Bicycle and Pedestrian Access Study

Irvington | Madison | Red Bank | Rutherford | Summit | Woodbridge

Irvington Bus Terminal

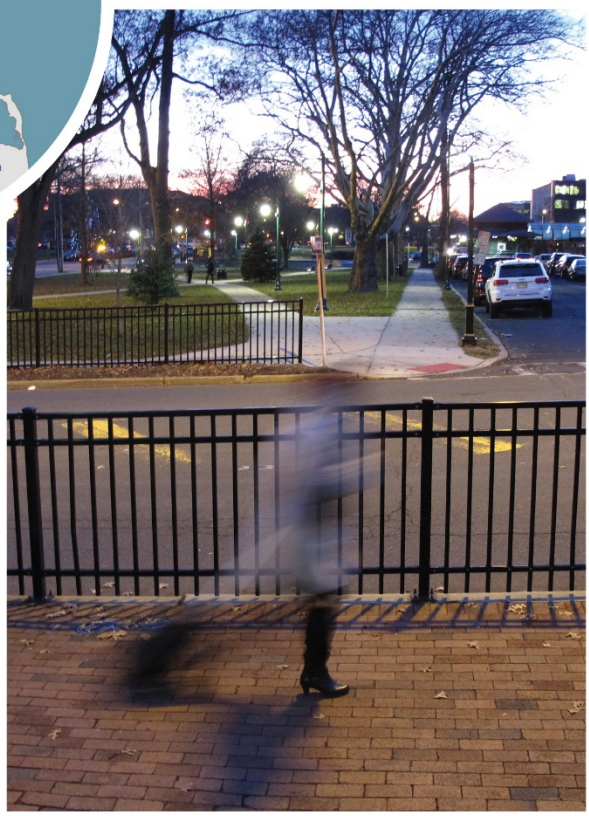
Madison Train Station

Red Bank Train Station

Rutherford Train Station

Summit Train Station

Woodbridge Train Station



NV5 | 4WARD PLANNING

FINAL REPORT
JUNE 2018

NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

NJTRANSIT
The Way To Go.

Prepared for NJ TRANSIT

Funded by North Jersey Transportation Planning Authority, Inc.

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Abstract:

The purpose of this study is to evaluate six NJ TRANSIT stations within the NJTPA region, and identify and address the most basic barriers limiting pedestrian and bicycle access to transit stations. This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement "low-hanging fruit" improvements that can be accomplished quickly and inexpensively. Each design concept also includes recommendations for implementation, phasing, and funding sources.

The findings of this study have been discussed and reviewed with local municipal officials and have been presented for public comment at a Public Information Center that was hosted at each station location.

Bicycle and Pedestrian Access Study

Irvington | Madison | Red Bank | Rutherford | Summit | Woodbridge

Contents

The Study Overview Report presents the purpose, goals, study area, and methodology of the overall study. The overview report establishes connections between growing trends of bicycle and pedestrian travel, transit station access, the benefits of Complete Streets implementation, and typical design recommendations and best practices that make for low-cost, effective improvements.

The Station Reports provide an individual assessment and set of recommendations for each of the six station areas. Each Station Report includes:

- *Overview, Context, and Background Data;*
- *Existing Conditions Field Assessment and Photo Log;*
- *Opportunities and Constraints Analysis with Maps;*
- *General Recommendations; Design Concepts, Cost Estimates, Phasing, and Funding Sources;*
- *Appendix (Traffic Counts, Cross Sections, Meeting/Public Input Records).*

Bicycle and Pedestrian Access Study

Irvington | Madison | Red Bank | Rutherford | Summit | Woodbridge

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NJTRANSIT The Way To Go.

Bicycle and Pedestrian Access Study

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EXECUTIVE SUMMARY

The NJ TRANSIT Bicycle and Pedestrian Access Study analyzes six NJ TRANSIT stations within the NJTPA region and identifies the most basic barriers limiting pedestrian and bicycle access to transit stations. The study provides design concepts to address bicycle and pedestrian barriers, improve "bikeability," and "walkability," and adhere to or upgrade existing facilities to meet ADA design guidelines. The ultimate goal of the study is to increase bicycling and walking trips to these six transit stations, thereby reducing traffic congestion at and around stations, reducing demand on station area parking supplies, and creating more vibrant communities.

This study emphasizes bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement the "low hanging fruit" that can be accomplished quickly and inexpensively. The most common recommendations include improved crosswalk visibility, upgraded pedestrian ramps for ADA compliance (full replacement or installation of tactile strips where missing), and bicycle facilities such as bicycle lanes, bicycle boulevards, covered bicycle parking and off-road connections, where feasible. At high conflict locations, Rectangular Rapid Flash Beacons and curb extensions were considered.

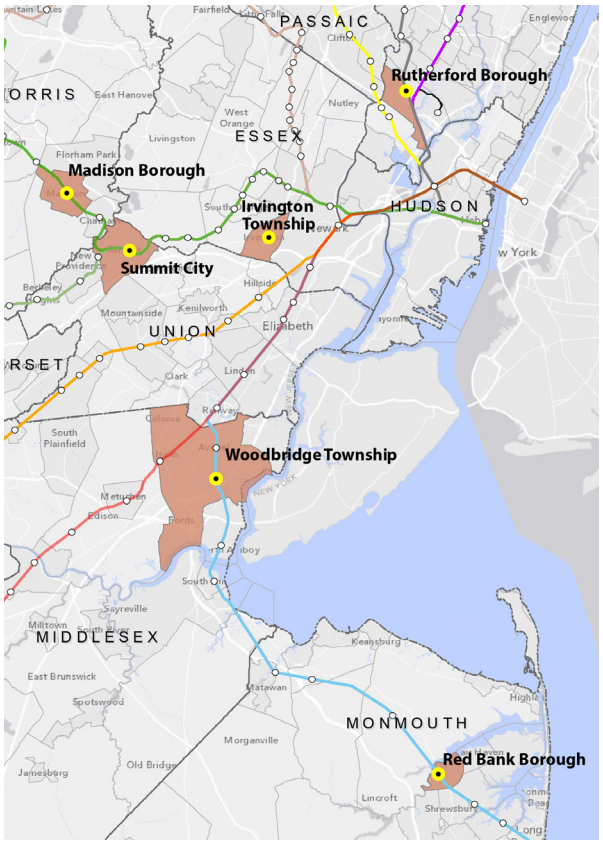
The Purpose of the Bicycle & Pedestrian Access Study

- Evaluate "walkability" within a 3/4-mile radius of six NJ TRANSIT stations;
- Evaluate "bikeability" within a 2-mile radius of six NJ TRANSIT stations;
- Provide design concepts (with cost estimates) to address field-observed deficiencies related to bicycle and pedestrian access;
- Identify reasonable funding sources for design concept implementation for each study area;
- Provide a model for future efforts.

Study Area

This study covers the following six NJ TRANSIT stations:

- **Irvington Bus Terminal,** Irvington Township, Essex County
- **Madison Station**, Borough of Madison, Morris County
- **Red Bank Station**, Borough of Red Bank, Monmouth County
- **Rutherford Station**, Borough of Rutherford, Bergen County
- **Summit Station**, City of Summit, Union County
- **Woodbridge Station**, Woodbridge Township, Middlesex County



Map of study area locations

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Typical Recommendations

This study provides municipalities with general guidance, "best practice" information, and design concepts for basic, readily-implementable bicycle and pedestrian facilities and accommodations. The design concepts have been developed with low-cost materials in mind that can be implemented independently or during re-surfacing or re-striping projects. These typically low-cost solutions include:

- Crosswalk Design
- Curb Ramp Design
- On-Street Bicycle Accommodations
- Bicycle Parking
- Curb Extensions
- Intersection Markings
- Lighting
- Rectangular Rapid Flash Beacons (RRFBs)

Many of the concepts in this study have the potential to be deployed as Tactical Urbanism projects, which are design changes implemented to street environments in a "light, quick, cheap," and temporary manner. By showing roadway users – pedestrians, bicyclists, drivers – the design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

High visibility crosswalks with ADA-compliant curb ramps and detectable warning strips

Bicycle facilities and accommodations (bicycle lanes, shared lane markings, bicycle boulevards, bicycle route signage)

Bicycle parking

Curb extensions

Intersection markings

RRFBs

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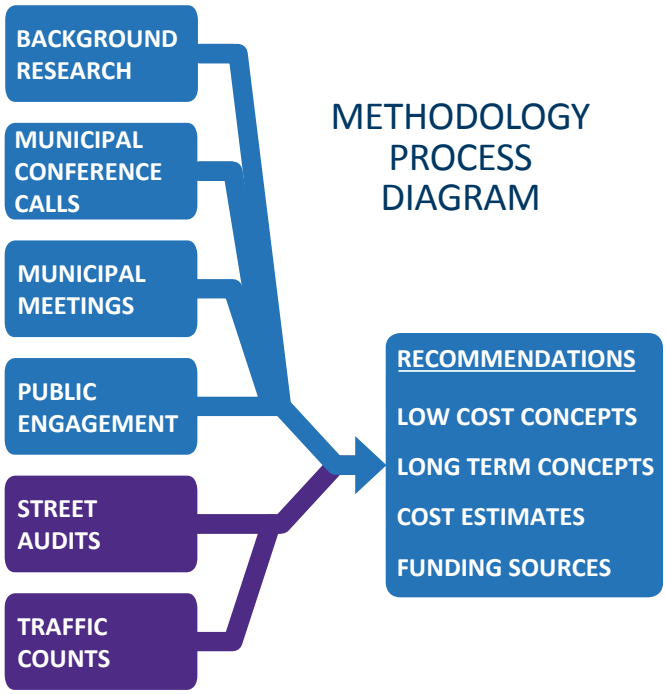
Methodology

This study was designed to identify and formulate improvements to basic barriers that limit bicycle and pedestrian access to six NJ TRANSIT stations. The study was initiated with a meeting of the Technical Advisory Committee (TAC), comprised of agency, county, and municipal representatives. The TAC assisted in identifying project parameters and identifying known barriers to bicycle and pedestrian mobility in the study areas. The subsequent analysis of each station included background research and data collection on each municipality, followed by a conference call between the project team and municipal representatives. After the conference calls, the project team visited each station and the surrounding areas to perform field assessments, including observations and documentation of existing conditions. Based on these visits, preliminary design concepts were developed and discussed with the municipalities. Refinements were then made with input from NJ TRANSIT, the NJTPA, and municipal representatives, and the concepts were presented at Public Information Centers conducted for each station. The finalized design concepts take into account input from all these activities, and are included in each individual Station Report.



Relevant Trends

Relevant trends in demographics and transportation users demonstrate the need both locally and nationally for improved access to transit.

Planning for Equity

- **1/3** ...of Americans do not drive.[1]
- **9%** ...of Black and Hispanic respondents identified transit stations as safe destinations for bicycling.[2]
- **40%** ...of U.S. adult respondents age 50+ indicated that their neighborhood is NOT pedestrian-friendly.[3]

Planning for Multi-Modal Growth

- **23%** ...the decrease in average vehicle miles traveled by people aged 16-34 between 2001 and 2009.[4]
- **12%** ..the decrease in high school seniors with a drivers license.[5]
- **90%** of Baby Boomers...
- **92%** of Generation Xers...
- **77%** of Millennials...

...commute by car.[6]

Sources: (1) *Dangerous by Design*, 2011, Transportation for America; (2) *Understanding Barriers to Bicycle Access & Use in Black and Hispanic Communities in New Jersey*, 2016, Voorhees Transportation Center; (3, 5, 6) *Bicycling & Walking in the United States Benchmarking Report*, 2016, Alliance for Biking and Walking; (4) *Transportation and the New Generation*, 2012, Frontier Group.

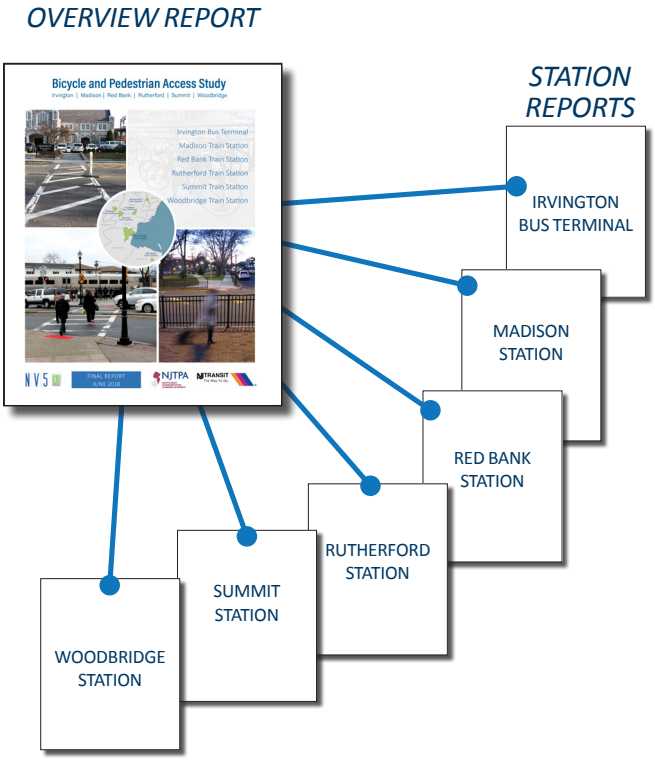
The Framework of the Study

The NJ TRANSIT Bicycle and Pedestrian Access Study is organized into two sections:

Section 1: Study Overview Report presents the purpose, goals, study area, and methodology of the overall study. The overview report establishes connections between growing trends of bicycle and pedestrian travel, transit station access, the benefits of Complete Streets implementation, and typical design recommendations and best practices that make for low-cost, effective improvements.

Section 2: Station Reports provides an individual assessment and set of recommendations for each of the six station areas. Each Station Report includes:

- Overview, Context, and Background Data;
- Existing Conditions Field Assessment and Photo Log;
- Opportunities and Constraints Analysis with Maps;
- General Recommendations; Design Concepts, Cost Estimates, Phasing, and Funding Sources;
- Appendix (Traffic Counts, Cross Sections, Meeting/Public Input Records).



Photos of Public Information Centers conducted as a component of this study

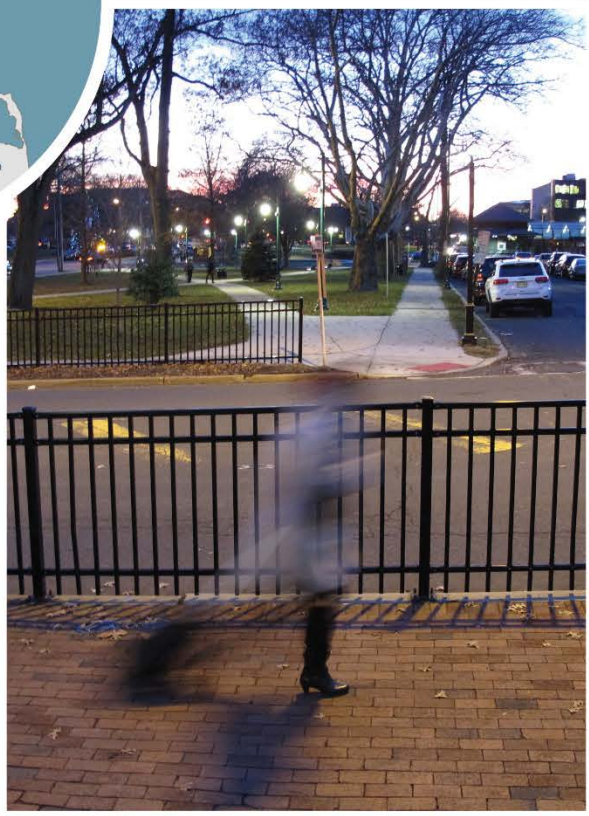
Implementation

The reports for each municipality identify locations where design concepts should be implemented, including specific details about how they should be implemented to enhance bicycling and pedestrian accessibility within the respective station areas. Implementation could involve multiple agencies depending on jurisdiction.

Funding for project implementation will have to be pursued individually by each municipality or in concert with county or state agencies. To guide municipalities, an overview of potential funding sources is provided in the Study Overview Report, and a potential funding source is identified for each design concept in all of the individual Station Reports. Funding will include Federal programs (FAST Act), NJDOT programs (Municipal Aid, SRTS, etc), Municipal funds, Non-profit, or Private funding sources, including local private-sector funding or maintenance partners.

Section 1

Study Overview Report



Bicycle and Pedestrian Access Study

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Study Overview Report Table of Contents

Introduction

Purpose

The focus of this effort has been to identify the most basic barriers limiting pedestrian and bicycle access to transit stations, and to recommend enhancements which address those barriers. Specifically, this study identifies bicycle and pedestrian facilities that municipalities, counties, and/or NJ TRANSIT can implement to meet ADA and multi-modal guidance with actionable design solutions in terms of cost, level of coordination, and time to implementation.

The purpose of the study is to evaluate the "walkability" and "bikeability" of the transportation infrastructure within a 2-mile radius of a transit station. Six stations were chosen within the North Jersey Transportation Planning Association (NJTPA) region from municipalities with adopted Complete Streets policies. Through a partnership between NJ TRANSIT and the NJTPA, this study builds on NJ TRANSIT's *Safe Routes to Transit Pilot Study* (2014) and can be applied to other NJ TRANSIT stations and tailored to the needs of host communities.

A quick analysis of the NJ TRANSIT stations included in this study illustrates the need for bicycle and pedestrian accommodations. The following table compares the number of parking spaces available at each station to the average number of boardings on weekdays.

Transit Access Principles

NJ TRANSIT is committed to encouraging transit users to walk and bicycle to and from stations. Walking and transit are complementary modes: all transit passengers are also pedestrians at some point on their journey, whether walking from their home or parked car to the station or from the station to their final destination. Walking and bicycling to and from transit depends on the quality of the walking and bicycling environment and the presence of destinations (homes, workplaces, shops, schools) within a reasonable distance from the transit stop or station.

Key considerations for transit access include:

1. Safety and Accessibility
2. Directness and Continuity of Route
3. Ease of Crossing Streets
4. Provision of Identification and Information
5. Context-sensitive Solutions

Station	NJ TRANSIT Parking Spaces Available	Average Weekday Boardings (2016)	% of Boardings NOT Associated with a Parking Space
Red Bank	484	1,155	58%
Woodbridge	510	1,813	72%
Madison	423	1,602	74%
Summit	966	3,951	76%
Rutherford	235	1,448	84%
Irvington*	*79*	*54,513*	*99.86%*

Data was not available for the average weekday bus boardings at Irvington Bus Terminal. The figures in this table for Irvington reflect the average ridership per day (in 2016) on bus routes that pass through Irvington Bus Terminal.

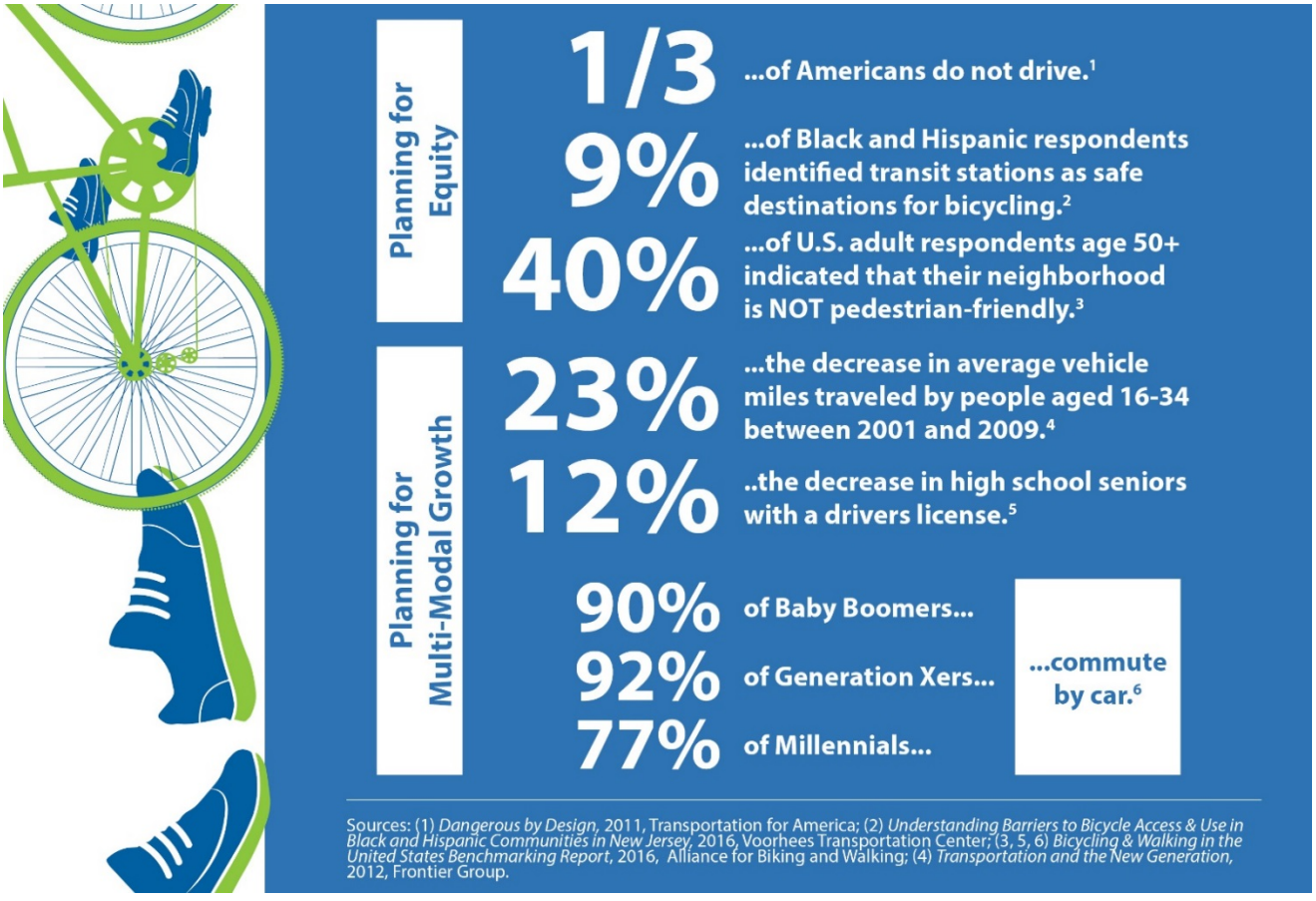
This indicates that, while parking for the private automobile is available at each station, a significant proportion of the daily ridership is accessing the stations by alternative means. Although it can be assumed that some proportion of those customers are being dropped off by others at the station (friends, family, taxi, ride-hail services, etc.) or taking other NJ TRANSIT modes to the station, it is likely that a significant proportion of the non-parking customers are either walking or biking to the station for some portion of their trip.

Upgrading and maintaining safe, convenient, and comfortable station access for pedestrians and bicyclists is a basic accommodation for NJ TRANSIT customers. This study recognizes that walking or bicycling to and from transit stations depends on the quality and the presence of appropriate facilities, not only on NJ TRANSIT properties, but in the surrounding community. As such, the purposes of this study are to:

- Evaluate the condition of existing bicycling and walking infrastructure around the six transit stations.
- Provide general guidance to municipalities on types of bicycling and walking facilities and best practices.
- Identify specific, implementable, cost-effective recommendations to improve bicycling and walking facilities and accommodations within the six transit station areas.
- Guide municipalities on the implementation of the recommendations.
- Function as a tool for communicating and coordinating with state and county agency partners and applying for project funding.

Relevant Trends

Relevant trends in demographics and transportation users demonstrate the need both locally and nationally for improved access to transit.



Goals

The ultimate goal of the project is to increase bicycling and walking trips to these six transit stations, thereby reducing traffic congestion at and around stations, reducing demand on station area parking supplies, and creating more vibrant communities.

The methodology used in this study can be applied to other NJ TRANSIT stations and tailored to the needs of the municipalities and counties that have jurisdiction over the roadway network.

Outcomes

The direct outcomes of this project are general guidance and specific, targeted recommendations for each participating municipality for improving bicycle and pedestrian access in the vicinity of the local NJ TRANSIT station.

Separate reports are provided for each municipality that consists of the following elements:

- Overview, Context, and Background Data;
- Existing Conditions Field Assessment and Photo Log;
- Opportunities and Constraints Analysis with Maps;
- General Recommendations; Design Concepts, Cost Estimates, Phasing, and Funding Sources;
- Appendix (Traffic Counts, Cross Sections, Meeting/Public Input Records).

Over 1000 photos were collected to document existing conditions and public input throughout the study.

Benefits of Multi-Modal Transportation

Providing infrastructure that supports walking and bicycling can also have a positive influence on the local and regional economy. Research demonstrates that investments to enhance bicycling and walking can have positive impact on the appeal of a place, encourage business and residential development, and contribute to a more connected regional economy. Also, improving bicycle and pedestrian accessibility to transit stations can support mixed-use development and other land use policies that lead to local economic growth.

There are many other benefits associated with implementing Complete Streets, including the following: mobility and safety for all users; equity, particularly for those without an automobile; improved public health by supporting active modes of transportation; enhanced quality-of-life by supporting livable, walkable communities; Increased economic vitality; reduced environmental impact; and eligibility to apply for local programs, such as NJDOT Local Aid grants.

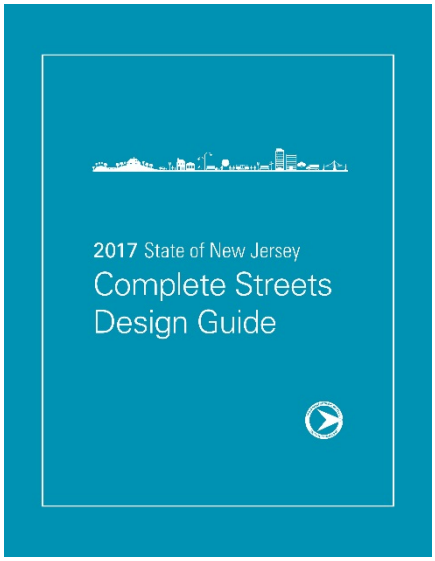
Word cloud of the benefits associated with multi-modal transportation

Guiding Principles: Complete Streets

The New Jersey Department of Transportation (NJDOT) encourages municipalities and counties to implement "Complete Streets." Each of the municipalities taking part in this study has adopted a Complete Streets policy.

The concept of Complete Streets underpins the approach to this project and the resulting recommendations for pedestrian and bicycle mobility improvements to station areas. Complete Streets are designed for everyone—all users, modes, and ability levels—balancing the needs of drivers, pedestrians, bicyclists, transit vehicles, emergency responders, and goods movement.

That said, implementing Complete Streets improvements does not mean that every street should have sidewalks, bicycle lanes, and transit. There is no universal, prescriptive design. Instead, the concept of Complete Streets is shaped by understanding local context, need, and demand. All streets should be designed to fit their unique context; provide for adequate mobility; and balance among sometimes competing needs for access, safety, vehicular travel, and economic development.



The 2017 State of New Jersey Complete Streets Design Guide is available for additional design guidance.
https://tinyurl.com/njcompletestreets

While specific pedestrian and bicycle facilities and amenities can vary depending on the context, some transit access needs are universal. Adequate sidewalks, pathways, and roadway crossings in the area around transit access points are important for pedestrian comfort and safety, as are amenities such as benches, wayfinding signs, and lighting at stops and stations.

Complete Streets & Transit

Walking and transit are complementary modes. All transit passengers are also pedestrians at some point on their journey, whether walking from their home or parked car to the transit station, or from the station to their final destination. "Incomplete" streets, which could be characterized by high travel speeds, heavy traffic volumes, and busy intersections, prevent bicyclists and pedestrians—including those who are disabled or of limited mobility due to age—from getting to transit in a safe and convenient manner. Crossing the street to catch the bus or reach a train station can be hazardous. A lack of sidewalks or bicycle facilities to and from a transit stop represents a barrier to transit accessibility for commuters, regardless of age, ability, or disability.

A pedestrian crossing at the Madison Train Station, Madison, NJ.

Streets that are well-designed for transit can encourage more people to leave their cars at home and take the bus or train. Designing, constructing, and maintaining sidewalk and street networks, pedestrian crossings, and

other infrastructure to support safe access to transit should consider a ¾-mile radius for pedestrian improvements and a 2-mile radius for bicycle improvements around each transit station.

Typical improvements include: high-visibility crosswalks, curb ramps at all intersections and crossings, bicycle accommodations along low-speed routes (bicycle boulevard treatments), epoxy curb extensions, Rectangular Rapid Flash Beacons (RRFBs) at unsignalized crossings, as appropriate, and sufficient bicycle parking at transit stations.

Implementing Complete Streets

Complete Streets principles are typically adopted through a written policy or resolution by an owner jurisdiction, such as a municipality, county, state, or transportation agency. These written policies define the purpose of Complete Streets, the users and modes they accommodate, types of improvements that should incorporate Complete Streets principles, reasonable exemptions to the policy, and most importantly, how the policy will be implemented. The policy effectively ingrains the concept of Complete Streets into the everyday way of doing business.

Implementing elements of a Complete Streets program does not necessarily require significant additional costs or new funding sources. Simple solutions, such as using paint to restripe a roadway and alter its layout, can be effectively implemented during routine maintenance and repairs.

Effective Complete Streets Implementation

- Update plans, policies, and procedures to incorporate Complete Streets principles.
- Incorporate Complete Streets into the development review process.
- Build institutional capacity through training, communication, and monitoring.
- Create partnerships to advance the policy.
- Initiate pilot projects to build support and demonstrate the value of Complete Streets.
- Integrate Complete Streets into the earliest stages of project delivery and throughout the project life cycle.
- Utilize available tools and resources to support implementation.

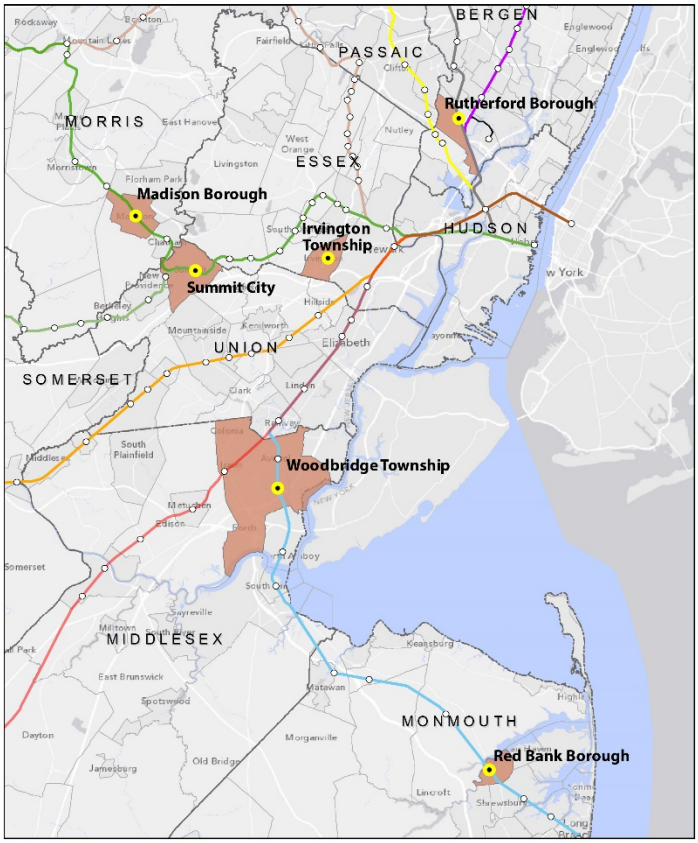
Complete Streets References and Guides

- New Jersey Department of Transportation (NJDOT)
  - *Complete Streets Website* www.state.nj.us/transportation/eng/completestreets
  - *NJDOT Complete Streets Design Guide* www.state.nj.us/transportation/eng/completestreets/pdf/NJCS_DesignGuide.pdf
- National Assoc. of City Transportation Officials (NACTO)
  - *Transit Street Design Guide* www.nacto.org/publication/transit-street-design-guide
- Federal Highway Administration (FHWA)
  - *Manual on Pedestrian and Bicycle Connections to Transit* www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/64496/ftareportno0111.pdf

Study Area

This study covers the following six NJ TRANSIT stations, as shown in the map to the right.

- **Irvington Bus Terminal**, Irvington Township, Essex County
- **Madison Station**, Borough of Madison, Morris County
- **Red Bank Station**, Borough of Red Bank, Monmouth County
- **Rutherford Station**, Borough of Rutherford, Bergen County
- **Summit Station**, City of Summit, Union County
- **Woodbridge Station**, Woodbridge Township, Middlesex County



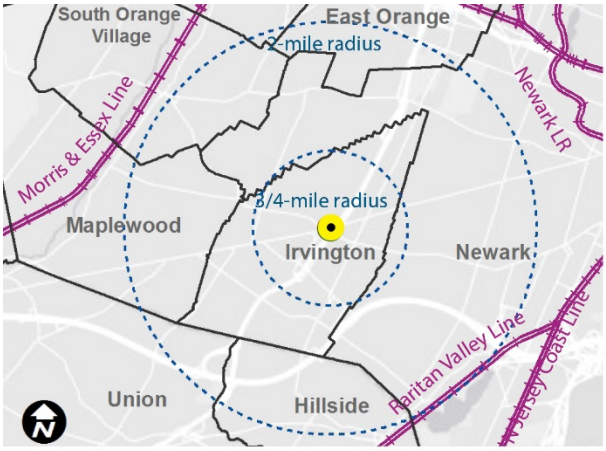
Participating municipalities and station locations, with rail lines through northern and central NJ

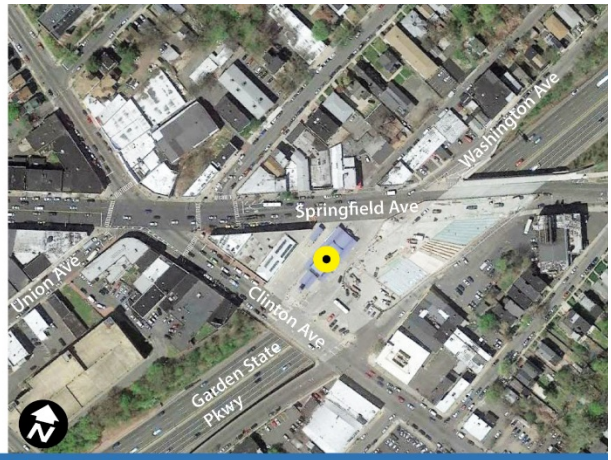
NJ TRANSIT and the NJTPA selected the transit stations for this study by focusing on communities that had adopted a Complete Streets policy as of July 2016. Communities were solicited for participation via a letter to the mayor's office, and inclusion was contingent upon designation of a municipal representative to coordinate the study on behalf of their town.

All of the study areas within the participating municipalities are focused around NJ TRANSIT rail stations, with the exception of the study area within Irvington Township, which is focused around a NJ TRANSIT bus terminal. In relation to each station, the bicycling and walking study areas were a ¾-mile radius for pedestrians (about a 15 minute walk) and 2-mile radius for bicyclists (about a 10 minute ride).

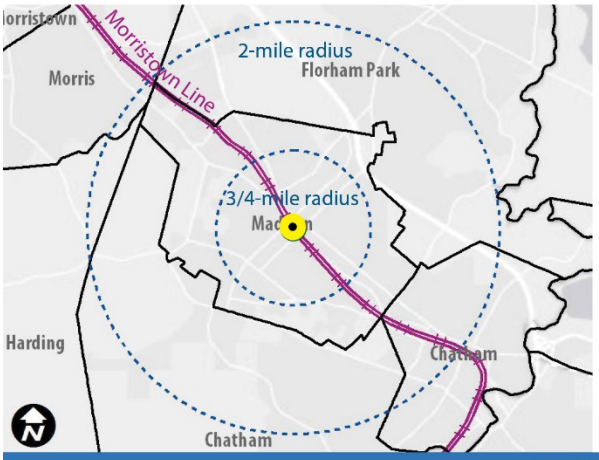
The two pages that follow provide thumbnail context maps and aerial photographs of the station areas in each of the six towns. The yellow circle in each image represents the location of the primary station building or platform center. The aerial photographs show the complex geometries created by the layout of streets, parking areas, open spaces, and railroad tracks (with the exception of the Irvington Bus Terminal) around the stations.

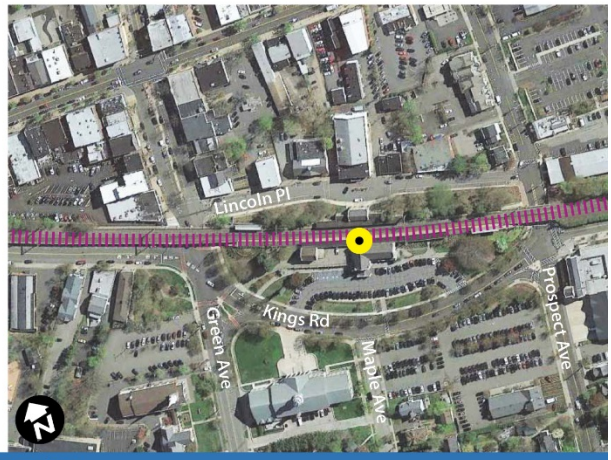
Station Areas – Irvington, Madison, Red Bank



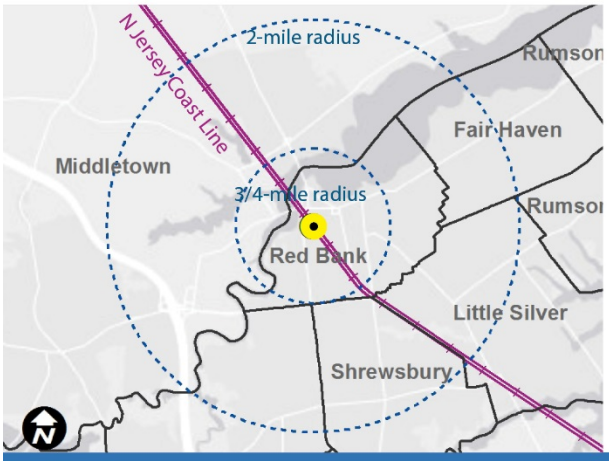


Irvington Bus Terminal



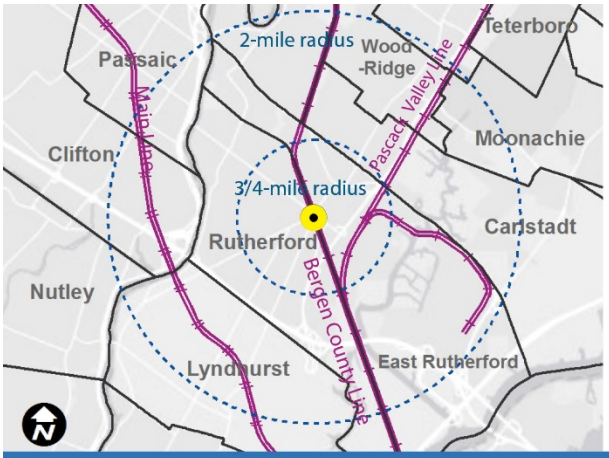


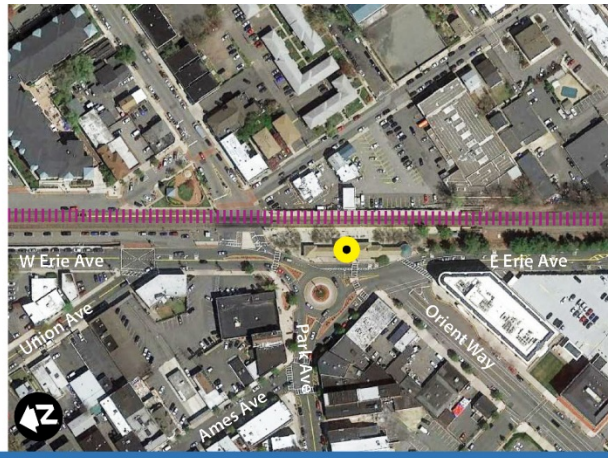
Madison Station



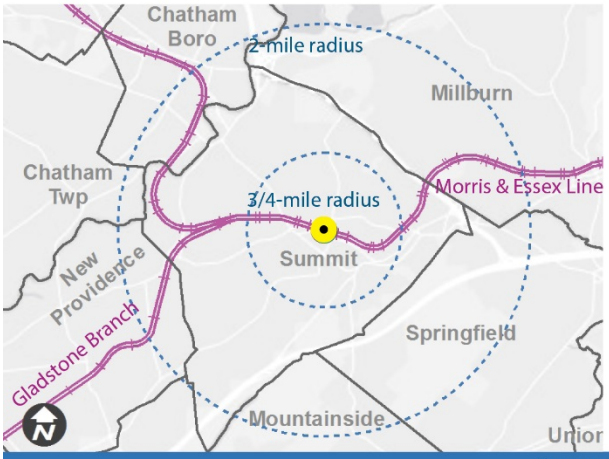
Red Bank Station

Station Areas – Rutherford, Summit, Woodbridge

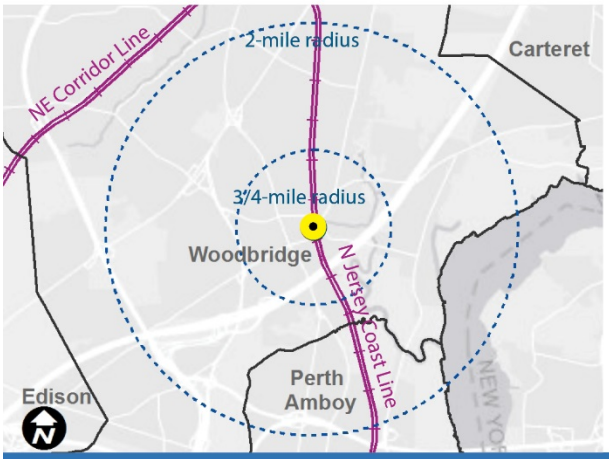


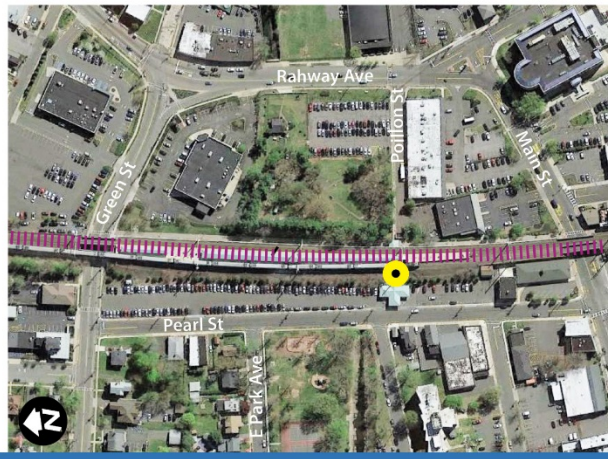


Rutherford Station



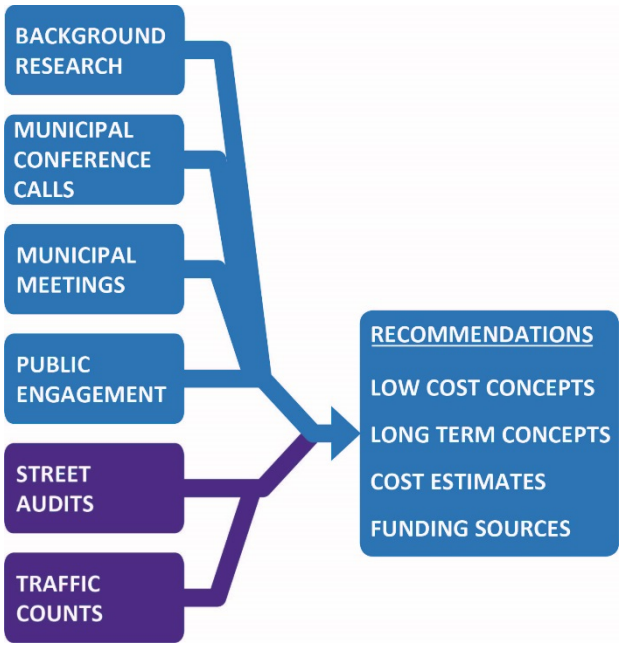
Summit Station





Woodbridge Station

Methodology



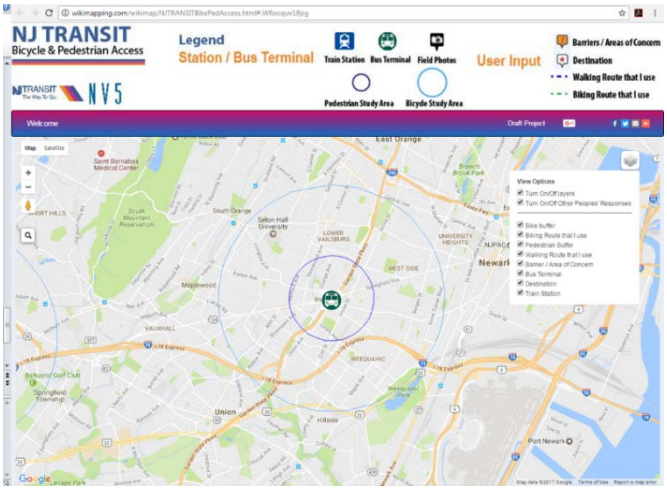
Methodology process diagram

The study was initiated with a meeting of the Technical Advisory Committee (TAC) comprised of agency, county, and municipal representatives. The TAC assisted in identifying project parameters and identifying known barriers to bicycle and pedestrian mobility in the study areas. The subsequent analysis of each station included background research and data collection on each municipality followed by a conference call between the project team and municipal representatives. After the conference calls, the project team visited each station and the surrounding areas to observe and document existing conditions. Based on these visits, preliminary concepts were developed and shared with the municipalities at a municipal meeting. Refinements were then made with input from NJ TRANSIT, the NJTPA, and municipal representatives, and the concepts were presented at Public Information Centers conducted for each station. The finalized design concepts take into account input from all these activities, and are included in each individual Station Report.

Background research began by circulating details of the planning process to municipalities, including the link to the project's WikiMap website. Using WikiMap, municipal representatives provided online, geographically-based input about existing conditions, areas of concern, and potential priority routes that the team should consider.

While there are many roads within the bicycle and pedestrian sheds, the analysis focused on the **immediate station areas** and the **priority routes** that link each train station with its surrounding neighborhoods. The "station area" includes the station platform, waiting areas, adjacent parking areas, and access from adjacent roadways.

The area surrounding the station was assessed for walkability within a ¾-mile radius of each station, and, for bicycle access, within a 2-mile radius of each station. Based on background research, including the conference call and WikiMap input, priority areas were identified within the pedestrian and bicycle radii. Priority areas could include on-road routes (streets that can support pedestrian and bicycle access to NJ TRANSIT stations but are in need of improvement), as well as off-road routes (off-road locations where pedestrian and bicycle facilities that support access to NJ TRANSIT stations may be viable).



The six participating municipalities utilized WikiMap to provide location specific information within their respective study areas.

The priority routes to each station were chosen based on the following criteria:

- The directness of the route.
- The presence of residential and commercial land uses.
- The presence of natural and/or human-made barriers (water, major highways).
- Input from municipal officials and residents.

A variety of approaches and resources were incorporated to create a baseline of existing bicycle and pedestrian accommodations in the station area and along priority routes.
The process involved the following steps:

1. Review existing plans and bicycle maps.
2. Conduct outreach through public meetings, surveys, and stakeholder meetings and interviews.
3. Assess pedestrian demand.
4. Assess bicycle suitability.
5. Undertake field visits.
6. Review and analyze data.

Collectively, these steps were used to identify context, existing conditions, needs, and opportunities. This baseline was then used to develop and prioritize recommendations.

Dates of Public Information Centers

Madison: April 10, 2018, 5-7 p.m.

Summit: April 12, 2018, 5-7 p.m.

Woodbridge: April 24, 2018, 5-7 p.m.

Red Bank: April 25, 2018, 5-7 p.m.

Irvington: May 2, 2018, 4-6 p.m.

Rutherford: May 8, 2018, 5-7 p.m.

Preliminary concepts were then developed and shared at the municipal meetings, which provided an opportunity to review the details with each municipality and get their initial feedback.

Public Information Centers were held during the evening commute hours, to share these concepts with commuters and solicit their input and/or additional considerations. The text box above lists the dates of each Public Information Center. Using the information collected from the public engagement process, concepts were adjusted and cost estimates, phasing, and funding recommendations were created for each station.

Photos from Public Information Centers

Typical Design Recommendations & Best Practices

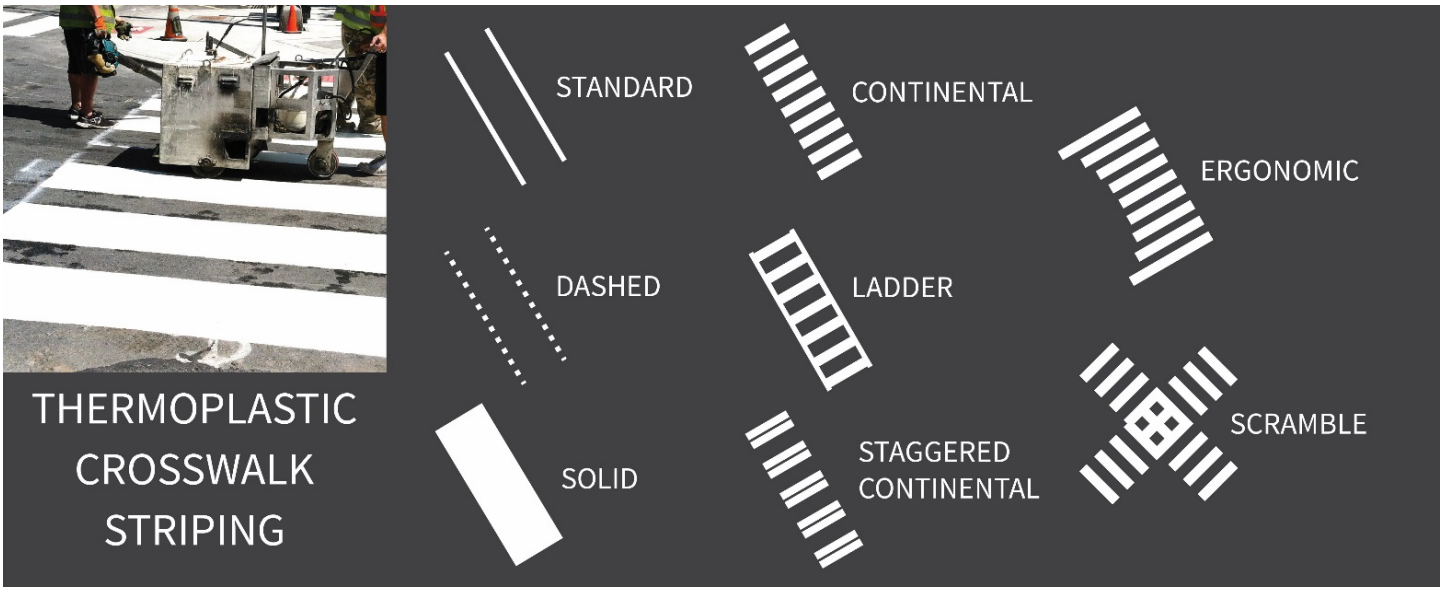
The purpose of this section is to provide municipalities with general guidance and "best practice" information on basic, readily-implementable bicycle and pedestrian facilities and accommodations. These recommendations also appear in the individual station reports. These typically low-cost solutions include:

- Crosswalk Design
- Curb Ramp Design
- On-Street Bicycle Accommodations
- Bicycle Parking
- Curb Extensions
- Intersection Markings
- Lighting
- Rectangular Rapid Flash Beacons

Crosswalk Design

Marked crosswalks guide pedestrians and alert drivers to a crossing location. The standard for crosswalks at intersections and driveways within station areas is the high-visibility crosswalk (see the "ladder" and "continental" crosswalks as shown below). High-visibility crosswalks are recommended for locations with high pedestrian volumes, such as the station areas. An ergonomic crosswalk is a variation that is flared at each end to follow pedestrian desired paths at certain intersections. Crosswalks should be marked at each leg of an intersection or crossing and advance stop bars should be installed to prevent vehicles from encroaching into the crosswalk area.

Crosswalks should be marked with thermoplastic paint, which is durable and contains retro-reflective properties that enhance visibility in dark conditions. It should be noted that thermoplastic paint bonds better to asphalt than concrete. The relatively weaker bond between thermoplastic paint and concrete can lead to separation, cracking, flaking, and fading of the crosswalk over time.



Typical designs for thermoplastic crosswalks

Curb Ramp Design

Pedestrian facilities should accommodate people with mobility impairments and meet ADA guidelines. The project team identified intersections within the six selected transit station areas that do not have curb ramps or do not conform to ADA standards. Curb ramps should be provided at all intersections where they are currently missing in order to provide an accessible pedestrian network.

Curb ramps leading to ladder style crosswalks near Woodbridge Station

ADA guidelines state that curb ramps should be perpendicular wherever possible, where each corner has two ramps installed perpendicular to the face of the curb (vs. a single ramp facing diagonally into the intersection). In doing so, the curb ramps lead directly along the line of travel, guiding pedestrians into the crosswalk rather than into the middle of the intersection. This is especially helpful to pedestrians with visual impairments. Curb ramps and crosswalks should be clear of obstacles. When they are not, conflicting elements should be moved as opportunities and budgets allow.

On-Street Bicycle Accommodations

To encourage bicycling, municipalities should provide bicycle facilities and accommodations connecting major destinations. And while dedicated bicycle lanes are an important element to a bicycle network, it is important to note that bicycle lanes are not the only type of accommodations possible. This section provides details on the following types of bicycle facilities: bicycle lanes, shared lane markings, bicycle boulevard, signage and wayfinding, and bicycle parking.

Bicycle Lane

A bicycle lane is a portion of the roadway that has been designated by striping, signs, and pavement markings for the preferential or exclusive use of bicyclists. Bicycle lanes enable bicyclists to ride at their preferred speed without interference from prevailing traffic conditions; facilitate predictable behavior and movements between bicyclists and motorists; and visually remind motorists of bicyclists' right to the street. The standard width of a bicycle lane is 5 to 6 feet. The lane should be marked, at a minimum, at each end of each block with a bicycle symbol and an arrow indicating the direction of bicycle traffic.

An example of a bicycle lane

Shared Lane Markings

Shared lane markings, also referred to as “sharrows,” are pavement markings that indicate that bicycles and automobiles share a lane. While they are not a dedicated facility for bicyclists, they are used to support a complete bicycle network. Shared lane markings are most appropriate for streets with low traffic volumes and speeds.

An example of a shared lane marking, or sharrow

Bicycle Boulevard

Bicycle boulevards are streets with low traffic volumes that are designed to prioritize bicycle travel using pavement markings and signs. Bicycle boulevards are often found on quiet, residential streets, which are often suitable for bicycling even without a bicycle boulevard treatment. Adding prominent bicycle logo markings, wayfinding signs, and other elements that can slow traffic, such as green infrastructure, can enhance the quiet character of the roadway and provide cues for motorists to expect cyclists.

Many of the priority routes considered in this study are narrow and do not have space for a dedicated bicycle lane, or have speed limits or traffic volumes that are too high for a shared lane marking. County roads that carry high volumes of through traffic also lack bicycle-friendly conditions. However, there is often a subnetwork of low-speed, primarily residential streets that would be comfortable to most bicyclists and could be considered for bicycle boulevard treatments.

An example of a "bicycle boulevard"
(Source: NACTO)

Signage and Wayfinding

Directional bicycle route wayfinding and signs to alert motorists and are important elements that enhance bicycle lanes, shared lanes, and bicycle boulevards. Wayfinding elements help street users navigate to trip-generating locations, such as commercial areas, transportation hubs, parks or recreation areas, and large employment centers. Using standardized format, style, and placement makes wayfinding signs easy to identify and refer to throughout a user’s trip. The design of wayfinding elements, such as directional signs, provides an opportunity to incorporate motifs, images, and themes that celebrate individual communities.

For a bicycle network, directional wayfinding signs can help reveal the planned bicycle network by directing users to key bicycle routes and connections. Marking the distance to key destinations provides additional details for users, and can be included using distance or average biking time, the latter often being more useful to users than distance, which is difficult to gauge.

An example of bicycle network wayfinding signage in Camden, NJ

Bicycle Parking

A lack of secure bicycle parking is commonly mentioned by bicyclists as a barrier to bicycling. NJ TRANSIT can install standard issue bicycle racks at stations that currently lack bicycle parking, providing an adequate structure to which bicycles can be locked. Additional factors that tend to increase bicycle ridership are covered and enclosed bicycle parking facilities, which protect bicycles from the elements and provide an increased measure of security.

NJ TRANSIT standard inverted-U bicycle racks beneath the railroad overpass at Madison Station

At present, many NJ TRANSIT stations offer single occupancy bicycle lockers for rent, at or near stations. In addition, the New Jersey Bike and Walk Coalition (NJBWC) has opened bicycle depots at or near three NJ TRANSIT train stations (Bay Street Montclair, Bloomfield, and Elizabeth). Bicycle depots, which are enclosed storage units, can offer increased security though membership-only access and video surveillance. Rental information for bicycle lockers can be found at www.njtransit.com, and information about the NJBWC bicycle depot program can be found at http://njbwc.org/bike-depot-program/.

Bicycle lockers at Red Bank Station

Curb Extensions

Curb extensions provide an expanded pedestrian area, which shortens the crossing distance and allows pedestrians to get closer to moving lanes while still being protected. Curb extensions also improve visibility for both drivers and pedestrians as they wait to cross. Many intersections throughout the municipalities included in this study already have 15-30 feet from crosswalks clear from parking, called "daylighting", to address pedestrian visibility. Formalizing these areas as curb extensions can improve pedestrian conditions, but it can also be expensive (perhaps prohibitively so) due to implications to drainage and other utilities that may be affected by a change to the curbline geometry.

Bloomfield Bike Depot located at Glenwood Parking Garage, Bloomfield, NJ (Source: NJBWC)

In this study, curb extensions are proposed primarily as short-term interventions that afford many of the benefits of traditional, built-out curb extensions, but without the cost and timeframe needed with capital improvements such as physical curb extensions. The short-term approach uses white edgeline paint filled in with a tan, textured epoxy gravel. This visual effect tightens up the intersection to slow traffic and shortens the crossing distance. Because the epoxy gravel sits on top of the asphalt, it allows water to flow as the street was originally designed, which avoids expensive relocation of utilities.

An example of an epoxy gravel curb extension in Hoboken, NJ

Intersection Markings

Crossing complex intersections, particularly long intersections with atypical geometry, can cause driver confusion. To aid in the alignment and safe passing through such locations, centerlines and lane lines can be extended from one side of the intersection to the other. The intersection of Clinton Avenue, Springfield Avenue, and Union Avenue in Irvington was recently redesigned with intersection markings where the lane alignment was atypical, guiding vehicles across. Improvements like this remove some of the possible confusion from complex intersections, which is safer for all road users, particularly pedestrians and cyclists.

The intersection of Clinton Avenue, Springfield Avenue, and Union Avenue in Irvington (Source: Nearmap)

Lighting

Adequate lighting is critical to the safety of commuters, particularly during winter months when one or both ends of a commute can take place during low-light hours. Each of the stations in this study was visited during low-light periods, to assess the adequacy of lighting levels, either before sunrise, or after sunset. Locations where additional lighting is recommended are noted on the Issues and Opportunities Map in each station report. While lighting is not a low-cost improvement, it is essential for safety and security, and should be considered a high priority.

Rectangular Rapid Flash Beacons

Another recommendation of moderate cost that has been made a high-priority at unsignalized crossings is a Rectangular Rapid Flash Beacon (RRFB). This beacon is placed along the roadway in advance of pedestrian crossings, typically with one on each side on a two-way street. RRFBs can be programmed to only flash during peak pedestrian hours, so the flashing is not a common condition that may become ignored after a period of time.

Example of a Rectangular Rapid Flash Beacon (RRFB) on Broad Street approaching Summit Station, Summit, NJ.

Additional Findings

This study created an opportunity for discussion among a diverse group of people, including those from NJ TRANSIT, the NJTPA, representatives from each municipality and county, representatives of local interest groups, direct contact with NJ TRANSIT customers, and the planners and designers on the consultant team. This section documents a small sample of the additional findings that resulted from these interactions. Though perhaps not actionable in the purview of this study, these findings are documented to assist in developing additional studies that can continue to bring positive change to NJ TRANSIT stations and surrounding communities.

- What the municipalities identify as priority routes tend to be arterials that provide a regional connection to transit stations. They tend to have high motor vehicle volumes and speeds and are commonly subject to county jurisdiction. The process of this study revealed that, though the arterials are often the first place one might look to include new bicycle facilities, they are often ill-suited to that purpose. Taking a "low-hanging fruit" approach, the idea of a bicycle boulevard on local, residential, low-volume roadways becomes an attractive option. Bicyclists are likely already using such routes to access the station. By formalizing the routes with shared lane markings, wayfinding signage, and traffic calming measures (as necessary), there is the potential to make bicycling to transit, safer, more comfortable, more apparent to motorists, and more attractive to would-be bicyclists.
- Municipal officials tend to understand and appreciate an approach to bicycle and pedestrian enhancements that begins with a low-cost implementation using paint, epoxy, and other non-permanent materials. This gives municipalities the opportunity to test design concepts in real-life deployment without the full expense of engineering and construction. The concepts that were developed through this study tend to take this approach.
- A remote, field-operational GIS application was used by NV5 during this project to collect assessment data on the intersections throughout the various study areas. Those assessments are presented graphically in the form of an Issues and Opportunities Map associated with each municipality's individual report. The GIS shapefiles assembled during the field investigation were provided to NJ TRANSIT, the NJTPA, and each municipality at the conclusion of the study. The creation of an efficient GIS assessment method for bicycle and pedestrian deficiencies is an important outcome of this study that will serve to track implementation and progress over time.
- Motorcyclists and motorized scooter operators encountered during this study expressed that they do not fit in the same category as motor vehicles operators, or as bicyclists and pedestrians. Their vehicles tend to take up much less space than a car, but right-sized and thoughtfully located parking facilities are not provided. Though motorized, these vehicles tend to use fuel more efficiently and produce less exhaust than cars, but allow for a longer and more topographically challenging travel route than would be expected for bicyclists and pedestrians. Although motorcyclists and motor scooter operators must follow motor vehicle operating laws, their unique parking needs may merit future consideration within transit station parking facilities.

Implementation Guidance

Strategies for Getting it Done

Each of the municipalities included in this study adopted a Complete Streets policy prior to the study. The logic of selecting such municipalities is that they have demonstrated a desire and capacity to implement transit access improvements that are based upon Complete Streets principles and design guidance.

Each Station Report identifies locations and specific details on where design concepts should be implemented to enhance bicycling and pedestrian accessibility within the respective station areas. Implementation of the recommendations could involve multiple agencies, depending on which entity or entities have jurisdiction over certain streets and properties.

Innovative Approach: Tactical Urbanism

Many of the concepts in this study have the potential to be deployed as Tactical Urbanism projects, which are design changes implemented to street environments in a "light, quick, cheap," and temporary manner. By showing roadway users – pedestrians, bicyclists, drivers – the effectiveness of design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

It is also important to note that the improvements included in this study are not funded for construction as part of the study. Funding for project implementation will have to be pursued individually by each municipality or in concert with county or state agencies. A description of funding sources is included in this section of the study.

For areas and streets that are municipally-owned, each municipality can select recommendations to implement based on available funding and/or pursue the potential funding opportunities. For areas and streets that are under the purview of state or county agencies, the individual municipalities will have to coordinate with those agencies. In either case, this report can be a useful tool to communicate the intent and details of various proposed enhancements, coordinate among agencies, and apply for funding. NJ TRANSIT will include recommendations that involve its properties in future improvements plans for implementation as funding becomes available.

Depending on the nature of the project, municipalities may choose to implement recommendations within the resources available locally. In other cases, various recommendations may be able to be packaged together and bid out to a contractor.

Phased Approach Example: Create a New Curb Extension

Short-Term (Low Cost) Materials (Phase 1)

- Colored epoxy gravel
- White thermoplastic edge striping
- Operational life: 2-5 years

Long-Term (High Cost) Materials (Phase 2)

- Concrete slab
- Concrete curb
- Curb ramp
- May require drainage modifications
- Operational life: 10 to 30+ years

Maintenance & Operations

In addition to pursuing funding for project implementation, municipalities and partners should be cognizant of the potential costs to be borne for maintenance and operation of new facilities. It is generally assumed that the maintenance and operational costs of a bicycle or pedestrian facility on a municipally-owned street would be the responsibility of the municipality; likewise, the same on a county-owned street would be the responsibility of the county. Maintenance agreements can sometimes be negotiated among agencies, but such arrangements are beyond the purview of this study.

In general, the concepts proposed in this study are designed to be low-maintenance; that is, they should not require additional maintenance efforts such as snow clearing, debris removal, sweeping, or clearing beyond what is required of the facilities already in operation in the area.

One important nuance to bear in mind, however, is that this study generally proposes a phased approach to implementation. In the first phase of a project's life cycle, it is constructed using short-term materials that are considered to be of low cost in terms of acquisition, installation, and effect on drainage patterns. These materials are of short-term durability once installed. In the second phase of a project's life cycle, once it has proven to be successful and of value, it can be constructed using more durable, long-term materials, that are more expensive in terms of acquisition and installation, and may require modifications to existing drainage patterns.

An alternative approach may be to never construct the long-term phase, opting instead to repair, maintain, or re-apply as necessary the short-term materials. In that case, the capital cost of the short-term concept becomes a recurring maintenance cost, of which certain components could be undertaken typically every 2-5 years. For municipalities that wish to take this approach, the cost estimate provided with each specific concept can be interpreted as a recurring cost.

Funding Sources

This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize improvements that are highly actionable in terms of cost, level of coordination, and time to implementation.

Each individual Station Report includes a cost estimate and a recommended funding source for each design concept. The funding source for each concept has been identified based on specific concept recommendations, locations, and context. For instance, for a design concept that is on a county road, it makes sense to seek NJDOT County Aid funding. Likewise, for a design concept that is near and provides access to a school, it makes sense to seek Safe Routes to School funding.

In general, the design concepts throughout this study are of a scale that is appropriate for state funding opportunities; however, municipal representatives may choose to package the design concepts together to pursue more significant funding opportunities at the federal level. The following matrix provides an overview of the funding sources identified in each station report. After the matrix, additional detail is provided on funding sources that have been, or could be used to fund pedestrian and bicycle improvements for NJ TRANSIT Station areas. The list is not exhaustive, but it identifies federal, state, and private/non-profit funding sources that can be utilized to fund bicycle and pedestrian planning and project development activities, as well as construction. For each source, links are provided to program websites that contain additional information related to: how to apply for funding, typical grant amounts, application deadlines, and eligible activities. Some funding sources may also be used to fund programmatic activities, such as safety, enforcement, and education.

