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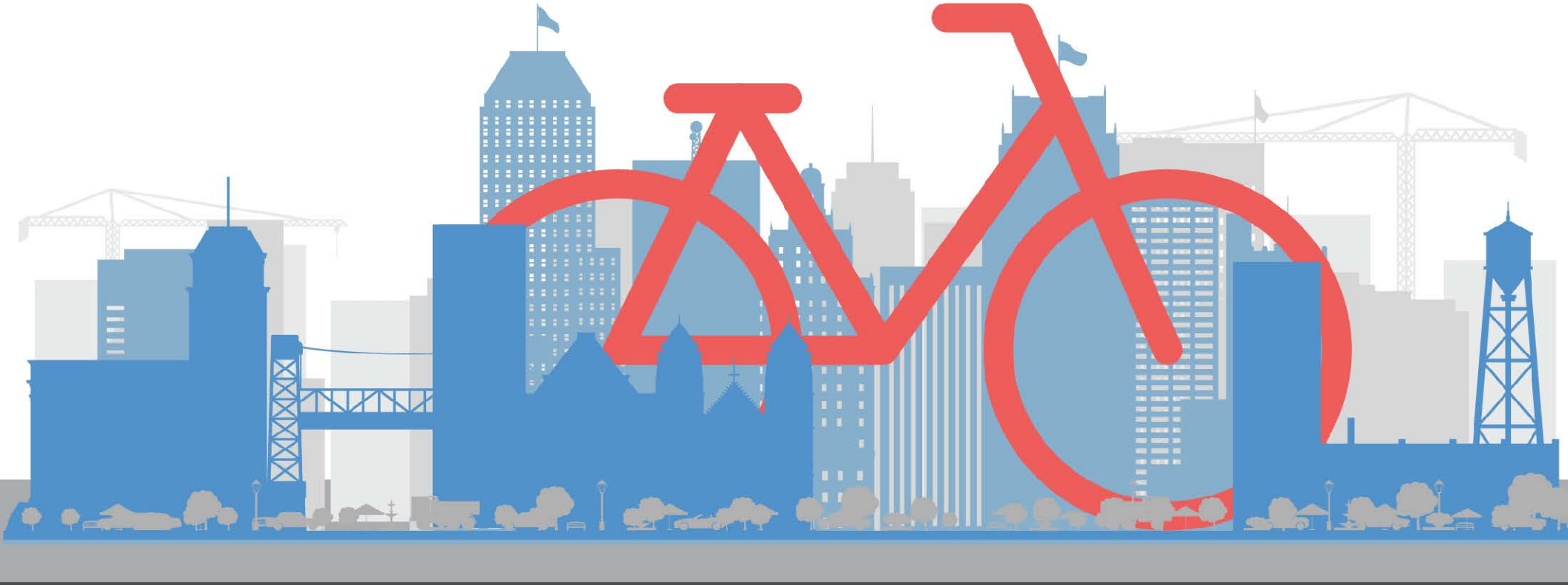

BIKENEWARK

BICYCLE PLAN FOR THE CITY OF NEWARK

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June 2024

DISCLAIMER

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Michael Baker International, Mercer Planning Associates, and WSP, except where noted.


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EXECUTIVE SUMMARY

Newark is on the move. With a population of more than 300,000 for the first time in decades, a thriving central business district, and diverse neighborhoods – Newark is experiencing significant change at a rapid pace. Even by conservative estimates, Newark is projected to continue to grow, and become increasingly diverse.

Newark features an extensive street and transit network providing access and mobility throughout the city, connecting neighborhoods and people between where they live and where they need to travel. Principal destinations include the city's large office towers, small workspaces, more than 100 schools, five universities, numerous parks and libraries, museums, and a significant breadth of local business, shopping, dining, and entertainment establishments.

Bicycling can be a relatively inexpensive, quick, and convenient mode of travel, complimenting existing transit modes by providing critical first- and last-mile connections, especially for underserved communities and densely populated urban areas like Newark. Numerous plans and studies have explored and established the many benefits of cycling – equity and affordability, improved safety, better health and wellness, expanded transportation choices, and enhanced mobility and access to opportunity.

The time is right to rethink mobility and the use of street space in Newark to provide more sustainable, resilient, and equitable transportation choices.

A Citywide Bicycle Plan

Newark360, the city's groundbreaking Master Plan established safe travel and access for all Newarkers as a key priority and recommended the development of a citywide bicycle plan and network.

BIKENewark – a comprehensive, citywide bicycle plan – is the ideal mechanism to accomplish these goals. This plan is informed by inclusive and equitable community engagement, a comprehensive planning process, and data-driven needs assessment, to create a plan for a safe, convenient, and continuous bicycle network that serves all Newarkers, and prioritizes the wellbeing of underserved communities and vulnerable road users.

Inclusive Community Engagement

Community input was an integral component of BIKENewark, creating a plan that truly reflects Newark's unique local context, needs, and priorities. Input was collected through a multi-pronged approach to facilitate participation from residents, students, workers, visitors, and other stakeholders through both traditional and non-traditional means. Engagement methods included the plan website and social media, focus group discussions, an interactive survey and mapping tool, a virtual public open house, and in-person engagement at local pop-up events in every ward. Multilingual materials and translations were provided to engage Newark' diverse stakeholders in languages and places where they feel most comfortable.

BIKENewark outreach activities garnered over 500 engagements, demonstrating support for bicycling in Newark through a robust compendium of comments, concerns, observations, and suggestions, and providing local insight on how to improve everyday travel experiences and plan for a citywide bicycle network.

Stakeholders raised concerns about numerous issues, including safety, access, and affordability; limitations and shortcomings of Newark's current bicycle infrastructure; and the need for an expanded citywide bicycle network. Newark residents consistently expressed a strong preference for bicycle facilities that were fully separated and protected from moving traffic.

BIKENewark used an equity assessment to identify the city's underserved communities and vulnerable road users, placing their daily travel needs and safety challenges at the center of this plan. The equity assessment identified numerous underserved communities spread across the city, establishing that it was essential to actively engage and collaborate with Newark's diverse populations, stakeholders, and constituencies.

BIKENewark Strategic Vision

Equitable access to safe, affordable, effective, and efficient travel options is essential to the everyday mobility needs of Newarkers and to achieving a high quality of life, healthy lifestyles, and gaining access to opportunity.

BIKENewark is …

- **Accessible,** reduces dependence on motor vehicle travel, and improves responsiveness to the needs of Newark's vulnerable road users
- Committed to a **Culture of Safety** by designing a transportation system that achieves a future without transportation-related serious injuries and fatalities
- **Equitable** and prioritizes the needs of Newark's underserved communities
- Committed to positive **Economic Development** that supports tourism, enhances access to Newark's businesses and educational institutions, and provides workers with reliable and efficient access to economic opportunity
- A dynamic **Living Plan designed to evolve with the city.** It will be reviewed and updated every few years to ensure it remains responsive to the needs of the community.

Biking in Newark Today

Newark's extensive street and transit network, demographics, density of population and employment, and numerous destinations and amenities make it ideally suited for sustainable, non-motorized transportation, including bicycle travel. Measures of both existing and potential bicycle demand support this conclusion.

The multimodal transportation network is extensive — moving people and freight within and across Newark, Essex County, and the greater NJTPA and metropolitan region. Travel by bicycle supports the reach and scope of transit by

creating new first- and last-mile connections. between transit stations and stops, and Newark's great diversity of destinations.

However, barriers in the form of stressful travel conditions, safety concerns, and limited availability of bicycle infrastructure can discourage many from bicycling. Newark's built environment and neighborhoods are frequently divided by its many wide roadways and several of New Jersey's busiest highways, isolating neighborhoods, and resulting in travel speeds incompatible with the walkable and bike-friendly character that makes many urban environments successful and desirable. And between 2017 and 2022, there were 6 fatal bicycle-related crashes, and 37 serious-injury bicycle crashes in Newark.

Newark's existing bicycle network is limited in scope and breadth, with few north-south routes and lacking any significant east-west connections. Currently, there are 13.4 miles of bicycle facilities in Newark, including 10.1 miles on-street and 1.3 off-street miles of the recently approved Essex-Hudson Greenway passing through the North Ward near Belleville. None of Newark's existing on-street bike lanes offer the desired separation and protection from moving traffic.

Building the Future Bicycle Network

Building a comprehensive, citywide bicycle network is a data-driven and community-led process, using proven measures of travel conditions and safety, existing bicycle and scooter share data, potential future bicycle demand, and consistent with the local context and conditions.

Bicycle facility selection for BIKENewark leverages the plan's extensive data resources to evaluate feasibility of candidate bicycle improvements. The goal is to develop a citywide bicycle network that addresses safety and equity; meets bicycle demand and accessibility needs; enhances local context, neighborhoods and local business; and that fits within the street cross-sections and available right-of-way. Each proposed bicycle facility is based on the standardized design treatments developed for **BIKE**Ironbound and consistent with state-of-the-practice design guidance and published standards.

Given the prevalence of high crash occurrence and severity, the preference for separation from moving traffic, persistent vehicle encroachment in bicycle facilities, aggressive driving behaviors, and high travel speeds, BIKENewark emphasizes "protected" bicycle facility designs to make biking safe and accessible, and achieve the potential for Newark to become a successful and sought-after cycling destination.

All proposed bike routes will require further analysis and input from the public, whether they are on city-, county-, or state-owned roadways. Furthermore, in collaboration with Essex County, the candidate bike routes along County roadways will require further study and analysis prior to authorization for construction

BIKENewark proposes to add 74 miles to the existing bicycle network 87.4 miles of dedicated on-street bicycle facilities, an eight-fold increase.

The bicycle network is presented in three groups, based on current known status and feasibility issues

- Existing – includes all existing bicycle infrastructure in the City of Newark plus projects that are approved for construction, including the 1.3 mile section of "The Greenway" in Branch Brook Park in the North Ward.
- Proposed – "Proposed" bicycle improvements fit within the existing roadway width. Each, however, would still be subject to further review by the roadway owner.
- Potential – Future additions labeled as "Potential" provide some measurable benefit to biking in Newark, but require additional study beyond the scope of this plan to determine feasibility.

	Bicycle Facility Miles
Total Existing Facilities	**13.4 miles (10.1 miles on-street)**
Shared Use Paths	3.3
Bike Lanes	6.7
Sharrows	3.4
Total Proposed Facilities	**74 miles (on-street)**
Shared Use Paths	0.0
Protected 2-way Bike Lanes	15
Protected 1-way Bike Lanes	36
Bicycle Boulevard	17
Standard Bike Lanes	6
Sharrows	1
Total Existing + Proposed Facilities	**87.4 miles (on-street)**
Potential (needs detailed study to determine feasibility)	15
Total Existing + Proposed + Potential Facilities	**102.4 miles (on-street)**

Supporting Policies, Plans, and Strategies

Experiences of cities and towns across New Jersey and the U.S. demonstrate that new bike facilities, signing, and striping alone are not enough to achieve the ambitious bicycle safety and mobility goals of the City of Newark.

In order to achieve the goal of more sustainable, resilient, and equitable transportation choices, Newark must address affordability, rethink the use of its streets, and build concepts of slower speeds, and safer travel behaviors into each street, neighborhood, new development and redevelopment project, and across all five city wards. Policy initiatives can advance these goals.

BIKENewark is therefore structured as a *living plan* with a diverse and innovative program of candidate bicycle projects, policies, community events, and education and safety initiatives. It is recommended that Newark evaluate progress of plan implementation and attainment of the BIKENewark vision and goals on a yearly basis.

Expand and Enhance Bike and Scooter Share Access, Use, and Affordability

- Evaluate affordability and equity to improve access to bike and scooter share services for daily travel needs
- Align hubs and docking locations with new bicycle facilities as they are built
- Increase awareness and promotion of micromobility shared services
- Promote bicycle safety and provide education of safe riding behaviors

Leverage Newark's SS4A Grant for Bicycle Lanes Implementation and Demonstration Project Opportunities

- Refine the bicycle recommendations towards implementation, with the goal of improving safety. This may include additional engineering evaluations
- Provide opportunities for additional stakeholder and public input which may include additional input on BIKENewark recommendations
- Conduct Road Safety Audits at high crash occurrence and high crash severity hot spots
- Implement demonstration projects and pop-up events
- Plan and conduct the proposed Safe Routes to Healthy Foods demonstration project event at Halsey Street

Expand safe, secure, and accessible parking and storage for bicycles and scooters

- Review and update zoning for bicycle parking
- Expand municipal-sponsored bicycle parking
- Explore bike locker programs at high demand locations

Improve parking utilization and enforcement of bike lane encroachment

- Develop and implement standards for restaurant loading zones
- Enhance enforcement of vehicle parking and encroachment in bike facilities

Build on successes and recommendations from recent plans including Newark360, Essex 2045, BIKEIronbound, Newark Downtown Circulation Improvement Study, and others

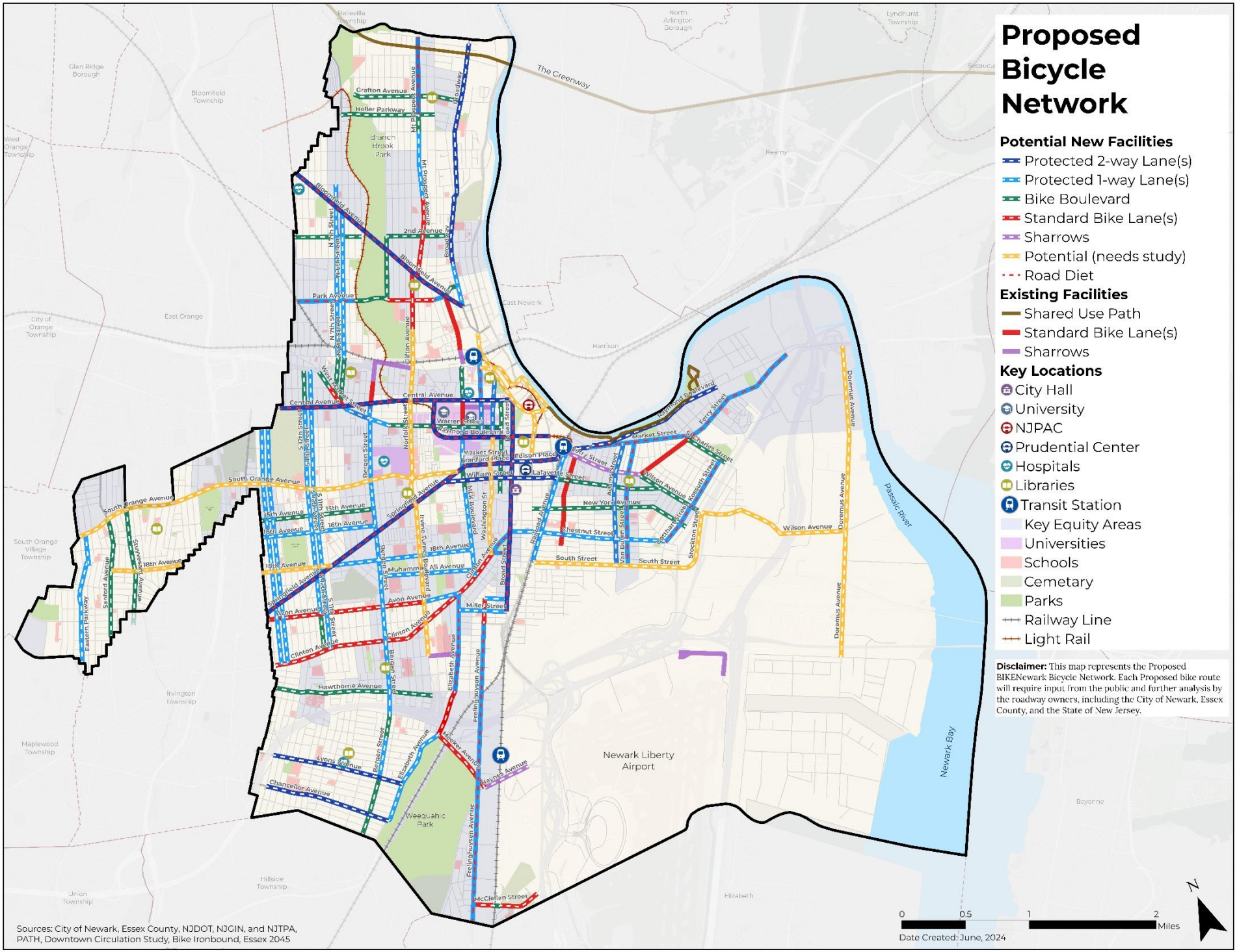
- Continue to prioritize Road Safety Audits and Safe Route to School Travel Plans
- Expand on Essex 2045 Road Diet case studies
- Standardize traffic calming to slow traffic, and emphasize safety and accessibility for vulnerable road users

Develop and adopt citywide Vision Zero Action Plan and strategic emphasis on equity and safety

- Create 20 MPH residential speed zones
- Targeted use of “No Turn on Red” at intersections
- Develop citywide street design templates based on context to align road design with local use and context
- Adopt Complete Streets, traffic calming, and Green Infrastructure as standard design elements
- Integrate Crime Prevention through Environmental Design (CPTED) approach into planning and design standards to create safe and accessible communities

Provide multimodal accommodations on all regional bridge connections to neighboring municipalities

Collaborate with plan partner Essex County to explore suitability of Branch Brook Park Drive for dedicated bicycle improvements


Proposed Bicycle Network
Potential New Facilities
Protected 2-way Lane(s)
Protected 1-way Lane(s)
Bike Boulevard
Standard Bike Lane(s)
Sharrows
Potential (needs study)
Road Diet
Existing Facilities
Shared Use Path
Standard Bike Lane(s)
Sharrows
Key Locations
City Hall
University
NJPAC
Prudential Center
Hospitals
Libraries
Transit Station
Key Equity Areas
Universities
Schools
Cemetary
Parks
Railway Line
Light Rail
Disclaimer: This map represents the Proposed BIKENewark Bicycle Network. Each Proposed bike route will require input from the public and further analysis by the roadway owners, including the City of Newark, Essex County, and the State of New Jersey.
Sources: City of Newark, Essex County, NJDOT, NJGIN, and NJTPA, PATH, Downtown Circulation Study, Bike Ironbound, Essex 2045
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Date Created: June, 2024
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The Greenway
Passaic River
Newark Bay
Newark Liberty Airport
Weequahic Park
Branch Brook Park
Central Avenue
Market Street
Broad Street
Clinton Avenue
South Orange Avenue
Bloomfield Avenue
Park Avenue
Grafton Avenue
Heller Parkway
Mt. Prospect Avenue
Broadway
2nd Avenue
Clifton Avenue
Norfolk Street
Bergen Street
Springfield Avenue
Muhammad Ali Avenue
Avon Avenue
Miller Street
Hawthorne Avenue
Elizabeth Avenue
Lyons Avenue
Chancellor Avenue
Haynes Avenue
McClellan Street
Freling huysen Avenue
Raymond Boulevard
Ferry Street
Lafayette Street
William Street
New York Avenue
Chestnut Street
South Street
Wilson Avenue
Doremus Avenue
Stockton Street
Van Buren Street
Orchard Street
Joseph Street
Wilkes Avenue
Adams Street
Edison Place
Warren Street
Halsey Street
Washington St
Railroad Avenue
Eastern Parkway
Sanford Avenue
Irvington Township
Maplewood Township
South Orange Village Township
City of Orange Township
East Orange
Bloomfield Township
Glen Ridge Borough
West Orange Township
Belleville Township
North Arlington Borough
Lyndhurst Township
Kearny
East Newark
Harrison
Hillside Township
Union Township
Elizabeth
Bayonne

INTRODUCTION

Newark is on the move. With a population of more than 300,000 for the first time in decades, a thriving central business district, and diverse neighborhoods, Newark is experiencing significant change at a rapid pace. Billions of dollars of new investment in housing, offices, redevelopment projects, and infrastructure, coupled with employment growth across a variety of sectors have contributed to the city's resurgence. Even by conservative estimates, the city is projected to grow over the next decade, become increasingly Hispanic and foreign-born, and decreasingly Black and White. (Newark 360 Plan, 2022).

Numerous plans and studies, including **BIKE**Ironbound and Newark360, have explored and established the many benefits of cycling – equity and affordability, improved safety, health and wellness, expanded transportation choices, environmentally responsible, and enhanced access to education, community services, and employment opportunities.

The time is right to rethink mobility and transportation infrastructure to provide more sustainable, resilient, and equitable transportation choices. A comprehensive, citywide bicycle plan is the ideal means to this end.

BIKENewark is informed by inclusive and equitable engagement, a comprehensive planning process, and data-driven needs assessment to create a safe, convenient, and continuous bicycle network that serves the needs of all ages and abilities, and that prioritizes the needs of vulnerable road users and traditionally underserved communities.

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BACKGROUND: THE CITY OF NEWARK, NEW JERSEY

Founded in 1666, Newark is one of America's oldest cities and the largest in New Jersey. Newark's transportation network is unrivaled among her peers, spanning local and county streets, state and Interstate highways, Newark Liberty International Airport, the Port of Newark, and an extensive network bus, light rail, commuter and high speed rail, and freight and goods movement infrastructure.

Newark is long past its Indigenous origins, long past its founding as a small town on the banks of the Passaic River, long past its peak population of nearly 440,000 in the 1940s, long past its industrial heritage, and long past the unrest of the 1960s and the many decades of retrenchment and decline that followed.

The Newark of today is growing, defined by its people and neighborhoods, becoming more diverse, and looking forward to a future as an equitable city grounded in the principles of health, equity, and sustainability.[i]

The City of Newark features an extensive street grid and transit network providing access and mobility throughout the city, and across a mix of primarily city-owned and county-owned streets. These include a blend of one-way and two-way streets connecting people between where they live and where they need to travel. Principal destinations include large office towers, small workspaces, dozens of schools, three universities, numerous parks and libraries, museums, bus and rail service, and a significant breadth of business and entertainment establishments. Newark's employment and population densities are among the highest of New Jersey's large cities.

These features make Newark ideally suited for sustainable, non-motorized transportation, including bicycle travel. Measures of both existing and potential bicycle demand support this conclusion.

BIKENewark is driven by the city's substantial planning efforts of the last decade - including **BIKE**Ironbound (2016), Newark Complete Streets Design Guidelines and Implementation Plan (2016), City of Newark Pedestrian and Bicycle Safety Action Plan (2016), Newark Downtown Circulation Improvement Study (2019), Newark360 Master Plan (2022), Essex 2045 (2023), and others to deliver on the vision of Newark as a city on the move.

BIKEIronbound demonstrated the viability of cycling as an essential mode of travel in Newark, created the framework for uniform and standardized design guidance for bicycle facilities, and led to the implementation of three dedicated bicycle facilities, on Adams, McWhorter, and Ferry Streets, within three months of plan adoption.

Building on the momentum of **BIKE**Ironbound, Newark360 established safe travel as a necessity for Newarkers of all ages and abilities, and called for the development of a city bicycle Master Plan and presented here as BIKENewark.

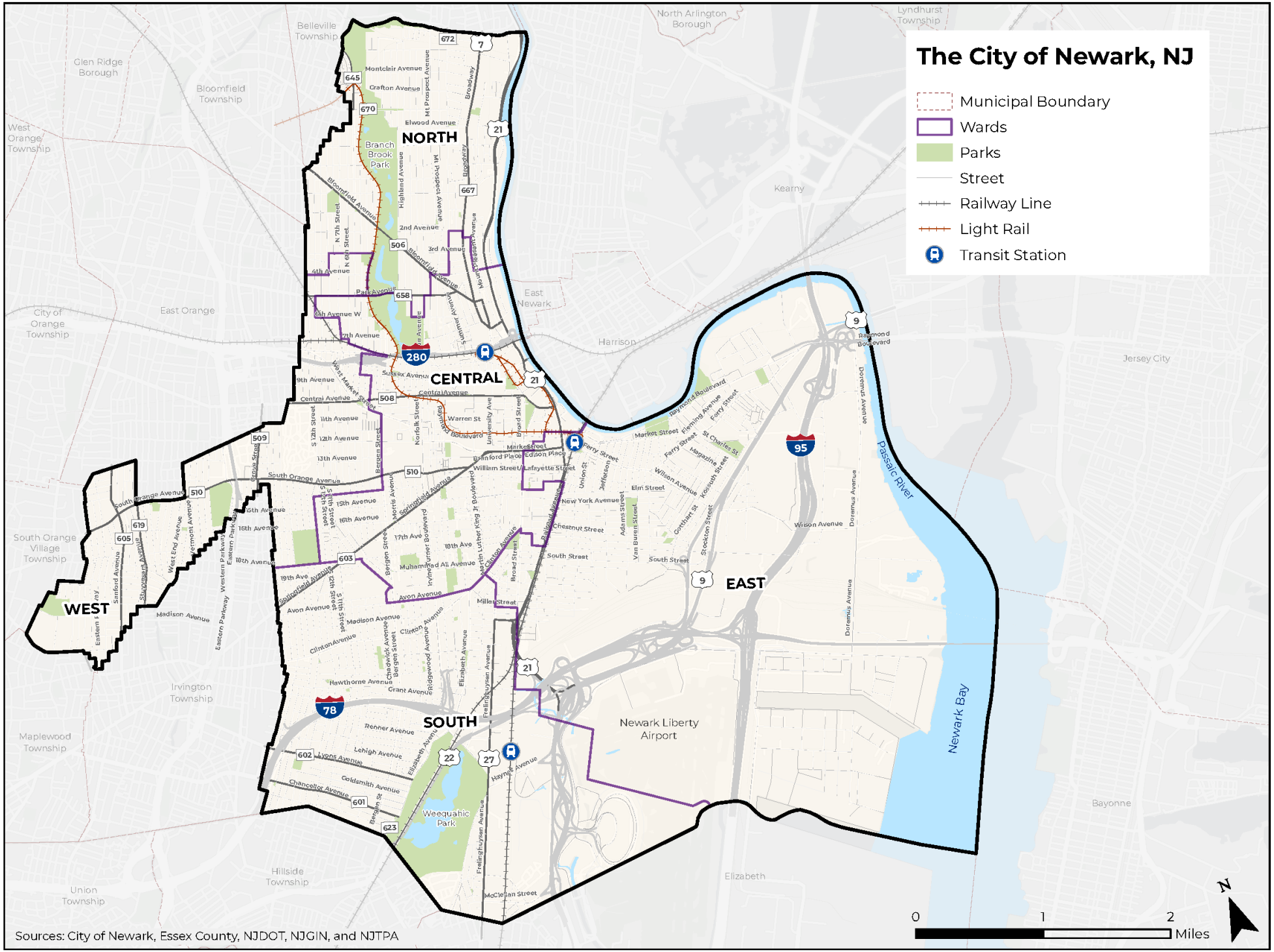


Figure 1. City of Newark, New Jersey

Bicycle Lane with Buffer, Raymond Boulevard, Newark, New Jersey

SUPPORTING PLANS, POLICIES, AND GUIDANCE

A series of municipal, county, regional, and statewide plans and resources informed the BIKENewark planning process. and the goals that guided development of this plan.

One of the pillar recommendations of Newark360 is the goal to “Enable Newarkers of all ages and abilities to safely move around the city.” In order to achieve these goals Newark must address affordability, rethink the use of its streets, and build concepts of slower speeds, and safer travel behaviors into each street, neighborhood, new development and redevelopment project, and across all five city wards. Policy initiatives can advance these goals.

These strategies are recommended consistently across the many plans and studies examined for BIKENewark, and have proven successful in New Jersey and across the U.S.

Detailed overview of the supporting plans, policies, and guidance in provide in the Existing Conditions Technical Memorandum.

CITY OF NEWARK PLANS

A series of recent citywide plans and policy initiatives guided the development of a comprehensive bicycle plan for the City of Newark.

