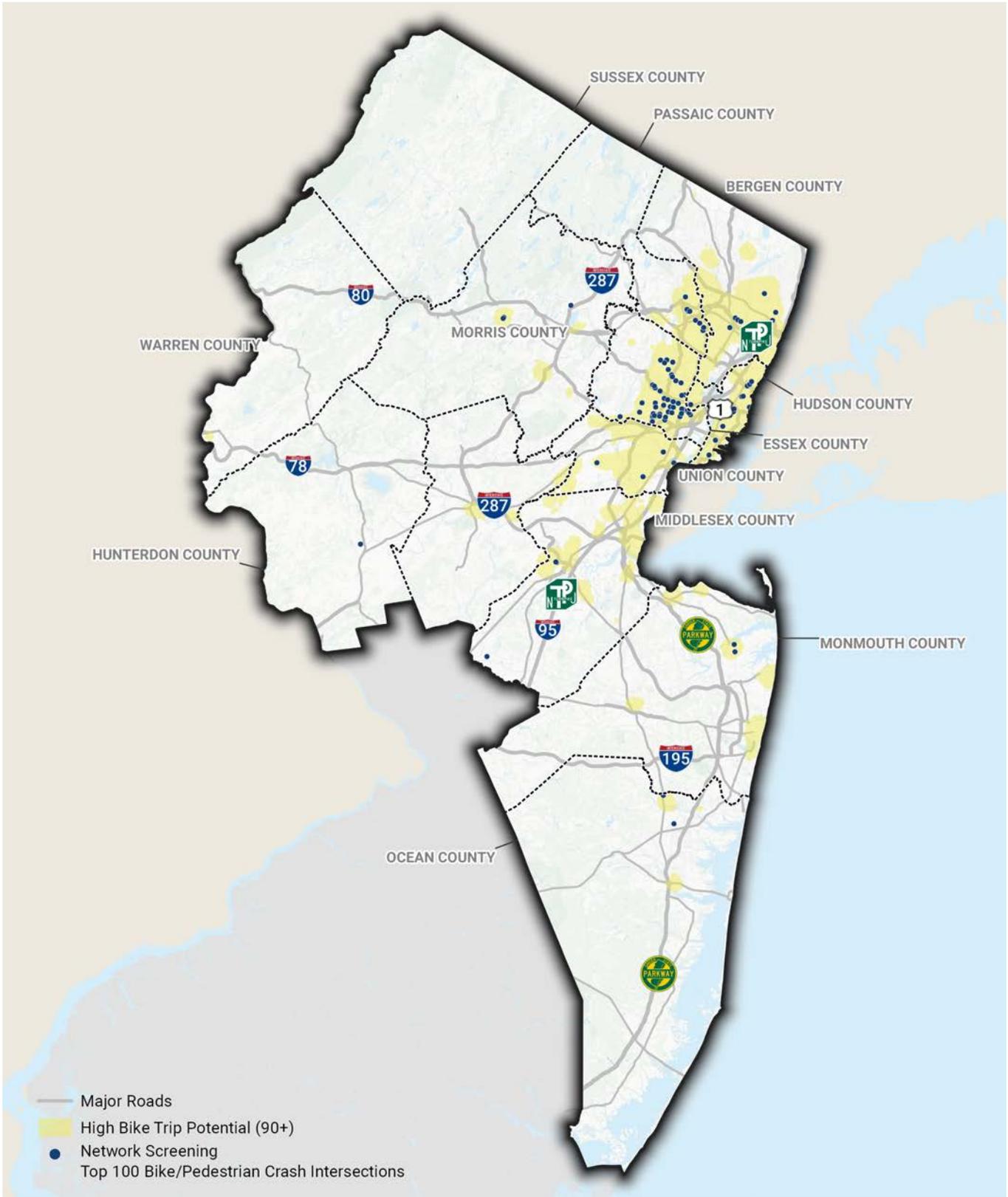
Figure 6: Network Screening Overlaid with High Walk Trip Potential

Legend:
- Major Roads
- High Pedestrian Trip Potential (90+)
- Network Screening
  Top 100 Bike/Pedestrian Crash Intersections

Counties shown: SUSSEX COUNTY, PASSAIC COUNTY, BERGEN COUNTY, WARREN COUNTY, MORRIS COUNTY, HUDSON COUNTY, ESSEX COUNTY, UNION COUNTY, HUNTERDON COUNTY, MIDDLESEX COUNTY, MONMOUTH COUNTY, OCEAN COUNTY
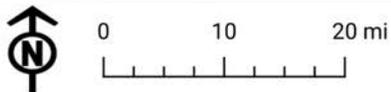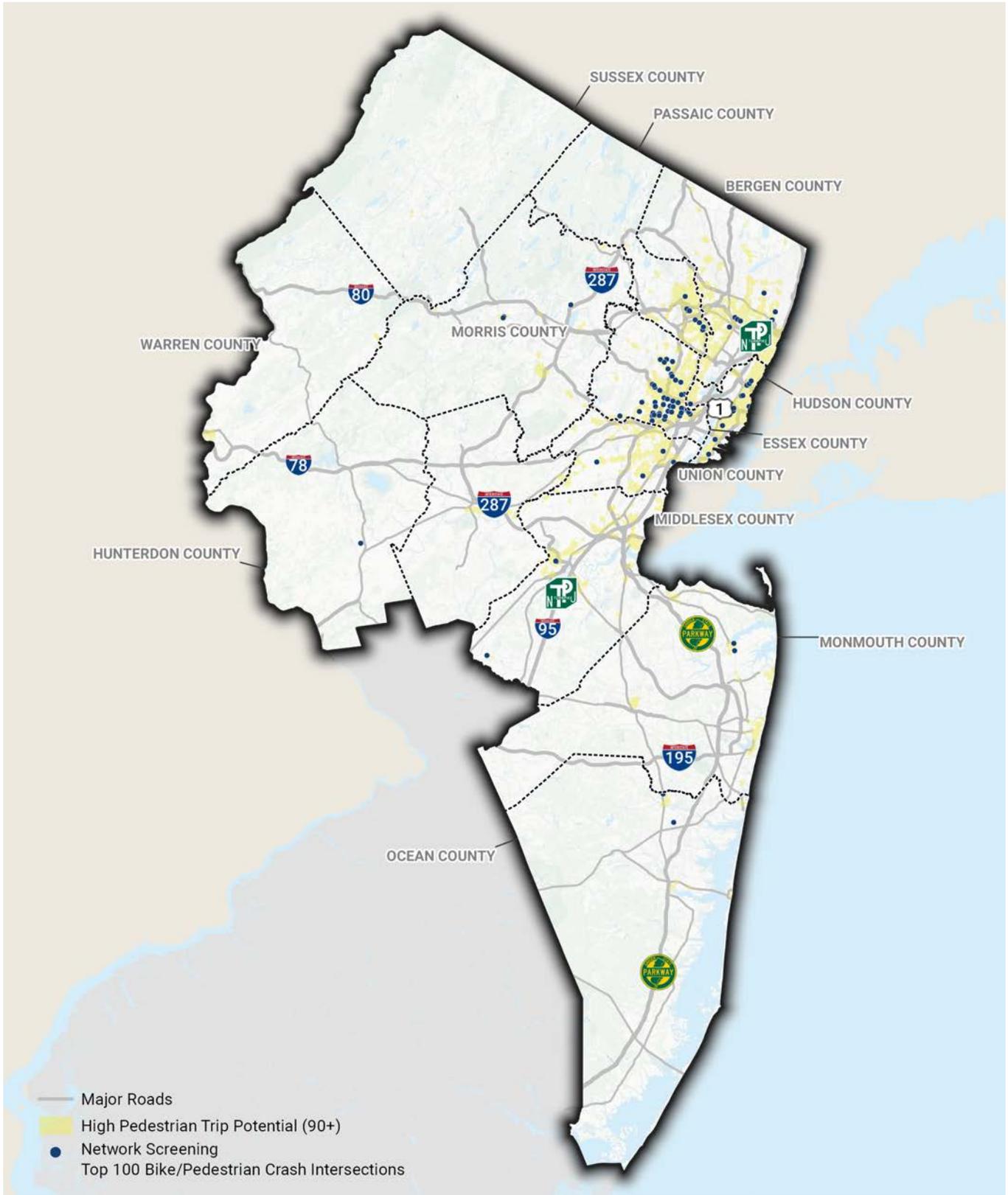
Ironbound neighborhood, City of Newark, Essex County

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.

This analysis used the NJDEP's OBC dataset. The dataset identifies OBCs at the census block group level using demographic information from 2020 Census Data where:

- at least 35 percent of the households are low-income;
- at least 40 percent of the residents identify as a minority or as members of a State recognized tribal community; and/or

- at least 40 percent of the households have limited English proficiency.