Funding Sources Matrix

Funding Source	Jurisdiction	Cost Scale	Duration to Implement
FEDERAL: Fixing America's Surface Transportation (FAST) Act			
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Federal (FAST Act)	Low-High	Short - Long
Transportation Alternatives Set-Aside	Federal (FAST Act)	Low-Medium	Short - Long
Highway Safety Improvement Program (HSIP)	Federal (FAST Act)	Medium-High	Short - Long
Safe Routes to School (SRTS)	Federal (FAST Act)	Medium-High	Short - Medium
STATE: New Jersey Department of Transportation			
Municipal Aid	State (NJDOT)	Low-Medium	Short-Medium
County Aid	State (NJDOT)	Low-Medium	Short-Medium
Bikeway Grant Program	State (NJDOT)	High	Short-Medium
Safe Streets to Transit	State (NJDOT)	High	Short-Medium
Transit Villages	State (NJDOT)	Medium-High	Short-Medium
STATE: New Jersey Division of Highway Traffic Safety Grants (HTS Grants)			
Comprehensive Traffic Safety Programs (CTSP's)	State (HTS Grants)	Low-Medium	Short
Pedestrian Safety Grant	State (HTS Grants)	Low-Medium	Short
Enforcement, Education or Engineering Counter-measure Grants	State (HTS Grants)	Low-Medium	Short
PRIVATE / NON-PROFIT			
Sustainable Jersey	Non-Profit	Medium-High	Short-Medium
People for Bikes Community Grants	Non-Profit	Low	Short
New Jersey Prevention Network Get Active NJ Funding Program	Non-Profit	Low	Short
Robert Wood Johnson Foundation	Private	Medium-High	Short - Long
The Geralidine R Dodge Foundation	Private	Medium	Short - Long
OTHER FUNDING SOURCES			
Municipal Allocations	Municipal	Low-High	Short - Long
Local Private-Sector Funding	Private	Low-High	Short - Long

Cost Scale	Duration to Implement
Low: Less than $10,000	Short: 1-5 years
Medium: $10,000 - $100,000	Medium: 5-10 years
High: More than $100,000	Long: 10+ years

Federal Funding Opportunities

The FAST Act

www.fhwa.dot.gov/fast act/

On December 4, 2015, President Obama signed the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) into law. This was the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The law provides federal transportation policy and funding for five years, authorizing $226.3 billion in Federal funding for fiscal years 2016 through 2020 for road, bridge, bicycling, and walking improvements. (The previous federal program was known as the Moving Ahead for Progress in the 21st Century Act, or "MAP-21"). Funding programs under the FAST Act are summarized below.

- **Congestion Mitigation and Air Quality Improvement (CMAQ) Program**
  https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm

  The CMAQ program provides a flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funds may be used for a transportation project or program such as construction of bicycle and pedestrian facilities that are not exclusively recreational (as they must reduce vehicle trips and therefore vehicle emissions), outreach promoting safe bicycle use, and other bicycle and pedestrian programs. CMAQ eligibilities include public transit, bicycle and pedestrian facilities, travel demand management strategies, alternative fuel vehicles, and facilities serving electric or natural gas-fueled vehicles.

- **Transportation Alternatives Set-Aside**
  https://www.fhwa.dot.gov/environment/transportation_alternatives/

  The Transportation Alternatives Set-Aside (TA Set-Aside, or TA) authorizes funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity; recreational trail projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former divided highways. The program will allocate $850 million annually in fiscal years 2018-2020.

- **Highway Safety Improvement Program (HSIP)**
  https://safety.fhwa.dot.gov/hsip/

  The Highway Safety Improvement Program (HSIP) is a core federal-aid program with the purpose of achieving a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance.

- **Safe Routes to School Program (SRTS)**
  http://www.state.nj.us/transportation/business/localaid/srts.shtm

  http://www.njtpa.org/project-programs/project-development/safe-routes-to-school.aspx

  The Safe Routes to School Program (SRTS) is a federally funded reimbursement program administered by the New Jersey Department of Transportation (NJDOT), in partnership with the North Jersey Transportation Planning Authority (NJTPA). Under MAP-21 legislation, the Transportation Alternatives Program (TAP) funding does not provide for a standalone Safe Routes to School Program. The New Jersey Department of Transportation (NJDOT) has elected to continue funding the SRTS program separately.

  Infrastructure projects may include the installation of sidewalks, crosswalks, bicycle lanes, multi-use paths, traffic calming measures, and other means to ensure the ease and safety of children walking or biking to school. Projects must be located within two miles of a school that serves students in grades K-8 and involve the school commute. Each of the six (6) stations areas meets this criterion and is eligible for funding based on GIS analysis of public municipal K-8 schools located within two miles of each station: Irvington (10), Madison (4), Red Bank (2), Rutherford (5), Summit (6), and Woodbridge (6).

  Any municipality, school district, or county is eligible to apply for funding after a solicitation is announced. Non-profit organizations are not eligible as direct grant recipients for the solicitation. However, non-profit organizations may partner with a local public agency that will assume responsibility and administration for the grant.

  In 2016, NJDOT announced a pilot program called “Design Assistance.” The program assists LPA’s, who received funding with development of plans, specifications and estimates for their SRTS projects.

State Funding Opportunities

NJDOT – Municipal Aid

http://www.state.nj.us/transportation/business/localaid/municaid.shtm

In the Municipal Aid program, funds are appropriated by the Legislature for municipalities in each county based on a formula contained in legislation. Additionally, $10 million is allotted for those municipalities that qualify for Urban Aid. Urban Aid is distributed by a formula that is computed by the New Jersey Department of Community Affairs. For fiscal year 2018, both Irvington and Woodbridge were included on the New Jersey Urban Aid Municipalities list.

Each spring, the New Jersey Department of Transportation (NJDOT) announces the program for that fiscal year and invites municipalities to apply. Road improvement projects such as resurfacing, rehabilitation or reconstruction and signalization are funded and distributed by formula.

Applications receive points based on various criteria including existing road conditions, Average Daily Traffic (ADT), safety improvements, and access to nodes (schools, residential areas, employment centers, etc.) Other important criteria include the project's readiness to construct, whether the municipality has received an allotment within the last three years, and the municipality's award and close-out performance on previously awarded State grants.

The State pays 75 percent of the funds at the time of bid approval and the remainder on a reimbursement basis after acceptance by the municipality and the State of the work completed.

NJDOT – County Aid

County Aid funds are appropriated by the Legislature annually for the improvement of public roads and bridges under county jurisdiction. Public transportation and other transportation projects are also included.

Each project must be included the in the county's Annual Transportation Program (ATP). In accordance with the County Aid regulations N.J.A.C. 16:20A, the ATP shall list a pool of eligible projects by name and location, including municipality, with a brief description of each project, project limits and an estimate of the construction cost.

NJDOT – Bikeway Grant Program

http://www.state.nj.us/transportation/business/localaid/bikewaysf.shtm

The New Jersey Department of Transportation's (NJDOT) Bikeway Grant Program provides funds to counties and municipalities to promote bicycling as an alternate mode of transportation in New Jersey. A primary objective of the Bikeway Grant Program is to support the State's goal of constructing 1,000 new miles of dedicated bicycle paths (facilities that are physically separated from motorized vehicular traffic by an open space or barrier either within the highway right of way or within an independent right of way). In an effort to establish regionally connected bicycle networks, this program is available to every municipality and county throughout New Jersey. Although priority will be given to construction of new bicycle paths, the proposed construction or delineation of any new bicycle facility will be considered.

NJDOT – Safe Streets to Transit

http://www.state.nj.us/transportation/business/localaid/safe.shtm

The Safe Streets to Transit (SSTT) program provides funding to counties and municipalities in improving access to transit facilities and all nodes of public transportation. The objectives of the SSTT program are:

- To improve the overall safety and accessibility for mass transit riders walking to transit facilities.
- To encourage mass transit users to walk to transit stations.
- To facilitate the implementation of projects and activities that will improve safety in the vicinity of transit facilities (approximately one-half mile for pedestrian improvements).

All counties and municipalities in New Jersey can apply for grant funding. Eligible projects include, but are not necessarily limited to intersection safety improvements, new sidewalks, curb ramps or sidewalk widening, safety enhancements, traffic calming measures, pedestrian oriented lighting. Although all transit related projects will be considered, funding requests for projects which are located within a half-mile of a transit station/center will be prioritized.

NJDOT Transit Villages

http://www.state.nj.us/transportation/business/localaid/transitvillagef.shtm

The Division of Local Aid and Economic Development's Transit Village Grant program will award grants for non-traditional transportation-related projects to New Jersey municipalities designated as Transit Villages. These are municipalities that have made a commitment to grow in the area surrounding a transit facility. The facility can service commuter rail, bus, ferry, or light rail. Growth in areas where infrastructure is already in place and where multi-modal transportation options are readily available helps to advance vital goals of the State of New Jersey such as reduced auto-dependency and cleaner air and water.

The Transit Village Task Force and NJDOT Commissioner designate Transit Villages. The number of designations varies each year and may be limited by the capacity of the State of New Jersey to accommodate and support additional Transit Villages. Once designated, a municipality is eligible for technical assistance and priority consideration by agencies that make up the Transit Village Task Force.

An application must be submitted to NJDOT and demonstrate that the municipality meets or intends to meet the following criteria: adopting a transit oriented development (TOD) redevelopment plan or TOD zoning ordinance, identifying "place making" efforts, and others listed on NJDOT website. If designated as a Transit Village, a municipality can receive funding for technical support services or receive high priority for other related funding, availability permitting. As of November 2017, Irvington, Rutherford and Summit have received Transit Village designation.

NJ Division of Highway Traffic Safety Grants (HTS Grants)

http://www.nj.gov/oag/hts/grants/index_south.html

The NJ Division of Highway Traffic Safety offers, on an annual basis, federal grant funding to agencies that wish to undertake programs designed to reduce motor vehicle crashes, injuries, and fatalities on the roads of New Jersey. Municipal, county, state government and law enforcement agencies, as well as non-profit organizations, are encouraged to apply for NJDHTS grant funding to address specific, local traffic safety issues.

Grant funding will only be awarded to programs that are in line with federal and state traffic and safety priorities to reduce car crashes, injuries and deaths.

- Comprehensive Traffic Safety Programs (CTSPs)

  The NJ Division of Highway Traffic Safety administers the Comprehensive Traffic Safety Program grants to address multiple traffic safety concerns within a county or region. CTSP grants include numerous tasks and strategies involving enforcement, education and engineering.

  Any CTSPs for the state of New Jersey fall under the Division of Highway Traffic Safety Grants. The CTSP grants include tasks involving enforcement, education and engineering to improve traffic safety. Other eligible programs for these grants include speeding, bicycle safety, school bus/pupil transportation and traffic engineering.

- Pedestrian Safety

  The NJ Division of Highway Traffic Safety administers Pedestrian Safety grants. Because the proportion of pedestrian fatalities in New Jersey is 30.2% (well above the national average), pedestrian safety is a continuing priority. The goal of the pedestrian safety program area is to lower the pedestrian fatality and injury crash rates. In New Jersey, municipalities that are statistically high for pedestrian injury crashes are eligible to apply for a Pedestrian Safety Grant. The grant includes funding for overtime enforcement at pedestrian safety hot spots in the community and educational outreach throughout the community.

- Other Eligible Programs

  The NJ Division of Highway Traffic Safety administers other grant applications that may also be submitted that utilize enforcement, education, or engineering counter-measures to address other specific traffic safety issues including:

  - Speed
  - Aggressive Driving
  - Bicycling Safety
  - Crash Investigation
  - Distractions
  - EMS Training - relating to crash response
  - Motorcycle Safety
  - School Bus/Pupil Transportation
  - Traffic Engineering - primarily pedestrian pavement markings and pedestrian signs, but some traffic studies will be considered.

Private or Non-Profit Funding Sources

Sustainable Jersey

www.sustainablejersey.com/grants-resources/

Sustainable Jersey is a nonprofit organization that provides tools, training and financial incentives for sustainable community initiatives. Their statewide certification program helps municipalities take steps to sustain their quality of life over the long term. In 2014, the Sustainable Jersey for Schools certification program was launched for New Jersey public schools interested in going green and conserving resources.

Participating local governments and schools voluntarily complete and document actions to earn points toward certification. Sustainable Jersey offers small grants ranging from $2,000 to $20,000 to assist communities and schools with completing Sustainable Jersey and Sustainable Jersey for Schools actions. To be eligible for a Sustainable Jersey or Sustainable Jersey for Schools Small Grant, a community or school must be registered or certified with Sustainable Jersey or Sustainable Jersey for Schools and have an active Green Team. The funds can only be used to implement actions that earn points in the Sustainable Jersey or Sustainable Jersey for Schools program.

Several Sustainable Jersey action items help provide sustainable transportation options. Funding is available for Safe Routes to School Programs, Complete Streets Programs, Bicycle and/or Pedestrian Audits, and Bicycle and/or Pedestrian Plans. Sustainable Jersey for Schools actions related to active transportation include Pedestrian and Bicycle Safety Promotion Initiatives, Safe Routes to School District Policy, and School Travel Plan for Walking and Bicycling. All six municipalities have been certified under the Sustainable Jersey program with Irvington, Red Bank, Rutherford, and Woodbridge receiving bronze level certification, and Madison and Summit achieving silver level certification.

PeopleforBikes Community Grants

www.peopleforbikes.org/pages/community-grants

The PeopleForBikes (formerly “Bikes Belong”) Community Grant Program provides funding for important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S. These projects include bicycle paths and rail trails, as well as mountain bicycle trails, bicycle parks, BMX facilities, and large-scale bicycle advocacy initiatives.

Since 1999, the program has awarded 356 grants to non-profit organizations and local governments in all 50 states and the District of Columbia. The PeopleForBikes Community Grant Program is funded by PeopleForBikes and partners in the bicycle industry, including Fuji, Giant, Shimano, Specialized, and Trek.

New Jersey Prevention Network

http://www.njpn.org/

Through funding from the New Jersey Department of Health, New Jersey Prevention Network’s “GET ACTIVE NJ” program provides technical assistance, training and incentives to assist municipalities to find ways to educate stakeholders on different policies that can help promote walking and the many benefits that this can have on their communities. NJPN offers financial assistance to NJ communities to help them evaluate their current policies and educate stakeholders on potential policy changes. In addition to financial resources, NJPN provides technical assistance and trainings to municipalities as they move though the policy change process in order to help them navigate its complexities. NJPN’s Walkability Toolkit includes the steps for identifying community needs, building capacity to address those needs, and explaining who makes policy at the local level.

Robert Wood Johnson Foundation

www.rwjf.org/

The Robert Wood Johnson Foundation (RWJF) invests in grantees (e.g., public agencies, universities, and public charities) that are working to improve the health of all Americans. Current or past projects in the topic area "walking and biking" include greenway plans, trail projects, advocacy initiatives, and policy development.

New Jersey Health Initiatives (www.njhi.org) is the statewide grant making program of the Robert Wood Johnson Foundation. New Jersey Health Initiatives supports innovations and drives conversations to build healthier communities through grant making across New Jersey.

The Geraldine R. Dodge Foundation

http://www.grdodge.org/what-we-fund/

The Geraldine R. Dodge Foundation provides funding for Arts, Education, Environment and Informed Communities initiatives that are innovative and promote collaboration and community-driven decision making.

Recipients may include nonprofit, community, government, and business leaders.

Other Funding Sources

Municipal Allocations

The most common sources of funding at the municipal and county level include allocations from a specific department, such as the parks and recreation department or public works department. Incorporating funding for maintenance of bicycle and pedestrian facilities into the annual budget guarantees funds are available to cover maintenance.

Local Private-Sector Funding

Local industries and private businesses may agree to provide support for Complete Streets development through one or more of the following methods:

- Donations of cash to support educational, promotional, and programmatic activities,
- Donations of services by large corporations to reduce the cost of Complete Streets implementation, including equipment and labor to construct and install elements of a specific concepts, such as wayfinding signage, benches, planters, or bicycle parking facilities,
- Reductions in the cost of materials purchased from local businesses that support temporary or short-term demonstration projects.

Appendix: Technical Advisory Committee Meeting Record

To:	Jennifer Buison	**Date:**	6/23/17
From:	Elizabeth Ward	**Project:**	728617-J468500.02
CC:	Megan Kelly, Mike Viscardi, Vivian Baker, Bettina Zimny, Mike Dannemiller		Bicycle and Pedestrian Access (BPA) at Selected Transit Stations Study
Subject:	Meeting Memo – 5/31 Kickoff Meeting		

Meeting Purpose:

To introduce the project team; review the study scope, schedule & goals; and begin discussion of station areas.

Attendees

Municipal and County Representatives

1. Ken Aloisio, Bergen County
2. Chris Helms, Bergen County
3. Donna Orbach, Bergen County
4. Doug Gladman, Irvington
5. Robert Vogel, Madison
6. Bruce McCracken, Middlesex County
7. Renu Chhonkar, Monmouth County
8. James Bonnano, Monmouth County
9. Gerald Rohsler, Morris County
10. Glenn Carter, Red Bank
11. Rose Inguanti, Rutherford
12. Aaron Schrager, Summit
13. Jeffrey Mayerowitz, Woodbridge
14. Brian Intindola, Neglia Engineering

Client/Consultant Team Representatives

15. Vivian Baker, NJ TRANSIT
16. Mike Viscardi, NJ TRANSIT
17. Zachary Subar, NJ TRANSIT
18. Kemmery Kendrick, NJ TRANSIT
19. Mia Joseph, NJ TRANSIT
20. Elmira Y., NJ TRANSIT
21. Megan Kelly, NJTPA
22. Doug Greenfeld, NJTPA
23. Mike Dannemiller, NV5
24. Elizabeth Ward, NV5
25. Bettina Zimny, NV5
26. Todd Poole, 4ward Planning

Action Items / Next Steps

1. The representative from Irvington will be leaving his position shortly. NJ TRANSIT to confirm a representative for the Township.
2. NJTPA will look into creating a "jumping off" page for the study on the NJTPA website.
3. NV5 will set up a Basecamp site for file sharing and invite the project team and municipal and county representatives. NV5 to post kickoff meeting materials.
4. NV5 to complete set-up of the study WikiMap, an interactive online mapping tool to gather information from the public about issues and opportunities in the study areas.
5. NV5 to create a project overview flyer and instructions on how to use the WikiMap. NV5 will share materials with the municipalities to post to their websites and/or share with their residents.
6. NV5 and NJ TRANSIT to coordinate with the municipalities and counties to schedule the initial municipal interviews and field visits.
7. NJ TRANSIT to share train and bus ridership data with the project team.

Summary

1. Introductory Remarks: Mike Viscardi, NJ TRANSIT, welcomed the attendees and informed the group that Jen Buison, Project Manager for NJ TRANSIT, was sorry that she was unable to attend the meeting. He explained that the six municipalities (Irvington, Madison, Red Bank, Rutherford, Summit, and Woodbridge) represent diverse locations, different counties, and all have adopted Complete Streets policies. Megan Kelly, NJTPA, gave an overview of NJTPA and their involvement in the study. Bettina Zimny, NV5, introduced the consultant team and asked everyone to fill out and return the questionnaire. The attendees introduced themselves.
2. Safe Routes to Transit Pilot Study: Mike Dannemiller, NV5, explained that the approach for this study is based on a pilot study completed for three stations in Monmouth County in 2015. The recommendations focused on short-term, low-cost improvements at the station area and along primary routes to the station. Lessons learned from this study included involving municipal and public input early to screen priority routes and locations, getting municipal guidance on existing, planned, and proposed projects and initiatives, and working with State, County, and neighboring municipalities on recommendations.
3. Study Overview: Elizabeth Ward, Project Manager for NV5, provided an overview of this study. She described the study's four major goals: 1 – increase bicycling and walking trips to these six transit stations; 2 – reduce traffic congestion at and near stations; 3 – alleviate the need for increased parking; and 4 – more vibrant communities.
4. Study process: There are three major steps in the development of this study. First is data collection. Data collection includes a review of existing plans and efforts and interviews with municipal and county stakeholders to gather local insight and priorities. Second is an assessment of the existing conditions for walking and bicycling. The project team will conduct field visits to each of the station areas. Municipal representatives will be invited to participate. Video and manual counts will also be performed. The third step in the process will be to review findings from the street assessment with municipal stakeholders and develop low-cost enhancements and identify potential long-term improvements. The recommendations will be presented to the public for review and comment at public meetings held in each of the six municipalities. The study is estimated to take approximately eight months to complete.

5. Study deliverables
    a. *Short-term, low-cost concept level enhancement plans*. The focus will be on signing and striping, as well as identifying missing sidewalks and potential crossing enhancements.
    b. *Long-term, off-road potential corridor concept*. This could include on-road protected bicycle facilities. No detailed utility or survey work will be included.
    c. *Typical cross section*s for up to 6 roadways and 2 off-road corridors.
    d. *Typical design details* for recommended improvements with sample images and sketches.
    e. *Cost estimate and Phasing Plan* will be prepared for the low-cost, concept level enhancements.
    f. *Funding Resources*
6. Mapping Exercise: Attendees separated into three tables to begin to mark-up maps and discuss priority routes, barriers, and destinations/community assets. The maps are attached. Some initial findings for each of the stations include:
    a. Irvington: Nye Avenue Streetscape Plan (County Road), link parking deck to terminal; Not all buses go into the terminal, some (25 & 70) have stops only on Springfield Avenue; Many midblock crossings, unsafe
    b. Madison: Issues include jaywalking, congestion with parking and traffic in peak hours, utilizing shoulders for parking vs. bicycles; making connections to colleges is an opportunity; there is a bicycle route plan as part of the Complete Streets Plan and part of the Master Plan; for the most part downtown is very walkable but there are some sidewalk and crosswalk issues; train station bicycle racks have been very successful; look at the SRTT Grant application and the Route 124 Morris County study.
    c. Red Bank: Destinations include the Count Basie Theater, Molly Pitcher Inn, the hospital; outreach to the Hispanic community will be important; sidewalk network is pretty good; bicycle lanes are beginning to be installed; making bicycle connections to Fair Haven is important; station could be better connected to the street network.
    d. Rutherford: look at redevelopment plans for Agnew Place and William Center Theater area; Erie is challenging; no pedestrian connection from Route 17; pedestrian crossing at the circle needs to be looked at; the path from Orient Way to the station is not clear. Investigate ownership/use of Boiling Springs parking deck and pedestrian connections.
    e. Summit: there are no sidewalks at Springfield Avenue, bridge; “Park Line” rail trail is an opportunity; more bicycle storage is needed; hills and narrow roads impact bicycling; sidewalk network is pretty good but there are some gaps.
    f. Woodbridge: bicycle lanes are planned for Rahway Avenue connecting Avenel Station to downtown, Woodbridge received TAP funding to implement; lots of redevelopment occurring; trucks through downtown is an issue; pedestrian crossings of the Turnpike are limited.

Notes

1. Municipal Roles and Responsibilities
    a. Share recent studies, plans, and local insights with the project team.
    b. Distribute WikiMap link to residents by posting to the municipal website, social media, and/or send by email.
    c. Participate in two conference calls. The first at the beginning of the study to review preliminary mapping and help identify priority locations and corridors to focus on during the field assessment. The second conference call will take place after the field assessment to review findings and brainstorm recommendations.
    d. Review recommendations before public review.

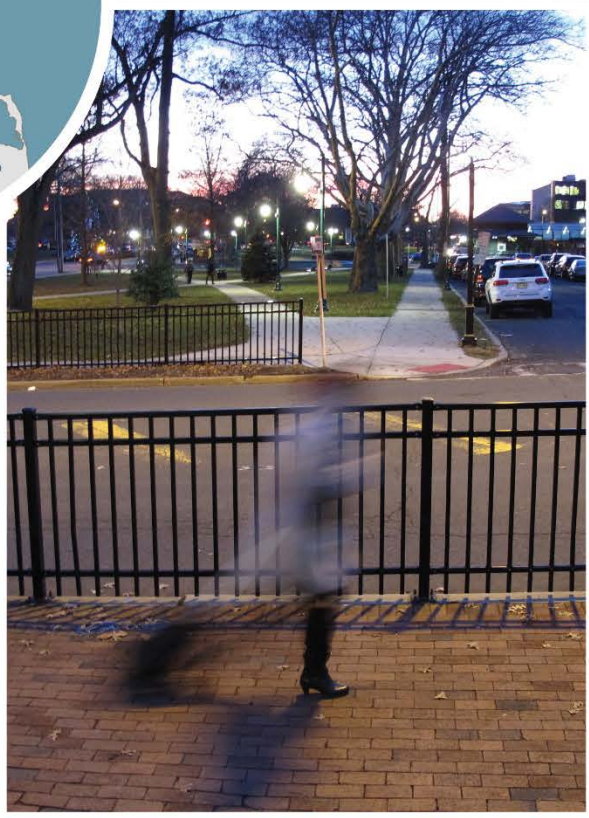
e. Host and advertise a public meeting at the end of the study for people to review and comment on recommendations. Municipalities are responsible for scheduling the venue.

2. Video and Manual Counts: It may make sense to wait until after summer to conduct counts since ridership may be impacted by people taking vacation and the work at Penn Station. This will be determined with input from the municipalities and NJ TRANSIT.
3. Transit Station vs. Transit Facility: It was recommended that the name of the study be changed from "at Selected Transit Stations" to "at Selected Transit Facilities" because bus terminals are not considered stations. Creating a glossary of terms (transit station, terminal, facility, etc.) could be useful.
4. Community notice/input: students and TMA's could be helpful in getting the word out. Posting flyers inside stations can sometimes be an issue.
5. Catchment Area: "Radius vs. walk- and bikesheds." The default area for pedestrian evaluations will encompass a ¾-mile radius around the station platform terminus. The bicycle evaluations will encompass an area within 2 miles of the station platform terminus. The project team also mapped the walk- and bikesheds for the study areas. The walk- and bikesheds measure the distance traveled along roadways, not linear distance, and presents a more accurate picture of travel distance.

End of Study Overview Report

Section 2

Station Reports



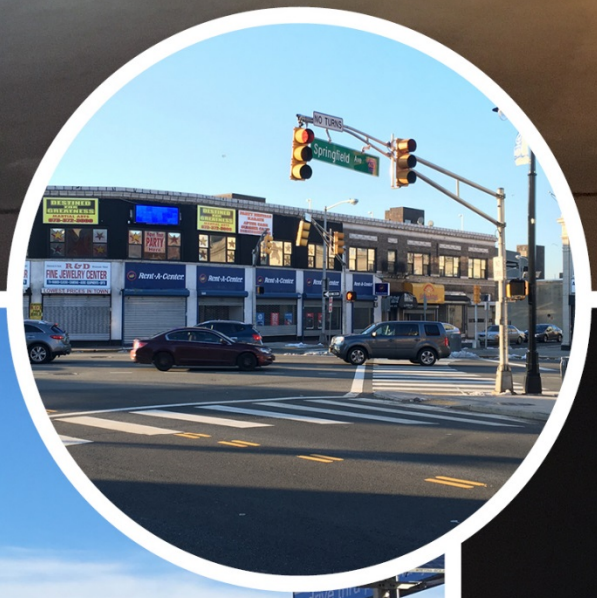
Bicycle and Pedestrian Access Study

Irvington | Madison | Red Bank | Rutherford | Summit | Woodbridge

Section 2: Station Reports

The Station Reports provide an individual assessment and set of recommendations for each of the six station areas. Each Station Report includes:

- *Overview, Context, and Background Data;*
- *Existing Conditions Field Assessment and Photo Log;*
- *Opportunities and Constraints Analysis with Maps;*
- *General Recommendations; Design Concepts, Cost Estimates, Phasing, and Funding Sources;*
- *Appendix (Traffic Counts, Cross Sections, Meeting/Public Input Records).*



IRVINGTON BUS TERMINAL REPORT

JUNE 2018

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Abstract:

The purpose of this study is to identify and address the most basic barriers limiting pedestrian and bicycle access to Irvington Bus Terminal. This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement "low-hanging fruit" improvements that can be accomplished quickly and inexpensively. Each design concept also includes recommendations for implementation, phasing, and funding sources.

The findings of this study have been discussed and reviewed with local municipal officials and have been presented for public comment at a Public Information Center that was hosted at Irvington Bus Terminal.

Prepared by NV5 and 4ward Planning

Irvington Bus Terminal Report Table of Contents

1. Overview and Context

The Irvington Bus Terminal is located in the center of the Irvington Township. The bus terminal is served by various NJ TRANSIT bus lines, with lines reaching Newark, Elizabeth, Maplewood, Clifton, and Plainfield, as well as points in between. With over a dozen bus lines converging on this hub, Irvington Bus Terminal is highly utilized for exchanges between lines.

Enhancing and encouraging walkability has been a priority for the Township, and pedestrian facilities are typically in good condition. Essex County recently improved and redesigned Springfield Avenue. There are no bicycle facilities in the vicinity of the bus terminal, including a lack of bicycle racks both at the terminal and the surrounding commercial area.

Irvington's street network consists of deflected grid patterns, which adjusts to follow major transportation and geographic barriers, such as Springfield Avenue and the Garden State Parkway. The Priority Routes Map (Figure I-1) for Irvington shows all routes that were reviewed in this study, as well as the priority routes, and indicates the locations of specific road cross-sections that are presented in the Appendix. The Priority Routes identified include:

- Springfield Avenue
- Clinton Avenue
- Park Place
- Cleremont Avenue
- Lyons Avenue
- Madison Avenue
- Grove Street

Background Data

Background research included review of existing documents, programs and data sources.

Local Documents

Title	Date
Irvington Complete Streets Policy	September 2012

2. Existing Conditions

(Observed March 14, 2018, temperature in the 40s)

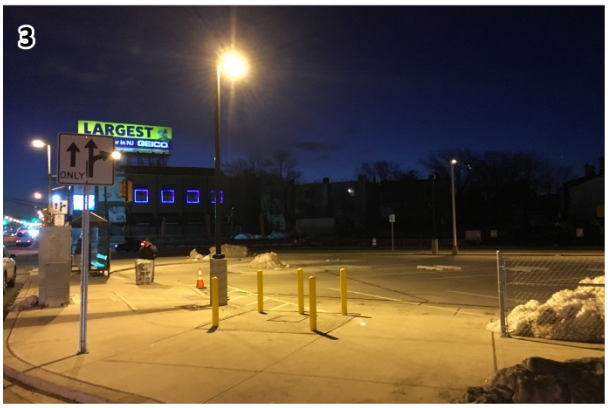
- Sidewalks in the vicinity of the bus terminal and between other pedestrian trip generators, are typically in good condition
    - Sidewalks are generally continuous with adequate connections within a 3/4-mile radius of the bus terminal
    - Crosswalks on concrete roadways east of the bus terminal are severely faded
    - Many pedestrian ramps outside of NJ TRANSIT property do not meet ADA standards
- Most of the intersections on Clinton Avenue, Western Parkway, and Eastern Parkway need pedestrian ramp upgrades and crosswalk re-striping; most other pedestrian ramps that are closer to the bus terminal are ADA compliant
- Crosswalks on Springfield Avenue are well-marked in the vicinity of the bus terminal, but are faded farther away from the terminal
- Evidence of ponding (water collecting in small puddles) was observed at the Clinton Avenue and Coit Street intersection and the Chester Avenue and Lyons Avenue intersection
- There are no bicycle racks at the bus terminal

Photo Log

The following photos and captions describe existing conditions around and to the bus terminal.

Passenger waiting area is well lit before daylight.

The bus terminal driveway is an elongated pedestrian crossing, but without crosswalk markings or adequate lighting for the middle of the driveway.



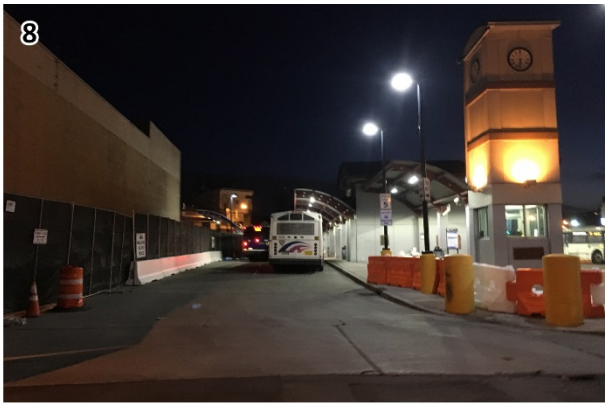
Parking lot lighting is adequate for adjacent pedestrian areas.

The parking lot itself was not yet in use, but had adequate lighting for circulation.

Without a clearly marked pedestrian crossing area, pedestrians walk in the roadway, often out of view of large buses exiting the terminal before and after daylight.

Within the bus terminal, walkways are well lit with overhead vehicular lighting. There are intermittent openings in the fence that allow pedestrian movement.

From Stuyvesant Avenue, the bus terminal meets the street at close to a 90 degree angle, which shortens the crossing distance. Lighting and signage seem to face this side of the terminal.



Buses access the terminal from Stuyvesant Avenue, picking up passengers and often exiting onto Springfield Avenue.

Crosswalk and other intersection markings do not adhere to the concrete roadway/bridge over the Garden State Parkway, leaving poorly marked intersections for all users.

ADA compliant ramps are found on most intersections adjacent to the bus terminal, but crosswalk markings are often faded due to high traffic volumes.

Many intersections are both well marked and have ADA compliant pedestrian ramps.

There are also various pedestrian refuge islands to provide safe and comfortable crossings that organize traffic. In this case, lighting has been incorporated into the pedestrian refuge island.

Some recently repaved streets may be awaiting the re-striping of crosswalks, but lack pedestrian ramps most likely due to the apex catch basin, which may require a capital project to replace.

Other crossings have recently been upgraded with new corner quadrants and ADA compliant pedestrian ramps.

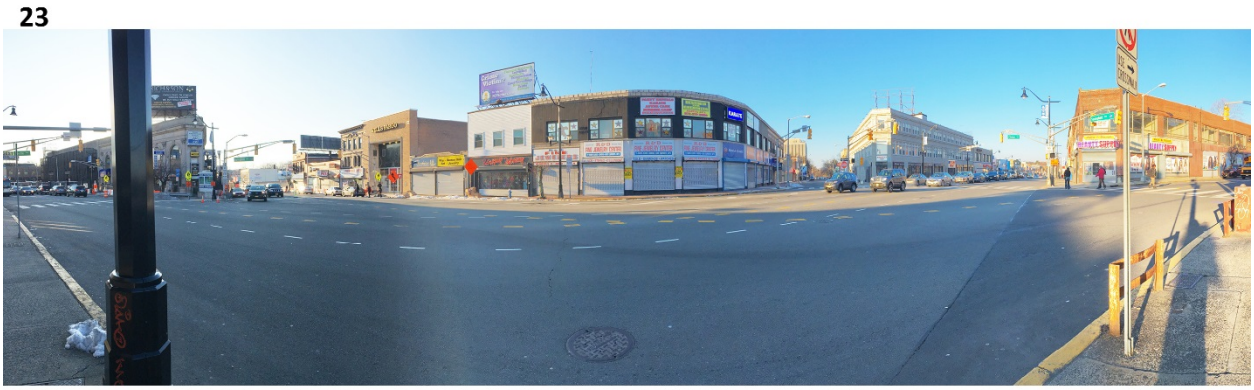
Low cost solutions could upgrade these intersections. The addition of tactile strips, one 5' x 5' flag of sidewalk, and re-striping the crosswalks with thermoplastic paint (as opposed to standard paint shown above) would upgrade this intersection to prioritize pedestrians.

Corners that were built without pedestrian ramps, varying roadway surfaces and a general lack of pedestrian amenities make many intersections challenging to navigate as a pedestrian.

Ponding occurs when water cannot drain properly and forms puddles. During field observations, temperatures had been below freezing overnight, revealing areas that may experience ponding issues during normal rain conditions. Pictured above are Clinton Avenue & Colt Street (left) and Chester Avenue & Lyons Avenue (right).

The painted slip right-turn lane from Union Avenue onto Clinton Avenue appears to work well for vehicles.

The existing ergonomic crosswalks appear to function as designed during high volume peaks.



The wide and complex intersection of Springfield Avenue, Clinton Avenue and Union Avenue has intersection alignment markings, also referred to as “deer tracks” to guide vehicles through in intersection and into the correct receiving lane.

Well marked crossings with ADA compliant pedestrian ramps built around apex catch basins can be found throughout Irvington. Chester Avenue and Lyons Avenue is a good example of such an intersection (aside from possible ponding shown in Image 20), which provides access to Irvington Park from the neighborhood to the south and west.

The driveway apron to Walgreens on Springfield Avenue at Harrison Place prioritizes pedestrians by maintaining a level plane with the sidewalk, with tactile warning strips on either side.

Wide parking lanes visually narrow the moving lanes, effectively slowing much of the through traffic.

The intersection of Washington Avenue, Springfield Avenue and Cleremont Street also sits on a bridge over the Garden State Parkway. Standard paint markings over the concrete roadway wears quickly and has left the intersection difficult to navigate.

3. Issues & Opportunities

General Issues

- Crosswalks and roadway markings on the concrete roadway over the Garden State Parkway are severely faded due to poor paint adhesion to the concrete
- Most of pedestrian ramps on Clinton Avenue south of Springfield Avenue need to be upgraded
    - Many pedestrian ramps outside of NJ TRANSIT property do not meet ADA standards
    - Springfield Avenue was recently reconstructed, so pedestrian ramps along this corridor are in good condition
- The Stuyvesant Avenue driveway to the bus terminal creates a very long, unmarked pedestrian crossing
    - No crosswalk connecting the existing pedestrian ramps
    - Middle of the crossing is poorly lit before and after sunlight
    - Only pavement markings for buses exiting the terminal are yield markings for the oncoming vehicular lane
- The new design of the intersection of Springfield Avenue, Clinton Avenue and Union Avenue appears to be functioning well, but some of the crossings are still excessively wide, which can be challenging for the elderly population and people with disabilities
- A high-volume of pedestrians cross Springfield Avenue from the driveway of the bus terminal to the traffic island at Washington Avenue
    - This is not a marked crossing, but it takes place frequently and presents an unsafe condition
- There are no bicycle racks or bicycle lanes in the vicinity of the terminal

Bus terminal area

North side of the bus terminal

- The bus terminal entrance onto Stuyvesant Avenue is wide and unmarked for pedestrians
- Pick-up/drop-off takes place at various locations

West side of the bus terminal

- Construction and nearby intersections limit the activity on this side of the bus terminal

Parking lot

- A new parking lot was recently constructed but was not open for public use
    - The lot is currently being rented out as a construction staging space and is expected to become available for public use when the rental agreement ends

General Opportunities

- Improve crosswalk visibility, paying attention to areas that wear out the most
    - Crosswalk upgrades and/or restriping should use “ladder” or “continental” striping
    - To minimize wear, utilize continental style crosswalks with striping applied parallel to the direction of motor vehicle travel
- For the bridges over the Garden State Parkway, consider paint or thermoplastic material made specifically for applying on concrete
- The Stuyvesant Avenue driveway to the bus terminal needs improvements
    - Crosswalk markings aligned with existing pedestrian ramps/tactile strips
    - Additional lighting
    - Rectangular Rapid Flash Beacon (RRFB)
- Add to the successful design of the intersection of Springfield Avenue, Clinton Avenue and Union Avenue
    - The slip right turn lane from Union to Springfield could be built out to provide a pedestrian refuge island
    - Normalize intersections where possible to shorten the crossings that are excessively wide
- Study the high-volume of pedestrians crossing Springfield Avenue from the driveway of the bus terminal to the traffic island at Washington Avenue (this is not a marked crossing)
- Bicycle racks should be installed in the vicinity of the terminal

Bus terminal area

North side of the bus terminal

- Upgrade the terminal entrance onto Stuyvesant Avenue
- Formalize pick-up/drop-off locations inside the parking lot along Stuyvesant Avenue

West side of the bus terminal

- Improve access to this side of the bus terminal once construction is complete

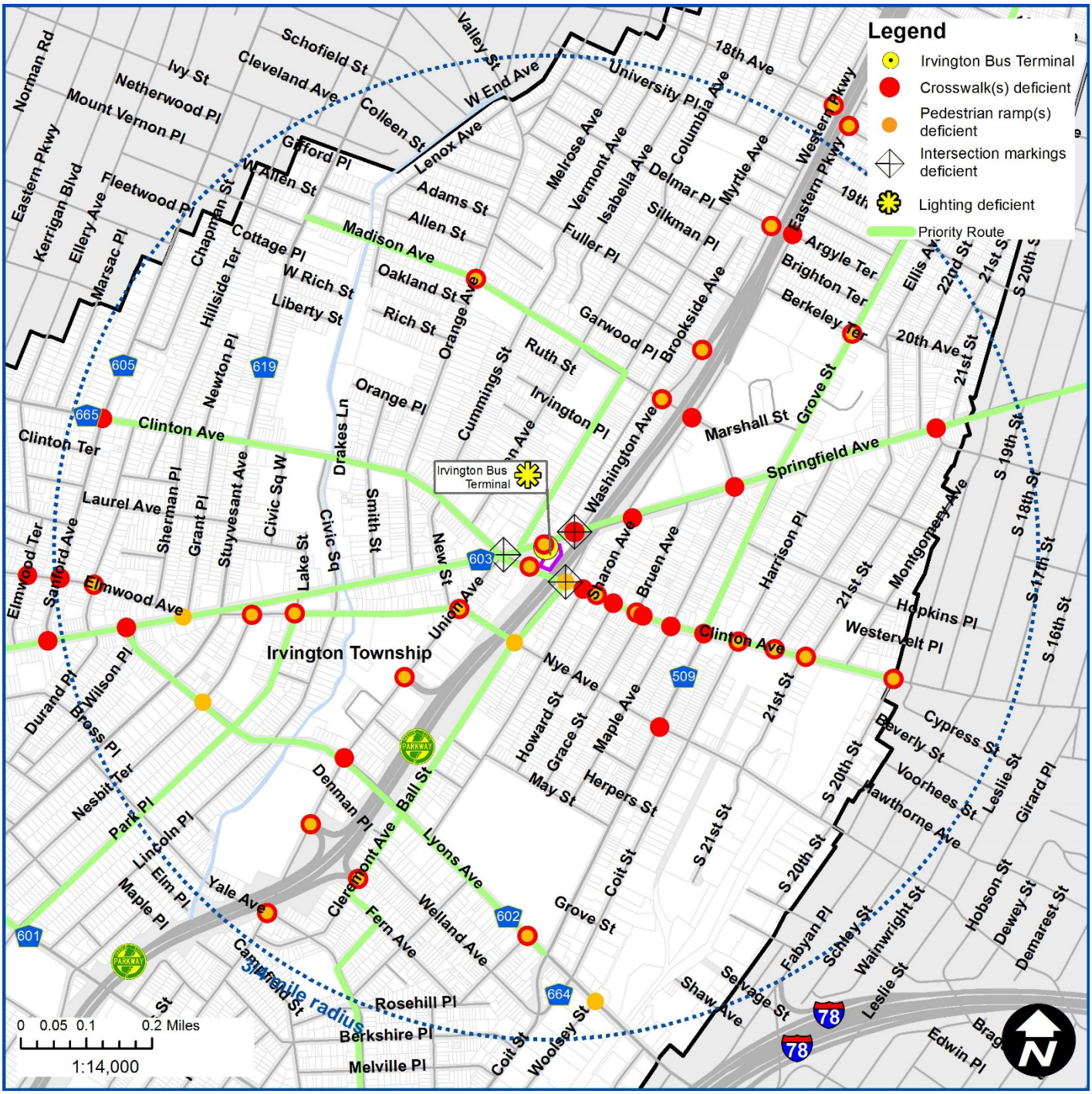
Parking lot

- Clarify allowable uses for parking lot

Existing Conditions, Issues & Opportunities (general and bus terminal area specific) are synthesized and presented in Figure I-2: Issue & Opportunities Map.

Figure I-1: Priority Routes Map

Figure I-2: Issues & Opportunities Map



KEY ISSUES				OPPORTUNITIES			
1	Bus terminal driveway on Springfield Avenue is wide and provides no pedestrian crossing indicators, despite heavy pedestrian volumes	3	Intersection of Clinton Avenue, Springfield Avenue and Union Avenue has long crossings and complex road geometry	1	Add markings, signage and other pedestrian amenities to provide a safer, more comfortable crossing	3	Normalize intersections with wide crossings; make crosswalks high-visibility & explore curb extensions
2	Crossing and lane markings are faded on the concrete roadway over the Garden State Parkway	4	No bicycle racks in the vicinity of the bus terminal	2	Explore paint options that are made to adhere to concrete	4	Install bicycle racks under terminal covering, south of terminal building

4. Recommendations & Design Concepts

The goal of this study is to identify the most basic barriers limiting pedestrian and bicycle access to the bus terminal, and to propose recommendations to address them. As such, the study has produced a series of actionable design concepts specific to the study area that propose improvements for bicyclists and pedestrians.

Most design recommendations consist mainly of markings, with more substantial interventions at high-priority locations. Locations where deficiencies have been observed in crosswalks, pedestrian ramps, intersection markings, and lighting are displayed in Figure I-2: Issues & Opportunities Map.

In general, recommendations respond to deficiencies involving:

- Pedestrian ramp condition (if any) for ADA compliance
- Crosswalks for visibility and condition
- Intersection markings to organize turning and thru alignment at complex intersections
- On-street bicycle facilities where feasible
- Lighting for adequate coverage during low-light hours

In response to these issues, the project team has identified the following general recommendations for each station area:

- Provide high-visibility crosswalks
- Provide curb ramps at all intersections and crossings
- Provide bicycle accommodations along low-speed routes (bicycle boulevard treatments)
- Deploy epoxy curb extensions
- Provide RRFBs at unsignalized crossings, as appropriate
- Track implementation and perform post-implementation studies
- Provide sufficient bicycle parking (coordination with NJ TRANSIT may be required to provide additional bicycle racks) and consider covered, secure bicycle parking

Short-Term Conceptual Enhancements

Most of the design concepts in this study have the potential to be deployed as short-term enhancements, also referred to as Tactical Urbanism projects, which are design changes implemented to street environments in a “light, quick, cheap,” and temporary manner. By demonstrating to roadway users – pedestrians, bicyclists, drivers – the effectiveness of design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

The short-term approach is the basis for most of the recommendations in this study. Minimal funding can accomplish many of these conceptual improvements, without having to initiate a larger capital project. In many cases, re-striping roads with these design concepts as a component of routine resurfacing projects could result in little to no additional cost, compared to replacing the markings as they were prior to resurfacing.

Long-Term Conceptual Enhancements

Many of the short-term concepts have the potential to become long-term buildouts. The primary example, which is used throughout the six transit stations reviewed in this study, is the proposed short-term curb extension composed of colored epoxy gravel. While the short-term application can be implemented almost anywhere, the long-term buildout of concrete-surface curb extensions could be pursued as a long-term upgrade. Locations where epoxy gravel curb extensions are proposed require additional study prior to long-term buildout with concrete, in order to understand implications to road drainage, utilities, and other factors, as well as to obtain funding for design and construction.

Phasing

With a goal of presenting NJ TRANSIT and the local municipalities with actionable recommendations to improve pedestrian and bicycle access to the stations, the recommendations were mainly low-cost and high-impact. Each location that received specific design concept recommendations includes a combination of treatments, and could be implemented in a phased approach, or combined together as part of a broader, more comprehensive effort.

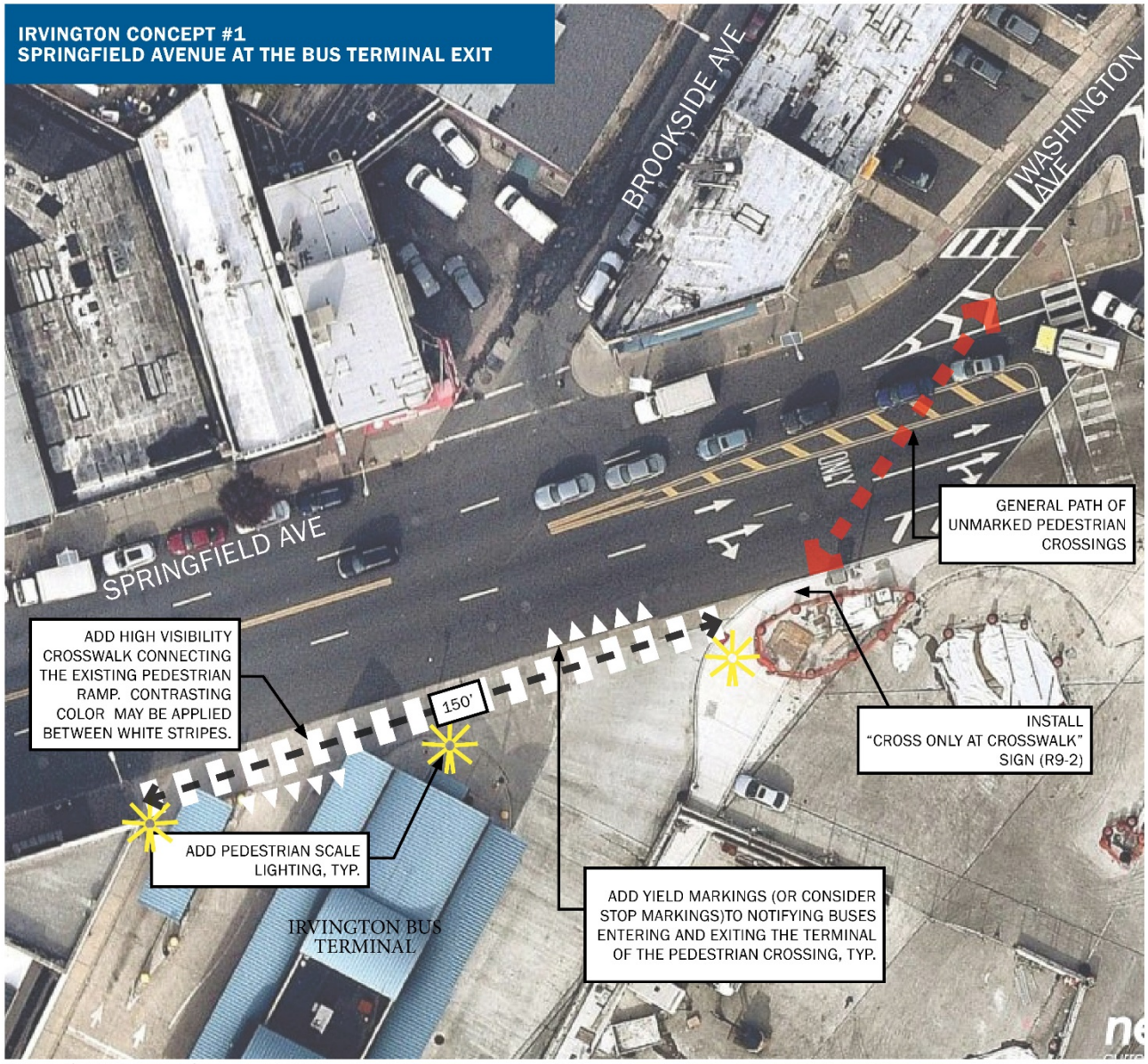
Design Concepts for Irvington Bus Terminal

There are deficient pedestrian ramps surrounding the Irvington Bus Terminal, although the intersections on and north of Springfield Avenue are typically in good condition. The Clinton Avenue, Union Avenue and Eastern/Western Parkway corridors have mostly deficient pedestrian ramps. Crosswalks surrounding the bus terminal as well as throughout the study area were faded or required application of high-visibility thermoplastic striping to function more effectively. The use of modular lane separator curbs would address the fading paint on concrete roadway surfaces on the bridge over the Garden State Parkway, and paired with colored epoxy gravel curb extensions would provide clear centerline assignment for drivers and shortened crossing distances for pedestrians. Improved visibility and pedestrian scale lighting would address conditions at both entrances/exits to the bus terminal, especially during months with shortened periods of daylight. Finally, a potential location was identified for providing covered bicycle parking under the bus terminal.

In response to these issues, conceptual design improvements have been developed at the following locations to address the most basic barriers limiting pedestrian and bicycle access to the bus terminal:

Design Concept #	Location	Description
1	Springfield Avenue at the Bus Terminal Exit	• Provide high-visibility crosswalks • Improve lighting
2	Springfield Avenue, Cleremont Avenue, & Washington Avenue	• Reinforce dedicated pedestrian space and vehicular movement patterns through application of striping and delineators
3	Clinton Avenue & Washington Avenue	• Create curb extension to shorten crossing distance and calm traffic using paint and flexible delineators • Provide bicycle parking under existing structure
4	Clinton Avenue, Springfield Avenue, & Union Avenue	• Install modular lane separator curb to delineate slip turn lane and make motor vehicle movements more predictable for pedestrians
5	Bicycle Boulevards	• Provide bicycle boulevard treatments on select low-speed roads

The remainder of this Station Report provides illustrations for each design concept along with a description of the general approach and materials for short-term and long-term construction. Cost estimates with recommendations for funding and phasing are presented after the design concepts.



Concept - Planning Purposes Only

General Approach:

Improve the pedestrian environment across the Springfield Avenue exit from the Bus Terminal. The existing crossing is 150' long and is unmarked. Before and after daylight, the crossings lack adequate lighting.

Further study is required to address the issue of pedestrians frequently crossing Springfield Avenue outside of the marked crosswalk (along the dashed red line shown).

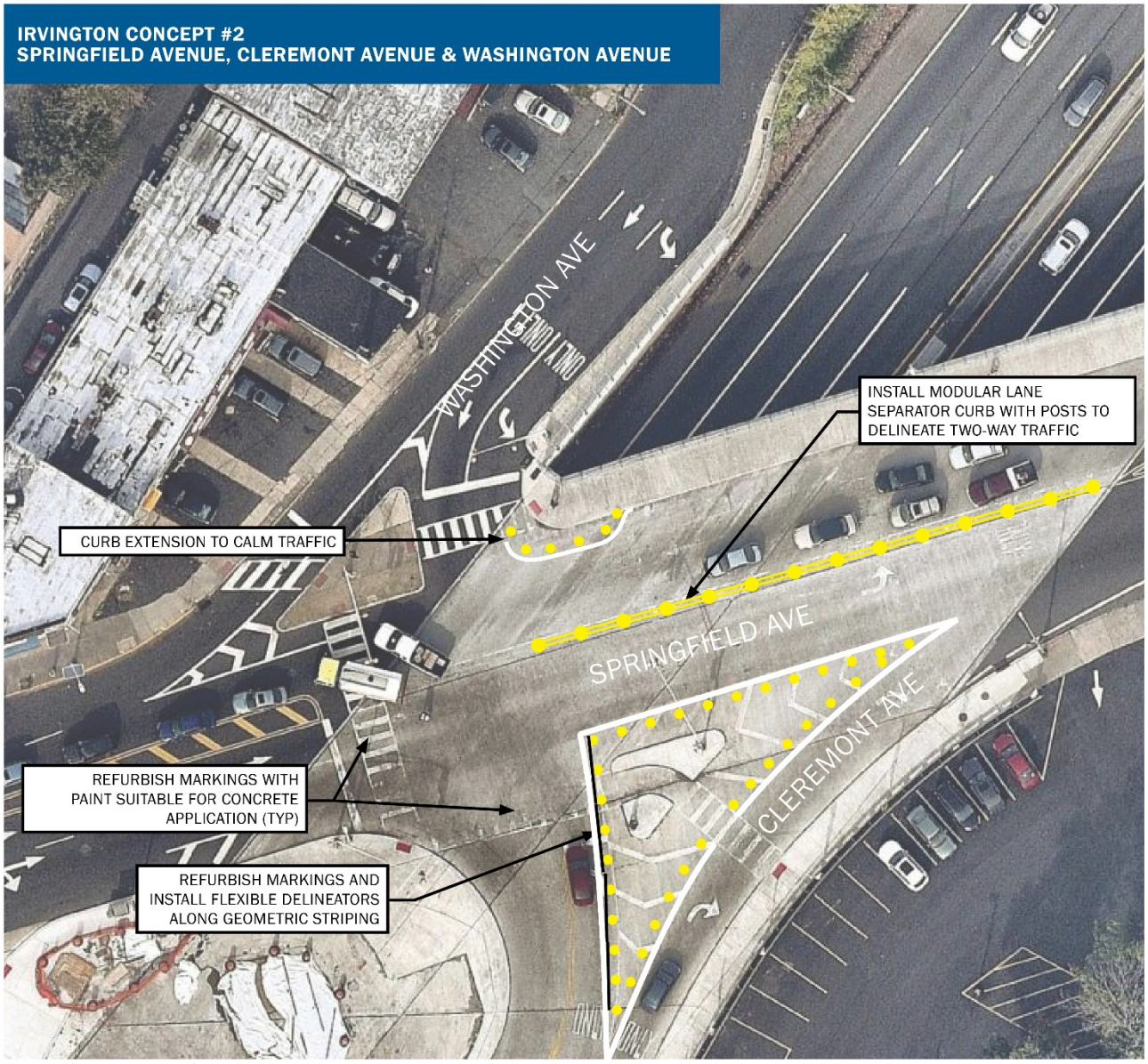
Short-Term (Low Cost) Materials:

- White thermoplastic crosswalk
- Sign

Long-Term (High Cost) Materials:

- Evaluate design solution for unmarked pedestrian crossing
- Pedestrian scale lighting

IRVINGTON CONCEPT #2
SPRINGFIELD AVENUE, CLEREMONT AVENUE & WASHINGTON AVENUE



Concept - Planning Purposes Only

General Approach:

Establish the desired roadway geometry by installing flexible delineators along white striping. Long-term buildout should include mountable curbs to allow large vehicles to make all turns.

Short-Term (Low Cost) Materials:

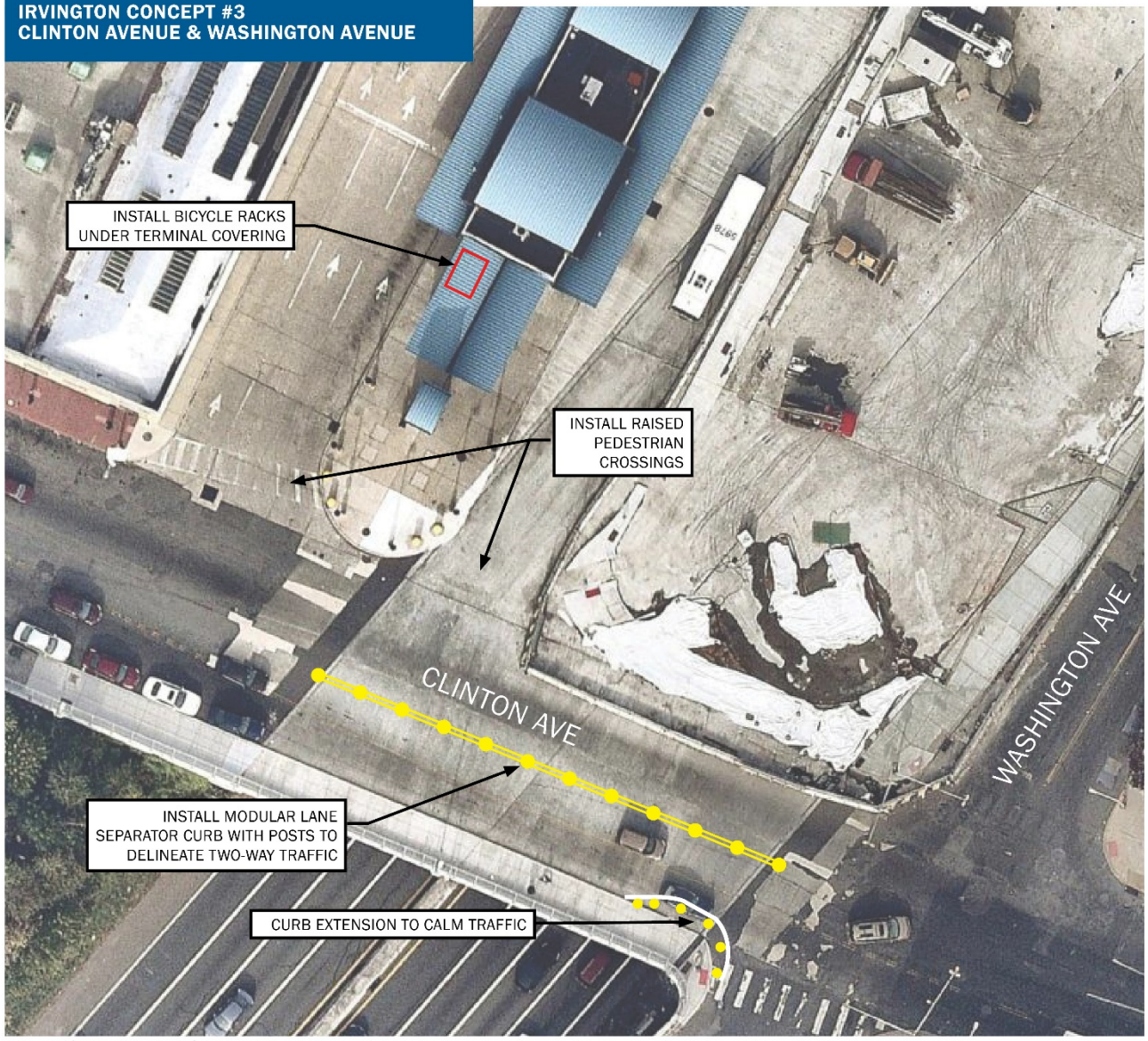
- Flexible delineators
- Modular lane separator curb with posts
- White paint suitable for concrete application (crosswalk)
- White paint suitable for concrete application (striping)

Long-Term (High Cost) Materials:

- Build out channelizing markings and curb extensions with mountable curbs

Example of flexible delineators (above) and modular lane separator curb with posts (below)

IRVINGTON CONCEPT #3
CLINTON AVENUE & WASHINGTON AVENUE



Concept - Planning Purposes Only

General Approach:

Establish the centerline for low-light situations using modular lane separator curb with posts. Create curb extension to shorten crossing distance and calm traffic using paint and flexible delineators.

Short-Term (Low Cost) Materials:

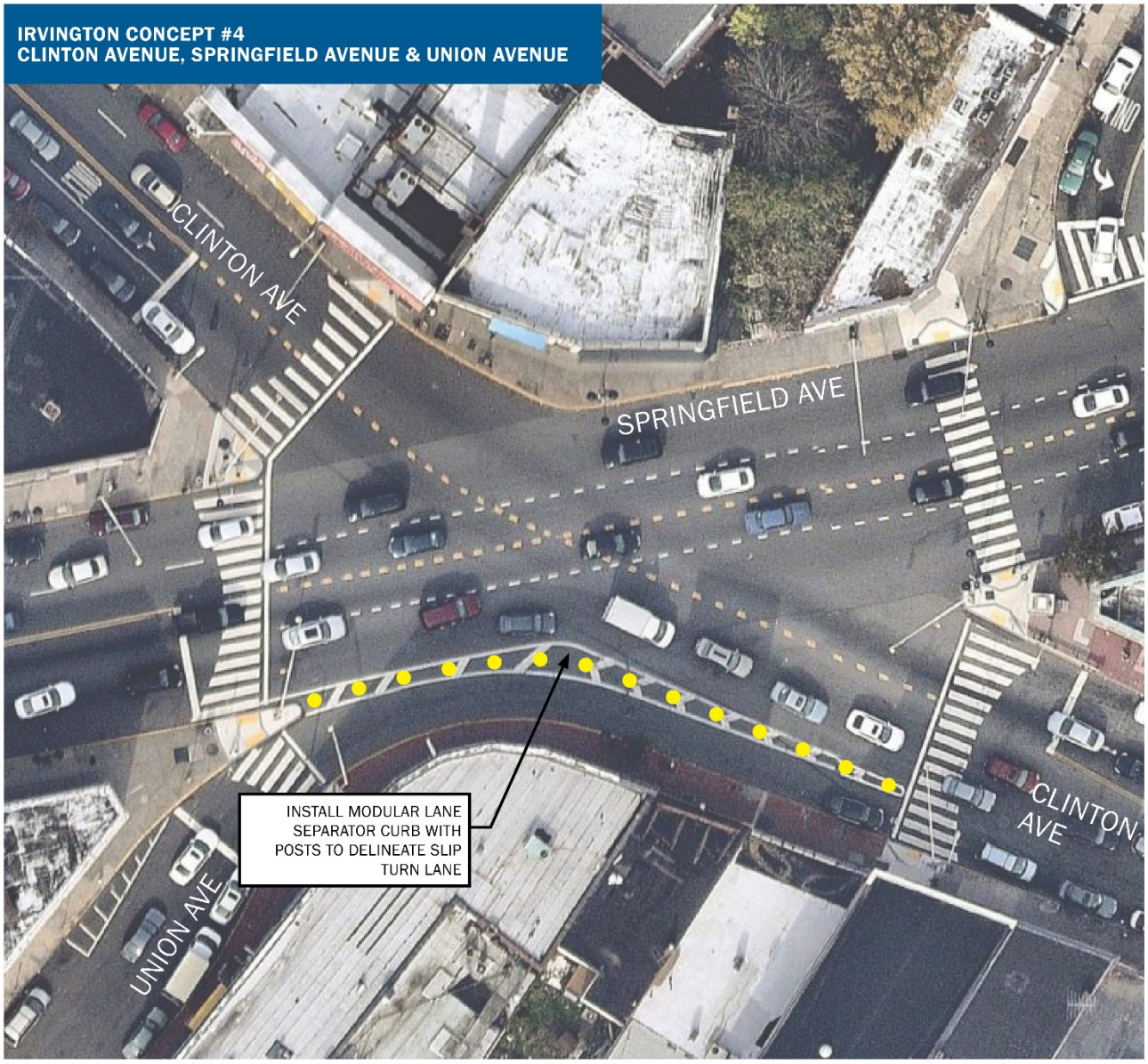
- Modular lane separator curb with posts
- White paint suitable for concrete application
- Flexible delineators
- Install bicycle racks under the terminal covering on the south side of the bus terminal

Long-Term (High Cost) Materials:

- Build out curb extensions with mountable curbs
- Build raised pedestrian crossings

Example of Flexible Delineators (above) and modular lane separator curb with posts (below)

IRVINGTON CONCEPT #4
CLINTON AVENUE, SPRINGFIELD AVENUE & UNION AVENUE



Concept - Planning Purposes Only

General Approach:

Install modular lane separator curt to delineate slip turn lane and make motor vehicle movements more predictable for pedestrians.