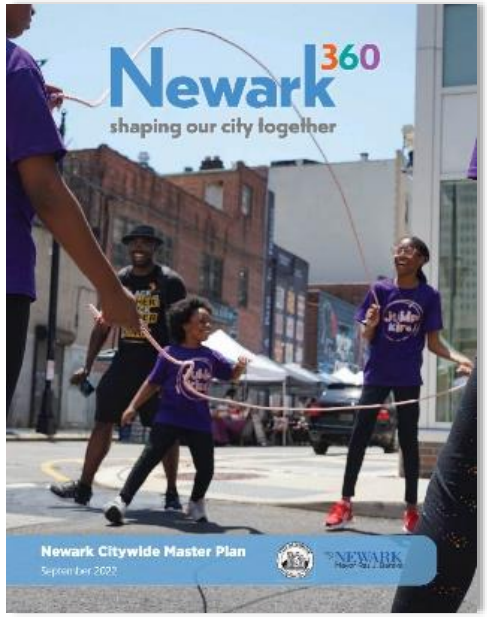
These include the Newark360 Master Plan, **BIKE**Ironbound, Newark Downtown Circulation Improvement Study, Newark Pedestrian and Bicycle Safety Action Plan, and Newark Complete Streets Policy.

Additional studies are underway to design and build targeted bicycle facilities, including portions of *The Greenway* and the Newark Riverfront Pedestrian & Bicycle Access and Bergen Street Pedestrian Improvement Studies.

Each stresses the importance of safely accommodating bicycling and non-motorized travel as part of a comprehensive multimodal transportation network for Newark, and each is structured to implement a standardized program of consistent bicycle design treatments based on local context and conditions.

Newark360 Master Plan (2020)

Newark360 prioritizes safe travel and access for Newarkers of all ages and abilities. The Plan recommends a series of priority actions that are incorporated into BIKENewark: prepare a Vision Zero Action Plan; develop a citywide bicycle network; provide bicycle connections to Newark's parks; conduct Road Safety Audits; implement Safe Route to School plans, and prioritize traffic calming and safety for vulnerable road users.



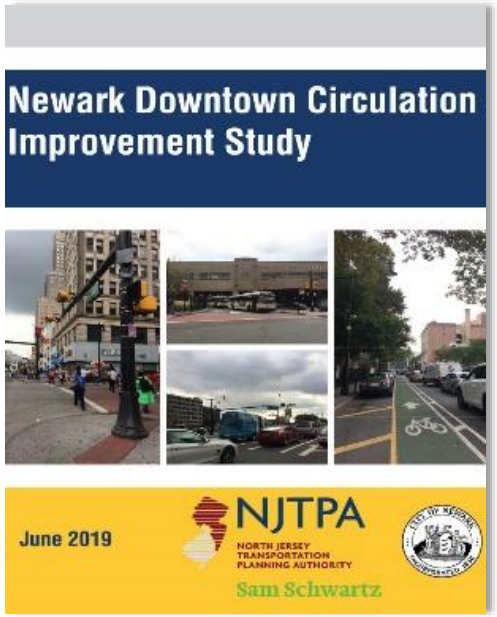
BIKEIRONBOUND (2016)

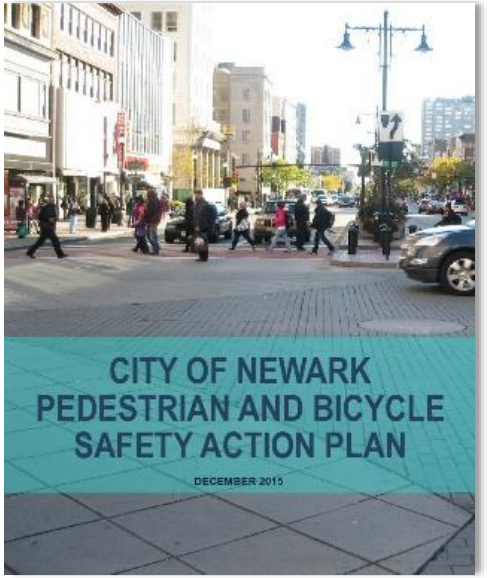
This bicycle plan for the Ironbound neighborhood established the framework for advancing bicycle infrastructure projects and serves as the model for BIKENewark and the development of a safe, convenient, and continuous citywide network of bicycle facilities.

The plan developed Bicycle Level of Traffic Stress and Bicycle Demand performance metrics, and created a standardized program of bicycle design treatments based on local context and conditions. Three pilot bike lane projects were developed and implemented within three months of plan adoption.

Newark Downtown Circulation Improvement Study (2019)

The Newark Downtown Circulation Improvement Study provided an assessment of the current and future downtown Newark Street network and travel conditions, and identifies specific bicycle projects and supporting strategies. The study focused on the primary activity centers including the Universities, Military Park, Newark Penn Station, Prudential Center, and Lincoln Park; was multimodal in scope; and prioritized crash hotspot locations.





Newark Pedestrian and Bicycle Safety Action Plan (2016)

The Safety Action Plan developed goals to reduce pedestrian and cyclist serious injuries and fatalities, and established priorities to implement a bicycle Master Plan by 2025, and a network of 90 miles of bike lanes. Implementation focus areas include the Central Business District, Ironbound neighborhood, areas with connectivity to train stations, and high residential growth areas. The Central Ward was also ranked as high priority due to crash occurrence and severity hot spots.

City of Newark Complete Streets Policy and Guidelines (2016)

The City of Newark Complete Streets Policy, and corresponding Newark Complete Streets Design Guidelines and Implementation Plan, establish Complete Streets as the default design principal citywide.

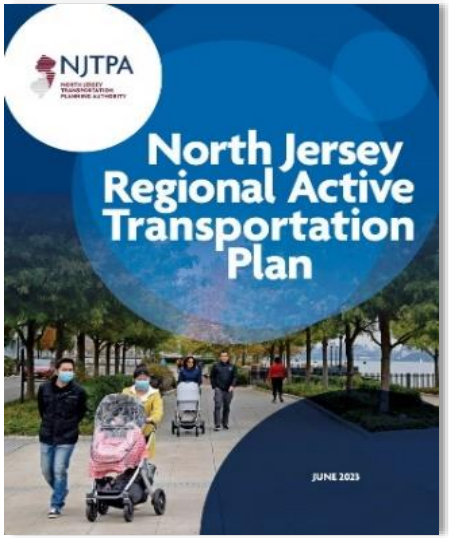
The Complete Streets policy commits the city to creating streets and intersections that are safe for all users and travel modes, with goals to “create a comprehensive, integrated, connected, multimodal network by facilitating connections to bicycling and walking trip generators such as employment, education, residential, recreational, and public facilities, as well as retail and transit centers.”

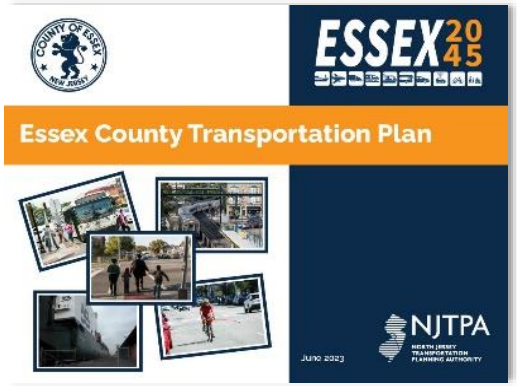
Consistent application of the Policy advances the Newark 360 Master Plan goal of enabling Newark residents of all ages and abilities to safely travel within and across the city, city and BIKENewark’s goal of creating a safe and accessible citywide bicycle network.

Essex County and Regional Plans

North Jersey Regional Active Transportation Plan (ATP) (2023)

The ATP presents the vision of a proposed 1,700 mile active transportation network across the NJTPA region. The proposed bike network in Newark includes portions of South Orange Avenue, Clinton Avenue, Broadway, Chancellor Avenue, Ferry Street, Springfield Avenue, Bergen Street, Broad Street, University Avenue, and Frelinghuysen Avenue. These facilities overlap with NJ TRANSIT rail service, offering first-and last-mile connections between transit and population centers.





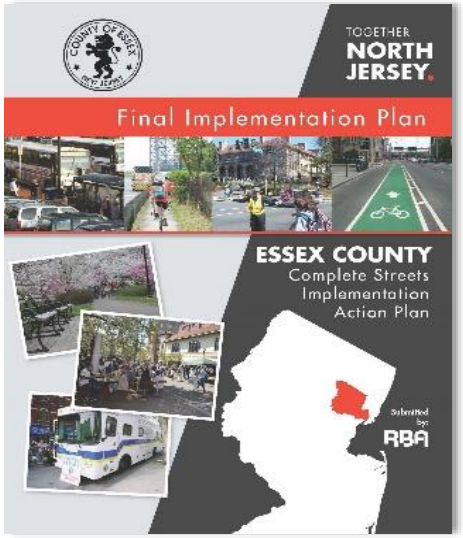
Essex 2045: Essex County Transportation Plan (2023)

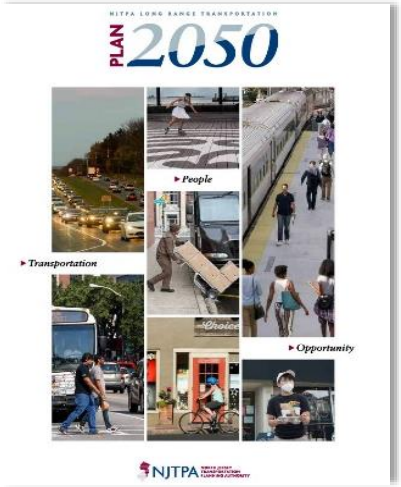
Essex 2045 propose 43 candidate intersection and corridor projects, supported by a wide variety of policies, strategies, and studies including the need for more and better pedestrian and bicycle infrastructure.

Essex 2045 examined potential road diets –Bloomfield Avenue, Springfield Avenue, and Broadway Avenue – demonstrating the viability of converting travel lanes for bicycle use, traffic calming, and safety improvements.

Essex County Complete Streets Implementation Plan (2014)

The Essex County Complete Streets Implementation Plan includes an array of tools to help Essex County with the implementation of its Complete Streets Policy, as adopted in 2012. These tools are designed to incorporate Complete Streets into all project phases, from planning and design to maintenance and operations, with checklists created for each project phase and a sign-off sheet to ensure that the project is compliant with the County's Complete Streets Policy.





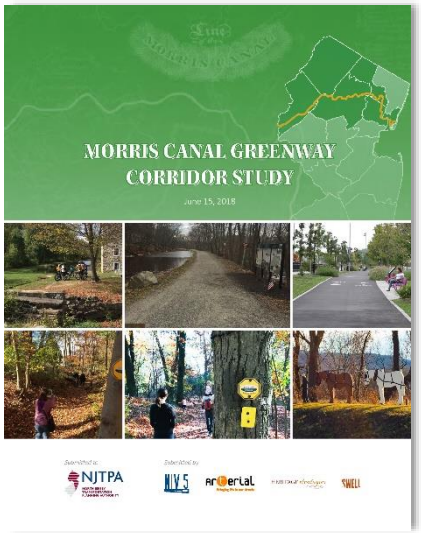
NJTPA Long Range Transportation Plan 2050 (2021)

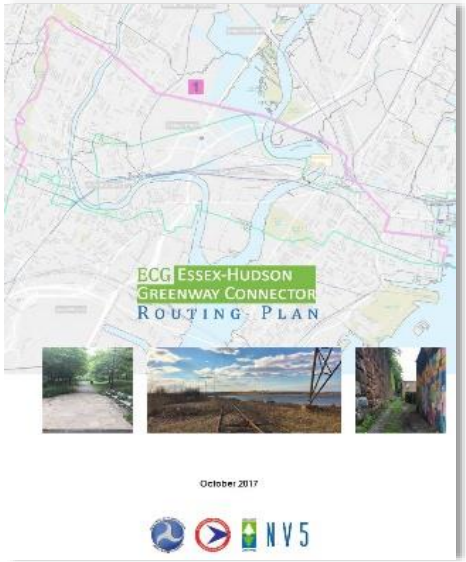
NJTPA's Long Range Transportation Plan addresses the region's developing needs and trends and emphasizes a vision for safe and efficient transportation focused on the movement of people and goods, and access to opportunity. Seven priority themes are presented: safety, accessibility, equity, active transportation, climate change, transportation technologies, and freight. The plan incorporates a series of performance measures to help identify strategies and support decision-making in achieving the plan's diverse goals.

Morris Canal Greenway Corridor Study (2018)

This NJTPA-funded study envisions a continuous greenway path for walking and bicycling that generally follows the original and historic Morris Canal route, stretching 102 miles from Warren County to Hudson County.

In Newark, potential access points include Branch Brook Park, Branch Brook Park South, Passaic River Waterfront Park, and Newark Penn Station. Recommended projects in the City of Newark include a focus on Raymond Boulevard, with bicycle and pedestrian improvements, and enhanced sidewalks (Passaic River to Branch Brook Park).





Essex-Hudson Greenway Connector Plan (2017)

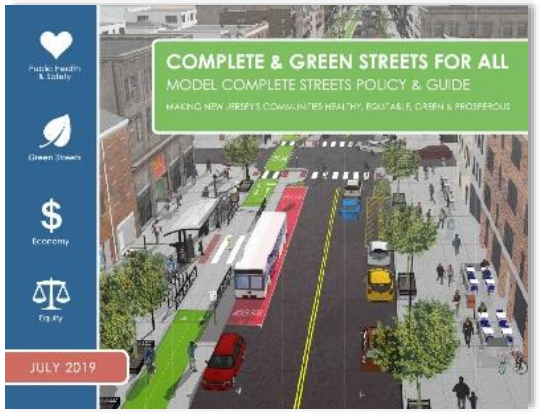
The Essex-Hudson Greenway Connector Routing Plan identifies potential routes to enhance the East Coast Greenway connection between Newark and Jersey City as well as surrounding municipalities including Harrison, Kearny, East Newark, and Secaucus. The chosen alignment in Newark begins in University Heights in Newark on Norfolk Street, then heads north through Branch Brook Park and eastbound along the Boonton Line where it crosses the Passaic River.

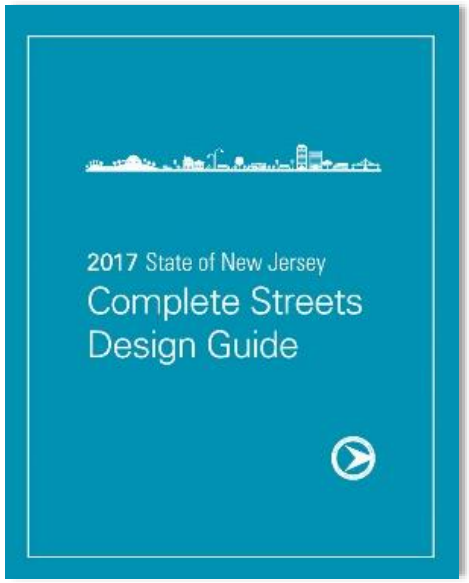
State of New Jersey Plans

New Jersey Complete & Green Streets for All: Model Complete Streets Policy and Guide (2019)

Complete & Green Streets for All: is a comprehensive resource for adopting a Complete Streets policy or resolution that is fully customizable to local need and context. The Guide is the first in New Jersey to link Complete Streets principles with Green Streets and sustainability goals to build safe, equitable, resilient communities.

The Guide also includes checklists to integrate Complete Streets during all phases of project planning, conceptual development, design, and construction.





NJDOT Complete Streets Design Guide (2017)

The NJDOT Design Guide is a comprehensive guide for incorporating Complete Streets into street planning and design.

The Guide presents detailed design standards and templates specific to New Jersey's unique context and conditions, data and research supporting the Complete Streets approach, accessible design, and case studies of successful implementation.

NJDOT Bicycle & Pedestrian Master Plan (2016)

New Jersey's Bicycle & Pedestrian Master Plan is organized around a vision statement for New Jersey where people of all ages and abilities can bike and walk with confidence and a sense of security. To achieve this vision, the Plan identifies priority goals for improving safety; enhancing access, mobility, and connectivity; achieving healthy sustainable communities; fostering a culture shift in roadway planning and design. Strategies to achieve these goals include prioritizing the most vulnerable user needs in projects and decision-making; maximizing the use of HSIP funding for multimodal projects; improving and expanding infrastructure for bicyclists and pedestrians throughout the state; educating the public on the benefits and safe practices for walking and bicycling; and addressing emerging technologies such as electric bikes and bike share.

Lessons Learned from Exemplary Bicycle Plans

Exemplary bicycle plans from medium-sized U.S. cities were examined to derive lessons learned for BIKENewark. These include plans from Jersey City, Pittsburgh, Indianapolis, Hartford, Orlando, Atlanta, and Durham, NC.

- Active transportation and bicycle plans are most effective when they are context sensitive and consider factors unique to the region including barriers to entry (i.e. bike purchase price or cost or bike share service).
- Emphasize equity when mapping the network and creating an implementation strategy, ensuring investment occurs where it is most needed.
- Give preference to designs that are accessible and comfortable for all bike riders. Sharrows, for example, may be applicable in some circumstances but may exclude many who do not feel safe sharing the road with motorized traffic.
- Bicycle planning is most effective when it considers all aspects of a trip including end-of-trip facilities like parking and amenities such as repair stations.

- Level-of-Traffic-Stress (LTS) data is more easily understood using combined Low-Stress (LTS 1 and 2) and High-Stress (LTS 3 and 4) displays.
- Recent plans and studies such as the NJTPA Regional Active Transportation Plan, Morris Canal Greenway Study, and ECG Essex-Hudson Greenway Plan provide both design guidance and specific bike routes recommended for Newark roadways.
- Regional integration of the bicycle network is key to providing broader connectivity including access to the neighboring towns, Essex County, and the greater northern New Jersey region.
- A project prioritization methodology should emphasize safety, equity, and connectivity to keep implementation efforts streamlined and focused on plan goals and vision.

These lessons were applied to the BIKENewark planning process, community engagement events and activities, technical assessment methodologies, development and application of context-sensitive design resources, and emphasis on equity, affordability, bicycle rider safe and comfort, and bicycle network connectivity.

1. EQUITY ASSESSMENT

Bicycling can be a relatively inexpensive, quick, and convenient mode of travel, especially in densely urban areas like Newark, where short bicycle trips can connect people to work, school, other essential travel needs. BIKENewark used an equity assessment to identify the city's underserved communities, better inform community engagement, and help integrate their daily travel needs and safety challenges into this plan. This analysis was conducted in accordance with the NJTPA *Title VI and Environmental Justice Assessment Guide for Planning Studies*. Additional details are provided in the Equity Assessment Technical Memorandum

The equity assessment identified numerous underserved communities spread across the city, establishing it was essential to actively engage and collaborate with Newark's diverse population, and constituencies. Based on these findings:

- Pop-up events and other in-person engagement events were held across the city (at least one in each ward) to meet with and listen to the concerns of Newark's diverse underserved communities and neighborhoods
- Focus group discussions were held with more than 30 constituent groups to engage Newark's many stakeholders, local business owners, students, social service providers, and community representatives.
- Study materials and events included multilingual translations for Newark's significant populations of Limited English Proficiency households.

The BIKENewark equity assessment included analysis and mapping of the following demographic indicators representing underserved communities who may have unique mobility needs or challenges that should be considered in the planning process. [ii]

- **(Racial/Ethnic) Minority** includes individuals who are Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, Other, Two or More Races, and/or Hispanic or Latino
- **Foreign-Born** includes individuals not born in the U.S.
- **Low Income** includes households whose income is less than or equal to twice the federal poverty level
- **Limited English Proficiency (LEP)** includes individuals who speak a language other than English and speak English "less than very well"
- **Age** includes adults aged 65 or older, children under 5 years of age, and young adults aged 5 to 17
- **People with Disabilities** includes individuals with one or more physical or mental disabilities
- **Female Householder** includes households with a female individual who is responsible for owning or renting the housing unit
- **Zero Vehicle Households** includes households that do not have access to an automobile
- **Less than High School Education** includes individuals with less than a high school diploma

Figure 2 provides a high-level overview of where each of these underserved communities are located, indicating that the distribution of Newark's underserved communities is spread across all five city wards, and within many neighborhoods. Major clusters of underserved communities include:

- Areas surrounding Newark's key transit connection points including Newark Penn Station and Newark Liberty International Airport Station.
- The principal arterial corridors, including Market Street/West Market Street, South Orange Avenue, Springfield Avenue, Central Avenue, Bergen Avenue, and Raymond Boulevard.
- Newark's many parks and recreation destinations such as Branch Brook Park and Weequahic Park.
- Many neighborhoods including large portions of North Ironbound, Dayton, Lincoln Park, Springfield/Belmont, Mount Pleasant/Lower Broadway, and Weequahic.

Significant mobility limitations among Newark's underserved communities include residents who do not own a car, including those of lower income, foreign born status, specific age groups, and/or disabled, and may therefore rely on bicycling.

Those with limited mobility choices may see bicycling as an affordable and accessible means of transportation.

LEP groups – including Spanish, Portuguese, and French/Haitian/Cajun speakers – are found primarily in the North Ward and portions of the East Ward, including the Ironbound neighborhood.

Overall, Newark has higher percentages of many underserved communities than both Essex County and the NJTPA region as a whole.

- About 90 percent of the city's population is minority, much higher than both Essex County at 71 percent and the NJTPA region at 48 percent.
- More than one-half of residents (51 percent) are low income, much higher than both the county (32 percent) and region (22 percent).
- LEP individuals comprise one quarter of the city's population, much higher than their share in the county (16 percent) and the region (14 percent), respectively.
- On average, more than one-third (37 percent) of Newark's residents live in zero vehicle households, compared to 22 percent in the county, and 12 percent in the region.
- People over 65 years (seniors) are the only population in Newark that has a lower proportion (10 percent) compared to Essex County (14 percent) and the overall NJTPA region (16 percent).

Outreach and engagement for BIKENewark was therefore designed to actively engage and listen to the city's diverse and extensive underserved communities – across the city, in every ward, and many neighborhoods – and discussed in detail in Chapter 3: Collaboration and Communication.

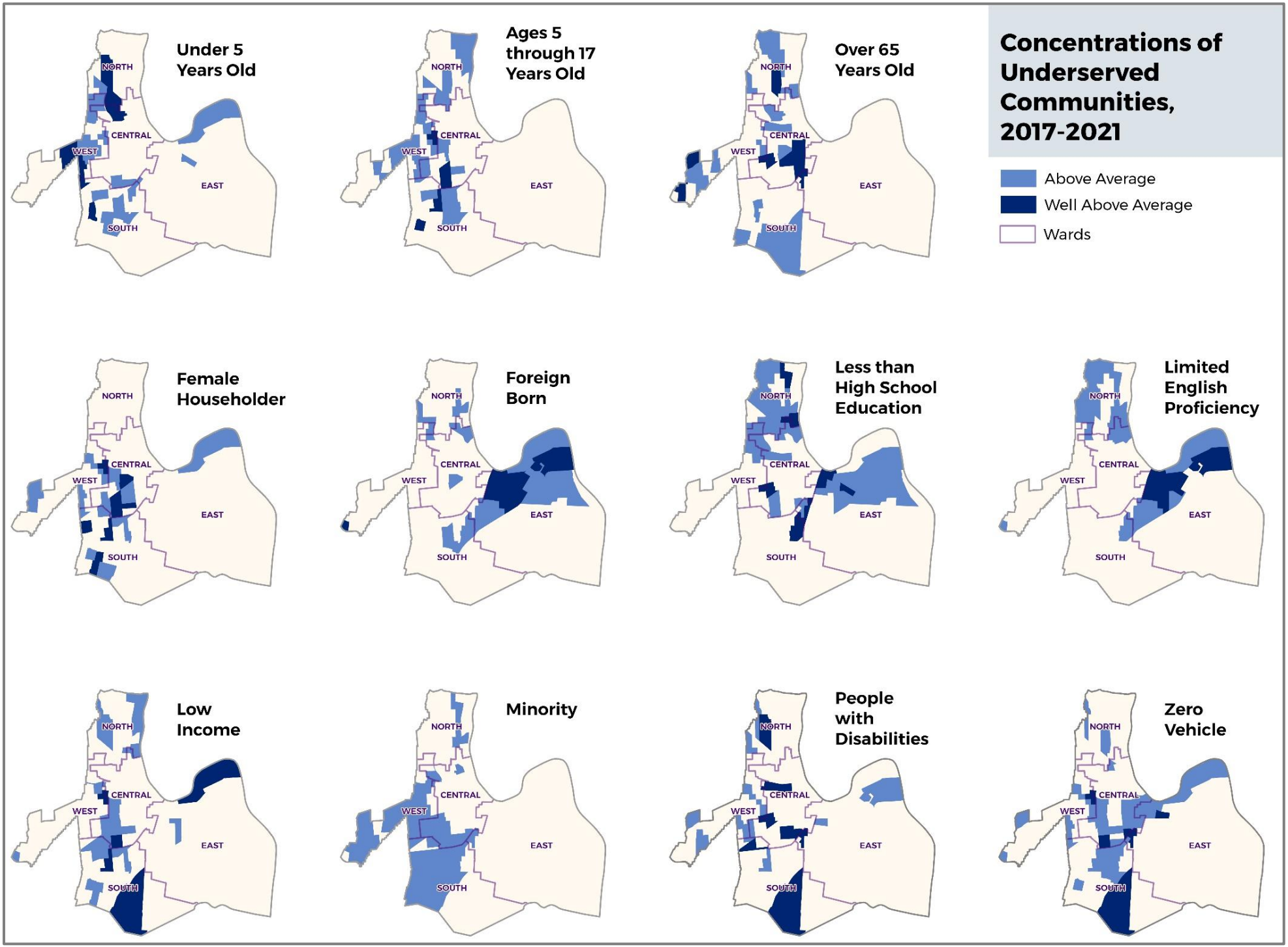


Figure 2. Individual Underserved Communities, City of Newark, 2017-2021

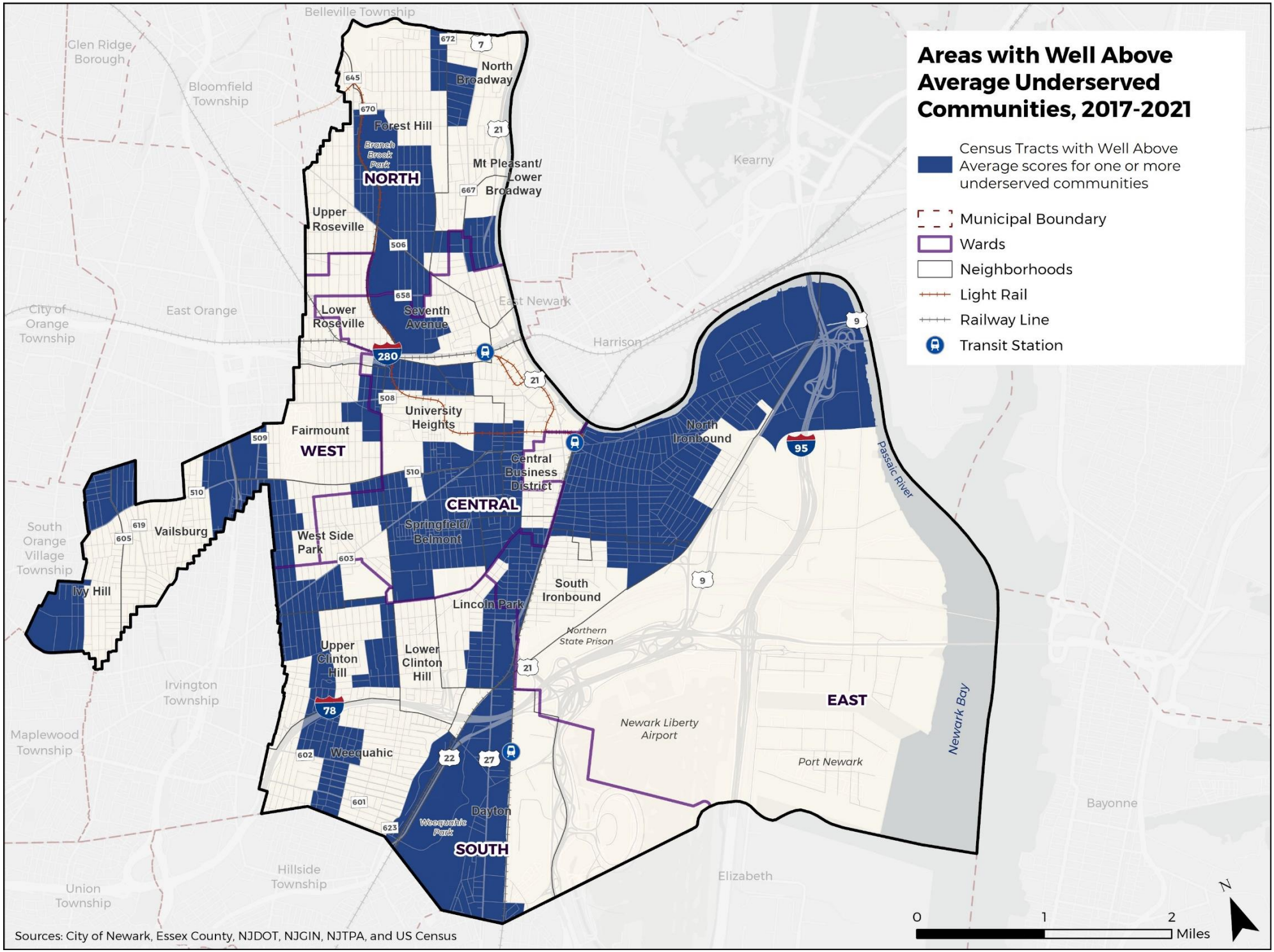


Figure 3. Areas with at Least One Well Above Average Underserved Community, 2017-2021

2. EXISTING CONDITIONS

After many decades of population decline and stagnation, Newark has experienced significant growth over the last decade, doubling the state's overall population growth rate at 13 percent. The city surpassed 300,000 residents for the first time since the 1980s. Compared to other municipalities in Essex County the City of Newark is the geographically largest, has the highest population, is more racially diverse, and has the lowest median household income. Newark also has the nation's highest percentage of renters, at nearly 80 percent. Newark is rich in destinations and activities, including entertainment, shopping, dining, schools, libraries, universities, offices and workspaces, and parks and recreation areas that are attractive and accessible to non-motorized travelers, and would be much more accessible to them with an enhanced and expanded bicycle network and supporting infrastructure.