Like the Network Screening analysis, the analysis overlaid the OBC layer with high-stress travel barrier locations (from the barrier analysis) as well as locations with high pedestrian and bicycle trip potential (scores of 90-100, which accounted for about 90 percent of the NJTPA region with pedestrian trip potential and about five percent of the NJTPA region for bicycle trip potential).

The results are available in Figure 7 and Figure 8. High-stress barriers in Bergen, Passaic, Ocean, Middlesex, and Morris 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.

Refer to the technical memorandum Equity and High Crash Network Screening Analyses for more information.

Figure 7: Overburdened Communities Overlaid with High Bike Trip Potential

Major Roads

High Bike Trip Potential (90+)

Overburdened Community Categories

Limited English, Low Income, or Minority

Two categories (Limited English, Low Income, Minority)

Low Income, Minority, and Limited English

0   10   20 mi

Figure 8: Overburdened Communities Overlaid with High Walk Trip Potential
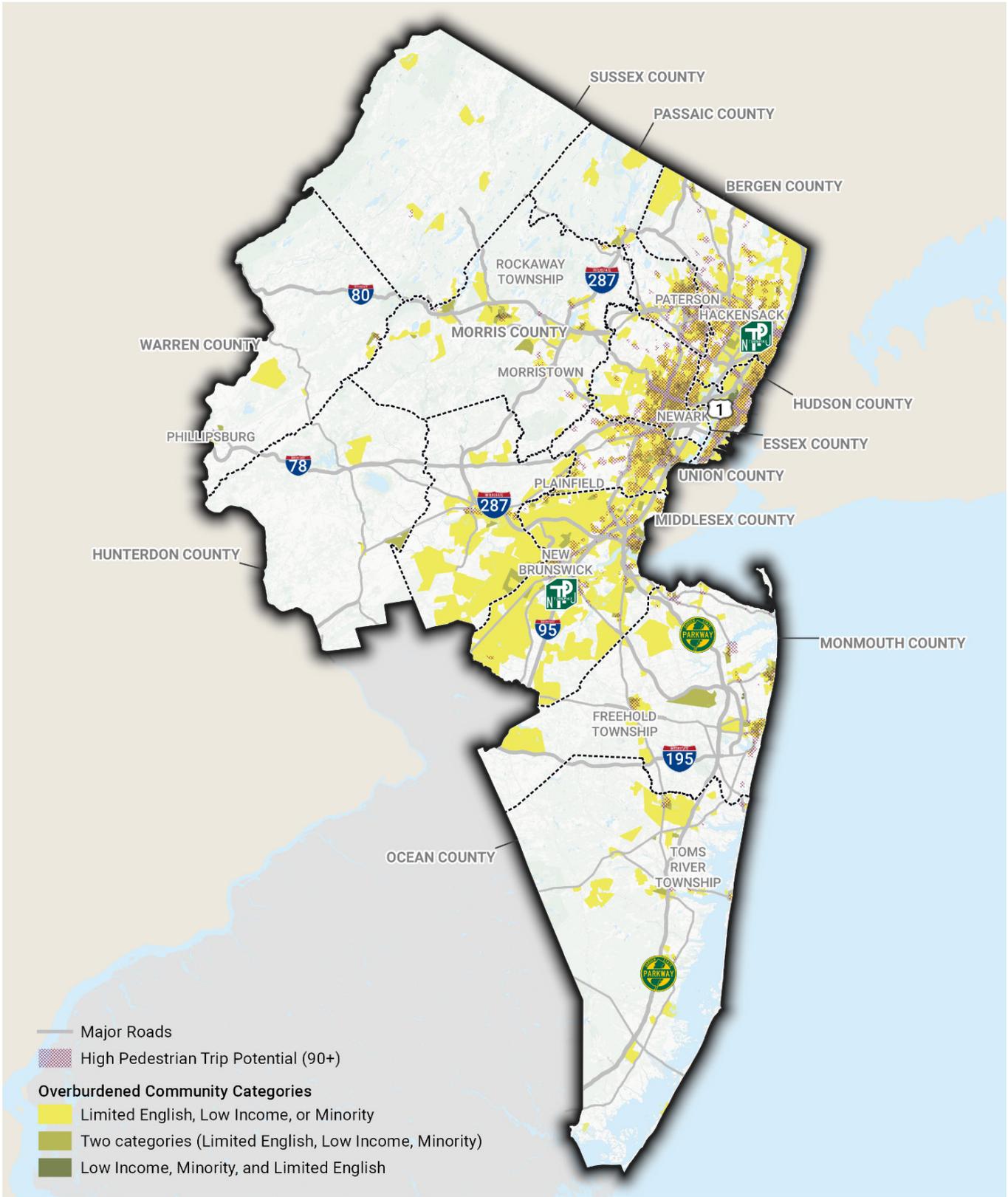
Legend:

— Major Roads

High Pedestrian Trip Potential (90+)

Overburdened Community Categories
- Limited English, Low Income, or Minority
- Two categories (Limited English, Low Income, Minority)
- Low Income, Minority, and Limited English

0   10   20 mi
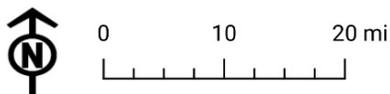
NJTPA

Public Engagement Summary

The NJTPA established four public engagement goals in developing the ATP:

- To capture equitable geographical representation of the North Jersey region, with special consideration for stakeholders from geographies without prior representation.

- To emphasize the inclusion of disadvantaged communities that have historically been missing from the engagement process.

- To gather feedback from the relevant community of transportation professionals and advocates, and the general public, to best inform technical and strategic ATP elements.

- To ensure that stakeholders see themselves reflected in the ATP's findings.

To achieve these goals, the NJTPA and consultant team created a strategic Community Engagement Plan and deployed various engagement methodologies to receive input from a diverse group of residents within the North Jersey region.

Development of the Stakeholder Engagement Plan

The stakeholder engagement plan laid out NJTPA engagement goals and synthesized research from similar active transportation projects that proactively incorporated the voices of a diverse group of residents, especially those in low-income communities and communities of color. The plan identified key community organizations and potential engagement methodologies to achieve NJTPA goals for inclusive feedback.

Engagement Strategies and Outcomes

A mix of public, organizational, and professional stakeholder engagement was key to successfully informing the Active Transportation Plan. The NJTPA used tailored activities to engage different types of communities across the region. These included surveys at pop-up events, focus groups, a technical advisory committee, small group interviews,

and case study interviews. The feedback gathered from the various events allowed for a diverse group of stakeholders, both residents and experts, to inform the ATP.

Pop-Up Public Engagement at Existing Community Gatherings

Pop-up public engagement events enabled the NJTPA to meet stakeholders where they already gather, and to solicit input across various demographics and counties. These events allowed the NJTPA to interact with many individuals, as the events had significant foot traffic.

The NJTPA deployed 12 pop-ups at existing large community events throughout the region in the summer and fall of 2022. At each event, staff set up an informational booth with visually compelling posters and brochures about the ATP, and asked passersby about their experience using active transportation in North Jersey. Participants were prompted to complete a survey via iPad on their active transportation choices and preferences. A web-based map enabled participants to pinpoint specific areas that currently provide robust active transportation options and areas that need improvement.

The NJTPA interacted with more than 130 people at the following community events:

- Plainfield National Night Out (August 2, 2022)
- Somerset County 4-H Fair, Bridgewater (August 11, 2022)
- Passaic County Fair, Woodland Park (August 12, 2022)
- Wharton Canal Day Music & Craft Festival
- (August 20, 2022)
- Hunterdon County 4-H Fair (August 26, 2022)
- Union County Transportation Advisory Board Meeting (September 7, 2022)
- Montclair Jazz Fest (September 10, 2022)
- Bridgewater Chinese Mid-Autumn Lantern Festival (September 10-18, 2022)
- New Brunswick Community Farmers Market (September 17, 2022)
- Newark's Lincoln Park Sustainable Living Community Bike Festival (September 18, 2022)
- Journal Square Green Market in Jersey City (September 21, 2022)
- Milford Alive (September 24, 2022)

Focus Groups

Focus group discussion encourages participants to express values and priorities, and leaves room for stakeholders to learn from and challenge each other in a group setting with representatives from multiple organizations. For this plan, focus groups aimed to provide a safe space for those who may have been previously left out or marginalized in conversations about transportation, mobility, and active transportation to express their thoughts and feedback.

Wharton Canal Day Music & Craft Festival

The NJTPA's consultant team organized and facilitated three focus groups to elevate the perspectives of people with disabilities, Hispanic residents, and Black residents. These three demographics were selected based on the NJTPA's goal to gain meaningful input from populations representing historically disadvantaged or underserved communities. To identify participants within these demographics, the team reached out to community organizations and nonprofits in North Jersey. Each participant received a stipend for participating.