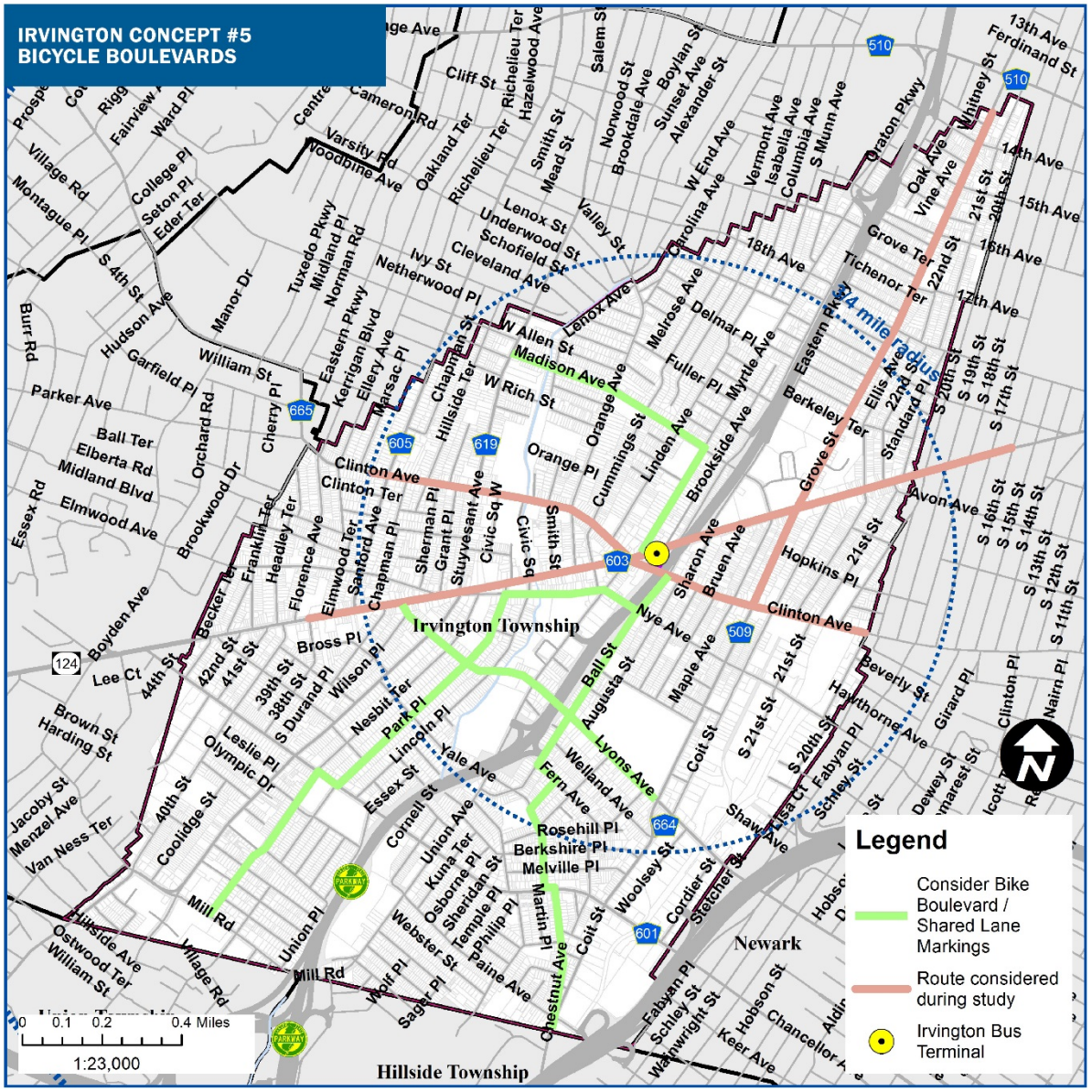
Short-Term (Low Cost) Materials:

- Line the slip turn lane from Union Avenue to Clinton Avenue with modular lane separator curb with posts

Long-Term (High Cost) Materials:

- Consider buildout of slip turn lane from Union Avenue to Clinton Avenue (study required)

Example of modular lane separator curb with posts



Concept - Planning Purposes Only

General Approach:

A bicycle boulevard is a low-volume and low-speed street that has been optimized for bicycle travel through treatments such as signage and pavement markings, traffic calming, and intersection crossing treatments. These treatments prioritize travel and safety for bicyclists and pedestrians, maintain access to local destinations for motor vehicles, but discourage high volume and high speed motor vehicle traffic.

Short-Term (Low Cost) Materials:

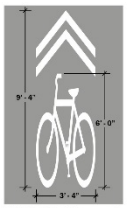
- Shared lane markings (thermoplastic preferred)
- Bicycle route signage

Long-Term (High Cost) Materials:

- Colored epoxy gravel for curb extensions, neckdowns
- Fully deployed wayfinding and signage
- Fully constructed traffic calming

Bicycle Boulevard marking

Bicycle Wayfinding



MUTCD Shared Lane Marking

Bicycle wayfinding signs help direct cyclists to the network designed for them

Residential street with Shared Lane Markings, or "sharrows"

5. Cost Estimates, Phasing, & Funding Sources

This section includes cost estimates, recommendations for project phasing (short-, medium-, or long-term), and identifies funding sources that are most appropriate or accessible for each design concept.

Refer to the Study Overview Report for additional information on funding sources that municipalities may consider pursuing.

These cost estimates include general material and installation costs. A contingency of 30% has been added to calculate the total estimated cost and account for price increases over time and price premiums that may apply to small projects. A phasing sequence with short-, medium-, and long-term time frames is provided to help the municipalities plan for implementation.

Item	**Concept 1: Springfield Avenue at the bus terminal Exit**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White thermoplastic crosswalk	1,600	SF	$3.20	$5,120	Short	Safe Streets to Transit
2	Sign	1	EA	$360.00	$360	Short	
				SUBTOTAL	$5,480		
				CONTINGENCY (30%)	$1,644		
				TOTAL	**$7,124**		

Item	**Concept 2: Springfield Avenue, Cleremont Avenue, & Washington Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Flexible delineators	300	LF	$10.00	$3,000	Medium	Safe Streets to Transit
2	Modular lane separator curb with posts	230	LF	$25.00	$5,750	Medium	
3	White paint suitable for concrete application (crosswalk)	1400	SF	$1.60	$2,240	Short	
4	White paint suitable for concrete application (striping)	360	LF	$1.60	$576	Short	
				SUBTOTAL	$11,566		
				CONTINGENCY (30%)	$3,470		
				TOTAL	**$15,036**		

Item	**Concept 3: Clinton Avenue & Washington Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Modular lane separator curb with posts	140	LF	$25.00	$3,500	Medium	Local Aid
2	White paint suitable for concrete (striping)	80	LF	$1.60	$128	Short	
3	Flexible delineators	80	LF	$10.00	$800	Short	
4	Bicycle racks	12	EA	$400.00	$4,800	Medium	
				SUBTOTAL	$9,228		
				CONTINGENCY (30%)	$2,768		
				TOTAL	**$11,996**		

Item	**Concept 4: Clinton Avenue, Springfield Avenue, & Union Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Modular lane separator curb with posts	170	LF	$25.00	$4,250	Medium	County Aid
				SUBTOTAL	$4,250		
				CONTINGENCY (30%)	$1,275		
				TOTAL	**$5,525**		

Item	**Concept 5: Bicycle Boulevards**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Shared lane markings (1 SLM every 250' in both directions on ±24,000' of roadway)	192	EA	$100.00	$19,200	Short	PeopleforBikes Community Grants
2	Bicycle route signage (1 sign every 500' in both directions on ±24,000' of roadway)	96	EA	$120.00	$11,520	Medium	
				SUBTOTAL	$30,720		
				CONTINGENCY (30%)	$9,216		
				TOTAL	**$39,936**		

Irvington Bus Terminal Report Appendix

June 2018

Appendix Contents

Traffic Counts

Field Observations

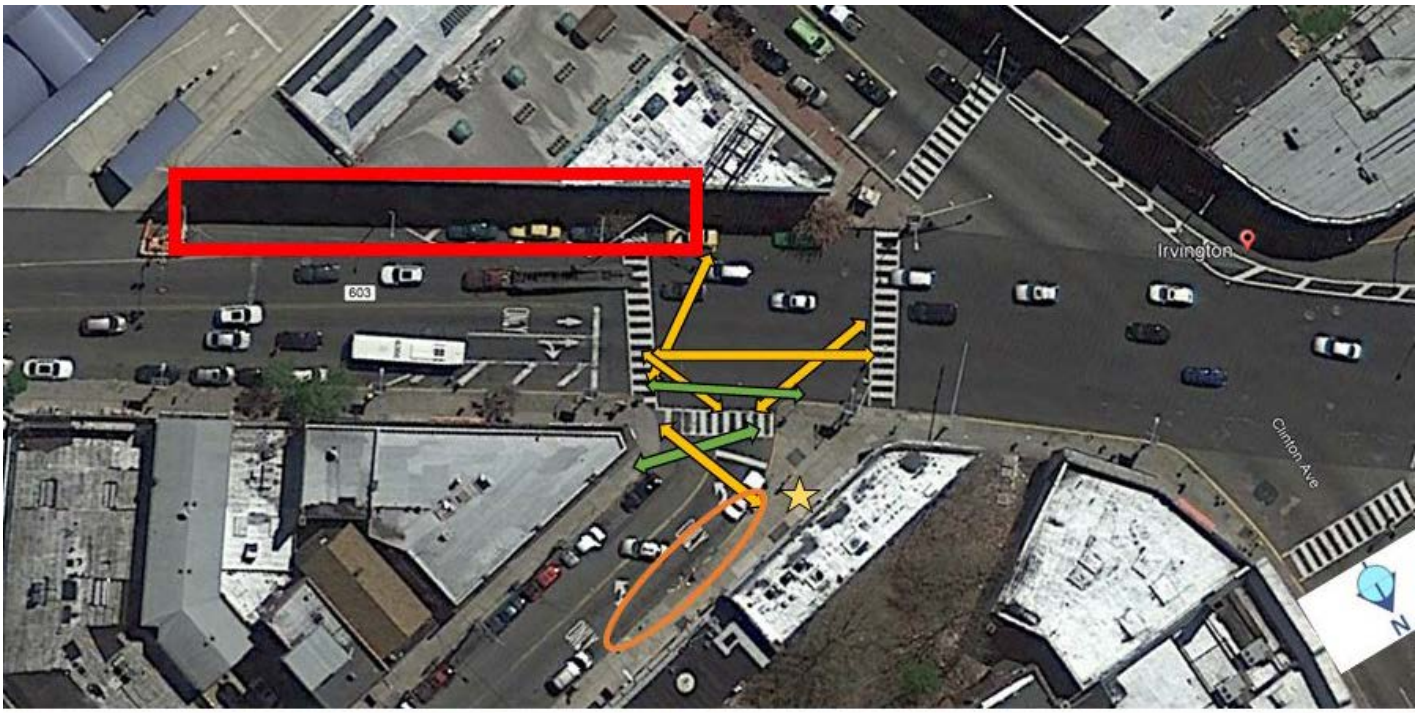
Bicycle and pedestrian counts were manually collected in the field during two-hour peak periods in the AM and PM. These counts identified bicycle parked at the bus terminal at the start of the count period, with a count at each hour to include additional bicycles parked or removed during each peak hour.

Date: Wednesday, April 11th, 2018
Time: AM Peak: 7:00 AM to 9:00 AM
Location: Myrtle Avenue & Springfield Avenue Intersection
Weather: 33°F Sunny

Pedestrian Count: 273
Bicycle Count: None observed

Notes:

- Highest volume of pedestrians recorded between 7:45 AM and 8:20 AM
- Sidewalk along Springfield Avenue closed, due to building construction, likely caused irregular crossing patterns (mapped)
- Pedestrians cross according to the presence of traffic, as opposed to traffic signals. No crosswalk signal push buttons.



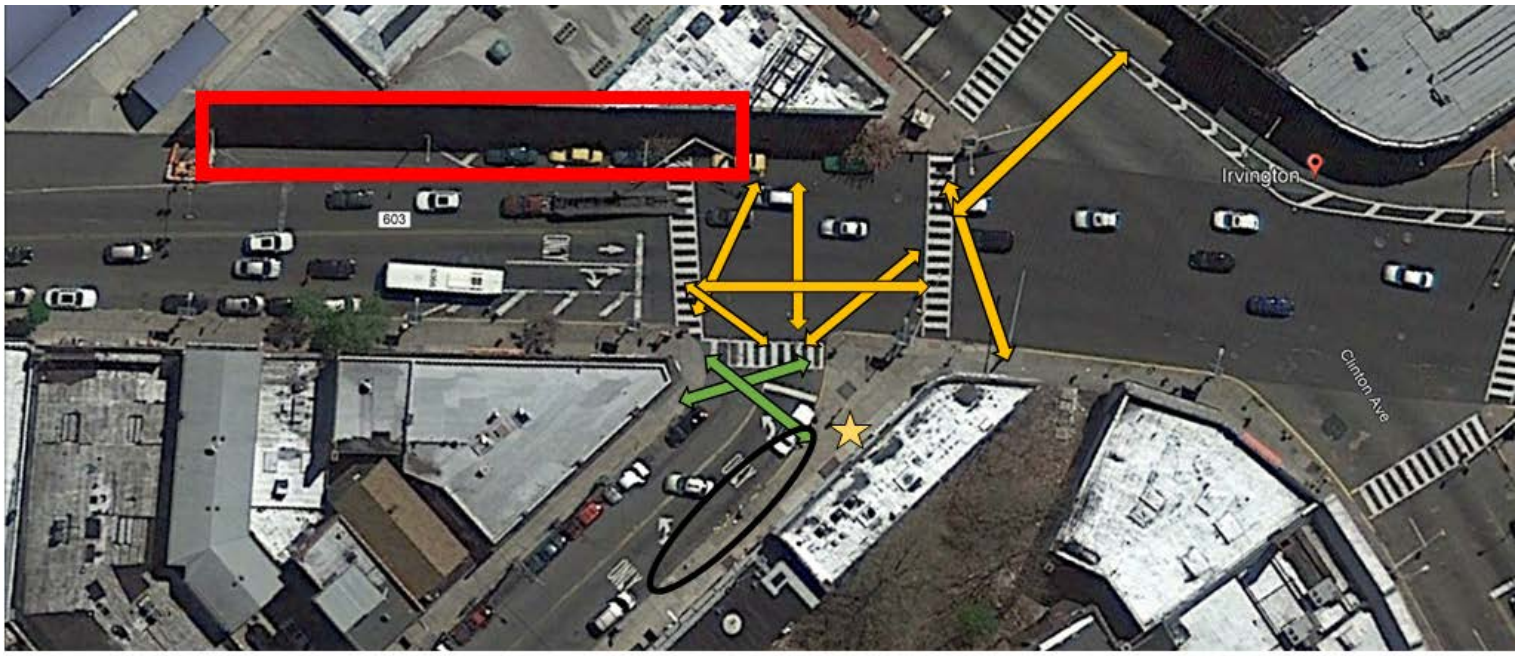
- Irvington Police assisting some pedestrians cross intersection. Police appeared to have little interaction with pedestrians
- Children and young adults consistently using crosswalks as intended
- Older adults crossing street in an irregular pattern
- “Taxi Parking Only” along Myrtle Avenue noted
- Taxi drivers congregating on street outside of their vehicles and interrupting normal traffic flow.
- Cars consistently stopping within crosswalk, causing pedestrians to cross outside of the crosswalk and in irregular patterns
- Irregular crossings were consistently observed
- Most common crossing pattern was the East-West crossing along Springfield Avenue (mapped below in green)

Date: Wednesday, April 11th, 2018
Time: PM Peak: 5:00 PM to 7:00 PM
Location: Myrtle Avenue & Springfield Avenue Intersection
Weather: 52°F Mostly Cloudy to Partly Cloudy

Pedestrian Count: 297
Bicycle Count: None observed

Notes:

- Highest volume of pedestrians recorded between 5:00 PM and 6:00PM
- Sidewalk along Springfield Avenue closed, due to building construction (mapped)
- Irvington Police not present, as in AM observation
- Children/young adults using crosswalks, as intended; older adults crossing irregularly
- "Taxi Parking Only" along Myrtle Avenue noted
- Taxi drivers congregating on street outside of their vehicles and interrupting normal traffic flow
- Cars consistently stopping within crosswalk, causing pedestrians to cross outside of the crosswalk and in irregular patterns.
- Irregular crossings were consistently observed
- As in AM, consistent crossing pattern was East-West crosswalk along Springfield Avenue (mapped in green)
- Despite irregular crossing patterns, most pedestrians used crosswalks as intended
- High pedestrian activity in the middle of the street which interrupted normal traffic flow, causing pedestrians to use irregular crossing patterns



= Area blocked off because of building construction
= Observed crossing patterns
= "Taxi Parking Only" Area
= Point of observation
= Most common crossing patterns

Digital Traffic Camera Counts

To supplement live field observations of pedestrian movements at the various bus terminal, NV5 staff installed portable digital traffic cameras (known as MioVision cameras) at a key location. The cameras are temporarily installed on a telescoping pole at an intersection or crossing area and record video from a 'bird's eye' view to observe pedestrian and vehicle travel movements. For this project, video was collected during two weekdays. This video helped to inform pedestrian patterns in the vicinity of the bus terminal while minimizing the number of field staff needed at a given location. When actual pedestrian volume data was desired, key times of the video were sent into Miovision for automated processing to determine the pedestrian, bicycle and vehicle volumes present.

Date: April 11, 2018
Location: Springfield Avenue & Myrtle Avenue

	Pedestrian		Bicycle	
Start Time	West Crosswalk Southbound	West Crosswalk Southbound	West Crosswalk Northbound	West Crosswalk Northbound
7:00	1	1	0	0
7:15	1	1	0	0
7:30	3	3	0	0
7:45	2	2	0	0
18:00	3	3	0	0
18:15	1	1	0	0
18:30	0	0	0	0
18:45	3	3	0	0
TOTAL	**14**	**14**	**0**	**0**

Cross Sections

The following cross sections were developed for priority walking and bicycling routes. These cross sections are representative of existing conditions observed March 14, 2018 and were used to assess the suitability of pedestrian and bicycle facilities, and to inform concept design development.

The following cross sections are included:

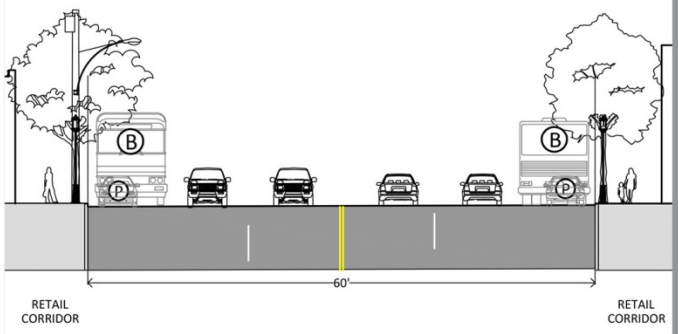
1. Springfield Avenue (Becker Terrace to 21st Street)
2. Lyons Avenue
    2.1 Springfield Avenue to Union Avenue and Augusta Street to Coit Street
    2.2 Union Avenue to Augusta Street and Coit Street to eastern township border
3. Clinton Avenue
    3.1 Franklin Terrace to Springfield Avenue
    3.2 Springfield Avenue to S. 20th Street
4. Grove Street (Dassing Avenue to Springfield Avenue)
5. Madison Avenue and Myrtle Avenue (Stuyvesant Avenue to Springfield Avenue)
6. Chestnut Avenue, Mt. Vernon Avenue, Medbourne Avenue, Fern Avenue, Claremont Avenue (Paine Avenue to Nye Avenue)
7. Nesbit Terrace, Park Place, Nye Avenue, Ball Street (Mill Road to Clinton Avenue)

For specific locations of cross-sections, refer to Figure I-1: Priority Routes Map.

Cross Section 1

Springfield Ave — Irvington

(Becker Terr to 21st St)

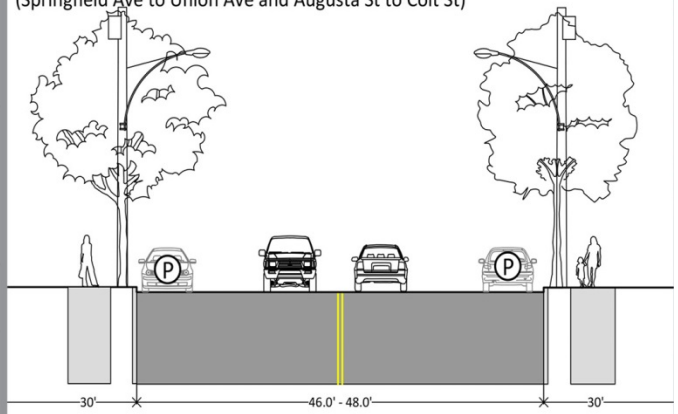


NOTES:
- ARTERIAL (SPEED LIMIT NOT POSTED)
- CR-603
- ON-STREET PARKING
- CURBSIDE BUS STOPS

Cross Section 2.1

Lyons Ave — Irvington

(Springfield Ave to Union Ave and Augusta St to Coit St)

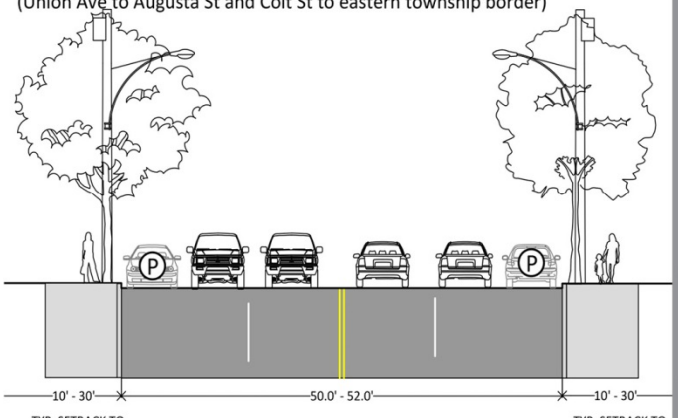


NOTES:
- CR-602
- SPEED LIMIT NOT POSTED
- ON-STREET PARKING

Cross Section 2.2

Lyons Ave — Irvington

(Union Ave to Augusta St and Coit St to eastern township border)

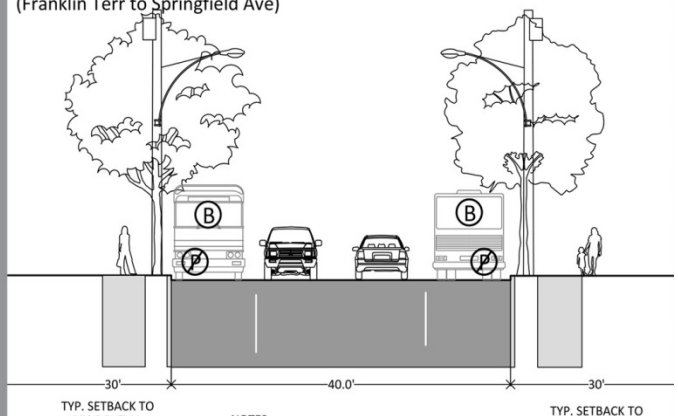


NOTES:
- CR-602
- SPEED LIMIT NOT POSTED
- ON-STREET PARKING

Cross Section 3.1

Clinton Ave — Irvington

(Franklin Terr to Springfield Ave)

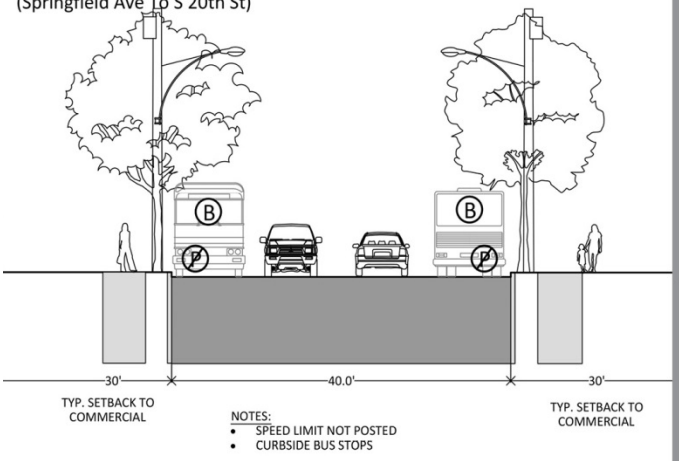


NOTES:
- SPEED LIMIT NOT POSTED
- CURBSIDE BUS STOPS

Cross Section 3.2

Clinton Ave — Irvington

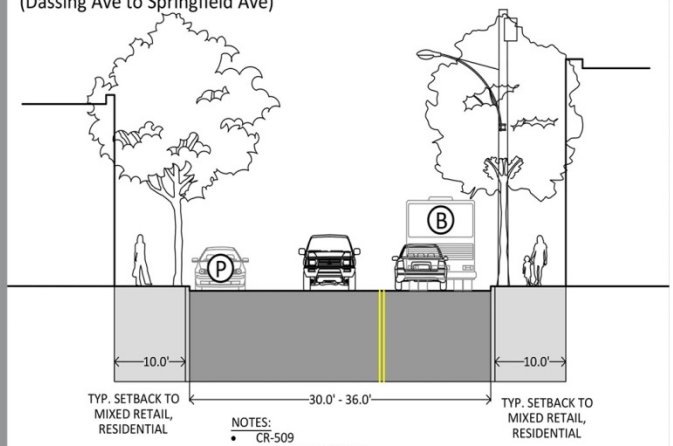
(Springfield Ave To S 20th St)



Cross Section 4

Grove St — Irvington

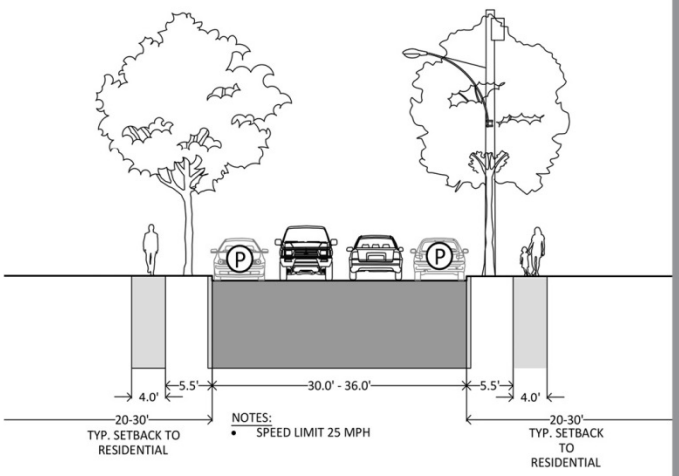
(Dassing Ave to Springfield Ave)



Cross Section 5

Madison Ave & Myrtle Ave — Irvington

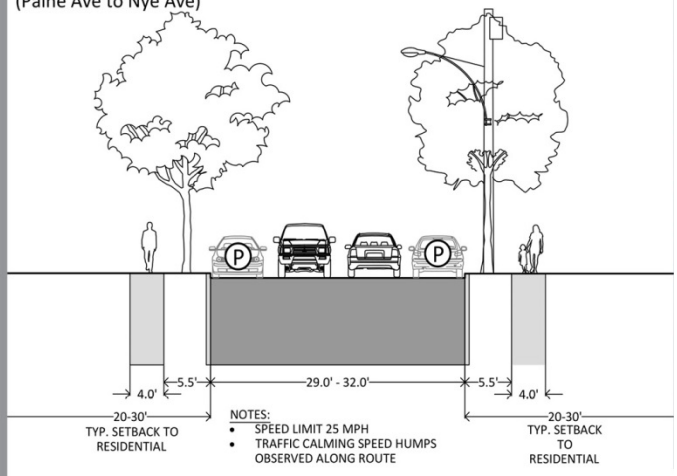
(Stuyvesant Ave to Springfield Ave)



Cross Section 6

Chestnut Ave, Mt. Vernon Ave, Medbourne Ave, Fern Ave, Claremont Ave — Irvington

(Paine Ave to Nye Ave)

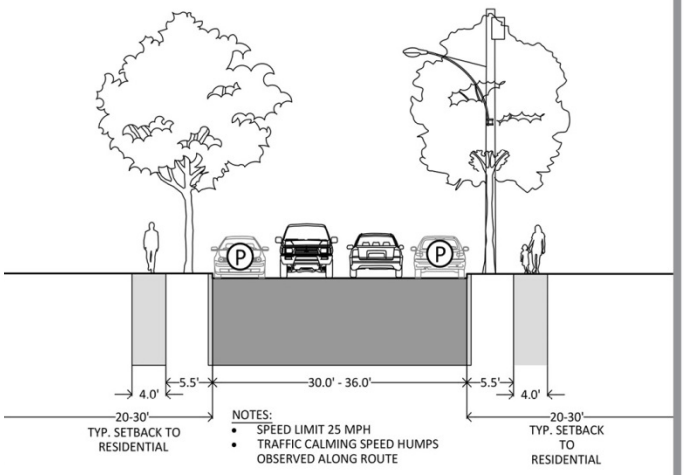


Cross Section 7

Nesbit Terr, Park Pl, Nye Ave, Ball St

Irvington

(Mill Rd to Clinton Ave)



Municipal Meeting Record

Municipal Meeting: Township of Irvington
660 Stuyvesant Avenue
April 17 – 10:00 AM

Attendees

1. Township of Irvington – Kyana Woolridge, Dawn Way
2. NJ TRANSIT – Jen Buison, Mike Viscardi
3. NV5 – Chris Lucas, Neil Desai, Kevin Perry

Purpose of meeting

The purpose of the meeting is to review findings from the street audit and brainstorm recommendations. The project team will have concepts for review, and the goal is to leave on the same page about recommendations for specific locations.

Agenda

1. Review of Street Audit Findings
    - What was documented: pedestrian amenities such as pedestrian ramps and crosswalks; bicycle facilities
2. Discuss Potential Concepts
    - Pedestrian Improvements
    - Traffic Calming
    - Other recommendations
3. Next Steps
    - Counts: MioVision and Manual
    - Public engagement session

Meeting Notes

- Irvington is interested to see concepts
    - Interested in bicycle facilities, comprehensive plan underway as separate effort
- Recent pedestrian improvements have been made to Springfield Avenue west of bus terminal including ergonomic crosswalks and intersection alignment markings for vehicles
- Springfield Avenue @ bus terminal concept
    - Provide marked crossing with vehicular yield markings along the wide entrance/exit to the bust terminal
    - Unsafe crossing from bus terminal to Washington Avenue was noted
- Springfield Avenue & Clermont Avenue concept
    - Painted roadway markings are faded on the concrete
    - Other options for delineating space are proposed
- Clinton Avenue & Washington Avenue concept
    - Marked crossings to bust terminal are faded on the concrete
    - Painted roadway markings are faded
    - Other options for delineating space are proposed
- Springfield Avenue, Union Avenue & Clinton Avenue
    - Recent design organizes vehicles through the intersection
    - The slip turn lane from Union Avenue to Clinton Avenue has a painted hatch, which vehicles sometimes merge through from Clinton Avenue, although Clinton Avenue has adequate travel lane alignment without the need for the slip turn lane
- Sheltered Bicycle Parking @ Irvington Bus Terminal concept
    - Irvington and NJ TRANSIT support this idea
- Bicycle Boulevard concept
    - Priority routes do not have adequate space for dedicated bicycle lanes
    - A network of bicycle boulevards will provide cyclists with the best routes for connecting through the irregular street grid
- Public outreach event will be held on May 2 from 4-6pm at the bus terminal

Public Input Record

A Public Information Center for this study was hosted at Irvington Bus Terminal on Wednesday, May 2, 2018 from 4-6 PM.

Comments Collected at Public Information Center

- Bicycle racks
- Ped signals to warn oncoming buses
- Improve lighting
- ADA entrances (ramps)– more needed at Clinton Avenue side
- Close gaps in fence between parking lot & bus terminal or outline crosswalk
    - Encourages frequent crossings
    - Consider crosswalks
- Bikeshare

Comments Collected via Email

None

End of Irvington Bus Terminal Report

MADISON TRAIN STATION REPORT

JUNE 2018

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Abstract:

The purpose of this study is to identify and address the most basic barriers limiting pedestrian and bicycle access to Madison Train Station. This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement "low-hanging fruit" improvements that can be accomplished quickly and inexpensively. Each design concept also includes recommendations for implementation, phasing, and funding sources.

The findings of this study have been discussed and reviewed with local municipal officials and have been presented for public comment at a Public Information Center that was hosted at Madison Borough Hall.

Prepared by NV5 and 4ward Planning

Madison Train Station Report Table of Contents

1. Overview and Context

The Madison Station is located on the western edge of the Borough's historic, mixed-use downtown. The station is served by NJ TRANSIT's Morris and Essex Morristown Line. In 2016, the station averaged 1,600 weekday boardings.

Both the pedestrian and bicycling networks in the Borough are pretty comprehensive. In 2012, the Borough adopted a Complete Streets Policy and Policy Manual and the Borough has been pursuing funding to implement additional pedestrian and bicycle facilities.

The area surrounding the station was assessed for walkability within a ¾-mile radius of the train station, and for bicycle access within a 2-mile radius of the train station. Based on background research, the discussion on the conference call and WikiMap input from the municipalities, priority areas were identified within the pedestrian and bicycle radii. Priority areas could include on-road routes (streets that can support pedestrian and bicycle access to NJ TRANSIT stations but are in need of improvement), as well as off-road routes (off-road locations where pedestrian and bicycle facilities that support access to NJ TRANSIT stations may be viable).

Madison's street network radiates outward in all directions like spokes on a wheel, with the train station at the center. The Priority Routes Map (Figure M-1) for Madison shows all routes that were reviewed in this study, as well as the priority routes, and indicates the locations of specific road cross-sections that are presented in the Appendix. The Priority Routes identified include:

- Kings Road
- Samson Avenue
- Prospect Street
- Hillside Avenue
- Woodland Road
- Green Avenue
- Morris Place
- Madison Avenue
- Danforth Road
- Park Avenue
- Ridgedale Avenue
- Central Avenue – Waverly Place
- Greenwood Avenue
- Rosedale Avenue

Background Data

Background research included review of existing documents, programs and data sources:

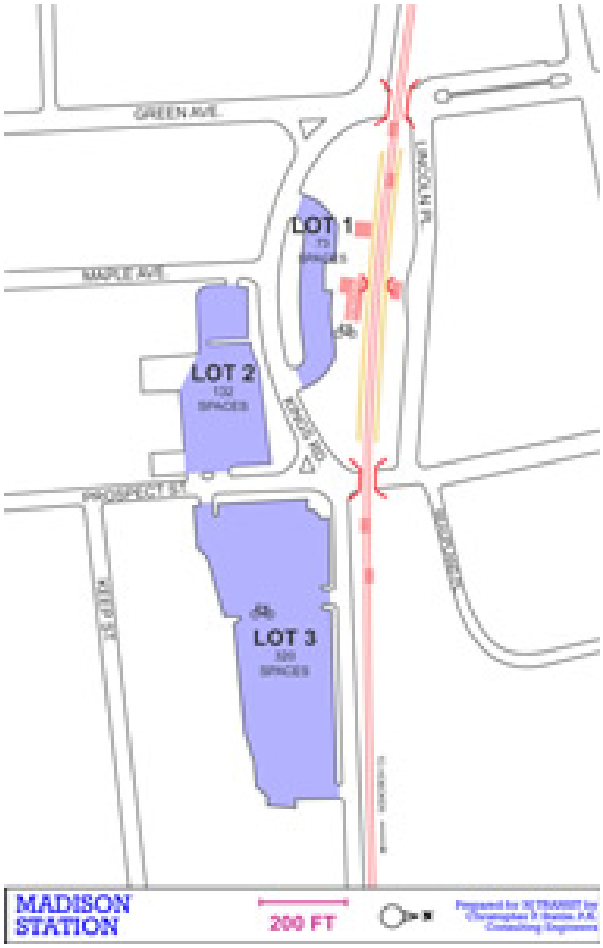
Local Documents

Title	Date
Borough of Madison Complete Streets Policy Manual	July 2013
Madison Bike Plan	July 2005
Madison Safe Streets to Transit Application	2017
NJ 124 Corridor Transit Access Improvement Study	2013

Parking Lots

Lot Number	Location	Owner	Spaces
1	Kings Road at station	NJ TRANSIT	73
2	Prospect Street & Kings Road	Borough of Madison	143
3	Prospect Street & Kings Road	Borough of Madison	207
		Total spaces	**423**

Map: Locations of Parking Lots



2. Existing Conditions

(Observed December 12, 2017, temperature in the 40s)

- Sidewalks in the vicinity of the train station, as well as between parking areas and other pedestrian trip generators, are typically in good condition
    - Sidewalks are continuous with adequate connections within 3/4-mile radius of the station
    - Crosswalks immediately adjacent to the station are deficient, and are either faded or lack visibility
    - Most pedestrian ramps outside of NJ TRANSIT property do not meet ADA standards
        - Most of the intersections on Green Avenue/Central Avenue, as well as Prospect Street/Greenwood Avenue require pedestrian ramp upgrades
        - Detectable warning surface at curb ramps varied throughout the study area. Some locations have high-contrast red or yellow composite truncated dome panels. Other locations employ paver-style blocks that provide a tactile surface but limited visual contrast.
- Some intersections require upgrades and/or intersection markings to organize movements through the intersections
- Bicycle racks are full on the west side of the station (Green Avenue and Kings Road, under the tracks)
- Bicycle lockers are present at the intersection of Lincoln Place and Prospect Street, to the east of the station
- On-road bicycle facilities in the Borough generally consist of striped shoulders of varying width and a bicyclist symbol blaze, along with bicycle route signage. These facilities are generally shared with on-street parking.
- The station area and downtown lack bicycle facilities and intersection treatments.

Photo Log

The following photos and captions describe existing conditions around and to the train station.

Sidewalks in the vicinity of the station are in good condition. (Madison_121217_105435.JPG)

At Prospect Street and Lincoln Place, yellow warning surfaces against the gray paver field provide some visual contrast. (Madison_121217_110119.JPG)

At Prospect Street and Kings Road, warning surfaces are concrete pavers set in a concrete field providing limited visual contrast. (Madison_121217_105614.JPG)

The intersection of Kings Road and Green Avenue is complex and may benefit from additional striping to organize movements, among other improvements. (Madison_121217_102609.JPG)

Bicycle racks are full on the west side of the station. Racks are provided under the tracks on both sides of Green Avenue and at Prospect Street. (Madison_171128_093458.JPG)

Crosswalks at Prospect Street and Kings Road are zebra style with thin stripes that are widely spaced. (Madison_121217_105656.JPG)

The pedestrian crossing at Kings Road and Maple Avenue is the crossing point for commuters that park in Lot 2. (Madison_121217_103735.JPG)

Once across Kings Road, pedestrians cross Lot 1 to access the station entrance. There are no markings to indicate pedestrians crossing the drive aisle. (Madison_121217_104801.JPG)

The Curb ramp at Kings Road and Maple Avenue does not align with the curb ramp where pedestrians should cross the parking lot. (Madison_121217_104006.JPG)

The pedestrian ramp into Lot 1 at the Kings Road and Maple Avenue entrance is in disrepair. (Madison_121217_104538.JPG)

Small planted median on Lincoln Place leaves a wide travel lane, which can be driven as a straight path through the intersection, rather than deflected. (Madison_121217_110824.JPG)

Curb ramps and crosswalks on Lincoln Avenue are too far from the station entrance; pedestrians were observed jaywalking here rather than use the crossings. (Madison_121217_110659.JPG)

The crossing of Kings Road at Madison Avenue is about 80' long. The existing median could be reconstructed as a pedestrian refuge. (Madison_121217_113157.JPG)

Crosswalks in the downtown business area generally lack tactile warning surface, as shown at Main Street and Green Village Road. (Madison_121217_114449.JPG)

The intersection of Ridgedale Avenue and Park Avenue would benefit from improved crosswalk markings. (Madison_121217_120124.JPG)

The view south on Greenwood Avenue at Bardon Street shows an example of the striped shoulder with bicycle blaze that is used around the borough. (Madison_121217_122151.JPG)

Tactile warning surface is absent from many curb ramps, such as observed at Central Avenue and Cook Avenue. (Newly reconstructed ramps were observed to include tactile warning surface). (Madison_121217_124134.JPG)

Pedestrian crossing signs assemblies (MUTCD W11-2 + W16-7P) were used throughout the borough, as seen here at Crescent Road and Hillside Avenue. (Madison_121217_142551.JPG)

3. Issues & Opportunities

General Issues

- Many crosswalks are faded or lack visibility
    - Many crosswalks are marked using standard markings which lack visibility
        - A mix of zebra or parallel stripe crosswalks were observed, with a few instances of ladder stripe
    - Graphic examples of each crosswalk type can be found in the Study Overview Report
- Wide intersections lack markings to organize and calm turning movements as well as thru-traffic
    - Madison Avenue, Park Avenue and Kings Road
    - Green Avenue and Kings Road
    - Central Avenue and Park Avenue
    - Green Village Road and Kings Road
    - Green Village Road and Park Avenue
    - Lincoln Place in front of the train station

Station Area Issues

South side of the station

- Commuters that park in Lot 2 are likely to cross Kings Road at the Maple Avenue intersection and enter station property.
    - The pedestrian route crossing from Kings Road and to and through the station parking lot drive aisle are not continuously marked for pedestrians (i.e. no crosswalk is marked between the existing pedestrian ramp and the station entrance)
    - Curb ramp on the southeast corner of Kings Road and Maple Avenue does not align with ramp on the northeast side of the intersection, which also aligns with the existing pedestrian ramp into the parking lot
    - Existing pedestrian ramp into the parking lot is in disrepair and is blocked by parking space

North side of the station

- Small planted median on Lincoln Place leaves a wide travel lane, which can be driven as a straight path through the intersection (rather than being deflected by the traffic circle)
    - Curbside use is not specified, which leads to disorganized pick-up and drop-off
    - Crosswalks are located far from station entry/exit. Pedestrians leaving the station and crossing Lincoln Place were observed crossing at the most convenient route, which is outside of the marked crosswalks.

Commuter parking lots

- Lots are generally well-lit with adequate access, aside from southeast parking lot which has intermittent lights that are not working.

General Opportunities

- Improve crosswalk visibility, paying attention to areas that wear out the most
    - To minimize wear, utilize continental style crosswalks with striping applied parallel to the direction of motor vehicle travel
- Upgrade crosswalks with standard markings to high-visibility "ladder" striping
- Improve curb ramps lacking high contrast tactile warning surface
- There is an opportunity to improve operations, organize traffic movements, and reduce motor vehicle speeds at certain intersections. Methods such as channelization (separating motor vehicle turning movements from through movements by application of lane striping), "deer tracks" (applying skip line(s) all the way through the intersection to reinforce lane space for through movement or turning movement), or gore striping (application of striping in paved areas where motor vehicles should NOT travel) may be considered at the following intersections:
    - Madison Avenue, Park Avenue, and Kings Road
    - Green Avenue and Kings Road
    - Central Avenue and Park Avenue
    - Green Village Road and Kings Road
    - Green Village Road and Park Avenue
    - Lincoln Place in front of the train station

Station Area Opportunities

South side of the station

- Clearly mark the pedestrian route through Lot 1
    - Align the crossing from Kings Road and Maple Avenue to and through the station parking lot
    - Align the curb ramp on the southeast corner of Kings Road and Maple Avenue to align with ramp on the northeast side of the intersection, which also aligns with the existing pedestrian ramp into the parking lot
    - Install new pedestrian ramp and move parking stalls to the east 4-6 feet to allow pedestrian use of existing pedestrian ramp
    - Paint crosswalk between the existing pedestrian ramp and the station entrance

North side of the station

- Paint or pave 2-3 feet around existing planted median on Lincoln Place to narrow the travel lane and deflect vehicles to achieve lower speeds
    - Assign curbside uses to organize station pick-up and drop-off

Commuter Parking Lots

- Replace lightbulbs and/or light posts in the southeast parking lot where lights that are not working

Existing Conditions, Issues & Opportunities (general and station area specific) are synthesized and presented in Figure M-2: Issue & Opportunities Map.

Figure M-1: Priority Routes Map

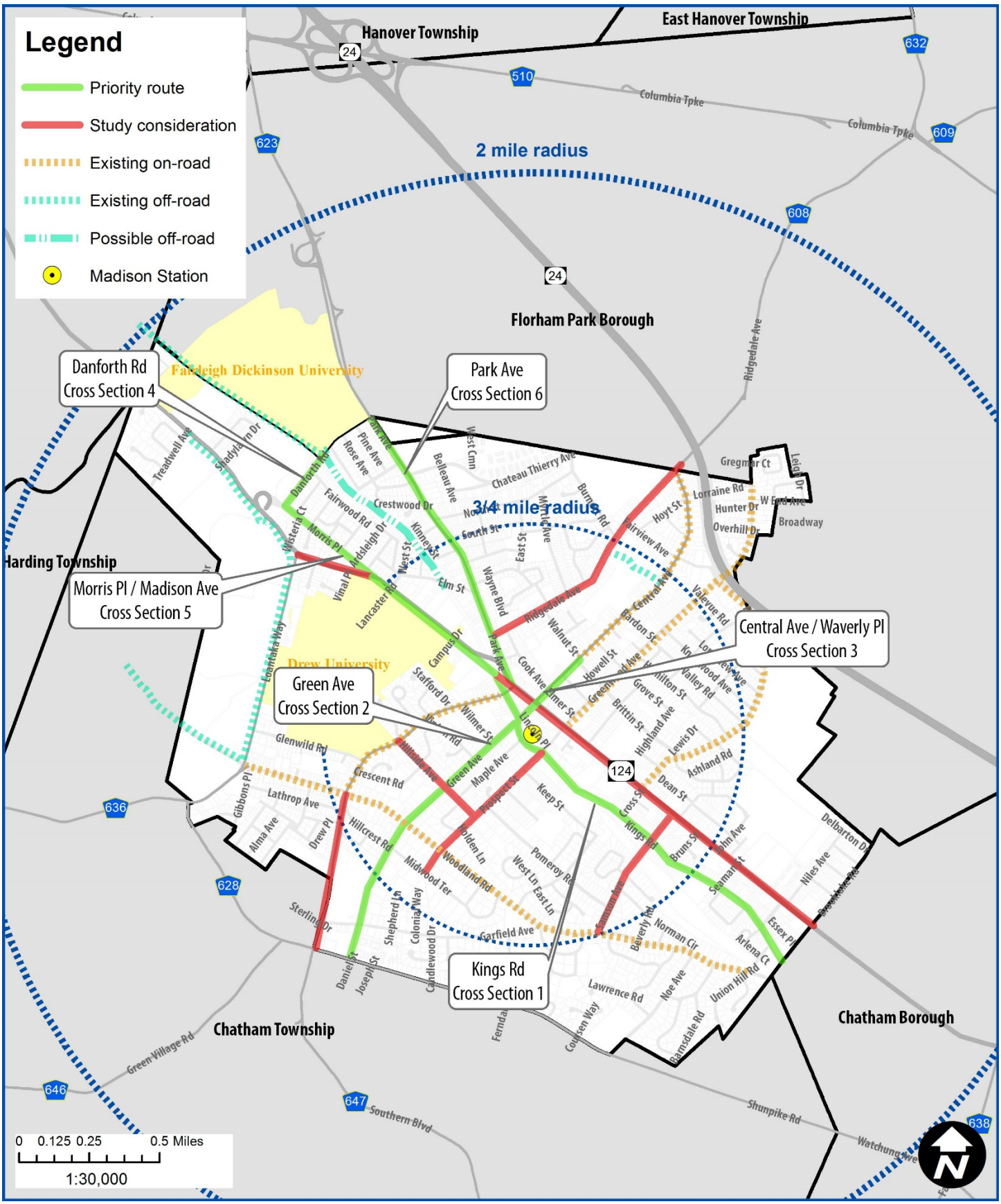


Figure M-2: Issues & Opportunities Map

KEY ISSUES				OPPORTUNITIES			
1	Lincoln Place north side of the station: unassigned roadway space and inadequate crosswalks	3	Kings Road and Green Avenue intersection in need of upgrades	1	Further delineate the pedestrian route from Lot 2 entering south side of station	3	Extend median to create pedestrian refuge at Kings Road and Madison Avenue
2	No marked pedestrian route from Kings Road to train station entrance	4	Pedestrian ramps deficient along Central Avenue and Greenwood Avenue	2	Improve pedestrian crossings in vicinity of the station with crosswalk, striping, and curb ramp upgrades	4	Provide lane treatments/ sharrows and/or intersection treatments in station vicinity

4. Recommendations & Design Concepts

The goal of this study is to identify the most basic barriers limiting pedestrian and bicycle access to the station, and to propose recommendations to address them. As such, the study has produced a series of actionable design concepts specific to the study area that propose improvements for bicyclists and pedestrians.

Most design recommendations consist mainly of markings, with more substantial interventions at high-priority locations. Locations where deficiencies have been observed in crosswalks, pedestrian ramps, intersection markings, and lighting are displayed in Figure M-2: Issues & Opportunities Map.

In general, recommendations respond to deficiencies involving:

- Pedestrian ramp condition (if any) for ADA compliance
- Crosswalks for visibility and condition
- Intersection markings to organize turning and thru alignment at complex intersections
- On-street bicycle facilities where feasible
- Lighting for adequate coverage during low-light hours

In response to these issues, the project team has identified the following general recommendations for each station area:

- Provide high-visibility crosswalks
- Provide curb ramps at all intersections and crossings
- Provide bicycle accommodations along low-speed routes (bicycle boulevard treatments)
- Deploy epoxy curb extensions
- Provide RRFBs at unsignalized crossings, as appropriate
- Track implementation and perform post-implementation studies
- Provide sufficient bicycle parking (coordination with NJ TRANSIT may be required to provide additional bicycle racks) and consider covered, secure bicycle parking

Short-Term Conceptual Enhancements

Most of the design concepts in this study have the potential to be deployed as short-term enhancements, also referred to as Tactical Urbanism projects, which are design changes implemented to street environments in a “light, quick, cheap,” and temporary manner. By demonstrating to roadway users – pedestrians, bicyclists, drivers – the effectiveness of design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

The short-term approach is the basis for most of the recommendations in this study. Minimal funding can accomplish many of these conceptual improvements, without having to initiate a larger capital project. In many cases, re-striping roads with these design concepts as a component of routine resurfacing projects could result in little to no additional cost, compared to replacing the markings as they were prior to resurfacing.

Long-Term Conceptual Enhancements

Many of the short-term concepts have the potential to become long-term buildouts. The primary example, which is used throughout the six transit stations reviewed in this study, is the proposed short-term curb extension composed of colored epoxy gravel. While the short-term application can be implemented almost anywhere, the long-term buildout of concrete-surface curb extensions could be pursued as a long-term upgrade. Locations where epoxy gravel curb extensions are proposed require additional study prior to long-term buildout with concrete, in order to understand implications to road drainage, utilities, and other factors, as well as to obtain funding for design and construction.

Off-Road Links

When possible, connections to existing or proposed off-road facilities were investigated.

Adjacent to Madison, the Traction Line Trail runs approximately 2.75 miles from Morristown to the northwestern border of Madison at the Danforth Road. The concept of continuing the trail along the existing railroad right-of-way and into the heart of downtown Madison was discussed during this study, but the project team was informed by Madison Borough that a past study on this concept produced concern for nearby residents. The project team was advised to investigate on-road options that parallel the railroad right-of-way. Use of the railroad right-of-way to extend the trail is a long-term consideration that would require effort from Madison Borough and Morris County to develop the project and allay the concerns of nearby residents.

Phasing

With a goal of presenting NJ TRANSIT and the local municipalities with actionable recommendations to improve pedestrian and bicycle access to the stations, the recommendations were mainly low-cost and high-impact. Each location that received specific design concept recommendations includes a combination of treatments, and could be implemented in a phased approach, or combined together as part of a broader, more comprehensive effort.

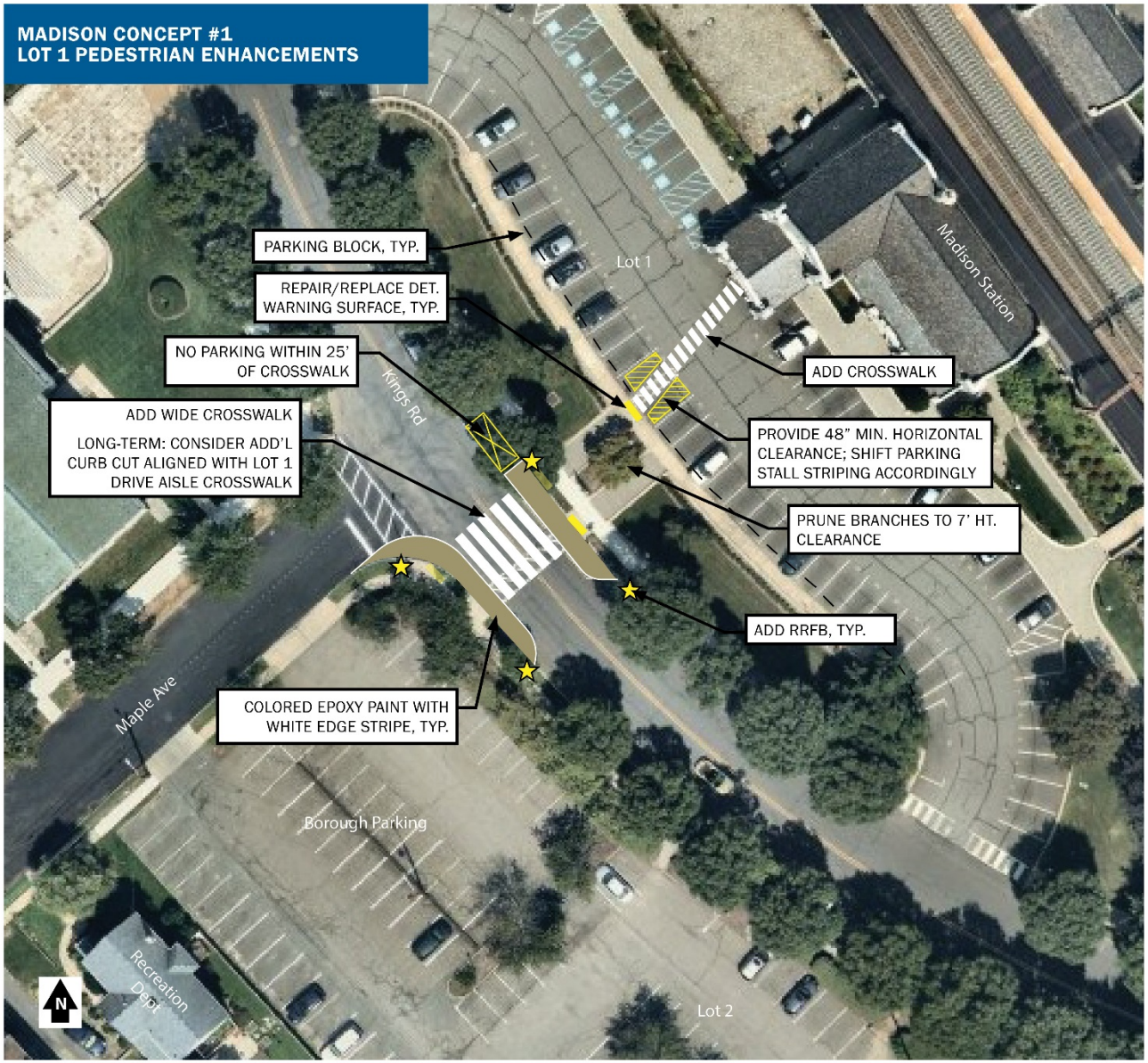
Design Concepts for Madison Train Station

Deficient pedestrian ramps surround the south side of the station, as well as along the corridors leading to and from the station. Crosswalks were also lacking in visibility throughout the station area, particularly to the northwest connecting to Drew University. The use of colored epoxy gravel to quickly and inexpensively achieve the benefits of curb extensions and median extensions could be paired with high-visibility crosswalk markings to improve the pedestrian connections to both sides of the station. At the existing crossing on the south side of the Madison Station, Rectangular Rapid Flash Beacons (RRFBs) are recommended at the crossing that connects the station to a commuter parking lot, to increase the visibility of pedestrians during peak hours, especially during months with shortened periods of daylight.

In response to these issues, conceptual design improvements have been developed at the following locations to address the most basic barriers limiting pedestrian and bicycle access to the station:

Design Concept #	Location	Description
1	Parking Lot 1	• Provide high-visibility crosswalks • Provide colored epoxy gravel curb extensions • Repair/upgrade curb ramps • Provide RRFBs at unsignalized crossing
2	Parking Lot 2	• Provide parking lot identification/wayfinding signage
3	Parking Lot 3	• Provide high-visibility crosswalks • Repair/upgrade curb ramps • Provide parking lot identification/wayfinding signage • Repair/upgrade lighting
4	Lincoln Place @ Madison Station	• Provide high-visibility ergonomic crosswalks • Provide striping to delineate pick-up/drop-off area
5	Green Avenue & Kings Road	• Provide high-visibility crosswalks • Provide colored epoxy gravel curb extensions • Repair/upgrade curb ramps • Provide line extensions to reinforce vehicular movements
6	Green Village Road & Kings Road	• Provide high-visibility crosswalks • Extend striped median with colored epoxy gravel
7	Madison Avenue & Kings Road	• Provide high-visibility crosswalks • Extend striped median and provide line extensions to reinforce vehicular movements
8	Central Avenue & Main Street	• Provide high-visibility crosswalks • Extend striped median and provide line extensions to reinforce vehicular movements
9	Select Roads	• Provided shared lane markings and bicycle wayfinding on select roads to improve bicycle access to Madison Station

The remainder of this Station Report provides illustrations for each design concept along with a description of the general approach and materials for short-term and long-term construction. Cost estimates with recommendations for funding and phasing are presented after the design concepts.



Concept - Planning Purposes Only

General Approach:

Provide a clearly defined and accessible route from the south sidewalk on Kings Road to the Madison Station entrance.

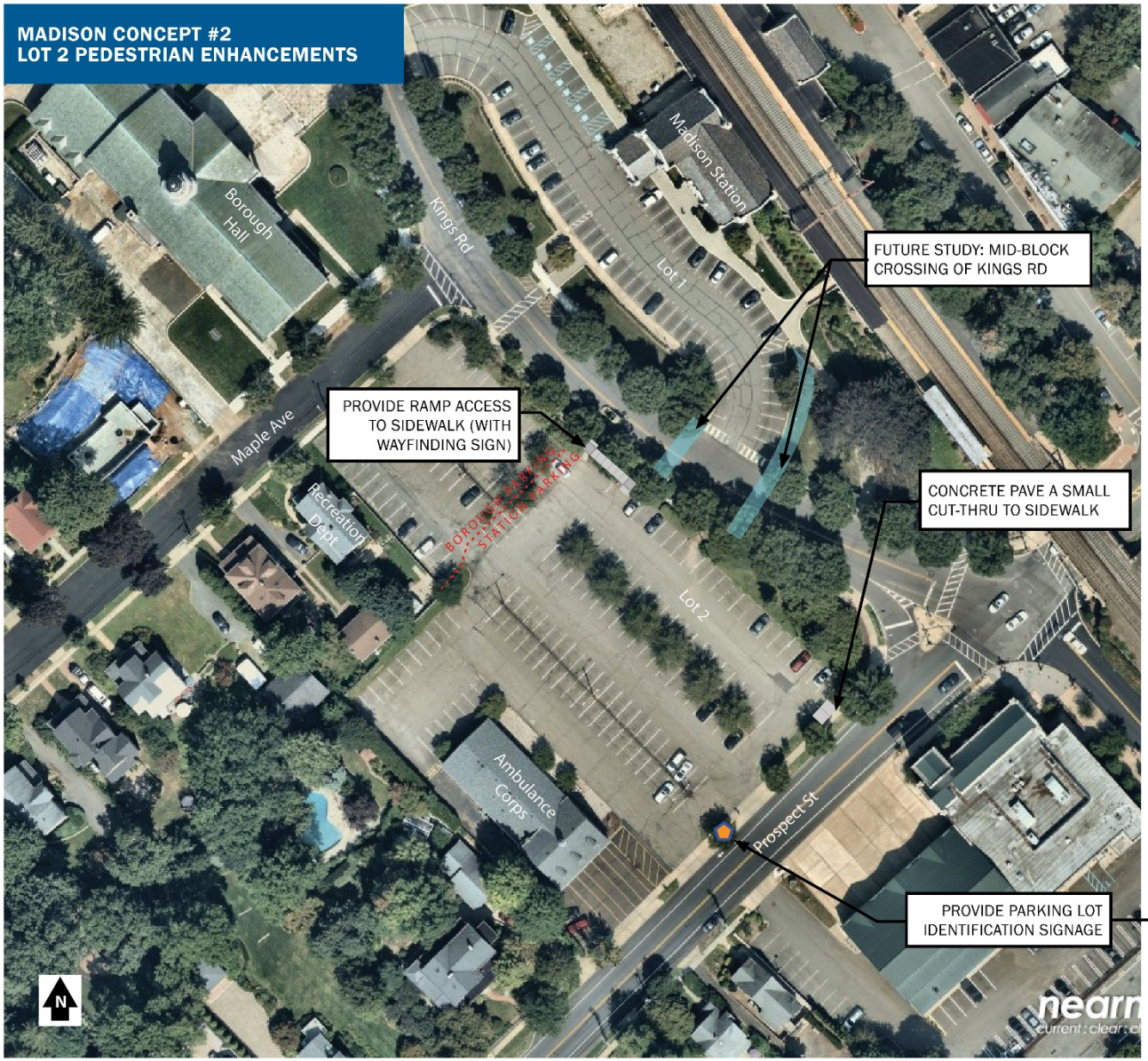
Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk
- Detectable warning surface
- Rectangular Rapid Flash Beacons (RRFB)
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Replace colored epoxy gravel areas with pavers to match existing on site
- Consider single leader tree for planting area to better maintain pedestrian height clearance

Example of RRFB in Summit, NJ



Concept - Planning Purposes Only

General Approach:

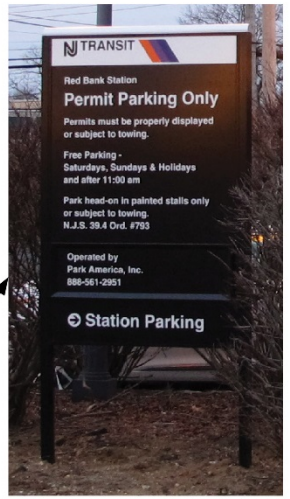
Improve overall clarity of site with distinct identification signage and wayfinding. Consider a future study to determine the feasibility of a mid-block crossing from Lot 2 to the station property.

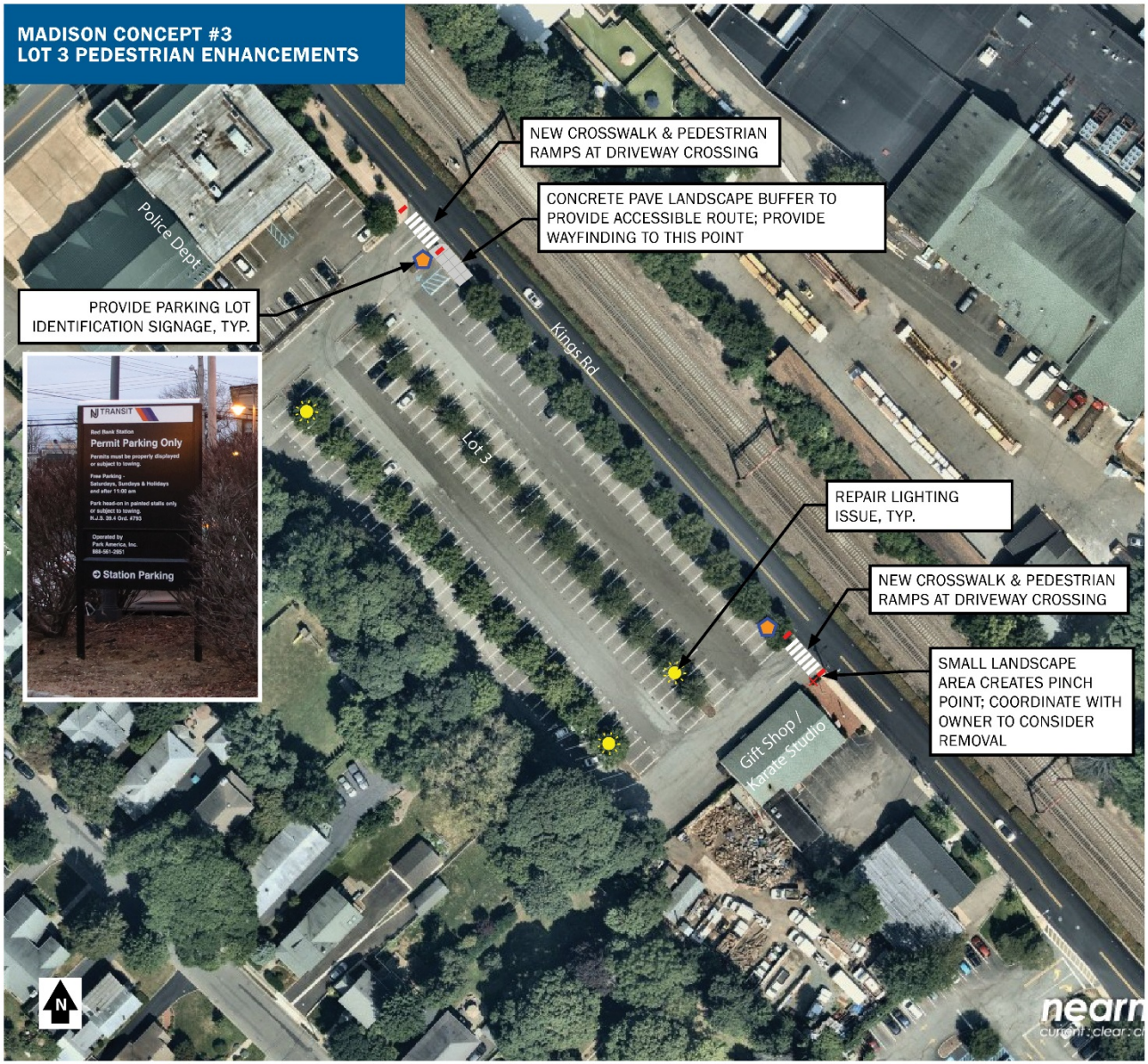
Short-Term (Low Cost) Materials:

- Lot identification signage

Long-Term (High Cost) Materials:

- Concrete path with retaining walls
- Curb ramps, crosswalk, and sidewalk connection within station property





Concept - Planning Purposes Only

General Approach:

Improve pedestrian crossings of parking lot driveways. Provide an accessible route from ADA parking spaces to sidewalk. Accessible route can be used by all parking lot patrons to access sidewalk in advance of driveway apron and cross in a marked crossing. Improve lighting in rear of pedestrian lot.