These factors contribute significantly to Newark's potential to become a hub for safe cycling and multimodal transportation.

Travel by bicycle supports the reach and scope of transit mobility by creating new first- and last-mile connections between transit stations and stops, and Newark's great diversity of trip generators, connecting people between they live and where they need to travel.

Newark's multimodal transportation network is extensive — moving people and freight within and across Newark, Essex County, and the greater NJTPA region.

The existing bike network for the city is limited and currently offers only north-south connectivity, this needs to be augmented to create a more complete network throughout the city. Newark's multimodal transportation network is extensive — moving both passengers and freight within and across Newark, Essex County, and the greater NJTPA region. Supplementing Newark's robust transit network with dedicated bicycle infrastructure would help to create additional connections between transit routes, potentially increasing transit use. Newark's built environment and neighborhoods, however, are frequently interrupted and divided by its Interstate highways and wide arterial roadways, isolating neighborhoods and discouraging travel by bicycle and by foot.

A detailed assessment of the existing conditions analysis is provided in the Existing Conditions Technical Memorandum.

POPULATION

Over the past decade, Newark experienced significant population growth, doubling the state's overall growth rate at 13 percent. in 2020 Newark surpassed 300,000 residents for the first time since the 1980s; population peaked in the 1930s at more than 442,000 and experienced nearly a century of population decline and stagnation. (see Figure 4). Even by conservative estimates, Newark is projected to grow over the next decade, become increasingly Hispanic and foreign-born, and decreasingly Black and White (Newark360).

Newark's population density is 12,684 people per square mile, third highest among New Jersey's large cities. The economy of Newark employs 130,546 people.

Compared to other municipalities in Essex County, Newark is geographically the largest, has the highest population, is more racially diverse, and has the lowest median household income. Newark also has the nation's highest percentage of renters at nearly 80 percent.[iii]

These factors play a significant role in shaping the demand for transportation. Lower income individuals are typically more likely to depend on transit, walking, and cycling to access work, education, and connect with their community. Renter households are also likely to have access to fewer vehicles, making use of walking, cycling, and transit essential. Newark's density also makes it well suited for non-motorized transportation.

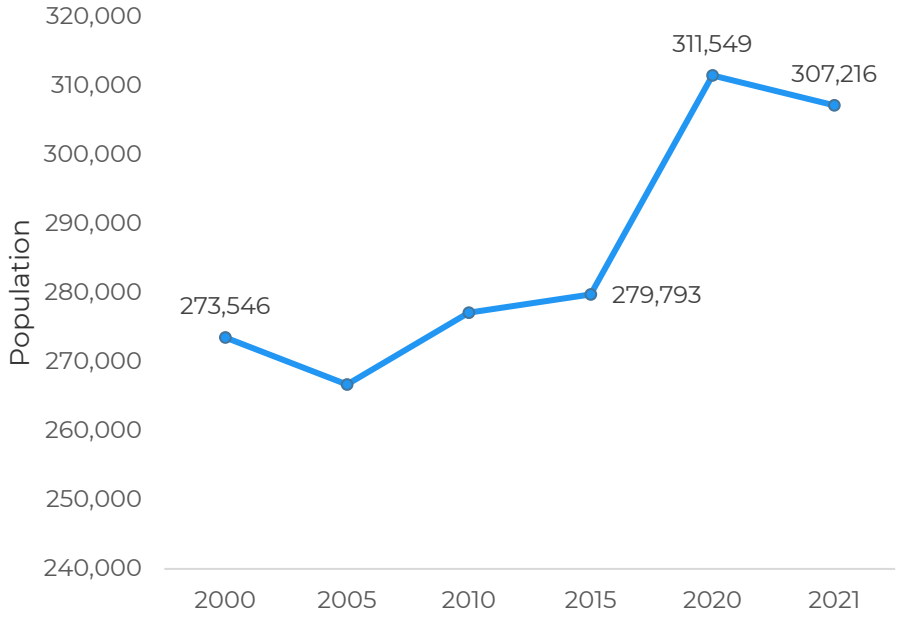


Figure 4. City of Newark Population

Newark's identity is defined by its diversity. The largest ethnic groups are Black or African American (Non-Hispanic) (46.5 percent), Other (Hispanic) (16.1 percent), White (Hispanic) (12.7 percent), and White (Non-Hispanic) (9.95 percent).

The largest industries in Newark are Health Care & Social Assistance (18,488 people), Transportation & Warehousing (15,765 people), and Construction (14,419 people), and the highest paying industries are Finance & Insurance ($61,391), Public Administration ($54,459), and Finance & Insurance, & Real Estate & Rental & Leasing ($53,368), based on 2021 estimates.

JOURNEY TO WORK

Journey to work data[iv] indicate that most people in Newark (53 percent) drove alone to journey to work in 2021, followed by those who used public transit (22.4 percent) and carpooled (8.5 percent), with an average commute time of 34 minutes (US average is 26.8 minutes).

Less than one percent bike to work, while 6.6 percent walk and 6.5 percent work from home. Additionally, nearly 6 percent of the workforce in Newark, NJ have "super commutes" of more than 90 minutes. The average car ownership in Newark is just 1 car per household, while 36.6 percent of households don't have access to a personal vehicle.

LAND USE

The City of Newark is dense and diverse in land uses and development patterns. Outside of downtown the city is largely residential. A large portion of the East Ward is comprised of the Newark Liberty International Airport and Port Newark, bordered by industrial uses to the west and north. More than one-quarter of Newark's land use is residential followed by another quarter which is commercial and industrial (26 percent together). Almost another quarter is dedicated to transportation and its related infrastructure (including the airport), with 6 percent identified as parks and forest.

North Ward

The North Ward is largely residential with commercial corridors along Mt. Prospect Avenue, Bloomfield Avenue, and Broadway, and industrial uses along the Passaic River. The North Ward is bisected by Branch Brook Park, the largest park in the City of Newark and the Essex County Parks System. Bloomfield Avenue crosses the North Ward diagonally from southeast to northwest, and is a major regional connector to Bloomfield, Montclair, Verona, and Caldwell.

Central Ward

The Central Ward is the home of Downtown Newark, a bustling area with cultural centers such as the New Jersey Performing Arts Center, Newark Symphony Hall, and the Newark Museum; major businesses like Prudential Financial; parks and open spaces; and educational institutions including Rutgers-Newark, the New Jersey Institute of Technology, and Essex County College. Because of its varied land uses, the Central Ward hosts a diverse daytime population of residents, workers, students, and visitors.

The Newark Light Rail system helps maintain connectivity throughout the Central Ward with 11 stations, and service as far north as Belleville and Bloomfield, and connections to the PATH, AMTRAK, and NJ TRANSIT rail lines at Newark Penn Station. To the west of downtown, the University Hospital is New Jersey's only public academic medical center and a Level I Trauma Center; it is also a major employer. The Hospital is adjacent to the bicycle corridor on Norfolk Street and Irvine Turner Boulevard running north-south but lacks east-west bicycle connectivity.

The Central Ward is the site of designated Redevelopment Areas at Broad Street Station, Newark Riverfront, Living Downtown, and Lincoln Park. These plans encourage high- and medium-density development in the Downtown area with limited parking requirements, capitalizing on the existing transit and pedestrian infrastructure. Additional bicycle infrastructure would enhance the vitality and viability of each.

South Ward

The vast majority in the South Ward is residential, with a major industrial corridor along Route 27 (Frelinghuysen Avenue) bordering the Newark Liberty International Airport. Clinton Avenue, Elizabeth Avenue, Springfield Avenue, Bergen Street, and Lyons Avenue are the main commercial corridors. Weequahic Park, located on the southern border of the ward, is the second largest developed park in Essex County.

East Ward

The East Ward contains the largest industrial area in the city, north of the Airport and along the Passaic River. This industrial hub is adjacent to Port Newark, Newark Airport, and major roads including the New Jersey Turnpike, I-78, and U.S. Routes 1 and 9.

Newark Pennsylvania Station is in the East Ward, making it vitally important for passenger travel as well. Ferry Street and Wilson Avenue are lined with shops, restaurants, and a variety of commercial uses, though businesses are dispersed throughout the Ironbound, which is zoned in many places for mixed-use. Independence Park is centrally located in the more residential zones, and the Newark Riverfront Park in the north by the Passaic River.

The Downtown Core Redevelopment Area is in the East Ward, and located between Route 21 and Broad Street. This area contains the Mulberry Commons, a public green space which opened in 2019, and the Prudential Center Arena—home to the New Jersey Devils, Seton Hall Basketball, and other live performances.

West Ward

The West Ward is largely residential with two major Redevelopment Areas: the Fairmount Commons, and the Model Neighborhood Initiative (MNI) area. Ivy Hill Park, Vailsburg Park, and the West Side Park offers recreation opportunities for West Ward residents.

The main retail node in the West Ward is located on CR 510 (South Orange Avenue) with some businesses on 18th Avenue and Central Avenue.

KEY DESTINATIONS

Figure 5 shows Newark's diversity of key trip destinations and amenities, including its commercial and employment centers, many schools, universities, libraries, entertainment venues, neighborhood centers, hospitals & childcare, and parks & recreation areas.

COMMERCIAL AND EMPLOYMENT CENTERS

Newark's strategic location and transportation infrastructure also make it highly attractive to businesses. The city's diverse economy includes employers in finance, healthcare, education, technology, and more.

Prudential Financial is one of Newark's largest employers, and of the largest financial services companies in the country. University Hospital, a major teaching hospital affiliated with Rutgers, is another important healthcare institution and employer. Panasonic's North American headquarters is also located in the city, contributing to the city's presence in the electronics and technology sector. Newark's five higher education institutions, with campuses downtown, play a crucial role in the city's employment and population.

Newark Liberty International Airport (EWR) is estimated to support over 22,000 jobs in the New York/New Jersey region, and is a key hub for international trade.

EDUCATION & LIBRARIES

There are a total of 127 Kindergarten- grade 12 schools in Newark. Most K-12 schools are located within or near existing residential areas.

The Newark City Schools bus fleet serves more than 3,900 public and private school students and travels more than 2,400 miles each day. Transportation services are available to elementary students living one mile from school and to middle school living students living 1.5 miles from school.[v]

Bussing to and from schools is provided for public school students by City Schools Transportation while the Office of Pupil Transportation provides services for students with special needs who meet eligibility requirements, some schools' athletic events and selected field trips.

With over 35,000 individuals studying and working in the higher education community, the city is home to prominent institutions such as Rutgers' business school, the state's largest teaching medical center, Seton Hall's law school, and the nationally ranked public university NJIT.

Newark has eight public libraries and two private libraries in the city, with at least one in each ward.

Hospitals & Childcare

Newark's four major hospitals are:

- Beth Israel Medical Center – Children's Hospital
- University of Medicine and Dentistry of NJ
- St. Michael's Medical Center – General hospital
- Columbus Hospital – Critical care specialty hospital

There are 106 childcare and daycare centers in the city, most are located adjacent to schools and in core residential neighborhoods.

Parks & Recreation

The Branch Brook Park, located north of I-280, and the Weequahic Park, located across from the Newark Airport complex on the southern border of the city, are the two largest parks in Newark and are home to active and passive open spaces. Both are part of the Essex County Parks System. Numerous smaller local parks include West Side Park, Independence Park, Liberty Park, Nat Turner Park, etc., that serve the recreational needs of residents and visitors.

The bulk of the paths and trails in Newark are not suitable for bicycle use, and are limited to pedestrian use only, including more than 13.4 miles of paths in Branch Brook Park and one-half mile in Weequahic Park.

Apart from its parks, there are also eight neighborhood recreation centers spread around the city with public facilities such as swimming pools and playing fields.

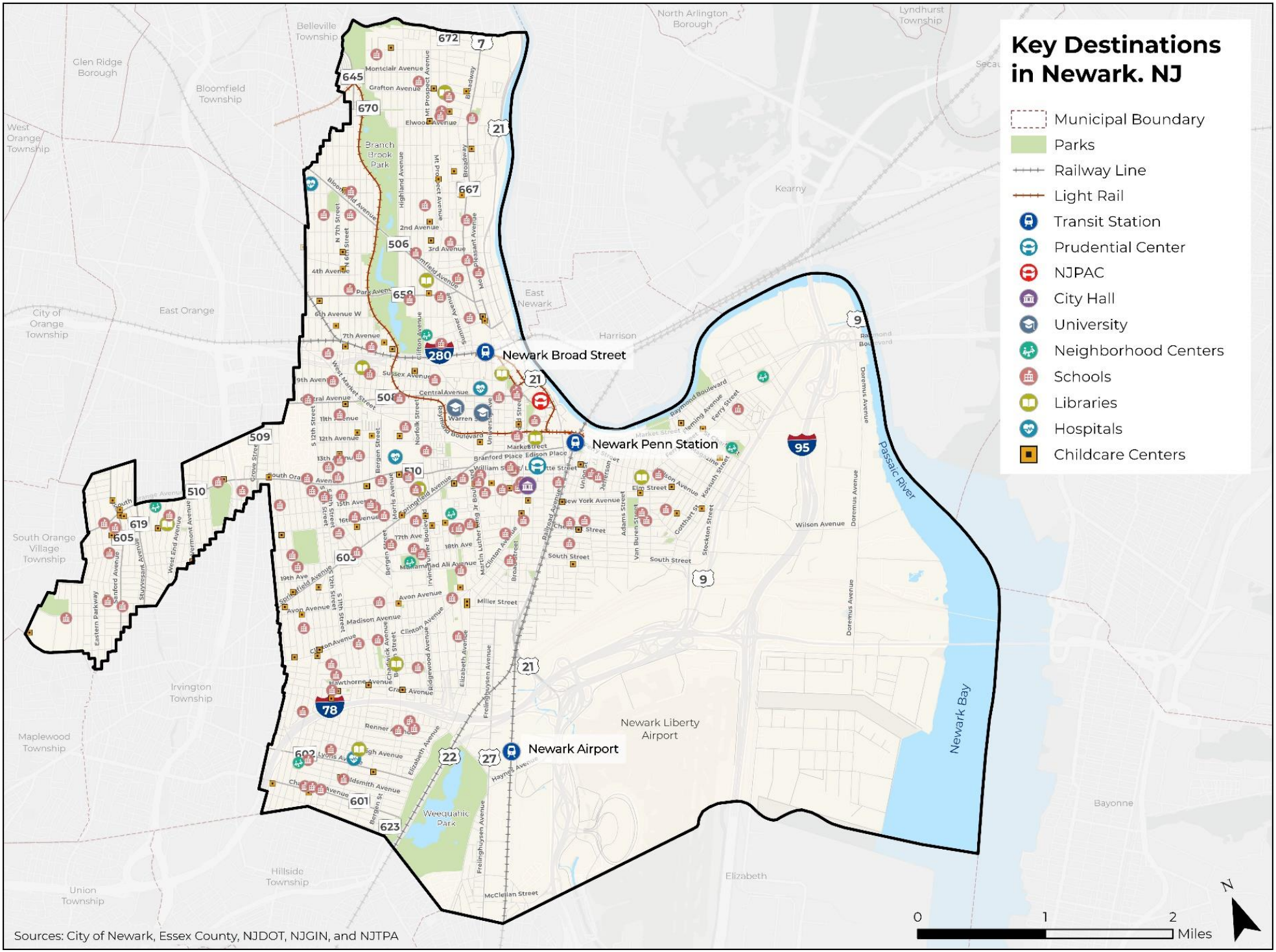


Figure 5. Key Destinations and Amenities, City of Newark


ONE WAY
DO NOT
ENTER
ONE WAY

TRANSPORTATION NETWORK

STREET INVENTORY

Newark's 492 miles of streets include city, county, and three interstate highways (see Figure 6 and Figure 7), of which 278 miles are under city jurisdiction. Newark's built environment and neighborhoods are frequently interrupted and divided by its Interstate highways and wide arterial roadways, isolating neighborhoods, and traveling at speeds incompatible with the walkable bike-friendly character that makes urban environments successful and desirable. Newark's street inventory including of the following roadway types:

Interstate: (shown in blue) these limited-access highways are part of the federal Interstate Highway System and provide the highest level of mobility and over the longest uninterrupted distance. Interstate access is limited to cars, buses, and light and heavy trucks; pedestrian and cyclist access is prohibited. In Newark, the 49 miles of interstates include:

- **I-280:** is aligned east-west and bisects central Newark, providing connections to points west including western Essex County and points east including I-95/NJ Turnpike, and the Holland and Lincoln Tunnels to New York City.
- **I-78:** runs east-west through south Newark, connecting to points west including Union and Morris Counties; to the east are Bayonne, Jersey City, and I-95/NJ Turnpike and the Holland Tunnel to New York City.
- **I-95 (NJ Turnpike):** runs north-south through eastern Newark, providing connections to points south (Union and Middlesex Counties) and north (Kearny and Hudson and Bergen Counties).

Other Freeway/Expressway: Like interstates, they are designed to maximize mobility, with limited access.

- **U.S. Route 1/9** runs southwest-northeast through Newark (29 miles), providing connections to points north including Jersey City and Hudson County and points south including Elizabeth, Union & Middlesex Counties.

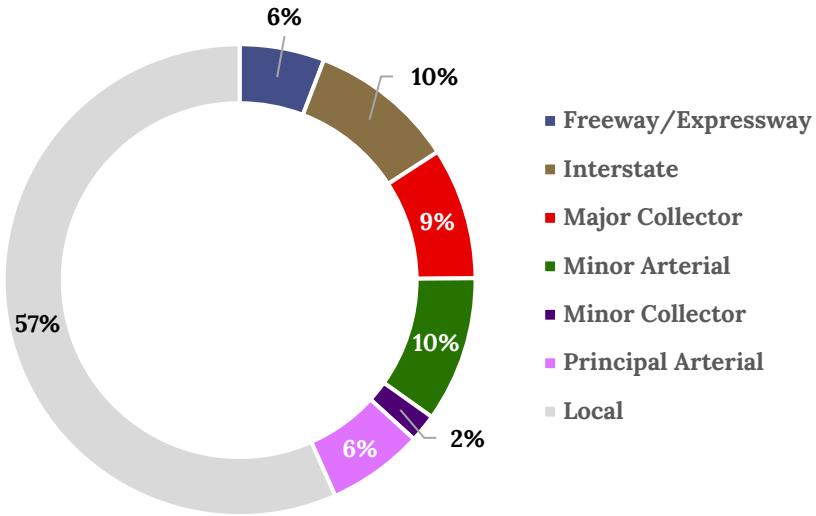


Figure 6. Breakdown of Street Types in Newark

Principal/Major Arterial: (shown in red) roadways that serve major/activity centers of metropolitan areas, carrying highest traffic volumes and longest trip demands. In Newark, the 32 miles of principal arterials include:

- **Market & Ferry Streets** serve as the east-west backbone of the city, passing through downtown, all the way to NJ Turnpike in the east and connecting to East Orange on the west side.
- **Raymond Boulevard** runs parallel and north of Market Street, and is one of the busiest streets in Newark
- **Central Avenue (CR 508)** runs east-west, parallel above CR 510, connecting Orange Township on the west side with Downtown Newark and many of the city's principal destinations.
- **South Orange Avenue (CR 510)** runs east-west through the middle of the city, connecting South Orange township on the west side to Newark downtown on the east.
- **Springfield Avenue (CR 603)** runs southwest-northeast through Newark connecting Irvington Township to Market Street and downtown.
- **Bloomfield Avenue (CR 506)** runs northwest-southeast diagonally across Branch Brook Park in the North Ward of Newark, merging onto Broadway near downtown.
- **Park Avenue (CR 658)** running east-west through Branch Brook Park, and merging with Bloomfield Avenue.

Minor Arterial: (dark green) routes provide intra-community connectivity. In Newark, the 49 miles of minor arterials include Bergen Street, the longest north-south street in Newark, Irvine Turner Boulevard/Norfolk Street, Mt. Prospect Avenue, Clinton Avenue, Elizabeth Avenue, Wilson Avenue, South Street, Doremus Avenue.

Major Collector: (dark purple) routes connect local roads and residential areas to and from the arterial network. In Newark, the 44 miles of Major Collectors include University Avenue, Washington Street, and Sussex Avenue in the Central Ward. Lake Street, Clifton Avenue Bloomfield Avenue, and Roseville Avenue In the North Ward. And 19th, South 11th and 12th Streets, Avon Avenue, Hawthorne Avenue, New York Avenue, and Chestnut Street.

Minor Collector: (light purple) These lower classification streets account for just 9 miles in Newark.

Local Streets: (light grey) low-traffic neighborhood roads or streets that provide connections between residences and local destinations and the collectors and arterials.

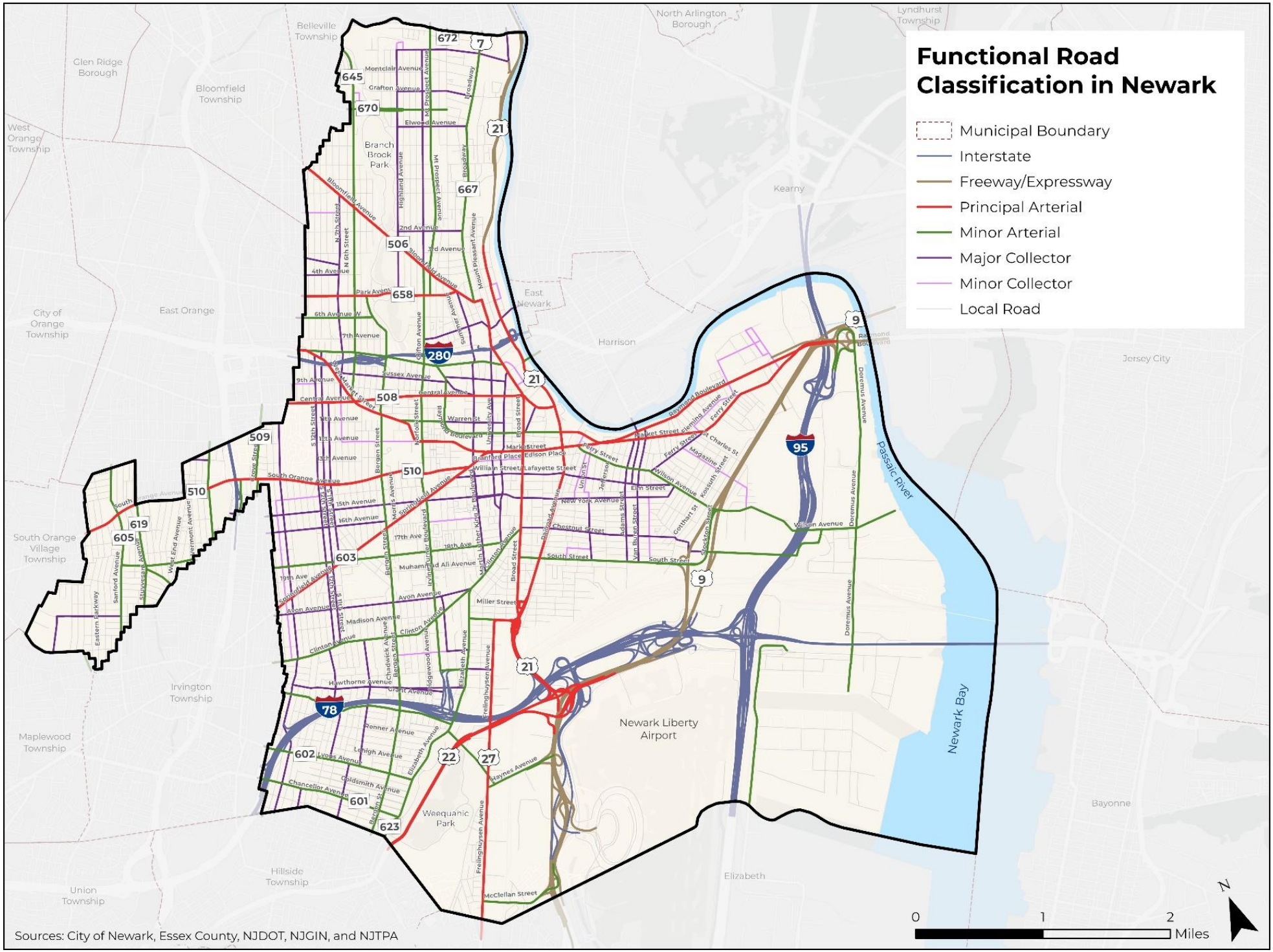


Figure 7. Roadway Functional Classifications, City of Newark

Posted Speed Limits

Virtually all non-interstate and freeway/expressway roadways in Newark, including Minor Arterials and Major Collectors, have a posted speed limit of 25 miles per hour (mph). Reduced School Speed Zones have speed limits of 20mph when the school is in session and flashing signals are flashing.

A limited group of higher functional roadways in Newark have regulated speed limits in designated areas; these include Raymond Boulevard (35mph from Blanchard Street to Brill Street, and 25mph from Brill Street to Market Street), Park Avenue (30mph from Bloomfield Avenue to East Orange City Line), and McCarter Highway (45mph between Routes US 1/9 and Miller Street, 40mph between Miller Street and Murray Street, and 35 mph between Murray Street and Clay Street).

Street Widths

Street width, including the number of travel lanes, on-street parking, medians, and other features, is one of several factors used to determine suitability for dedicated bicycle facilities.

The vast majority of Newark's streets – 87 percent – are less than 40 feet wide, 8 percent are 40-59 feet wide, and 6 percent are 60 feet wide and above. (see Figure 8).