The focus groups were held virtually for 90 minutes each. The groups consisted of four to seven participants, with a total of 16 participants across the three focus groups (seven men and nine women). Participants ranged in age from 24-70 and lived in seven different counties.

Questions focused on individual experiences with active transportation, the available active transportation infrastructure in North Jersey, and how individuals' identities may impact their active transportation decisions and experiences. Focus group questions included the following:

- On an average week or weekend, how do you currently get around North Jersey?
- Where do you use active transportation? If you don't currently use active transportation, why not?
- Are there currently places you feel that you need to drive to, but would prefer to use other forms of transportation to reach?
- What would make active transportation feel easier or more inclusive for you?

The focus groups surfaced overarching themes about active transportation and travel preferences across demographics. Safety concerns posed the greatest barrier to participants using active transportation more often, and encompassed accessible street design, adequate lighting, and reducing vehicle speed.

Sidewalk and path maintenance was another common concern, particularly for participants with disabilities who use wheelchairs or power chairs and face challenges moving across paths that have not been cleared or maintained. Participants across all three groups also noted that many roads do not have sidewalks, limiting options for active transportation.

Within specific groups, the following themes emerged:

People with Disabilities

The unique disabilities of each participant resulted in a range of preferred transportation modes, from wheelchair to tricycle. Participants stressed the need for planners and municipalities to think through potential obstacles at all stages of a journey. Participants with disabilities shared the following feedback:

- The lack of sidewalk access and curb ramps can pose major barriers to mobility.

- Design decisions such as the visibility of signs, the street grade, and the timing of traffic signals for crosswalks are critical safety features.

- Beyond the street design and infrastructure, maintenance is critical to ensure that sidewalks are level and navigable for users of all abilities.

- Pylons and incomplete sidewalk pathways prevent wheelchair access.

- Irregular terrain makes it difficult for those with balance issues to walk.

- Crosswalk and call buttons are often difficult to reach. Crosswalks could also be improved by providing more time for pedestrians to cross.

- Recreation trails that are evenly paved are more accessible.

- Signs indicating that an area is handicap accessible would allow residents with disabilities to feel more confident or included in spaces..
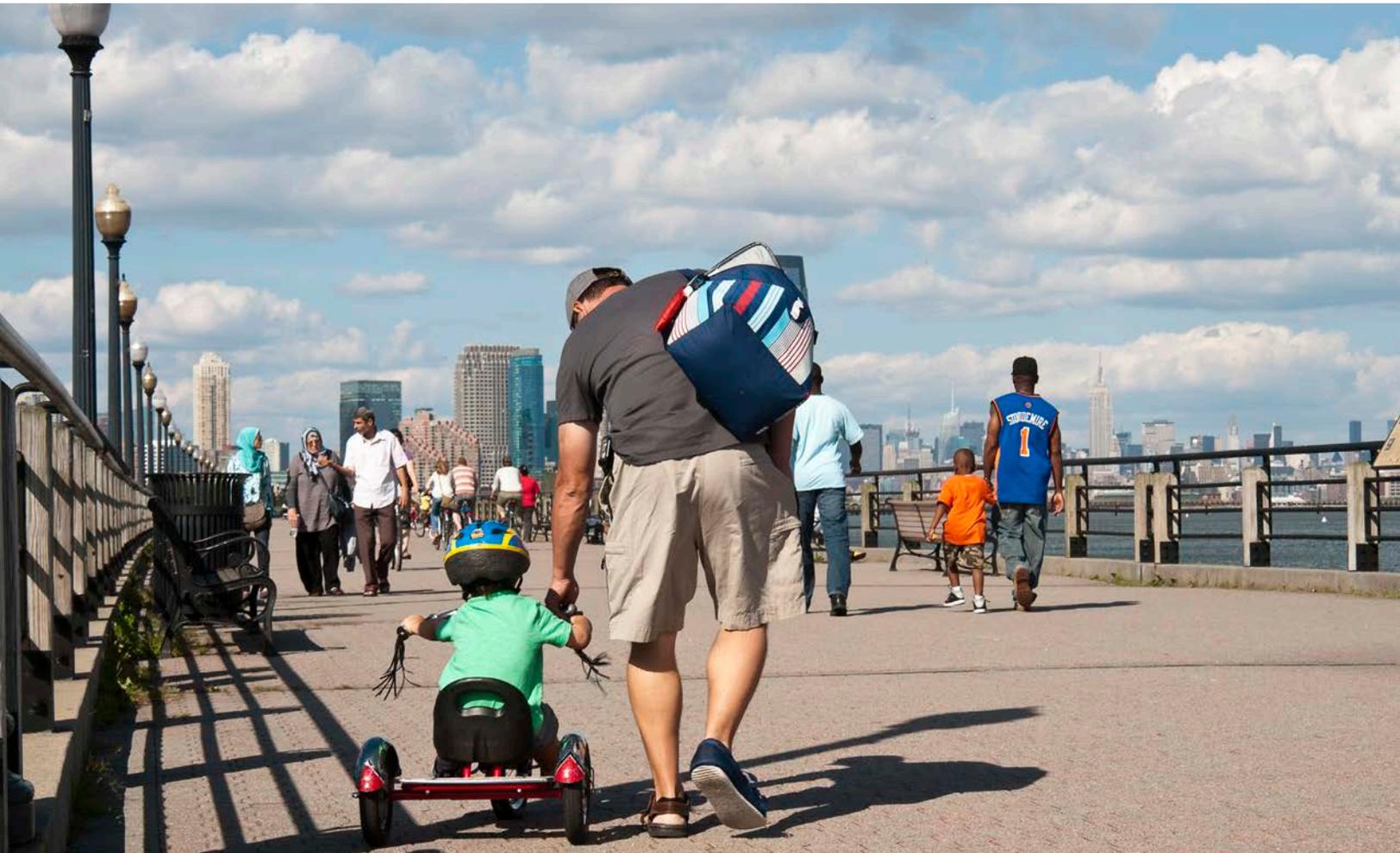
City of Jersey City, Hudson County

Hispanic Residents

Each of the participants in this group identified as immigrants and as women with children, which resulted in a shared experience around traveling with young people. The discussion centered around ways to create better active transportation systems for families. A Spanish language interpreter was present to support the discussion. Participants shared the following feedback:

- Safety concerns, particularly when crossing streets, was a major deterrent for using active forms of transportation.

- Litter on the sidewalk and uneven pavement create inhospitable active transportation conditions.

- The lack of street lighting poses a safety concern for going outside in the evening.

- Participants were more likely to consider walking or biking in the spring and summer when the weather is warmer.

- Hispanic participants were less familiar with the available recreational trails and bike paths than those in the other focus groups.

Black Residents

In this group, many participants were interested in using modes of active transportation more often, but felt that the design of their communities, particularly suburban neighborhoods, made it difficult or unsafe to travel unless in a car. Black participants shared the following feedback:

- Participants noted a need for better non-car connections between neighborhoods and stores/destinations.

- Several participants noted their appreciation for the state's trail systems, particularly in warmer weather.

- There is a need for better cross-transportation resources like space on PATH trains for bikes.

- More safety barriers and protected bike lanes would help residents consider biking more often without safety concerns.

- Campaigns to promote biking for all would broaden who is seen as a "cyclist" and shift public perception away from highly confident road cyclists who occupy an outsized and visible presence on the road.

- Trees and other design aspects to beautify a neighborhood make people want to walk and bike.

Technical Advisory Committee

The TAC consisted of local and regional agency staff, advocates, elected officials, and other stakeholders across the region who understand local community needs or obstacles and possess an in-depth technical understanding of active transportation best practices, tools, and strategies. TAC members assisted in the development of the ATP by establishing network development criteria, identifying missing supplemental data for network analysis, highlighting key challenges for active transportation connections across the region, and providing feedback on the proposed regional ATP network.

The NJTPA staff identified potential TAC members based on their subject matter expertise, ties to their community, and role within the ATP process, while also ensuring that the committee was geographically representative of the North Jersey region. A total of 22 TAC members were invited to join the TAC. Members represented city, county, and state-level agencies, community organizations, academic institutions, Transportation Management Associations, and the NJTPA's Regional Transportation Advisory Committee (RTAC).

The TAC met twice during the project—in May 2022 and in November 2022. Each meeting included a progress update and TAC members provided important feedback at key points in the process. Specifically, TAC members were involved in providing direct feedback on the preliminary network and regional network analysis. Mentimeter, an interactive online collaboration tool, served as an interactive visual tool at each meeting during feedback discussions, allowing TAC members to see multiple responses at once and contribute to the discussion simultaneously.