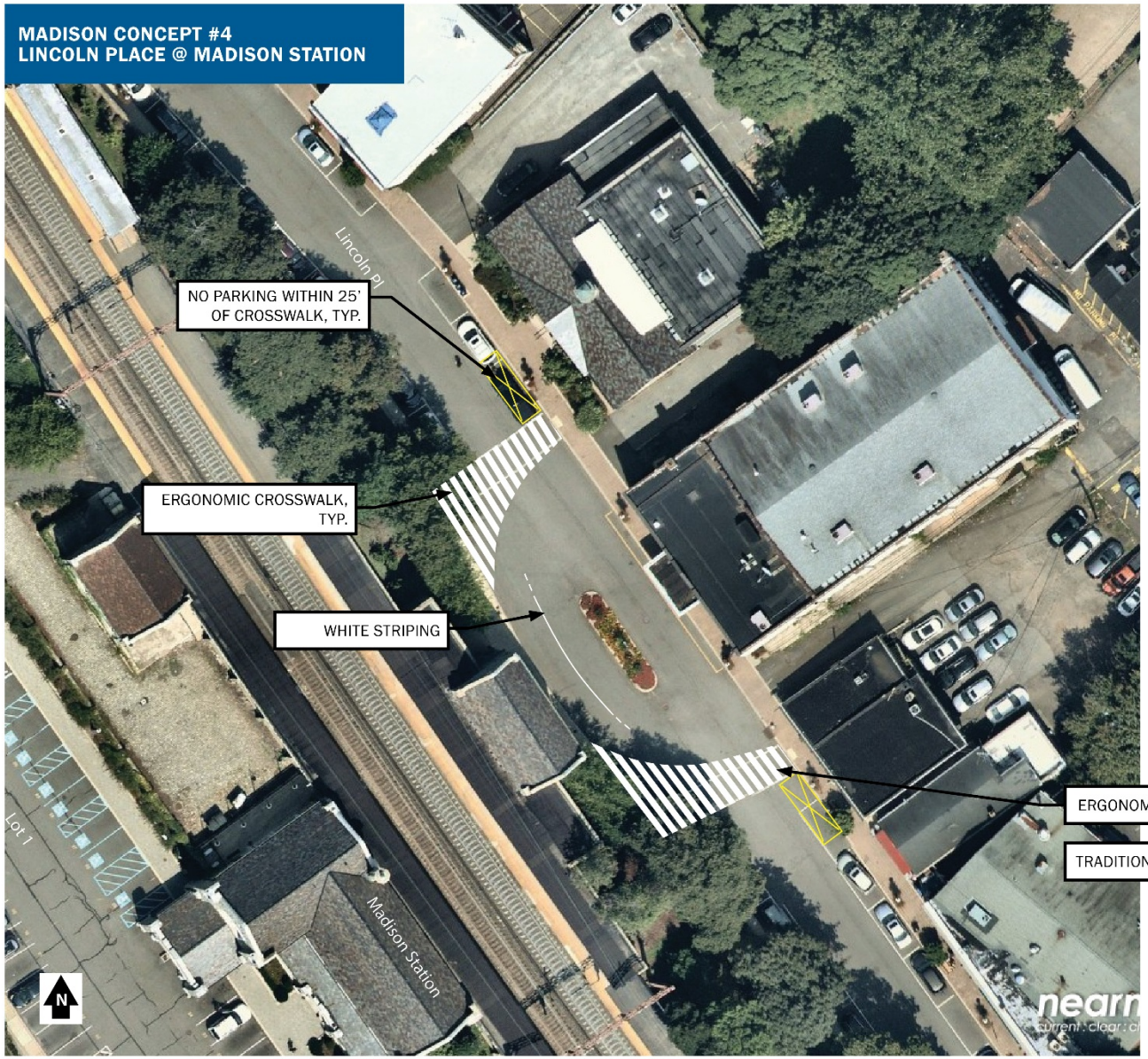
Short-Term (Low Cost) Materials:

- White thermoplastic crosswalk
- Detectable warning surface
- Lot identification signage

Long-Term (High Cost) Materials:

- Concrete sidewalk
- Lighting upgrades

MADISON CONCEPT #4
LINCOLN PLACE @ MADISON STATION



Concept - Planning Purposes Only

General Approach:

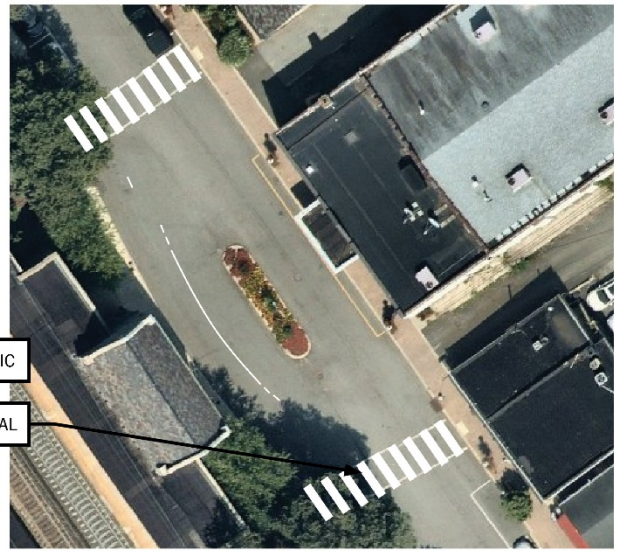
Provide lane striping at drop-off area to clearly separate travel path of drop-off and through traffic. Provide ergonomic crosswalks to make pedestrian crossing movements more predictable.

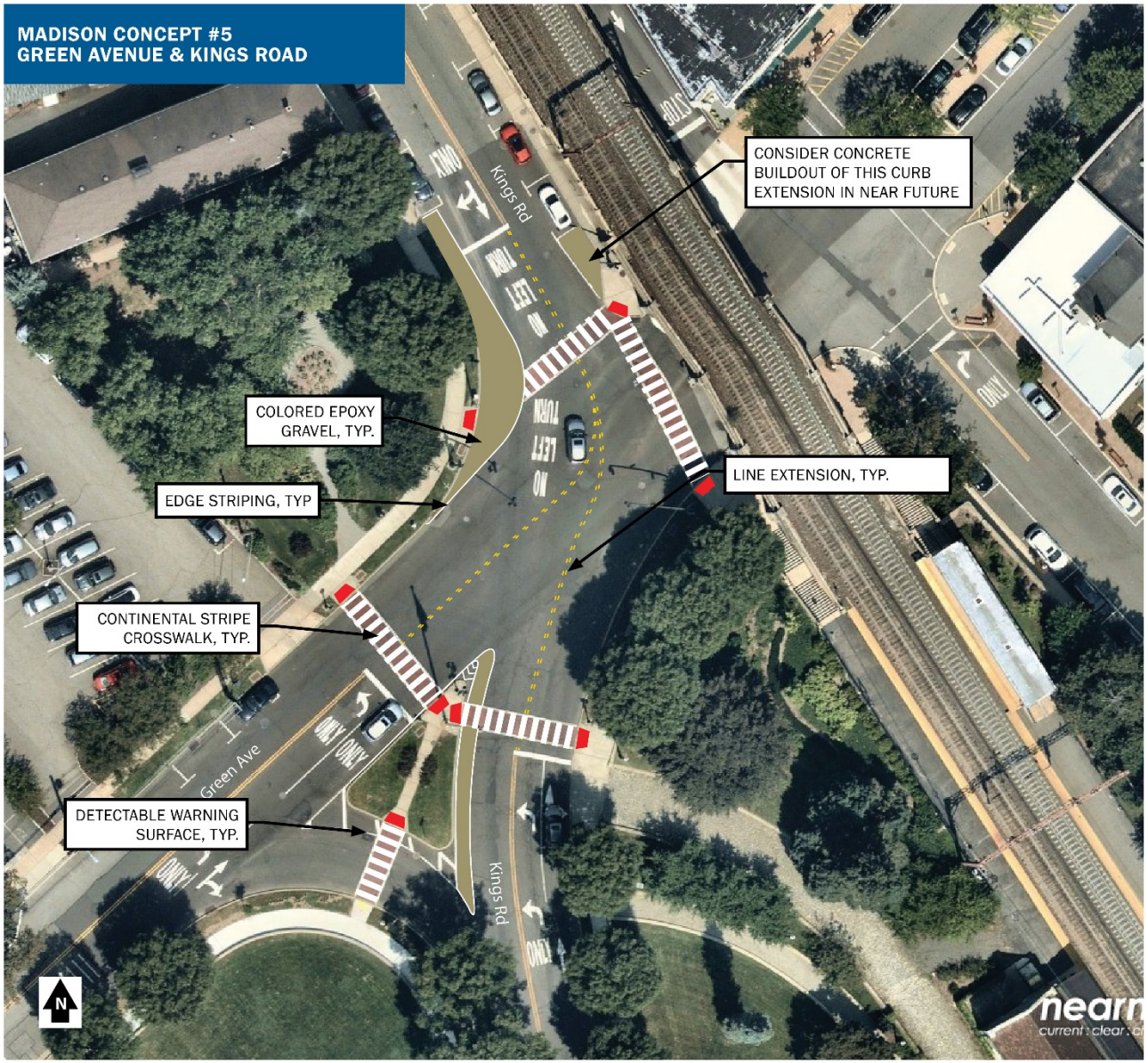
Short-Term (Low Cost) Materials:

- White thermoplastic crosswalk
- White striping

Long-Term (High Cost) Materials:

- None





Concept - Planning Purposes Only

General Approach:

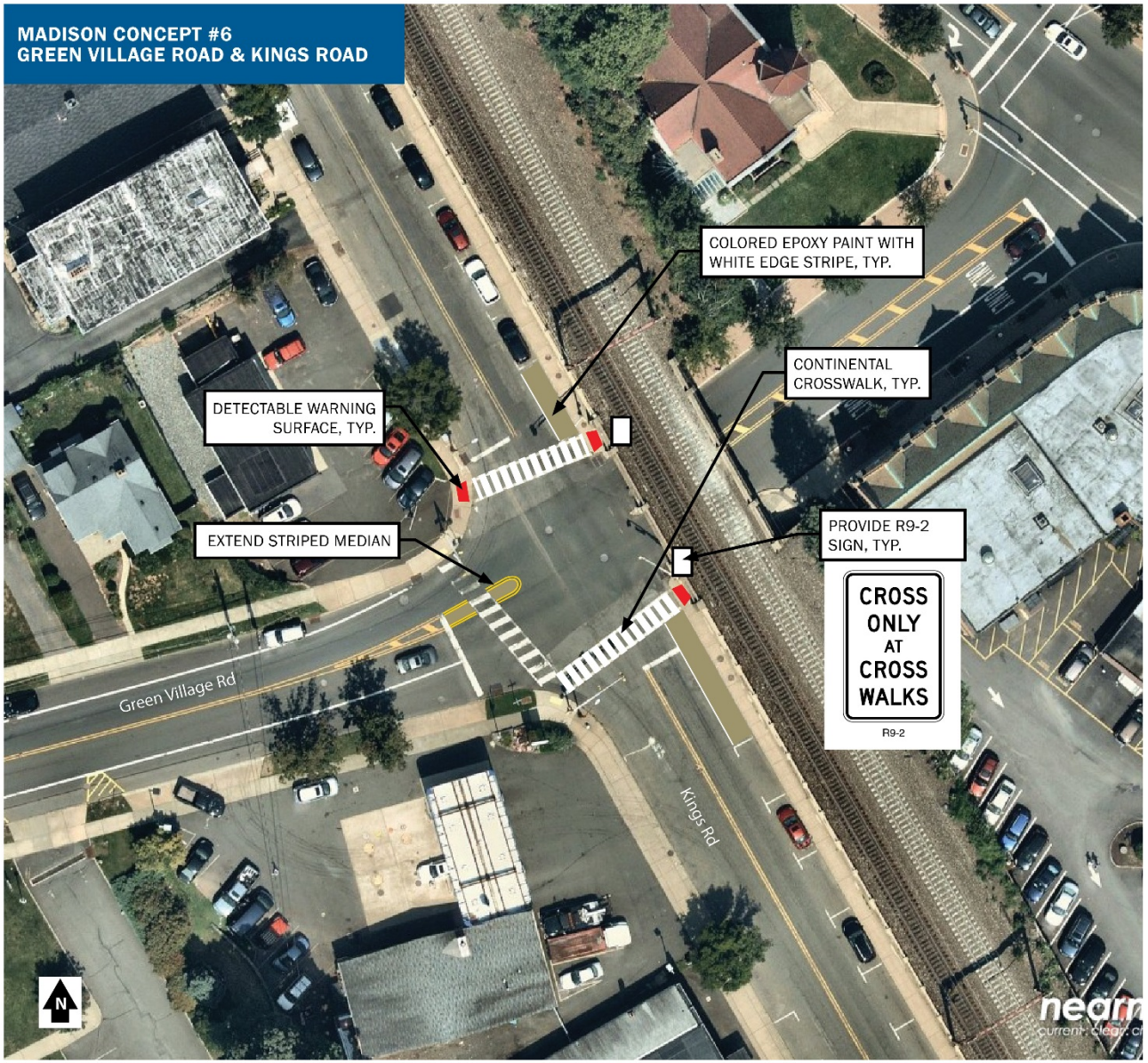
Improve pedestrian crossing at difficult intersection by reducing turn radii, narrowing travel lanes, channelizing motor vehicle movement, and reducing pedestrian crossing distances. Upgrade crosswalks to continental stripe at next re-paving project.

Short-Term (Low Cost) Materials:

- Yellow striping
- Colored epoxy gravel
- White striping
- Detectable warning surface
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Continental crosswalk striping on all crossings
- Concrete buildout of epoxy gravel areas



Concept - Planning Purposes Only

General Approach:

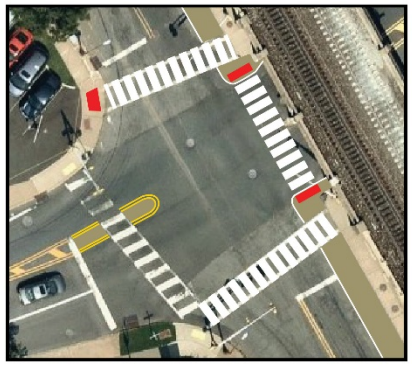
Improve crosswalk striping and provide detectable warning surface at curb ramps. Provide signage (R9-2) to direct pedestrians to use only marked crosswalks. Use colored epoxy gravel in advance of crosswalks on Kings Road to improve pedestrian visibility.

Short-Term (Low Cost) Materials:

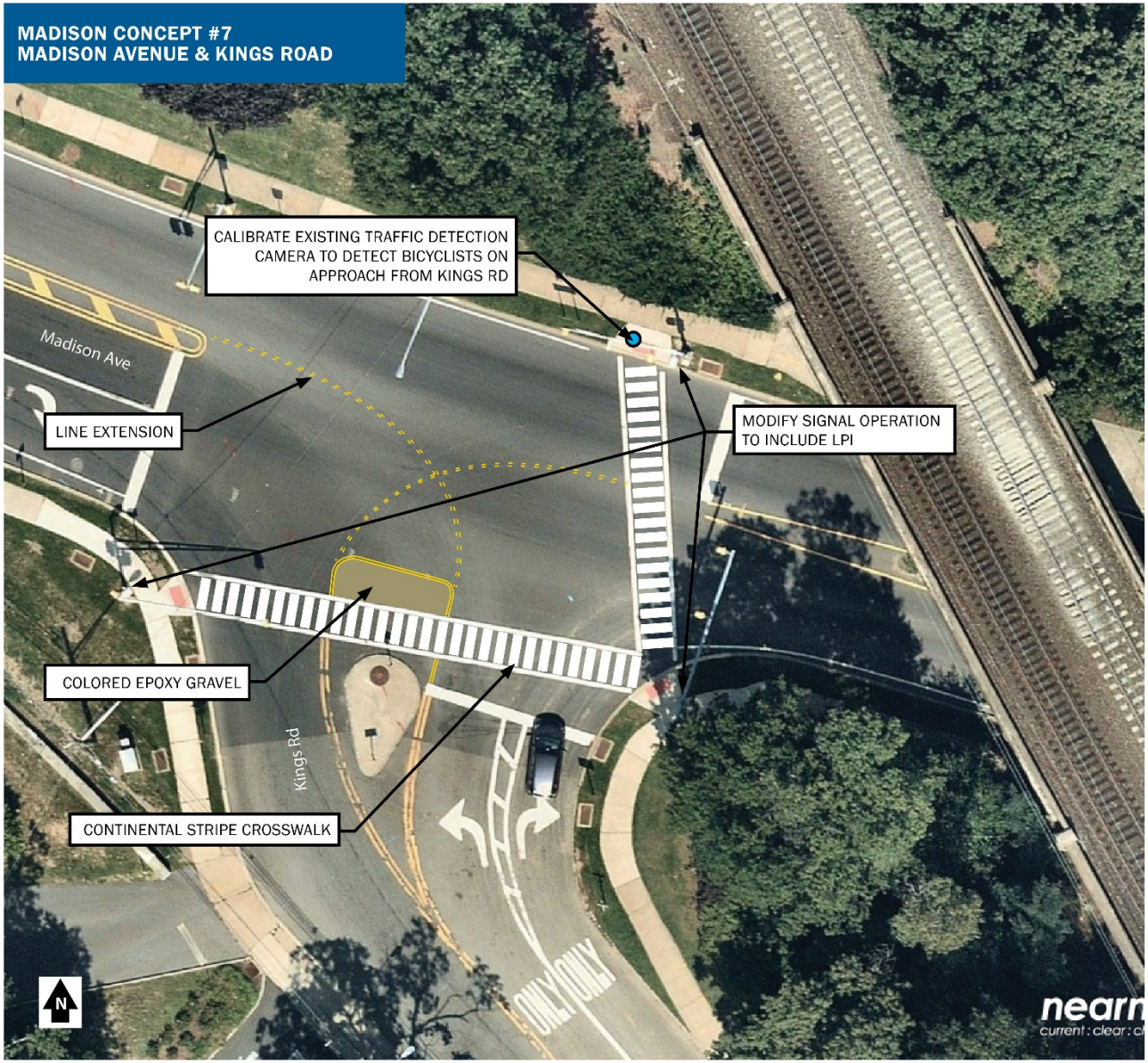
- Yellow striping
- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk
- Signs
- Detectable warning surface
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Build out colored epoxy gravel areas in concrete (may require relocation of drainage inlets)



ALTERNATIVE: Provide pedestrian crossing on northeast leg of crosswalk. This will require engineering analysis of sight lines beneath railroad bridge and possible long-term relocation of drainage inlets.



Concept - Planning Purposes Only

General Approach:

Extend median treatment from Kings Road to create pedestrian crossing refuge in long crosswalk. Provide line extensions through intersection to facilitate predictable motor vehicle movement. Enhance existing pedestrian signal heads with actuated leading pedestrian interval (LPI). Calibrate traffic detection camera to detect bicyclists.

Short-Term (Low Cost) Materials:

- Yellow striping
- Colored epoxy gravel
- White thermoplastic crosswalk
- Modify signal operation to include LPI
- Calibrate existing traffic detection camera to detect bicyclists on approach from Kings Road
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Concrete buildout of pedestrian crossing refuge

Concept - Planning Purposes Only

General Approach:

Extend median treatment from Waverly Place to create pedestrian crossing refuge in long crosswalk. Provide line extensions through intersection to facilitate predictable motor vehicle movement. Upgrade curb ramps to include detectable warning surface. Upgrade crosswalks to high visibility continental stripe.

Short-Term (Low Cost) Materials:

- Yellow striping
- Colored epoxy gravel
- White thermoplastic crosswalk
- Detectable warning surface
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Full construction of median treatment

MADISON CONCEPT #9
SHARED LANE MARKINGS & BICYCLE WAYFINDING

General Recommendation:

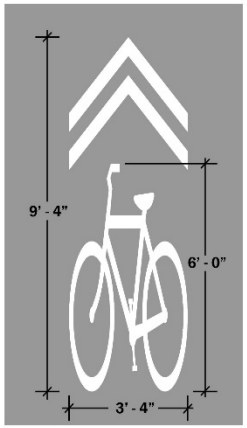
Madison has an existing network of striped shoulders that bicyclists use to travel throughout the borough. As bicyclists approach the station area on this network, the shoulder space becomes encumbered by parked automobiles. To increase the visual presence and acceptance of bicyclists in the approach to the station area, provide the following:

- Increase application of bicycle route directional signage throughout the Borough's route network. Include:
  - Destination,
  - Distance,
  - Direction.

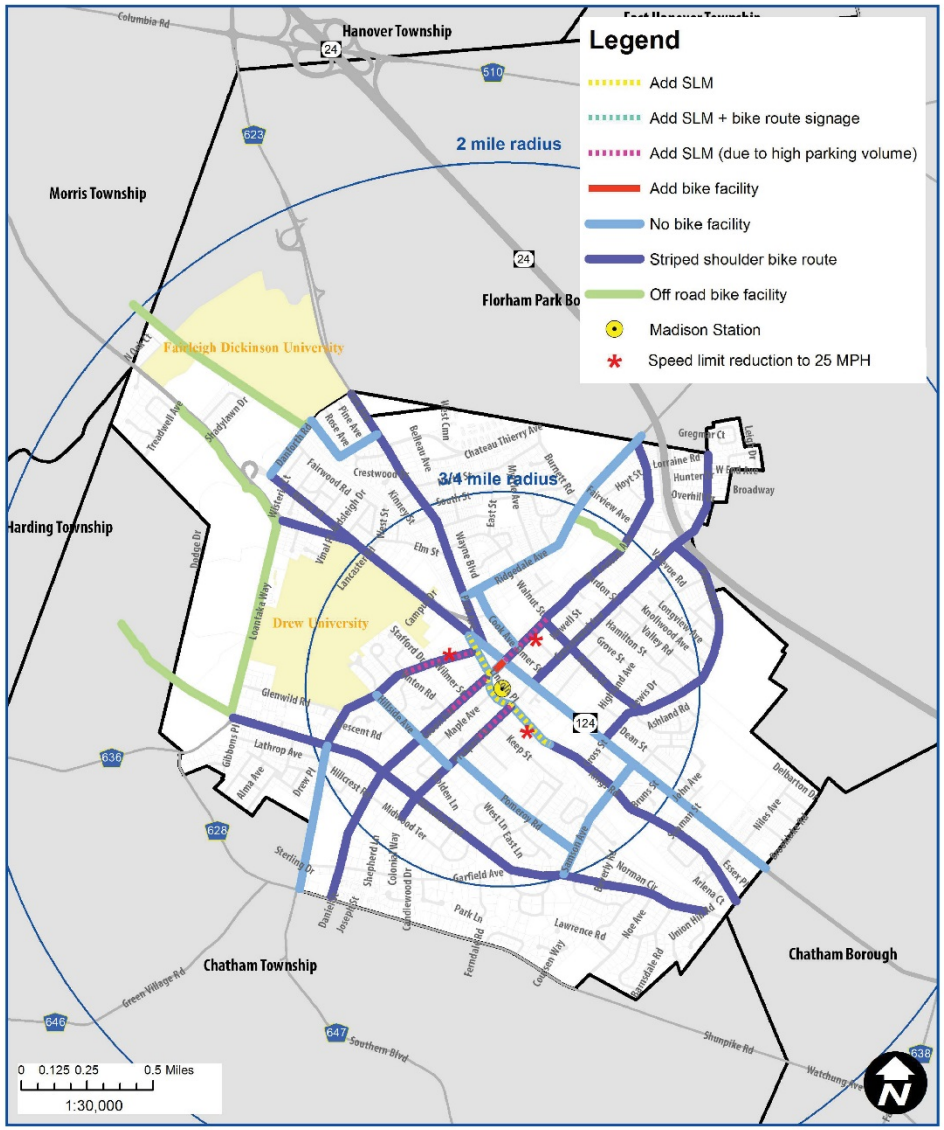
- Provide shared lane markings to indicate and visually reinforce a shared lane environment for bicycles and automobiles.

A robust, visible system of bicycle route directional signage, coupled with appropriate application of shared lane markings, will increase the visual presence of the potential for bicycle operation in the roadway and may attract more bicyclists over time. A good signage system will also reinforce smart bicycle routes that help bicyclists avoid high-stress locations.

Typical bicycle wayfinding signage



Typical Shared Lane Marking



Concept - Planning Purposes Only

5. Cost Estimates, Phasing, & Funding Sources

This section includes cost estimates, recommendations for project phasing (short-, medium-, or long-term), and identifies funding sources that are most appropriate or accessible for each design concept.

Refer to the Study Overview Report for additional information on funding sources that municipalities may consider pursuing.

These cost estimates include general material and installation costs. A contingency of 30% has been added to calculate the total estimated cost and account for price increases over time and price premiums that may apply to small projects. A phasing sequence with short-, medium-, and long-term time frames is provided to help the municipalities plan for implementation.

Item	**Concept 1: Lot 1 Pedestrian Enhancements**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	750	SF	$7.50	$5,625	Medium	Safe Streets to Transit
2	White striping	150	LF	$1.60	$240	Short	
3	White thermoplastic crosswalk	1,345	SF	$3.20	$4,304	Short	
4	Detectable warning surface (2'x4' each)	4	EA	$250.00	$1,000	Short	
5	Rectangular Rapid Flash Beacons	4	EA	$15,000.00	$60,000	Medium	
6	OPTION: Planters in epoxy area	4	EA	$250.00	$1,000	Long	
				SUBTOTAL	$72,169		
				CONTINGENCY (30%)	$21,651		
				TOTAL	**$93,820**		

Item	**Concept 2: Lot 2 Pedestrian Enhancements**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Lot identification signage	1	EA	$3,000.00	$3,000	Medium	Municipal Aid
				SUBTOTAL	$3,000		
				CONTINGENCY (30%)	$900		
				TOTAL	**$3,900**		

Item	**Concept 3: Lot 3 Pedestrian Enhancements**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White thermoplastic crosswalk	1,050	SF	$3.20	$3,360	Short	Municipal Aid
2	Detectable warning surface (2'x4' each)	4	EA	$250.00	$1,000	Short	
3	Lot identification signage	2	EA	$3,000.00	$6,000	Medium	
				SUBTOTAL	$10,360		
				CONTINGENCY (30%)	$3,108		
				TOTAL	**$13,468**		

Item	**Concept 4: Lincoln Place at Madison Station**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White thermoplastic crosswalk	1300	SF	$3.20	$4,160	Short	Safe Streets to Transit
2	White striping	70	LF	$1.60	$112	Short	
				SUBTOTAL	$4,272		
				CONTINGENCY (30%)	$1,282		
				TOTAL	**$5,554**		

Item	**Concept 5: Green Avenue & Kings Road**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	300	LF	$1.60	$480	Short	Safe Routes to School
2	Colored epoxy gravel	895	SF	$7.50	$6,713	Medium	
3	White striping	250	LF	$1.60	$400	Short	
4	Detectable warning surface (2'x4' each)	8	EA	$250.00	$2,000	Short	
5	OPTION: Planters in epoxy area	4	EA	$250.00	$1,000	Long	
				SUBTOTAL	$10,593		
				CONTINGENCY (30%)	$3,178		
				TOTAL	**$13,770**		

Item	**Concept 6: Green Village Road & Kings Road**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	78	LF	$1.60	$125	Short	County Aid
2	Colored epoxy gravel	640	SF	$7.50	$4,800	Medium	
3	White striping	50	LF	$1.60	$80	Short	
4	White thermoplastic crosswalk	700	SF	$3.20	$2,240	Short	
5	Signs	2	EA	$360.00	$720	Short	
6	Detectable warning surface (2'x4' each)	3	EA	$250.00	$750	Short	
7	OPTION: Planters in epoxy area	4	EA	$250.00	$1,000	Long	
				SUBTOTAL	$9,715		
				CONTINGENCY (30%)	$2,914		
				TOTAL	**$12,629**		

Item	**Concept 7: Madison Avenue & Kings Road**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	184	LF	$1.60	$294	Short	Municipal Aid
2	Colored epoxy gravel	230	SF	$7.50	$1,725	Medium	
3	White thermoplastic crosswalk	755	SF	$3.20	$2,416	Short	
4	Modify signal operation to include LPI	3	EA	$1,450.00	$4,350	Medium	
5	Calibrate existing traffic detection camera				Varies	Long	
6	Option: Install planters in colored epoxy gravel area	2	EA	$250.00	$500	Long	
				SUBTOTAL	$9,285		
				CONTINGENCY (30%)	$2,786		
				TOTAL	**$12,071**		

Item	**Concept 8: Central Avenue & Main St**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	228	LF	$1.60	$365	Short	SRTS/ County Aid
2	Colored epoxy gravel	100	SF	$7.50	$750	Medium	
3	White thermoplastic crosswalk	1700	SF	$3.20	$5,440	Short	
4	Detectable warning surface (2'x4' each)	8	EA	$250.00	$2,000	Long	
5	OPTION: Install planters in colored epoxy gravel area	2	EA	$250.00	$500	Long	
				SUBTOTAL	$9,055		
				CONTINGENCY (30%)	$2,716		
				TOTAL	**$11,771**		

Item	**Concept 9: Shared Lane Markings and Bicycle Wayfinding**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Shared lane markings (1 SLM every 250' in both directions on ±19,000' of roadway)	160	EA	$100.00	$16,000	Short	Peoplefor-Bikes Community Grants
2	Bicycle route signage (1 sign every 500' in both directions on ±12,500' of roadway)	49	EA	$120.00	$5,880	Medium	
				SUBTOTAL	$21,880		
				CONTINGENCY (30%)	$6,564		
				TOTAL	**$28,444**		

Madison Train Station Report Appendix

June 2018

Appendix Contents

Traffic Counts

Field Observations

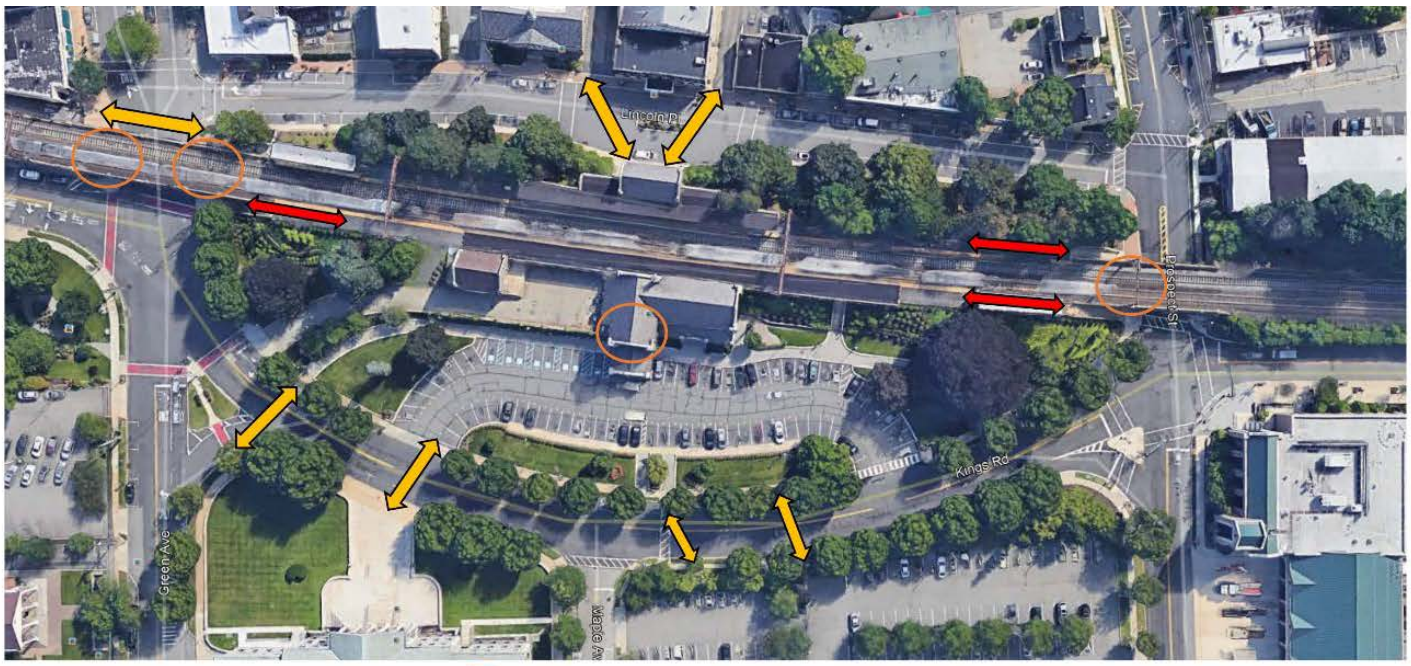
Bicycle and pedestrian counts were manually collected in the field during two-hour peak periods in the AM and PM. These counts identified bicycles parked at the station at the start of the count period, with a count at each hour to include additional bicycles parked or removed during each peak hour.

Date: Wednesday, March 28th, 2018
Time: AM Peak: 7:00 AM to 9:00 AM
Location: Kings Road, Madison NJ, 07940 (Madison Train Station)
Weather: 37°F Mostly Cloudy

Pedestrian Count: 343
Bicycle Count 7:00 AM: 29
Bicycle Count 9:00 AM: 33

Notes:

- Highest volume of pedestrians seen between 7:30 AM and 8:15 AM.
- Noticeable amount of pedestrians being dropped off in front of Kings Road side of station.
- Unmarked shuttle vehicles taking pedestrians from station.
- Irregular crossing patterns were consistent on Lincoln Place side of station (marked below).
- Irregular crossing patterns were consistent on Kings Road side of station (marked below).
- Crosswalk was used but not consistently as observed before, minimal to no snow piled up on the curbs encouraging more people to cross where no crosswalks are (mapped below).
- Most pedestrians used the staircases leading to Prospect Street and Green Avenue to enter/exit from the station.

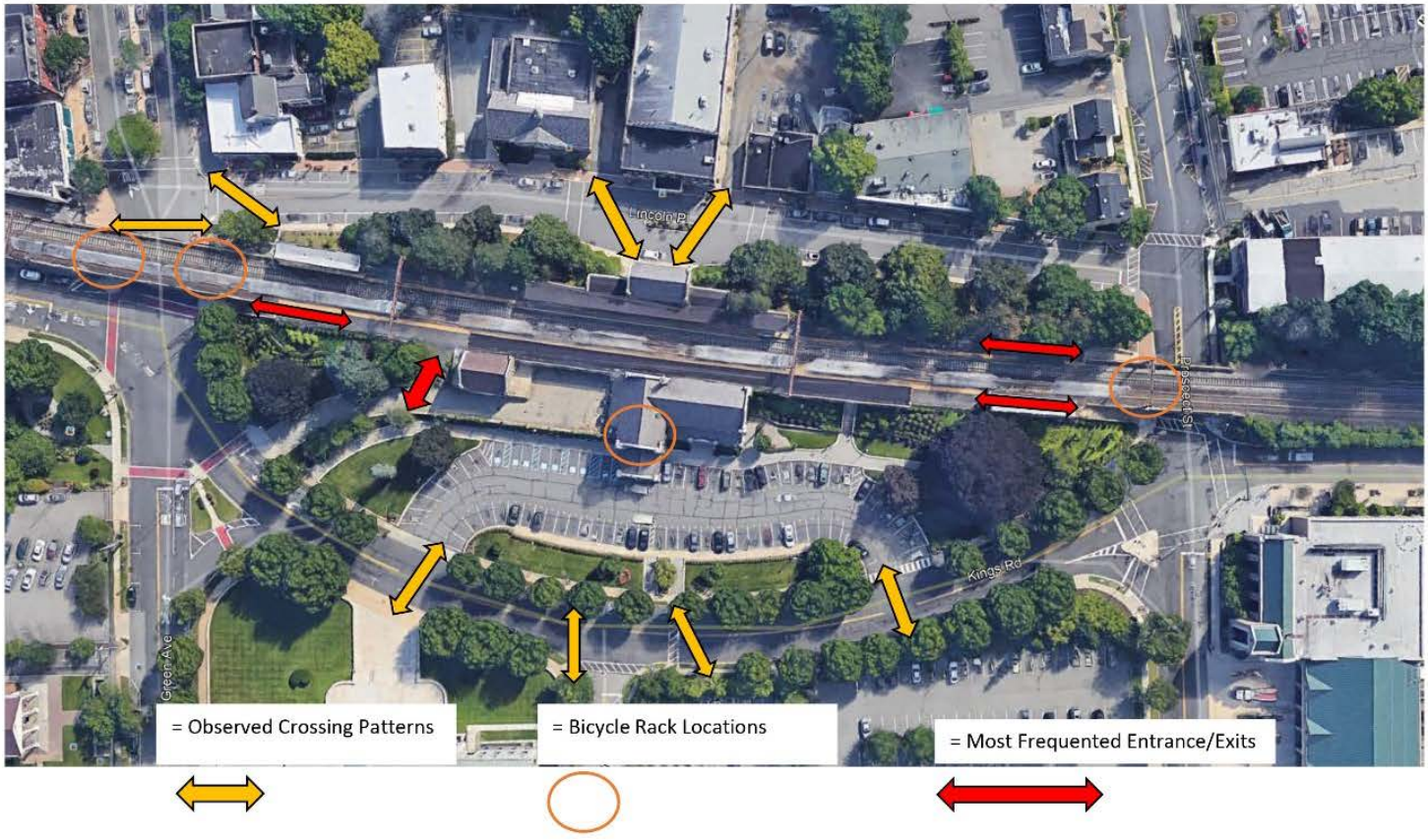


Date: Wednesday, March 28th, 2018
Time: PM Peak: 5:00 PM to 7:00 PM
Location: Kings Road, Madison NJ, 07940 (Madison Train Station)
Weather: Weather: 51°F Cloudy

Pedestrian Count: 383
Bicycle Count 5:00 PM: 38
Bicycle Count 7:00 PM: 24

Notes:

- Highest volume of pedestrians seen between 6:00 PM and 6:45 PM.
- Noticeable amount of pedestrians being picked up in front of Kings Road side of station.
- Unmarked shuttle vehicles taking pedestrians to station.
- Irregular crossing patterns were consistent on Lincoln Place side of station (marked below).
- Irregular crossing patterns were consistent on Kings Road side of station (marked below).
- Crosswalk usage was noted but not consistent, little to no snow piled on curbside allowed .pedestrians to not use crosswalks regularly (mapped below).
- Most pedestrians used the staircases leading to Prospect Street and Green Avenue to enter/exit from the station.
- Some pedestrians used dirt path leading to Kings Road from platform for exit consistently.
- Event at Drew University could have had an impact on pedestrian counts.
- Train delays between 5 and 10 minutes were observed could have had an impact on pedestrian count.



Digital Traffic Camera Counts

To supplement live field observations of pedestrian movements at the various train stations, NV5 staff installed portable digital traffic cameras (known as MioVision cameras) at key locations at each station. The cameras are temporarily installed on a telescoping pole at an intersection or crossing area and record video from a 'bird's eye' view to observe pedestrian and vehicle travel movements. For this project, video was collected during two weekdays. This video helped to inform pedestrian patterns in the vicinity of the train stations while minimizing the number of field staff needed at a given location. When actual pedestrian volume data was desired, key times of the video were sent into Miovision for automated processing to determine the pedestrian, bicycle and vehicle volumes present.

Date: Tuesday, March 6, 2018
Location: Kings Road, Madison NJ, 07940 (Madison Train Station)

PEDESTRIANS				
Start Time	Kings Rd & Prospect St Crosswalk	Kings Rd & Prospect St Crosswalk	Kings Rd & Prospect St Crosswalk	Kings Rd & Prospect St Crosswalk
	Northbound	Southbound	Eastbound	Westbound
7:00	9	25	19	21
7:15	15	15	17	15
7:30	7	17	16	23
7:45	14	31	17	21
18:30	8	30	11	31
18:45	2	9	2	10
19:00	8	19	11	24
19:15	0	3	0	4
TOTAL	**55**	**149**	**93**	**149**

BICYCLES				
Start Time	Kings Rd & Prospect St Crosswalk	Kings Rd & Prospect St Crosswalk	Kings Rd & Prospect St Crosswalk	Kings Rd & Prospect St Crosswalk
	Northbound	Southbound	Eastbound	Westbound
7:00	0	0	0	0
7:15	0	0	0	0
7:30	0	0	0	0
7:45	0	0	0	0
18:30	0	0	0	2
18:45	0	0	0	0
19:00	0	0	0	0
19:15	0	0	0	0
TOTAL	**0**	**0**	**0**	**2**

Cross Sections

The following cross sections were developed for priority walking and bicycling routes. These cross sections are representative of existing conditions observed December 12, 2017 and were used to assess the suitability of pedestrian and bicycle facilities, and to inform concept design development.

The following cross sections are included:

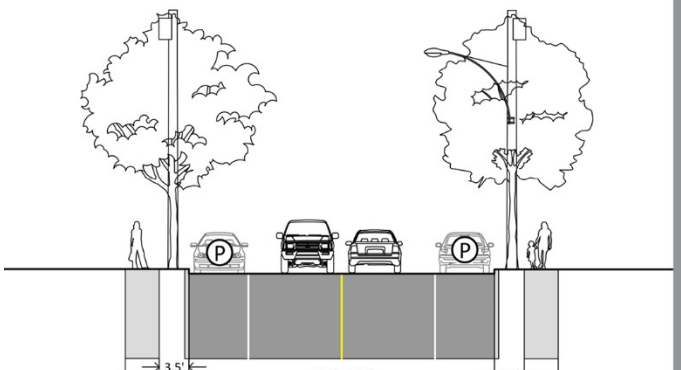
1. Kings Road
   1.1. Division Avenue to railroad underpass
   1.2. Railroad underpass to Prospect Street
   1.3. Prospect Street to Green Avenue
   1.4. Green Avenue to Madison Avenue
2. Green Avenue (Shunpike Road to Kings Road)
3. Central Avenue – Waverly Place
   3.1. Central Avenue from Main Street to Brittin Street
   3.2. Waverly Place from Lincoln Place to Main Street
4. Danforth Road (Morris Place to Park Avenue)
5. Morris Place – Madison Avenue
   5.1. Morris Place (Danforth Road to Madison Avenue)
   5.2. Madison Avenue (Morris Place to Kings Road)
6. Park Avenue(Danforth Road to Main Street)

For specific locations of cross-sections, refer to Figure M-1: Priority Routes Map.

Cross Section 1.1

Kings Rd — Madison

(Division Ave to railroad underpass)



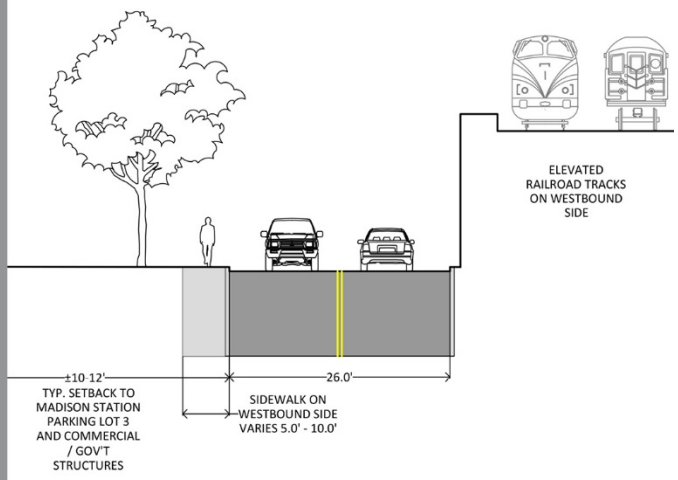
NOTES:

- STRIPED SHOULDERS DIVISION AVE TO CROSS ST INCLUDE MODIFIED BIKE LANE SYMBOL
- ON-STREET PARKING PROHIBITED IN 30' WIDE SECTIONS AND STRIPED SHOULDER REDUCED TO ±3' WIDE
- SIDEWALK CHANGES AT POINTS (BOTH SIDES IN SOME AREAS, ALTERNATING SIDES IN OTHER AREAS)

Cross Section 1.2

Kings Rd — Madison

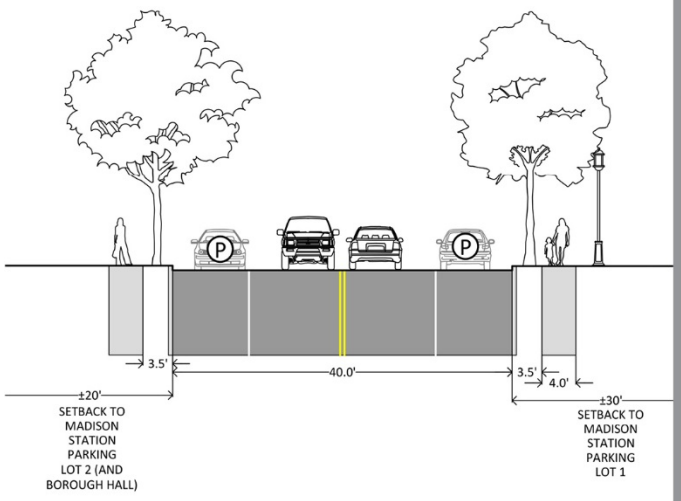
(Railroad underpass to Prospect St)



Cross Section 1.3

Kings Rd — Madison

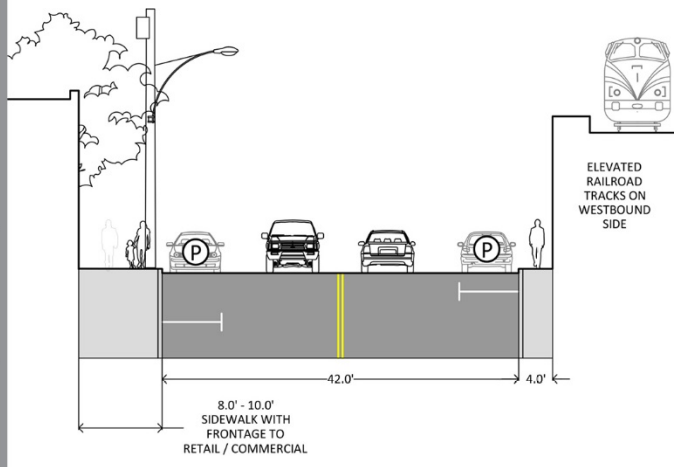
(Prospect St to Green Ave)



Cross Section 1.4

Kings Rd — Madison

(Green Ave to Madison Ave)

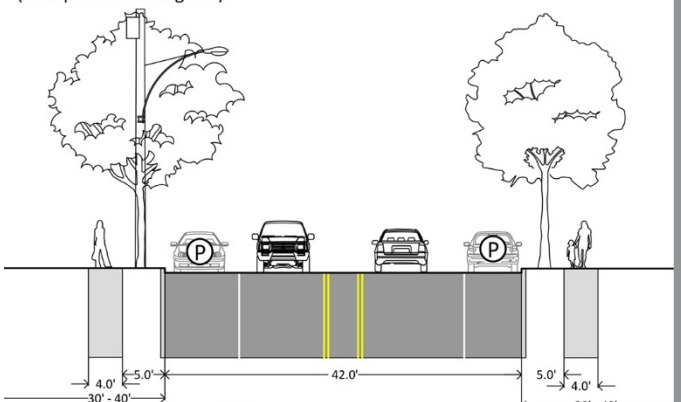


Cross Section 2

Green Ave

(Shunpike Rd to Kings Rd)

Madison



NOTES:

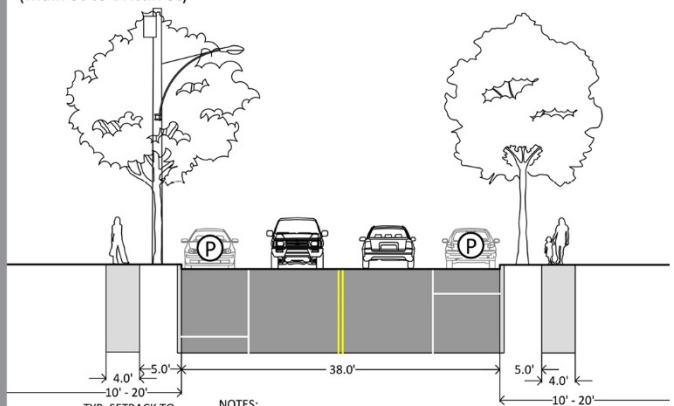
- STRIPED SHOULDERS WITH ON-STREET PARKING
- STRIPED SHOULDERS INCLUDE MODIFIED BIKE LANE SYMBOL
- CATCH BASINS ARE OFFSET

Cross Section 3.1

Central Ave

(Main St to Brittin St)

Madison



NOTES:

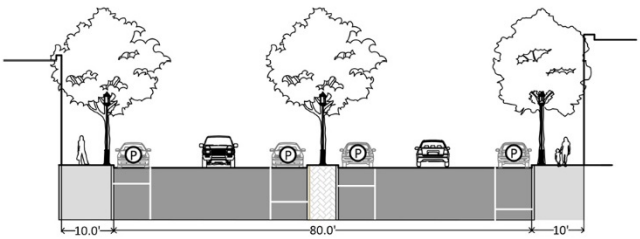
- STRIPED SHOULDERS WITH MARKED ON-STREET PARKING

Cross Section 3.2

Waverly Pl

(Lincoln Pl to Main St)

Madison



NOTES:

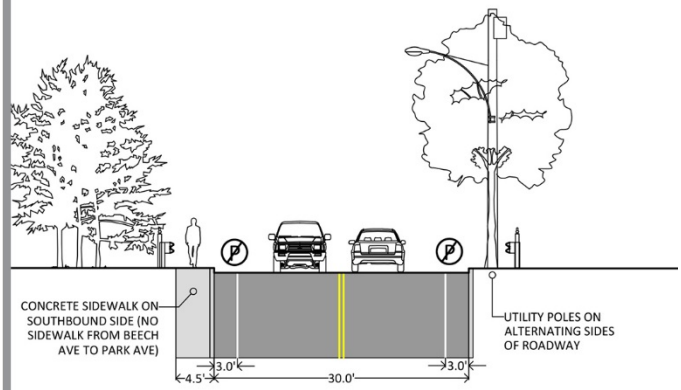
- WIDE BOULEVARD WITH RETAIL, STREET TREES, AND PAVER SURFACING
- ±22' TRAVEL LANES WITH PARKING ON BOTH SIDES
- CENTER MEDIAN IS INVITING, BUT TREE PITS PREVENT PEDESTRIANS FROM USING IT
- INCLUDE (4) LANES OF STRIPED SHOULDERS WITH MARKED ON-STREET PARKING

Cross Section 4

Danforth Rd

(Morris Pl to Park Ave)

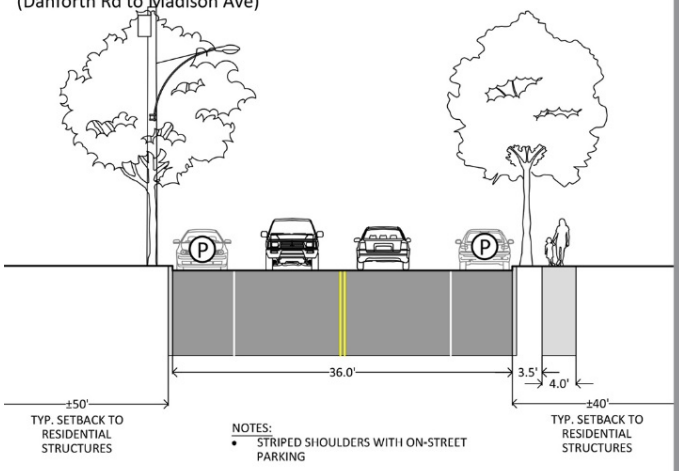
Madison



Cross Section 5.1

Morris Pl — Madison

(Danforth Rd to Madison Ave)

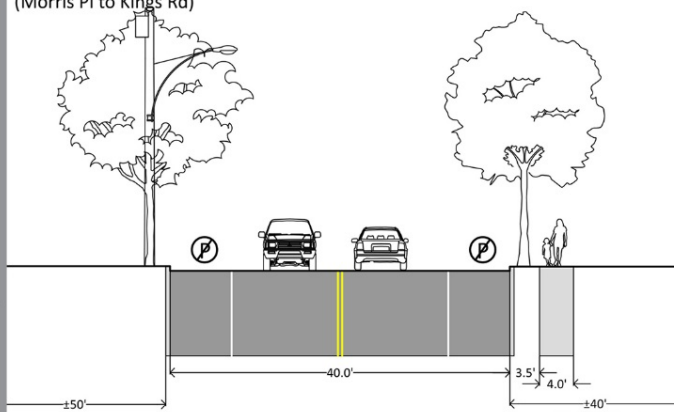


NOTES:
- STRIPED SHOULDERS WITH ON-STREET PARKING

Cross Section 5.2

Madison Ave — Madison

(Morris Pl to Kings Rd)

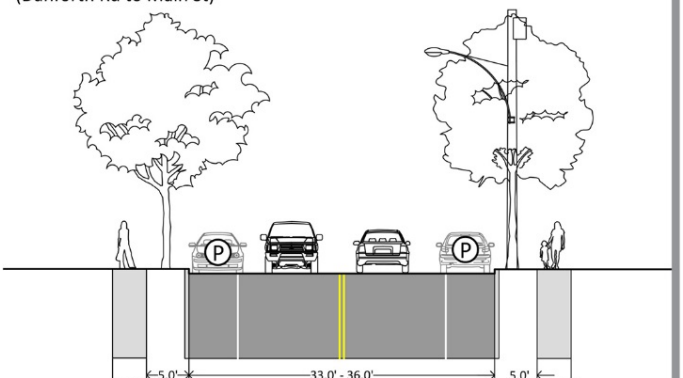


NOTES:
- STRIPED SHOULDERS WITH NO ON-STREET PARKING
- STRIPED SHOULDERS INCLUDE MODIFIED BIKE LANE SYMBOL
- STATE HIGHWAY RT-124
- CURBSIDE BUS STOP ON BOTH SIDES AT DREW UNIVERSITY GATE

Cross Section 6

Park Ave — Madison

(Danforth Rd to Main St)



NOTES:
- UTILITY POLES ALONG NORTHBOUND SIDE
- SIDEWALK ON NORTHBOUND SIDE ONLY NORTH OF NORTH ST
- SIDEWALK GAP FROM REALOGY HOLDING PROPERTY TO DANFORTH RD

Municipal Meeting Record

Municipal Meeting: Borough of Madison
50 Kings Road, Committee Room
February 14 – 2:00 PM

Attendees

1. Borough of Madison – Mayor Robert Conley, Robert Vogel
2. NJ TRANSIT – Jen Buison, Mike Viscardi
3. NV5 – Chris Lucas, Kevin Perry, Michael Dannemiller
4. 4Ward Planning – Todd Poole

Purpose of meeting

The purpose of the meeting is to review findings from the street audit and brainstorm recommendations. The project team will have concept starter ideas to review with you. The goal is to leave on the same page about recommendations for specific locations.

Agenda

1. Review of Street Audit Findings
    - What the project team documented: pedestrian amenities such as pedestrian ramps and crosswalks; bicycle facilities
2. Concept Development Discussion
    - Pedestrian Improvements
        - Intersection/Crossings
        - Parking lot enhancements
    - Bicycle Improvements
    - Traffic Calming
    - Off-road
    - Other recommendations
3. Next Steps
    - Counts: MioVision and manual counts
    - Public outreach event

Meeting Notes

- Lot 1: connectivity to Lot 2 additional lighting at this location is brought to attention for further ped safety
- Issue of jaywalking brought to attention in regards to crosswalk placement (doubling up crosswalk agreed upon)
- Green Avenue & Kings Road Lot: possible sidewalk extension (near future) Short-term: paint
- Green Village Road & Kings Road: Line extensions into question. Could add to the traffic problems
- Madison Avenue & Kings Road: Yield to ped/bicyclists sign addition? Bicycle box addition?
- Bicycle Routes: shared lane markings on approach to town in question.
    - A way to address route for different bicyclists? (Sunday ride, interested but concerned, experienced) to increase ridership
    - Sign disputes: sharrows? "Share the road", designated lanes to direct bicyclists downtown, train station, elsewhere
    - Bicycle Facility adequacy: is there enough? Eyesores?
- Priority Routes: Safe routes of transit to schools, downtown, residential, etc.
- Redevelopment Opportunities: additional revenue opportunities to fund infrastructure for bicycle facilities or other transit oriented development opportunities

Public Input Record

A Public Information Center for this study was hosted at Madison Borough Hall on Tuesday, April 10, 2018 from 5-7 PM.

Comments Collected at Public Information Center

- Many area bicyclists use sidewalk, not comfortable sharing the road
- Flashing beacons at crosswalk sound great
- Shared lane markings in/past high priority parking areas makes sense
- Bicycle security is a concern
- NJ Transit should allow bicycles on trains at rush hour
- Bicycle route on Green Avenue is good, only complaint is debris on bicycle lane in the winter months
- "Blind" right on red columns - Lead left for motorist?
- Push button for crossing at Park Avenue and Cedar Avenue? High ped volumes from Fairleigh Dickinson University
- Add sidewalk Staging -loading/unloading? Kiss & Go?

Comments Collected via Email

None

End of Madison Train Station Report

RED BANK TRAIN STATION REPORT

JUNE 2018

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Abstract:

The purpose of this study is to identify and address the most basic barriers limiting pedestrian and bicycle access to Red Bank Train Station. This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement "low-hanging fruit" improvements that can be accomplished quickly and inexpensively. Each design concept also includes recommendations for implementation, phasing, and funding sources.

The findings of this study have been discussed and reviewed with local municipal officials and have been presented for public comment at a Public Information Center that was hosted at a storefront adjacent to Red Bank Train Station.

Prepared by NV5 and 4ward Planning

Red Bank Train Station Report Table of Contents

1. Overview and Context

The Red Bank Station is located in the northwest corner of the Borough in a mixed-use neighborhood. The station is served by NJ TRANSIT's North Jersey Coast Line. In 2016, the station averaged 1,150 weekday boardings.

The pedestrian network in the Borough is comprehensive, although many crosswalks and pedestrian ramps are deficient. In 2010, the Borough adopted a Complete Streets Policy and undertook the Red Bank Bicycle/Pedestrian Planning Project, a study of potential improvements to bicycle and pedestrian amenities that informed the priority bicycle routes examined in this street audit.

Red Bank's street network follows a deflected grid pattern, which adjusts to follow major transportation and geographic barriers, such as the bank of the Navesink River and the North Jersey Coast Line. The Priority Routes Map (Figure RB-1) for Red Bank shows all routes that were reviewed in this study, as well as the priority routes, and indicates the locations of specific road cross-sections that are presented in the Appendix. The Priority Routes identified include:

- Shrewsbury Avenue
- Monmouth Street
- Oakland Street
- Peters Place
- Harding Road
- Reckless Place
- Broad Street

Background Data

Background research included review of existing documents, programs and data sources:

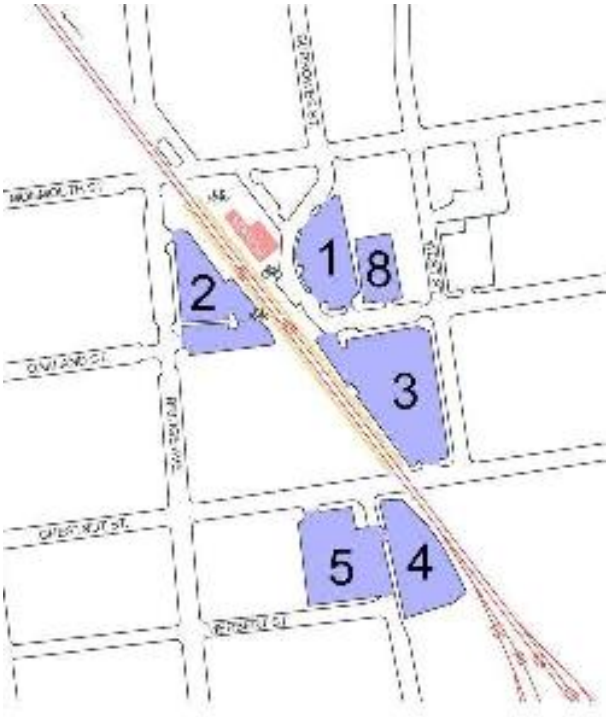
Local Documents

Title	Date
Walkable Community Workshop	October 2006
Red Bank Borough Complete Streets Policy	August 2010
Red Bank Bicycle/Pedestrian Planning Project	December 2010

Parking Lots

Lot Number	Location	Owner	Spaces
1	Monmouth Street & Burrowes Street	NJ TRANSIT	73
2	Bridge Avenue & Oakland Street	NJ TRANSIT	60
3	Oakland Street & Burrowes Street	NJ TRANSIT	143
4	Chestnut Street	NJ TRANSIT	69
5	Chestnut Street	NJ TRANSIT	100
8	Oakland Street & West Street	NJ TRANSIT	39
		Total spaces	**484**

Map: Locations of Parking Lots



2. Existing Conditions

(Observed February 1, 2018, temperature in the 40s)

- Sidewalks in the vicinity of the train station, as well as between parking areas and other pedestrian trip generators, are typically in good condition
    - Sidewalks are generally continuous with adequate connections within a 1/2-mile radius of the station
    - Crosswalks in the immediate vicinity of the station are severely faded Many pedestrian ramps outside of NJ TRANSIT property do not meet ADA standards
- Most of the intersections on Shrewsbury Avenue, Broad Street and Maple Street require pedestrian ramp upgrades and crosswalk re-striping
- Bicycle racks are full on the north side of the station building at Monmouth Street
- Bicycle lockers are available on the east side of the station
- Bicycle parking is available for (58) bicycles at the station

Photo Log

The following photos and captions describe existing conditions around and to the train station.

Red Bank Station has good quality signage that clearly identifies the station and how the parking lots are to be used. (RedBank_180201_070506.JPG, RedBank_180201_070443.JPG)

Lighting at the station and on adjacent sidewalks is bright and in good condition. (RedBank_180201_070313.JPG)

Parking for (20) bicycles is available on the north side of the station building with access to the New York-bound platform. (RedBank_180201_070609.JPG)

Additional parking for (16) bicycles is provided south of the station building on the NY-bound side (6 rack capacity + 10 bike box capacity). (RedBank_180201_074038.JPG)

Parking for (22) bicycles is provided in (3) locations with access to the Bay Head-bound platform. (RedBank_180201_072437.JPG , RedBank_180201_072303.JPG)

At the Bridge Avenue and Oakland Street intersection, all crosswalks need to be re-striped. The northern leg of this intersection, crossing Bridge Avenue, did not include a crosswalk and curb ramps. It may be worth adding a crosswalk and curb ramps to this leg, since it is a natural travel pattern to/from the station. (RedBank_180201_071950.JPG, RedBank_180201_072000.JPG, RedBank_180201_072005.JPG)

Lot 2 includes landscape islands with shrubbery in need of pruning. It may be possible to retrofit these islands to function as infiltration gardens by providing curb cuts and re-grading. (RedBank_180201_072330.JPG)

Lot 2 includes (5) ADA parking spaces with an accessible route to a ramp leading to the station platform. The ramp is ±200' from the parking. (RedBank_180201_072434.JPG)

The east side of the station includes Lots 1, 3, and 8 with access roads and drive aisles throughout. Curb ramps were recently upgraded within the vicinity of the station. High visibility crosswalks will help with safety and circulation in these areas. (RedBank_180201_073348.JPG)

This crossing at a drive aisle in Lot 1 was not upgraded as shown in the previous photo. (RedBank_180201_073553.JPG)

Cars were observed moving quickly through the station area. It may be advisable to post a parking lot speed limit (such as 9 MPH) and increase the visual presence of pedestrian crossings. (RedBank_180201_073921.JPG)

Markings and striping throughout the parking lots are due for replacement. (RedBank_180201_074611.JPG)

Lot 3 includes striped parking lot islands. These can be retrofitted as infiltration gardens through pavement removal, curbing, soil amendment, and planting. (RedBank_180201_074922.JPG)

The eastern edge of Lot 3 could be retrofitted with a bioswale between the parking lot and sidewalk to aid in stormwater infiltration. (RedBank_180201_075201.JPG)

Lot 8 appears on NJ TRANSIT's parking lot inventory for Red Bank station, but signage at the site indicates it is managed by Mayo Auto Service. (RedBank_180201_075517.JPG)

The intersection of West Street and Monmouth Street could be improved for pedestrian safety with high visibility crosswalks and curb extensions. (RedBank_180201_075840.JPG)

The Bridge Avenue and Herbert Street intersection is an example of ADA-compliant curb ramps and high visibility crosswalks that could be replicated throughout the borough. (RedBank_180201_084125.JPG)

The intersection of Drummond Avenue and S. Bridge Avenue is an example of an intersection due for curb ramp replacement and crosswalk re-striping. (RedBank_180201_084825.JPG)

The northern half of Broad Street is finished with brick paver sidewalks that are generally in good condition. Brick paver curb ramps should be retrofitted with detectable warning surface. (RedBank_180201_093350.JPG, RedBank_180201_093439.JPG)

Bridge Avenue has bike lanes between Chestnut Street and Drs. James Parker Boulevard. It may be advisable to provide centerline striping on this road. (RedBank_180201_095919.JPG)

Chestnut Street lacks a marked crossing for pedestrians between Lots 4 and 5 (to left) and the station (to right). (RedBank_180201_114230.JPG)

3. Issues & Opportunities

General Issues

- Crosswalks in the immediate vicinity of the station are severely faded
- Many pedestrian ramps outside of NJ TRANSIT property do not meet ADA standards
    - Most of the intersections on Shrewsbury Avenue, Broad Street and Maple Street require pedestrian ramp upgrades and crosswalk re-striping
- The intersection of Chestnut Street and the railroad tracks, southeast corner, does not have a continuous sidewalk
    - Gravel service areas parallel to the tracks spill out onto Chestnut Street without a driveway apron or sidewalks connecting adjacent sidewalks on the northwest and southeast sides of the tracks
- No existing pedestrian crosswalk access at Chestnut Street between Parking Lots 4 and 5 to the train station platform
    - Nearest connection requires a detour, users of Parking Lots 4 and 5 cross Chestnut Street at the shared entrance to these lots
- Crosswalk markings at the intersection of the Oakland Street terminus and the exits from Parking Lots 1 and 3 is faded and does not adequately organize vehicles
    - Lack of channelizing markings allow pick-up and drop-off to take place at this pedestrian crossing location. Methods such as channelization (separating motor vehicle turning movements from through movements and other travel modes by application of lane striping) may be considered.
- Private vehicle pick-up and drop-off take place in the bus stop just south of the station building
    - Bus stop is poorly marked and faded
    - Bicycle racks are full on the north side of the station building at Monmouth Street
    - On-road bicycle facilities are striped in standard paint
        - Chestnut Street: shared lane markings are spaced infrequently
            - One or fewer shared lane markings are installed per block
        - Bridge Avenue: bicycle lane is in good condition
            - Bicycle lane lines are marked in 4” white paint
        - W. Bergen Place: shared lane markings are spaced infrequently
            - One or fewer shared lane markings are installed per block
- The station downtown area lacks bicycle parking
    - NJ Transit bicycle racks have been installed on the north side of the station building, off of Monmouth Street

Station Area Issues

East side of the station

- Pick-up/drop-off takes place at various locations
    - Handicapped parking stalls south of station building
    - Bus stop south of station building
    - At the terminus of Oakland Street, between Parking Lots 1 and 3
    - In the taxi pick-up/drop-off area west of the platform in Lot 2
- Vehicles were observed traveling at speeds that were uncomfortably fast for the setting

- Drive aisle are wide
- Pedestrian crossings lack visual prominence
- General pavement markings are lacking

West side of the station

- Taxi area in Parking Lot 2 is poorly marked

Commuter parking lots

- No ADA compliant connection between Parking Lots 4 & 5 and the platforms

General Opportunities

- Improve crosswalks visibility, paying attention to areas that wear out the most
  - Crosswalk upgrades and/or restriping should use "ladder" or "continental" striping
  - To minimize wear, apply striping parallel to the direction of motor vehicle travel
- Improve curb ramps lacking high contrast tactile warning surface
- On-road bicycle facilities should use thermoplastic paint when roadway is re-striped
  - Chestnut Street: shared lane markings should be placed as frequent as every 100' to provide greater visibility for the shared lane facility
  - Bridge Avenue: bicycle lane lines should be re-striped with 6" bicycle lane lines to resist wear and increase longevity
  - W. Bergen Place (Drs. James Parker Boulevard): shared lane markings should be placed as frequent as every 100' to provide greater visibility for the shared lane facility
- Install bicycle parking in the downtown area

Station Area Opportunities

East side of the station

- Clearly define an area for pick-up/drop-off

West side of the station

- Taxi pick-up/drop-off area is poorly designated

Commuter parking lots

- Employ traffic calming strategies in Lots 1 and 3 to reduce vehicle travel speeds
- Create ADA compliant connection from Parking Lots 4 & 5 and the platform entrances
- Explore green infrastructure measures for stormwater infiltration in all parking lots

Existing Conditions, Issues & Opportunities (general and station area specific) are synthesized and presented in Figure RB-2: Issue & Opportunities Map.