Truck Routes

Interstates I-280, I-95, and I-78 are the designated National Highway Freight Network (NHFN)truck routes in Newark. South Orange Avenue, Central Avenue, Bloomfield Avenue, Route 21, and Route 1/9 are designated truck routes on the New Jersey Access Network (NJAN). There are few local routes in the city, including Raymond Boulevard, Ferry Street, Market Street, Wilson Avenue, and South Street, etc. that allow large trucks. Figure 9 identifies the designated truck routes in the City of Newark.

Although freight and goods movement activity is an essential component of Essex County's economy and employment base, the presence of large trucks on local streets may be a safety concern for underserved communities and vulnerable road users, especially schools-age children, seniors, pedestrians and bicyclists.

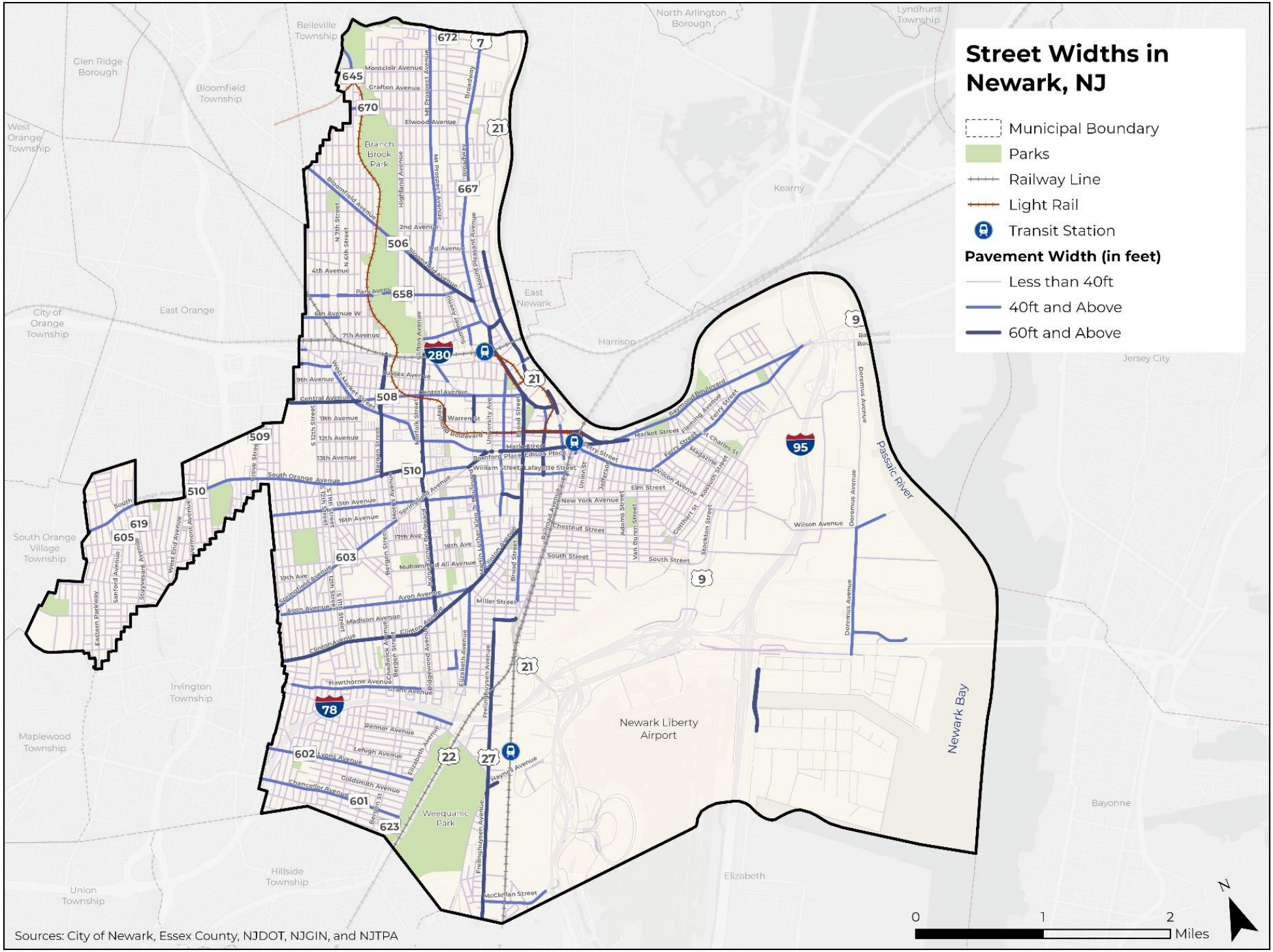


Figure 8. Summary of Street Widths, City of Newark

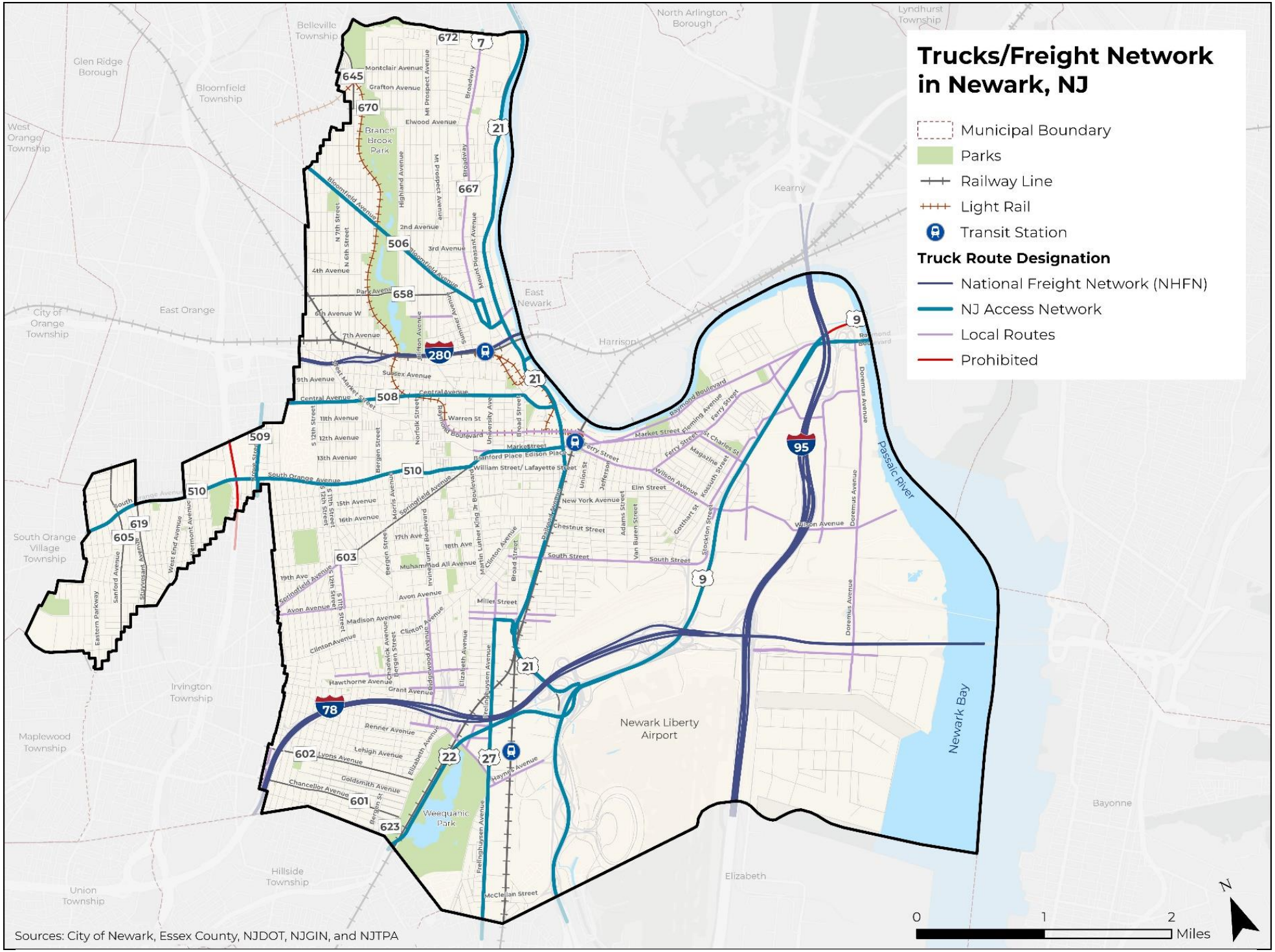


Figure 9. Designated Truck Routes, City of Newark

MULTIMODAL INVENTORY

Travel by bicycle supports the reach and scope of transit mobility by creating new first- and last-mile connections between transit and Newark's great diversity of trip destinations. Newark's multimodal transportation network is extensive — moving people and freight within and across Newark, Essex County, and the greater NJTPA region (see Figure 10). Essex 2045 provides an extensive assessment of transit services in Essex County and the City of Newark.

Each service provider has its own unique policies and rules regarding bicycle access to transit vehicles; customers should check with the service provider for specific details in advance of boarding.

NJ TRANSIT Passenger Rail

NJ TRANSIT has six passenger rail lines that converge in Newark at two rail stations - Newark Pennsylvania (Penn) Station and Newark Broad Street. Three NJ TRANSIT lines also pass through Newark Penn Station: the Northeast Corridor, North Jersey Coast, and Raritan Valley lines. Connections to NJ TRANSIT light rail and buses, PATH, and Amtrak trains are available at Newark Penn. Three additional NJ TRANSIT rail lines pass through the Broad Street Station: the Gladstone Branch, Morristown, and the Montclair-Boonton lines.

Both -stations have bicycle parking; there are currently 27 bike racks at Penn Station that can accommodate up to 54 bikes,[vi] and Broad Street Station has one bike rack that can accommodate seven bicycles at a time.[vii]

NJ TRANSIT Trains can accommodate two personal vehicles per car on single-level trains, and up to eight personal vehicles per car on multilevel trains. Restrictions on non-folding personal vehicles on NJ TRANSIT trains shown in Table 1.

Additionally, NJ TRANSIT employees may limit personal vehicles onboard if transit vehicles are crowded or personal vehicles create an unsafe situation for other customers.

NJ TRANSIT Light Rail

The NJ TRANSIT Newark Light Rail (NLR) Line provides two routes: a "subway-surface" line with 12 stations between Newark Penn Station and Grove Street station in Bloomfield, and the extension line from Newark Penn Station to Broad Street Station with 6 stations. Prominent stations include Military Park, Washington Street, NJPAC/Center Street, Warren Street/ NJIT, and Harriet Tubman Square. NLR connects through to Belleville and Bloomfield.

Non-folding personal vehicles can be carried on board NLR vehicles outside of peak hours: 9:30 a.m. to 4 p.m. and 7 p.m. to 6 a.m. on weekdays and anytime on weekends and holidays.

Table 1. NJ TRANSIT non-folding personal vehicle regulations.

	PERMITTED	NOT-PERMITTED
WEEKDAYS	10 a.m. – 4 p.m. and 7 p.m. – 6 a.m.	Trains arriving in Hoboken, Newark, or New York 6 - 10 a.m., and departing 4 p.m. – 7 p.m. (These restrictions also apply to any station stops in between during those timeframes)
WEEKENDS	At all times on Raritan Valley, Gladstone, and Montclair-Boonton Line trains. On NEC, NJCL and Morristown trains between 1 p.m. – 4 p.m. and 8 p.m. – 9 a.m.	On NEC, NJCL and Morristown train lines arriving in New York between 9 a.m. -12 p.m. and departing New York between 5 p.m. and 8 p.m. *(These restrictions also apply to any station stops in between during those timeframes*)
HOLIDAYS		Not permitted on any train lines traveling through Newark, and includes the day before Rosh Hashanah and Yom Kippur

AMTRAK PASSENGER RAIL

The National Railroad Passenger Corporation (Amtrak) offers passenger rail services out of Newark Penn Station to the greater Northeast region including Boston, New York, Trenton, Philadelphia, Wilmington (DE), Baltimore, and Washington, DC.

AMTRAK's Bring Your Bicycle Onboard policy[viii] allows bicycles and folding scooters up to 50 pounds on its trains. The policy however notes that each train has unique equipment and that customers should check the AMTRAK website for specific details. On Northeast Trains advance reservations are required and bicycle fee of $20 applies on most trains, refer to the website for specific details.[ix]

PATH (PORT AUTHORITY TRANS HUDSON) AND AIRTRAIN

PATH provides frequent rail service connecting Newark Penn Station to Harrison, NJ, Grove Street and Exchange Place in Jersey City, and five stations in New York City between Midtown and World Trade Center.

Similar to NJ TRANSIT, non-folding bicycles are not permitted on the PATH trains on weekdays during the peak periods between 6:30 a.m. and 9:30 a.m. and between 3:30 p.m. and 6:30 p.m.

Located about 2.5 miles south of Newark Penn Station, the Newark Liberty International Airport Station serves NJ TRANSIT and AMTRAK passengers with its AirTrain line connecting to all airline terminals, hotel shuttles, parking, and rental car facilities.

Bicycles are always permitted on AirTrain with no time restrictions.

NJ TRANSIT Bus Service

Newark's bus network, operated by NJ TRANSIT, is one of the largest in the country, with dozens of routes. According to the ACS 2022 5-Year Estimates, about 36 percent of households in Newark do not have a vehicle available, making the bus system an essential service for Newark residents.

NJ TRANSIT initiated the NewBus Newark: Bus Network Redesign Study in 2019 to evaluate the existing bus network and how it can be realigned to better serve customers based on an analysis of where people live, work, and travel, and customer feedback. Aligning bicycle infrastructure with the city's most utilized bus lines can help improve transit ridership and address both mobility and equity needs. NewBus currently has no recommendation specific to bicycles or bicycle travel.

Two-wheel, non-folding bicycles are always permitted on NJ TRANSIT buses that have bicycle racks on the front or underfloor luggage compartments, on a first-come, first-serve basis. Currently, one-half of the bus fleet can accommodate bicycles.

Private Buses

Coach USA offers bus service from Newark Airport to Manhattan. Trans-Bridge Lines offers trips between Newark Airport and Pennsylvania with stops including Lehigh Valley International Airport and Allentown Transportation Center.

EZ Ride Shuttles

EZ Ride Transportation Management Association (TMA) provides a free shuttle service called the **Essex Night Owl**, operating between Newark Penn Station and residents' homes in Newark, Orange and East Orange, and Irvington between 1:00 a.m. and 5:00 a.m. Shuttles run hourly between the designated times and reservations must be made at least 24 hours in advance. The EZ Ride **WAVE** shuttle, funded by Essex County, provides free transportation to low-income residents accessing agencies in the Newark Area offering work training and work assistance. The Service operates Monday-Friday between 8:00 a.m. and 4:45 p.m.

EZ RIDE does not provide bike racks on its shuttle buses. Folding bicycles and folding scooters are permitted provided that they are safely folded, wheels removed, and held by the passenger.

Essex County Transportation Services

The Essex County Division of Citizen Services offers paratransit services to senior citizens over 60 and people with disabilities (18+) through the Essex County Special Transportation System (ECSTS). Transportation services are provided from 8:00 a.m. to 3:00 p.m. and are curb-to-curb by appointment only. NJ TRANSIT also operates Access Link which provides paratransit services for those unable to use the local NJ TRANSIT fixed-route bus system.

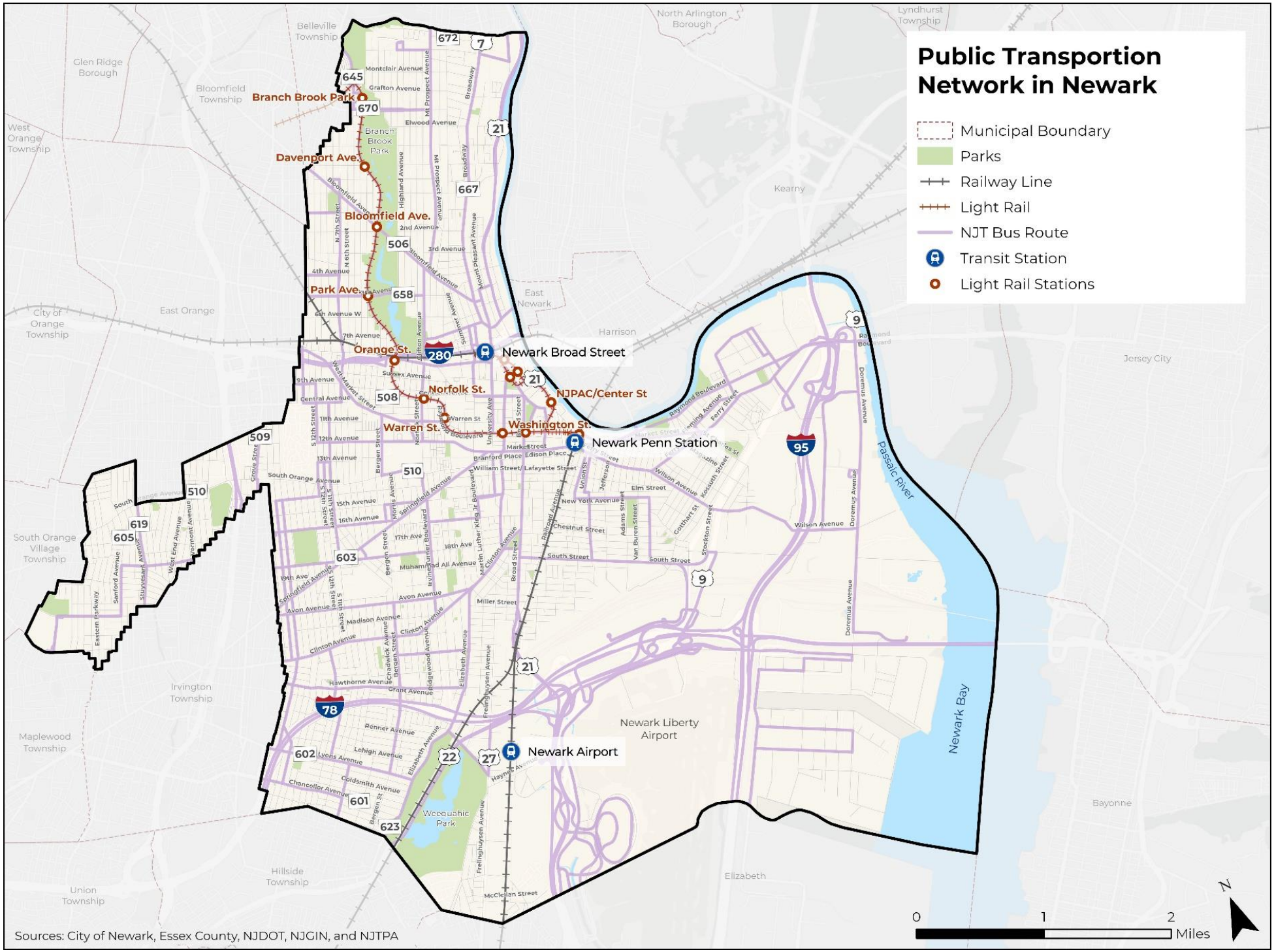


Figure 10. Public Transit Network, City of Newark

EXISTING BICYCLE NETWORK

Newark's existing bicycle network is limited in scope and breadth, and offers primary north-south connectivity in the North, Central, and East Wards. The bicycle network lacks any significant facilities to make east-west connections. Currently, there are 13.4 miles of bicycle facilities in Newark, including 10.1 miles of bike lanes and sharrows and 1.3 off-street miles of the recently approved Essex-Hudson Greenway passing through the North Ward near Belleville. (See Table 2 and Figure 11). Many of Newark's existing standard bike lanes have a painted or texture green surface treatment to improve visibility.

None of Newark's existing on-street bike lanes offer the desired physical separation and protection from moving traffic.

A number of recent plans and studies have proposed new bicycle facilities for Newark, including **BIKE**Ironbound, Morris Canal Greenway Plan), Downtown Circulation Improvement Study, and Newark360 Master Plan. These initiatives informed the selection of candidate bicycle facilities.

Development of the comprehensive, city-wide bicycle network is a step-by-step, data-driven process, as outlined in Appendix B: Bicycle Facility Design Guide.

The following paragraphs describe the existing bicycle network, including locations, facility types, and connections to Newark principal trip destinations and amenities.

Bicycle and pedestrian projects currently underway or approved are described in Appendix C, and include The Greenway in the North Ward, Newark Riverfront Pedestrian and Bicycle Access, and Bergen Street Pedestrian Safety Improvement.

NORTH WARD

North Ward residents can connect to the Central and South Wards by using on-street standard bicycle lanes aligned north-south on Clifton Avenue, Norfolk Street, and Irvine Turner Boulevard. Standard bike lanes run north-south on Mt. Prospect Avenue, from Tiffany Boulevard, near the Newark/Belleville border, to Heller Parkway (0.6 miles). Construction of the (Essex-Hudson) Greenway's 1.3-mile section through Branch Brook Park recently received funding approval.

The path system in Branch Brook Park (13.4 mile long) is extensive and widely used, by pedestrians and bicyclists alike, but officially limited to pedestrian use only.

CENTRAL WARD

The Central Ward, encompasses Newark's downtown with its employment, cultural, educational, and medical centers, and affords significant access to transit. Existing bicycle facilities include standard bike lanes along Dr. Martin Luther King Jr. Boulevard from Warren Street to Central Avenue (0.2 miles), adjacent to the Rutgers University and New Jersey Institute of Technology (NJIT) campuses and buildings. To the north, there is a gap of 0.26 miles in the MLK bike facilities between Central Avenue and Orange

Street. North of Orange Street there are northbound sharrows to the I-280 underpass, and then a northbound bike lane from the I-280 underpass to just south of Bloomfield Avenue, a distance of 0.6 miles.

University Avenue is aligned one-way southbound and has with a standard bike lane from Central Avenue to Raymond Boulevard (0.22 miles). This corridor is adjacent to Saint Michael's Medical Center and several Rutgers University buildings including the School of Nursing, Ackerson Hall, Engelhard Hall, Prokop Chuk Research Lab, Frederick Douglass Field, and Blumenthal Hall; a Rutgers-Newark Bike Parking hub is located on University Avenue between Bleeker Street and Central Avenue.

One block east of University Avenue, Washington Street is aligned one-way northbound and has a standard bike lane from Raymond Boulevard to Broad Street (0.5 miles). This corridor runs adjacent to the Golden Dome Athletic Center, Rutgers University School of Law, School of Public Affairs and Administration, St. Patrick's Pro-Cathedral, Newark Museum of Art, Ruth Bader Ginsburg Hall, Newark Public Library, and Harriet Tubman Square with connections to Newark Light Rail.

Raymond Boulevard has sharrows including the block between Washington Street and University Avenue, connecting the existing bike lanes on these two parallel streets. Similarly, Warren Street has sharrows between Washington Street and Dr. Martin Luther King Jr. Boulevard connecting the bike facilities on both those corridors and University Avenue. On Halsey Street, just north of Warren Street, there is a bike corral for bicycle parking. Central Avenue has eastbound sharrows between Dr. Martin Luther King Jr. Boulevard and University Avenue, making east-west connections between the bike lanes on the north side of the downtown cluster of bike facilities.

Beyond the downtown, the Central Ward has several corridors with existing bicycle infrastructure. Clifton Avenue, adjacent to Branch Brook Park, has a southbound standard bike lane between Branch Brook Park Drive and Orange Street, and northbound sharrows between 8th Avenue and Branch Brook Park Drive (0.31 miles). South of this bicycle facility, sharrows are provided along Norfolk Street from Orange Street to West Market Street (0.64 miles). South of West Market, a long segment of Norfolk Street/Jones Street/Irvine Turner Boulevard has standard bike lanes extending to Clinton Avenue (1.4 miles). This corridor is adjacent to several apartment complexes, the KIPP Lab High School, the Norfolk Street Light Rail Station, Science Park High School, and several shops and businesses. The combined Clifton-Norfolk-Jones-Irvine Turner corridor extends across more than 2.3 miles, the longest existing bicycle facility in Newark.

Several blocks west on Norfolk Street, 1st Street has sharrows from the I-280 off-ramps to Sussex Avenue (0.1 miles), standard bike lanes from Sussex Avenue to New Street (0.24 miles), and sharrows from New Street to West Market Street (.06 miles), for a total corridor length of 0.39 miles. At West Market Street, existing bike lanes extend west to 4th Street (0.16 miles).

SOUTH WARD

The Elizabeth Avenue bicycle lane from Watson Avenue to Hawthorne Avenue/East Peddie Street is 0.3 miles long. Sharrows extend 0.3 miles on Elizabeth Avenue from East Peddie Street intersection to the West Bigelow Street intersection, with the sharrows continuing west on West Bigelow Street to Irvine Turner Boulevard (0.25 miles). The Irvine Turner Boulevard bicycle facilities which run north all the way through to Branch Brook Park in the Central Ward start in the South Ward at Clinton Avenue. The shared-use path in Weequahic Park (0.5 mile long) is limited to pedestrian use only.

EAST WARD

The Newark Riverfront Park and Essex County River Front Park are located on the north side of the East Ward and adjacent to the Passaic River. These parks feature shared use paths (2.1 miles long) from Riverview Court to Center Street. Ferry Street has bike lanes from the "5 Corners" intersection of Ferry, Merchant, and Wilson Avenue to Mott Street (0.46 miles). McWhorter Street, which is one-way southbound, has a buffered bike lane from Ferry Street/Edison Place to Johnson Street (0.72 miles). Adams Street has a northbound buffered bike lane from South Street to Market Street (1.0 mile). Sharrows are marked along Brewster Road from Airis Drive to New Jersey Air Services (0.60 miles). Additional bicycle network connecting to the East Ward has the potential to significantly improve access to the extensive work opportunities at the Newark Airport, Port of Newark, and adjacent industrial areas.

WEST WARD

The West Ward is primarily residential and has few direct east-west street connections to Newark's Central and South Wards. and the least bike facility mileage of any Ward in the city, which is currently limited to just a small portion of the West Market Street bike lanes that are located primarily in the Central Ward. The West Ward has no other existing bike facilities.

Although the West Ward provides vital connections between the Central and South Wards and the adjacent municipalities of Irvington, Maplewood, South Orange, and Orange, existing and proposed bicycle facilities in the West Ward are currently very limited. Extending the east-west bicycle network between the West, South, and Central Wards would require additional collaboration among the various municipal partners.