Project Website, Map, and Survey

To capture a broad audience across the NJTPA region, as well as those who may not be able to attend in-person events, the NJTPA created a project website as a means to solicit public input through a survey and interactive map which were available from June to October 2022. The survey received more than 650 responses.

The interactive map activity received nearly 400 responses from every county in the region (see Figure 9). While these responses are not a representative sample of the North Jersey population, they do provide some insight on public priorities regarding active transportation needs and potential improvements. The map responses were clustered in Jersey City, Newark, Hackensack, and Elizabeth. More than 78 percent of the segments noted in the map are within or intersect an area identified as OBC. Participants could categorize their responses in the map activity. Table 1 provides the number of responses for each category (participants could select more than one category for each line they drew on the map). Most respondents noted desired improvements and/or current walking/biking use along local roadways.

Table 1: Responses by interactive map activity category

This is a comment about:	Number of responses
Where I currently walk/bike	153
Where I would like to walk/bike more	283
Space to walk	159
Space to bike	159
Space to scooter or skateboard	97
Vehicle speeding	126
Aggressive driving	117
Poor sidewalk or pavement conditions	114
Safer crossings	160
Accessibility / Accommodations for people with disabilities	49
Transit	43
Bike parking	38
Street lighting	42
Street trees or greenery	30
Flooding	8
Other	33

Hunterdon County Fair

Figure 9: Public Webmap Responses

Legend:
- Webmap Responses
- Major Roads
- Scenic Byways

0   10   20 mi

N

NJTPA
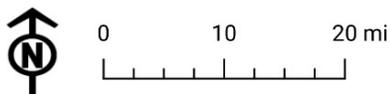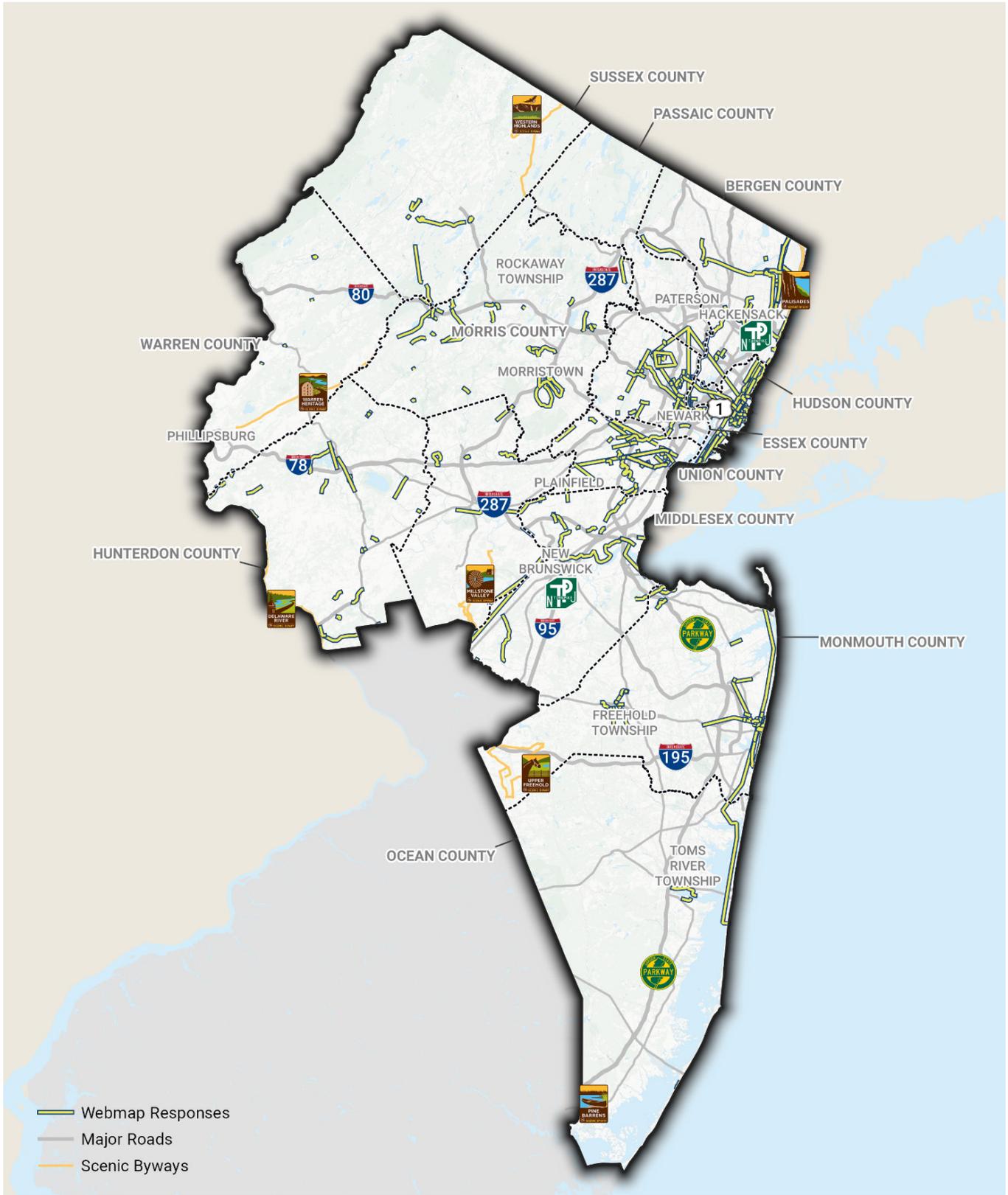
Integrating Engagement throughout Plan Development

Strategy Guide and Small Group Interviews

Conducting four small group interviews helped to develop recommended strategies for local active transportation project implementation in subregions and municipalities across North Jersey. The NJTPA invited city, county, regional, and state stakeholders to describe their methods and approaches to successfully implementing active transportation projects. Findings from the small group interviews were a key input for developing a set of informed, successful strategies for implementing active transportation projects and programs at the subregional and local levels.

The small group interviews functioned as formal listening sessions, wherein interview participants individually responded to a discussion prompt from the facilitator or to each other's responses. Facilitators used four sets of discussion questions to guide the small group interviews in discussing active transportation implementation at the county and local levels. Each set of prompts contained questions specific to the participant group, as well as questions posed to all groups. Common questions between all four interviews were about equity and EJ, community engagement and outreach, interdepartmental or multijurisdictional collaborations, and a catch-all question for advice to local municipalities. Other questions in the small group interviews were about funding, public engagement, and data and performance measures.

For the small group interview analysis, the project team identified common responses among participants by paraphrasing and consolidating the main takeaways from each small group interview. The outcomes from the interviews formed several core themes and set the framework for the Strategy Guide. The core themes in the Strategy Guide are:

- Interjurisdictional and multisectoral collaboration
- Building success for active transportation within municipal organizations
- Equity and EJ
- Measuring success and data
- Community engagement and outreach
- Funding for active transportation delivery

Case Study Stakeholder Meetings

Stakeholder identification and engagement were critical in understanding the needs of each of the case study locations as well as input on the proposed recommendations. There were two stakeholder meetings held in April 2023 with identified stakeholders. The goal of these meetings was to provide an update on case studies as well as to gather feedback. A summary of participants' discussion and feedback is available in the Case Studies: Parish Drive in Wayne and Main Street in Stanhope/Netcong Memorandum.

Creating the Network

The conceptual regional network took shape from information gathered from the analyses described above, as well as public input from the region's residents and stakeholders, and extensive collaboration with NJTPA staff, counties, and municipalities. The intent was to identify facilities that could be upgraded and improved through the concerted efforts of communities, counties, civic organizations, state government and others to create a connected regional active transportation network.

One of the most significant challenges in planning a regional network is the NJTPA region's size. The region is more than 4,200 square miles, about 70 miles from west to east, and approximately 130 miles north to south. To conceive the network, it was critical to understand what trips are in greatest demand and most likely to occur, and how to quantify and visualize that understanding. To do this, the ATP began by analyzing selected datasets to develop the initial network, and then expanded the network's coverage based on initial NJTPA feedback to ensure it addresses the region's active transportation needs. This approach involved an iterative process in which multiple analyses were synthesized to identify network segments with the strongest potential for addressing active transportation needs.

Roadway Network

Initial on-road network development relied primarily on county and state roads. Local roads were not included because they are less likely to traverse county lines and are therefore less useful for developing a regional active transportation network. However, local roads that parallel regional network corridors may be used as alternate low-stress routes if improvements are not feasible on larger roads, and similar levels of connectivity can be achieved.

Montclair Township, Essex County

This is indicated on the maps through a half-mile buffer around all regional network segments to show that nearby local roads may be considered.