Figure RB-1: Priority Routes Map

Figure RB-2: Issues & Opportunities Map

KEY ISSUES				OPPORTUNITIES			
1	Oakland Street terminus between Lot 1 and Lot 3 has disorganized vehicle movement for site access and pick-up/drop-off	3	Private vehicle pick-up/drop-off takes place in designated bus stop in Lot 3	1	Add channelizing striping to organize exiting vehicles and to limit pick-up and drop-off at undesignated locations	3	Re-stripe bus stop area in Lot 1 with 6" thermoplastic markings; install enlarged bus stop sign
2	Discontinuous sidewalk on both sides of the railroad crossing of Chestnut Street	4	No crosswalk at Chestnut Street to connect Lots 4 and 5 to the station area	2	Connect existing sections of sidewalk to provide a continuous, ADA compliant route	4	Provide bicycle and pedestrian improvements along Monmouth Street

4. Recommendations & Design Concepts

The goal of this study is to identify the most basic barriers limiting pedestrian and bicycle access to the station, and to propose recommendations to address them. As such, the study has produced a series of actionable design concepts specific to the study area that propose improvements for bicyclists and pedestrians.

Most design recommendations consist mainly of markings, with more substantial interventions at high-priority locations. Locations where deficiencies have been observed in crosswalks, pedestrian ramps, and intersection markings are displayed in Figure RB-2: Issues & Opportunities Map.

In general, recommendations respond to deficiencies involving:

- Pedestrian ramp condition (if any) for ADA compliance
- Crosswalks for visibility and condition
- Intersection markings to organize turning and thru alignment at complex intersections
- On-street bicycle facilities where feasible
- Lighting for adequate coverage during low-light hours

In response to these issues, the project team has identified the following general recommendations for each station area:

- Provide high-visibility crosswalks
- Provide curb ramps at all intersections and crossings
- Provide bicycle accommodations along low-speed routes (bicycle boulevard treatments)
- Deploy epoxy curb extensions
- Provide RRFBs at unsignalized crossings, as appropriate
- Track implementation and perform post-implementation studies
- Provide sufficient bicycle parking (coordination with NJ TRANSIT may be required to provide additional bicycle racks) and consider covered, secure bicycle parking

Short-Term Conceptual Enhancements

Most of the design concepts in this study have the potential to be deployed as short-term enhancements, also referred to as Tactical Urbanism projects, which are design changes implemented to street environments in a “light, quick, cheap,” and temporary manner. By demonstrating to roadway users – pedestrians, bicyclists, drivers – the effectiveness of design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

The short-term approach is the basis for most of the recommendations in this study. Minimal funding can accomplish many of these conceptual improvements, without having to initiate a larger capital project. In many cases, re-striping roads with these design concepts as a component of routine resurfacing projects could result in little to no additional cost, compared to replacing the markings as they were prior to resurfacing.

Long-Term Conceptual Enhancements

Many of the short-term concepts have the potential to become long-term buildouts. The primary example, which is used throughout the six transit stations reviewed in this study, is the proposed short-term curb extension composed of colored epoxy gravel. While the short-term application can be implemented almost anywhere, the long-term buildout of concrete-surface curb extensions could be pursued as a long-term upgrade. Locations where epoxy gravel curb extensions are proposed require additional study prior to long-term buildout with concrete, in order to understand implications to road drainage, utilities, and other factors, as well as to obtain funding for design and construction.

Phasing

With a goal of presenting NJ TRANSIT and the local municipalities with actionable recommendations to improve pedestrian and bicycle access to the stations, the recommendations were mainly low-cost and high-impact. Each location that received specific design concept recommendations includes a combination of treatments, and could be implemented in a phased approach, or combined together as part of a broader, more comprehensive effort.

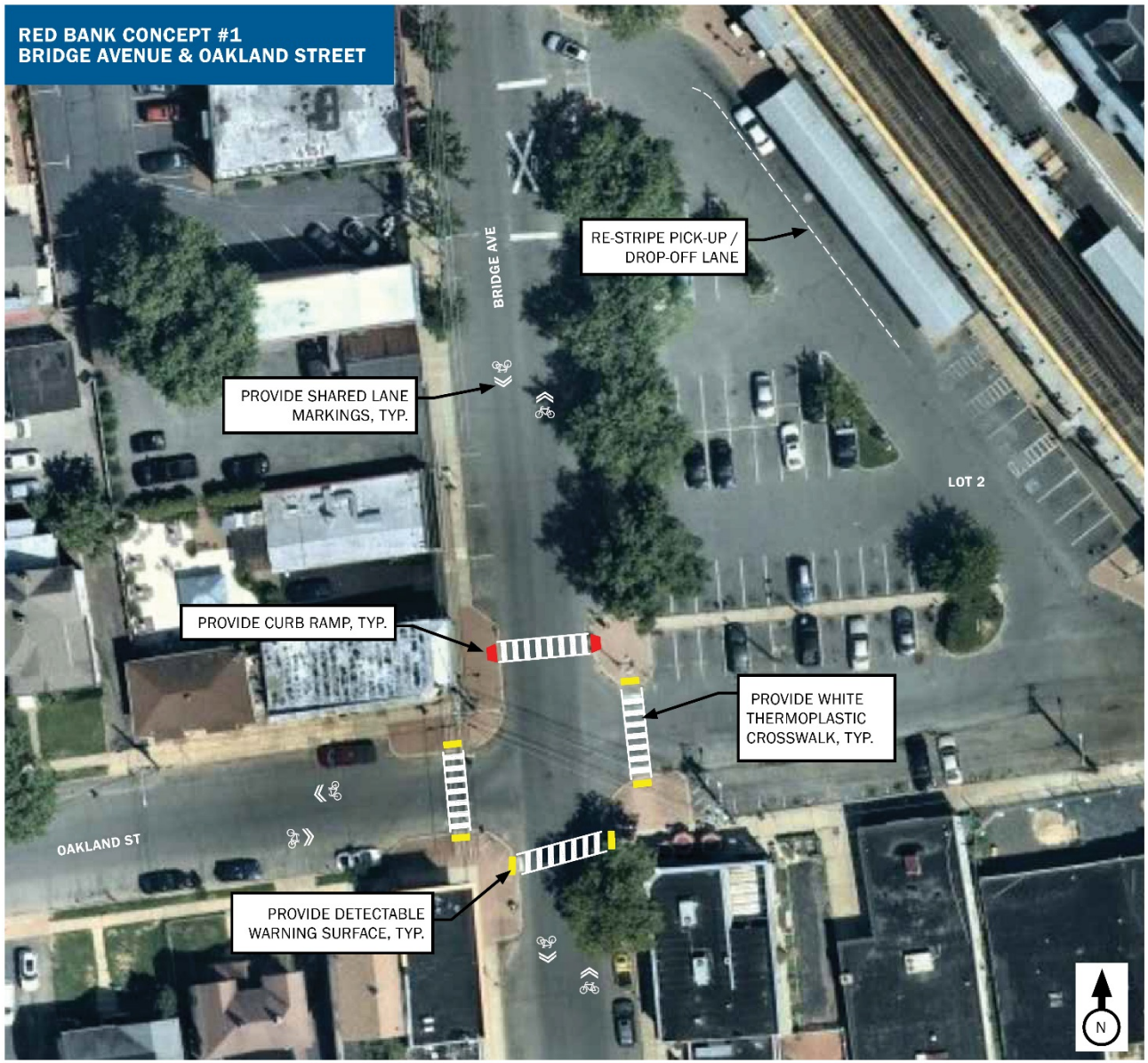
Design Concepts for Red Bank Train Station

Deficient pedestrian ramps were consistently observed throughout the study area, along with crosswalks that were either faded or required application of high-visibility thermoplastic striping to function more effectively. With many curb extensions already in place, the focus was to provide appropriate pedestrian ramps and high-visibility crossings to connect the highly walkable area surrounding the station. On the west side of the south end of the Red Bank Station, Rectangular Rapid Flash Beacons are recommended at a proposed midblock crossing that critically connects two of the commuter parking lots to the station, to increase the visibility of pedestrians during peak hours, especially during months with shortened periods of daylight.

In response to these issues, conceptual design improvements have been developed at the following locations to address the most basic barriers limiting pedestrian and bicycle access to the station:

Design Concept #	Location	Description
1	Bridge Avenue & Oakland Street	• Provide high-visibility crosswalks • Provide/upgrade curb ramps
2	Lots 4 & 5	• Provide high-visibility crosswalk at mid-block location • Provide Rectangular Rapid Flash Beacons for unsignalized crossing • Provide curb ramps
3	Lots 1 & 3	• Provide high-visibility crosswalks • Provide colored epoxy curb extensions • Provide shoulder striping to narrow travel lanes and delineate pick-up/drop-off area • Provide regulatory signage
4	Oakland Street & West Street	• Provide high-visibility crosswalks • Provide/upgrade curb ramps • Provide shoulder striping to narrow travel lanes
5	Monmouth Street	• Provide high-visibility crosswalks • Provide colored epoxy curb extensions • Provide bicycle parking
6	Shrewsbury Avenue	• Provide high-visibility crosswalks • Provide colored epoxy curb extensions • Provide bicycle parking
7	Select Roads	• Provide bicycle boulevard treatments on select low-speed roads
8	Broad Street	• Long-term study for bicycle facilities

The remainder of this Station Report provides illustrations for each design concept along with a description of the general approach and materials for short-term and long-term construction. Cost estimates with recommendations for funding and phasing are presented after the design concepts.



Concept - Planning Purposes Only

General Approach:

The intersection of Bridge Avenue and Oakland Street is a busy pedestrian crossing in need of rejuvenation. Provide ADA-compatible curb ramps at all crossing locations. Re-stripe crosswalks in high visibility thermoplastic. Northern leg of crosswalk is new; proposed to address pedestrian crossing habits that were observed in the field.

Short-Term (Low Cost) Materials:

- White striping
- White thermoplastic crosswalk
- Detectable warning surface
- Curb ramps
- Shared lane markings on Bridge Avenue and Oakland Street

Long-Term (High Cost) Materials:

- New curb ramps

Concept - Planning Purposes Only

General Approach:

Provide a designated crossing for Lot 4 and 5 users across Chestnut Street. Include high visibility crosswalks, curb ramps, concrete sidewalks with pedestrian priority driveway aprons, and Rectangular Rapid Flash Beacons.

Note: These concept level recommendations adjacent to the railroad crossing will require engineering design and approvals from local jurisdiction, NJ TRANSIT, and NJDOT.

Short-Term Materials:

- White thermoplastic crosswalk
- Curb ramps
- Concrete sidewalk at driveway aprons
- Rectangular Rapid Flash Beacons (RRFBs)

Example RRFB in Summit, NJ

Example of concrete sidewalks with concrete surface extended through driveway apron

RED BANK CONCEPT #3
LOTS 1 AND 3

General Approach:

Improve multi-modal operations, specifically between bus and pedestrian traffic. Clearly delineate pedestrian crossings and vehicular movements within Lots 1 and 3 through the application of high visibility crosswalks, neckdowns, edge striping, arrow stencils, and signage.

Short-Term (Low Cost) Materials:

- White thermoplastic crosswalk
- White striping
- Yellow striping
- Colored epoxy gravel
- Regulatory signs

Long-Term (High Cost) Materials:

- Curb Ramps
- Green infrastructure considerations (Lot 3)

Concept - Planning Purposes Only

Concept - Planning Purposes Only

General Approach:

Increase visibility at this parking lot access road, and slow/calm traffic entering/exiting the lots from Oakland Street. Provide parking stall lines to visually narrow and calm traffic on Oakland Street. (Shared lane markings are proposed on Oakland Street).

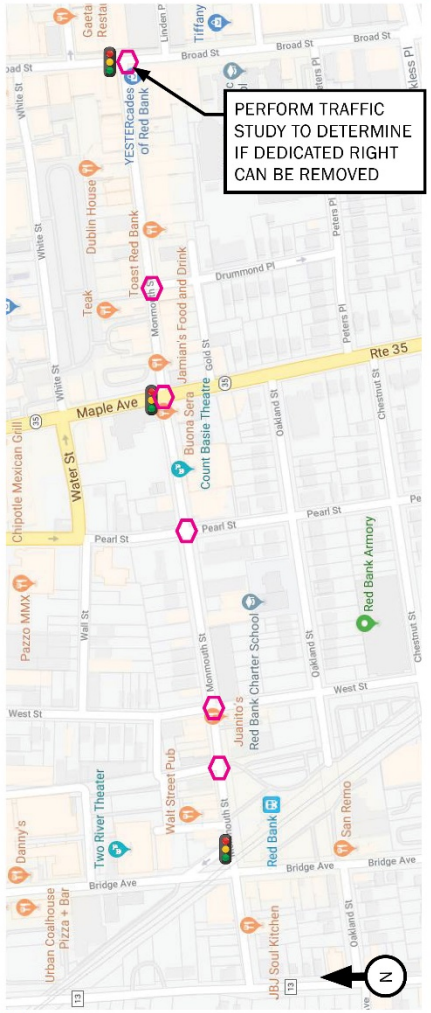
Short-Term (Low Cost) Materials:

- White thermoplastic crosswalk
- Detectable warning surface
- White striping

Long-Term (High Cost) Materials:

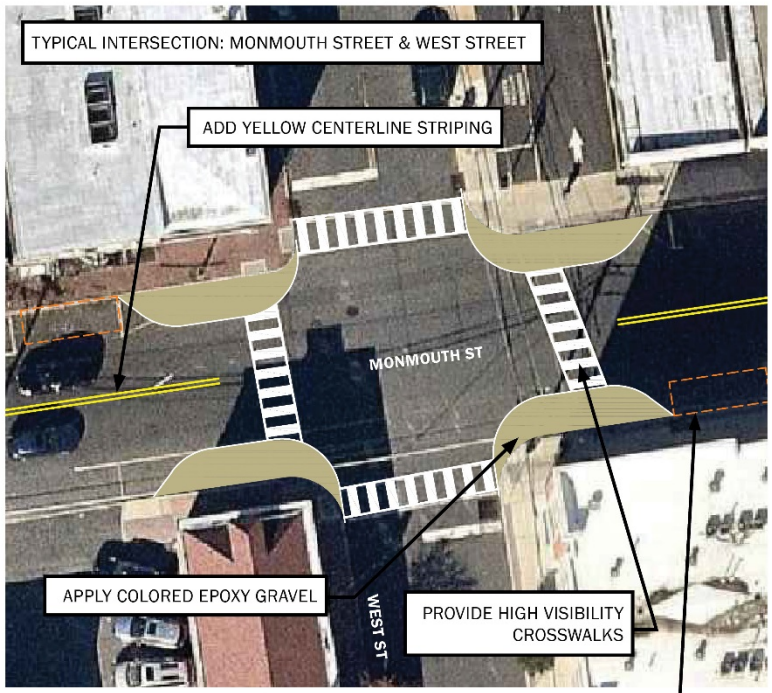
- Extend sidewalk and provide (2) new curb ramps and a crosswalk on the west side of West Street
- Extend existing planting design into new curb area

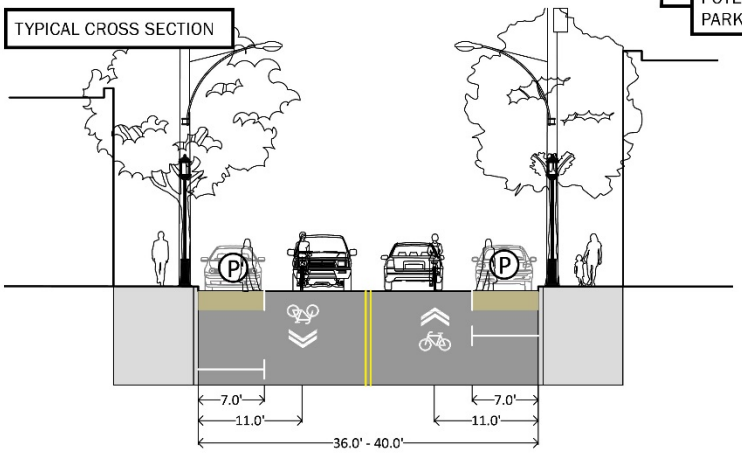
RED BANK CONCEPT #5
MONMOUTH STREET
TYPICAL INTERSECTION TREATMENT



⬡ = ADD CURB EXTENSION + HIGH VISIBILITY CROSSWALK

Concept - Planning Purposes Only





General Approach:

Provide Complete Streets improvements for pedestrians and bicyclists on Monmouth Street. Provide curb extensions and high visibility crosswalks at intersection crossings. Provide shared lane markings and bicycle parking.

Short-Term (Low Cost) Materials:

- Yellow striping
- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Full buildout curb extensions (concrete curb, paving, new curb ramps)
- Full buildout curb extensions can accommodate additional amenities, such as bicycle parking, benches, and street trees/green infrastructure

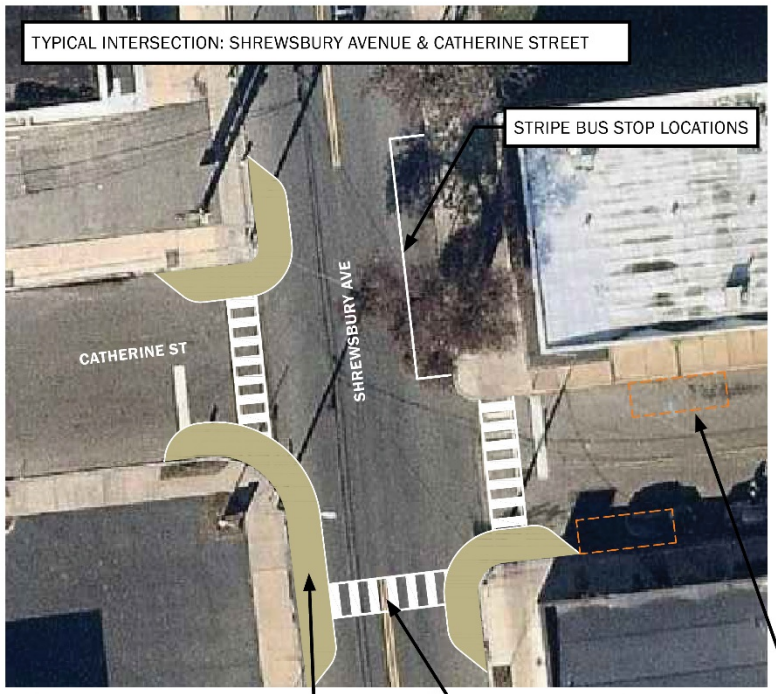
Example of a low cost approach to provide bicycle parking along Monmouth Street that will not interfere with pedestrian movement along the sidewalks. (Image source: njbikeped.org)

RED BANK CONCEPT #6
SHREWSBURY AVENUE
TYPICAL INTERSECTION TREATMENT

✶ = EXISTING CROSSWALK

⬡ = ADD CURB EXTENSION + HIGH VISIBILITY CROSSWALK

Concept - Planning Purposes Only



MUTCD sign assembly W11-2 and W16-7P may be used to mark uncontrolled crossing locations.

Example of the In-Street Pedestrian Crossing Sign (MUTCD #R1-6a).

General Approach:

Provide Complete Streets improvements for pedestrians Shrewsbury Avenue. Provide curb extensions and high visibility crosswalks at intersection crossings. Consider providing bicycle parking at cross streets.

Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White thermoplastic crosswalk
- White striping
- Option: Install planters in colored epoxy gravel area

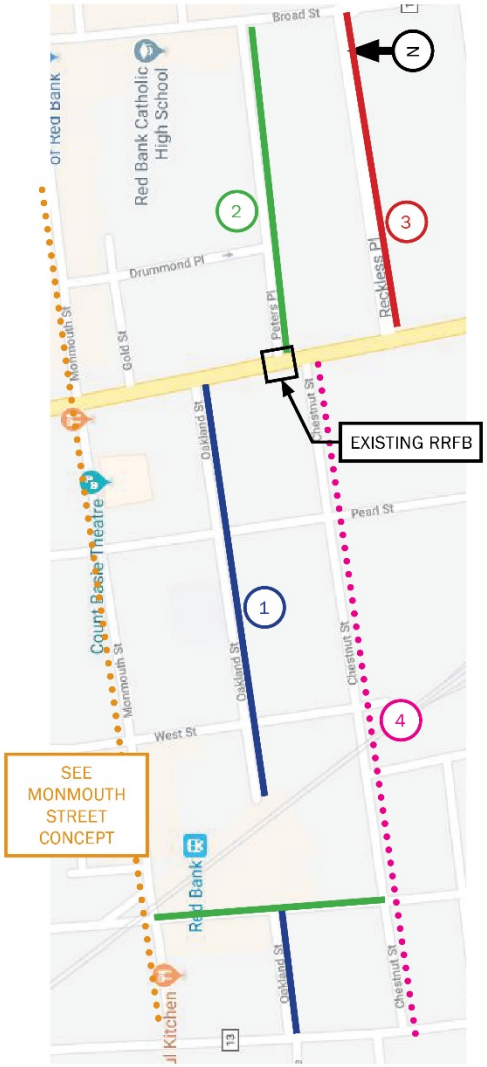
Long-Term (High Cost) Materials:

- Full buildout curb extensions (concrete curb, paving, new curb ramp)
- Full buildout curb extensions can accommodate additional amenities, such as bicycle parking, benches, and street trees/green infrastructure

Example of a low cost approach to provide bicycle parking along Shrewsbury Avenue that will not interfere with pedestrian movement along the sidewalks. (Image source: njbikeped.org)

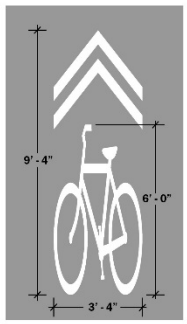
- Note: Monmouth County is currently engaged in a design process for Shrewsbury Avenue. County recommendations may differ from what is show here.

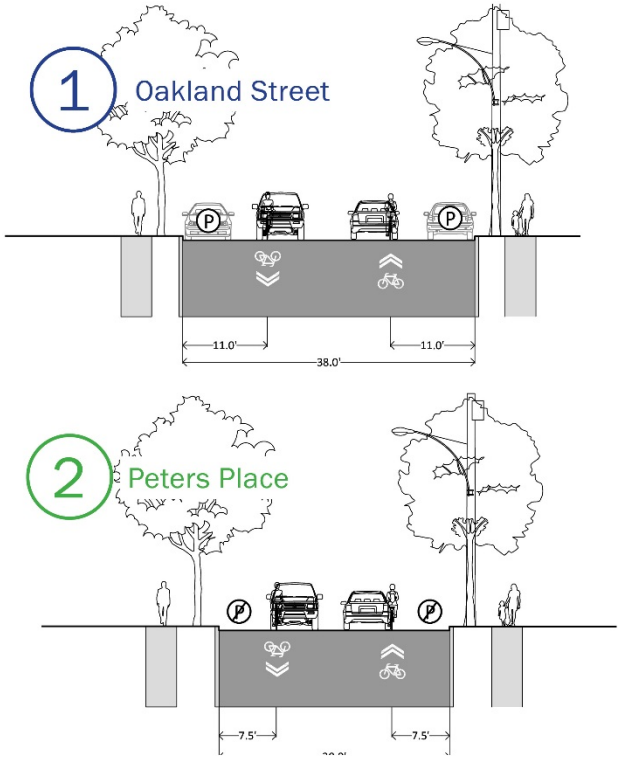
RED BANK CONCEPT #7
BICYCLE BOULEVARDS



Concept - Planning Purposes Only

NACTO bicycle boulevard example





General Approach:

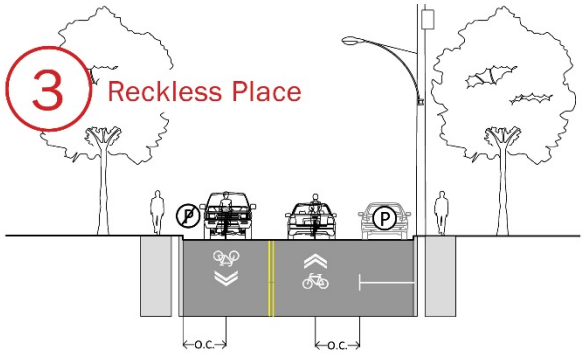
A bicycle boulevard is a low-volume and low-speed street that has been optimized for bicycle travel through treatments such as signage and pavement markings, traffic calming, and intersection crossing treatments. These treatments prioritize travel and safety for bicyclists and pedestrians, maintain access to local destinations for motor vehicles, but discourage high volume and high speed motor vehicle traffic.

Short-Term (Low Cost) Materials:

- Shared lane markings (thermoplastic preferred)
- Bicycle route signage

Long-Term (High Cost) Materials:

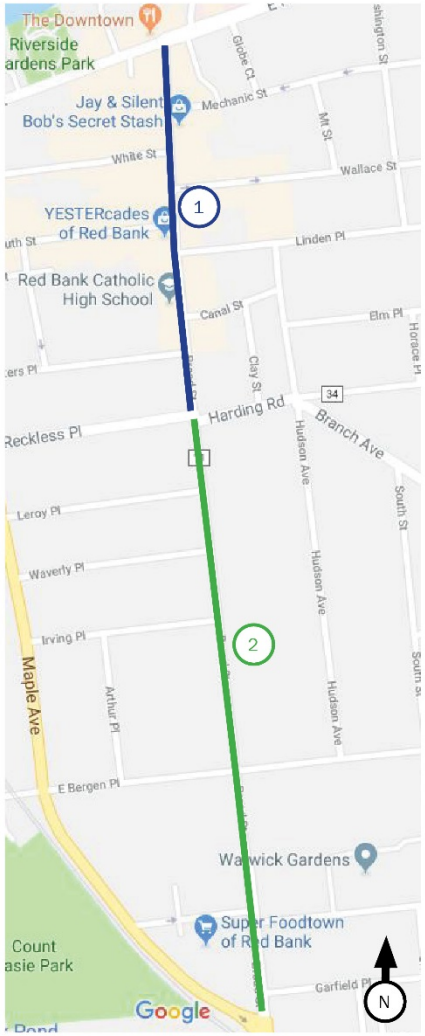
- Colored epoxy gravel for curb extensions, neckdowns
- Fully deployed wayfinding and signage
- Fully constructed traffic calming



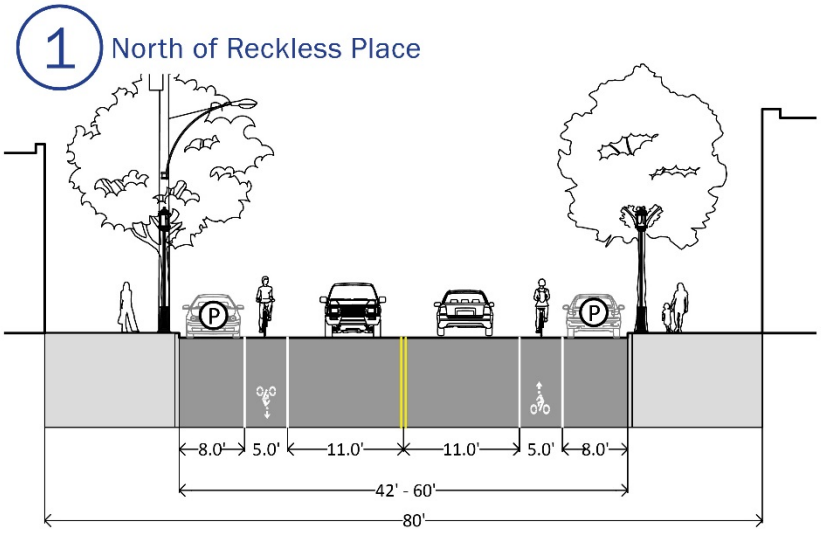
4 Chestnut Street and Bergen Place (not on map)

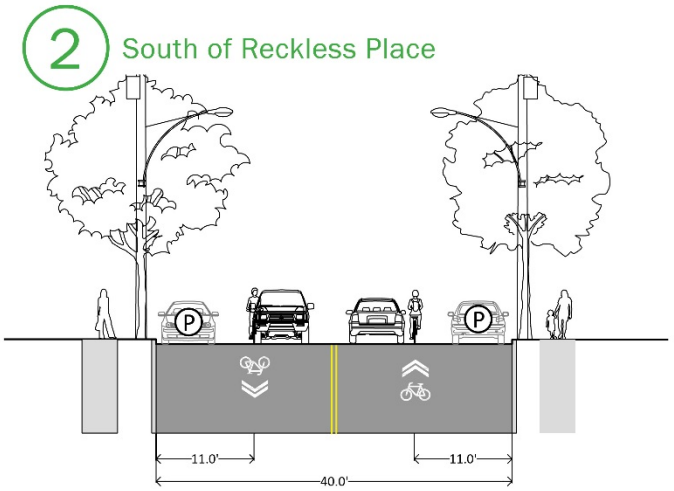
Increase The frequency of Shared Lane Markings along Chestnut Street and Bergen Place . Markings should be placed at interval of 200-250 feet. Also provide bicycle route signage.

RED BANK CONCEPT #8
BROAD STREET



Concept - Planning Purposes Only





Speed limit reduction from 30 to 25 MPH should be evaluated

General Approach:

Broad Street is the principal street in Red Bank's downtown retail and dining district. This study presents the concept of developing bicycle lanes and/or shared lane markings along Broad Street as a means to improve pedestrian and bicycle connections between Red Bank Station and the retail and dining district.

The Borough of Red Bank expressed that including bicycle infrastructure on Broad Street would be a difficult undertaking and would be unlikely to gain public support due to high traffic volume, heavy commercial activity and deliveries, high pedestrian volume, existing curb alignment (many curb extensions), and parking demand. This study recognizes and values that input.

Whereas the majority of the concepts included in this study are intentionally easy to implement in the short term, in contrast, the idea of bicycle infrastructure for Broad Street is very complex and would require a comprehensive design process with public input. Such a process would likely include an economic study to identify benefits and impacts; engineering studies for traffic counts, signal timing and level of service, survey, utilities, and drainage; along with a conceptual design development phase, cost estimates, multiple rounds of public input, approval from the governing body.

This concept remains in this study as documentation of an idea that was discussed during the study.

5. Cost Estimates, Phasing, & Funding Sources

This section includes cost estimates, recommendations for project phasing (short-, medium-, or long-term), and identifies funding sources that are most appropriate or accessible for each design concept.

Refer to the Study Overview Report for additional information on funding sources that municipalities may consider pursuing.

These cost estimates include general material and installation costs. A contingency of 30% has been added to calculate the total estimated cost and account for price increases over time and price premiums that may apply to small projects. A phasing sequence with short-, medium-, and long-term time frames is provided to help the municipalities plan for implementation.

Item	**Concept 1: Bridge Avenue & Oakland Street**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White striping	110	LF	$1.60	$176	Short	
2	White thermoplastic crosswalk	715	SF	$3.20	$2,288	Short	Safe Streets to Transit
3	Detectable warning surfaces (assuming 2'x4')	6	EA	$250.00	$1,500	Short	
4	Curb ramps	2	EA	$1,500.00	$3,000	Short	
5	Shared lane markings on Bridge Avenue & Oakland Street (assuming 30 SF)de	6	EA	$200.00	$1,200	Short	
				SUBTOTAL	$8,164		
				CONTINGENCY (30%)	$2,449		
				TOTAL	**$10,613**		

tem	**Concept 2: Lots 4 & 5 Station Access**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White thermoplastic crosswalk	495	SF	$3.20	$1,584	Short	Safe Streets to Transit
2	Curb ramps	2	EA	$1,500.00	$3,000	Short	
3	Concrete sidewalk at driveway aprons (assume 5' wide)	55	LF	$60.00	$3,300	Short	
4	Rectangular Rapid Flash Beacons (RRFBs)	2	EA	$15,000.00	$30,000	Medium	
				SUBTOTAL	$37,884		
				CONTINGENCY (30%)	$11,365		
				TOTAL	**$49,249**		

Item	**Concept 3: Lots 1 & 3**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White thermoplastic crosswalk	2,065	SF	$3.20	$6,608	Short	NJ TRANSIT Capital / Maintenance Programs AND/OR Local efforts
2	White striping	295	LF	$1.60	$472	Short	
3	Yellow striping	225	LF	$3.20	$720	Short	
4	Colored epoxy gravel	250	SF	$7.50	$1,875	Medium	
5	Regulatory signs	8	EA	$360.00	$2,880	Short	
				SUBTOTAL	$12,555		
				CONTINGENCY (30%)	$3,766		
				TOTAL	**$16,321**		

Item	**Concept 4: Oakland Street & West Street**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White thermoplastic crosswalk	1,030	SF	$3.20	$3,296	Short	Safe Routes to School
2	Detectable warning surfaces (assuming 2'x4')	2	EA	$250.00	$500	Short	
3	White striping	280	LF	$1.60	$448	Short	
				SUBTOTAL	$4,244		
				CONTINGENCY (30%)	$1,273		
				TOTAL	**$5,517**		

Item	**Concept 5: Monmouth Street Typical Intersection Treatment (per intersection)**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	90	LF	$1.60	$144	Short	Local Aid / PeopleforBikes Community Grants
2	Colored epoxy gravel	1,020	SF	$7.50	$7,650	Medium	
3	White striping	240	LF	$1.60	$384	Short	
4	White thermoplastic crosswalk	765	SF	$3.20	$2,448	Short	
5	OPTION: Planters in epoxy area	4	EA	$250.00	$1,000	Long	
				SUBTOTAL	$11,626		
				CONTINGENCY (30%)	$3,488		
				TOTAL	**$15,114**		

Item	**Concept 6: Shrewsbury Avenue Typical Intersection Treatment (per intersection)**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	825	SF	$7.50	$6,188	Medium	County Aid
2	White thermoplastic crosswalk	440	SF	$3.20	$1,408	Short	
3	White striping	245	LF	$1.60	$392	Short	
4	OPTION: Planters in epoxy area	4	EA	$250.00	$1,000	Long	
				SUBTOTAL	$8,988		
				CONTINGENCY (30%)	$2,696		
				TOTAL	**$11,684**		

Item	**Concept 7: Bicycle Boulevards**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Shared lane markings (1 SLM every 250' in both directions on ±8,700' of roadway)	70	EA	$100.00	$7,000	Short	PeopleforBikes Community Grants
2	Bicycle route signage (1 sign every 500' in both directions on ±8,700' of roadway)	35	EA	$120.00	$4,200	Medium	
				SUBTOTAL	$11,200		
				CONTINGENCY (30%)	$3,360		
				TOTAL	**$14,560**		

Item	**Concept 8: Broad Street**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Budgeting cost for possible future Planning Study	1	EA	$150,000	$150,000	Long	NJDOT
				SUBTOTAL	$150,000		
				CONTINGENCY (30%)	$45,000		
				TOTAL	**$195,000**		

Red Bank Train Station Report Appendix

June 2018

Appendix Contents

Traffic Counts

Field Observations

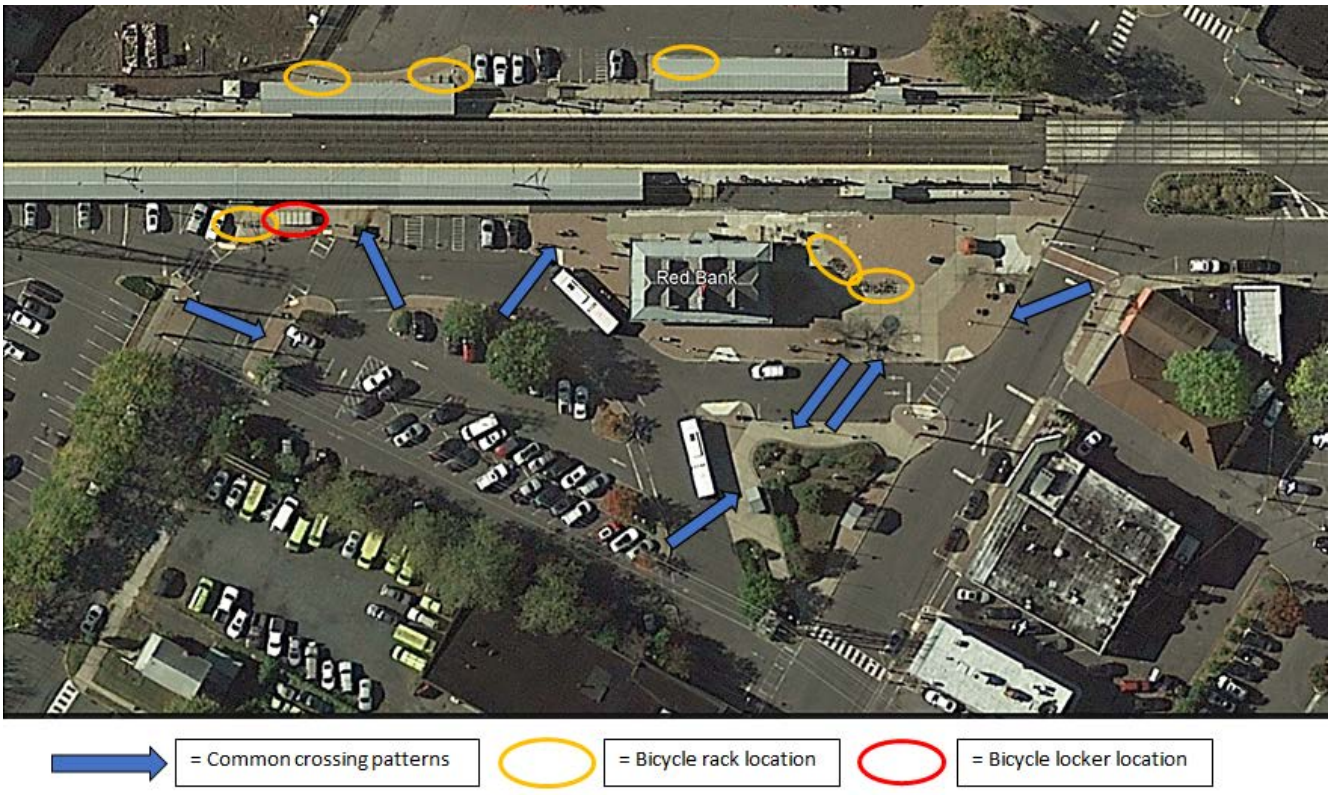
Bicycle and pedestrian counts were manually collected in the field during two-hour peak periods in the AM and PM. These counts identified bicycles parked at the station at the start of the count period, with a count at each hour to include additional bicycles parked or removed during each peak hour.

Date: Tuesday, May 15th, 2018
Time: AM Peak: 7:00 AM to 9:00 AM
Location: Red Bank Train Station
Weather: 62°F Foggy turned to Sunshine

Pedestrian Count: 243
Bicycle Count 7:00 AM: 13
Bicycle Count 9:00 AM: 14

Notes:

- Five (5) bicycle lockers are present at this train station. The design of the locker requires a lock and key and bicycles cannot be seen inside them. It was unclear whether they were in use or not.
- Bus usage is very frequent at this location. Although safety for the entirety of the station is the goal, pedestrian safety around the bus drop-off/pick-up points should be put at a higher priority. Heaviest pedestrian use of the busses was between 8:45 AM and 9:00 AM.
- Existing crosswalks were used consistently and as intended throughout AM observation.
- Mapped irregular crossing patterns below were the most consistent throughout the morning.

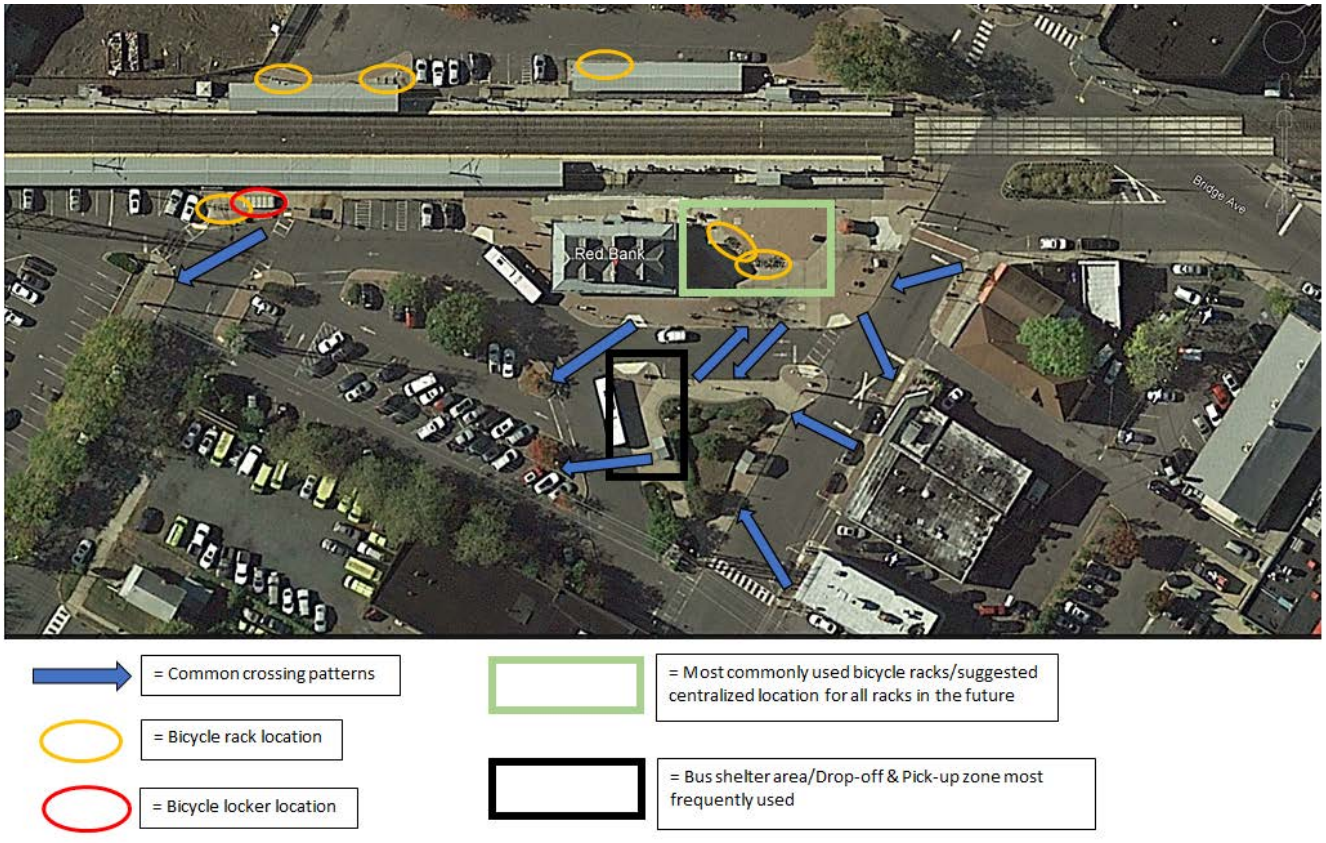


Date: Tuesday, May 15th, 2018
Time: PM Peak: 5:00 PM to 7:00 PM
Location: Red Bank Train Station
Weather: 87 & Sunny (Impending severe weather)
Roughly 6:00 PM: Dark clouds/Light rain
6:20 PM – 6:30 PM: Heavier rain with thunder & lightning

Pedestrian Count: 411
Bicycle Count 5:00 PM: 31
Bicycle Count 7:00 PM: 21

Notes:

- Impending severe weather could have played a role in pedestrian/bicycle counts & crossing patterns.
- Bus usage is very frequent at this location. As with the AM observation, there should be a focus on pedestrian safety around the bus drop-off/pick-up zones.
- Most irregular crossing patterns were observed around the bus shelter at the station – supporting the need for increased pedestrian safety around this location. (mapped below)
- Existing crosswalk were used consistently and as intended throughout the observation.
- No use of the bicycle lockers observed during analysis.
- One main area of bicycle racks was used throughout both AM & PM observations. A consideration for a prospective project is to centralize the bicycle racks and move the bicycle lockers to encourage more bicycle usage to and from the station.



Digital Traffic Camera Counts

To supplement live field observations of pedestrian movements at the various train stations, NV5 staff installed portable digital traffic cameras (known as MioVision cameras) at key locations at each station. The cameras are temporarily installed on a telescoping pole at an intersection or crossing area and record video from a 'bird's eye' view to observe pedestrian and vehicle travel movements. For this project, video was collected during two weekdays. This video helped to inform pedestrian patterns in the vicinity of the train stations while minimizing the number of field staff needed at a given location. When actual pedestrian volume data was desired, key times of the video were sent into Miovision for automated processing to determine the pedestrian, bicycle and vehicle volumes present

Date: Wednesday, April 11, 2018
Location: Red Bank Train Station

PEDESTRIANS				
Start Time	Station to/from Lot 4 Southbound	Station to/from Lot 5 Southbound	Station to/from Lot 4 Northbound	Station to/from Lot 5 Northbound
6:30	0	0	23	1
6:45	1	0	12	0
7:00	4	0	3	0
7:15	2	0	20	0
18:30	9	3	3	0
18:45	11	0	2	0
19:00	10	0	0	0
19:15	16	1	2	0
TOTAL	**53**	**4**	**65**	**1**

BICYCLES				
Start Time	Station to/from Lot 4 Southbound	Station to/from Lot 5 Southbound	Station to/from Lot 4 Northbound	Station to/from Lot 5 Northbound
6:30	0	0	0	0
6:45	0	0	0	0
7:00	1	0	0	0
7:15	0	0	0	0
18:30	0	0	0	0
18:45	1	0	0	0
19:00	0	0	0	0
19:15	0	0	0	0
TOTAL	**2**	**0**	**0**	**0**

Cross Sections

The following cross sections were developed for priority walking and bicycling routes. These cross sections are representative of existing conditions observed February 1, 2018 and were used to assess the suitability of pedestrian and bicycle facilities, and to inform concept design development.

The following cross sections are included:

1.0 Shrewsbury Avenue (Newman Springs Road to West Front Street)
2.0 Monmouth Street (Shewsbury Avenue to Broad Street)
3.0 Oakland Street (Shrewsbury Avenue to Lot 2, and, Lots 1 & 3 to Maple Avenue)
4.0 Peters Place (Maple Avenue to Broad Street)
5.0 Harding Road/Reckless Place
    5.1 Harding Road (Prospect Avenue to Broad Street)
    5.2 Reckless Place (Broad Street to Maple Avenue)
6.0 Broad Street
    6.1 Broad Street (Front Street to Harding Road)
    6.2 Broad Street (Harding Road to Rumson Place)

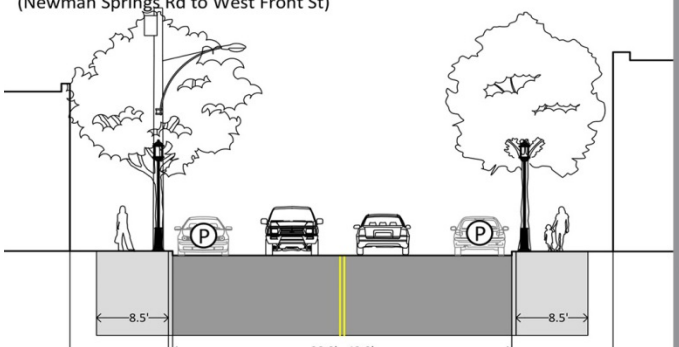
For specific locations of cross-sections, refer to Figure RB-1: Priority Routes Map.

Cross Section 1

Shrewsbury Ave

Red Bank

(Newman Springs Rd to West Front St)



NOTES:

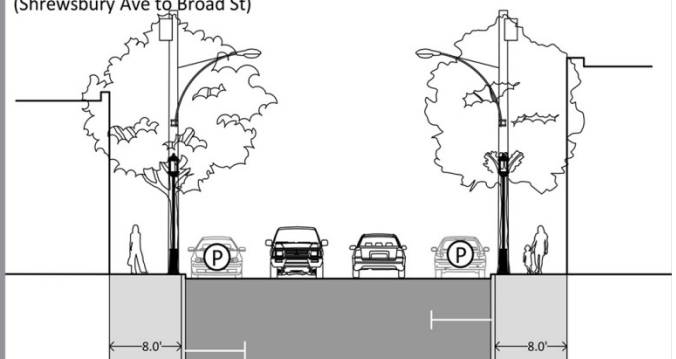
- CR-13
- SPEED LIMIT 30 MPH
- ON-STREET PARKING
- CURBSIDE BUS STOPS
- BRIDGE AVE IS PARALLEL ROUTE ONE BLOCK OVER WITH BIKE LANE
- BUSY ROADWAY LIKELY HIGH LEVEL OF STRESS TO MOST BICYCLISTS

Cross Section 2

Monmouth St

Red Bank

(Shrewsbury Ave to Broad St)



NOTES:

- SPEED LIMIT 25 MPH
- ON-STREET PARKING
- CURBSIDE BUS STOPS

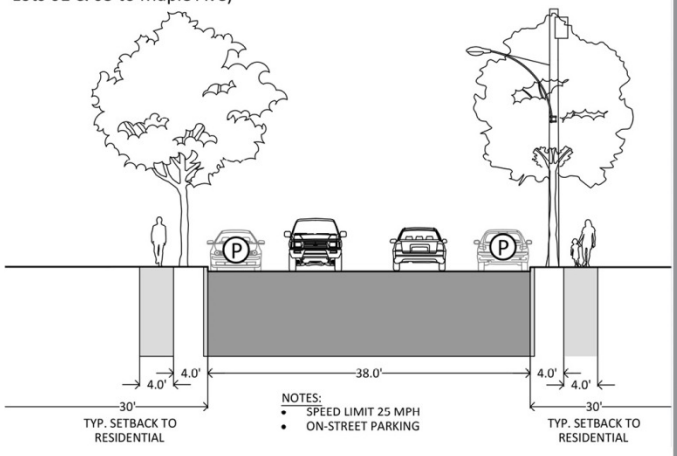
Cross Section 3

Oakland St

Red Bank

(Shrewsbury Ave to Lot 02, and,

Lots 01 & 03 to Maple Ave)



NOTES:

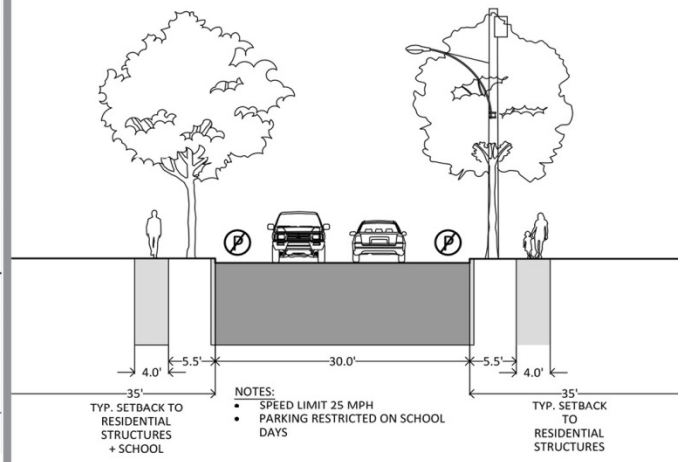
- SPEED LIMIT 25 MPH
- ON-STREET PARKING

Cross Section 4

Peters Pl

Red Bank

(Maple Ave to Broad St)



NOTES:

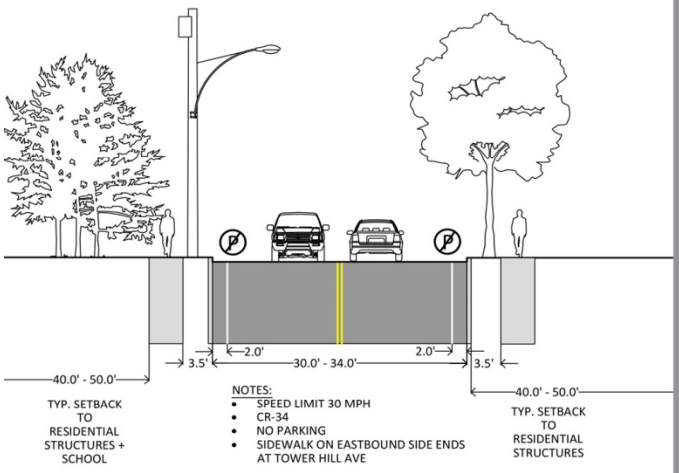
- SPEED LIMIT 25 MPH
- PARKING RESTRICTED ON SCHOOL DAYS

Cross Section 5.1

Harding Rd

(Prospect Ave to Broad St)

Red Bank



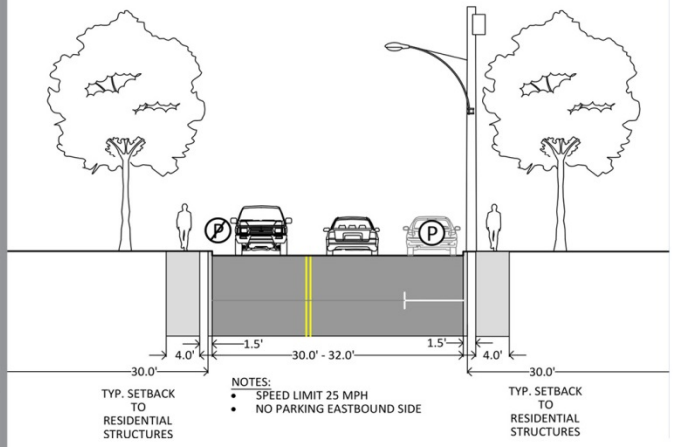
NOTES:
- SPEED LIMIT 30 MPH
- CR-34
- NO PARKING
- SIDEWALK ON EASTBOUND SIDE ENDS AT TOWER HILL AVE

Cross Section 5.2

Reckless Pl

(Broad St to Maple Ave)

Red Bank



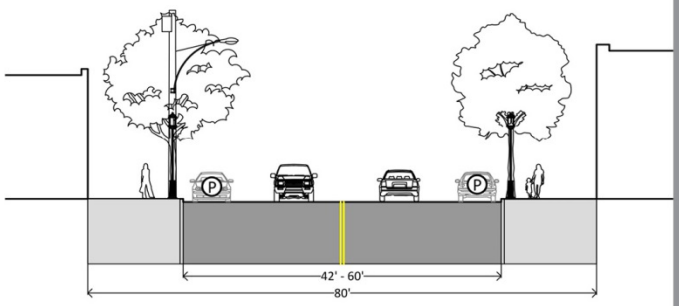
NOTES:
- SPEED LIMIT 25 MPH
- NO PARKING EASTBOUND SIDE

Cross Section 6.1

Broad St

(Front St to Harding Rd)

Red Bank



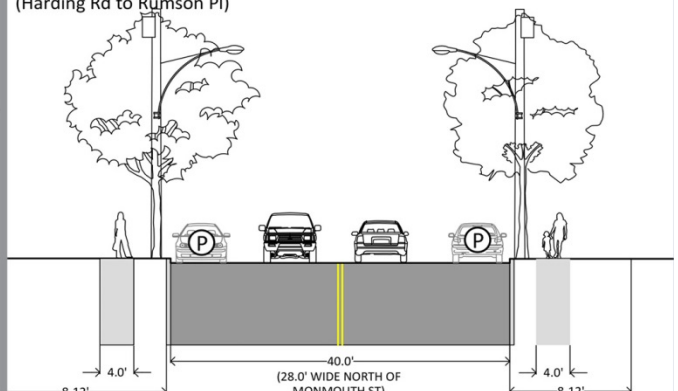
NOTES:
- ON-STREET PARKING
- MAJOR RETAIL DESTINATION
- CURBFACE-TO-CURBFACE DISTANCE IS HIGHLY VARIABLE FROM BLOCK TO BLOCK

Cross Section 6.2

Broad St

(Harding Rd to Rumson Pl)

Red Bank



NOTES:
- CR-11
- SPEED LIMIT 30 MPH
- ON-STREET PARKING
- CURBSIDE BUS STOPS

Municipal Meeting Record

Municipal Meeting: Red Bank Borough
90 Monmouth Street, Red Bank NJ
March 28, 2018 – 10:00 AM

Attendees

1. Red Bank – Glenn Carter
2. NJ TRANSIT – Jen Buison, Mike Viscardi
3. NJTPA – Keith Hamas
4. NV5 –Chris Lucas, Kevin Perry
5. 4WARD PLANNING – Todd Poole

Purpose of meeting

The purpose of the meeting is to review the project team's findings from the street audit and brainstorm recommendations. The project team will have concept starter ideas to review with you. The goal is to leave on the same page about recommendations for specific locations.

Agenda

1. Review of Street Audit Findings
    - The project team documented: pedestrian amenities such as pedestrian ramps and crosswalks; bicycle facilities
2. Concept Development Discussion
    - Pedestrian Improvements
    - Bicycle Improvements
    - Traffic Calming
    - Off-road
    - Other recommendations
3. Next Steps
    - Counts: MioVision and Manual
    - Public outreach event

Meeting Notes

- Discussed parking lot entrance improvements
- Asked about changes to the bus lane circulation patterns. Stated that the bus depot area is very active location. NJ Transit stated it could be redesigned to handle higher capacity, but it would mean giving up more station property. Hard to get a capital improvement funding if there were an increase in bus activity. Only if there is a safety hazard issue would NJ Transit be able to redesign the bus depot area.
- Need to have really obvious striping and signage, for pedestrian safety. If the buses are going faster than they should, NJ Transit should be alerted. Because of the bus turning movements, it's a very wide drive aisle.

Oakland and West Street

- There were some parking lines at some point – restripe
- High-visibility cross walks

- What are the requirements for the speed limit on roadways that permit bicycles and what is the required width (asked by Glen from Red Bank)?
- Three bicycle symbols per block, according to NV5.
- NJ Transit: slower speed is the key to make the block safe for bicycles and pedestrians (bicycles in particular). Posted speeds are adequate, but the actual speeds reached by autos are too fast. Need to enforce the 25MPH speed limit when heading through a residential neighborhood leading to the station.

Monmouth and West

- Pretty wide crossing with daylighted intersections. Epoxy markings would only affect a portion of the intersection.
- NV5: suggested a spot for creating epoxy marking areas for bicycle parking
- RED BANK: are there any bikeshare examples in the area? Asbury Park, Princeton and Hoboken were mentioned. There are dockless and docked bicycle sharing programs. Dockless is a lower cost of entry and allows the program to be flexible, in terms of where bicycles are picked up and dropped off.
- NJT: Fairhaven is fairly progressive bikeshare town. If you have nice bicycle associated amenities, the bikeshare program can work well.
- NJT: Happy to work with Red Bank on assisting in the establishment in a local bikeshare program.
- NJTPA: Recommended petitioning NJTPA for funding to conduct a bikeshare study.
- NJT: Partner with organizations to get a bikeshare program up and running. The more bicycle boulevards and sharrows the beneficial it is to creating and maintaining a bikeshare program.

Shrewsbury Avenue

- NV5: Showing high-visibility crosswalks with signage and bicycle parking at key intersections. Not suggesting to put bicycle lanes on Shrewsbury Avenue.
- RED BANK: County engineering is taking the lead and is calling for bump outs. This section of town has a lower income profile and wants to encourage bicycle use. County wasn't proposing bikeshare or lanes; they are doing a general improvement plan. It does make sense to simply have bicycle parking locations. Trying to identify the appropriate locations for crosswalks. Shrewsbury is becoming more congested, due to development activity.
- NV5: Hasn't looked at drainage.
- NJT: Shrewsbury is a cut through street to avoid traffic.

Broad Street

- NV5: Wide enough to put in bicycle lanes. Have you considered bicycle lanes on Broad Street?
- RED BANK: Haven't considered. Doesn't know how residents and the business community would react to bicycle lanes on Broad. Broad Street is viewed as the heart of the borough.
- Discussed drop-in open-house logistics. Red Bank also asked if the team is able to present to the governing body.
- NV5 recommended the size tables which would be appropriate for the open house forum. April 25th is the proposed date.
- Lambs and Wools, a hair dressing business, across from the station, was proposed. If not there, the train station itself.

Public Input Record

A Public Information Center for this study was hosted at 66 Bridge Avenue C, Red Bank, NJ 07701 as well as on the sidewalk adjacent to Red Bank Train Station on Wednesday, April 25, 2018 from 5-7 PM.

Comments Collected at Public Information Center

- Drivers paid attention to crosswalks
- NJT would take account of all the redevelopment that is occurring on NJCL i.e. Aberdeen, Matawan, Avalon, Old Bridge, Red Bank and others.
- Safer bicycle storage options

Comments Collected via Email

5/3/18

- Red Bank Station access would improve for pedestrians if there was a regular taxi stand. (The original one was demolished.)
- ...there were more ramps.
- ...the station hours were longer so more people could wait inside.
- ...the free parking hours were extended, especially starting before 11:00 on weekdays.
- ...printed bus schedules to Port Authority were available.

4/24/18

1) The bicycle lockers are awesome! Get more and site them anywhere within 100 yds of the train platforms. These are great for regular commuters that can lease lockers.
2) Two key bicycle parking elements are security and weather protection. Red Bank train station has a lot of bicycle vandalism, so bicycle stands (even covered ones to protect from weather) is a poor solution; some kind of gated access is important.
3) Ad hoc bicycle parking users may not care as much about weather protection, but still need a gated space to prevent vandalism. Is there something akin to a parking meter based timed lock on a gated structure? A key thing would be low cost, e.g. Park Edison charges $1/day for bicycles in lots that charge $20/day for cars.
4) Another option for leased bicycle parking is a bicycle room in a multi-use building with a locked door and interior bicycle stands. Allowing ad hoc users doesn't work well unless additional security was there, e.g. cameras with replay or a staffed space.
5) A couple of nits:
a) Can NJ Transit stop plowing snow onto the bicycle lockers? After every significant snow storm, I have to drive down and shovel out access to my locker - yes, I bicycle commute through the winter.
b) The bicycle locks themselves are secure, but thaw/freeze cycles cause the lock cylinders to ice up. A better design would prevent melting snow atop the locker from seeping into the lock. Consider how other cities in the US and Europe manage bicycle parking. There are great solutions available

End of Red Bank Train Station Report

RUTHERFORD TRAIN STATION REPORT

JUNE 2018

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Abstract:

The purpose of this study is to identify and address the most basic barriers limiting pedestrian and bicycle access to Rutherford Train Station. This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement "low-hanging fruit" improvements that can be accomplished quickly and inexpensively. Each design concept also includes recommendations for implementation, phasing, and funding sources.

The findings of this study have been discussed and reviewed with local municipal officials and have been presented for public comment at a Public Information Center that was hosted at Rutherford Train Station.

Prepared by NV5 and 4ward Planning

Rutherford Train Station Report Table of Contents

1. Overview and Context

The Rutherford Station is located in the northwest corner of the Borough in a mixed-use neighborhood. The station is served by NJ TRANSIT's Main/Bergen-Port Jervis Line. In 2016, the station averaged 1,450 weekday boardings.

The pedestrian network in the Borough is comprehensive, although many crosswalks and pedestrian ramps are deficient. In 2010, the Borough adopted a Complete Streets Policy and undertook the Rutherford Bicycle/Pedestrian Planning Project, a study of potential improvements to bicycle and pedestrian amenities.

Rutherford's street network follows a deflected grid pattern, which adjusts to fan out from the station on either side of Park Avenue. The Priority Routes Map (Figure R-1) for Rutherford shows all routes that were reviewed in this study, as well as the priority routes, and indicates the locations of specific road cross-sections that are presented in the Appendix. The Priority Routes identified include:

- Washington Avenue
- Vanderburgh Avenue
- Passaic Avenue
- Riverside Avenue
- Pierrepont Avenue
- Park Avenue

Background Data

Background research included review of existing documents, programs and data sources:

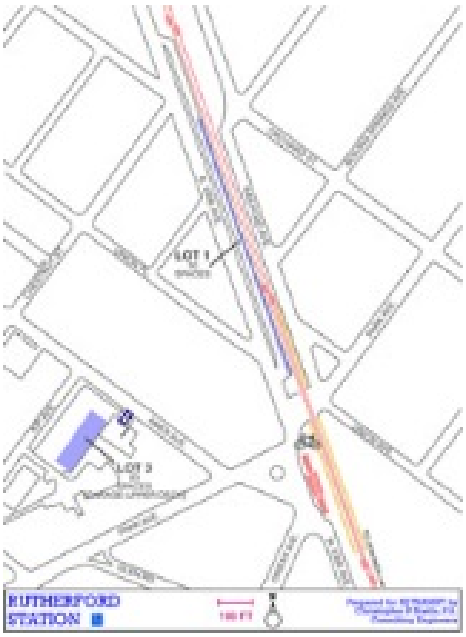
Local Documents

Title	Date
Rutherford Complete Streets Policy	March 2011
Rutherford Bicycle and Pedestrian Master Plan	July 2013
Rutherford Bicycle/Pedestrian Planning Project	December 2010

Parking Lots

Lot Number	Location	Owner	Spaces
1	Erie Avenue & Railroad Avenue	Municipality	105
3	Ames Avenue & Kip Avenue (Parking Garage)	Municipality	130
		Total spaces	**235**

Map: Locations of Parking Lots



2. Existing Conditions

(Observed February 21, 2018, temperature in the 40s)

- Sidewalks in the vicinity of the train station, as well as between parking areas and other pedestrian trip generators, are typically in good condition
    - Sidewalks are generally continuous with adequate connections within a 3/4-mile radius of the station
    - Crosswalks in the immediate vicinity of the station are generally in good condition, aside from the intersections connecting the commuter parking lots
    - Most pedestrian ramps outside of NJ TRANSIT property meet ADA standards, with the exception of the Union Avenue corridor and intersections connecting the commuter parking lots
- Bicycle racks are in use on the north side of the station building at E. Erie Avenue and Park Avenue
- Bicycle lockers are not available at this station
- Bicycle parking is available for 12 bicycles at the station

Photo Log

The following photos and captions describe existing conditions around and to the train station.