Table 2. Existing Bicycle Facility Mileage

Total Mileage	**13.4 miles (10.1 miles on-street)**
Shared Use Paths	3.3
Bike Lanes	6.7
Sharrows	3.4
Paths (Pedestrian only)	13.9

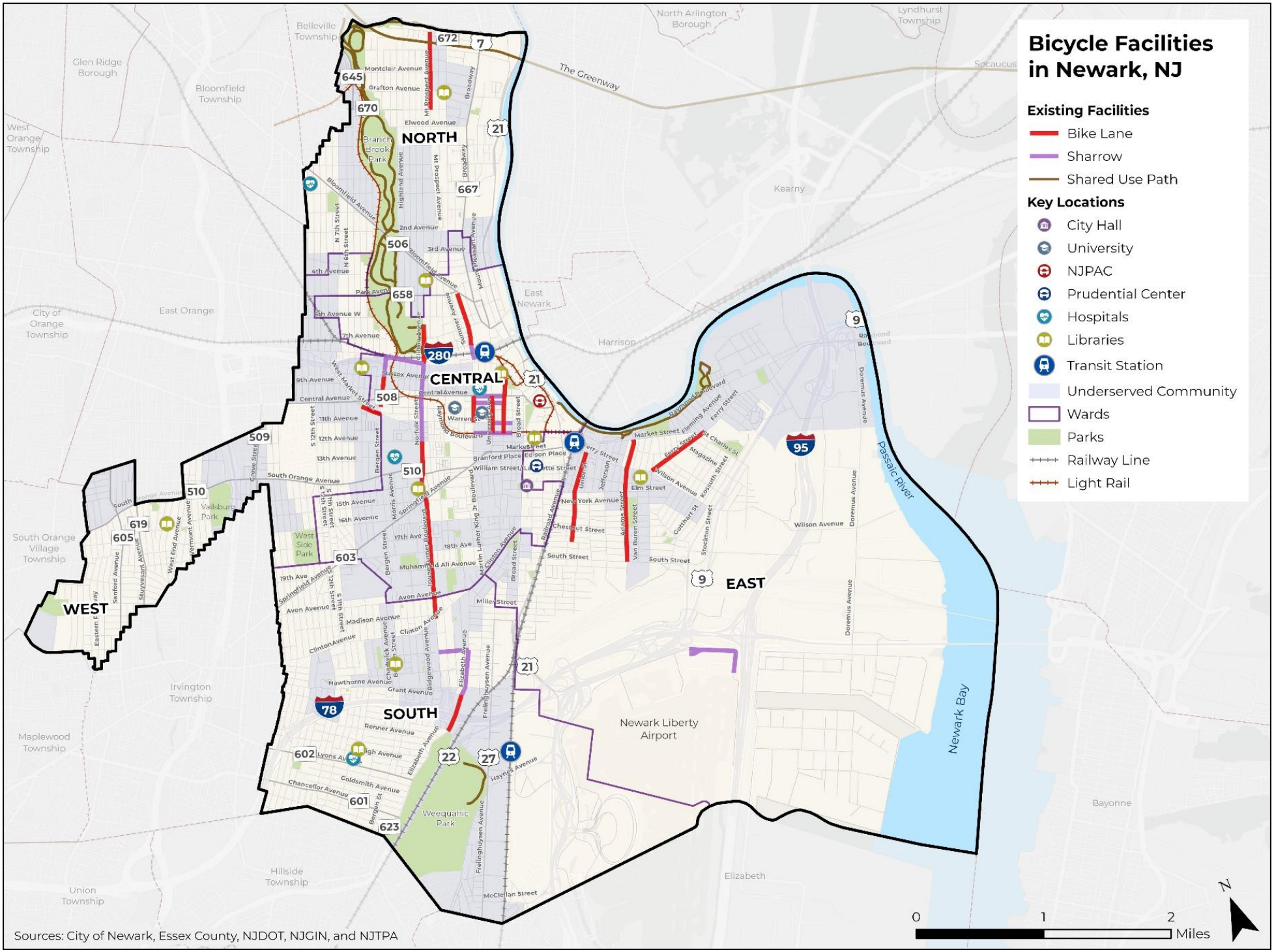


Figure 11. Existing Bicycle Facilities, City of Newark

MICROMOBILITY

NewarkGo, the city's electric bike and scooter share pilot program was launched in July 2021, a joint venture among the city, and two service operators, Veo Micromobility and Bird Scooters, to develop an inexpensive, convenient, and environmentally friendly travel mode for Newark residents. The program involved about 2,000 e-scooters and bikes shared between the two companies and reached a milestone of over 1.5 million total trips by the summer of 2023. This included roughly 3,500 rides per day during peak season and saw some of its highest ridership in the Downtown (especially to/from Penn Station), Ironbound, University Heights, and Lincoln Park neighborhoods, which may be partly due to the fleet anchors being located in these areas. Findings from the initial pilot programs indicate the shared micromobility program is providing significant equity, safety, and mobility benefits: a vast majority of Veo and Bird riders have been Newark residents; most have household incomes below $50,000 and identified themselves as minority; more than 60 percent reported not owning or having access to a vehicle; riders reported a variety of trip purposes, not just to and from work; and many use Veo and Bird for first- and last-mile transit connections. Also notable, is the high number of rides along major busy roads extending out from downtown that currently do not have dedicated bicycle facilities, supporting the need for an expanded citywide bicycle network.

City Council passed an ordinance to make the **NewarkGo** program permanent and selected Veo and Bird as the operators, with two-year renewable permits.

VEO MICROMOBILITY

Newark is one of three VEO locations in New Jersey. Veo users pay $1 to unlock the vehicle, then 39 cents a minute for Cosmo seated scooters or 35 cents a minute for Astro standing models. Veo offers Newark residents **Veo Access**, a discounted fare program. to anyone who qualifies for a Newark local, New Jersey State, or federal assistance program, such as NJ SNAP or NJ FamilyCare.[x]

BIRD

Bird offers both e-scooters and e-bike in Newark. Users pay $1 to unlock one of the vehicles using a phone app, plus another 15 cents per minute. Bird's Commuter Pricing option is an automatic discount for riding during peak congestion times, Monday through Thursday from 4 am to 6 pm. The Bird Ride Pass offers bundles of free weekly or monthly scooter unlocks for one low fixed price, while the Global Ride pass has options for daily/monthly unlimited rides and 1-month and 3-month unlimited unlocks pass. Bird also has a Community Pricing Program offering a 50 percent discount to low-income riders, Pell grant recipients, select local nonprofit and community organizations, veterans, and senior citizens. This was inspired by the positive response to their "Free Rides for Healthcare Professionals" and "Free Rides for Teachers" initiatives during the pandemic.

CRASH DATA SUMMARY

Transportation crash data for the five-year period from 2017 to 2021 from the New Jersey Department of Transportation's (NJDOT) was examined to evaluate travel safety in Newark; 2021 is the most recent year for which comprehensive crash data is available (refer to Table 3 and Figure 12 for details). Data from 2022-2023 is currently available in summary totals only. All crash data is provided by NJDOT via the Safety Voyager platform.[xi]

Transportation crash data refers to bicyclists and other cyclists including riders of two-wheel, nonmotorized vehicles, tricycles, and unicycles powered solely by pedals are all referred to using the term "pedalcyclist."

CRASH SEVERITY & TYPE

- Between 2017 and 2021, Newark recorded 59,775 total transportation crashes, of which 432 (0.7 percent) were bicycle-related, and 2,361 (3.9 percent) were pedestrians.
- Between 2017 and 2022, there were 6 fatal bicycle-related crashes, and 37 serious-injury bicycle crashes in Newark.
- Since 2021, Veo and Bird recorded five and seven reported collisions respectively, where riders incurred an injury requiring medical attention: none involving a pedestrian.
- Crash Hotspots and Fatal bicycle-involved crashes occurred across all five wards

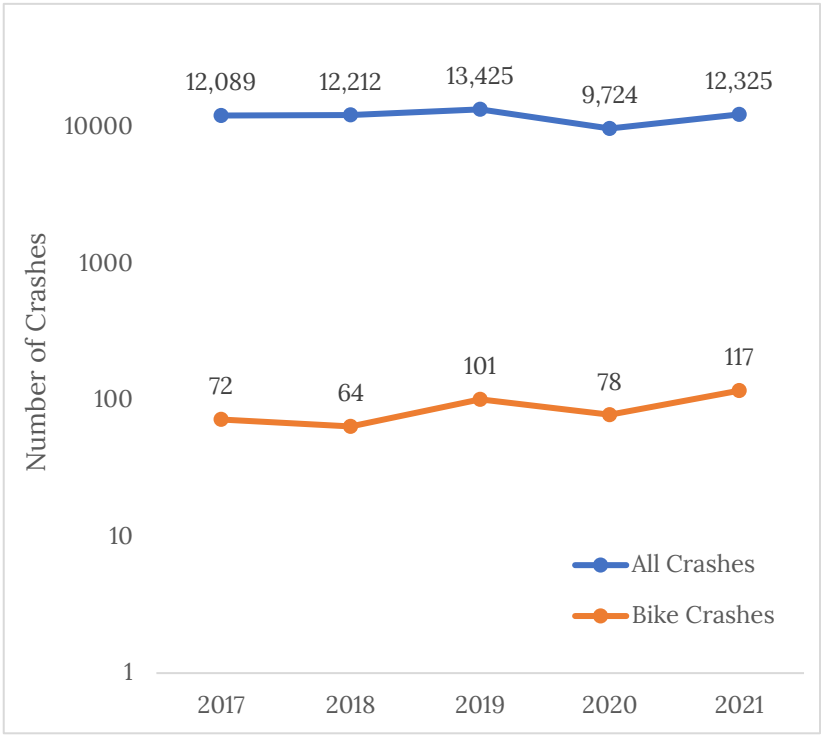


Figure 12. Total Crashes by Year, 2017-2021

Table 3. Total Transportation Crashes by Severity, City of Newark, 2017-2021

	COUNT	PERCENT	BICYCLE-RELATED	PERCENT
No Apparent Injury	44,865	75%	89	20.6%
Possible Injury	10,477	17.5%	178	41.2%
Suspected Minor Injury	3,469	5.8%	137	31.7%
Suspected Serious Injury	835	1.4%	23	5.3%
Fatal Injury	129	0.2%	5	1.2%
Grand Total	**49,893**	**100%**	**354**	**100%**

Bicycle Crashes And Hotspots

As can be seen in Figure 13 there are bicycle crashes in every ward, with concentrations along the principal arterial roads such as South Orange Avenue, Central Avenue, Park-Bloomfield Avenues, Clinton Avenue, near Penn Station, and in the Ironbound neighborhood to the east. This trend also overlaps with the lack of east-west connections in the city's bicycle infrastructure, especially along these roads, and should warrant investments in bicycle infrastructure to improve safety.

Between 2016 and 2020 of the 354 reported crashes, 20 were Fatal and Serious Injury (FSI) crashes of which a majority were in the Central Ward, especially in the downtown area near challenging intersections such as Raymond Boulevard with Route 21 and Market Street, intersection at South Orange Avenue (CR 510) and Springfield Avenue (CR 603), and areas around the Woodland Cemetery and parks in the upper South Ward.

When evaluating the overlap of these crash hotspots with underserved communities (Figure 14) identified through the equity analysis which aggregates scores for 11 Equity Factors at the census tract level (including income, minority, age, limited English proficiency, zero vehicle households, etc.), a significant overlap is evident. This analysis helps identify priority areas impacted by poor mobility and unsafe road conditions and, consequently, the locations that need to be addressed through strategic recommendations and public outreach as part of the BIKENewark Plan.

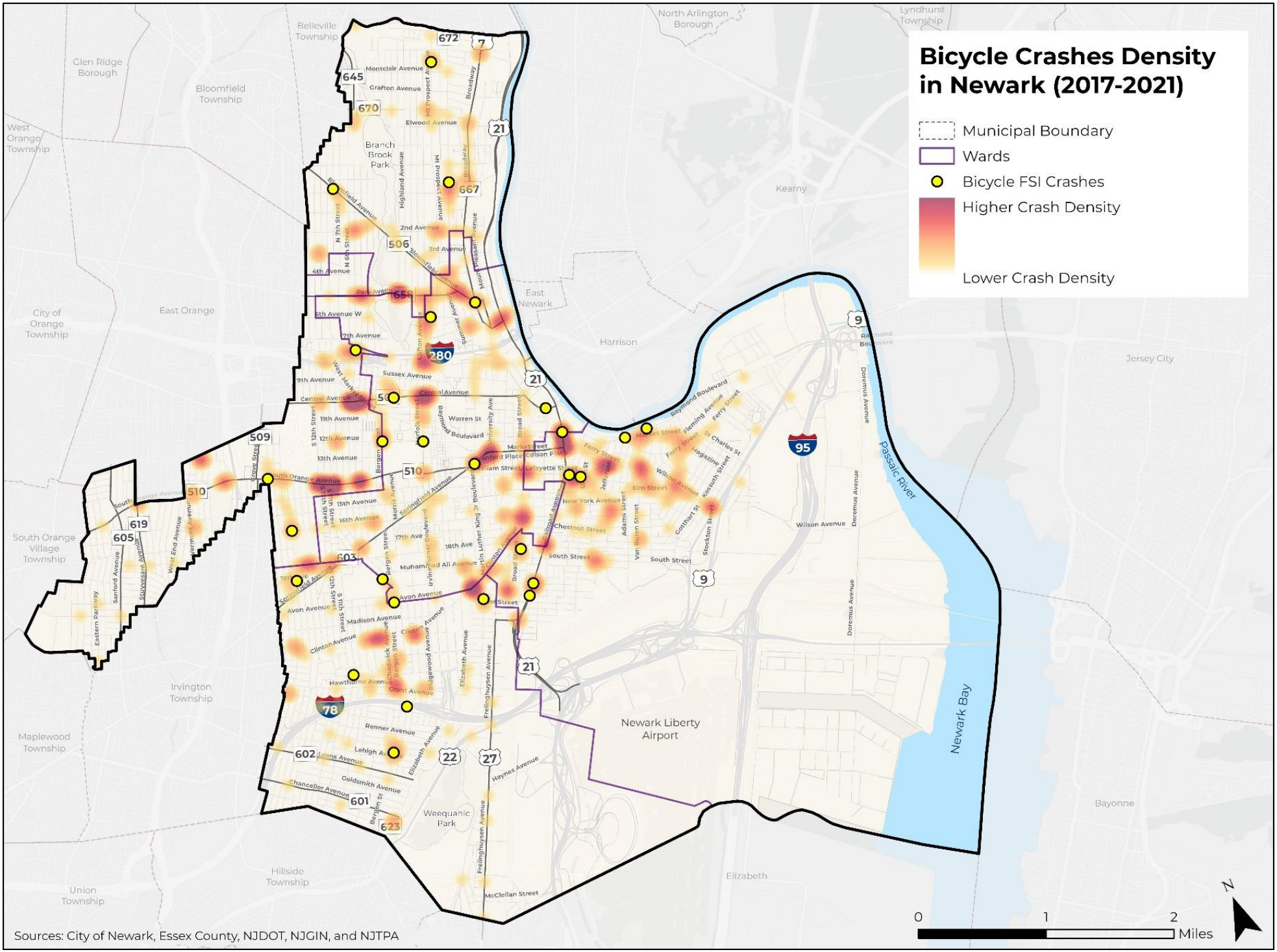


Figure 13. Bicycle Fatal and Serious Injury (FSI) Crashes and Hotspot Locations

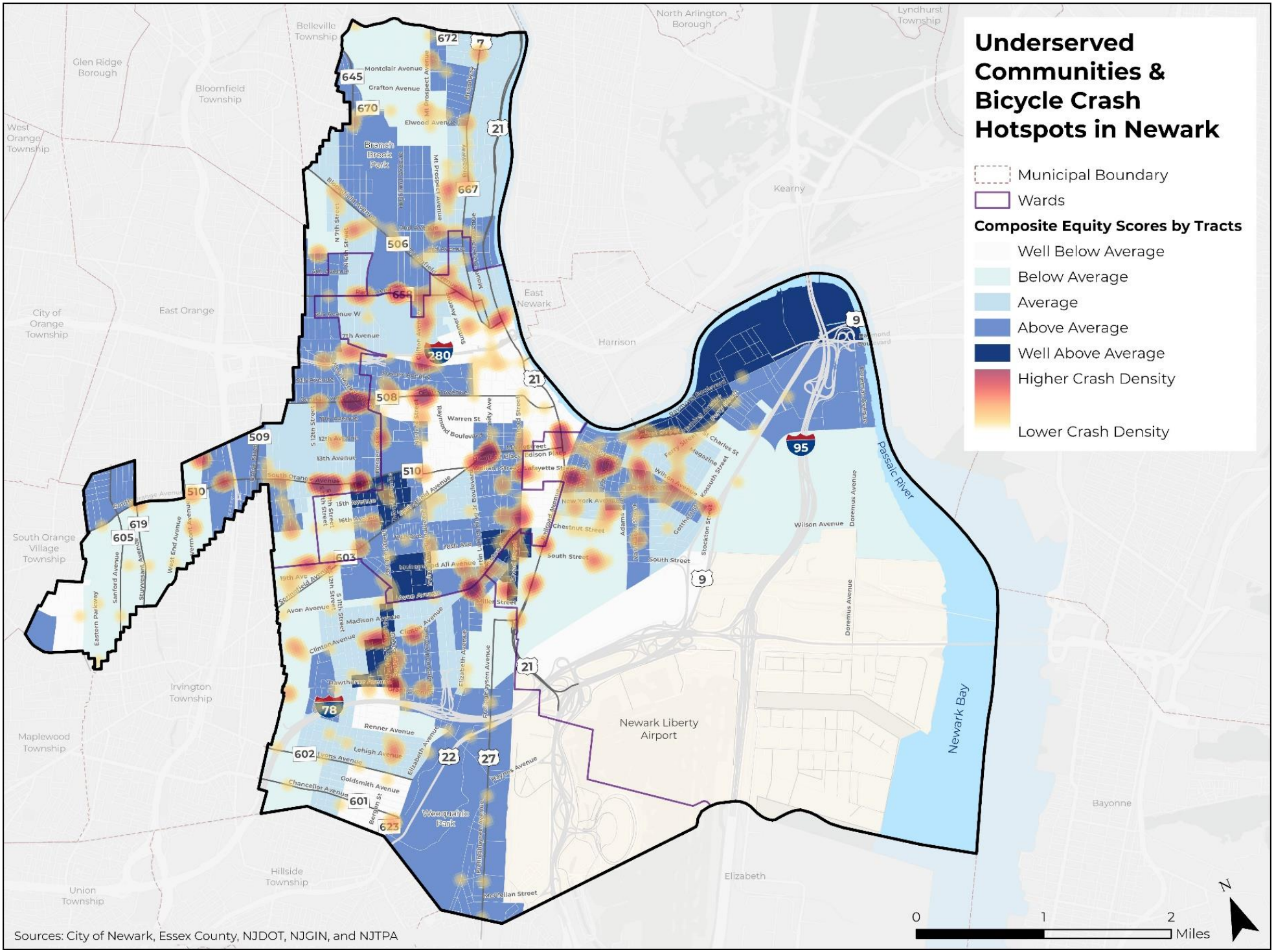


Figure 14. Bicycle Crash Hotspot Locations and Key Underserved Communities


THE DELIC OUS SCIENCE OF BUBBLE TEA
FRESH PASTRIES AND SPECIALTY COFFEE
FEEL THE HEAT!
Freshly brewed tea
Fresh Bagels
veo
L80 MVZ

3. Collaboration, Communication, and strategic vision

Newark established a Technical Advisory Committee (TAC) to help guide development of BIKENewark through an eight-month planning process that included extensive community outreach. Public outreach included a multi-pronged approach to facilitate participation from public officials, residents, and other stakeholders through both traditional and non-traditional methods.

A mix of qualitative and quantitative input from the community was combined with a needs assessment to develop a detailed, comprehensive city-wide bike plan to rethink micromobility and provide equitable transportation choices. A comprehensive compendium of public outreach results analysis is provided in the Community Engagement Technical Memorandum.

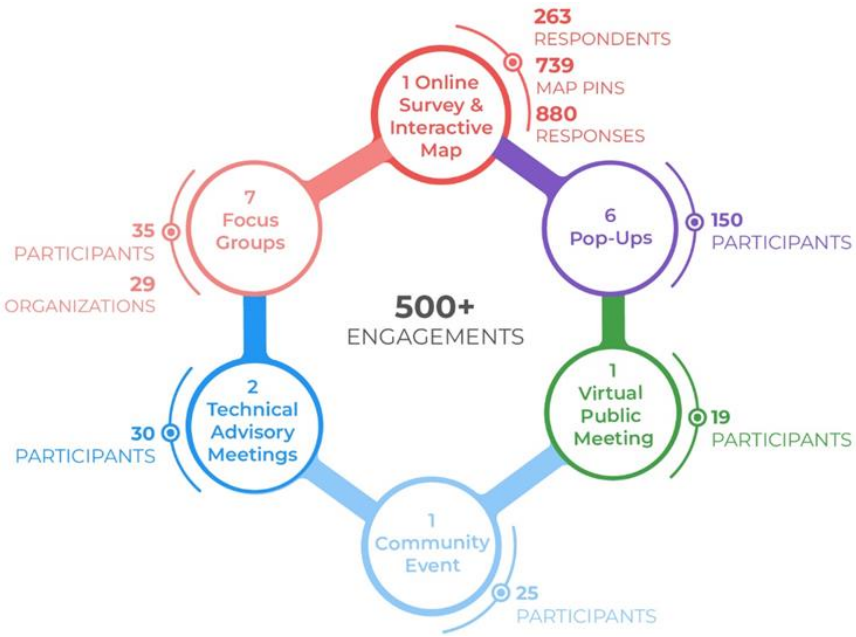
BIKENewark Engagement Timeline

TAC Members

- City of Newark
- City of Newark Transportation Consultant
- Commercial District Services
- Essex County Parks
- Essex County Public Works
- EZ Ride TMA
- Invest Newark
- Ironbound Business Improvement District
- New Jersey Bike & Walk Coalition
- Newark Bicycle Shop
- Newark Public Schools, Office of Safety and Security
- NJ Bicycle & Pedestrian Resource Center at Alan M. Voorhees Transportation Center
- NJ TRANSIT
- NJ Department of Transportation
- New Jersey Transportation Planning Authority
- Office of City Council Member, Partick O. Council
- Office of City Council President, LaMonica McIver
- RBG Cyclist of Newark

GATHERING FEEDBACK

More than 500 stakeholders engaged with the City of Newark: responding to the online survey/map, participating in focus groups and public meetings, or at pop-up events in underserved communities. Participants of all ages and backgrounds shared their ideas and concerns about the current and future state of the city's bike and scooter infrastructure.



MAKING OUTREACH ACCESSIBLE

The public outreach plan employed a wide range of outreach methods to provide multiple opportunities for engagement. These include a project website, online survey and mapping exercise, social media campaign, and strategic partnerships with stakeholders already engaged or with a vested interest in improving accessibility in Newark through bike infrastructure.

Specific efforts were made to reach underserved communities, including:

1. Setting up pop-up engagement kiosks in all five wards of Newark.
2. Translation of public outreach materials into Spanish and Portuguese.
3. Distributing public meeting announcements and other public outreach materials to strategic partners in underserved communities.
4. Providing incentives to encourage broader participation at every community involvement activity.
5. Having a Spanish translator at every community involvement event.

Newark's underserved communities were identified through quantitative analysis of census data, including assessment of Income, Age Group, Limited English Proficiency, Zero-vehicle Households, and other indicators.

WEBSITE, SOCIAL MEDIA & PROMOTIONAL MATERIALS

The public outreach process began with a branding exercise including the project name and the BIKENewark logo. Subsequently, Newark launched a multi-lingual website where stakeholders could find information about the bike plan's purpose, project updates, and ways to get involved.

Content was created for the City of Newark's official Facebook, Instagram, and Twitter pages and produced pre-packaged, easy-to-share social media content for strategic project partners. Social media content was provided in English, Spanish, and Portuguese.

Additionally, strategic partners distributed promotional hangers to advertise the survey in English, Spanish, and Portuguese within underserved communities. These hangers were also given to participants and passersby during pop-up events and were placed on bikes, scooters, lockers, and racks across Newark.

Social Media & Promotional Materials

VIRTUAL FOCUS GROUPS

Seven virtual focus groups were held with strategic stakeholders who were either actively engaged in Newark or had a vested interest in enhancing accessibility through bike infrastructure in the city. The purpose of these focus groups was to gather feedback about current bike infrastructure and perceptions of safety, to identify desired destinations and location-specific concerns, and to exchange insights on other biking-related issues and untapped opportunities. The focus groups explored participant experiences with the current bike infrastructure, reasons for choosing other modes of transportation, potential improvements that could encourage them to ride, and their vision for the future of biking and transportation. Additionally, participants were asked to identify key riding destinations and specific location concerns through an interactive mapping exercise. Focus group sessions were held for Bicycle & Street Safety Advocates, Community & Neighborhood Organizations, Economic Development, Public Officials, Educational Institutions, Anchor Institutions, and Developers & Property Managers.

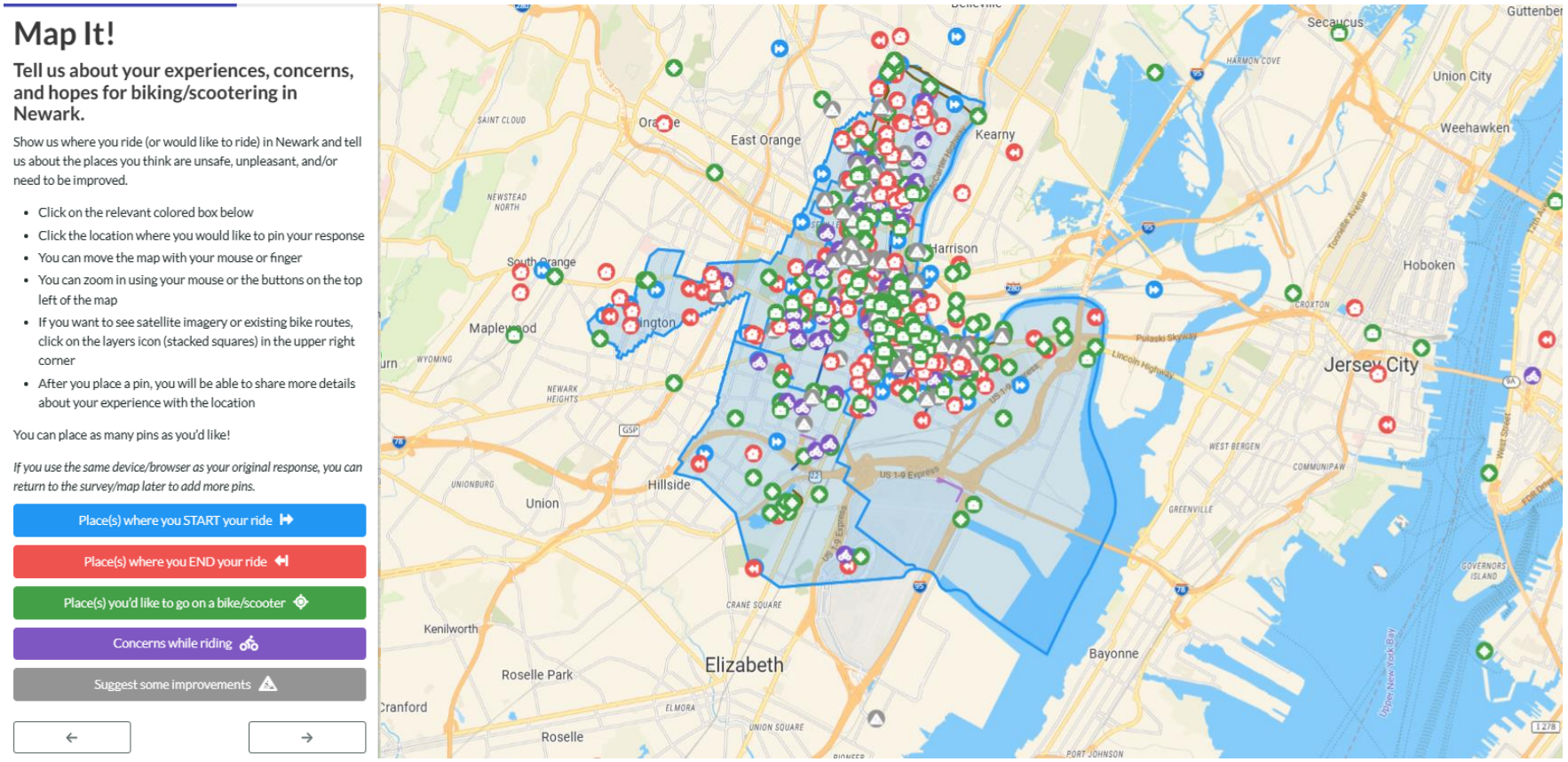
VIRTUAL PUBLIC MEETING

Newark hosted a virtual public meeting on June 6, 2024, toward the end of the planning process, to present and gather feedback on draft recommendations. During the meeting, participants were given the opportunity to review the draft proposed bike network and policy recommendations, ask questions, and provide comments.

SURVEY & MAP TOOL

An online survey and an interactive map were used to collect insights into Newark's bike and scooter infrastructure, including information on ridership patterns, network deficiencies, and untapped opportunities. The interactive mapping component allowed participants to pinpoint location-specific concerns and identify key riding destinations within and outside Newark. The survey included optional demographic questions and was available in three languages: English, Spanish, and Portuguese. To encourage broader participation, respondents were offered an opportunity to enter a raffle to win one of four $25 gift cards to ShopRite. Ultimately, the online survey and map yielded 263 validated responses.