Scenic Byways

New Jersey has eight designated Scenic Byways. These routes are specially designated for their scenic, natural, recreational, cultural, historic, and archaeological qualities. Due to their lower traffic volumes and many points of interest, the Scenic Byways are also ideal for recreational cycling. Approximately 35 percent of the regional network overlaps with Scenic Byways.

Trail Network

In addition to the roadway network, expanding and connecting the region's existing and planned trails was a key consideration during network development. NJTPA

staff and the project team identified regionally significant trails that connect to the regional network using the following criteria:

- Any trail that spans two or more counties or crosses multiple municipal boundaries.
- Any trail that connects to other states/regions
- Trails that parallel major transportation corridors (transit and/or major roads)
- Trails that are not regionally significant in length but provide connections between important destinations (e.g., between a transit hub and a downtown)

Keyport Borough, Monmouth County

4 Recommendations

Recommendations for the ATP are divided into two categories:

1. The regional priority network includes recommended routes to accommodate a variety of trip types and users, including local and regional recreation, commuting, and other local transportation trips for people walking and biking. This network comprises the infrastructure recommendations of the ATP to guide cooperative efforts by communities, counties, the state, the private sector and interested parties to improve, expand and link active transportation opportunities. The following section includes a summary of network development; more information, including a county-by-county summary of active transportation opportunities, is available in the technical memorandum, Regional Active Transportation Network Recommendations. Data used in the network development is being made available on the ATP website.

2. Policy and program recommendations include a comprehensive set of strategies to support active transportation network implementation. A summary is included on the following pages, with more information available in the Strategy Guide.

Active transportation corridor case studies and an analysis of highway interchanges form the final elements of ATP recommendations and combine the two approaches mentioned above. The case studies synthesize infrastructure improvements as well as program/policy updates within two representative corridors. The analysis of interchanges examines where the network overlaps highway interchanges throughout the region and best practices for active transportation facility design at these locations. These elements provide implementation guidance that is transferable and replicable for active transportation projects throughout the NJTPA region. This chapter concludes with a summary of case study findings and recommendations.

Regional Network

This section presents recommendations for a conceptual regional active transportation network for the NJTPA region. The network is intended to provide the foundation for creating a safe, functional, and connected system that accommodates a variety of trip types and users, including local and regional recreation, commuting, and other local transportation trips (errands/shopping, etc.) for people walking and biking. These recommendations are meant to both fill gaps in the existing network and to expand the network to better connect the region.

The network is aspirational in scope, envisioning North Jersey's ideal regional active transportation system, unconstrained by fiscal and other limitations, and does not delve into the particulars of facility types and exact alignments. The purpose of creating a conceptual regional active transportation network is to establish a common framework for all jurisdictions—municipal, county and state—to refer to when creating active transportation facilities so that, in the long term, these facilities together begin to build an interconnected network to support all types of nonmotorized trips. An excellent example of this is the Circuit Trails in Greater Philadelphia. When complete, the network will include 800 miles of trails and connect urban, suburban and rural communities in one of the largest metropolitan regions in the country.[18]

Network Recommendations

Conceptual Network

A conceptual network provides a framework for expanding active transportation opportunities throughout the region. Because local jurisdictions are primarily responsible for building and maintaining active transportation infrastructure, the NJTPA plays a limited role in the facility selection and design of individual routes. For this reason, network recommendations are not tied to specific facility types.

A conceptual network also helps make the financial and political case for the type of local-level interventions that will be needed from one jurisdiction to the next. Building consensus around a shared vision for active transportation in North Jersey lays the groundwork for productive conversations about facility selection and other implementation details moving forward.

Regional Network and Local Networks

The regional network aims to provide the backbone for intermunicipal connections across North Jersey. It is meant to supplement—not supersede—recommendations for active transportation infrastructure from local active transportation plans. It is expected that local jurisdictions will continue to update and develop their own plans to improve local roads that align with and contribute to the regional network's connectivity as it is implemented. The NJTPA will consider using policy and funding mechanisms to ensure that the regional network adapts over time and connects to new local facilities, and vice versa.

Connecting Communities on Low-Stress Routes

As individual municipalities complete and update their own ATPs, connections between communities should be a central focus. The Barrier Analysis showed that many of the proposed routes between communities are on high-stress roads. These roads would need substantial improvements to convert them to low-stress routes that are comfortable for people of all ages and abilities. In some cases, existing parallel low-stress routes could serve as primary active transportation corridors and would require fewer changes. These corridors may take the form of shared use paths and trails that are comfortable for users of all ages and abilities, or separated facilities that follow existing roads—such as separated bike lanes, sidepaths, and sidewalks—that provide a high degree of comfort to users as well as direct access to important destinations. In cases where traffic volumes and speeds are low, paved shoulders or signed routes[19] may provide enough accommodation for most riders. Counties and municipalities should refer to the conceptual network when developing local projects, and study potential low-stress alternatives and parallel routes in more detail to supplement these recommendations.

Network Benefits

Taken together, the proposed routes developed through this planning effort and the existing and planned trails within the region form a comprehensive regional transportation system for walking and biking. Once complete, this system would dramatically expand the region's active transportation accommodations. It would also connect to existing facilities and fill gaps in the region's

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18   Circuit Trails Coalition. (2022). About the Circuit Trails. Retrieved from: https://circuittrails.org/what-is-the-circuit/
19   Signed routes can also be installed with separated facilities such as protected bike lanes and trails.

Newark Light Rail, City of Newark, Essex County

current active transportation network. For example, the network improves access to NJ TRANSIT services, providing a strong opportunity to strengthen first- and last-mile connections from transit stations to population centers throughout the region. It also expands the reach of regionally significant trails, such as the Middlesex Greenway and East Coast Greenway; and increases access to existing trail systems with on-street connections. In urban, suburban, and rural settings, the network would enhance recreational and utilitarian trips for people walking and biking throughout North Jersey.

The regional network includes 1,733 miles of recommended improvements for walking and biking across North Jersey. More than 5.6 million people live within one mile of the proposed network, comprising 80 percent of the region's population.

More information on network development is available in the technical memorandum Regional Active Transportation Network Recommendations.

Planning for Walking at the Regional Scale

Planning for walking at the regional scale requires a different approach than for bicycling. The regional network focuses primarily on accommodating bicycle travel, as walking trips tend to be short distances. However, as both pedestrians and bicyclists are vulnerable road users, it is important to ensure that low-stress bicycle corridors are similarly accessible for pedestrians and equipped with ADA-compliant surfaces, sidewalks, and crossing treatments. This section provides general guidance for future pedestrian network planning in conjunction with the implementation of the regional active transportation network.

- Identify pedestrian zones or corridors with high expected levels of pedestrian activity. The regional pedestrian trip potential analysis provides a starting point for this process. Regionally significant

pedestrian zones and corridors should connect multiple jurisdictions, provide direct access to regional destinations, or support recommendations from other local or regional plans. These corridors should be highly comfortable, including facilities designed to accommodate expected levels of pedestrian activity.

- It is important to design and implement connected pedestrian networks that are safe and comfortable for all ages and abilities, since most people are pedestrians in some way or form on any given day. The transportation network should accommodate pedestrians with a variety of needs and abilities.

- Pedestrian facilities at intersections is critical since these locations are the chief conflict points between pedestrians and motor vehicles. Well-designed and appropriately placed treatments can increase pedestrian safety and comfort.

Additional resources for pedestrian network planning are available in the Strategy Guide and via the following links:

- FHWA Small Town and Rural Design Guide
- FHWA Achieving Multimodal Networks
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities

The NJTPA helps local agencies plan for walking by providing education, technical assistance, tools, and guidance. The NJTPA also develops and shares data, analyses, and design resources with local planners to encourage best practices in pedestrian planning.

Policy and Program Recommendations

Introduction

The Strategy Guide is a component of the ATP dedicated to advising subregions (member counties and cities) and local municipalities on active transportation network implementation with a set of recommended strategies. The strategies are based on recommendations from municipal, county, regional, and community representatives who have been involved in successful implementation of local active transportation projects across the North Jersey region.

The Strategy Guide includes six recommended strategies for local jurisdictions and counties to advance active transportation, with 29 supportive actions. The strategies include actions for local municipalities and agencies within the NJTPA subregions, and are categorized as follows:

1. Capacity Building
2. Interjurisdictional and Multidisciplinary Collaboration
3. Equity and Environmental Justice
4. Data Collection
5. Communication and Public Outreach
6. Funding for Active Transportation Implementation

Table 2 lists all recommended strategies and supportive actions. The table serves as a quick reference menu for local and county organizations seeking guidance on active transportation network implementation. Additional guidance for the recommended strategies are explained in the following section.