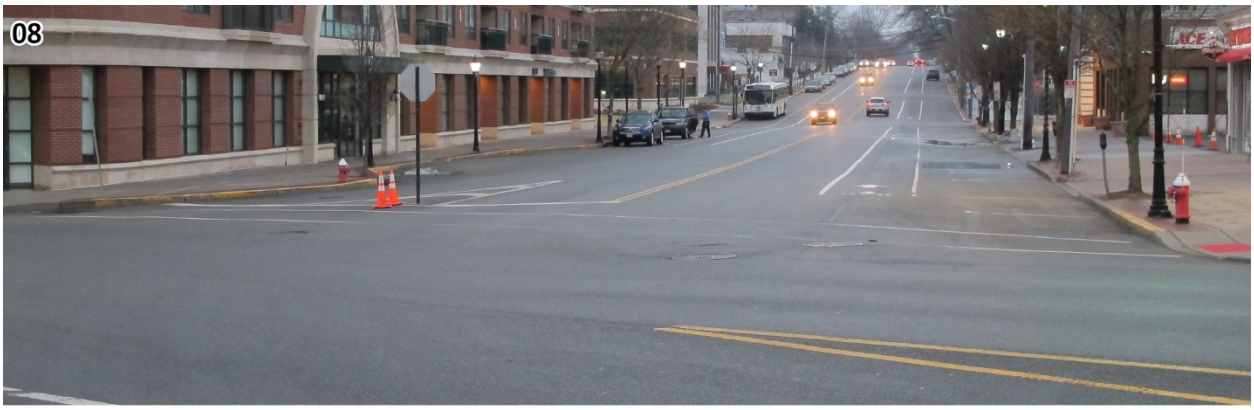
Crosswalks connecting Lot 1 (background) with the station are in poor condition. (Rutherford_180221_063443.JPG)

Parking for 12 bicycles is available on the north side of the station and appears to be well utilized. (Rutherford_180221_063443.JPG)

Pedestrian Crossing signs at the station along Erie Avenue include actuation devices but lack blinking signals. (Rutherford_180221_063646.JPG, Rutherford_180221_063720.JPG, Rutherford_180221_064215.JPG)

The bus only pick-up/drop-off lane was observed to be used by private vehicles in addition to buses. (Rutherford_180221_064008.JPG)

The bus stop in the eastbound approach from Park Avenue to Erie Avenue produces a significant volume of pedestrian crossings through the roundabout. (Rutherford_180221_064053.JPG)



Orient Way (background) includes bicycle lanes. The intersection of E. Erie Avenue and Orient Way could be improved for pedestrians and bicyclists. (Rutherford_180221_064322.JPG)

NJ TRANSIT customers walking between the station and Lot 3 cross at the intersection of Park Avenue and Ames Avenue. The intersection is in good condition and features high visibility crosswalks and striped curb extensions on the south side. It may be worth considering a full build-out of the curb extensions in concrete/pavers. (Rutherford_180221_065604.JPG, Rutherford_180221_065530.JPG)

Daylighting measures that aid in pedestrian crossing were observed at locations along Park Avenue. Full build-out may be worth consideration. (Rutherford_180221_065832.JPG)

This landscape bed on the north side of the roundabout at Park Avenue could be considered for redesign to integrate additional bike parking. (Rutherford_180221_071214.JPG)

The crosswalk at E. Erie Avenue on the north side of the station provides a direct path to the station platform and is used by pedestrians. (Rutherford_180221_071328.JPG)

The crosswalk at E. Erie Avenue on the south side is logically placed within existing constraints, but is not a direct path to the station platform. Pedestrians were observed short-cutting the crosswalk. (Rutherford_180221_063933.JPG)

The unsignalized intersection of Park Avenue with Chestnut Street, W. Passaic Avenue, Lincoln Avenue, and E. Passaic Avenue is confusing for motor vehicles, bicyclists, and pedestrians. It features 7 crosswalk legs, the longest of which (shown) is about 160'. (Rutherford_180221_081117.JPG, Rutherford_180221_081212.JPG)

The skewed angles on the signalized intersection of Park Avenue and E. Pierrepont Avenue make it very difficult for pedestrians to read the traffic signals from the curb ramp. The signal may be considered for redesign or retrofitting with pedestrian signal heads and actuation.

Standard crosswalks would help motorists anticipate the presence of pedestrians in Rutherford's residential neighborhoods. Many, but not all intersections include crosswalks. (Rutherford_180221_074332.JPG)

Most of the stop signs in residential areas were observed to have a mounting height of 5'. Mounting height should increase to 7' minimum. Add appropriate plaques to indicate two-way or all-way stops. (Rutherford_180221_091323.JPG)

ADA parking in Lot 1 needs to be re-striped. The accessible way is provided only on the passenger side of the vehicle in this unique parallel parking situation. (Rutherford_180221_111319.JPG, Rutherford_180221_111332.JPG)

The pathway that leads from Lot 3 to the building pass-through, and to Park Avenue and the station needs to be re-striped and signed. The building pass-through light fixtures should be refitted with LED for improved visibility and facial rendering. (Rutherford_180221_113317.JPG, Rutherford_180221_113410.JPG, Rutherford_180221_113015.JPG)

3. Issues & Opportunities

General Issues

- Crosswalks at the intersections connecting the commuter parking lots are in poor condition
    - Ames Avenue and Kip Avenue
    - Union Avenue and Agnew Place
    - Union Avenue and E. Erie Avenue
- Most pedestrian ramps outside of NJ TRANSIT property meet ADA standards, aside from:
    - Ames Avenue and Kip Avenue
    - Most of the intersections on Union Avenue require pedestrian ramp upgrades
- Some require crosswalk re-striping in the outer areas of the 3/4-mile radius
- Unsafe pedestrian desire line from Ames Avenue across roundabout, rather than using the existing crosswalk on E. Erie Avenue
- Long crossing distance across Orient Way at E. Erie Avenue
    - Gore striping encourages vehicles to encroach into the crosswalk to look around E. Erie Avenue to the south
- Private vehicle pick-up and drop-off take place in the designated curbside bus stop on E. Erie Avenue
    - Bus stop is well marked but compliance is low
- Long and numerous crossings at the intersection of Park Avenue, E. Passaic Avenue, Chestnut Street, Lincoln Avenue and W. Passaic Avenue
    - Intersection has been designed around historic statue but leave numerous crossings for pedestrians
- Bicycle racks are in use on the north side of the station building, no bicycle racks on the south side of the station
    - Orient Avenue leads to south side of the station
- On-road bicycle facilities are striped in standard paint
    - Orient Avenue: bicycle lane is in good condition
        - Bicycle lane lines are marked in 4” white paint
- The larger station downtown area lacks bicycle parking

Station Area Issues

East side of the station

- Pick-up/drop-off takes place at various locations in East Rutherford

West side of the station

- Pick-up/drop-off takes place in designated curbside bus lane on E. Erie Avenue

Commuter parking lots

- Lot 1 has a unique configuration with a one-way northbound drive aisle with parallel parking spaces adjacent to the tracks. The parking lot includes four spaces marked as ADA. ADA design guidelines do not provide for parallel parking as ADA-compatible. The sidewalk route from Lot 1 appears to be ADA-compliant from a slope perspective, but should be improved with detectable warning surface at crossing points.
- Lot 3 includes permit-controlled parking in a portion of the Kip Avenue Parking Garage. The garage includes two spaces marked as ADA, however it is unclear whether they are associated with station or with the adjacent Senior Center.

General Opportunities

- Improve crosswalks visibility, paying attention to areas that wear out the most
    - Crosswalk upgrades and/or restriping should use "ladder" or "continental" striping
    - To minimize wear, utilize continental style crosswalks with striping applied parallel to the direction of motor vehicle travel
- Upgrade crosswalks in poor condition at the intersections connecting the commuter parking lots
    - Ames Avenue and Kip Avenue
    - Union Avenue and Agnew Place
    - Union Avenue and E. Erie Avenue
    - Some require crosswalk re-striping in the outer areas of the 3/4-mile radius
- Upgrade pedestrian ramps at:
    - Ames Avenue and Kip Avenue
    - Most of the intersections on Union Avenue
    - Various locations as shown on Figure R-2: Issues & Opportunities Map
- Install planters or another decorative barrier to discourage/impede unsafe pedestrian desire line from Ames Avenue across roundabout, rather than using the existing crosswalk on E. Erie Avenue
- Shorten crossing distance across Orient Way at E. Erie Avenue
    - Build out northeast curb to normalize intersection
    - Expand and build out gore striping to allow for a pedestrian refuge if vehicles continue to encroach into the crosswalk to look around E. Erie Avenue to the south
- Paint bus stop red to address private vehicle pick-up and drop-off, in addition to existing BUS ONLY markings
- Consider redesign to shorten and consolidate crossings at the intersection of Park Avenue, E. Passaic Avenue, Chestnut Street, Lincoln Avenue and W. Passaic Avenue
    - Lincoln Avenue, E. Passaic Avenue and W. Passaic Avenue could be normalized to shorten crossing distance
    - Could historic statue be part of a curb extension on W. Passaic Avenue, cutting off the slip lane onto Park Avenue?
- Orient Avenue bicycle lane is striped in 4" standard paint
    - When restriping, use 6" thermoplastic paint for the bicycle lane stripe adjacent to the moving lane
- Consider bicycle parking around the larger downtown area

Station Area Opportunities

West side of the station

- See above for proposed upgrades to the designated curbside bus lane on E. Erie Avenue

Commuter parking lots

- Create ADA compliant connection between Parking Lots 1 & 3 and the platforms by upgrading pedestrian ramps and crosswalks

Existing Conditions, Issues & Opportunities (general and station area specific) are synthesized and presented in Figure R-2: Issue & Opportunities Map.

Figure R-1: Priority Routes Map

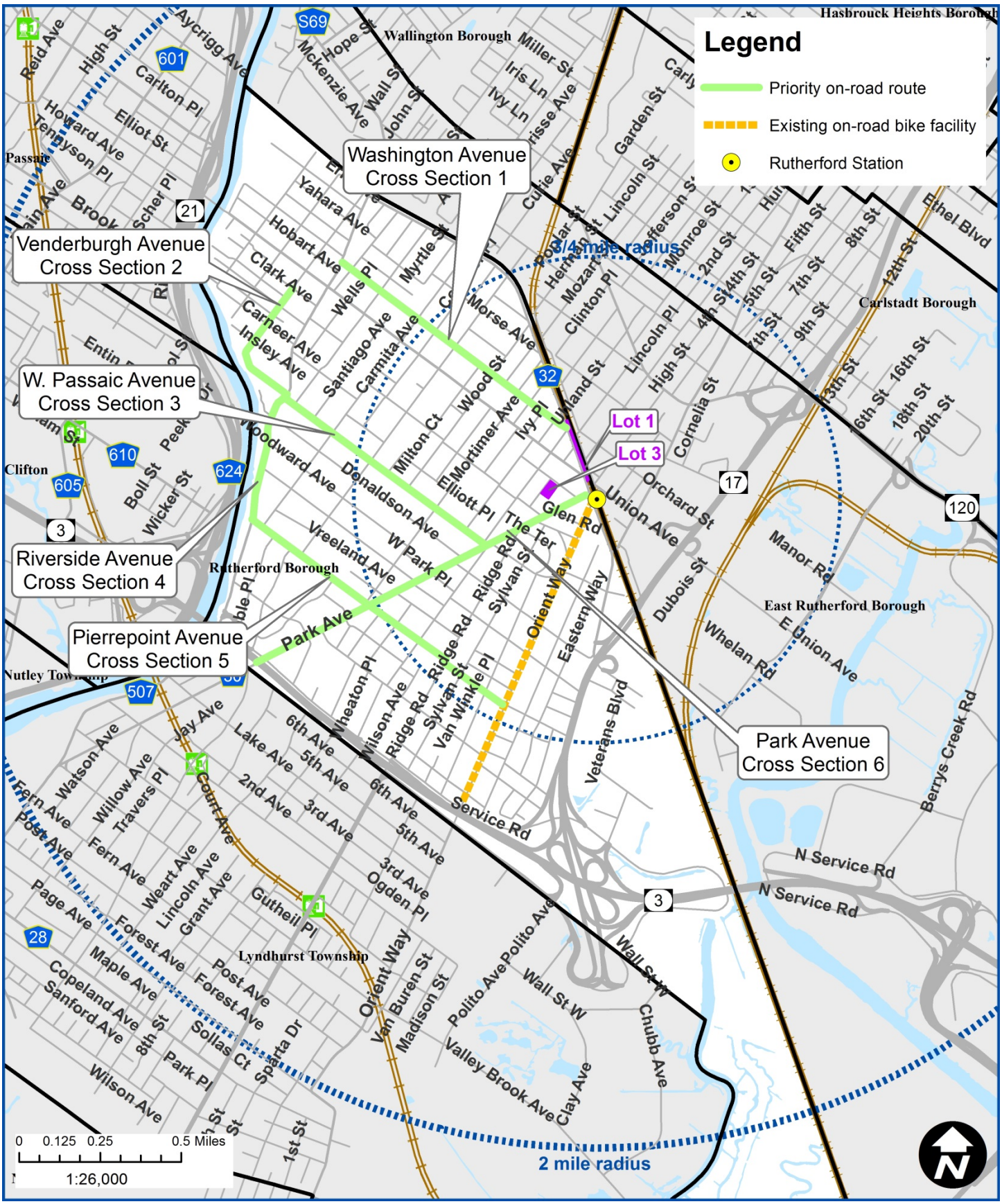
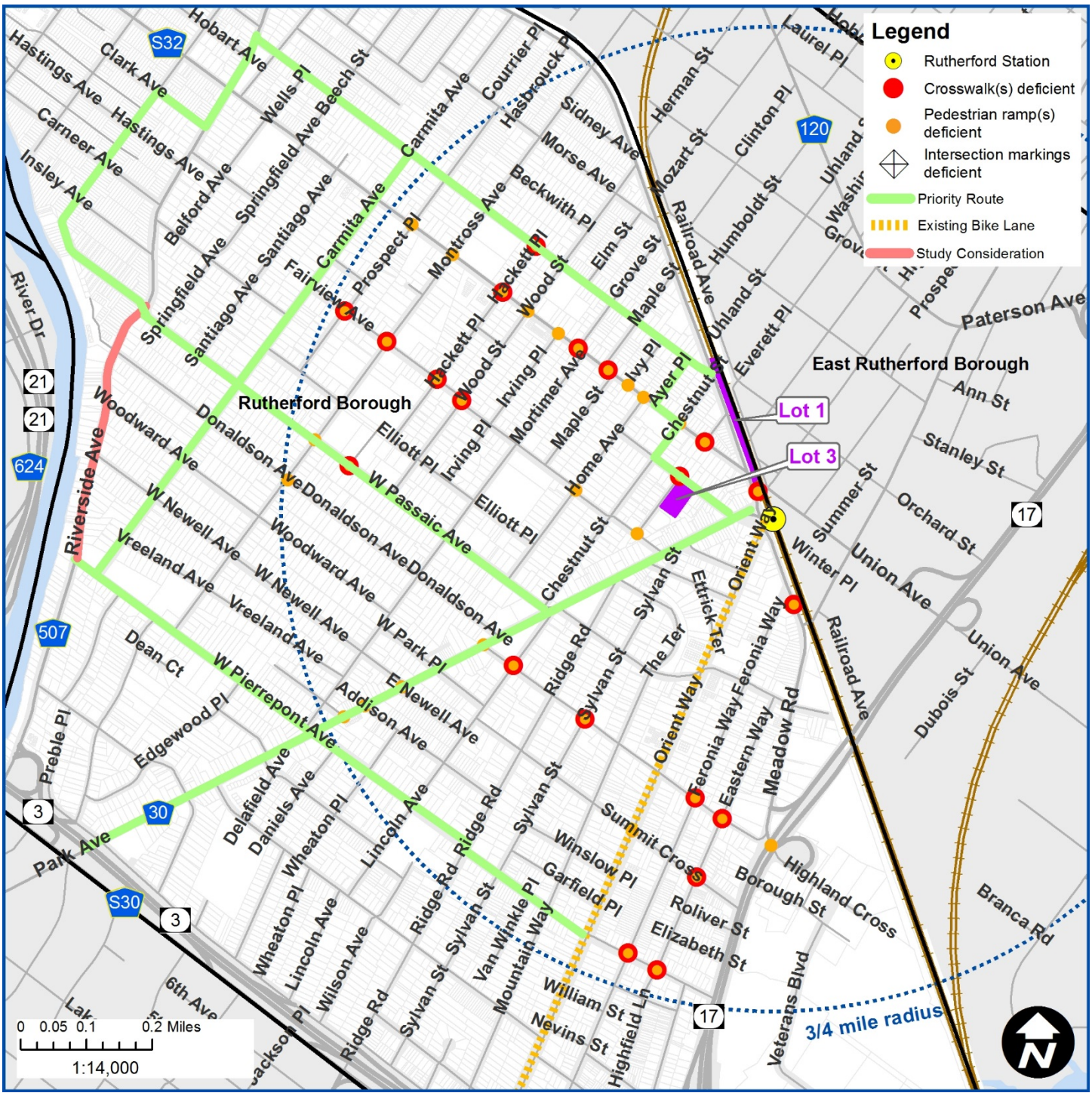


Figure R-2: Issues & Opportunities Map



KEY ISSUES				OPPORTUNITIES			
1	Pedestrian desire line from Lot 3 cuts across roundabout, not using existing crosswalk on E. Erie Avenue	3	Private vehicle pick-up/drop-off takes place in designated curbside bus stop on E. Erie Avenue	1	Place signs directing pedestrians to the crosswalk; Planters or decorative barrier to block unsafe crossing behavior	3	Paint curbside bus lane red in addition to existing "BUS ONLY" markings
2	Long crossing across Orient Way at E. Erie Avenue; Gore striping encourages cars to block crosswalk	4	Long, complex crossings at Park Avenue, W. Passaic Avenue, Chestnut Street, and Lincoln Avenue intersection	2	Extend northeast curb to normalize intersection; or expand and build out gore striping	4	Consider redesign that normalizes intersections and includes the statue in W. Passaic Avenue curb extension

4. Recommendations & Design Concepts

The goal of this study is to identify the most basic barriers limiting pedestrian and bicycle access to the station, and to propose recommendations to address them. As such, the study has produced a series of actionable design concepts specific to the study area that propose improvements for bicyclists and pedestrians.

Most design recommendations consist mainly of markings, with more substantial interventions at high-priority locations. Locations where deficiencies have been observed in crosswalks, pedestrian ramps, and intersection markings are displayed in Figure R-2: Issues & Opportunities Map.

In general, recommendations respond to deficiencies involving:

- Pedestrian ramp condition (if any) for ADA compliance
- Crosswalks for visibility and condition
- Intersection markings to organize turning and thru alignment at complex intersections
- On-street bicycle facilities where feasible
- Lighting for adequate coverage during low-light hours

In response to these issues, the project team has identified the following general recommendations for each station area:

- Provide high-visibility crosswalks
- Provide curb ramps at all intersections and crossings
- Provide bicycle accommodations along low-speed routes (bicycle boulevard treatments)
- Deploy epoxy curb extensions
- Provide RRFBs at unsignalized crossings, as appropriate
- Track implementation and perform post-implementation studies
- Provide sufficient bicycle parking (coordination with NJ TRANSIT may be required to provide additional bicycle racks) and consider covered, secure bicycle parking

Short-Term Conceptual Enhancements

Most of the design concepts in this study have the potential to be deployed as short-term enhancements, also referred to as Tactical Urbanism projects, which are design changes implemented to street environments in a “light, quick, cheap,” and temporary manner. By demonstrating to roadway users – pedestrians, bicyclists, drivers – the effectiveness of design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

The short-term approach is the basis for most of the recommendations in this study. Minimal funding can accomplish many of these conceptual improvements, without having to initiate a larger capital project. In many cases, re-striping roads with these design concepts as a component of routine resurfacing projects could result in little to no additional cost, compared to replacing the markings as they were prior to resurfacing.

Long-Term Conceptual Enhancements

Many of the short-term concepts have the potential to become long-term buildouts. The primary example, which is used throughout the six transit stations reviewed in this study, is the proposed short-term curb extension composed of colored epoxy gravel. While the short-term application can be implemented almost anywhere, the long-term buildout of concrete-surface curb extensions could be pursued as a long-term upgrade. Locations where epoxy gravel curb extensions are proposed require additional study prior to long-term buildout with concrete, in order to understand implications to road drainage, utilities, and other factors, as well as to obtain funding for design and construction.

Phasing

With a goal of presenting NJ TRANSIT and the local municipalities with actionable recommendations to improve pedestrian and bicycle access to the stations, the recommendations were mainly low-cost and high-impact. Each location that received specific design concept recommendations includes a combination of treatments, and could be implemented in a phased approach, or combined together as part of a broader, more comprehensive effort.

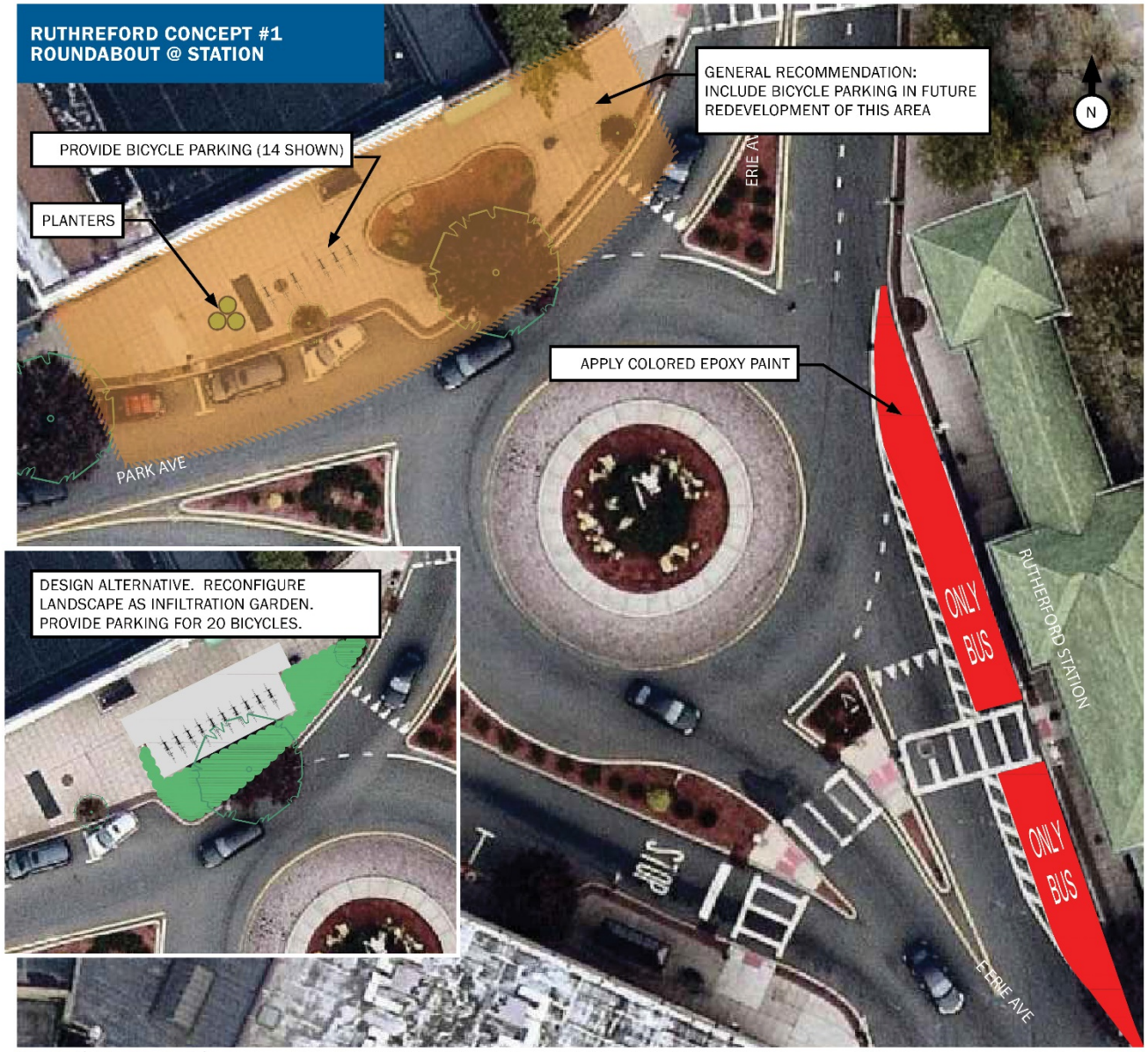
Design Concepts for Rutherford Train Station

Deficient pedestrian ramps were observed immediately surrounding the station, but in general, pedestrian ramps along the major pedestrian thoroughfares were acceptable, although spot improvements are required throughout. The crosswalks surrounding the station were either faded or required application of high-visibility thermoplastic striping to function more effectively. While the existing roundabout appears to function acceptably, physical design recommendations address an observed pedestrian behavior of crossing on the north side of the roundabout in the roadway rather than walking slightly away from the station to cross at the marked crosswalk. On the south and southwest sides of the roundabout, the use of colored epoxy gravel would quickly and inexpensively achieve the benefits of curb extensions and median extensions to shorten pedestrian crossing distances. Modifications to the location and layout of ADA parking were also recommended to provide adequate spacing and layout.

In response to these issues, conceptual design improvements have been developed at the following locations to address the most basic barriers limiting pedestrian and bicycle access to the station:

Design Concept #	Location	Description
1	Roundabout @ Station	• Delineate bus-only pick-up/drop-off lane • Provide bicycle parking
2	E. Erie Avenue & Orient Way	• Provide high-visibility crosswalk • Provide colored epoxy curb extensions • Provide RRFBs at unsignalized crossing
3	Lot 1 South End	• Provide accessible route (concrete sidewalk) and relocate existing ADA parking spaces
4	Park Avenue & Ames Avenue	• Provide high-visibility crosswalks • Provide colored epoxy curb extensions
5	Parking Garage Pass-Thru to Park Avenue	• Provide painted path, lighting, and signage improvements
6	Park Avenue & Glen Road	• Provide high-visibility crosswalks • Provide colored epoxy curb extensions and median
7	Park Avenue, W. Passaic Avenue, & Chestnut Street	• Provide high-visibility crosswalks • Provide colored epoxy curb extensions and median
8	Park Avenue & Pierrepont Avenue	• Provide high-visibility crosswalks • Provide colored epoxy curb extensions
9	Intersection Crossings in Residential Areas	• Provide high-visibility crosswalks • Upgrade regulatory signage to MUTCD specifications • Provide plastic pylons to prevent parking in proximity of intersection
10	Select Roads	• Provide bicycle boulevard treatments on select low-speed roads and bicycle lanes on select wide roads

The remainder of this Station Report provides illustrations for each design concept along with a description of the general approach and materials for short-term and long-term construction. Cost estimates with recommendations for funding and phasing are presented after the design concepts.



Concept - Planning Purposes Only

General Approach:

Add red epoxy paint to the bus pick-up/drop-off area adjacent to the station to discourage/prevent private motorists from using the space.

Provide bicycle parking that can benefit transit users and local businesses in the landscaped sidewalk area that is to be redeveloped on the north side of the roundabout.

Short-Term (Low Cost) Materials:

- Red epoxy paint
- White lettering
- Bicycle racks
- Planters

Long-Term (High Cost) Materials:

- Revise curb around planting area
- Provide sidewalk paving beneath bicycle racks

Concept - Planning Purposes Only

General Approach:

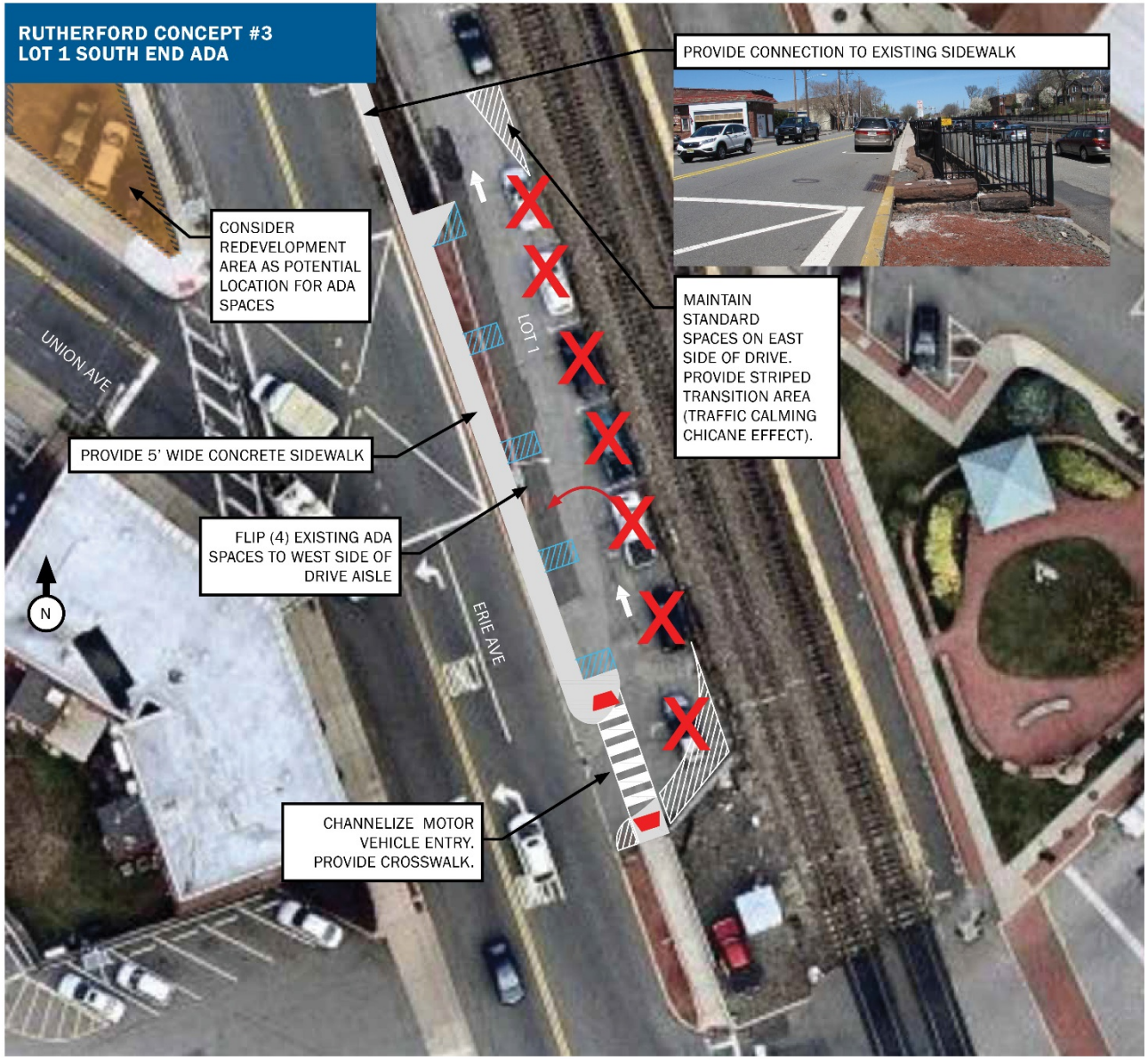
Normalize the intersection approach to reduce large curb radii and slow vehicular turning movements. Provide curb extensions to shorten pedestrian crossing distance. At the roundabout southern approach, replace or restore the pedestrian crossing beacons. Consider removing the crosswalk on E. Erie Avenue.

Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk
- Yellow striping
- Rectangular Rapid Flash Beacons

Long-Term (High Cost) Materials:

- Concrete curb extensions and curb ramps
- Consider planting areas within expanded curb extensions



Concept - Planning Purposes Only

General Approach:

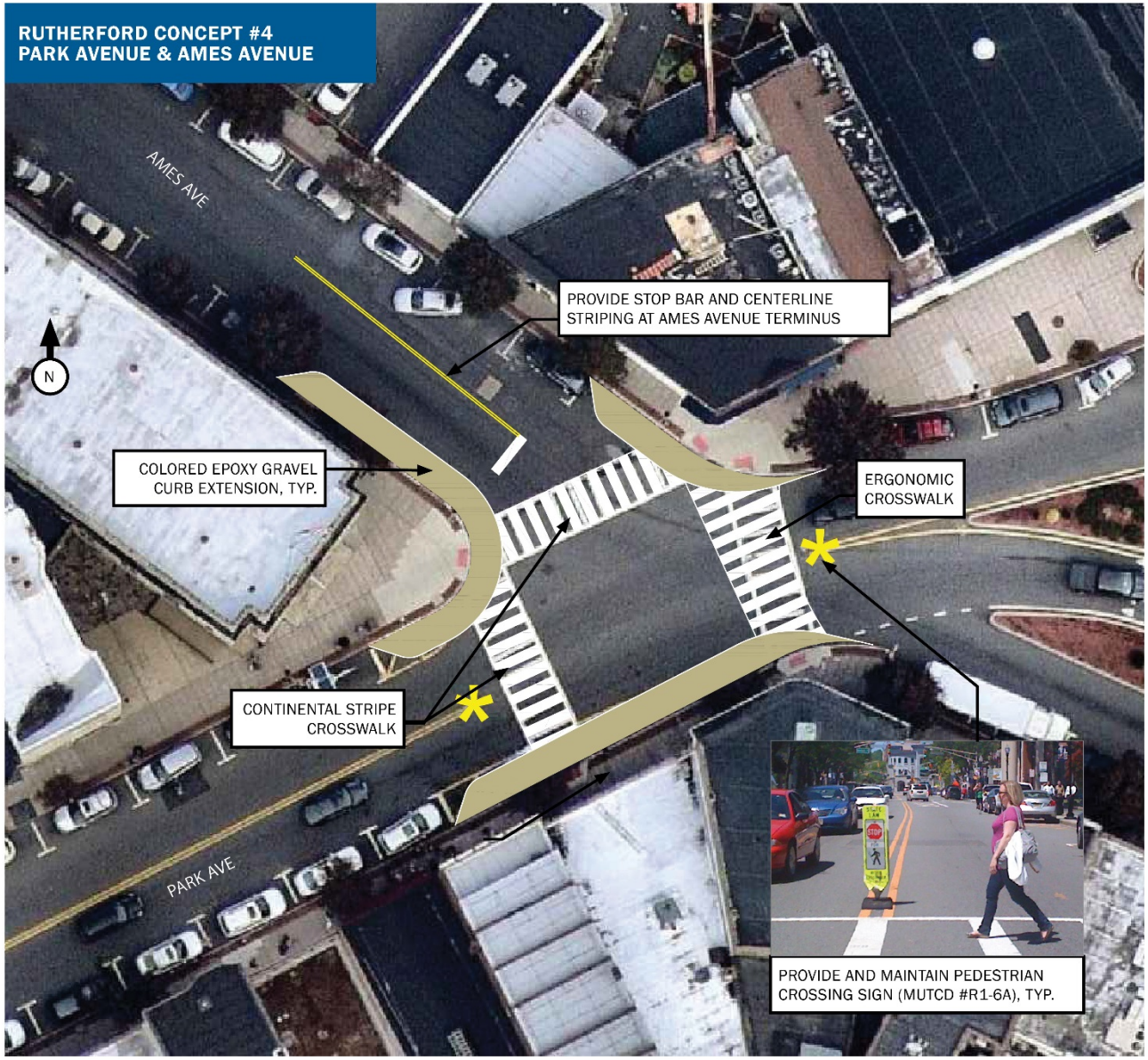
There are currently four accessible parking spaces provided in Lot 1. The striping is in poor condition, and there is no accessible way that is marked. Although parallel parking spaces are not covered in ADA design guidelines, the unique constrains of this linear parking lot do not allow for standard spaces. The improvements in this concept apply ADA design guidance as best possible to the parallel spaces.

Short-Term (Low Cost) Materials:

- None

Long-Term (High Cost) Materials:

- Concrete sidewalk
- Curb ramps
- White thermoplastic crosswalk
- ADA striping and signage
- White striping



Concept - Planning Purposes Only

General Approach:

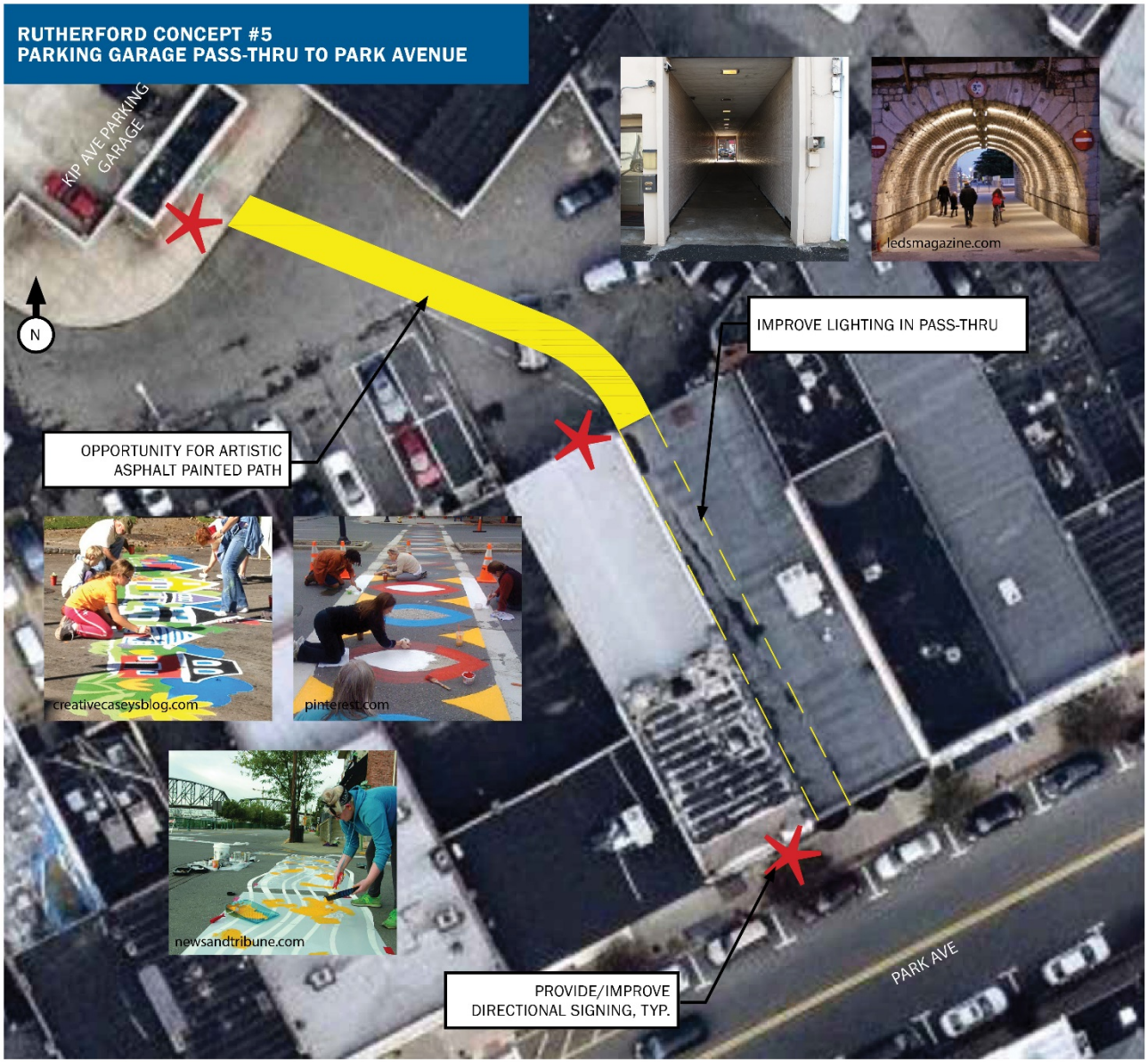
Provide curb extensions, along with a stop bar and centerline striping on Ames Avenue, to slow and channelize vehicular movements at this unsignalized intersection. Provide high visibility crosswalks and pedestrian crossing signs.

Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk
- Yellow striping
- MUTCD #R1-6A pedestrian crossing signs

Long-Term (High Cost) Materials:

- Concrete curb extensions and curb ramps
- Consider planting areas within expanded curb extensions
- Consider ergonomic crosswalks at all legs, assuming curb extensions are constructed



Concept - Planning Purposes Only

General Approach:

The pass-thru that connects the Kip Avenue Parking Garage to Park Avenue is a great feature for connecting transit customers to the station and local businesses. Currently, the path that leads from the parking deck to the pass-thru is faded and nearly invisible. From a Crime Prevention Through Environmental Design (CPTED) perspective, this space can be enlivened, made to feel more welcoming (like a place people *should* be), and practically improved with signage and lighing. The pathway could be re-painted through the effort of local artists or school groups. The pass-thru tunnel is very dark, feels unsafe, and would be improved with new light fixtures that use brighter LED lighting. Signs directing users to and from the parking deck would make this feature more apparent to all.

This concept may require coordination with adjacent owners.

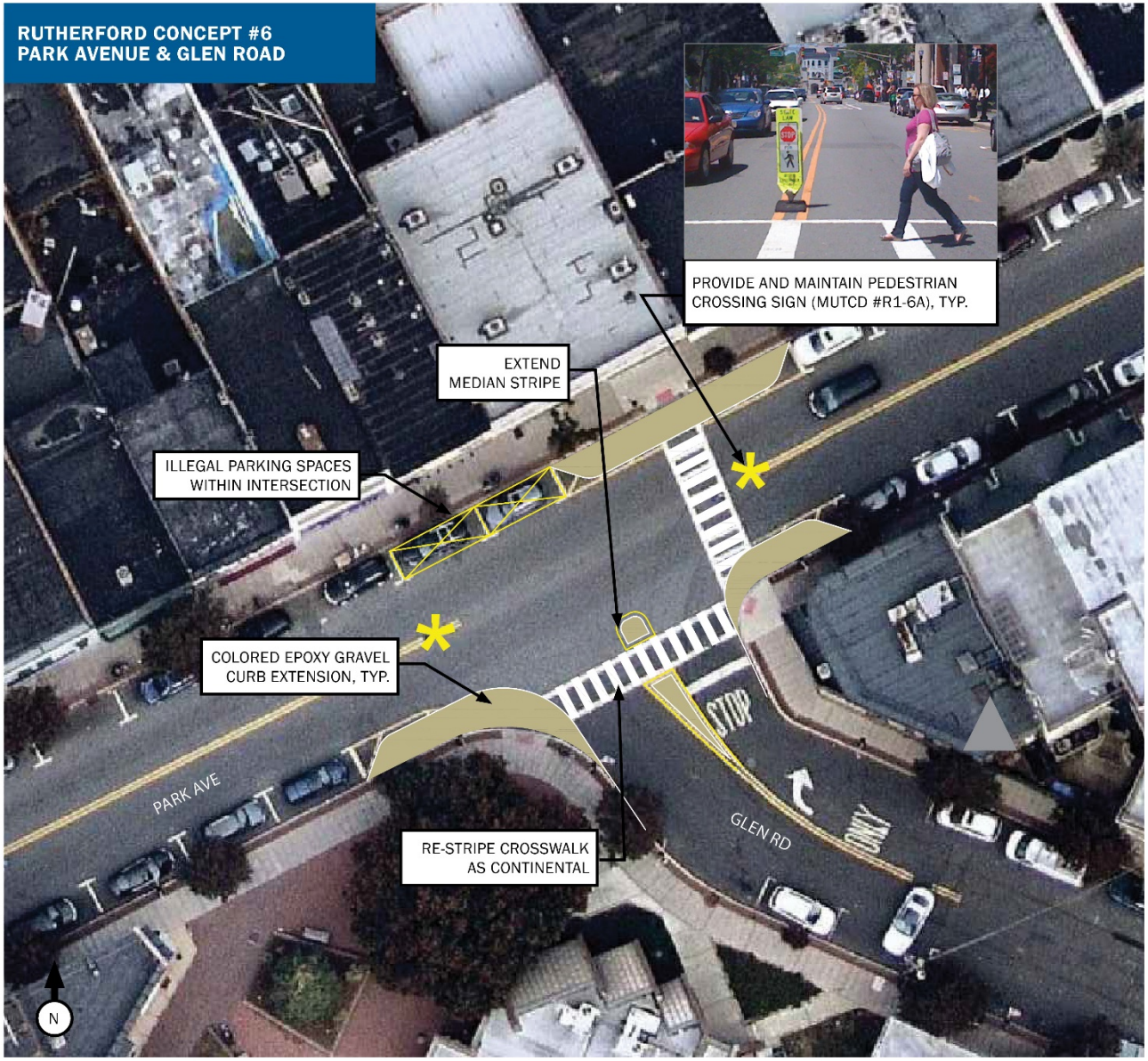
Short-Term (Low Cost) Materials:

- Colored paints
- Signs

Long-Term (High Cost) Materials:

- LED lighting retrofit

RUTHERFORD CONCEPT #6
PARK AVENUE & GLEN ROAD



Concept - Planning Purposes Only

General Approach:

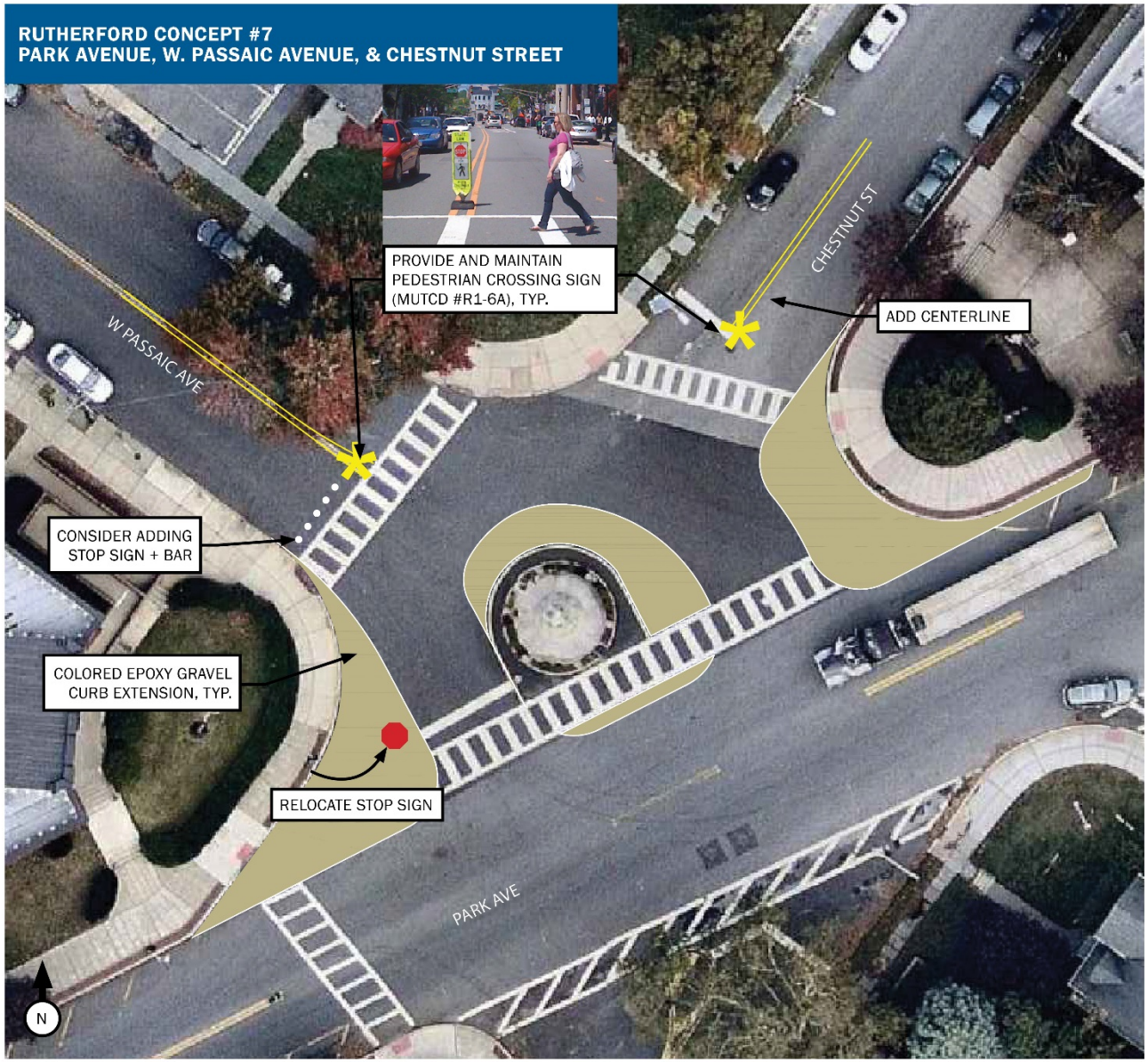
Provide curb extensions to slow and channelize vehicular movements at this unsignalized intersection. Extend median striping on Glen Road to provide pedestrian protection and channelize motor vehicle left turns from Park Avenue. Provide and maintain Pedestrian Crossing Signs.

Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk
- MUTCD #R1-6A pedestrian crossing signs
- Yellow striping

Long-Term (High Cost) Materials:

- Concrete curb extensions and curb ramps
- Consider planting areas within expanded curb extensions



Concept - Planning Purposes Only

General Approach:

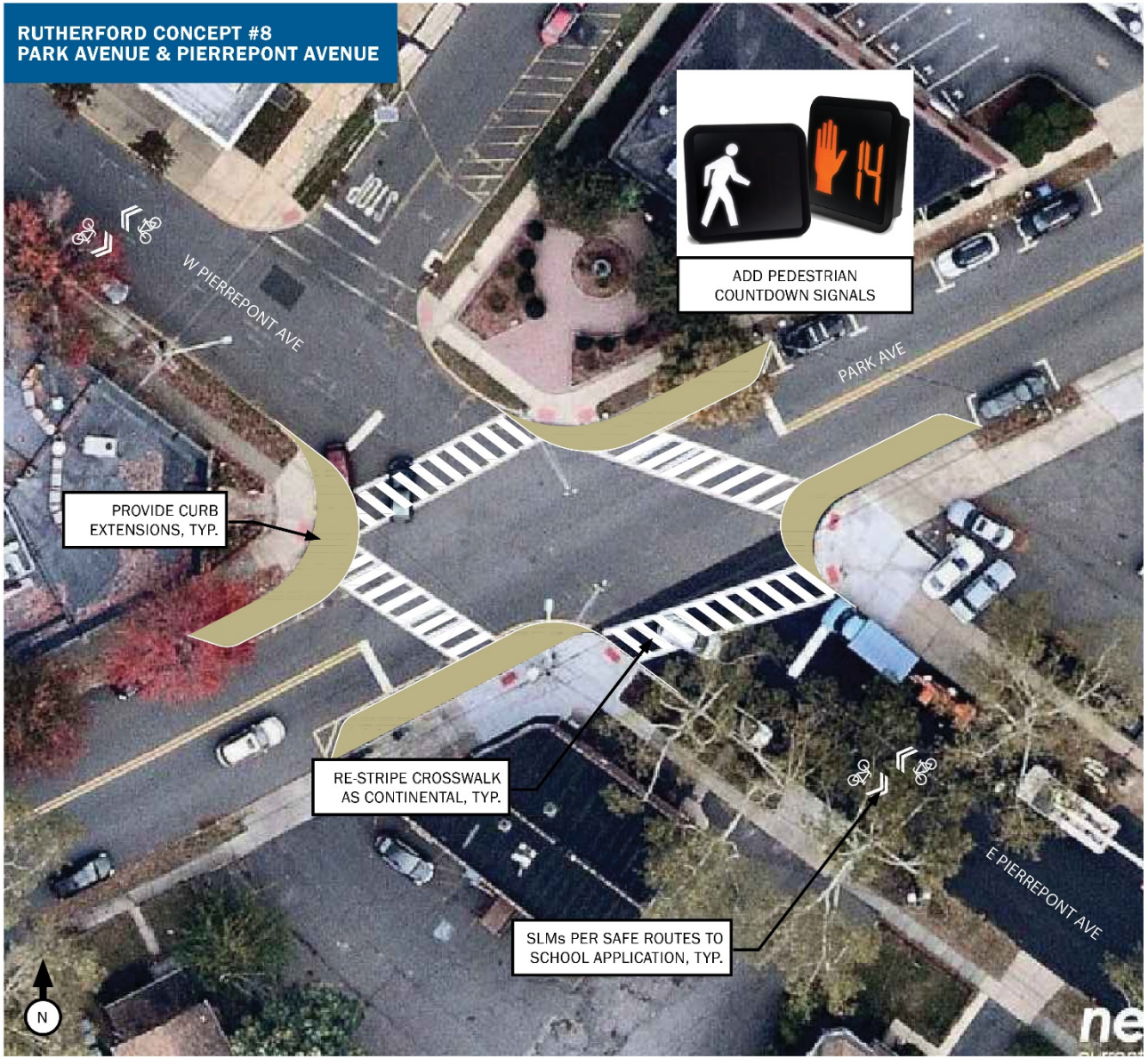
Normalize the intersection approach to reduce large curb radii and slow vehicular turning movements. Provide curb extensions to shorten pedestrian crossing distance. Provide and maintain Pedestrian Crossing Signs. Add centerline stripe to Chestnut Street approach.

Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White striping
- MUTCD #R1-6A pedestrian crossing signs
- Portable stop sign
- Yellow striping

Long-Term (High Cost) Materials:

- Concrete curb extensions and curb ramps
- Consider planting areas within expanded curb extensions



Concept - Planning Purposes Only

General Approach:

Provide curb extensions to slow and channelize vehicular movements. Provide continental stripe crosswalk at all legs of intersection. Upgrade existing traffic signals with pedestrian countdown signal heads.

Note: Due to the age of the traffic signals, the addition of pedestrian heads would likely require a full signal upgrade.

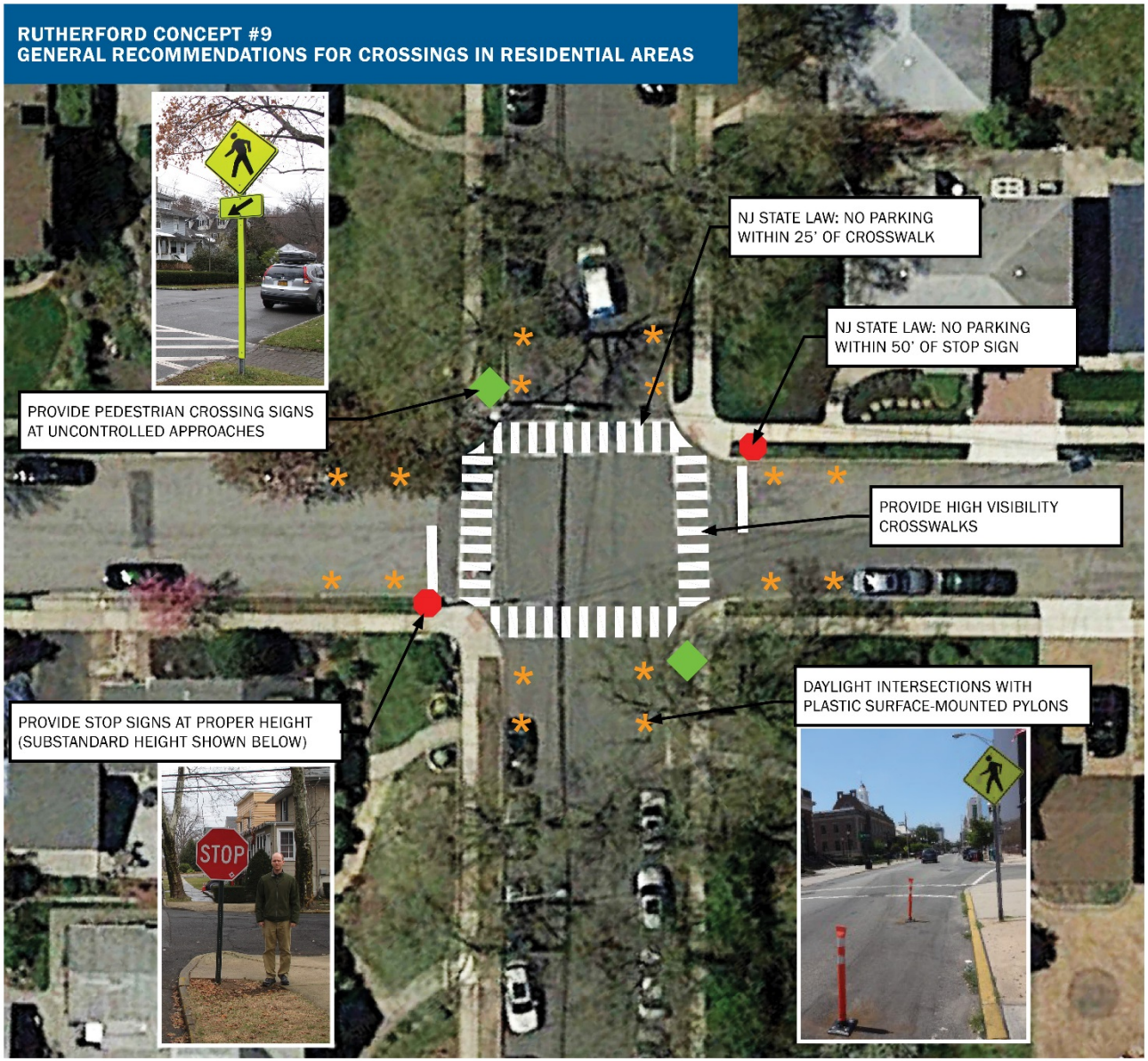
Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk

Long-Term (High Cost) Materials:

- Pedestrian countdown signals
- Concrete curb extensions and curb ramps
- Consider planting areas within expanded curb extensions

RUTHERFORD CONCEPT #9
GENERAL RECOMMENDATIONS FOR CROSSINGS IN RESIDENTIAL AREAS



Concept - Planning Purposes Only

General Approach:

Improve pedestrian safety at Rutherford's many residential intersections by:

- "Daylighting" intersection approaches by installing plastic pylons,
- Providing stops signs at minimum 7' height, including retroreflective strips and supplemental ALL WAY plaque (R1-3P) as appropriate
- Providing pedestrian crossings signs (W11-2 + W16-7P) in yellow-green fluorescent with retro-reflective strips at uncontrolled intersection approaches, and
- Providing high visibility crosswalks

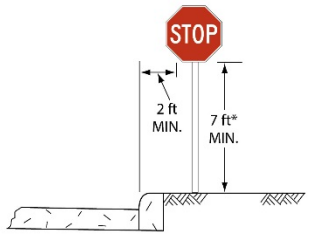
Short-Term (Low Cost) Materials:

- White thermoplastic crosswalk and stop bars
- Regulatory signs
- Flexible delineators

Long-Term (High Cost) Materials:

- Construct concrete curb extensions

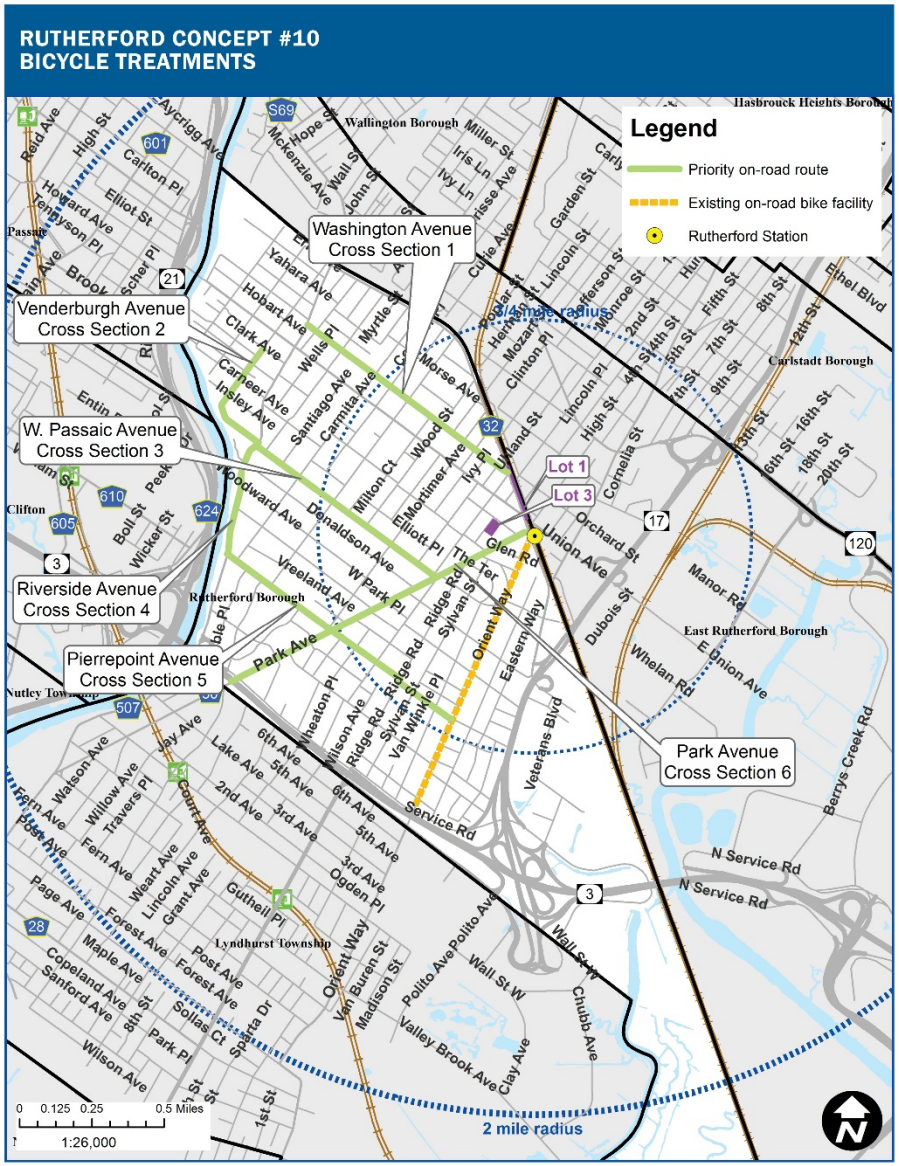
ROADSIDE SIGN IN BUSINESS, COMMERCIAL, OR RESIDENTIAL AREA



*Where parking or pedestrian movements are likely to occur

Roadside sign mounting height per MUTCD Figure 2A-2 page 38

RUTHERFORD CONCEPT #10
BICYCLE TREATMENTS



Concept - Planning Purposes Only

General Approach:

This study generally supports the findings of the *Rutherford Borough Bicycle and Pedestrian Master Plan* (2013) and the ongoing efforts of the Rutherford Green Team to increase on-road bicycle treatments and develop the Rutherford Bicycle Ring.

The map to the displays conceptual on-road bicycle treatments as they relate to the findings of this study. Typical cross sections are provided below.

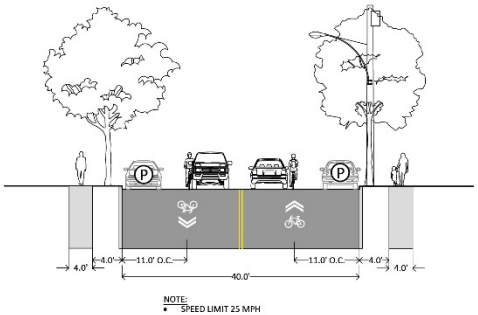
Short-Term (Low Cost) Materials:

- Shared lane markings (thermoplastic preferred)
- Bicycle lane markings (thermoplastic preferred)
- Bicycle route signage

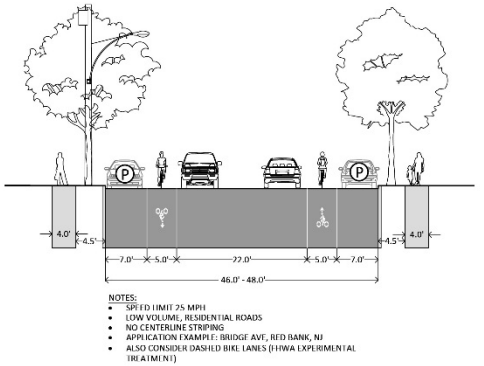
Long-Term (High Cost) Materials:

- Fully deployed wayfinding and signage
- Fully constructed traffic calming (as necessary)

Typical Shared Lane Markings — Rutherford



Typical Bike Lanes on Low-Volume Roads — Rutherford



Shared lane markings can be augmented with wayfinding signage and traffic calming measures to create Bicycle Boulevards

5. Cost Estimates, Phasing, & Funding Sources

This section includes cost estimates, recommendations for project phasing (short-, medium-, or long-term), and identifies funding sources that are most appropriate or accessible for each design concept.

Refer to the Study Overview Report for additional information on funding sources that municipalities may consider pursuing.

These cost estimates include general material and installation costs. A contingency of 30% has been added to calculate the total estimated cost and account for price increases over time and price premiums that may apply to small projects. A phasing sequence with short-, medium-, and long-term time frames is provided to help the municipalities plan for implementation.