Screenshots of Survey/Map tool

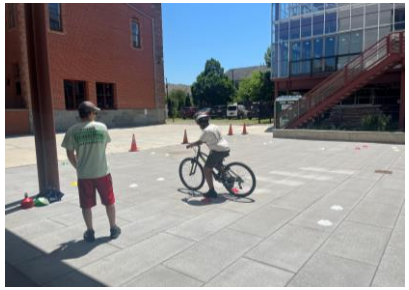


Pop-up Engagement

Six pop-up engagement events were held early in the planning process to directly engage Newark's underserved community groups. At least one event was hosted in each ward and two in the Central Ward. These events provided an opportunity for the public to learn about BIKENewark and featured activity boards for passersby to share their riding experiences and safety concerns.

The final pop-up event, held in collaboration with the Greater Newark Conservancy (GNC), Makerhoods, and EZ Ride, served to inform and gather feedback from residents and stakeholders about the proposed bike network and policy recommendations in an engaging manner. Activities included a mapping exercise where participants could leave comments on the proposed bike plan and help prioritize community spending on infrastructure. GNC also hosted a launch event for its upcoming summer Farmer's Market and promoting their Safe Routes to Healthy Food Initiative. Additionally, EZ Ride organized a Bike Rodeo to teach bike riding and safety skills, offering inexperienced riders a chance to learn and experienced riders an opportunity to enhance their skills and safety knowledge.

Images from Pop-up Engagement & Community Events



What we Heard

The feedback and input collected from various methods of community outreach helped inform the strategic vision and development of the BIKENewark Plan proposed bike network and policy recommendations.

Most Frequently Noted Concerns

Over 500 stakeholders shared their riding experiences, concerns, and opportunities related to Newark's biking and transportation landscape. The most frequently noted concerns included:

- Insufficient designated bike lanes and a disjointed bike network pose safety risks for cyclists and scooter riders in Newark.
- Fear of traffic and being hit by a vehicle, including motorists speeding, not yielding to cyclists, creating an unsafe condition for riders citywide.
- Upkeep and maintenance of existing bike and scooter infrastructure should keep pace with increasing demand.
- Desire for additional bike and scooter infrastructure, including racks, lockers, and parking spaces.

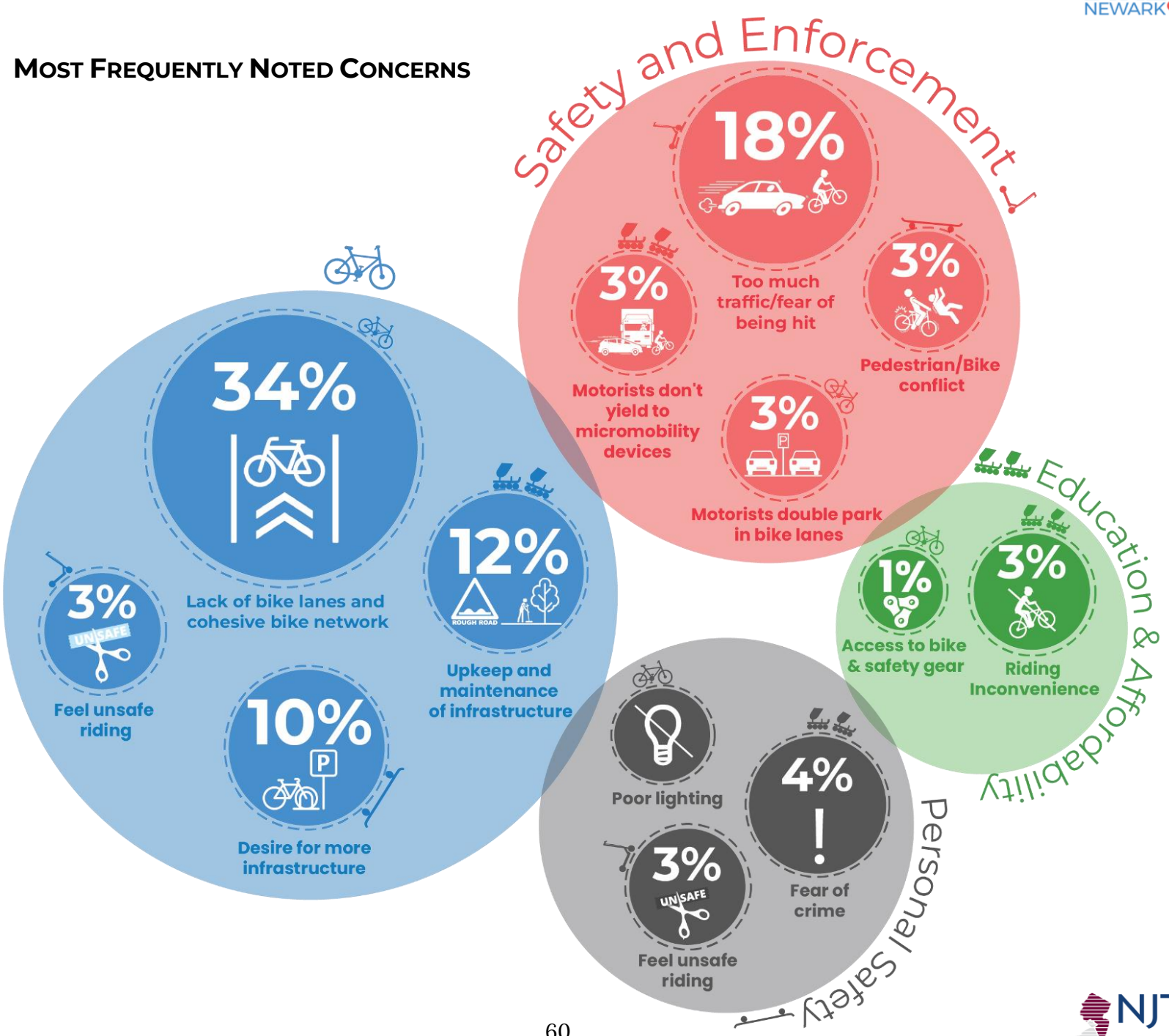
Other notable concerns included:

- Vehicles parking in bike lanes or disregarding them entirely, causing inconvenience and safety hazards.
- Cyclists using sidewalks due to inadequate infrastructure, leading to conflicts with pedestrians.
- The need for more education and training programs to raise awareness among motorists about sharing the street.
- The need to improve access to affordable bikes, scooters, and safety equipment.
- Challenges related to biking, including uphill rides, helmet usage, and accommodating passengers.
- Concerns about personal safety and crime, particularly during nighttime biking.

A total of 284 concern-related map pins and 384 destination map pins were gathered from the various online and in-person outreach activities. The majority of the concern-related responses were clustered in Downtown Newark, particularly in the heavily-traveled areas around and between Newark Penn Station and Broad Street Station.

Participants expressed concerns about Central Avenue, University Avenue, Broad Street, Bloomfield Avenue, Irvine Turner Boulevard, Ferry Street and Wilson Avenue in the Ironbound, and at Branch Brook Park, Weequahic Park, and Riverfront Park.

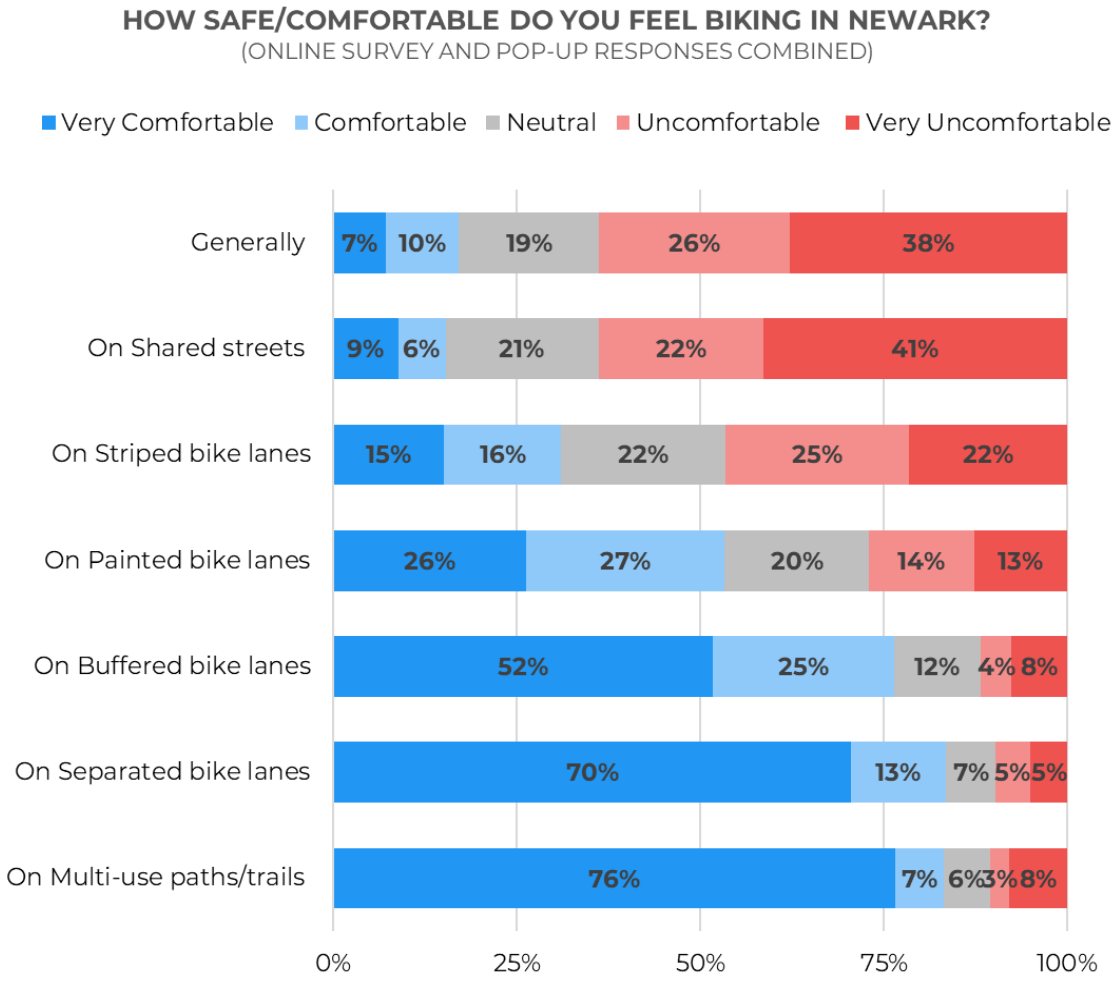
Most Frequently Noted Concerns



Perception of safety and comfort while bike riding in Newark

The responses from both online and in-person outreach events were combined to gauge perceptions of safety and comfort while riding. Most respondents felt unsafe when biking or scootering in Newark. Additionally, respondents were asked about their safety and comfort preferences using different types of bike facilities.

A clear trend is evident, as many reported feeling safer when more separation and protection are provided between riders and motorists. The majority indicated that they felt safest and most comfortable on multi-use paths/trails, separated bike lanes, and buffered bike lanes in Newark.



Common Themes

The following common themes were heard throughout the public outreach and served as the basis for the proposed Bike Plan and Policy Recommendations for Newark.

Participants want more programs and resources tailored to Newark residents, with the aim to make biking more appealing to people of all ages, abilities, and means.

Participants want to prioritize strategies that **improve the bike network**, including adding more connected bike lanes and trails across the City of Newark.

Participants want better maintenance of the existing bike infrastructure – in addition to the desire for more bike racks, lockers, and parking.

Participants want both **improved bicycle safety** and a focus on safety of all vulnerable road users.

STRATEGIC VISION

Equitable access to safe, affordable, effective, and efficient travel options is essential to meeting the everyday mobility needs of Newarkers and to achieving a high quality of life, healthy lifestyles, and gaining access to opportunity.

The strategic vision for BIKENewark is informed by the community outreach process, creating a plan that truly reflects Newark's local context, needs, and priorities, and guides plan implementation and prioritizations of bicycle projects, and the supporting policies, plans, and strategies.

The strategic vision includes goals and objectives. Goals are broad, long-term, and outcome-oriented, focusing on the improvements the plan seeks to achieve. Objectives detail the specific steps needed to attain these long-term goals.

ACCESSIBILITY

BIKENewark will create the means to enhance overall accessibility, reduce dependence on motor vehicle travel, and improve responsiveness to the needs of Newark's vulnerable road users.

OBJECTIVES:

- Create a cohesive citywide bike network with dedicated bike lanes to improve connectivity across each ward, focusing on East-West connectivity.
- Connect community members to adjacent municipalities and an expanding regional network of traffic-free paths and trails, including The Greenway (formerly known as the Essex Hudson Greenway) and Morris Canal Greenway.
- Provide multimodal accommodations on all regional bridge connections, including those to neighboring Harrison, East Newark, Kearny, and North Arlington
- Promote multimodal integration by creating connections between bike infrastructure and other forms of transportation (e.g., buses, trains) to create a seamless and efficient transit network that benefits all residents.
- Develop comprehensive wayfinding to guide cyclists to key destinations and amenities.
- Focus on expanding hubs, docking locations, and parking spaces as the bike network is built.

SAFETY

BIKENewark will commit to a "culture of safety" by designing a transportation system safe for all Newarkers and achieve a future without transportation related serious injuries and fatalities.

OBJECTIVES:

- Incorporate speed calming techniques and road safety audits at high crash locations and crash severity hotspots.
- Strengthen the enforcement of existing traffic laws, particularly in areas with high crash rates, to deter dangerous behaviors such as speeding and reckless driving.
- Prioritize interventions such as road diets, traffic medians, bulb-outs, curb extensions, and crossings in locations with fatal and serious injury crashes.
- Promote community education and awareness focused on safe driving, cycling, and walking practices to foster a culture of mutual respect and safety on the roads.
- Continuously collect and analyze data on traffic incidents to identify new crash hotspots and emerging safety issues, allowing for timely interventions.
- Adopt Vision Zero principles, aiming to eliminate all traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all.

EQUITY

BIKENewark will prioritize bike infrastructure policies and investments to reduce inequities across the transportation system and increase access to and among Newark's diverse neighborhoods.

OBJECTIVES:

- Identify underserved communities and integrate their daily travel needs and safety challenges into the plan.
- Ensure the needs of all vulnerable road users are recognized and equally addressed.
- Evaluate affordability and accessibility of micromobility shared services in underserved communities.
- Educate residents on safe riding behaviors ensures that new bike infrastructure is used safely and effectively, benefiting all community members.

ECONOMIC DEVELOPMENT

BIKENewark will invest in bicycle infrastructure as an essential economic driver that supports tourism, enhances access to Newark's businesses and educational institutions, and provides reliable and efficient access to economic opportunity.

OBJECTIVES:

- Implement BIKENewark's projects, plans, and strategies to create positive economic change across the city.
- Promote access to many of Newark's principal destinations - including offices, workspaces, and commercial districts, and amenities- including schools and libraries, parks and recreation areas, and dining and entertainment options.
- Foster collaborations with local businesses to support and promote bike-friendly initiatives, such as discounts for cyclists or sponsoring bike-related events.
- Create bike-friendly tourism packages and guided bike tours to attract visitors and boost local tourism.

THE LIVING PLAN

BIKENewark is a dynamic, living plan designed to evolve with the city and its ever-changing needs. BIKENewark will be reviewed and updated every few years to ensure that it remains responsive to the Strategic Vision and the needs of the community.

OBJECTIVES:

- Revisit and update the plan regularly to integrate new infrastructure and opportunities, ensuring that the bicycle network continues to grow and improve in alignment with Newark's development.
- Establish performance indicators and data collection methods to monitor the usage, effectiveness, and impact of bike infrastructure investments over time and use this information to guide future planning and decision-making.
- Advocate for policies and regulations that promote bicycle-friendly infrastructure and practices, such as Complete Streets policies, bike-friendly zoning ordinances, and incentives for bike-friendly development.
- Work collaboratively with shared mobility providers to ensure active integration of shared micro-mobility devices such as electric scooters and bikes into Newark's evolving transportation network.
- Make BIKENewark a reference guide during street repaving projects and make necessary adjustments to ensure bike lanes and other infrastructure are considered and implemented where feasible.

This E-scooters station provide essential first- and last-mile connections to transit at Newark's Broad Street Station

4. BUILDING THE BICYCLE NETWORK

The City of Newark features an extensive street and transit network providing access and mobility throughout the city across a mix of primarily city-owned and county-owned streets. These include a combination of one-way and two-way streets connecting people between where they live and where they need to travel. Principal destinations include large office towers, small workspaces, dozens of schools, three universities, numerous parks and libraries, museums, bus and rail service, and a significant breadth of business and entertainment establishments. Newark's employment and population densities are among the highest of New Jersey's large cities.

These features make Newark ideally suited for sustainable, non-motorized transportation, including bicycle travel. Measures of both existing and potential bicycle demand support this conclusion.

Consistent, however, throughout BIKENewark is the finding that Newark's streets present numerous safety, mobility, and access challenges, particularly for cyclists and pedestrians.

In contrast with its marquee, one-of-a-kind destination streets such as Halsey Street in the heart of downtown and Ferry Street in the Ironbound, travel in Newark is too often characterized by overly-wide, multi-lane arterial roadways that are inconsistent with the local context and that encourage high-speed, aggressive, and risky driving behaviors. Many of these roadways lack basic traffic calming features and cater to speeds well above the 25-mph speed limit, enabling a culture of double-parking and aggressive driving, which discourage travel by bike and foot, and that generate even more, rather than less, motorized travel and parking demand.

Development of the comprehensive, city-wide bicycle network is a step-by-step, data-driven process using proven measures of travel conditions, level-of-traffic stress (Bicycle LTS) and the "island effect," existing bicycle and scooter share data, potential future bicycle demand, and consistent with the local context and conditions.

Each proposed bicycle facility is based on the standardized design treatments included in Appendix B, and consistent with state-of-the-practice design guidance. These include guidance and published standards from MUTCD (Manual on Uniform Traffic Control Devices for Streets and Highways), AASHTO Bike Deign Guide, 5th Edition (American Association of State Highway and Transportation Officials), NACTO (National Association of City Transportation Officials), **BIKE**Ironbound, and others.

BICYCLE LEVEL OF TRAFFIC STRESS (LTS)

Individual cyclists have varying abilities to tolerate the stress created by exposure to automobile traffic, buses, and large trucks. Although the most experienced and risk-averse cyclists are fully comfortable with stressful conditions, most cyclists require separation from moving traffic. Bicycle Level of Traffic Stress (LTS) is a metric used to measure a cyclist's traffic stress level on a given street based on the traffic conditions and roadway design. The LTS metric is based on the Dutch concept of low-stress bike riding, and has proven beneficial to the advancement of bicycle planning in the U.S.

In general, lower stress bicycle facilities provide increased separation between cyclists and motorized traffic, along with lower speeds and lower traffic volumes. Higher stress environments generally involve cyclists riding in close proximity to traffic, with higher speeds and traffic volumes, and along multi-lane roadways.

Figure 15 explains the four LTS levels by depicting typical members of each rider group and the type of facilities preferred by each. The diminishing separation and protection from traffic is clearly displayed while scanning across from LTS 1 to LTS 4.[xii]

LTS scores range from one to four:

- **LTS 1** is the stress level that most persons "8 to 80" can tolerate. LTS 1 streets are defined as being suitable for children and adults of all ages; they typically have strong separation from moving traffic, and are often local, neighborhood streets with simple-to-use crossings. Lake Street, Vassar Avenue, Smith Street, Morris Avenue, and Delancy Street are examples of LTS 1 streets in Newark.
- **LTS 2** is the stress level acceptable to most adults, those considered "Interested but Concerned." These streets are typically characterized by low speed and/or low traffic volume situations, and may feature dedicated bicycle facilities where cyclists interact with traffic only at formal crossings. LTS 2 roadways in Newark include Wilson Avenue, Madison Avenue, Sussex Avenue, and Elwood Avenue East.
- **LTS 3** is the stress level acceptable to the "Enthused and Confident" cyclists. These streets are characterized by moderate traffic volumes, and higher speed traffic. Many of Newark's busier streets, including Bloomfield Avenue (CR 506), Sanford Avenue (CR 605), Lafayette Street, and Springfield Avenue (CR 603) are LTS 3.
- **LTS 4** roads are appropriate only for the most skilled riders, the "Strong and Fearless." LTS 4 cyclists are comfortable mixing with higher travel speeds, high traffic volumes, large trucks, and multilane cross-sections. Examples include Frelinghuysen Avenue (US 27), Market Street, South Orange Avenue (CR 510), and McCarter Highway (US 21).

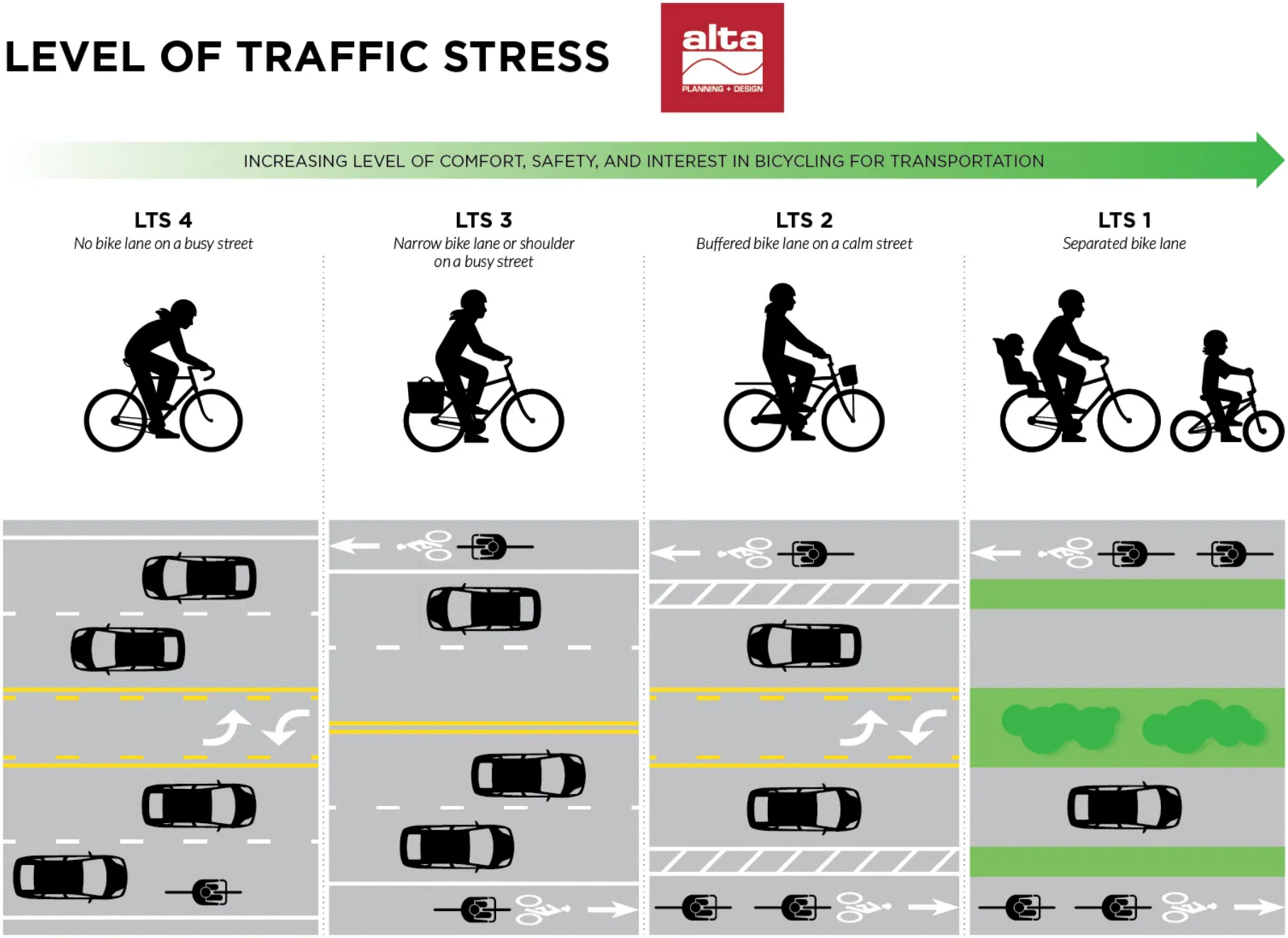


Figure 15. Level of Traffic Stress (LTS) Classifications, Alta Planning + Design

BIKENewark includes a citywide LTS assessment of Newark's street network, with LTS values assigned for each roadway segment in Newark, and derived from the following data resources:

- **Number of lanes**: data was sourced from *Open Street Map*, with additional sources reviewed for improved accuracy for select corridors with multiple lanes.
- **Average daily traffic (ADT)**: traffic data was sourced from NJDOT, county, and local data, where available. The *Replica* data platform was used as a supplement for roadways without available ADT data.
- **Prevailing speed**: speed data was sourced from NJDOT SRI data, *Open Street Map*, and *Replica*, with the highest speed from the three sources used in the analysis to allow for conservative estimates of travel conditions. These resources indicate a prevailing vehicular travel speed of at least 30 mph citywide.
- **Roads where bikes are prohibited** were excluded from the calculation and display of LTS; examples include Route 9, Route 22, I-78, I-280, Garden State Parkway, New Jersey Turnpike, and the Newark Airport (EWR) internal circulation roadways.

Vehicle parking and encroachment in bike facilities in both standard and buffered (not protected) bike lanes is frequent and assumed to be a citywide occurrence.

The BIKENewark LTS assessment finds that two-thirds of Newark streets are low stress (LTS 1 and 2) with significant potential to develop a safe, equitable, and accessible bicycle network. Traffic stress levels are equally distributed among LTS 1, LTS 2, and LTS 3+4 groupings, with approximately one-third of roadway miles in each group, as depicted in Figure 16.

Significantly, many of Newark's primary arterial roadways and destination streets experience high-stress (LTS 3 and 4) conditions, including Market Street, South Orange Avenue, Raymond Boulevard, Springfield Avenue, Central Avenue, Park Avenue, McCarter Highway, and Frelinghuysen Avenue.

Among these, Market Street and Central Avenue in particular, host the types of activities and destinations that are highly desirable to those who travel by foot and bicycle, but are also high-stress roadways whose travel conditions discourage biking because of the stressful travel conditions and frequent conflicts with motorized traffic.

Many of these high-stress roadways are essential for all but the shortest neighborhood trips, severely inhibiting overall bicycle mobility, creating barriers for many potential bike riders, and on a significant portion of the Newark street network. BIKENewark seeks to overcome these barriers, safely connecting people and neighborhoods with Newark's numerous destinations and activity centers.