Town of Morristown, Morris County

Figure 10: Regional Network
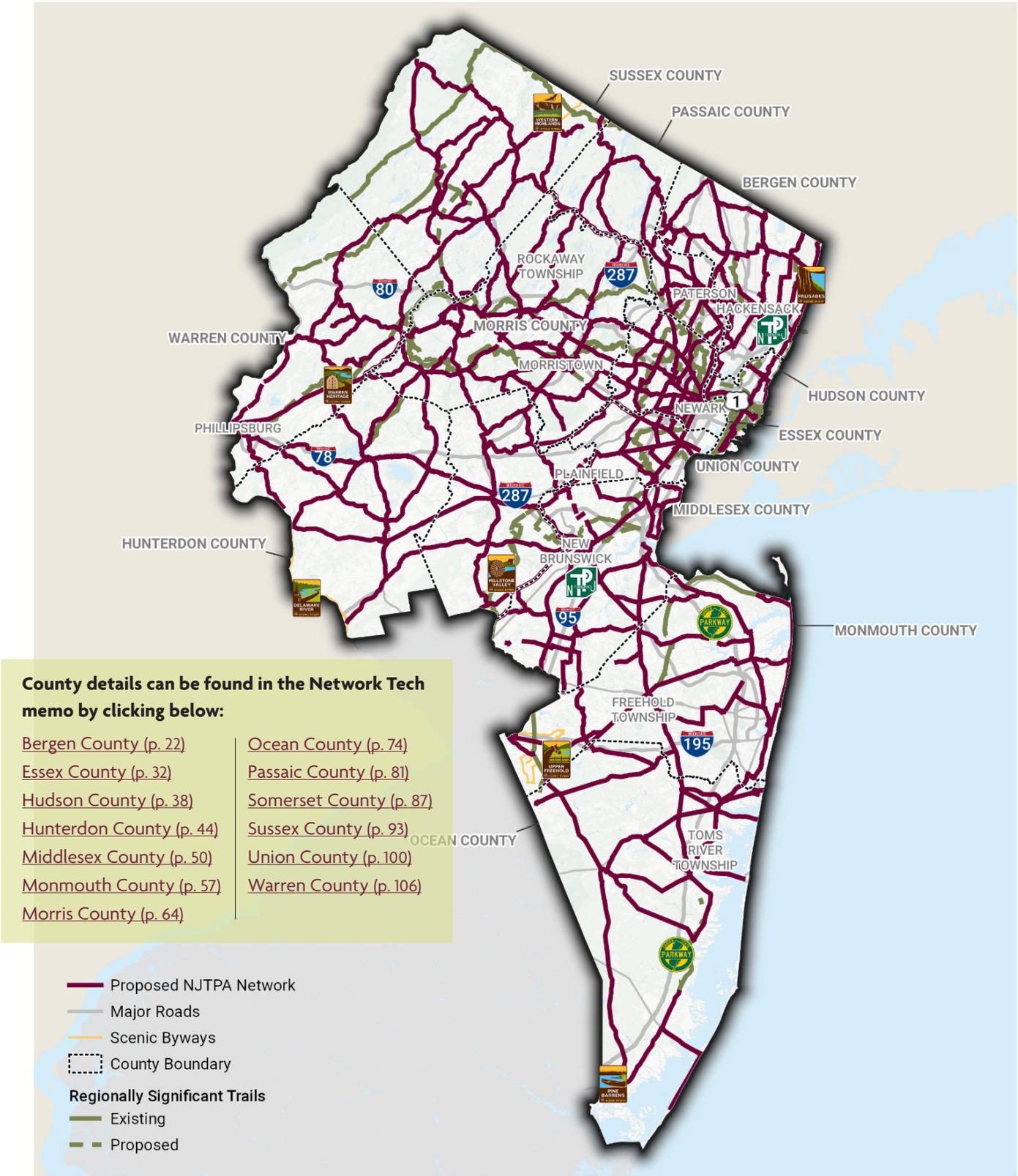
County details can be found in the Network Tech memo by clicking below:

Legend:
— Proposed NJTPA Network
— Major Roads
— Scenic Byways
⬚ County Boundary

Regionally Significant Trails
— Existing
- - Proposed
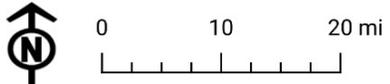
Recommended Strategies for Subregional and Local Jurisdictions

This section of the Strategy Guide includes recommended strategies for county and local agencies.

Table 2: Recommended Strategies for Subregional and Local Jurisdictions

Strategy	Action
1. Capacity Building Advance active transportation projects efficiently with support from staff, consultants, and stakeholders.	1A. Leverage Complete Streets policy adoption by elected officials to shift paradigms and catalyze changes within existing programs, and match changes with an internal checklist for staff.
	1B. Ensure that on-call support vendors, engineering, and planning staff are knowledgeable about and engaged in using active transportation design best practices.
	1C. Invite county or municipal staff and elected leaders to a walk/bike audit or for data collection to experience a corridor via walking or biking.
	1D Train staff to communicate ongoing projects accurately and effectively to the public and to enhance public participation in the planning process.
	1E. Create a multi-disciplinary body, including public stakeholders and other jurisdictional representatives, to assist with communication and strategy for active transportation projects.
	1F. Map the project process from planning to maintenance to identify opportunities for collaboration and cross communication between departments and/or jurisdictions.
2. Interjurisdictional and Multidisciplinary Collaboration Encourage consistent, open communication between stakeholders on active transportation project implementation.	2A. Build relationships through consistent and substantial communication between counties, municipalities, and the state to lay groundwork for a connected, regional network.
	2B. Quickly implement low-cost improvements, even incrementally, to demonstrate success, rally public support, and motivate decisionmakers to make more long-term, permanent investments.
	2C. Bring opportunities for interjurisdictional collaboration to the attention of elected leaders at the county and municipal levels.
	2D. Pursue consistent, open dialogue with jurisdictions and between departments about planned or ongoing projects.
	2E. Communicate and set expectations early between municipal and county stakeholders by clearly conveying the project scale, scope, and goals.
3. Equity and Environmental Justice Integrate equity and environmental justice into active transportation planning processes.	3A. Develop an internal equity and environmental justice rubric to align with the equity criteria used for federal or state funding.
	3B. Encourage or require staff engineers and planners to participate in continuing education on ways to incorporate equity and environmental justice in their work.
	3C. Incorporate equity into all components of active transportation projects.
4. Data Collection Collect and analyze active transportation data to prioritize and evaluate projects.	4A. Collect baseline data, such as bicycle and pedestrian counts.
	4B. Gather existing conditions data through field visits and by collecting information from residents using qualitative methods.
	4C. Routinely revisit traffic count data, such as Annual Average Daily Traffic (AADT) or bike/ped count data, to evaluate the accuracy of past projections compared to actual traffic counts.
	4D. Include post-implementation evaluation when setting project scopes and budgets.
	4E. Develop both internal key performance indicators, such as construction authorization, and external key performance indicators, such as post-installation counts, to evaluate active transportation project implementation.

Strategy	Action
5. Communication and **Public Outreach** Create transparency around active transportation projects through open communication with the public.	5A. Provide a way for interested residents to stay informed about future changes or modifications after project implementation.
	5B. Create or adjust land development review procedures to flag proposed developments near planned active transportation projects, future trail corridors, or priority network corridors.
	5C. Add the NJDOT Model Complete and Green Streets checklists to project development forms at each stage of the project process (e.g., Concept Development, Preliminary Engineering, Construction, and Maintenance) to adhere to recommended practices.
	5D. Clearly communicate the objectives, benefits, costs, and impacts of the project with the public.
	5E. Use community feedback received in other outreach efforts for related projects to inform small-scale active transportation projects with shorter timelines, such as projects included in scheduled resurfacings.
6. Funding for Active Transportation Implementation Use a wide range of resources to fund active transportation project implementation.	6A. Deliver local active transportation projects consistently, and potentially with greater impact, by using local funds to incorporate active transportation elements into existing projects.
	6B. Support shovel-ready projects through interjurisdictional collaboration on combined grant applications.
	6C. Pursue active transportation funding opportunities.
	6D. Consider maintenance and operations challenges and costs early in the planning process by including public works staff on project committees.
	6E. Become familiar with various funding opportunities (local, state, federal, or private) and application timeframes and requirements, and take advantage of available active transportation support programs.

Sparta Township, Sussex County

Case Studies

Case studies were conducted in two regional active transportation corridors: Parish Drive in Wayne Township (Case Study 1); and Main Street in the Borough of Stanhope and Netcong (Case Study 2).

These case studies embody many of the challenges and opportunities that other communities across the region encounter when it comes to implementing successful active transportation projects and promoting livability, Complete Streets, and safe multimodal travel. The recommendations and guidance resulting from the case studies are provided in the document, Case Studies: Parish Drive in Wayne and Main Street in Stanhope/ Netcong Memorandum.