Item	**Concept 1: Roundabout @ Station**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Red epoxy paint	1,290	SF	$7.50	$9,675	Medium	Transit Village
2	White lettering	250	SF	$3.20	$800	Short	
3	Bicycle racks	7	EA	$400.00	$2,800	Short	
4	Planters	3	EA	$250.00	$750	Short	
				SUBTOTAL	$14,025		
				CONTINGENCY (30%)	$4,208		
				TOTAL	**$18,223**		

Item	**Concept 2: E. Erie Avenue & Orient Way**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	1,175	SF	$7.50	$8,813	Medium	Safe Streets to Transit
2	White striping	380	LF	$1.60	$608	Short	
3	White thermoplastic crosswalk	242	SF	$3.20	$774	Short	
4	Yellow striping	30	LF	$1.60	$48	Short	
5	Rectangular Rapid Flash Beacon	2	EA	$15,000.00	$30,000.00	Medium	
				SUBTOTAL	$40,243		
				CONTINGENCY (30%)	$12,073		
				TOTAL	**$52,316**		

Item	**Concept 3: Lot 1 South End ADA**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Concrete sidewalk (assume 5' wide)	160	LF	$60.00	$9,600	Long	Safe Streets to Transit
2	Curb ramps	2	EA	$1,500.00	$3,000	Long	
3	White thermoplastic crosswalk	175	SF	$3.20	$560	Long	
4	ADA striping and signage	1	LS	$1,500.00	$1,500	Long	
5	White striping (hatch)	300	SF	$3.20	$960	Long	
				SUBTOTAL	$15,620		
				CONTINGENCY (30%)	$4,686		
				TOTAL	**$20,306**		

Item	**Concept 4: Park Avenue & Ames Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	1,615	SF	$7.50	$12,113	Medium	Safe Streets to Transit
2	White striping	290	LF	$1.60	$464	Short	
3	White thermoplastic crosswalk	1,245	SF	$3.20	$3,984	Short	
4	Yellow striping	65	LF	$1.60	$104	Short	
5	MUTCD #R1-6A pedestrian crossing sign	2	EA	$360.00	$720	Short	
				SUBTOTAL	$17,385		
				CONTINGENCY (30%)	$5,215		
				TOTAL	**$22,600**		

Item	**Concept 5: Parking Garage Pass-Thru to Park Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored paints	615	SF	$1.00	$615	Short	Municipality / Local community effort
2	Signs	3	EA	$500.00	$1,500	Short	
				SUBTOTAL	$2,115		
				CONTINGENCY (30%)	$635		
				TOTAL	**$2,750**		

Item	**Concept 6: Park Avenue & Glen Road**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	1,335	SF	$7.50	$10,013	Medium	County Aid
2	White striping	250	LF	$1.60	$400	Short	
3	White thermoplastic crosswalk	255	SF	$3.20	$816	Short	
4	MUTCD #R1-6A pedestrian crossing sign	2	EA	$360.00	$720	Short	
5	Yellow striping	80	LF	$1.60	$128	Short	
				SUBTOTAL	$12,077		
				CONTINGENCY (30%)	$3,623		
				TOTAL	**$15,699**		

Item	**Concept 7: Park Avenue, W. Passaic Street, & Chestnut Street**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	2,955	SF	$7.50	$22,163	Medium	County Aid
2	White striping	640	LF	$1.60	$1,024	Short	
3	MUTCD #R1-6A pedestrian crossing sign	2	EA	$360.00	$720	Short	
4	Portable stop sign	1	EA	$500.00	$500	Short	
5	Yellow striping	248	LF	$1.60	$397	Short	
				SUBTOTAL	$24,804		
				CONTINGENCY (30%)	$7,441		
				TOTAL	**$32,244**		

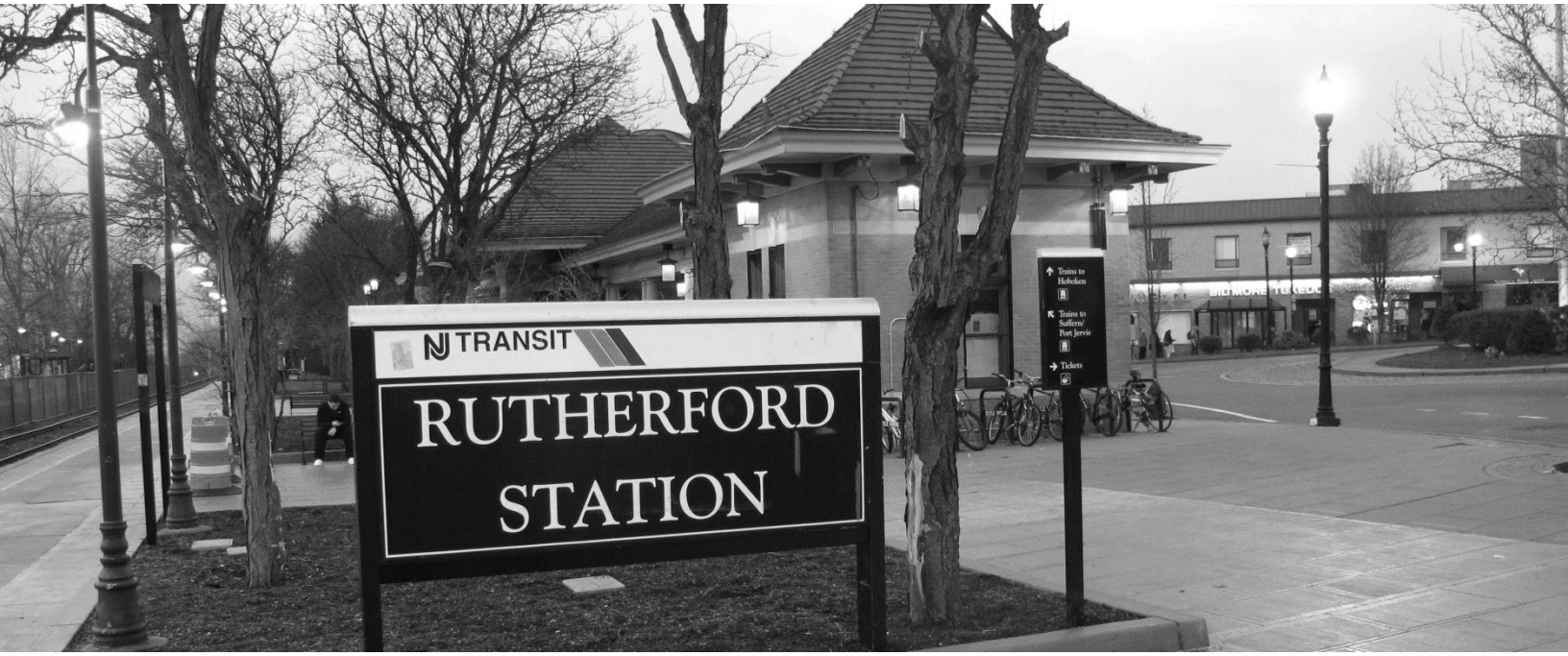
Item	**Concept 8: Park Avenue & Pierrepont Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	1,885	SF	$7.50	$14,138	Medium	Safe Routes to School
2	White striping	355	LF	$1.60	$568	Short	
3	White thermoplastic crosswalk	1,335	SF	$3.20	$4,272	Short	
				SUBTOTAL	$18,978		
				CONTINGENCY (30%)	$5,693		
				TOTAL	**$24,671**		

Item	**Concept 9: General Recommendations for Crossings in Residential Areas**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White thermoplastic crosswalk and stop bars	1500	SF	$3.20	$4,800	Medium	Safe Routes to School
2	Regulatory signs	4	EA	$300.00	$1,200	Short	
3	Flexible delineators	16 - 32	EA	$50.00	$800 - $1600	Short	
				SUBTOTAL	$7,600		
				CONTINGENCY (30%)	$2,280		
				TOTAL	**$9,880**		

Item	**Concept 10: Bicycle Treatments**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Shared lane markings (1 SLM every 250' in both directions on ±23,300' of roadway)	187	EA	$100.00	$18,700	Short	Safe Routes to School / PeopleforBikes Community Grants
2	Bicycle lane striping (6050'of roadway with bicycle lanes on both sides)	12,100	LF	$1.60	$19,360	Short	
3	Bicycle lane markings (1 bicycle lane marking every 500' in both directions on 6050' of roadway)	25	EA	$120.00	$3,000	Short	
4	Bicycle route signage (1 sign every 500' in both directions on ±29,350' of roadway)	118	EA	$120.00	$14,160	Medium	
				SUBTOTAL	$55,220		
				CONTINGENCY (30%)	$16,566		
				TOTAL	**$71,786**		

Rutherford Train Station Report Appendix

June 2018



Appendix Table of Contents

Traffic Counts

Field Observations

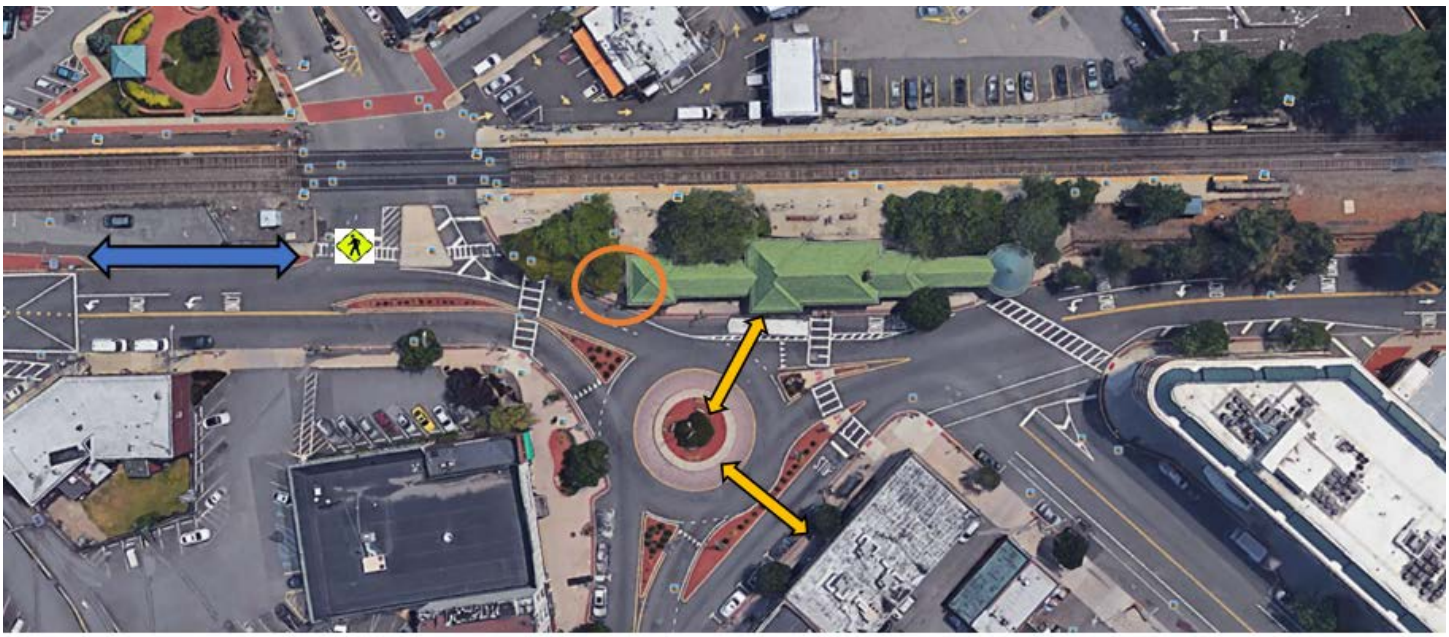
Bicycle and pedestrian counts were manually collected in the field during two-hour peak periods in the AM and PM. These counts identified bicycle parked at the station at the start of the count period, with a count at each hour to include additional bicycles parked or removed during each peak hour.

Date: Wednesday, April 4th, 2018
Time: AM Peak: 7:00 AM to 9:00 AM
Location: Rutherford Train Station
Weather: 43°F Light Drizzle/Dense Fog

Pedestrian Count: 468
Bicycle Count 7:00 AM: 7
Bicycle Count 9:00 AM: 7

Notes:

- Highest volume of pedestrians seen between 7:45 AM and 8:30 AM.
- Rutherford is transfer stop for busses, as well, and a noticeable number of pedestrians are using train to reach the bus and vice versa. Most pedestrians waited no longer than 20 minutes for the train or bus.
- Crosswalk usage was consistent throughout the morning. Pedestrians had ample time to cross, with help from the pedestrian islands around traffic circle and on Erie Avenue.
- Inconsistent crossing activity between crosswalks and traffic circle (mapped).
- Largest number of pedestrians approached from Erie Avenue towards the train station. No observed pedestrian warning sign (for motorists) along crosswalk.



Date: Wednesday, April 4th, 2018
Time: PM Peak: 5:00 PM to 7:00 PM
Location: E. Erie Avenue, Rutherford, NJ 07070 (Rutherford Train Station)
Weather: 55°F Partly Sunny/Wind with Heavy Gusts

Pedestrian Count: 478
Bicycle Count 5:00 PM: 7
Bicycle Count 7:00 PM: 5

Notes:

- Highest volume of pedestrians seen between 5:50 PM and 6:20 PM.
- Noticeable number of pedestrians using train to reach the bus and vice versa, as in AM observation. Most pedestrians waited no longer than 30 minutes for bus or train. Fewer pedestrians waiting for transfers than in AM observation.
- Crosswalk usage was consistent on West Bound side of station.
- Heaviest number of pedestrians walked towards Erie Avenue away from train station. As suggested in AM Observation, one pedestrian sign or flash beacon should be considered, especially during peak hours.
- When eastbound pedestrians get off the train they congregate on Union Avenue dangerously close to the train (within the train crossing signs); once the gates lift and train passes it turns to a free-for-all towards marked crosswalks (mapped).
- Area requires one or more interventions to improve pedestrian safety along Union Avenue.

Digital Traffic Camera Counts

To supplement live field observations of pedestrian movements at the various train stations, NV5 staff installed portable digital traffic cameras (known as MioVision cameras) at key locations at each station. The cameras are temporarily installed on a telescoping pole at an intersection or crossing area and record video from a 'bird's eye' view to observe pedestrian and vehicle travel movements. For this project, video was collected during two weekdays. This video helped to inform pedestrian patterns in the vicinity of the train stations while minimizing the number of field staff needed at a given location. When actual pedestrian volume data was desired, key times of the video were sent into Miovision for automated processing to determine the pedestrian, bicycle and vehicle volumes present.

Date: Wednesday, April 11, 2018

Location: E. Erie Avenue, Rutherford, NJ 07070 (Rutherford Train Station)

PEDESTRIANS		
Start Time	SE Roundabout Crosswalk	Se Roundabout Crosswalk
	Westbound	Eastbound
7:00	14	15
7:15	20	8
7:30	11	15
7:45	8	15
18:00	8	5
18:15	15	16
18:30	7	0
18:45	19	3
TOTAL	**102**	**77**

BICYCLES		
Start Time	SE Roundabout Crosswalk	Se Roundabout Crosswalk
	Westbound	Eastbound
7:00	0	0
7:15	0	0
7:30	0	0
7:45	0	0
18:00	0	0
18:15	0	0
18:30	0	0
18:45	0	1
TOTAL	**0**	**1**

Cross Sections

The following cross sections were developed for priority walking and bicycling routes. These cross sections are representative of existing conditions observed February 21, 2018 and were used to assess the suitability of pedestrian and bicycle facilities, and to inform concept design development.

The following cross sections are included:

1.0 Washington Avenue (W. Erie Avenue to Jackson Avenue)
2.0 Vanderburgh Avenue (Washington Avenue to W. Passaic Avenue)
3.0 W Passaic Avenue
    3.1 (Vanderburgh Avenue to Montross Avenue)
    3.2 (Montross Avenue to Park Avenue)
4.0 Riverside Avenue (W. Passaic Avenue to W. Pierrepont Avenue)
5.0 Pierrepont Avenue
    5.1 (Riverside Avenue to Park Avenue)
    5.2 (Park Avenue to Ridge Road)
    5.3 (Ridge Road to Rt. 17)
6.0 Park Avenue
    6.1 (Rt. 3 to Pierrepont Avenue)
    6.2 (Pierrepont Avenue to Passaic Avenue)

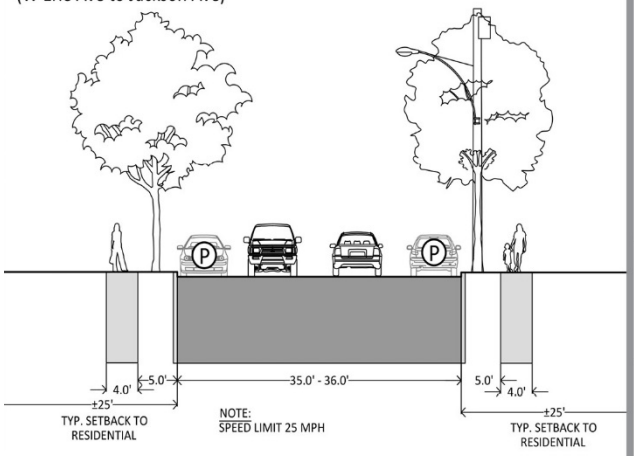
For specific locations of cross-sections, refer to Figure R-1: Priority Routes Map.

Cross Section 1

Washington Ave

(W Erie Ave to Jackson Ave)

Rutherford

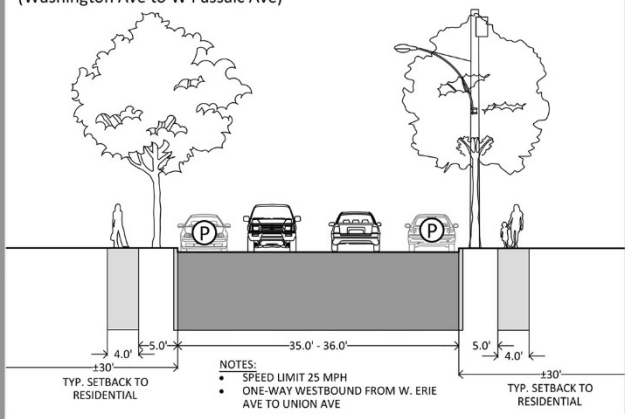


Cross Section 2

Vanderburgh Ave

(Washington Ave to W Passaic Ave)

Rutherford

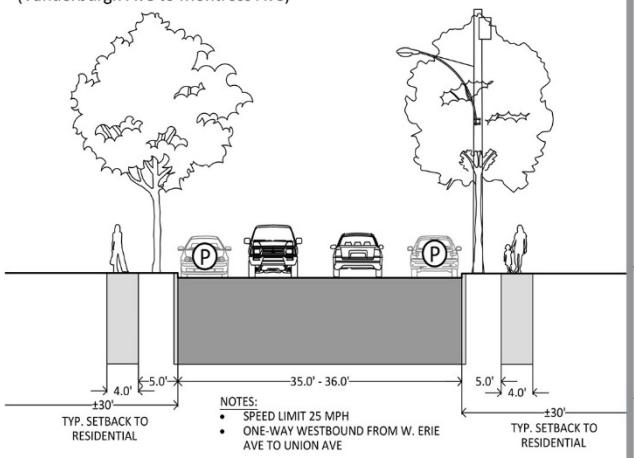


Cross Section 3.1

W Passaic Ave

(Vanderburgh Ave to Montross Ave)

Rutherford

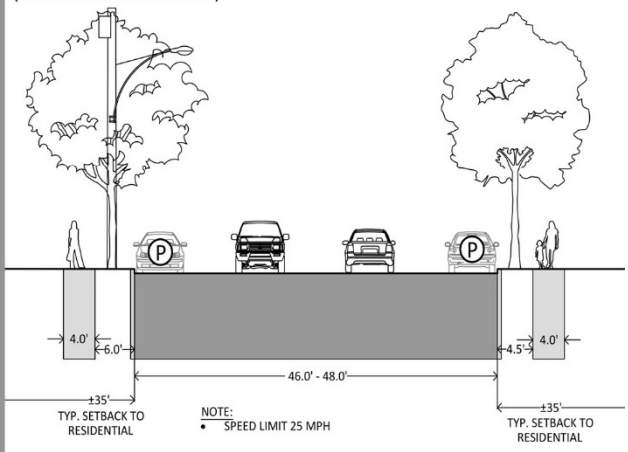


Cross Section 3.2

W Passaic Ave

(Montross Ave to Park Ave)

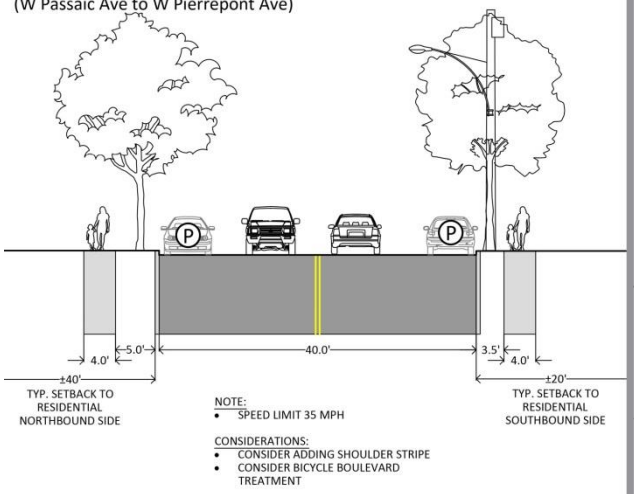
Rutherford



Cross Section 4

Riverside Ave — Rutherford

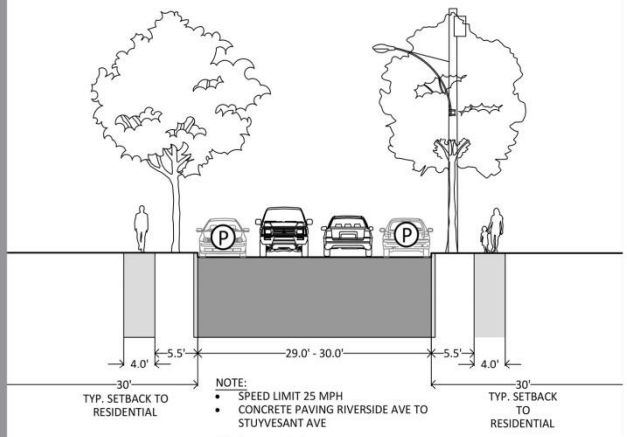
(W Passaic Ave to W Pierrepont Ave)



Cross Section 5.1

W Pierrepont Ave — Rutherford

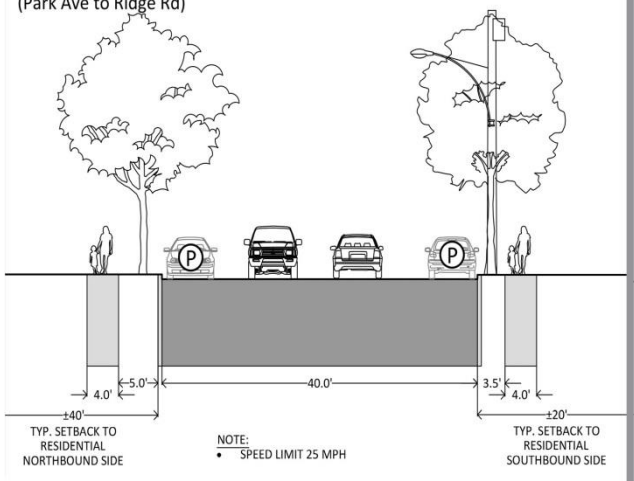
(Riverside Ave to Park Ave)



Cross Section 5.2

E Pierrepont Ave — Rutherford

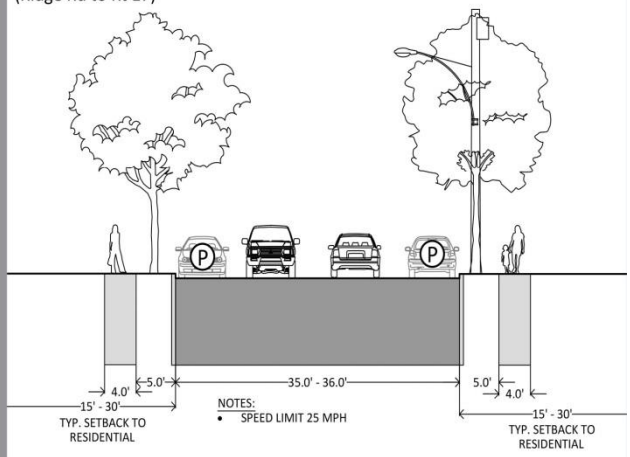
(Park Ave to Ridge Rd)



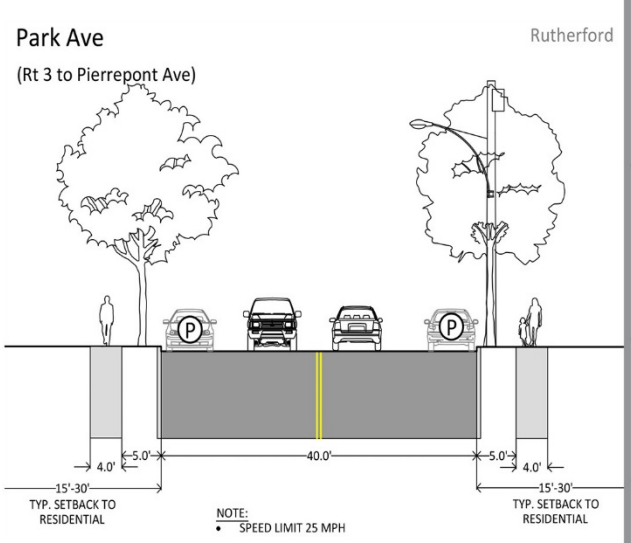
Cross Section 5.3

E Pierrepont Ave — Rutherford

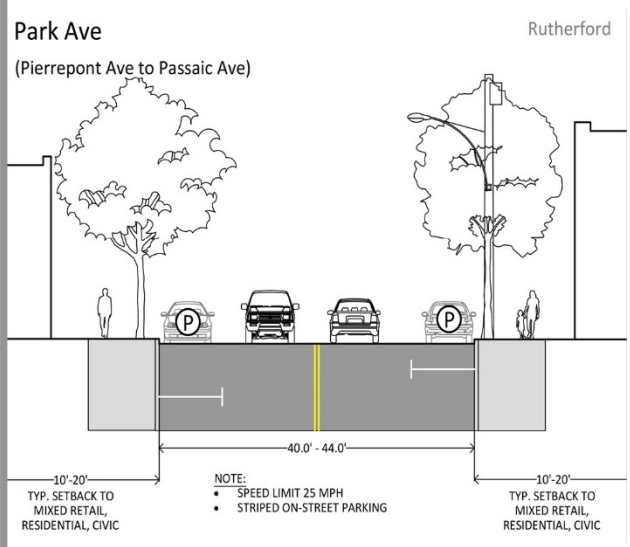
(Ridge Rd to Rt 17)



Cross Section 6.1



Cross Section 6.2



Municipal Meeting Record

Municipal Meeting: Rutherford Borough
Blue Room -- Rutherford Borough Hall, 176 Park Avenue
April 23, 2018 – 10:00 AM

Attendees

1. Rutherford Borough – Rose Inguanti, John R. Russo, Robert Kakoleski
2. NJ TRANSIT – Jen Buison, Mike Viscardi
3. NJTPA – Keith Hamas
4. NV5 –Chris Lucas, Kevin Perry
5. 4WARD PLANNING – Todd Poole

Purpose of meeting

The purpose of the meeting is to review the findings from the street audit and brainstorm recommendations. We will have concept starter ideas to review with you. The goal is to leave on the same page about recommendations for specific locations.

Agenda

1. Review of Street Audit Findings
    - What the project team documented: pedestrian amenities such as pedestrian ramps and crosswalks; bicycle facilities
2. Concept Development Discussion
    - Pedestrian Improvements
    - Bicycle Improvements
    - Traffic Calming
    - Off-road
    - Other recommendations
3. Next Steps
    - Counts: MioVision and Manual
    - Public outreach event

Meeting Notes

NJT: provided a general project overview, with particular emphasis on bicyclists having access to the train station.

NV5: Discussed efforts undertaken, to date; also discussed some of the low-cost pedestrian and bicycle interventions. Asked that participants from Rutherford provide input on the recommendations to be shared.

Roundabout in Front of Station: Seems to work well with traffic. Talked about general observations. Concerned about people coming from Ames Avenue. Very well-functioning

Rutherford: Does have a grant application proposal to create counter height space where pedestrians can stop and rest their laptops or briefcase.

Erie and Orient Way: NV5 described street treatment recommendations. Rutherford asked about the bus turning onto Orient Way (concerned about turning radius available, given proposed curb extension. Rutherford concerned about traffic backing up. Rutherford recognized that the epoxy curb extension serves as a guideline for traffic but will be driven over, from time to time, as buses come through. Rutherford requested that the proposed curb extension be pulled back slightly to leave the existing parking space intact. All felt that the on surface beacons are ineffective. Rutherford stated that the in-street beacons were never really adopted by pedestrians. Union Avenue is county road slated to be repaved this year.

Lot 1 South End ADA: NV5 would like to get the parking facility ADA compliant, but stated the current lot configuration is challenging. Proposing a new stretch of sidewalk and parallel parking adjacent. Rutherford stated it would be great if the proposed sidewalk could provide access to the existing sidewalk across the street (across Erie). There is to be an open plaza at the triangle of Erie and Union Avenue, according to Rutherford officials. NJTPA asked if it was possible to get angled parking but NJT and Rutherford stated it would be tough to do.

Park Avenue & Ames Avenue: NV5 explained the recommendations for this intersection. Mentioned that it is good to see that there are in street pedestrian crossing signs, which is also part of NV5's recommendations. Rutherford asked for clarification on how far away parkers should be from crosswalks, given the proposed configurations recommended by NV5. There is uncertainty as to whether or not the state statute's 20 foot throw line is applicable, given the proposed design/location of the ergonomic crosswalks.

Parking Garage Pass-Thru to Park Avenue: NV5 discussed its observations and recommendations. Rutherford stated they applied for an NJ TAP Grant to improve the "no-man's land."

Park Avenue & Glen Road: NV5 discussed its recommendations. No comment from Rutherford.

Park Avenue, W. Passaic Avenue, & Chestnut Street: NV5 discussed its observations and recommendations. Rutherford stated that it is looking to make the same improvements (have been in the planning stage and reflects back on what existed in the 1930s). Rutherford stated that they have a state historic grant to restore the improvements as they once existed in the 1930s. Rutherford is looking to put in bollards and new lighting.

Park Avenue & Pierrepont Avenue: NV5 discussed its recommendations. Rutherford identified this intersection as one of their safe routes to school areas and asked if NV5 considered adding a bicycle lane to the improvement recommendations. Rutherford stated that NV5 should show sharrows on the street.

General Recommendations for Crossing in Residential Areas: NV5 discussed its observations and recommendations. Rutherford asked if there had to be a certain number of pedestrian crossings to justify a pedestrian crossing walk/crosswalk. Rutherford stated that it was an engineering recommendation, based on pedestrian counts observed. Rutherford stated that they will need to develop an overlay map showing proposed improvements.

NV5 shared next steps and what to expect in the report.

NV5 discussed the proposed bicycle routes. Stated that they did not have enough space to create a dedicated bicycle lane. Rutherford asked if NV5 had received the 2013 bike/ped master plan's recommendations concerning dedicated bicycle lane. Rutherford is concerned about going "backwards," with respect to bicycle lane recommendations. Rutherford asked that NV5 borrow from the "Safe Routes to School" plan, regarding where to recommend dedicated bicycle lanes.

NV5 stated that a date needs to be selected for the public engagement session. NJT Transit stated they need at least a week lead time. The week of May 7th was suggested.

Public Input Record

A Public Information Center for this study was hosted at Rutherford Train Station on Tuesday, May 8, 2018 from 5-7 PM.

Comments Collected at Public Information Center

- Clear crossing at RR tracks
- No left turn from Erie to Orient, instead drive through the circle
- More bicycle racks would be nice
- Walking along north side of Erie to station:
    - Narrow sidewalk
    - Sidewalk breaks and ped must enter roadway to go to station
    - No crosswalk at intersection w/Union
- Provide a greater police presence to help pedestrians cross street
- Looking for bicycle lanes on other side of town
- Need improved snow removal for pedestrians and cyclists
- Would like to have covered pedestrian shelter for waiting riders
- Gazebo inhibits visibility for both pedestrians and motorists
- Do volumes allow lane removal for bicycle lane
- Ban left? Traffic use circle instead
- Missing sidewalk connection under RR bridge
- Bicycle Path along old RR to East Rutherford border along Erie Avenue

Comments Collected via Email

5/2/18

Crossing the street/crosswalks right by the station. Cars DO NOT STOP…they zoom by. Perhaps one of those “Stop” lights that blink (for Pedestrians) would help. I don’t think many people realize they MUST STOP for pedestrians

End of Rutherford Train Station Report

SUMMIT TRAIN STATION REPORT

JUNE 2018

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Abstract:

The purpose of this study is to identify and address the most basic barriers limiting pedestrian and bicycle access to Summit Train Station. This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement "low-hanging fruit" improvements that can be accomplished quickly and inexpensively. Each design concept also includes recommendations for implementation, phasing, and funding sources.

The findings of this study have been discussed and reviewed with local municipal officials and have been presented for public comment at a Public Information Center that was hosted at Summit Train Station.

Prepared by NV5 and 4ward Planning

Summit Train Station Report Table of Contents

1. Overview and Context

The Summit Station is located on the southern edge of the City's historic, compact, and walkable downtown. With an average weekday boarding of approximately 4,000 passengers, the Summit train station is one of the most highly utilized commuter train stations on the Morris-Essex NJ TRANSIT line. Both the Gladstone Branch and Morristown Line provide service to the station.

Enhancing and encouraging walkability has been a priority for the City, and pedestrian facilities are typically in good condition. The City adopted a sidewalk policy where the City pays for the cost of installation. Bicycle facilities are limited and a Bicycle Plan by the Environmental Commission was initiated. The Summit Park Line, a proposed horizontal park along the Rahway Valley Railroad right-of-way, has the potential to connect neighborhoods in the eastern part of the municipality to the downtown and the train station. The City recently paved a section of the Parkline behind Overlook Hospital between Morris Avenue and Broad Street.

An objective of *Summit RE:VISION*, the City's 2016 Master Plan Re-Examination, is to establish the train station as desirable public space. A few of the actions and strategies related to this objective and include:

- Studying and improving the circulation patterns around the train station,
- Leveraging grant funding to design and build a welcoming and safe bicycle parking facility adjacent to the train station, and
- Improving connectivity and access between the train station and the commuter parking garage through pedestrian experience and safety improvements.

Summit's street network radiates outward in all directions like spokes on a wheel, with the train station at the center. The Priority Routes Map (Figure S-1) for Summit shows all routes that were reviewed in this study, as well as the priority routes, and indicates the locations of specific road cross-sections that are presented in the Appendix. The Priority Routes identified include:

- Summit Avenue
- Whittredge Road
- Springfield Avenue
- Broad Street
- Orchard Road
- Baltustrol Road – Morris Avenue
- Mountain Avenue – Elm Street – Summit Avenue
- Maple Street
- Pine Grove Avenue – Blackburn Road – Prospect Street
- Springfield Avenue
- Kent Place Boulevard
- Morris Avenue
- Woodland Avenue

Background Data

Background research included review of existing documents, programs and data sources:

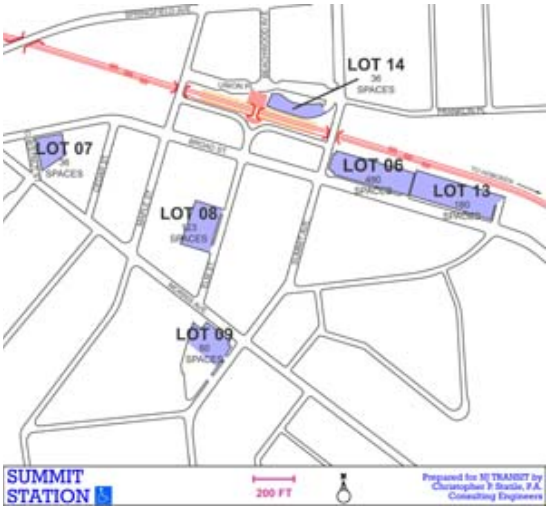
Local Documents

Title	Date
Summit re:Vision (Master Plan Re-Examination)	November 2016
Summit Park Line: Creating Summit's Landmark	February 2016
Safe Routes to School Travel Inventory for elementary and middle schools (EZ Ride TMA)	No date
Bicycle Rack Location Map	2014
18-11 Policy on the Installation of Sidewalks for the Safety of Pedestrians	
Complete Streets Policy	2014

Parking Lots

Lot Number	Location	Owner	Spaces
13	Broad Street & Summit Avenue	City of Summit	180
14	Summit Avenue & Union Place	NJ TRANSIT	36
6	Broad Street & Summit Avenue	City of Summit	482
7	Chestnut Street & Broad Street	City of Summit	55
8	Elm Street & Broad Street	City of Summit	123
9	Summit Avenue & Morris Avenue	City of Summit	90
		Total spaces	**966**

Map: Locations of Parking Lots



Resident Commuter Ridesharing Program

From October 20160 through March 2017, the City launched a pilot program with Uber to provide rides to and from the Summit train station for $4, the cost of the daily parking fee. According to the City, the program was successful but did contribute to congestion and didn't free up any parking spaces. Beginning in December 2017, the City extended the program for another year with Lyft.

Bicycle Rack Data

City of Summit performed counts of station area bicycle racks in 2015 and 2017. The 2015 counts occurred 25 times between March and May. The 2017 counts took place on 21 days between June and October.

	2015 (March-May)	2017 (June-October)
Average # of Bicycles	42	59
Max. # of Bicycles	68 (May 20 - 63°, cloudy)	83 (Oct. 10 - 80°, sunny)
Min. # of Bicycles	20 (Mar. 24 - 41°, clear)	27 (Aug. 18 - 74°, rainy)

2. Existing Conditions

(Observed Dec 5, 2017, temperature in the 40s)

- Pedestrian amenities in the vicinity of the train station, as well as between parking areas and other pedestrian trip generators, are typically in good condition
    - Sidewalks are continuous with adequate connections within 3/4-mile radius of the station
    - Red tinted stamped concrete crosswalks were observed in various locations, but seem to be getting phased out in favor of striped crosswalks
    - Almost all pedestrian ramps (outside of NJ TRANSIT property) meet ADA standards
- Bicycle racks are full on the north side of the station (Union Place)
    - Additional bicycle racks on the west side of the station plaza area were empty
- Bicycle lockers are available inside the commuter parking lot at Union Place and Summit Avenue

Photo Log

The following photos and captions describe existing conditions around and to the train station.

Stamped asphalt crosswalks at Elm Street and Broad Street are showing wear. (Summit_171206_105720.JPG)

Bicycle racks are filled on the north side of Summit Station. (Summit_171128_072023.JPG)

Bicycle racks on the northwest side of Summit Station are not filled. (Summit_171128_072153.JPG)

Bicycle lockers are available in the commuter parking lot at Union Place and Summit Avenue. A new bicycle shelter is plannned for this space. (Summit_171206_163638.JPG)

Ladder style crosswalk at Maple Street and Broad Street are faded; reducing the impact of contrast with the road surface. (Summit_171206_104938.JPG)

High visibility thermoplastic continental stripe crosswalks, as used at Maple Street and Railroad Avenue, offer the best combination of visual contrast and durability. (Summit_171206_104800.JPG)

Pedestrians wishing to access the westbound sidewalk on Broad Street must take a circuitous route since there is no marked crossing at the logical crossing point. (Summit_171206_145110.JPG)

The retaining wall in the background likely precludes the addition of an eastbound sidewalk along this stretch of Broad Street. (Summit_171206_145126.JPG)

The curb ramps at Summit Avenue & Morris Avenue are oriented to the apex of the curb radius. (Summit_171206_151648.JPG)

The curb ramps at Woodland Avenue & Springfield Avenue (and in most locations in Summit) are oriented to the tangent sides of the curb radius. (Summit_171206_161942.JPG)

The southeast crossing of Railroad Aveueto Summit Station would benefit from upgrades to the crosswalk and curb ramp. (Summit_171206_110857.JPG)

The southwest crossing of Railroad Avenue to Summit Station would benefit from crosswalk, curb ramp, and lighting upgrades. (Summit_171206_110927.JPG)

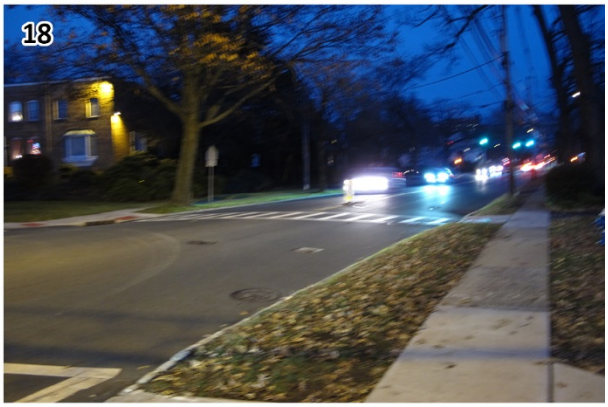
The walkway across Village Green from Maple Street to the Railroad Avenue southwest crossing is well lit. (Summit_171206_170451.JPG)

In comparison to Image 13, there is a need to improve lighting at the crossing of Railroad Avenue from Village Green. (Summit_171206_170600.JPG)

The curb ramp at Railroad Avenue and Summit Avenue is not ADA compliant. (Summit_171206_112621.JPG)

The intersection of Broad Street and Summit Avenue provides access to ±68% (662) of the parking spaces associated with Summit Station and would benefit from pedestrian upgrades and/or additional study. (Summit_171206_111754.JPG)

The asphalt path that provides access to Elm Street from Lot 9 is in poor condition. In the background, a large shrub is encroaching on the path near the pay station. (Summit_171206_165757.JPG)



The intersection of Morris Avenue and Elm Street is poorly lit. (Summit_171206_165718.JPG)

3. Issues & Opportunities

General Issues

- Some crosswalks faded
- Many crosswalks are marked using standard markings which lack visibility
- High-visibility thermoplastic "ladder" or "continental" crosswalks, as used at Maple Street and Railroad Avenue, offer the best combination of visual contrast and durability
- Wide intersections lack markings to organize and calm turning movements as well as thru-traffic Examples:
    - High Street & Kent Place Boulevard
    - Springfield Avenue & Morris Avenue
    - Broad Street, Walnut Street & Lower Overlook Road
    - Union Place & Beechwood Road
    - Summit Avenue & Union Place
- The intersection of Broad Street and Park Avenue does not provide any crossing opportunity for pedestrians to access the sidewalk on the westbound side of Broad Street. There is no sidewalk on the eastbound side of Broad Street. At this time, it would be cost-prohibitive to propose the addition of a sidewalk due to a substantial existing retaining wall. Pedestrians wishing to access the westbound sidewalk on Broad Street must use the crosswalk at Ashwood Avenue and Park Avenue, which is approximately 500' out of the way and in the opposite direction of Summit Station.

The following intersections include curb ramps that are oriented to the apex of the curb radius. Although apex orientation is permissible, it is preferred that curb ramps be oriented to the tangent sides of the curb radius to better orient the visually impaired and wheelchair users to the intersection and provide curb protection from vehicles cutting the corner.

- Maple Street & Broad Street
- Summit Avenue & Broad Street
- Summit Avenue & Railroad Avenue
- Summit Avenue & Morris Avenue
- Whittredge Road & Hobart Avenue

Station Area Issues

South side of the station

- Southeast crossing of Railroad Avenue:
    - This route takes commuters from the station to the large parking deck, which can be accessed at Summit Avenue and Broad Street
    - The crossing is poorly marked with a standard crosswalk
    - The crossing has a puddling issue and lacks detectable warning surface in the low point of the curb ramp adjacent to the station
- Southwest crossing of Railroad Avenue:
    - Is poorly marked with a standard crosswalk
    - Lacks detectable warning surface in the curb ramp adjacent to the station

    - Is poorly lit and would benefit from additional light post in the Village Green in the lawn or planting area at the confluence of walkways adjacent to the curb ramp
- There are superfluous curb cuts approximately 20-30' outward of existing curb ramps at crosswalks that provide a false desire line. (These were perhaps once used for drop-offs.)
- Medians on Broad Street do not extend to crosswalks at Railroad Avenue/Elm Street
- Pedestrian crossing at Summit Avenue and Railroad Avenue (specifically the curb ramp descent from the bridge) is not ADA compliant
    - Summit Avenue is a bridge over the railroad tracks from Railroad Avenue to Union Place

North side of the station

- Traffic circle on Union Place & Beechwood Road leaves a wide travel lane, which can be driven as a straight path through the intersection (rather than being deflected by the traffic circle)

Commuter parking lots

- Parking deck has inconsistent paving condition and some ponding at the landing of the stairway entrance
- Generally well-lit with adequate access
- The intersection of Broad Street and Summit Avenue channels pedestrian traffic from the Broad Street Garage and East Lot (approximately 68 percent of available parking, 662 spaces) to Summit Station
    - At peak times, there are high volumes of pedestrian and motor vehicle traffic
    - Motor vehicles turning left on Summit Avenue have a left-only phase followed by an unrestricted green
    - Crosswalks are faded and apex-mounted
    - This area should be considered for additional study and/or counts
- Parking Lot 9 at Morris Avenue and Elm Street has, as its main pedestrian access to Elm Street, an asphalt path in poor condition
    - The intersection of Morris Avenue and Elm Street is poorly lit and it is difficult to see pedestrians

General Opportunities

- Improve crosswalks visibility
    - Crosswalk upgrades and/or restriping should use high-visibility ladder striping
    - Placement of the lines parallel to the direction of travel should be placed around the portions of the lane where tires track and wear down markings, to minimize wear
- Pedestrian improvements on NJ TRANSIT property would match surrounding high-visibility, mostly ADA compliant pedestrian facilities
- Many of the continuous through corridors connecting the station area to outlying residential areas are low-volume, residential streets that could support a bicycle boulevard treatment
- There is an opportunity to improve operations, organize traffic movements, and reduce motor vehicle speeds at certain intersections. Methods such as channelization (separating motor vehicle turning movements from through movements by application of lane striping), "deer tracks" (applying skip line(s) all the way through the intersection to reinforce lane space for through movement or turning movement), or gore striping (application of striping in paved areas where motor vehicles should NOT travel) may be considered at the following intersections:
    - High Street & Kent Place Boulevard
    - Springfield Avenue & Morris Avenue
    - Broad Street, Walnut Street & Lower Overlook Road
    - Union Place & Beechwood Road
    - Summit Avenue & Union Place

Station Area Opportunities

South side of the station

- High-visibility crossings
    - This route takes commuters from the station to the Broad Street Garage, a large parking deck which can be accessed at Summit Avenue and Broad Street
- Southwest crossing is poorly marked and poorly lit
    - Additional light post in the Village Green at the intersection of Elm Street and Railroad Avenue would provide adequate lighting
- In the concrete sidewalk area extending out from the station, there are two curb ramps leading into Railroad Avenue that are not marked with a crosswalk and lack reciprocal curb ramp on the opposite side of the road. It is possible that these curb ramps were once used for curbside drop-offs in this area. The two curb ramps lead pedestrians to cross at unmarked locations and should be considered for removal.
- Medians on Broad Street should be extended through crosswalks at Railroad Avenue/Elm Street
    - Painted extension could provide benefits in the short term
    - Built out median extensions with flush pedestrian cut outs would be appropriate for this high trafficked intersection
- Extend northwest curb to improve the pedestrian crossing at Summit Avenue and Railroad Avenue and make it ADA compliant
    - Curb extension is needed to achieve ADA compliant grades between the Summit Avenue bridge and the roadway of Railroad Avenue

North side of the station

- Markings to organize the curbside uses and travel lanes would better delineate the intersection of Union Place & Beechwood Road

Existing Conditions, Issues & Opportunities (general and station area specific) are synthesized and presented in Figure S-2: Issue & Opportunities Map.

Figure S-1: Priority Routes Map

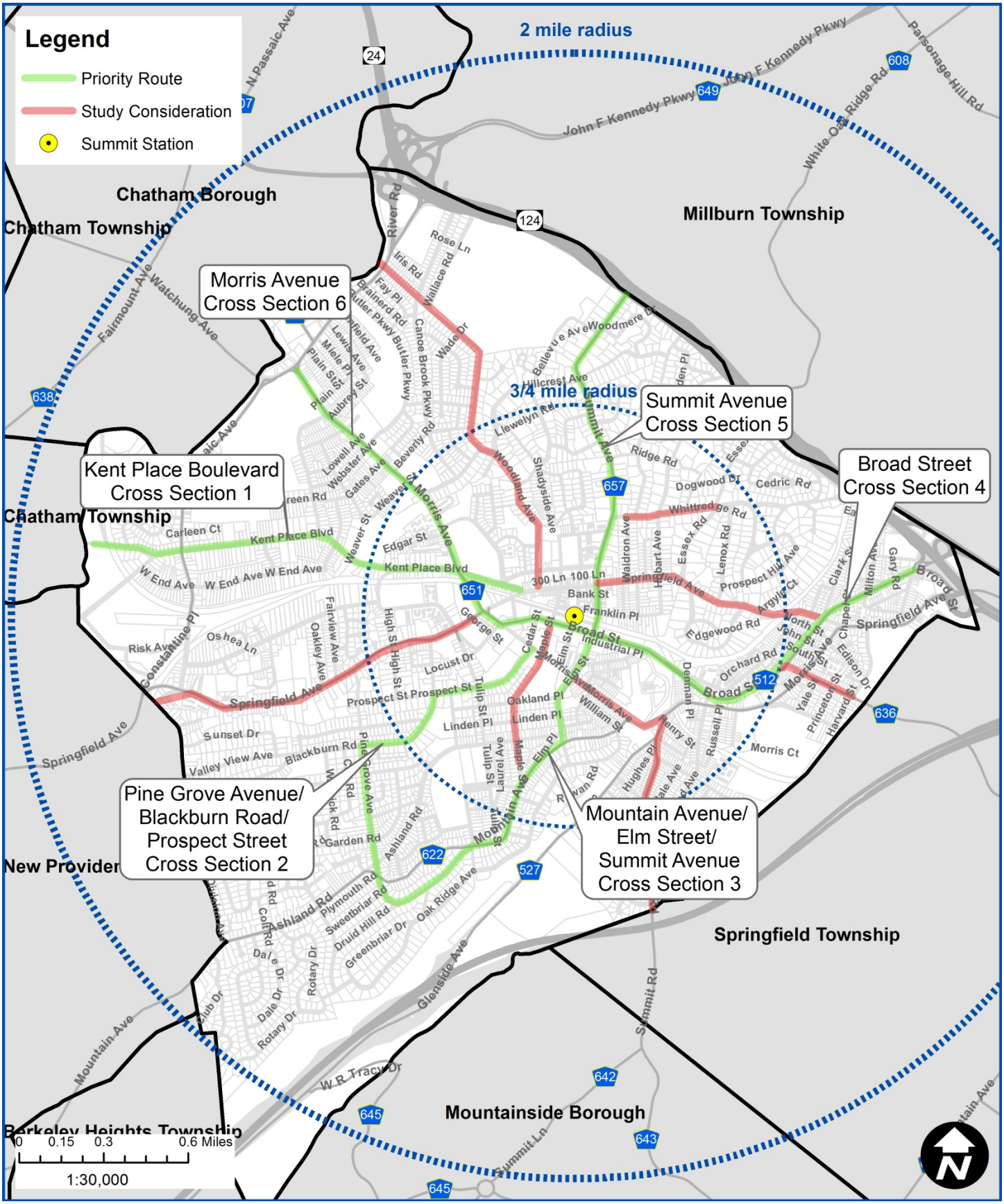
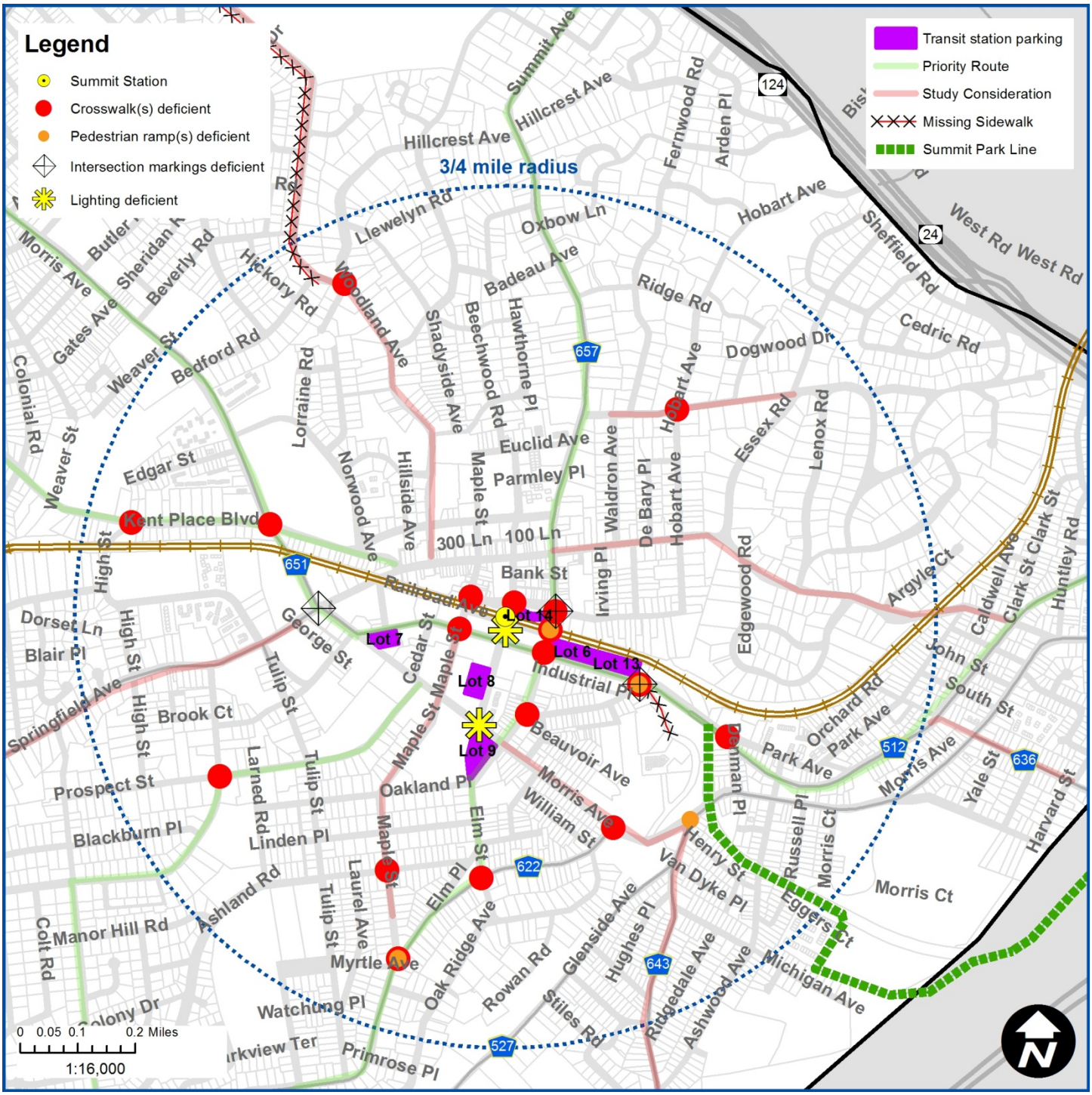


Figure S-2: Issues & Opportunities Map



KEY ISSUES				OPPORTUNITIES			
1	No crosswalk across Springfield Avenue	3	Drop off/pick up area crossings insufficient	1	Consider crosswalk across Springfield Avenue	3	Pedestrian-priority redesign for drop off/pick up area; spot lighting improvements at station
2	Lane assignment markings worn on Springfield Avenue; wide, undesignated intersection	4	Medians do not extend through crosswalks	2	Refurbish lane assignment markings on Springfield Avenue; channelize intersection	4	Improve crossing of Morris Avenue at Lot 9; improve lighting

4. Recommendations & Design Concepts

The goal of this study is to identify the most basic barriers limiting pedestrian and bicycle access to the station, and to propose recommendations to address them. As such, the study has produced a series of actionable design concepts specific to the study area that propose improvements for bicyclists and pedestrians.

Most design recommendations consist mainly of markings, with more substantial interventions at high-priority locations. Locations where deficiencies have been observed in crosswalks, pedestrian ramps, intersection markings, and lighting are displayed in Figure S-2: Issues & Opportunities Map.

In general, recommendations respond to deficiencies involving:

- Pedestrian ramp condition (if any) for ADA compliance
- Crosswalks for visibility and condition
- Intersection markings to organize turning and thru alignment at complex intersections
- On-street bicycle facilities where feasible
- Lighting for adequate coverage during low-light hours

In response to these issues, the project team has identified the following general recommendations for each station area:

- Provide high-visibility crosswalks
- Provide curb ramps at all intersections and crossings
- Provide bicycle accommodations along low-speed routes (bicycle boulevard treatments)
- Deploy epoxy curb extensions
- Provide RRFBs at unsignalized crossings, as appropriate
- Track implementation and perform post-implementation studies
- Provide sufficient bicycle parking (coordination with NJ TRANSIT may be required to provide additional bicycle racks) and consider covered, secure bicycle parking

Short-Term Conceptual Enhancements

Most of the design concepts in this study have the potential to be deployed as short-term enhancements, also referred to as Tactical Urbanism projects, which are design changes implemented to street environments in a “light, quick, cheap,” and temporary manner. By demonstrating to roadway users – pedestrians, bicyclists, drivers – the effectiveness of design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

The short-term approach is the basis for most of the recommendations in this study. Minimal funding can accomplish many of these conceptual improvements, without having to initiate a larger capital project. In many cases, re-striping roads with these design concepts as a component of routine resurfacing projects could result in little to no additional cost, compared to replacing the markings as they were prior to resurfacing.

Long-Term Conceptual Enhancements

Many of the short-term concepts have the potential to become long-term buildouts. The primary example, which is used throughout the six transit stations reviewed in this study, is the proposed short-term curb extension composed of colored epoxy gravel. While the short-term application can be implemented almost anywhere, the long-term buildout of concrete-surface curb extensions could be pursued as a long-term upgrade. Locations where epoxy gravel curb extensions are proposed require additional study prior to long-term buildout with concrete, in order to understand implications to road drainage, utilities, and other factors, as well as to obtain funding for design and construction.

Off-Road Links

When possible, connections to existing or proposed off-road facilities were investigated as a component of this study.

In Summit, there is a concept for a recreational path, the Park Line. While only a small section has been built, the terminus of the Park Line's conceptual alignment is within a block of the Summit Train Station. However, limited roadway space, as well as private property, means that this connection requires significant additional consideration under a separate and future study.

Phasing

With a goal of presenting NJ TRANSIT and the local municipalities with actionable recommendations to improve pedestrian and bicycle access to the stations, the recommendations were mainly low-cost and high-impact. Each location that received specific design concept recommendations includes a combination of treatments, and could be implemented in a phased approach, or combined together as part of a broader, more comprehensive effort.

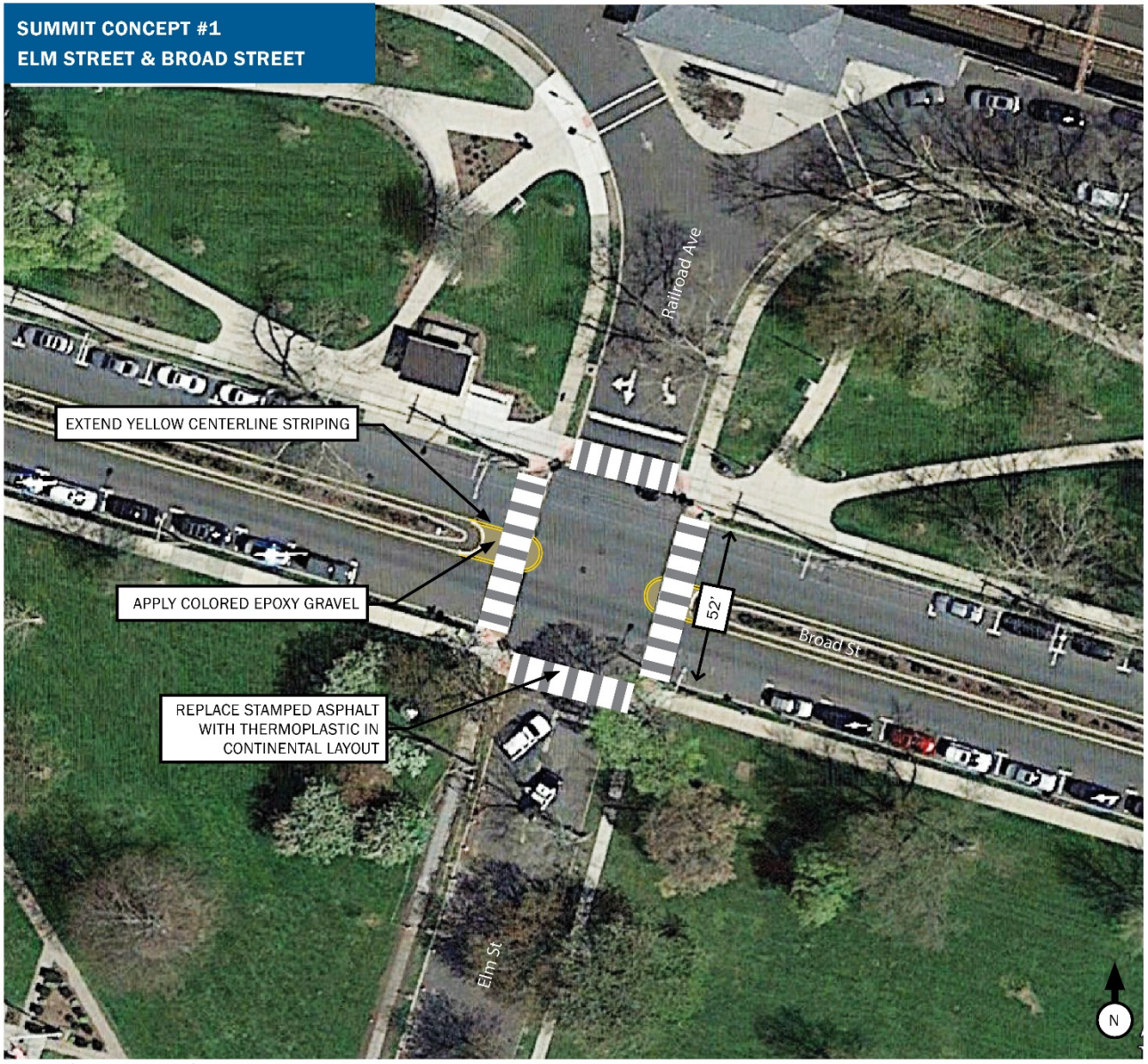
Design Concepts for Summit Train Station

Summit had very few deficient pedestrian ramps; however, the crosswalks surrounding the station were either faded or required application of high-visibility thermoplastic striping to function more effectively. The use of colored epoxy gravel to quickly and inexpensively achieve the benefits of curb extensions and median extensions can be paired with intersection markings to improve vehicular alignment. High-visibility crossings as well as spot lighting improvements between the station and parking garage will improve the visibility of high volume crossing locations. Approximately two blocks south of the Summit Station, Rectangular Rapid Flash Beacons are recommended at the entrance to a commuter parking lot, to increase the visibility of pedestrians during peak hours, especially during months with shortened periods of daylight.

In response to these issues, conceptual design improvements have been developed at the following locations to address the most basic barriers limiting pedestrian and bicycle access to the station:

Design Concept #	Location	Description
1	Elm Street & Broad Street	• Provide high-visibility crosswalks • Extend existing medians through striping and colored epoxy surfacing
2	Railroad Avenue @ Summit Station	• Provide high-visibility crosswalks • Extend pedestrian area and channelize vehicle movements
3	Union Place & Beechwood Road	• Extend the curbside pick-up/drop off area on the north side of Summit Station • Reinforce vehicular movement patterns through line extensions
4	High Street & Kent Place Boulevard	• Provide line extensions and center island to guide vehicular turning movements and provide a measure of protection for pedestrians
5	Morris Avenue, Springfield Avenue, & Chapel Street	• Reduce lane width though Morris/Springfield Avenue curve to reduce vehicle speeds and provide a buffer to pedestrians
6	Upper Overlook Road, Walnut Street, & Broad Street	• Provide a colored epoxy curb extension to reduce the crossing distance of Walnut Street • Provide line extensions to guide vehicular turning movements
7	Lot 9 Access and Crossing Morris Avenue	• Provide RRFBs at unsignalized crossing
8	Select Roads	• Provide bicycle boulevard treatments on select low-speed roads

The remainder of this Station Report provides illustrations for each design concept along with a description of the general approach and materials for short-term and long-term construction. Cost estimates with recommendations for funding and phasing are presented after the design concepts.



Concept - Planning Purposes Only

General Approach:

Extend Broad Street median to create pedestrian safety islands. This will limit pedestrian exposure in the intersection, as well as channelize and reduce the speed of vehicle movement.

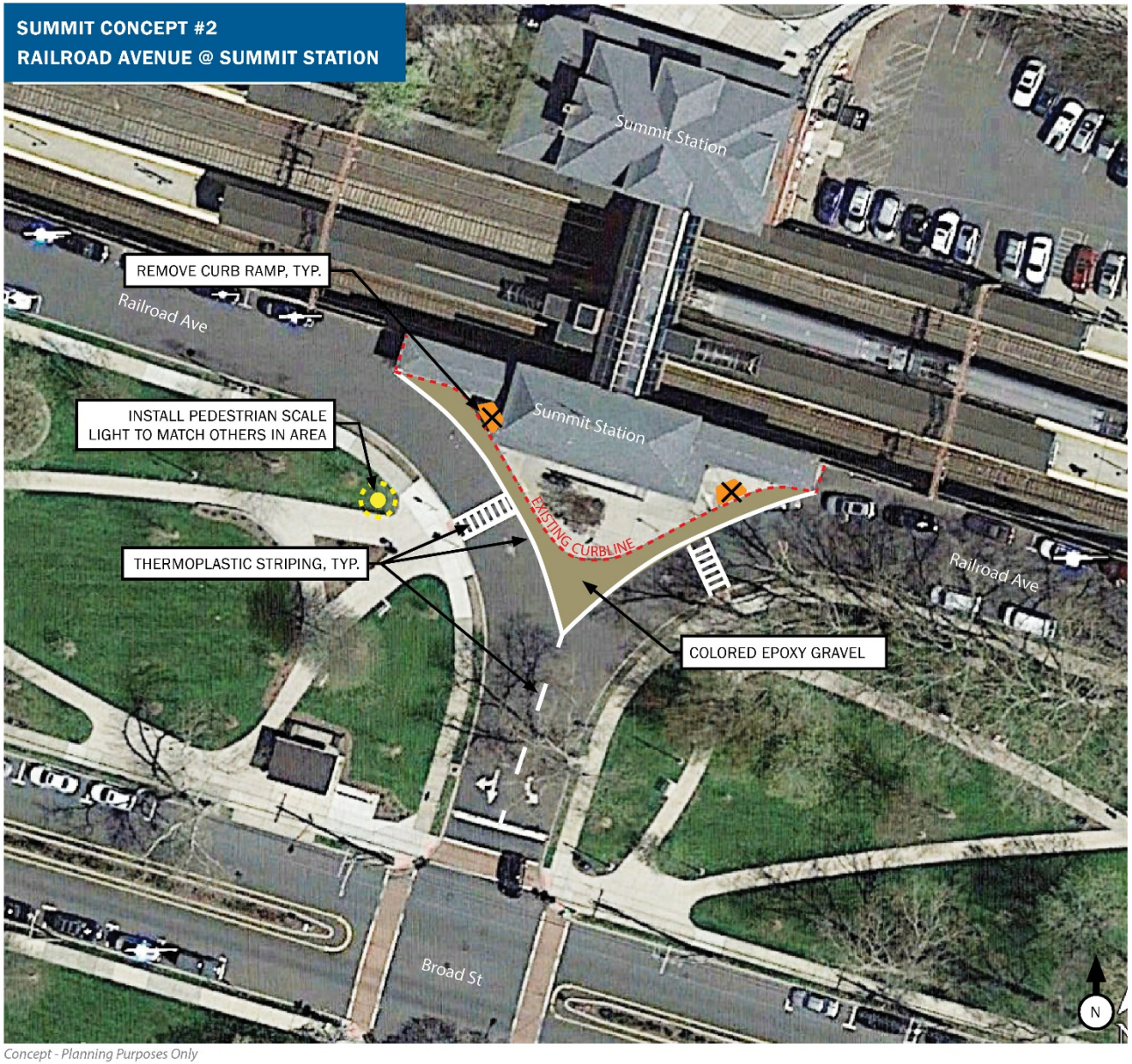
Turning radii for buses, particularly the left turn from the station side of Railroad Avenue onto Broad Street, must be considered.

Short-Term (Low Cost) Materials:

- Yellow striping
- Colored epoxy gravel
- White thermoplastic crosswalk
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Extend concrete curb
- Extend existing planting design into new curb area



Concept - Planning Purposes Only

General Approach:

Narrow the Railroad Avenue travel lanes and extend the pedestrian terrace on the south side of Summit Station. Provide high visibility crosswalks in location of existing crosswalks and remove extraneous curb ramps. This will give pedestrians a clear crossing point, as well as channelize and reduce the speed of vehicular movements.

Review lane widths to ensure that design vehicles (either bus only, or bus with passing space for motor vehicles) can negotiate curb line.

Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White striping
- White thermoplastic crosswalk
- Remove yellow paint and install planters or move trash receptacles to block access to extraneous curb ramps
- Sign assemblies (MUTCD W11-2 + W16-7P) in advance of crosswalk

Long-Term (High Cost) Materials:

- Construct new curb, curb ramps, and extend concrete terrace
- Provide pedestrian scale lighting within extended terrace
- Consider increasing the planting area within the terrace to create a bioretention garden to process runoff from the station roof and/or paved areas

SUMMIT CONCEPT #3
UNION PLACE & BEECHWOOD ROAD

Concept - Planning Purposes Only

General Approach:

Extend the curbside drop-off area and reinforce vehicular movement patterns with line extensions through roundabout. This will contain and reduce the speed of vehicle movement through a busy area and provide more space for drop-offs.

Short-Term (Low Cost) Materials:

- Colored epoxy gravel
- White and yellow thermoplastic striping
- Thermoplastic crosswalk striping
- MUTCD #R1-6A pedestrian crossing signs

Long-Term (High Cost) Materials:

- Maintain as constructed

Example of the In-Street Pedestrian Crossing Sign (MUTCD #R1-6a).

SUMMIT CONCEPT #4
HIGH STREET & KENT PLACE BOULEVARD

Concept - Planning Purposes Only

General Approach:

Provide line extensions and center island to guide vehicular left turns from Kent Place Boulevard and High Street. This will make vehicle movements through the intersection more predictable and provide a measure of protection for pedestrians on the long crossing of the High Street approach. Consider bus turning movements, especially left turn from Kent Place Boulevard on to High Street.

Short-Term (Low Cost) Materials:

- Yellow striping
- Colored epoxy gravel
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Construct center island with concrete curb and surface
- Consider a low maintenance planting design (<36" height) as alternative to concrete surface

SUMMIT CONCEPT #5
MORRIS AVENUE, SPRINGFIELD AVENUE, & CHAPEL STREET

Concept - Planning Purposes Only

General Approach:

Reduce lane width though Morris/Springfield Avenue curve as a way to reduce vehicle speeds and provide a buffer to pedestrians.