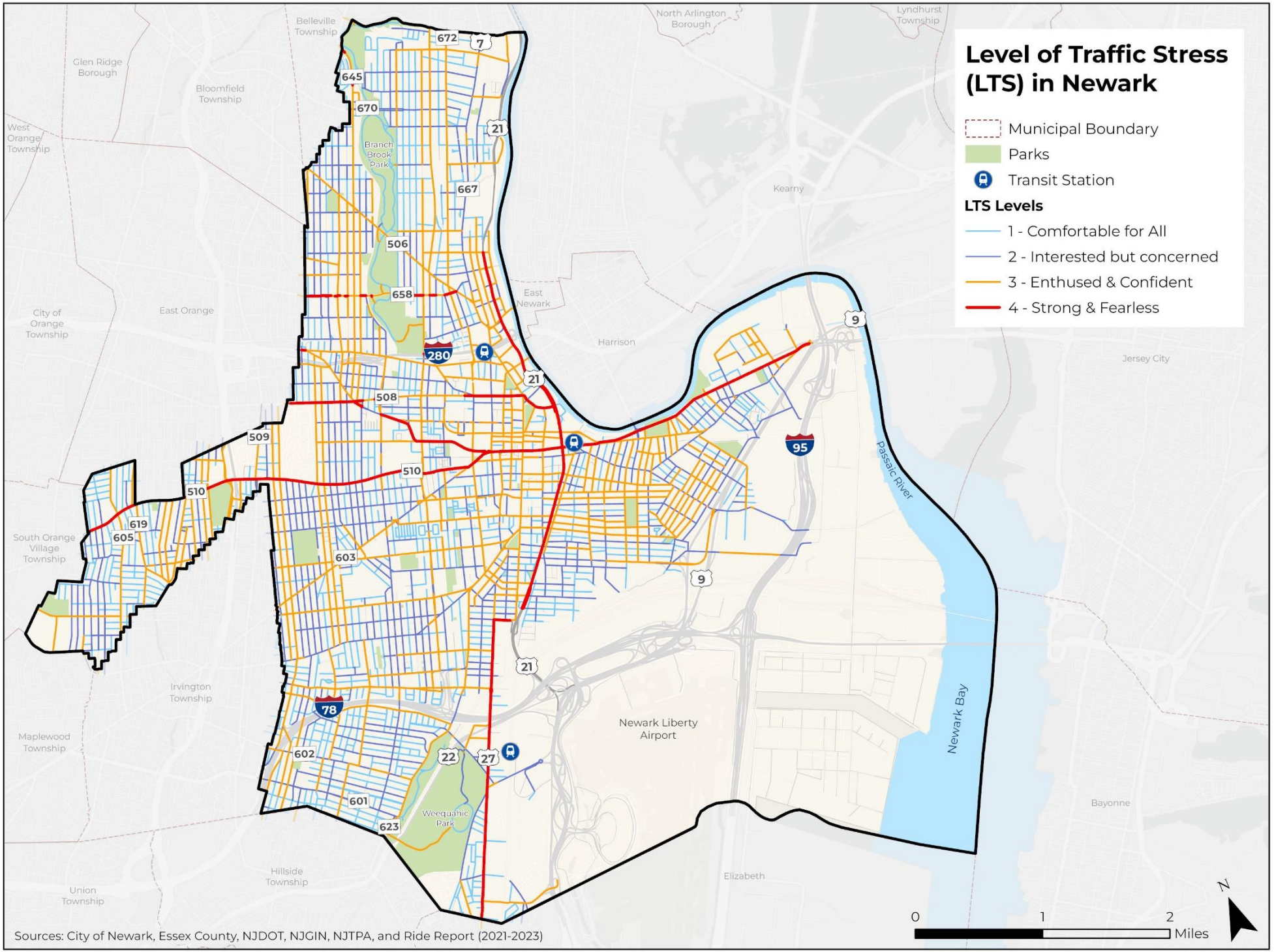


Figure 16. Level of Traffic Stress (LTS), City of Newark

ISLAND EFFECT AND BARRIER STREETS

High traffic-stress roadways (LTS 3 and 4) discourage travel by bike and create barriers to both local and regional mobility and access. The result is an "island effect" where cyclists are confined to small areas of low-stress biking, effectively cut off from adjacent neighborhoods and the rest of the city. This finding is consistent with comments and observations from the community engagement activities where many respondents indicated that they feel unable or uncomfortable bicycling beyond their own streets and neighborhoods due to safety concerns.

The combined analysis of LTS, island effect, and equity data confirms that Newark's street network is heavily fragmented with severe connectivity limitations due the prevalence of these high-stress roadways and barrier street conditions. The presence of many low-street street provide opportunities to connect Newark's neighborhoods and wards with dedicate new bicycle facilities

Figure 17 depicts dozens of low-stress islands across the City of Newark, cut off from each other by high-stress barrier streets and areas with heavy traffic volumes, high travel speeds, and large trucks and buses. These low-stress islands overlaid on the underserved communities identified through the equity analysis.

The Garden State Parkway, New Jersey Turnpike, Route 9, Route, 22, I-78, and I-280 highways; the Northeast Corridor (NEC), Montclair Boonton, and Raritan Valley lines (NJ TRANSIT), and Newark Light Rail railroad lines; and Newark International Airport (EWR) access and circulation roadways severely constrain mobility in Newark, especially among cyclists, creating significant barriers to safe and efficient movement of people and goods throughout the City of Newark, which are difficult to mitigate.

This effect is pervasive across each of Newark's five wards:

In the **East Ward** (including the Ironbound neighborhood, Airport, and Ports), notable barrier streets include all or portions of: Ferry Street, Raymond Boulevard, Market Street, South Street, and Route 9.

In the **Central Ward** (including Downtown), notable barrier streets include all or portions of: Raymond Boulevard, Central Avenue, Market Street, South Orange Avenue, Springfield Avenue, I-280, McCarter Highway (NJ 21), and Bergen Street.

In the **North Ward**, notable barrier streets include all or portions of: Park Avenue, Bloomfield Avenue, Clifton Avenue, and Mt. Prospect Avenue.

In the **South Ward**, notable barrier streets include all or portions of: South Orange Avenue, I-78, Bergen Street, Elizabeth Avenue, and Frelinghuysen Avenue (NJ 21).

In the **West Ward**, notable barrier streets include all or portions of: South Orange Avenue and the Garden State Parkway.

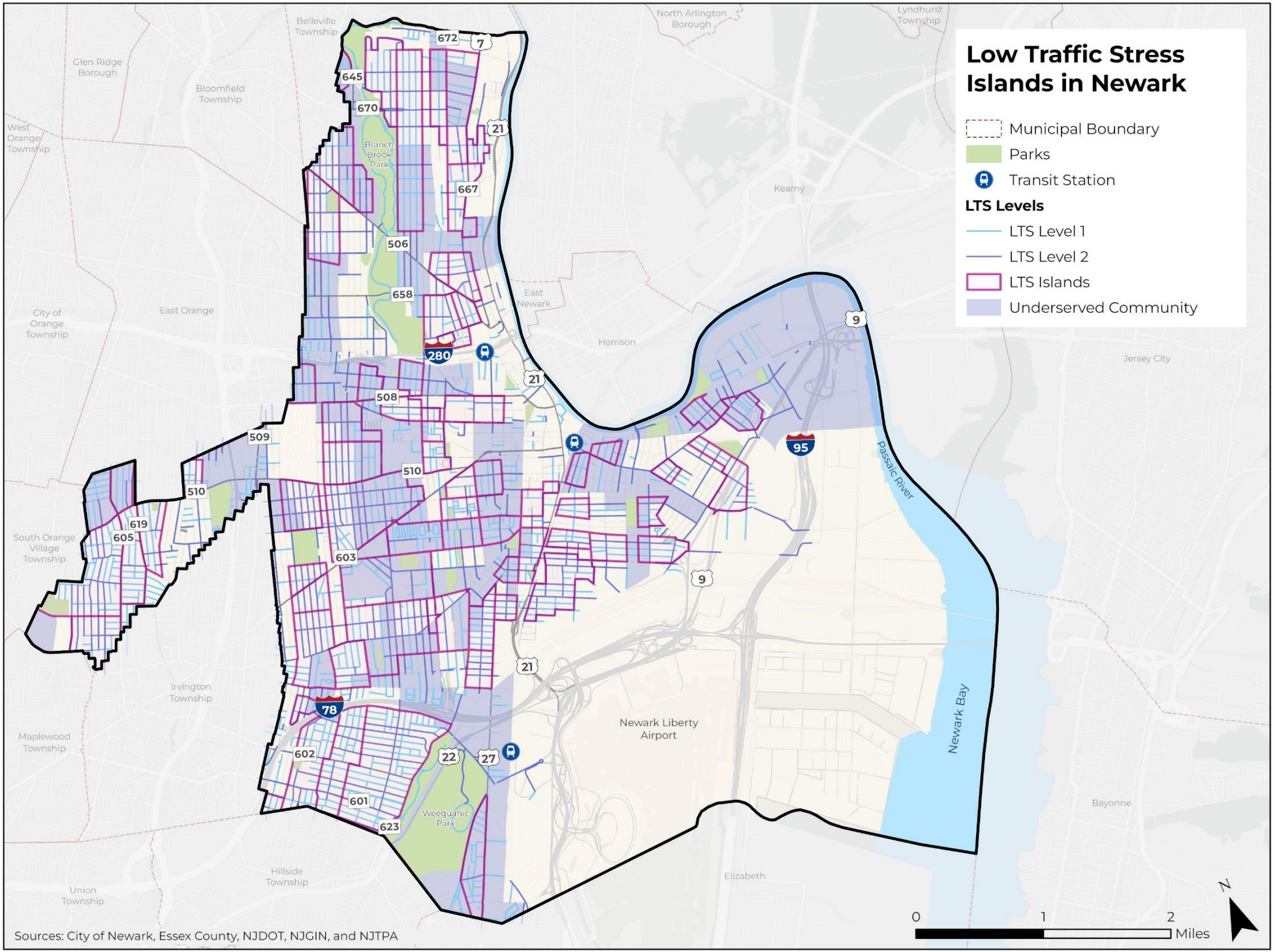


Figure 17. Low Traffic Stress Islands with Key Areas of Underserved Communities

THE CITY STREET NETWORK

The ability to implement bicycle facilities is based in large part on identifying streets with available right-of-way and/or flexible design options; in most cases some change is required to accommodate bicycle infrastructure. Options may, for example, include narrowing a very wide travel lane, converting a single parking lane or travel lane to bicycle use, implementing a Road Diet, or changing a two-way street to one-way configuration. Any proposed changes must be consistent with the local context, land use and development patterns, and travel conditions.

Excluding about 135 miles of interstates, freeways, and ramps, Newark's street network totals 357 roadway miles (see Table 4), with a mix of one-way (37 percent of total roadway mileage) and two-way streets (63 percent). The pattern of one-way streets is often disjointed and inconsistent in many neighborhoods, particularly within the West Ward/Vailsburg area. A comprehensive, citywide assessment is recommended to better coordinate directionality and address both local and regional mobility and travel constraints.

Some of the city's one-way streets feature a single travel lane of 18-20 feet wide. This cross section can be reconfigured to accommodate an 11-foot travel lane, five-foot bike lane and a protected two-foot wide buffer with no impact to on-street parking or traffic capacity. A single travel lane that is just 11-14 feet wide, however, does not have sufficient available right-of-way to accommodate both a travel and a bicycle lane.

Newark is also home to a significant inventory of wide, multi-lane arterial roadways such as Raymond Boulevard and South Orange Avenue that capture heavy traffic volumes and create a high-stress environment that discourages bicycle travel. Some of these wide streets are candidates for Road Diets which affords the opportunity to repurpose a travel lane for dedicated bicycle use. Converting a four-lane, two-way street to a three-lane Road Diet configuration may, for example, create the opportunity for standard or protect bike lanes. Road Diet projects have also shown to improve road safety without detriment to travel and operational performance, enhancing safety and creating benefits for all modes and travelers.

Table 4. Street Type and Direction, City of Newark

Street Types in Newark		
	Road Miles	**Percent**
One-way Streets	**133**	**37**
1 Lane	27	8
2 Lanes	100	28
2+ Lanes	6	2
Two-way Streets	**224**	**63**
2 Lanes total, 1 in each direction	201	56
3 to 4 Lanes total	16	4
5 or more total Lanes	7	2
Grand Total	**357**	**100%**

EXISTING BICYCLE DEMAND

BIKENewark examined existing data resources for existing non-motorized travel, including data from the bicycle and e-scooter share service providers (VEO X BIRD) to identify areas that currently experience significant measured demand for non-motorized (bike and e-scooter) travel. These resources include three years of data for the period 2021-2023.[xiii]

These locations with high existing demand are prime candidates for new designated bicycle facilities, with the potential to make these trips, safer, more convenient, and more accessible.

The existing demand data were combined with the existing LTS assessment of Newark's streets, to present a combined appraisal of both demand and stress level (see Figure 18 and Figure 19); these data indicate that the majority of the existing non-motorized travel in Newark experience high traffic-stress conditions.

Existing demand for non-motorized travel modes was recorded across the city, in all five wards, and was highest in the Ironbound and the downtown area that includes the universities, city and county government, principal office towers, and many of Newark's principal destinations and everyday activity generators.

Although overall bicycle demand was spread across a wider geographic area than of e-scooters, the overall bicycle demand numbers were lower. This is consistent with data from Asbury Park, for example, which found that bike trips were longer, but smaller in number, and that scooter use was higher overall, and for shorter average trip lengths than those made by bicycle.

The highest demand levels were recorded along Newark's principal streets, most of which are high stress (LTS 3 and 4). These include Market Street, Broad Street, Ferry Street, Bloomfield Avenue (CR 506), Park Avenue, Springfield Avenue (CR 603), Broadway (CR 667), Raymond Boulevard, Central Avenue (CR 508), Bergen Street, and Irvine Turner Boulevard/Norfolk Street/Clifton Avenue.

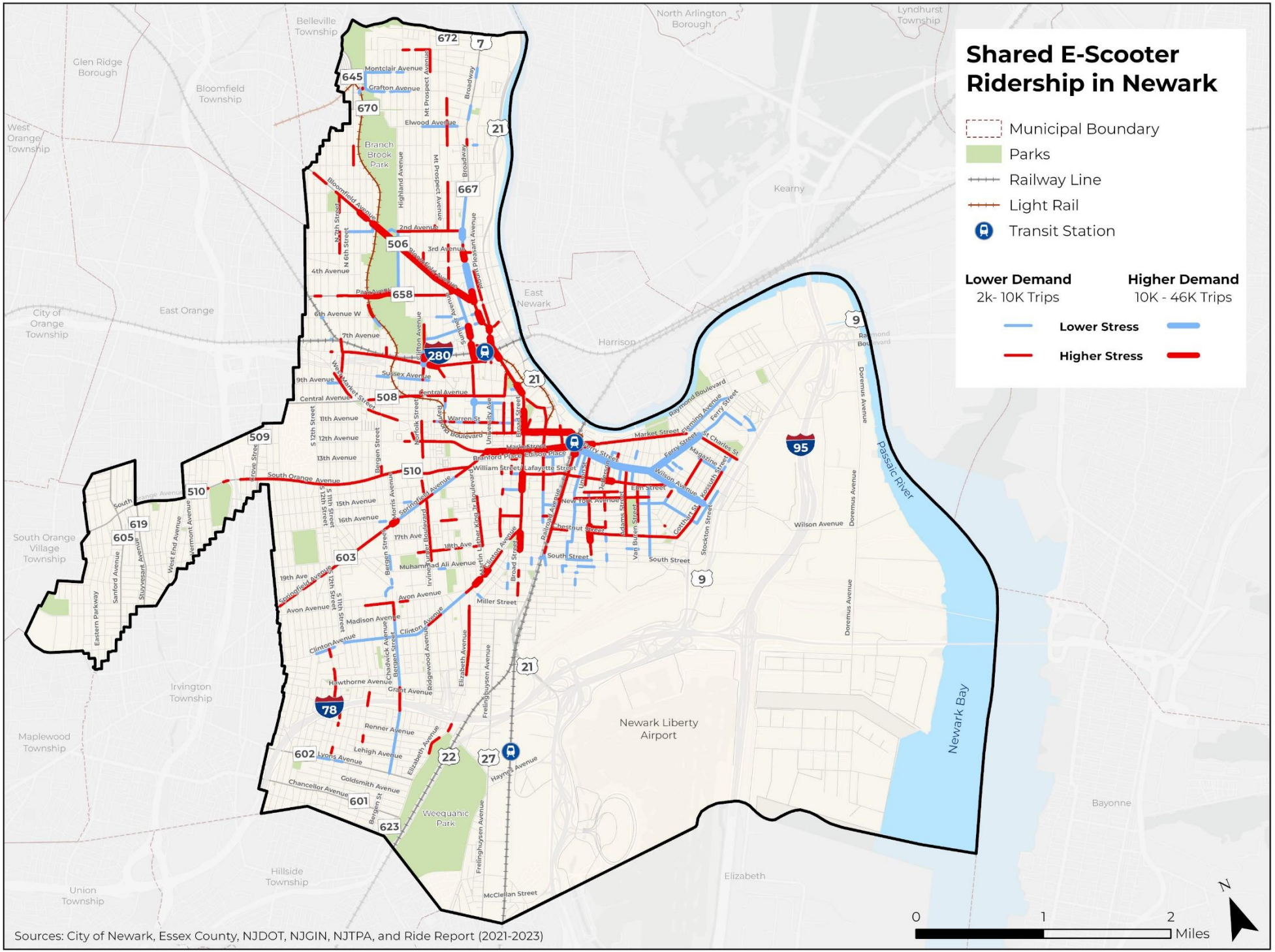


Figure 18. Shared E-Scooter Ridership Demand and LTS

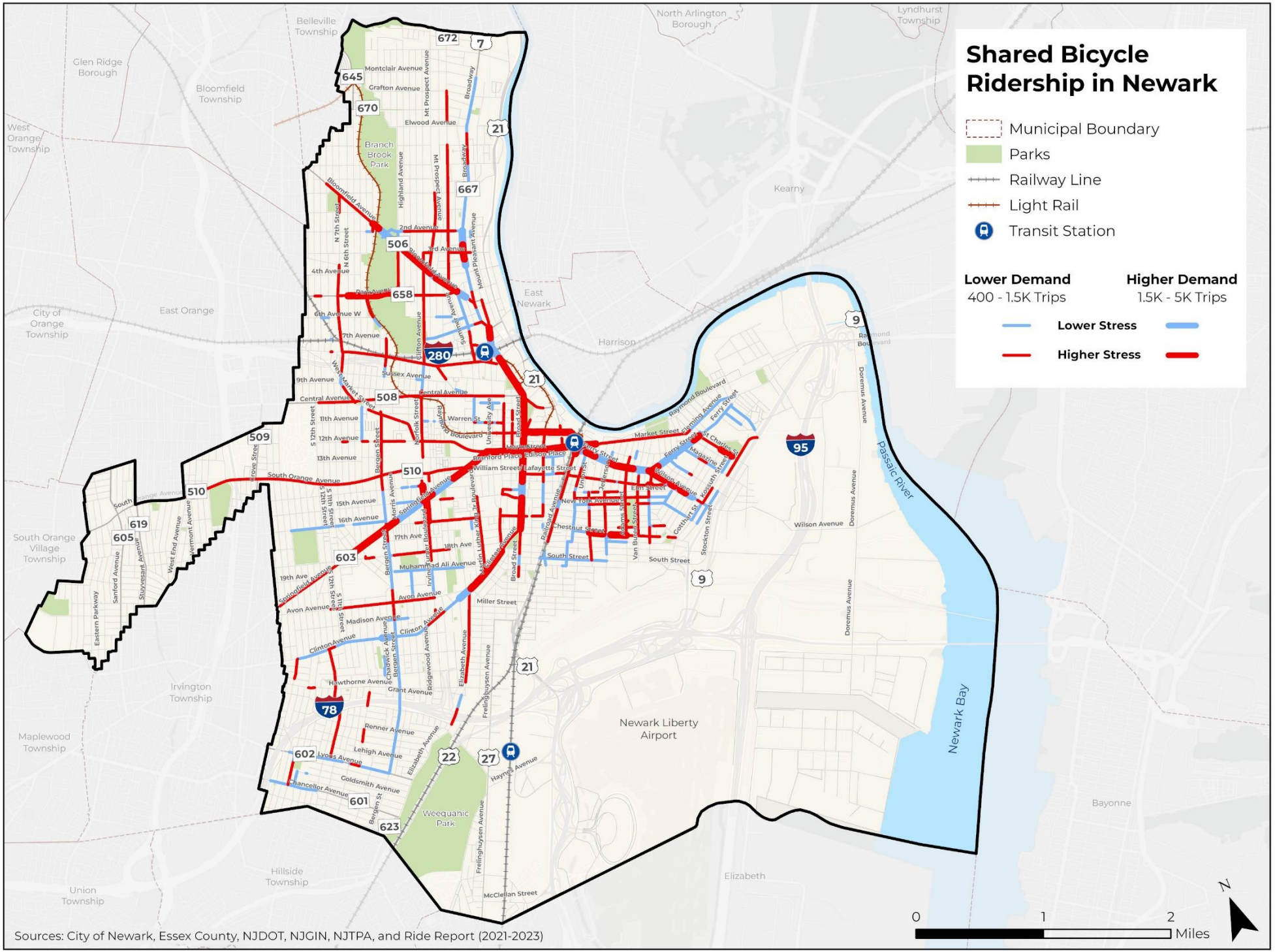


Figure 19. Shared Bicycle Ridership Demand and LTS

POTENTIAL FUTURE BICYCLE DEMAND

The Bicycle Demand Model supplements the existing non-motorized travel demand data to provide a more comprehensive assessment of travel needs in Newark. These future demand data offer a measure of potential or latent demand for bicycle travel by residents, employees, visitors, and customers who are more likely to travel by bicycle if low stress facilities were available.

A variety of factors influence bicycle demand, including where population and job centers are located, presence of key trip generators and destinations, and equity and demographic characteristics. The bicycle demand analysis uses the same methodology as developed for **BIKE**Ironbound , incorporating the most recent data and indicators of potential bicycle demand.

The geographic data resources used for the bicycle demand model (see Table 5) were aggregated at the Census Block Level, and demographic factors were normalized to the block area to account for differences in block sizes. The primary categories include population density, job density, key destinations, and equity factors; each was assigned a weight (percent of total) similar to those established for **BIKE**Ironbound .

Existing demand is highest in the Ironbound, downtown, University areas, more limited and scattered in the North and far South Ward areas, with very little demand in the West Ward. The Potential Future Bicycle Demand heat map (Figure 20) indicates high demand potential across the Central Ward and Ironbound, significant additional demand extending within the North and South Wards, with some low moderate demand in the West Ward.

Table 5. Potential Future Bicycle Demand: Data Resources

Data Resources	Percent of Total
Population Density	**18%**
Job Density	**18%**
Key Destinations	**35%**
Schools	4%
University	7%
Parks	4%
Regional Trails	3%
Commercial	7%
Bus Stops / Bike Share	3%
Train Stations	7%
Equity Factors	**29%**
Under 18	6%
No Car Access	8%
Income <125% Poverty	5%
Bike to Work	5%
Walk or Transit to Work	4%
Grand Total	**100%**

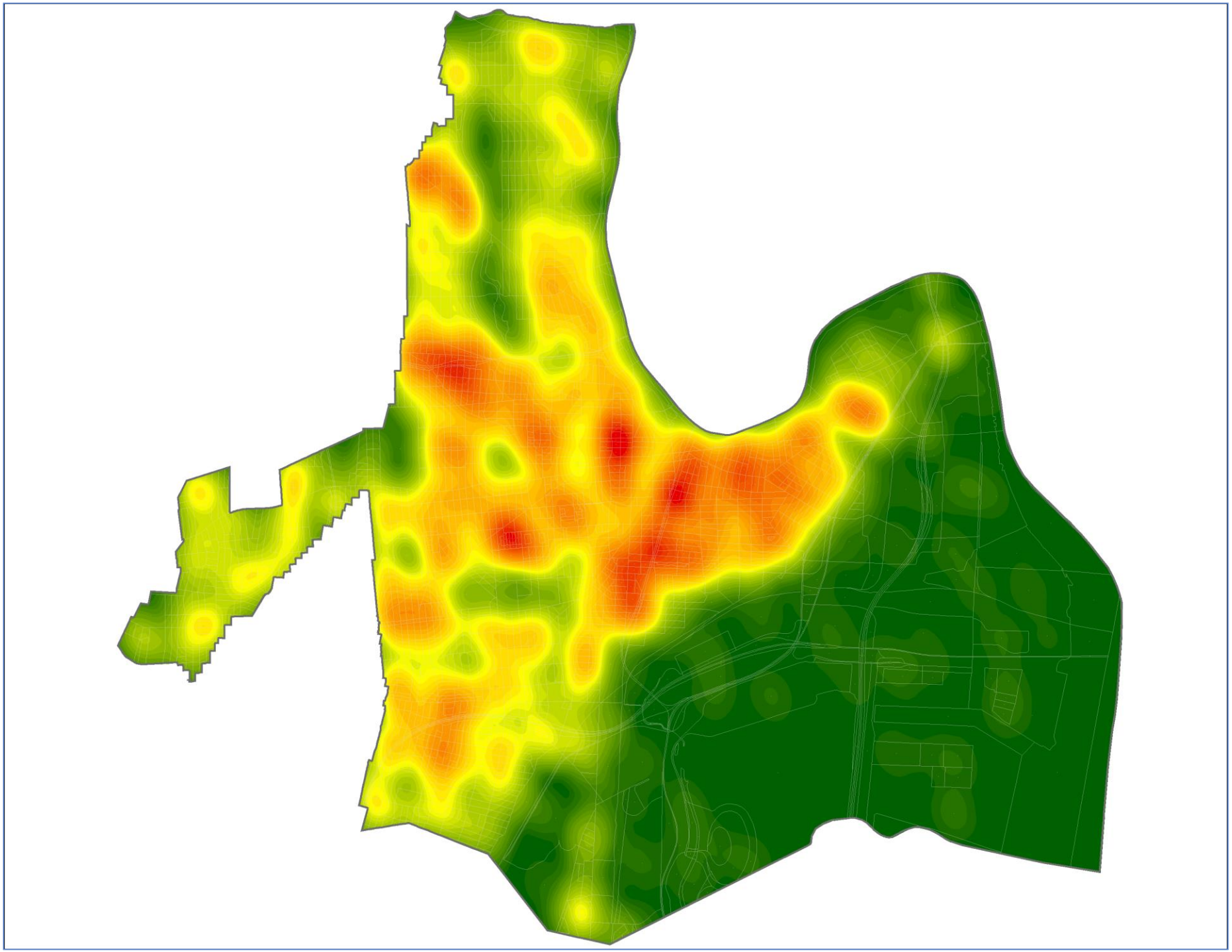


Figure 20. Potential Future Bicycle Demand, City of Newark

BICYCLE FACILITY SELECTION

Bicycle facility selection is a step-by step and iterative process to evaluate and propose potential candidate bicycle improvements for Newark. The goal is to develop a comprehensive, citywide bicycle network that addresses safety and equity considerations; meets bicycle trip making and accessibility needs (existing and potential future demand); enhances local context and neighborhoods; supports local business, dining, and entertainment establishments; incorporates LTS and Island Effect assessment; and that fits within the street cross-sections and available paved right-of-way.

Given the prevalence of high crash occurrence and severity, the preference for separation from moving traffic, persistent vehicle encroachment in bicycle facilities, aggressive driving behaviors, and high travel speeds, BIKENewark emphasizes "protected" bicycle facility designs to make biking safe and accessible, and achieve the potential for Newark to become a successful and sought-after cycling destination.

Developing the citywide bicycle network, began with finding candidate bike routes with significant existing and/or potential future demand, and then adding in shorter bike route segment that link together the individual bike routes, and creating citywide bicycle connectivity.

The methodology for selecting candidate bicycle facilities is a step-by step and iterative process, and conceptualized in Figure 21.

1. **Evaluate Demand:** Starting with the highest demand streets, screen the network one street at a time to identify suitable candidate routes with existing and/or potential future bicycle demand.
2. **Street Suitability & Configuration.** Determine the LTS and Island Effect assessment for each candidate route to evaluate whether they are suitable for safe and accessible biking, and calculate if the street is wide enough to accommodate a dedicated bicycle facility.

   If the street is not suitable for safe and accessible biking, is there a parallel or nearby alternative?
3. **Implementation Considerations.** Select the appropriate facility type, and determine if any changes would be needed to fit a bicycle facility. For example, would a Road Diet or removal of parking free up enough space to fit a dedicated bicycle facility?
4. **Fill-in the Gaps.** Repeat the process to identify additional candidate streets that interconnect the individual bike routes and provide connectivity within and across Newark's neighborhoods and wards, to create the citywide bicycle network.