Each case study includes a review of relevant policy documents, existing conditions, and contextual factors such as surrounding land use and community demographics. The memo includes conceptual renderings that provide high-level recommendations for infrastructure improvements (see examples on the following pages), as well as program and policy solutions that cross-reference the ATP Strategy Guide. See Figure 11 for case study locations. *(Recommendations in this report are based on study findings and are preliminary in nature. Any future efforts to implement these recommendations should involve further study.)*.

Above: Existing Conditions on Parish Drive
Below: Suggested bike lanes on Parish Drive

Figure 11: Case Study Locations
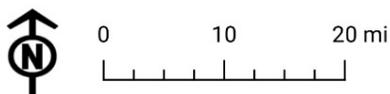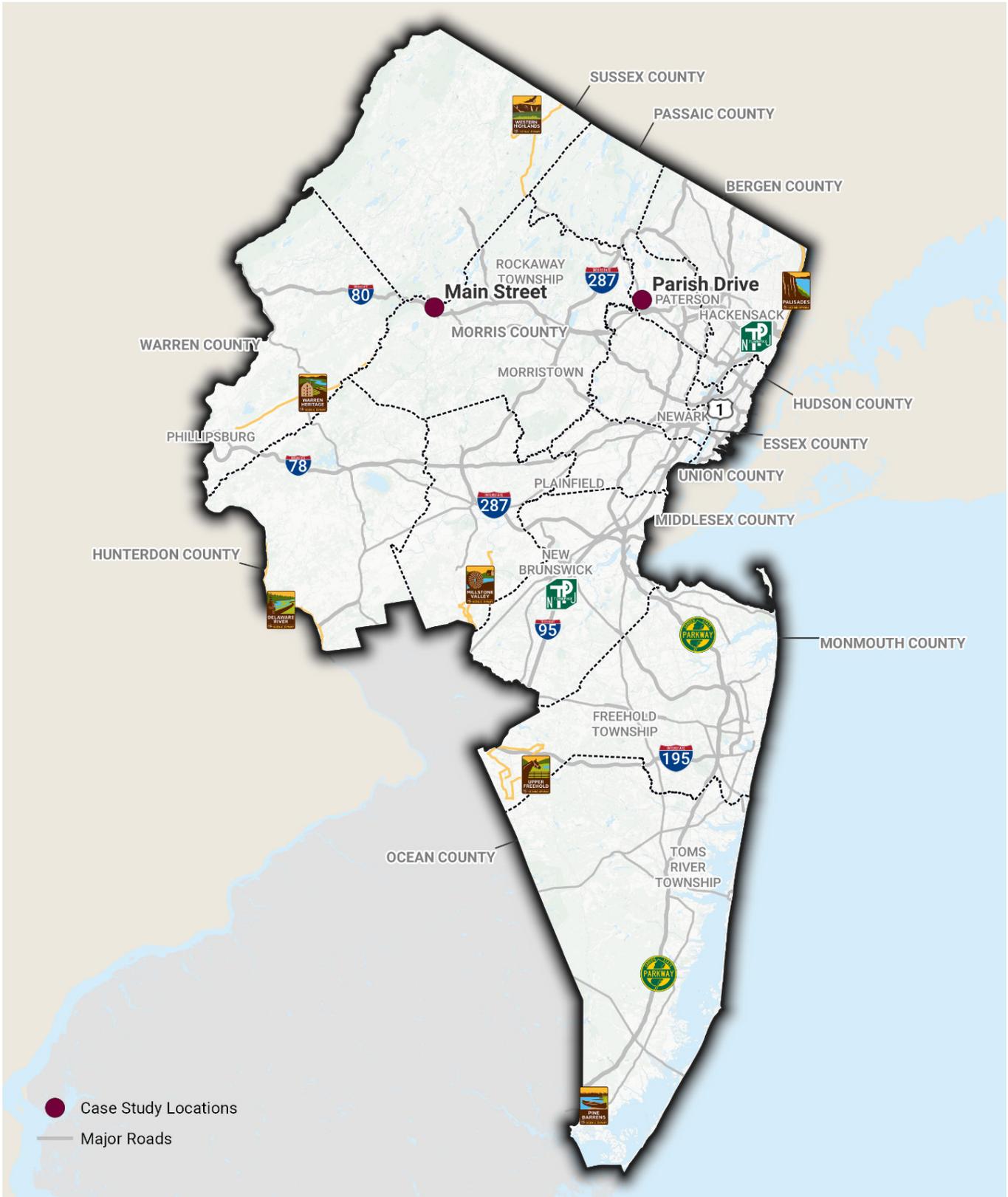
Above: Existing Conditions on Mountainview Boulevard
Below: Suggested two-way separated bike lane on Mountainview Boulevard

Above: Existing Conditions on Plane Lane
Below: Suggested Green Alley on Plane Lane

# Active Transportation Facility Design At Highway Interchanges

To supplement the two case studies, an analysis was conducted examining the regional active transportation network segments that overlap with highway interchanges. This included 58 locations where existing bicycle facilities intersect with highway interchanges, and 187 locations where the regional active transportation network intersects with interchanges. The analysis includes a summary of these segments and their distribution across the region by county.

Many of the locations are along high-volume state highway corridors or on major roads that cross through interchanges; as such, these segments are not presently conducive to active transportation. However, walk/bike potential does exist in these areas, and interchanges can be improved to safely accommodate people walking and biking as the network is built out. The technical memorandum Active Transportation Facility Design At Highway Interchanges includes design guidance and provides high-level principles that planners and designers should consider as they implement the regional active transportation network. Below are examples of design guidance for accommodating active transportation users at interchanges.
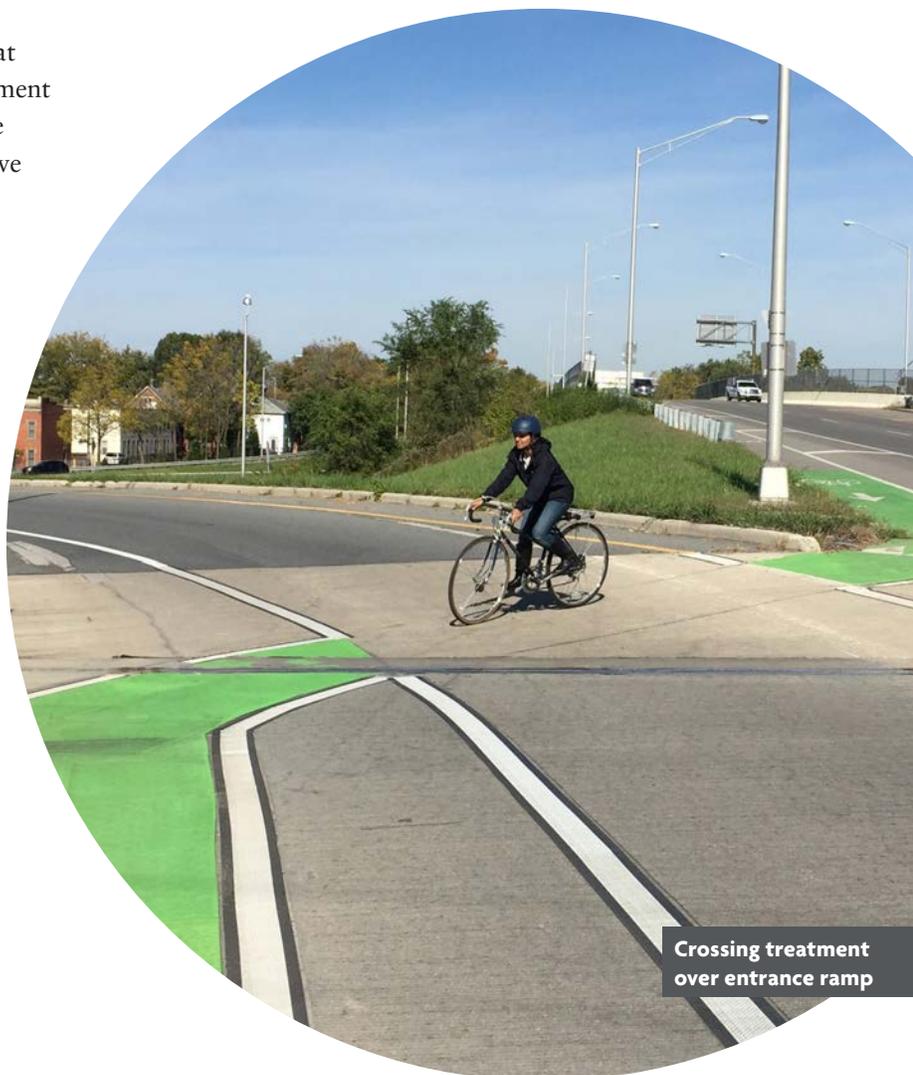
Crossing treatment over entrance ramp

Example Interchange Treatment (Bicycle Lane Carried Across an Exit Ramp Throat)

BIKE LANE

bicycle crossing

green-colored
pavement (optional)

mountable
truck apron
(optional)

BIKE LANE

R3-17 (typ)

W11-1

YIELD

R1-2
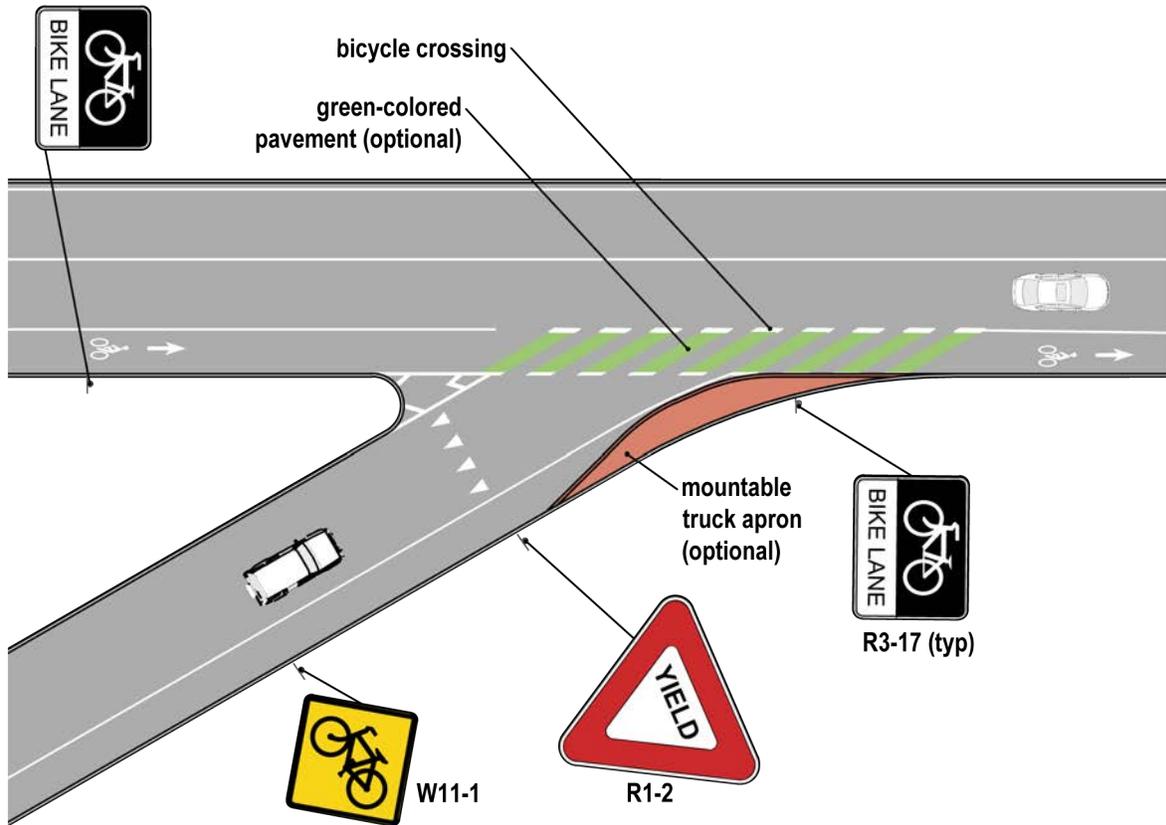
Example Interchange Treatment (Bike Lane Positioned in High-Exposure Weaving Area)

bicycle ramp (optional)
see Section 5.10.7

green-colored
pavement (optional)

auxiliary lane
drop at ramp

sidewalk

auxiliary lane

marked
crosswalk (typ)

sidewalk or
sidepath

bicycle crossing

vehicle
travel
path
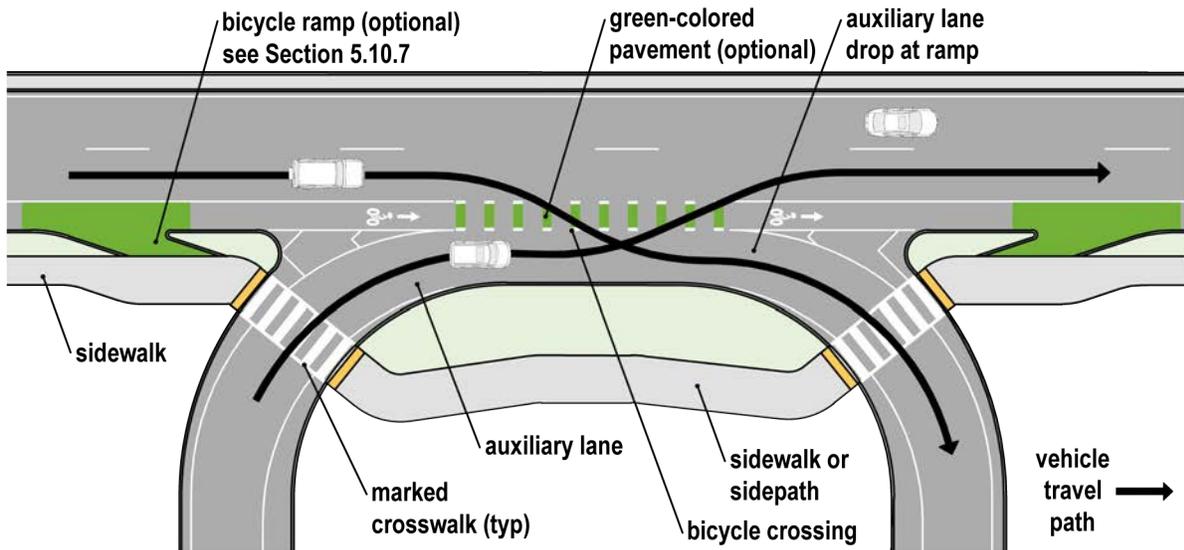
Table 3: Summary of Safety and Design Issues and Recommended Solutions

Safety and Design Issues	Relevant Section (click links for more information)	Selected Treatments
Crossings of free-flow, potentially high-volume, motor vehicle movements	Bicycle Crossings at Ramps	• Transition on-street bike lane to separated bike lane or sidepath • Create a protected intersection • Mountable truck apron • Raised crosswalk (below 30 mph) • Active warning device or traffic signal • Warning signage • Green-colored pavement
Exposure to higher-speed traffic	• Bicycle Crossings at Ramps • Minimize Conflicts with Motor Vehicles • Channelized Right-Turn Lanes	• Active warning device or traffic signal • Design interchange junctions as right-angle intersections • Minimize high-speed merging lanes and free-flow traffic movements
Weaving movements across a bicyclist's path of travel and other travel lanes	Merging and Weaving Areas	• Transition on-street bike lane to separated bike lane or sidepath • Warning signage • Green-colored pavement
Designs which require unconventional travel paths and may result in routing confusion	Bicyclist Routing and Delay	• Provide a highly visible and coherent route • Provide straight line routing through intersections for on-street bike facilities • Provide dotted lane lines through wide intersections • Accommodate desire lines of bicycle travel and reduce out-of-direction travel • Minimize grade changes • Minimize bicyclist exposure to high-speed and/or free-flowing traffic movements
Multi-stage crossings or transitions which can increase bicyclist travel time or delay	Bicyclist Routing and Delay	• Minimize the use of multi-stage crossings except where a multi-stage crossing can reduce delay or eliminate crossings of high-volume, free-flow ramps
Long crossings which increase exposure and, in some cases, do not provide adequate clearance intervals at signalized crossings for bicyclists to fully traverse the crossing	• Minimize Conflicts with Motor Vehicles • Ramp Skew • Exit Ramps and Merging Areas • Additional Conflict Mitigation Treatments • Channelized Right-Turn Lanes	• Minimizing exposure to conflicts with motorists by creating short crossing distances and physically separated bikeways • Design perpendicular crossings across exit and entrance ramps • Transition on-street bike lane to separated bike lane or sidepath • Install channelized right-turn refuge island
Bikeways with constrained widths adjacent to higher-speed traffic	Designs that Place Bicyclists in Constrained Areas	• Include adequate buffer space • Install crashworthy barriers or other vertical separation
Conditions that require bicyclists to operate with pedestrians in crosswalks and other shared use facilities	Minimize Conflicts with Pedestrians	• Maximize visibility between bicyclists and pedestrians • Where separated bike lanes are provided, continue to separate bicyclists and pedestrians at crossings • In shared use paths, ensure that there is adequate width for safe passing between bicyclists and pedestrians • Provide curb ramps which match the full width of shared use paths

Figure 12: Interchange Crossings on Regional Network

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