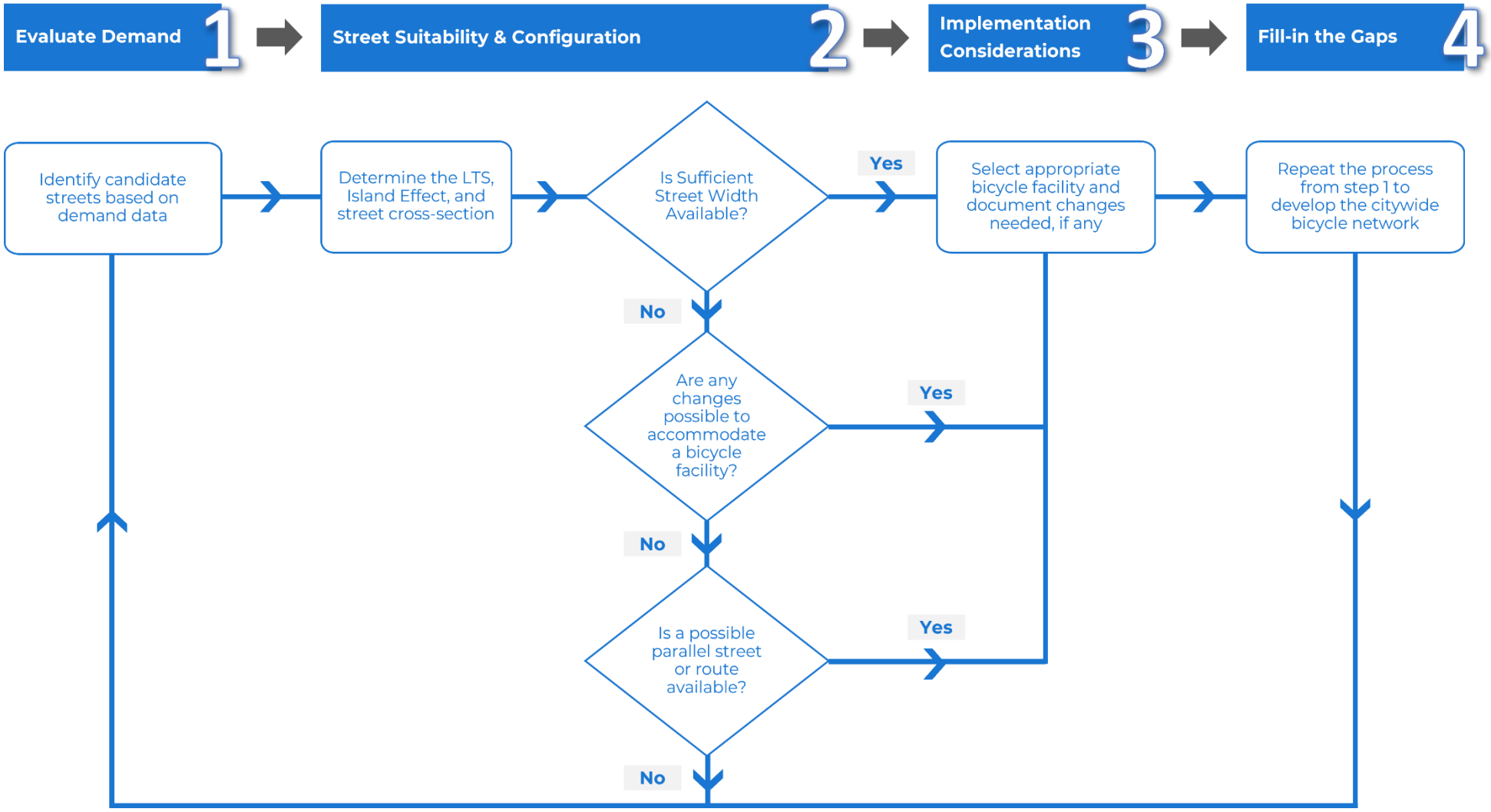


Figure 21. Methodology for Selecting Candidate Bicycle Facilities

The following guidelines were used to evaluate bicycle facility need and feasibility (see Appendix B: Newark Bicycle Facility Design Guide, for additional details, dimensions, and visualizations):

- **Protected Two-Way Bicycle Lanes** are physically separated from moving traffic and provide exclusive space for bicycle movement in both directions along one side of the road and protected from vehicle encroachment to prevent double-parking. The protected design improves safety and is desirable for bicyclists of all levels and ages.

  Typical Dimensions: 12 ft. preferred, 10 ft. minimum, with protected buffer (3 ft preferred).

- **Protected One-Way Bicycle Lanes** share many of the same design characteristics as protected two-way bicycle lanes, but with separate one-way bicycle lanes on each side of the street.

  Typical Dimensions: 6 ft. preferred, 5 ft. minimum, with protected buffer (3 ft preferred) in each direction.

- **Bicycle Boulevards** are intended to create a travel environment that prioritizes mobility for vulnerable roadway users (pedestrians, cyclists, transit portions, etc.) These streets are generally too narrow to accommodate Standard or Protected Bicycle Lanes. Bicycle Boulevard treatments are recommended primarily for neighborhood zones and short street segments characterized by lower traffic volumes and prevailing speeds. Traffic calming is integral to the Bicycle Boulevard, and the posted speed limit should be lowered to 20 mph.
- **Standard Bicycle Lanes** provide no physical separation from vehicle encroachment, double-parking, or "dooring" incidents and therefore no reduction in LTS.

  Typical Dimensions: 5 ft. minimum with no buffer.

BICYCLE FACILITY SELECTION EXAMPLES

The following examples present a series of different scenarios for application of this process: screening candidate locations for bike facilities, evaluating demand suitability, and identifying suitable candidate bike facilities for implementation.

MARKET STREET (CENTRAL WARD-DOWNTOWN)

Market Street in downtown Newark hosts the types of activities and destinations that are highly desirable to those who travel by foot and bicycle and is the highest existing bicycle demand street in Newark. However, it also attracts high traffic volumes, has numerous bus routes and bus stops, and is among the widest streets in the city, resulting in significant safety concerns and bicycle-vehicle interactions.

As such, Market Street is LTS 4 and is a significant barrier to safe and accessible bicycle travel. There are no practical changes that can be made to Market Street to mitigate these many deficiencies, and very limited feasibility to implement a Road Diet or other changes to accommodate a dedicated bicycle facility.

However, just one block south is a series of smaller, low traffic volume, interconnected streets that provide a suitable and lower-stress alternative that can meet similar needs while still connecting to the area's principal destinations, amenities, and Newark Penn Station. The combination of the parallel streets of Branford Place, Edison Place, and Ailing Street can accommodate a continuous Protected 2-way Bike Lane facility, connecting Springfield Avenue through to Newark Penn Station by removing one travel lane, removing parking in several locations, and converting one block of Edison Place from two-way to one-way configuration. No roadway widening is required.

Ferry Street (East Ward-Ironbound)

Ferry Street in Newark's Ironbound neighborhood is a one-of-a-kind, marquee destination, attracting visitors and residents alike to its unique blend of local dining, shopping, and entertainment establishments. Similar to downtown Newark's Market Street. Ferry Street in the Ironbound is also among Newark's highest existing and potential future biking demand locations.

Unlike Market Street, however, Ferry is low-stress (LTS 2) and features significant traffic calming and safety improvements. But at just 40 feet wide and with on-street parking considered essential to local business success, Ferry has no available right-of-way to accommodate a dedicated bike facility.

Suitable alternatives, are however located nearby and adjacent to Ferry Street, including Raymond Boulevard, Market Street, and Lafayette Street; candidate bike facilities are proposed for each.

Mt. Prospect Avenue (North Ward)

Mt. Prospect Avenue in the North Ward presents the opportunity to create one of Newark's longest continuous bike facilities at almost two miles long between the municipal boundary with Belleville south and Bloomfield Avenue.

Mt. Prospect currently has Standard (unprotected) Bike Lanes along a portion of its alignment. It is rich in connectivity and affords access to the Greenway multiuse trail, Belleville Park, Branch Brook Park, numerous residential areas, and a variety of local small businesses and amenities. Mt. Prospect attracts both existing and potential future biking demand, but its high stress condition (LTS 3) is a barrier to local and regional bike mobility.

BIKENewark proposes a variety of candidate bicycle facilities, each based on local context and roadway cross-section, and all fitting within the available right-of-way, with the goal of minimizing disruption of the existing roadway cross-sections. The candidate facilities include Bicycle Boulevard, Protected Bike Lane(s), Conversion of Standard Bike Lanes to Protected configuration, and Standard Bike Lane(s) with no buffer or protection in some limited locations.

Frelinghuysen Avenue (NJ Route 27)

Located in Newark's South Ward, Frelinghuysen Avenue is a state-owned roadway (NJ 27), parallel to, and on the western edge of, the Northeast Corridor Rail Line. Frelinghuysen Avenue provides the potential for excellent bicycle access throughout the South Ward and also connects downtown Newark to the North and East Wards.

Frelinghuysen Avenue connects to several proposed bicycle facilities, including on Broad Street, McClellan Street, Meeker Avenue, Miller Street, and others; and to Weequahic Park, Newark International Airport, the City of Elizabeth, and other key destinations.

Frelinghuysen Avenue however is high stress (LTS 3 and 4) due to its wide cross section (4 lanes with on-street parking), high traffic volumes, and turning movements. It has low existing demand but significant future potential to improve safety and enhance the connectivity and reach of Newark's bicycle network. Much of Weequahic and South Ward are Underserved Communities.

Despite its wide cross section, Frelinghuysen Avenue lacks sufficient width to accommodate a dedicated bicycle facility. However, converting its 4 lanes to a road diet configuration can provide sufficient area to install Protected 1-way bike lanes from Virginia Street to Pointer Street by removing one travel lane. At a distance of 2.35 miles, the proposed Frelinghuysen Avenue; these Protected 1-way bike lanes on would be among the longest and most significant bicycle facilities in Newark.

Adams Street (East Ward-Ironbound)

Located adjacent to Independence Park in the East Ward, Adams Street is one-way and one-lane northbound and provides connectivity across the Ironbound and its residential neighborhoods from South Street to Market Street, crosses Ferry Street, and terminates adjacent to Newark Riverfront Park and Riverbank Park. Adams Street connects to existing and proposed bicycle facilities on South Street, Chestnut Street, New York Avenue, Lafayette Street, Ferry Street, Market Street, and Raymond Boulevard.

Due to its location, access to destinations, amenities, and residential density, Adams Street has moderate existing demand and high future demand potential. Adams Street was one of the first locations recommended by **BIKE**Ironbound to have bike lanes installed, a project completed in 2016 with Standard Bike Lane design. However the Adams Street bike lane is not a Protected design and as such remains high stress at LTS 3, due to frequent vehicle encroachment and illegal -parking in the bike lane area.

BIKENewark proposes converting the Standard Bike Lane to Protected 1-way design. This change can be accommodated within the existing right-of-way and retains the existing travel lane and parking The proposed Protected 1-way Bike Lanes design lowers the high stress condition (LTS 3) to low stress (LTS 2) with no detriment to traffic flow, operations, or parking capacity.

LTS BENEFITS OF DEDICATED BICYCLE FACILITIES

For a bicycle network to attract the highest use possible, it must provide safe and accessible low-stress connectivity, defined as "providing routes between people's origins and destinations that do not require cyclists to use [streets] that exceed their tolerance for traffic stress." [xiv] This concept is consistent with the low-street (LTS 1+2) bicycle network.

Without significant traffic calming features and lowering travel speeds to 20 mph or less, a bicycle facility that is not fully protected from moving traffic and vehicle encroachment provided minimal improvement to bicycle safety. Based on this assessment, BIKENewark applies the following framework to assess the benefits of the candidate bicycle facilities.

Shared Use Path: LTS = 1

- Assumes the path has full separation from traffic, off-street alignment, and an independent right-of-way.

Protected Bike Lanes (parking or raised median) = LTS 2

- Given Newark's traffic volumes, prevailing travel speeds of at least 30 mph, and frequent conflicts with turning vehicles, Protected Bike Lanes (with protection provided by parking or raised median) are assumed to reduce the stress level to LTS 2.

Protected Bike Lanes (flexible delineator or bollard) = reduce LTS by 1 (but not less than LTS 2)

- Protected Bike Lanes (with protection provided by flexible delineator or bollard) reduce the stress level but to a lesser degree than the protection provided by parking or raised median. The effective LTS is reduced by one level but not lower than LTS 2.

Bicycle Boulevard (20 mph): LTS 2

- Given Newark's dense urban environment and complex street network, the Bicycle Boulevard reduces traffic stress to LTS 2 but not lower, when supported by traffic calming, appropriate signs, and a posted speed limit lowered to 20 mph.

Standard Bike Lanes: No Improvement in LTS

- Based on Newark's existing bike facilities being frequently blocked by illegally parked vehicles and prevailing speeds of at least 30 mph, the Standard Bike Lane is effectively similar to "biking in mixed traffic" and, therefore, considered to provide no benefit in terms of reducing the prevailing LTS level.

Buffered Bike Lanes: No Improvement in LTS

- Although some additional buffer area is provided, these facilities are effectively similar to Standard Bike Lanes due to the constraining factors of being frequently blocked and exposure to prevailing speeds of at least 30 mph. Buffered Bike Lanes are, therefore, assumed to provide no reduction in the prevailing LTS.

BIKENewark PROPOSED BICYCLE NETWORK

Application of the BIKENewark bicycle facility selection process identified 74 miles of proposed new bicycle facilities for the City of Newark, an eight-fold increase in network extent and reach compared to existing conditions. The majority of these proposed bicycle facilities feature protected designs. The proposed bicycle network improves bicycle safety, access, and mobility, emphasizes equity and the needs of underserved communities, and fulfills the BIKENewark vision and goals.

BIKENewark proposes 36 new miles of Protected 1-Way Bike Lanes, 15 miles of Protected 2-Way Bike Lanes, and 17 miles of Bicycle Boulevards. In a limited number of cases, candidate bicycle facilities require additional study. These locations are indicated as “Potential“ and include portions of South Orange Avenue, 18th Avenue, Norfolk Street, Wilson Avenue, and others. “Potential” bicycle facilities are recommended for additional study separate from this Plan to evaluate feasibility, constructability, and related issues.

Details of the proposed bicycle network are documented in Table 6 and Figure 22. A full BIKENewark implementation matrix is provided in Appendix A. The implementation matrix documents each proposed bicycle facility, including roadway jurisdiction, street name and limits, the proposed recommendation, project purpose and need, considerations for implementation, and implementation time frame.

Implementation time frames (estimated) are:

- Short Term: 1-3 years
- Medium Term: 4-5 Years
- Long Term: 6 or more years

All proposed bike routes will require further analysis, whether they are on city-, county-, or state-owned roadways. Furthermore, in collaboration with Essex County, the candidate bike routes along County roadways will require further study and analysis prior to authorization for construction.

The bicycle network is presented in three groups, based on current known status and feasibility issues

- Existing – includes all existing bicycle infrastructure in the City of Newark plus projects that are approved for construction, including the 1.3 mile section of “The Greenway” in Branch Brook Park in the North Ward
- Proposed – all “Proposed” bicycle improvements fit within the existing roadway width. Each, however, would still be subject to further review by the roadway owner.
- Potential – Future bicycle network additions labeled as “Potential” provide some measurable benefit to biking in Newark, but require additional study beyond the scope of this plan to determine feasibility.

Table 6. Summary of Existing and Proposed Bicycle Facilities

	Bicycle Facility Miles
Total Existing Facilities	**13.4 miles (10.1 miles on-street)**
Shared Use Paths	3.3
Bike Lanes	6.7
Sharrows	3.4
Total Proposed Facilities	**74 miles (on-street)**
Shared Use Paths	0.0
Protected 2-way Bike Lanes	15
Protected 1-way Bike Lanes	36
Bicycle Boulevard	17
Standard Bike Lanes	6
Sharrows	1
Total Existing + Proposed Facilities	**87.4 miles (on-street)**
Potential (needs detailed study to determine feasibility)	15
Total Existing + Proposed + Potential Facilities	**102.4 miles (on-street)**

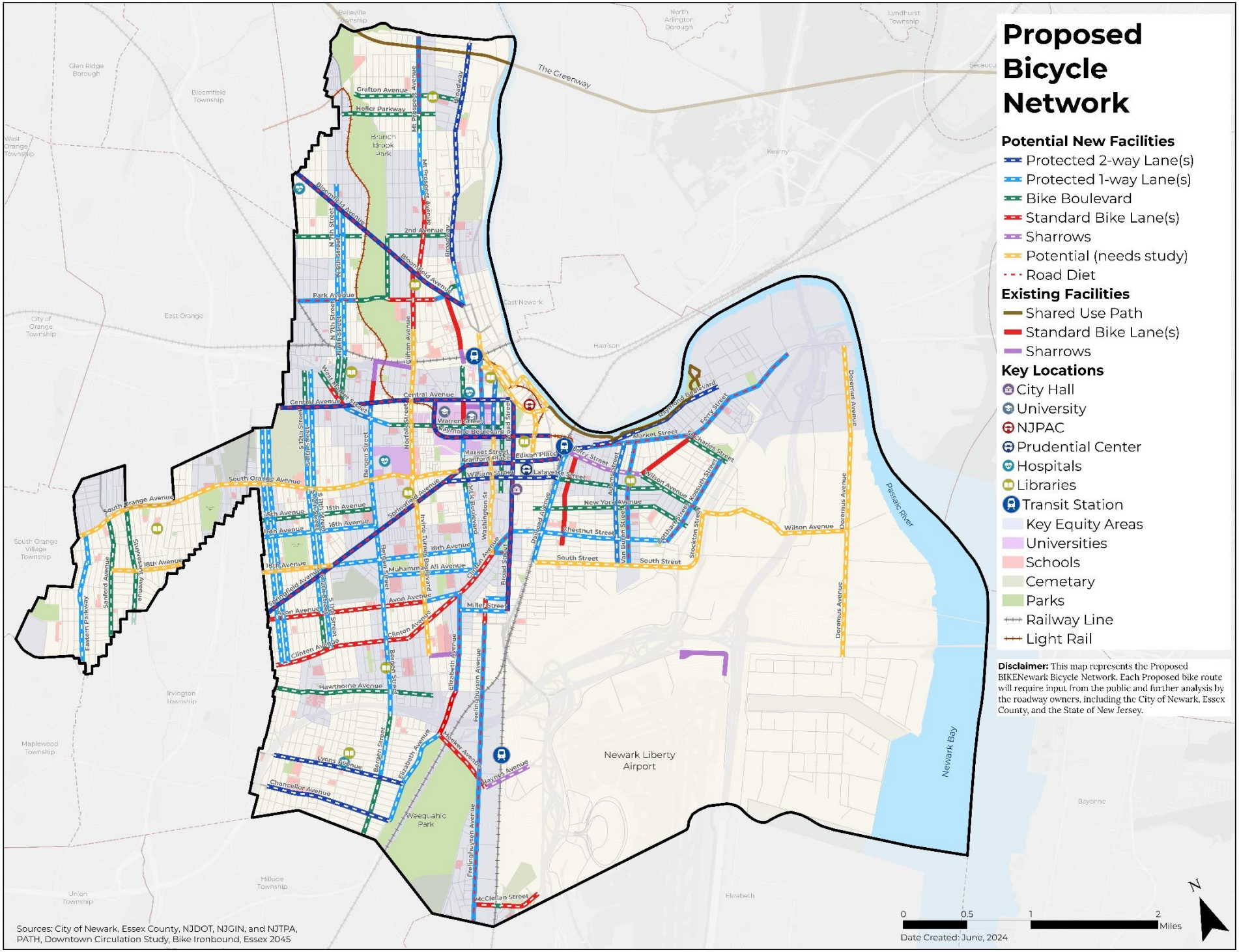


Figure 22. Proposed BIKENewark Bicycle Network

5. SUPPORTING POLICIES, PLANS, AND STRATEGIES

Experiences of cities and towns across New Jersey and the U.S. demonstrate that new bike facilities, signing, and striping alone are not enough to achieve the ambitious bicycle safety and mobility goals of BIKENewark, **BIKE**Ironbound, and Newark360. The city must also address affordability, rethink the use of its streets, and build concepts of slower speeds, and safer travel behaviors into each street, neighborhood, new development and redevelopment project, and across all five city wards.

BIKENewark is therefore structured as a living plan with a diverse and innovative program of recommended improvements, policies, community events, and education and safety initiatives to be developed, designed. funded, and implemented over the coming years. It is recommended that Newark evaluate progress of plan implementation and attainment of the vision and goals on a yearly basis.

Supporting policies, plans and strategies include

- Make travel by bike more affordable and accessible
- Leverage Newark's SS4A Grant opportunities
- Plan and Conduct Safe Routes to Healthy Foods Demonstration Project
- Expand safe and accessible bicycle parking
- Improve parking utilization and safety enforcement
- Implement Vision Zero Action Plan and Complete Streets Framework
- Conduct Safe Routes To School and Roadway Safety Audits

Make Travel by Bike More Affordable and Accessible, Especially for Newark's Underserved Communities and Vulnerable Road Users

Launched in 2021, NewarkGo, the city's electric bike and scooter share pilot program has been successful in providing an alternative, convenient, and environmentally friendly travel mode for Newark residents. For many, however, cost and access continue to be of reach. Affordability of micromobility, in particular, is frequently noted by plan participants and stakeholders. Priority actions to address cost and accessibility include:

- Evaluate affordability and equity considerations to improve access for daily mobility and travel needs
- Evaluate grant opportunities to subsidize and reduce costs
- Increase awareness and promotion of micromobility share services
- Align bike and scooter share hubs and docking locations with bicycle facilities and new housing as they are built
- Promote education of safe riding behaviors
- Conduct Bike Safety Rodeos, and free helmet and bike light promotions

Leverage Newark's SS4A Grant for Bicycle Lanes and Demonstration Project Opportunities

Newark was recently awarded an SS4A (Safe Streets 4 All) Grant by the Federal Highway Administration.
The grant includes opportunities to refine the bicycle recommendations towards implementation. This refinement may include additional engineering evaluations. Development of the safety action plan development process includes a stakeholder and public input process, with opportunities for additional input on BIKENewark recommendations.

Priority actions include:

- Conduct Road Safety Audits at high crash occurrence and high crash severity hot spots
- Implement demonstration projects and pop-up events to test and promote innovative roadway design concepts
- Develop temporary bike lanes, bike parking, road diets, traffic medians, bulb-outs, curb extensions, crossings
- Provide funding for new and upgraded traffic signal and pedestrian beacon installations

Plan and Conduct Safe Routes to Healthy Foods Demonstration Project Event at Halsey Street

Working with a diversity of Newark community organizations develop and conduct an Open Streets Demonstration Project at Halsey Street to promote wellness, healthy eating and life styles, biking and walking, and featuring local eateries, small businesses, artists, and vendors.

- Family-friendly community event with demonstration project activities
- Open Streets traffic-free event to prioritize pedestrian and bicycle travel
- Farmers market featuring fresh, locally-grown foods
- Sustainable gardening, landscaping, and green infrastructure
- Bicycle Rodeo and safety training with helmet fitting, bicycle safety checks, and bike safety skills and group riding events
- "*Design Your Street*" interactive activity for community-led design of safe, multimodal Newark community streets and bicycle facilities
- Local eateries, foods truck, and arts and crafts vendors
- Safe and securing bicycle parking areas provided free-of-charge on site to encourage riding to event instead of driving

Expand safe, secure, and accessible parking and storage for bicycles and scooters

Multi-element approach to provide safe and accessible bicycle parking across Newark. Priority actions include:

- Review and update zoning including requirements for bicycle parking at new housing, offices, and community facilities including libraries and schools
- Expand availability municipal-sponsored bicycle parking across all five Newark wards, prioritizing residential areas, large offices, destinations and amenities
- Explore commercial vendor bike locker programs (e.g. Jersey City Oonee Pod Program)

Improve parking utilization and enforcement of bike lane encroachment

- Develop and implement standards for restaurant loading zones to benefit local business to provide more efficient use of on-street parking capacity
- Enhance enforcement of vehicle parking and encroachment in bike facilities to improve safety and utilization of dedicated bicycle facilities

Build on successes and recommendations from recent plans including Newark 360, Essex 2045, BIKEIronbound, Newark Downtown Circulation Improvement Study, and others

Recent plans and studies for Newark and Essex County consistently recommend a core program of supporting policies and actions. Priority actions include:

- Implement a Vision Zero and Complete Streets Framework
- Road Safety Audits at high crash occurrence and high crash severity hot spots
- Continue to apply for Safe Route to School grants
- Expand on Essex 2045 Road Diet assessment to advance additional Road Diet needed to implement candidate bicycle facilities

Seek to provide multimodal accommodations on all regional bridge connections, including those to neighboring Harrison, East Newark, Kearny, and North Arlington

Safe multimodal connections to all neighboring municipalities are essential to creating safe, accessible, and equitable connectivity, both across bridges and to adjoining municipalities, destinations, and amenities.

SAFE ROUTES TO SCHOOL (SRTS)

SRTS is an FHWA-funded program that promotes walking and bicycling to school through infrastructure improvements, enforcement, education, and incentives to encourage walking and bicycling to school.

Recent School Travel Plan locations in Newark include both standard multimodal SRTS safety improvements and a variety of supporting actions and initiatives: maintenance of nearby abandoned properties; annual safety presentation for students and parents; and traffic safety improvements to nearby state and county roadways.

Recent School Travel Plan locations include:

- Camden Street Elementary School
- McKinley Elementary School
- Hawkins Street Elementary School
- Sussex Avenue Renew School
- Thirteenth Avenue School

Many BIKENewark bicycle facility recommendations are located near Newark schools. Future SRTS grant applications can be used to fund bicycle infrastructure projects to provide safe access to city schools. Newark's SS4A Plan also includes additional SRTS School Travel Plans as priority actions.

ROADWAY SAFETY AUDITS (RSA)

The FHWA-funded RSA program consists of a structured safety performance assessment of a roadway and a report focused on potential road safety issues and opportunities to improve safety

Both of these recent Newark RSAs included bicycle safety and bicycle infrastructure elements. Newarks360 also recommends that Road Safety Audits (RSAs) at high crash intersections on a regular basis, as well as at intersections that are identified as unsafe by communities. Newark's SS4A grant also includes RSAs grants as priority actions.

Recent Road Safety Audits in Newark include:

FERRY STREET FROM MERCHANT STREET TO MARKET STREET/LEXINGTON STREET

- Recommendations included installing bike lanes and bicycle parking, planting trees, repairing pavement, installing curb extensions, and installing speed tables.

CLINTON AVENUE BETWEEN 11TH STREET AND 20TH STREET

- Recommendations included installing traffic calming measures, examining bicycle-safe grates, and installing speed feedback signs.

VISION ZERO ACTION PLAN

Vision Zero is an approach to transportation planning and engineering that makes protecting human life on roadways the highest priority. The need for a City Newark Vision Zero Action Plan is based on the strategic emphasis on both equity and safety

From its earliest origins in Sweden, the Vision Zero movement has been dedicated to the idea that crashes are not accidents – they can be prevented through better roadway design and safer behaviors among all road users.[xv]

Vision Zero focuses strategic action where it is most needed with the goal of eliminating transportation-related fatalities and severe injuries.

This approach has proven effective in nearby Hoboken which achieved the Vision Zero goal of no traffic fatalities for four consecutive years from 2019-2022 through the Hoboken Vision Zero Action Plan.[xvi]

VISION ZERO PRIORITIES FOR NEWARK INCLUDE

- Create 20 MPH residential speed zones to slow traffic and create safe, walkable, neighborhoods and downtowns
- Prioritize targeted use of "No Turn on Red" at intersections
- Develop citywide street design templates based on context to align road design with local use and context rather than emphasizing traffic flow through vehicle throughput
- Adopt Complete Streets, traffic calming, and Green Infrastructure as standard design elements
- Integrate Crime Prevention through Environmental Design (CPTED) approach into planning and design standards to create safe and accessible communities

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