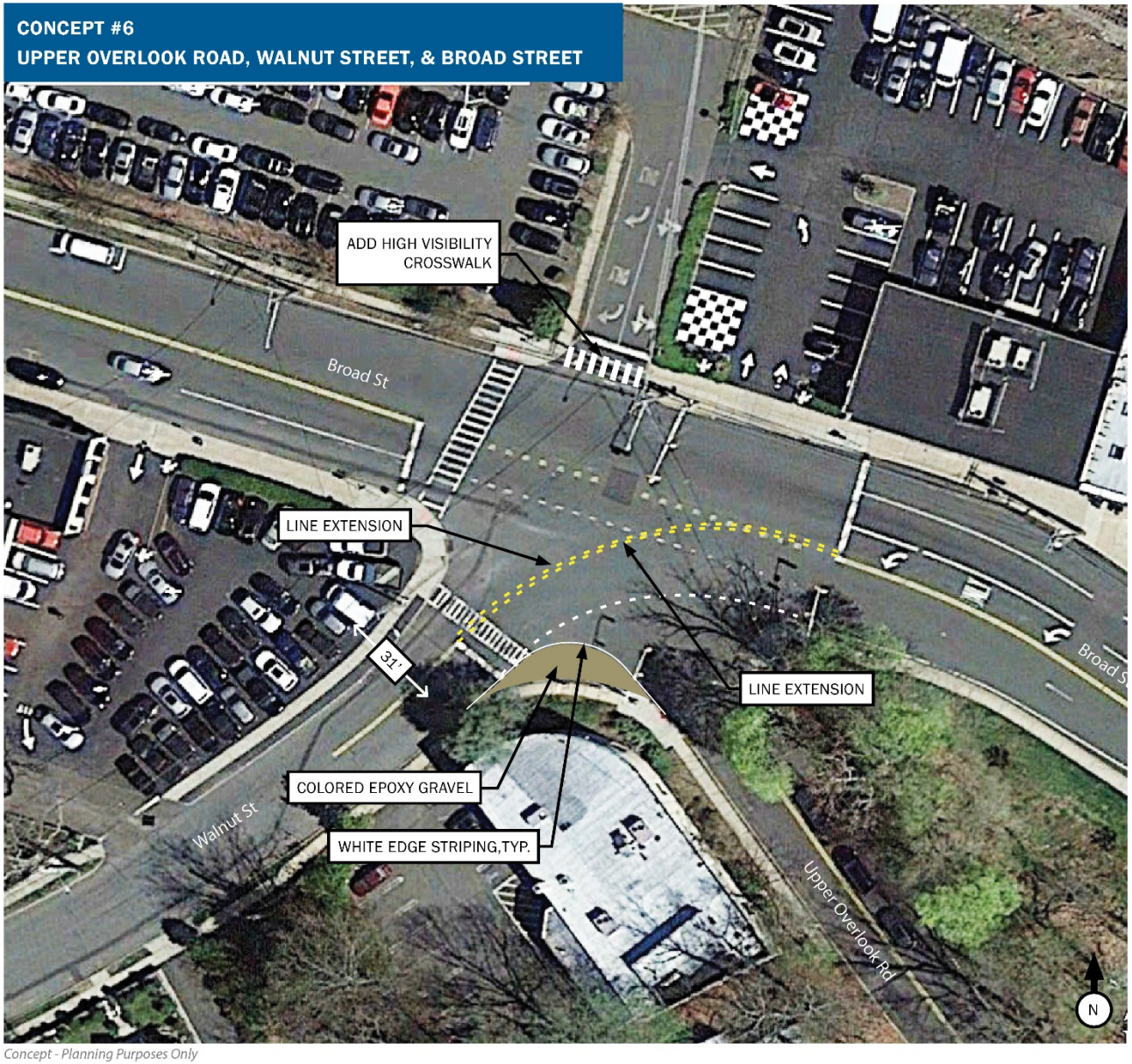
Short-Term (Low Cost) Materials:

- White striping
- Colored epoxy gravel
- Option: Install planters in colored epoxy gravel area

Long-Term (High Cost) Materials:

- Construct new curbs and extend turf grass or provide planting areas
- Consider planting as a bioretention garden to process runoff from adjacent paved areas

CONCEPT #6
UPPER OVERLOOK ROAD, WALNUT STREET, & BROAD STREET



Concept - Planning Purposes Only

General Approach:

Shorten pedestrian crossing of Walnut Street at Broad Street and provide line extension striping to guide vehicular turns. Provide high visibility crosswalk at driveway.

Short-Term (Low Cost) Materials:

- Yellow and white Striping
- Colored epoxy gravel
- Option: Install planters in colored epoxy gravel area
- Thermoplastic crosswalk striping

Long-Term (High Cost) Materials:

- Construct new curbs and extend turf grass or provide planting areas
- Consider planting as a bioretention garden to process runoff from adjacent paved areas

CONCEPT #7
LOT 9 ACCESS AND CROSSING MORRIS AVENUE

EXAMPLE RRFB ON BROAD Street IN SUMMIT

Concept - Planning Purposes Only

General Approach:

Improve pedestrian safety and facilities associated with Parking Lot 9 and crossing Morris Avenue en route to Summit Station via Elm Street. Replace existing asphalt path with ADA compatible concrete walkway. Provide actuated crossing beacon for pedestrians crossing Morris Avenue.

Short-Term (Low Cost) Materials:

- Rectangular Rapid Flash Beacons

Long-Term (High Cost) Materials:

- 4" deep concrete walkway, 6' wide x ±60' long
- Curb edge along east side of walkway (to retain planting area)

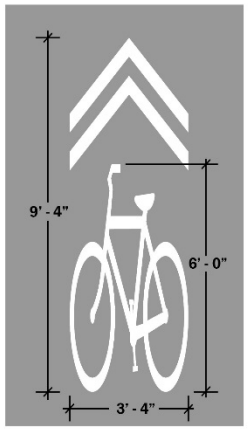
Existing asphalt pathway to Lot 9 in poor condition

CONCEPT #8
BICYCLE BOULEVARD TREATMENT

D11-1

D10-1a

D1-2c



Concept - Planning Purposes Only

General Approach:

A bicycle boulevard is a low-volume and low-speed street that has been optimized for bicycle travel through treatments such as signage and pavement markings, traffic calming, and intersection crossing treatments. These treatments prioritize travel and safety for bicyclists and pedestrians, maintain access to local destinations for motor vehicles, but discourage high volume and high speed motor vehicle traffic.

Short-Term (Low Cost) Materials:

- Shared lane markings (thermoplastic preferred)
- Bicycle route signage

Long-Term (High Cost) Materials:

- Colored epoxy gravel for curb extensions, neckdowns
- Fully deployed wayfinding and signage
- Fully constructed traffic calming

5. Cost Estimates

This section includes cost estimates, recommendations for project phasing (short-, medium-, or long-term), and identifies funding sources that are most appropriate or accessible for each design concept.

Refer to the Study Overview Report for additional information on funding sources that municipalities may consider pursuing.

These cost estimates include general material and installation costs. A contingency of 30% has been added to calculate the total estimated cost and account for price increases over time and price premiums that may apply to small projects. A phasing sequence with short-, medium-, and long-term time frames is provided to help the municipalities plan for implementation.

Item	**Concept 1: Elm Street & Broad Street**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	100	LF	$1.60	$160	Short	Safe Streets to Transit
2	Colored epoxy gravel	175	SF	$7.50	$1,313	Medium	
3	White thermoplastic crosswalk	688	SF	$3.20	$2,202	Short	
4	OPTION: Planters in epoxy area	4	EA	$250.00	$1,000	Long	
				SUBTOTAL	$4,674		
				CONTINGENCY (30%)	$1,402		
				TOTAL	**$6,076**		

Item	**Concept 2: Railroad Avenue @ Summit Station**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	775	SF	$7.50	$5,813	Medium	Safe Streets to Transit
2	White thermoplastic crosswalk	144	SF	$3.20	$461	Short	
3	White striping	160	LF	$1.60	$256	Short	
4	MUTCD W11-2 + W16-7P sign assemblies and posts	2	EA	$360.00	$720	Short	
5	OPTION: Planters or receptacles	2	EA	$250.00	$500	Long	
				SUBTOTAL	$7,749		
				CONTINGENCY (30%)	$2,325		
				TOTAL	**$10,074**		

Item	**Concept 3: Union Place & Beechwood Road**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Colored epoxy gravel	325	SF	$7.50	$2,438	Medium	Transit Village
2	White and yellow striping	170	SF	$1.60	$272	Short	
3	Thermoplastic crosswalk	922	SF	$3.20	$2,950	Short	
4	MUTCD #R1-6A pedestrian crossing sign	3	EA	$360.00	$1080	Short	
				SUBTOTAL	$6,740		
				CONTINGENCY (30%)	$2,022		
				TOTAL	**$8,762**		

Item	**Concept 4: High Street & Kent Place Boulevard**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	302	LF	$1.60	$483	Short	Municipal Aid
2	Colored epoxy gravel	200	SF	$7.50	$1,500	Medium	
3	OPTION: Planters in epoxy area	2	EA	$250.00	$500	Long	
				SUBTOTAL	$2,483		
				CONTINGENCY (30%)	$745		
				TOTAL	**$3,228**		

Item	**Concept 5: Morris Avenue, Springfield Avenue & Chapel Street**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White striping	172	LF	$1.60	$275	Short	County Aid
2	Colored epoxy gravel	1,290	SF	$7.50	$9,675	Medium	
3	OPTION: Planters in epoxy area	2	EA	$250.00	$500	Long	
				SUBTOTAL	$10,450		
				CONTINGENCY (30%)	$3,135		
				TOTAL	**$13,585**		

Item	**Concept 6: Upper Overlook Road, Walnut Street, Broad Street**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow and white striping	243	LF	$1.60	$389	Short	County Aid
2	Colored epoxy gravel	435	SF	$7.50	$3,263	Medium	
3	White thermoplastic crosswalk	140	SF	$3.20	$448	Short	
4	OPTION: Planters in epoxy area	2	EA	$250.00	$500	Long	
				SUBTOTAL	$4,599		
				CONTINGENCY (30%)	$1,380		
				TOTAL	**$5,979**		

Item	**Concept 7: Lot 9 Access & Crossing Morris Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Rectangular Rapid Flash Beacons	4	EA	$15,000.00	$60,000	Long	Safe Streets to Transit
				SUBTOTAL	$60,000		
				CONTINGENCY (30%)	$18,000		
				TOTAL	**$78,000**		

Item	**Concept 8: Bicycle Boulevards**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Shared lane markings (1 SLM every 250' in both directions on ±24,000' of roadway)	192	EA	$100.00	$19,200	Short	PeopleforBikes Community Grants
2	Bicycle route signage (1 sign every 500' in both directions on ±24,000' of roadway)	96	EA	$120.00	$11,520	Medium	
				SUBTOTAL	$30,720		
				CONTINGENCY (30%)	$9,216		
				TOTAL	**$39,936**		

Summit Train Station Report Appendix

June 2018

Appendix Contents

Traffic Counts

Field Observations

Bicycle and pedestrian counts were manually collected in the field during two-hour peak periods in the AM and PM. These counts identified bicycle parked at the station at the start of the count period, with a count at each hour to include additional bicycles parked or removed during each peak hour.

Date: Friday, March 16th, 2018
Time: AM Peak: 7:00 AM to 9:00 AM
Location: 40 Union Place, Summit NJ, 07901 (Summit Train Station)
Weather: 29° Sunny, Slight Breeze

Pedestrian Count: 994
Bicycle Count 7:00 AM: 18
Bicycle Count 9:00 PM,: 29

Notes:

- Heavy train delays & cancellations between Newark & Penn Station because of Amtrak Portal Bridge being stuck in the "up" position. Announced at 7:20 AM. Normal schedules resumed after 8:20 AM.
- Heaviest amount of pedestrians between 7:15 AM and 8:15 AM
- Some irregular crossing patterns but not consistent (detailed in map below)
- Most pedestrians crossed at designated crosswalks ad waited for the signal to do so
- Most pedestrians came in from the Broad Street entrance (labeled below)

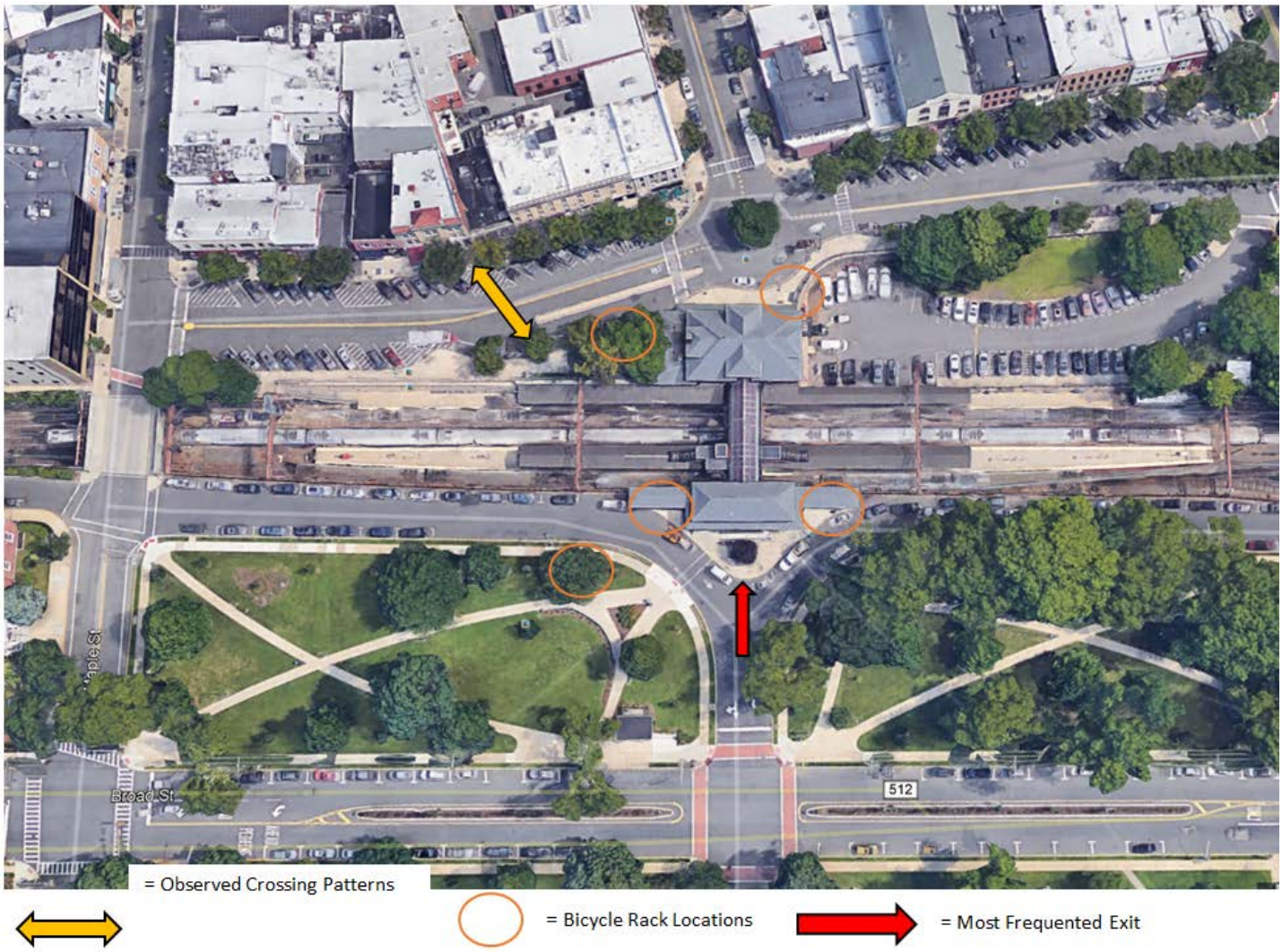
= observed crossing patterns = Bicycle Rack Locations = Most Frequented Entrance

Date: Friday, March 16th, 2018
Time: PM Peak: 5:00 PM to 7:00 PM
Location: 40 Union Place, Summit NJ, 07901 (Summit Train Station)
Weather: 36° Sunny, Windy

Pedestrian Count: 906
Bicycle Count 6 PM: 18
Bicycle Count 7 PM: 11

Notes:

- Heaviest amount of pedestrians between 5:45 PM and 6:15 PM
- Some irregular crossing patterns but not consistent (detailed in map below)
- Most pedestrians crossed at designated crosswalks and waited for the signal to do so
- Most pedestrians exited to the Broad Street side of the station (labeled below)
- Most pedestrians walking in directions towards parking garage on Broad Street



Digital Traffic Camera Counts

To supplement live field observations of pedestrian movements at the various train stations, NV5 staff installed portable digital traffic cameras (known as MioVision cameras) at key locations at each station. The cameras are temporarily installed on a telescoping pole at an intersection or crossing area and record video from a 'bird's eye' view to observe pedestrian and vehicle travel movements. For this project, video was collected during two weekdays. This video helped to inform pedestrian patterns in the vicinity of the train stations while minimizing the number of field staff needed at a given location. When actual pedestrian volume data was desired, key times of the video were sent into Miovision for automated processing to determine the pedestrian, bicycle and vehicle volumes present.

Date: Tuesday, March 6, 2018
Location: Union Place, Summit NJ, 07901 (Summit Train Station)

PEDESTRIANS				
Start Time	Summit & Broad Northbound	Summit & Broad Southbound	Summit & Broad Eastbound	Summit & Broad Westbound
7:00	6	81	6	10
7:15	2	64	4	6
7:30	9	104	14	8
7:45	5	26	4	10
18:30	8	28	10	14
18:45	5	5	5	7
19:00	4	19	7	10
19:15	0	9	2	7
TOTAL	**39**	**336**	**52**	**72**

BICYCLES				
Start Time	Summit & Broad Northbound	Summit & Broad Southbound	Summit & Broad Eastbound	Summit & Broad Westbound
7:00	0	0	0	0
7:15	0	0	0	0
7:30	0	0	0	0
7:45	0	0	0	0
18:30	0	0	0	0
18:45	0	0	0	0
19:00	0	0	0	0
19:15	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**

Cross Sections

The following cross sections were developed for priority walking and bicycling routes. These cross sections are representative of existing conditions observed December 5, 2017 and were used to assess the suitability of pedestrian and bicycle facilities, and to inform concept design development.

The following cross sections are included:

1. Kent Place Boulevard (Passaic Avenue to Morris Avenue)
2. Pine Grove Avenue – Blackburn Road – Prospect Street
    - 2.1. Pine Grove Avenue (Ashland Road to Blackburn Road)
    - 2.2. Blackburn Road (Pine Grove Avenue to Prospect Street)
    - 2.3. Prospect Street (Blackburn Road to Morris Avenue)
3. Mountain Avenue – Elm Street – Summit Avenue
    - 3.1. Mountain Avenue (Ashland Road to Elm Street)
    - 3.2. Elm Street (Mountain Avenue to Summit Avenue)
    - 3.3. Summit Avenue (Elm Street to Broad Street)
4. Broad Street
    - 4.1. Route 124 to Park Avenue
    - 4.2. Park Avenue to Morris Avenue
5. Morris Avenue (River Road to Summit Avenue)
6. Summit Avenue (Elm Street to Broad Street)

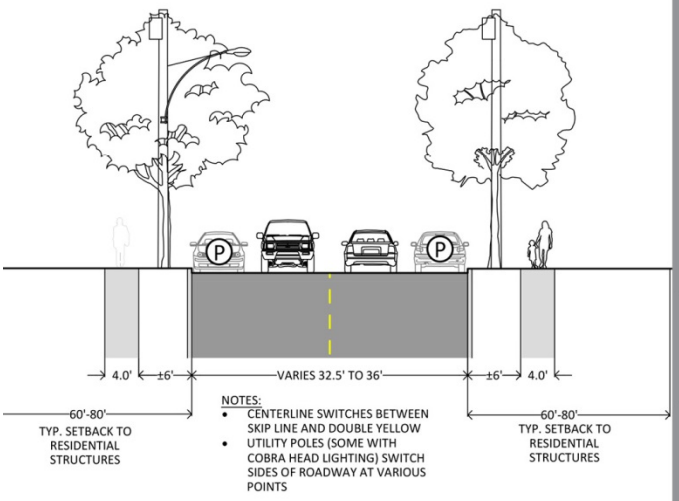
For specific locations of cross-sections, refer to Figure S-1: Priority Routes Map.

Cross Section 1

Kent Place Boulevard

(Passaic Ave to Morris Ave)

Summit

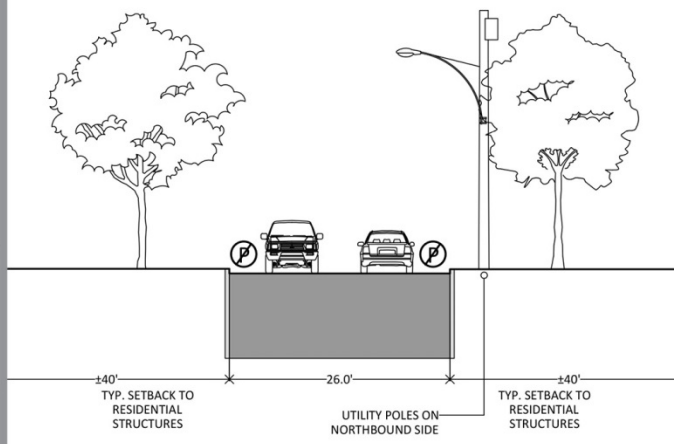


Cross Section 2.1

Pine Grove Ave

(Ashland Rd to Blackburn Rd)

Summit

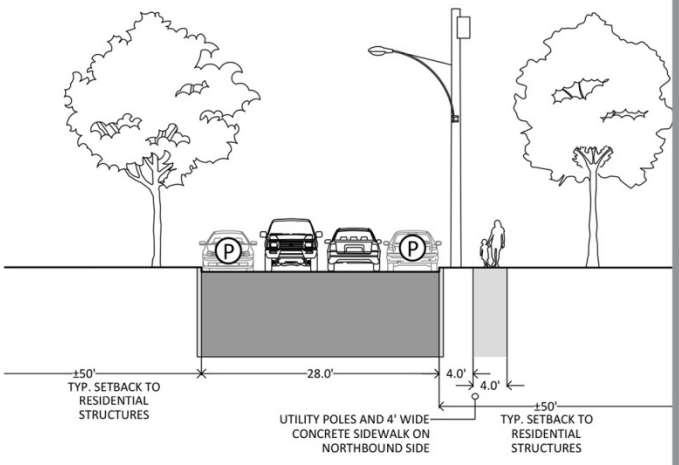


Cross Section 2.2

Blackburn Rd

(Pine Grove Ave to Prospect St)

Summit

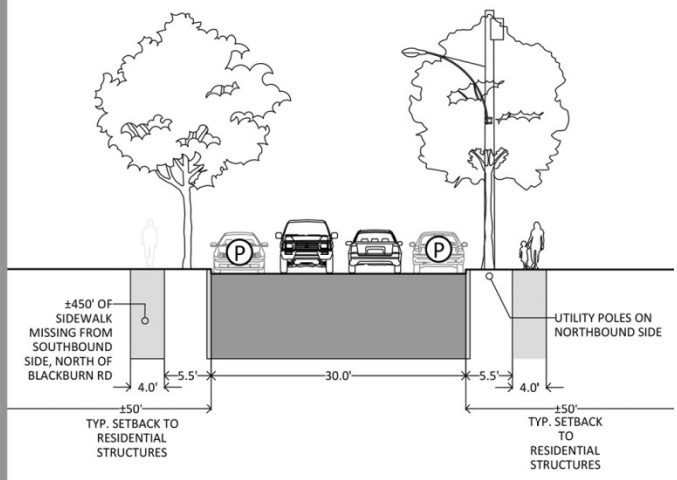


Cross Section 2.3

Prospect St

(Blackburn Rd to Morris Ave)

Summit

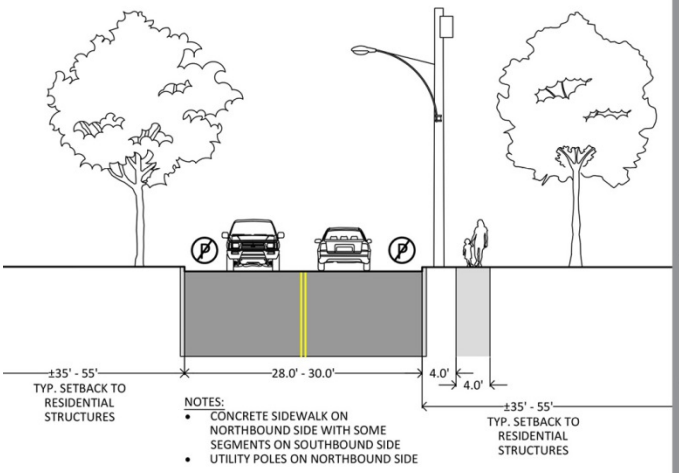


Cross Section 3.1

Mountain Ave

(Ashland Rd to Elm St)

Summit



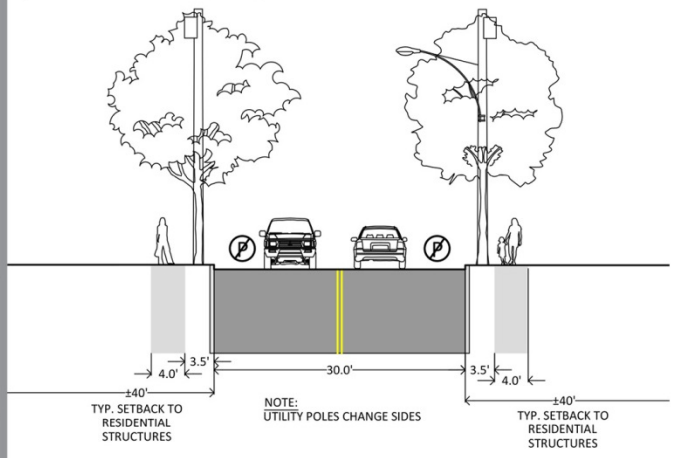
NOTES:
- CONCRETE SIDEWALK ON NORTHBOUND SIDE WITH SOME SEGMENTS ON SOUTHBOUND SIDE
- UTILITY POLES ON NORTHBOUND SIDE

Cross Section 3.2

Elm St

(Mountain Ave to Summit Ave)

Summit

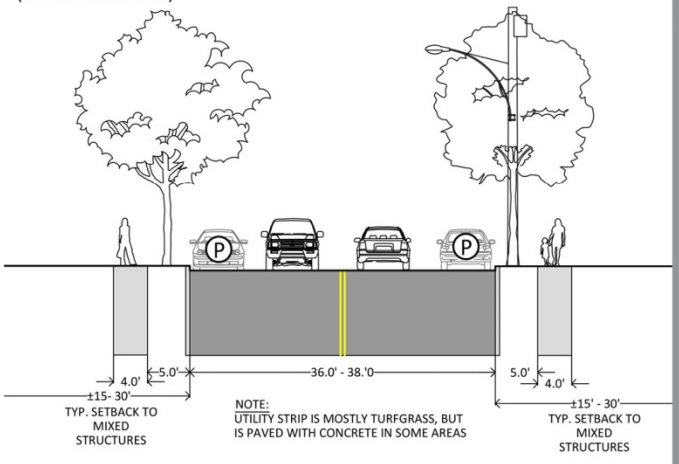


Cross Section 3.3

Summit Ave

(Elm St to Broad St)

Summit

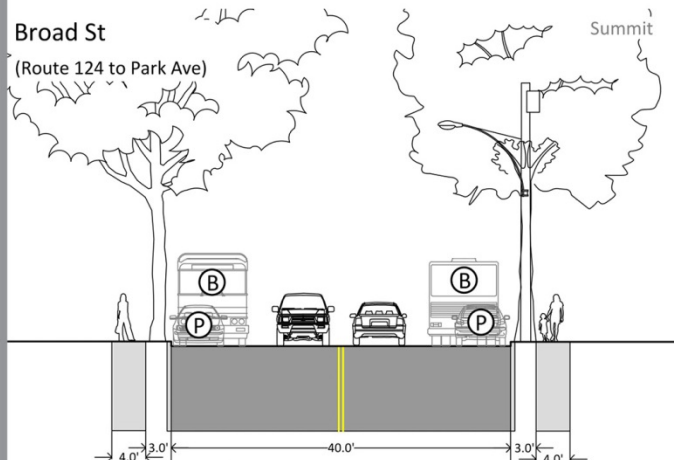


Cross Section 4.1

Broad St

(Route 124 to Park Ave)

Summit

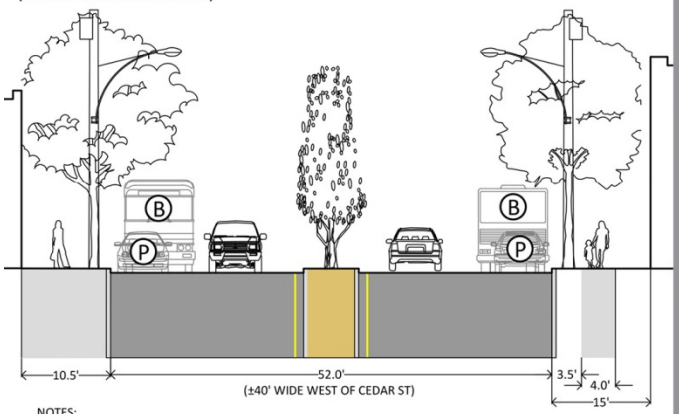


Cross Section 4.2

Broad St

Summit

(Park Ave to Morris Ave)



NOTES:

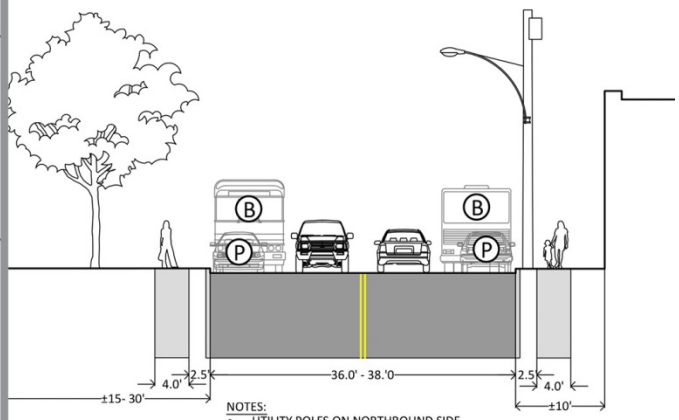
- 10' - 15' TYPICAL SETBACK TO COMMERCIAL/RETAIL AND PARKING DECK. (NO BUILDINGS ON SUMMIT VILLAGE GREEN)
- PARK AVE TO WALNUT ST: MEDIAN AND (2) WESTBOUND TRAVEL LANES
- WALNUT ST TO SUMMIT AVE: DOUBLE YELLOW CENTERLINE (NO MEDIAN)
- SUMMIT AVE TO MAPLE ST: MEDIAN AS DEPICTED
- MAPLE ST TO MORRIS AVE: DOUBLE YELLOW CENTERLINE (NO MEDIAN) AND REDUCED CARTWAY WIDTH (±40')

Cross Section 5

Morris Ave

Summit

(River Rd to Summit Ave)



NOTES:

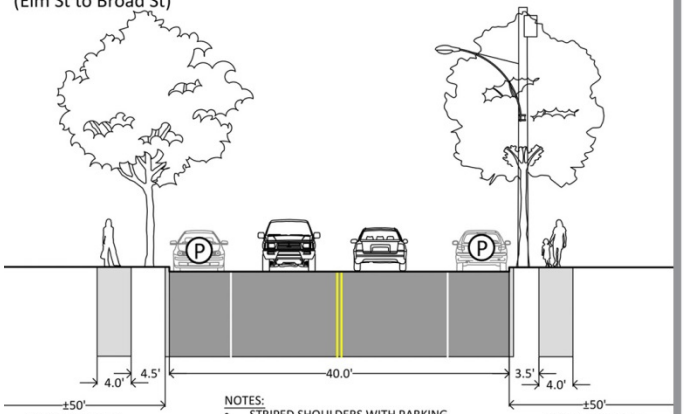
- UTILITY POLES ON NORTHBOUND SIDE
- 10' - 30' TYPICAL SETBACK TO VARIOUS USES INCLUDING RESIDENTIAL, COMMERCIAL, RETAIL.

Cross Section 6

Summit Ave

Summit

(Elm St to Broad St)



TYP. SETBACK TO RESIDENTIAL STRUCTURES

NOTES:

- STRIPED SHOULDERS WITH PARKING NORTH OF PARMLEY PLACE
- MARKED PARKING SPACED SOUTH OF PARMLEY PLACE INTO DOWNTOWN
- UTILITY POLES ALTERNATE NORTHBOUND AND SOUTHBOUND SIDES AT VARIOUS LOCATIONS

TYP. SETBACK TO RESIDENTIAL STRUCTURES

Municipal Meeting Record

Municipal Meeting: City of Summit
512 Springfield Avenue
February 7 – 10:00 AM

Attendees

1. City of Summit – Aaron Schrager
2. NJ TRANSIT – Jen Buison, Mike Viscardi
3. NJTPA – Keith Hamas
4. NV5 – Liz Ward, Chris Lucas, Kevin Perry

Purpose of meeting

The purpose of the meeting is to review findings from the street audit and brainstorm recommendations. The project team will have concept starter ideas for review. The goal is to leave on the same page about recommendations for specific locations.

Agenda

1. Review of Street Audit Findings
    - What was documented: pedestrian amenities such as pedestrian ramps and crosswalks; bicycle facilities
2. Concept Development Discussion
    - Pedestrian Improvements
    - Bicycle Improvements
    - Traffic Calming
    - Off-road
    - Other recommendations

Next Steps

- Counts: MioVision and Manual
- Public outreach event

Meeting Notes

- Summit is interested to see concepts
- Recent pedestrian improvements have been made to Springfield Avenue east of station including sidewalk and protective rail under railroad bridge
- Work on Morris Avenue bridge over railroad tracks west of station should be completed in Spring 2018
    - Bridge closure affecting traffic patterns for station access
- Elm Street and Broad Street concept:
    - Ensure buses can make eastbound left from station area onto Broad Street (long-term extension of concrete curb may not be feasible or they would have to be mountable)
- Railroad Avenue @ Summit Station concept
    - Ensure reduced lane width accommodates buses
    - Possible conflict if vehicle is stopped in narrow lane
    - Long-term idea of improving waiting space for transit customers on south side of station is a good idea
- Union Place & Beechwood Road concept
    - Reconsider possible merging conflicts re: drop-off lane entering traffic flow
    - Summit may investigate long-term solution in this area; consideration of cobble surface
- High Street & Kent Place Boulevard concept
    - Ensure turning radii can accommodate bus for long term
    - Higher volumes at this intersection currently due to Morris Avenue bridge work
- Morris Avenue, Springfield Avenue, & Chapel Street concept
    - The proposed concept may help alleviate speeding around bend
    - Springfield Avenue will have striped shoulders
- Upper Overlook Road, Walnut Street, & Broad Street concept
    - Ensure right turn radius from Walnut Street to Upper Overlook Road is functional
    - Private driveway access north of intersection could be improved with marked crosswalk
- Sheltered Bicycle Parking @ Summit Station concept
    - Summit and NJ TRANSIT in process for this idea
- Lot 9 Access and Crossing Morris Avenue concept
    - Lot to be resurfaced soon
    - Crossing beacons a good idea for this location
- Priority routes / bicycling in Summit
    - Topography can be a limiting factor
    - Priority routes identified tend to be arterials
    - Use of residential routes for bicycles would be beneficial but routing study should be comprehensive
- Connect the Park Line concept
    - City of Summit has not formally adopted this project; it is in concept and being handled by local non-profit

Public Input Record

A Public Information Center for this study was hosted at Summit Train Station on Thursday, April 12, 2018 from 5-7 PM.

Comments Collected at Public Information Center

- Getting to the train station can be dicey
- Need covered bicycle racks
- Curb extensions work in Evanston, IL: Parking reduced and snow plow operates learned to work around curb extensions
- Broad Street & Summit Avenue intersection has lots of traffic: poor visibility
- Union Place & Summit Avenue: Needs better visibility; make it legible to stangers
- Look @ Bank Street near Greek Diner
- Make the bicycle trail – connect to the station
    - New Providence
    - Berkely HT
    - RT 32
- Covered bicycle parking on Northeast side of station
- Need enforcement to prohibit the double parking of cars
- Blackburn connection to New Providence
- Maple Avenue & Union Place Ped Improvement needed
- Deforrest Norwood - Flashing lights don't always work
- More covered bicycle parking (South Side)
- More flashing beacons
- Need to prevent cabs from running through crosswalks while pedestrians are walking
- More RI-6a's @Xwelks
- Cars need to be more careful and cognizant of cyclists
- Behavior change
- Not enough bicycle parking on south side (in summer)
- Elm Street Lot, provide increased clear zone from drive aisle exit to Elm Street. It is difficult to turn safely
- Privacy safety
- Scooter parking
- Broad Street and Summit Avenue intersection, lots of traffic, poor visibility

Comments Collected via Email

None

End of Summit Train Station Report

WOODBRIDGE TRAIN STATION REPORT

JUNE 2018

The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Abstract:

The purpose of this study is to identify and address the most basic barriers limiting pedestrian and bicycle access to Woodbridge Train Station. This study has produced a series of conceptual design enhancements at targeted locations to improve transit station access and safety for bicyclists, pedestrians, and people with disabilities. The design concepts emphasize bicycle and pedestrian improvements that are highly actionable in terms of cost, level of coordination, and time to implementation. In other words, this study looks to implement "low-hanging fruit" improvements that can be accomplished quickly and inexpensively. Each design concept also includes recommendations for implementation, phasing, and funding sources.

The findings of this study have been discussed and reviewed with local municipal officials and have been presented for public comment at a Public Information Center that was hosted at Woodbridge Train Station.

Prepared by NV5 and 4ward Planning

Woodbridge Train Station Report Table of Contents

1. Overview and Context

Woodbridge Station is located on Pearl Street between Main and Green Streets in Woodbridge Township, NJ. The station is served by NJ TRANSIT's North Jersey Coast Line and averaged 1,800 weekday boardings in 2016. In addition to Woodbridge Station, the township is also served by Avenel and Metropark Stations.

Woodbridge Township covers an area of about 24.5 square miles and has a population of approximately 100,000 people. Many distinct unincorporated communities exist within the township, such as Downtown Woodbridge, Port Reading, Sewaren, Avenel, Iselin, and Fords, among others. Woodbridge Station is located in Downtown Woodbridge, in walking distance of the Main Street retail area and the municipal complex.

Woodbridge Township adopted a Complete Streets policy in 2017 and has conducted prior studies related to bicycle and/or pedestrian mobility in the general area of Woodbridge Station, including:

- Township of Woodbridge Bicycle Route and Phasing Plan (2014), and
- Woodbridge-Rahway Regional Access to the Arts (2014, Together North Jersey Local Demonstration Project)

Both studies demonstrate the important links among bicycle and pedestrian mobility, access to public transit, access to business and arts centers, and economic growth. The Bicycle Route and Phasing Plan proposes conceptual designs for Green Street, Rahway Avenue, and Main Street, each of which was identified as a priority route for this study. The Regional Access to the Arts project re-envisions the station and adjacent property as an "anchor" to provide access and patronage to a burgeoning arts community and future arts-based development and programming in Downtown Woodbridge.

Woodbridge's street network follows a deflected grid pattern, which adjusts to follow major transportation and geographic barriers, including:

- New Jersey Turnpike,
- Route 1
- Route 9
- Route 35
- Heards Brook
- North Jersey Coast Line
- Northeast Corridor

The Priority Routes Map (Figure W-1) for Woodbridge shows all routes that were reviewed in this study, as well as the priority routes, and indicates the locations of specific road cross-sections that are presented in the Appendix. The Priority Routes identified include:

- Rahway Avenue
- Green Street
- Main Street
- Pearl Street
- Woodbridge Avenue
- Berry Street
- Legion Place
- Fulton Street
- Port Reading Avenue
- 6th Avenue
- Langford Avenue
- 5th Avenue
- Grand Avenue
- Blair Road

Background Data

Background research included review of existing documents, programs and data sources:

Local Documents

Title	Date
Main Street Rehabilitation & Transit Village Plan	June 2008
Township of Woodbridge Official Zoning Map	December 2009
Woodbridge Township Complete Streets Policy	July 2011
Woodbridge-Rahway Regional Access to the Arts (Together North Jersey)	August 2014
Transportation Alternatives Funding Application for Woodbridge Bicycle Connect	March 2015
Township of Woodbridge Bicycle Route & Phasing Plan	August 2015
Woodbridge Bicycle Connect / Transportation Alternatives Program Striping Plan*	January 2018

*Note: This study was conducted concurrently with the latter stages of road striping design for the Bicycle Connect Plan. Results from this study may deviate from the Bicycle Connect Plan

Parking Lots

Lot Number	Location	Owner	Spaces
1	Green Street & Pearl Street	NJ TRANSIT	130
2	Pearl Street	NJ TRANSIT	20
3	Poillon Street	Woodbridge Township	79
4	Eleanor Place	NJ TRANSIT	281
		Total spaces	**510**

Map: Locations of Parking Lots

2. Existing Conditions

(Observed January 22, 2018, temperature in the 40s)

- Sidewalks in the vicinity of the train station, as well as between parking areas and other pedestrian trip generators, are typically in good condition
    - Sidewalks are continuous with adequate connections within 3/4-mile radius of the station
    - Dedicated pedestrian connection across Main Street between Parking Lot 4 and the station entrance is in excellent condition
    - Crosswalks outside of the immediate vicinity of the station are generally deficient, and are either faded or lack visibility
    - Many pedestrian ramps outside of NJ TRANSIT property do not meet ADA standards
        - Most of the intersections on Woodbridge Avenue, Main Street, Rahway Avenue, and Amboy Avenue (Rt 35) require pedestrian ramp upgrades
- The intersections to the east of the station have large, concrete channelizing islands that shorten pedestrian crossing distance and organize and slow moving vehicles
    - Rahway Avenue, Green Street, and E. Green Street
    - Main Street, Rahway Avenue, and Berry Street
- Bicycle racks are full on the east side of the station at Green Street
- No covered bicycle parking or bicycle lockers are present at the station
- There are no on-road bicycle facilities (except for a ±140’ bicycle lane on Main Street at Pearl Street/Fulton Street that does not connect to other bicycle facilities)
- The station area and downtown lack bicycle facilities and bicycle parking

Photo Log

The following photos and captions describe existing conditions around and to the train station.

NJ TRANSIT parking lots at Woodbridge Station are well lit. (Woodbridge_180122_070211.JPG)

Parking for (24) bicycles is provided at the north end of the station property adjacent to Walgreens. Covered parking could be considered here. (Woodbridge_180122_071433.JPG)

A mid-block crossing at Green Street was observed to be busy in the morning hours. An actuated pedestrian signal like the one at Main Street may be appropriate here. (Woodbridge_180122_072204.JPG)

"Desire paths" from adjacent property to the station should be considered for paving over. (Woodbridge_180122_072524.JPG)

Parking for (8) bicycles is provided adjacent to the eastern entrance of the station. (Woodbridge_180122_072647.JPG)

Shrubbery on Pearl Street south of the station entrance is encroaching on the sidewalk. (Woodbridge_180122_074115.JPG)

The west station entrance at Pearl Street sees a high volume of drop-off activity. Vehicle movements were observed to be unpredictable. This area may benefit from measures to formalize the drop-off and pick-up movements. (Woodbridge_180122_073005.JPG, Woodbridge_180122_073134.JPG)

ADA parking is provided in Lot 2 on the south side of the station. The accessible route from ADA parking to station elevators is unmarked, indirect, and forces users to awkwardly approach and cross a driveway. (Woodbridge_180122_073804.JPG), Woodbridge_180122_073819.JPG)

Main Street has a short (±140') stretch of buffered bicycle lane passing under the tracks. (Woodbridge_180122_074342.JPG)

The actuated pedestrian signal at Main Street is an excellent feature that makes access from Lot 4 to the station safer and more convenient. (Woodbridge_180122_074825.JPG)

Lot 4 could benefit from aesthetic upgrades (planting, screening of dumpsters) at the pay station and start of the paver path. (Woodbridge_180122_075202.JPG)

This paver path connects Lot 4 to Green Street (±1200') along the east side of the tracks. It is an excellent feature for this linear station configuration. (Woodbridge_180122_075233.JPG)

Pedestrian crossing signals were observed at Poillon Street & Rahway Avenue. Actuators were not present. It is unclear if the signals are operational. (Woodbridge_180122_081342.JPG)

Sidewalks along Pearl Street adjacent to Lot 1 are approaching a state of disrepair. (Woodbridge_180122_083454.JPG)

Sidewalk along Green Street at the track crossing would benefit from widening. (Woodbridge_180122_083923.JPG)

Many intersections in the study area were observed to include "daylighting" measures such as what is pictured here, at Pearl Street. (Woodbridge_180122_083619.JPG)

Crosswalks and curb ramps varied in condition throughout the study area. It is generally recommended to bring all curb ramps up to standard in terms of slope and inclusion of detectable warning surface. (Woodbridge_180122_095742.JPG, Woodbridge_180122_093500.JPG)

The intersection of Main Street and Amboy Avenue is wide, busy, and challenging to pedestrians. Pedestrian enhancements should be considered. (Woodbridge_180122_095417_P.JPG)

N. Park Drive and S. Park Dr along Heards Brook Park are quiet, calm, and lead directly to the station entrance at Pearl Street. These routes should be considered for a bicycle boulevard treatment. (Woodbridge_180122_121741.JPG, Woodbridge_180122_122222.JPG)

3. Issues & Opportunities

General Issues

- Many crosswalks faded or lack visibility
    - Many crosswalks are marked using standard markings which lack visibility
        - Continental stripe crosswalks were observed mainly along Main Street
    - Graphic examples of each crosswalk type can be in the Study Overview Report
- Intersection of Main Street & Amboy Avenue requires pedestrian amenities and vehicular alignment cues

Station Area Issues

East side of the station (Poillon Street)

- Pick-up/drop-off takes place on Poillon Street, which is a dead end street
- Pedestrian crossing signals were observed at Poillon Street and Rahway Avenue, but they lack actuation and it is unclear whether they are functional

West side of the station (Pearl Street)

- Pick-up/drop-off takes place at the front of the station where Pearl Street intersects with Brook Street and drive aisles for Lots 1 and 2
    - Motor vehicle movements are unpredictable in this area
- No crosswalks present over Pearl Street to provide station access
- No bicycle parking on west side of station

Commuter parking lots

- No ADA compliant connection between Parking Lot 2 and the train station entrance
- Sidewalk and curb along Lot 1 (Pearl Street) in medium-poor condition
- No formal transition between Parking Lot 4 and the paver path to the train station

General Opportunities

- Improve crosswalks visibility, paying attention to areas that wear out the most
    - Crosswalk upgrades and/or restriping should use “ladder” or “continental” striping
    - To minimize wear, utilize continental style crosswalks with striping applied parallel to the direction of motor vehicle travel
- Improve curb ramps lacking high contrast tactile warning surface
- Improvements to intersection of Main Street and Amboy Avenue to organize turning movements and negotiation the alignment of Main Street
    - Add pedestrian refuge island to western approach
    - Bring curb ramps to ADA compliance
    - There is an opportunity to improve operations, organize traffic movements, and reduce motor vehicle speeds through channelization (separating motor vehicle turning movements from through movements by application of lane striping), and applying “deer tracks” (skip lines all the way through the intersection to reinforce lane space for through movement or turning movement)

- Provide bicycle access from adjacent neighborhoods to Woodbridge Station
    - Sewaren connection via Woodbridge Avenue
    - Port Reading connection via Port Reading Avenue
    - Bicycle boulevard along Heards Brook Park could be low-stress bicycle access to station for surrounding residential area
- Extend existing curbside buffered bicycle lane with a shared lane markings along Main Street as far as needed to connect to intersecting routes

Station Area Opportunities

East side of the station

- Consider cul-de-sac style turn around at the terminus of Poillon Street, at the eastern train station entrance/exit
- Consider adding a shelter to provide covered bicycle parking at the 24-bicycle capacity parking area adjacent to Walgreens
- Consider adding Rectangular Rapid Flash Beacons (RRFB) at mid-block crossings on Green Street that connect to the station

West side of the station

- Consider striping plan to formalize pick-up/drop-off movements
- Provide crosswalk over Pearl Street for pedestrian access to station (as leg of Pearl Street & Brook Street, or at a mid-block location)

Commuter Parking Lots

- Lots 1 and 2:
    - Re-stripe Lot 1 with ADA parking spaces adjacent to the existing concrete sidewalk, so that the sidewalk can serve as the accessible route to the station
    - Standardize the drive aisle width in Lot 1 at 24’; this enables space for bicycle parking and or plantings next to the sidewalk at the north end of the lot
    - Re-stripe existing ADA spaces in Lot 2 as compact car parking
- Lot 4 - Formalize the connection between the parking and the paver walkway to the train station

Existing Conditions, Issues & Opportunities (general and station area specific) are synthesized and presented in Figure W-2: Issue & Opportunities Map.

Figure W-1: Priority Routes Map

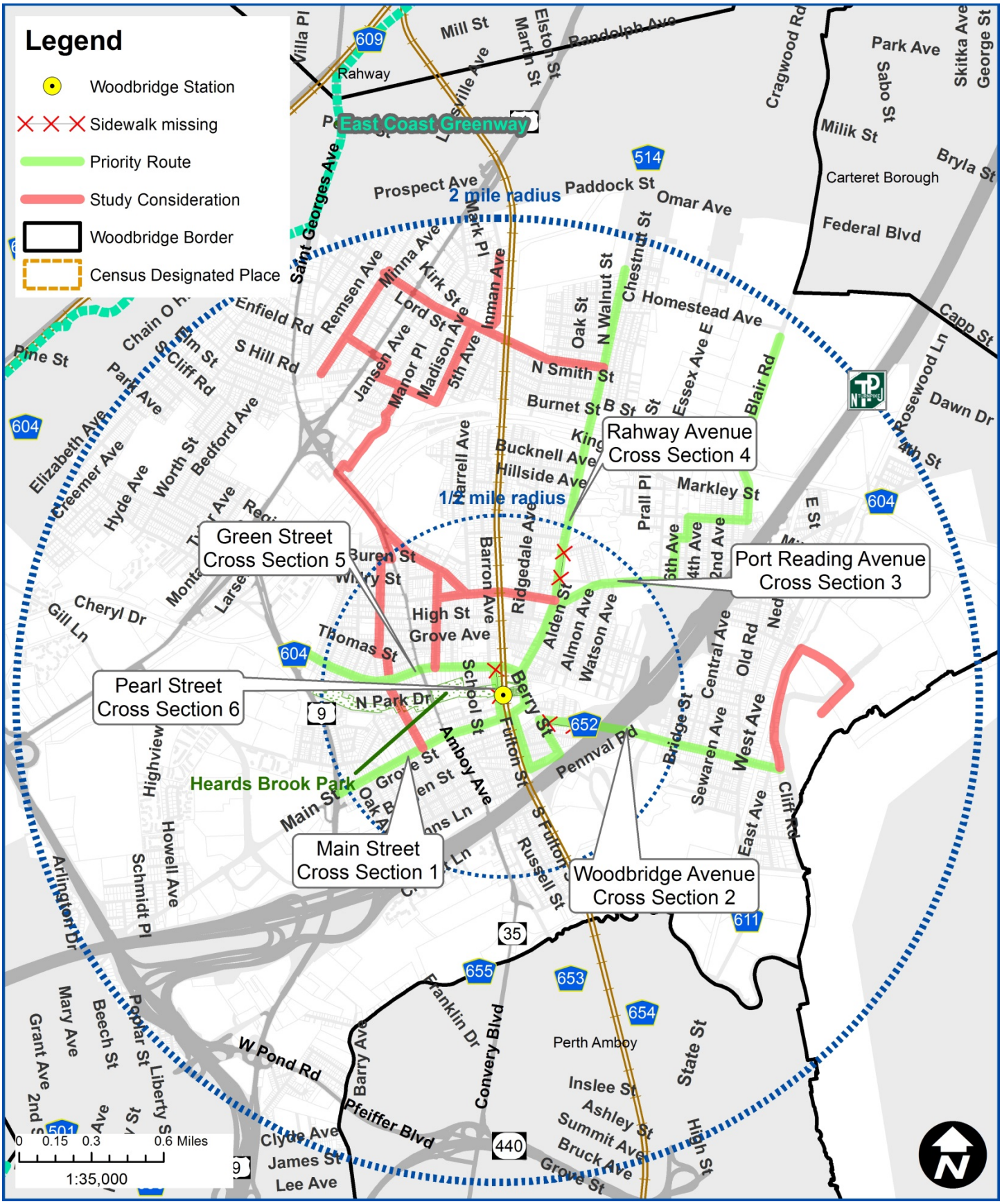
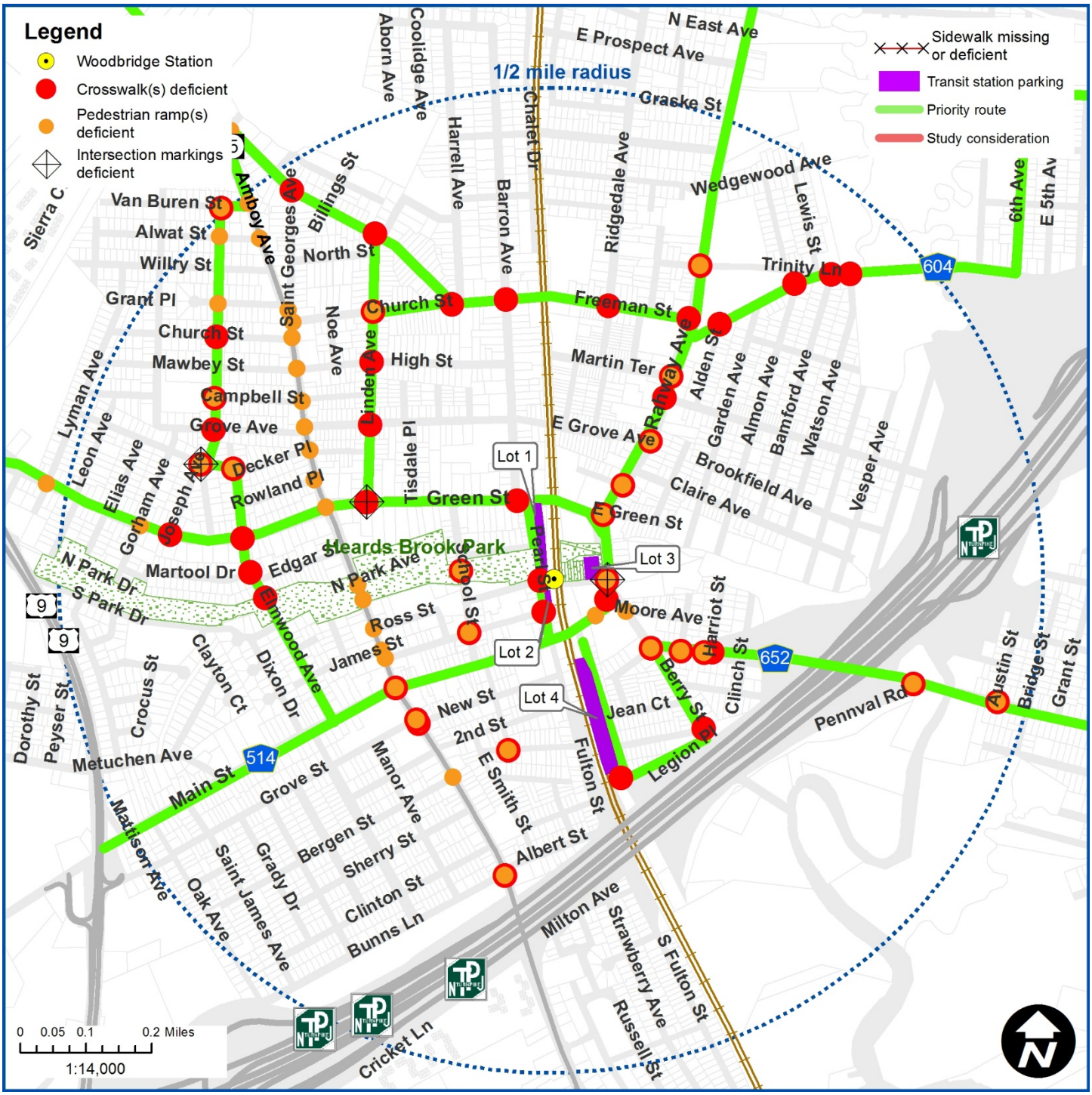


Figure W-2: Issues & Opportunities Map



KEY ISSUES				OPPORTUNITIES			
1	Intersection of Main Street & Amboy Avenue has various turning conflicts; Main Street alignment and width changes at Amboy Avenue	3	Parking Lot 4: No pedestrian connection from Parking lot to station	1	Add pedestrian refuge to western approach, intersection striping and make curb ramps compliant	3	Parking Lot 4: Install paver path to create pedestrian connection from Parking lot to station
2	Parking Lot 1: No accessible route on south side of station			2	Parking Lot 1: Create accessible path on south side of station,		

4. Recommendations & Design Concepts

The goal of this study is to identify the most basic barriers limiting pedestrian and bicycle access to the station, and to propose recommendations to address them. As such, the study has produced a series of actionable design concepts specific to the study area that propose improvements for bicyclists and pedestrians.

Most design recommendations consist mainly of markings, with more substantial interventions at high-priority locations. Locations where deficiencies have been observed in crosswalks, pedestrian ramps, and intersection markings are displayed in Figure W-2: Issues & Opportunities Map.

In general, recommendations respond to deficiencies involving:

- Pedestrian ramp condition (if any) for ADA compliance
- Crosswalks for visibility and condition
- Intersection markings to organize turning and thru alignment at complex intersections
- On-street bicycle facilities where feasible
- Lighting for adequate coverage during low-light hours

In response to these issues, the project team has identified the following general recommendations for each station area:

- Provide high-visibility crosswalks
- Provide curb ramps at all intersections and crossings
- Provide bicycle accommodations along low-speed routes (bicycle boulevard treatments)
- Deploy epoxy curb extensions
- Provide RRFBs at unsignalized crossings, as appropriate
- Track implementation and perform post-implementation studies
- Provide sufficient bicycle parking (coordination with NJ TRANSIT may be required to provide additional bicycle racks) and consider covered, secure bicycle parking

Short-Term Conceptual Enhancements

Most of the design concepts in this study have the potential to be deployed as short-term enhancements, also referred to as Tactical Urbanism projects, which are design changes implemented to street environments in a “light, quick, cheap,” and temporary manner. By demonstrating to roadway users – pedestrians, bicyclists, drivers – the effectiveness of design changes in real space, there is an opportunity to build significant community support before making large investments in infrastructure.

The short-term approach is the basis for most of the recommendations in this study. Minimal funding can accomplish many of these conceptual improvements, without having to initiate a larger capital project. In many cases, re-striping roads with these design concepts as a component of routine resurfacing projects could result in little to no additional cost, compared to replacing the markings as they were prior to resurfacing.

Long-Term Conceptual Enhancements

Many of the short-term concepts have the potential to become long-term buildouts. The primary example, which is used throughout the six transit stations reviewed in this study, is the proposed short-term curb extension composed of colored epoxy gravel. While the short-term application can be implemented almost anywhere, the long-term buildout of concrete-surface curb extensions could be pursued as a long-term upgrade. Locations where epoxy gravel curb extensions are proposed require additional study prior to long-term buildout with concrete, in order to understand implications to road drainage, utilities, and other factors, as well as to obtain funding for design and construction.

Phasing

With a goal of presenting NJ TRANSIT and the local municipalities with actionable recommendations to improve pedestrian and bicycle access to the stations, the recommendations were mainly low-cost and high-impact. Each location that received specific design concept recommendations includes a combination of treatments, and could be implemented in a phased approach, or combined together as part of a broader, more comprehensive effort.

Design Concepts for Woodbridge Train Station

Deficient pedestrian ramps were observed throughout the study area; as well as crosswalks that were either faded or required application of high-visibility thermoplastic striping to function more effectively. The use of colored epoxy gravel to quickly and inexpensively achieve the benefits of curb extensions and median extensions can be paired with intersection markings to improve vehicular alignment. High-visibility crossings will improve the visibility of high volume crossing locations. Station signage, localized concrete work, and landscape improvements would improve the connection between the existing pedestrian path with decorative pavers and Lot 4. Modifications to the location and layout of ADA parking (Lots 1 and 2) are also recommended to provide adequate spacing, layout, and an accessible path.

In response to these issues, conceptual design improvements have been developed at the following locations to address the most basic barriers limiting pedestrian and bicycle access to the station:

Design Concept #	Location	Description
1	Bicycle Parking @ Woodbridge Station	• Provide bicycle parking
2	Pearl Street	• Provide striping and signage to improve pick-up/drop-off operations
3	Parking Lots 1 & 2	• Provide accessible route from ADA parking to station • Provide bicycle parking
4	Parking Lot 4	• Provide signage, concrete ramp, and landscaping
5	Main Street & Amboy Avenue	• Provide high-visibility crosswalks • Provide a colored epoxy pedestrian refuge • Provide line extensions to guide vehicular turning movements
6	Sewaren Connection via Woodbridge Avenue	• Provide bicycle lanes, shared lane markings, and bicycle route signage
7	Rectangular Rapid Flash Beacons at Unsignalized Crossings	• Provide RRFBs at unsignalized crossings

The remainder of this Station Report provides illustrations for each design concept along with a description of the general approach and materials for short-term and long-term construction. Cost estimates with recommendations for funding and phasing are presented after the design concepts.

WOODBRIDGE CONCEPT #1
BICYCLE PARKING @ WOODBRIDGE STATION

Concept - Planning Purposes Only

General Approach:

Expand bicycle parking as demand increases through implementation of Woodbridge Bicycle Connect / Transportation Alternatives Plan.

Short-Term:

Expand existing bicycle parking area adjacent to Green Street by providing a concrete pad and NJ TRANSIT inverted-U style bicycle racks

- Concrete pad
- Bicycle racks

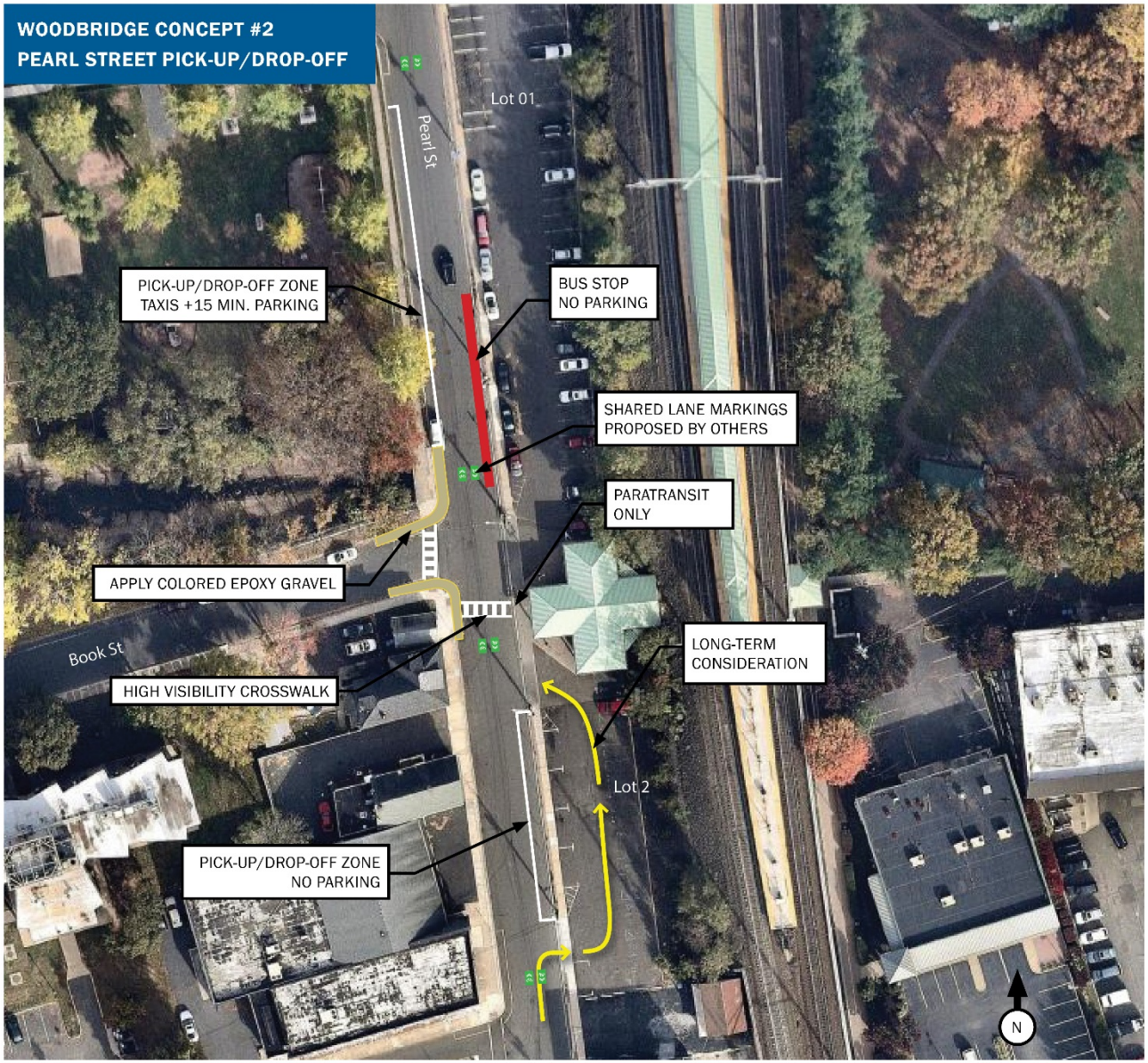
Long-Term:

Consider providing covered, secure bicycle parking.

Considerations:

- Evaluate current use of existing bicycle racks and growing demand over time as the result of the Woodbridge Bicycle Connect / Transportation Alternatives Plan
- Bicycle stations vary in design and costs
- Consider enclosure material options:
  - no enclosure
  - partial enclosure
  - clear acrylic (weather resistance)
  - steel mesh (durability)
- Consider accessories such as lighting, air, and repair station
- Consider rack style to be employed within shelter and implications for capacity

Sample product for long-term consideration: Bicycle station with partial enclosure (Source: duo-gard.com)



Concept - Planning Purposes Only

General Approach:

Clearly define drop-off areas for taxi and private vehicles. Increase visibility of daylighted intersection and shorten crossing distance by painting and/or building out the existing curb extension outlines.

Short-Term (Low Cost) Materials:

- White striping
- White thermoplastic crosswalk
- Yellow striping
- Colored epoxy gravel
- Signage

Long-Term (High Cost) Materials:

- Build concrete curb extensions
- In re-design of parking lot configuration, Lot 2 could include a formal drop-off area that is ADA accessible for paratransit and private vehicle pick-up and drop-off

WOODBRIDGE CONCEPT #3
PARKING LOTS 1 & 2

General Approach:

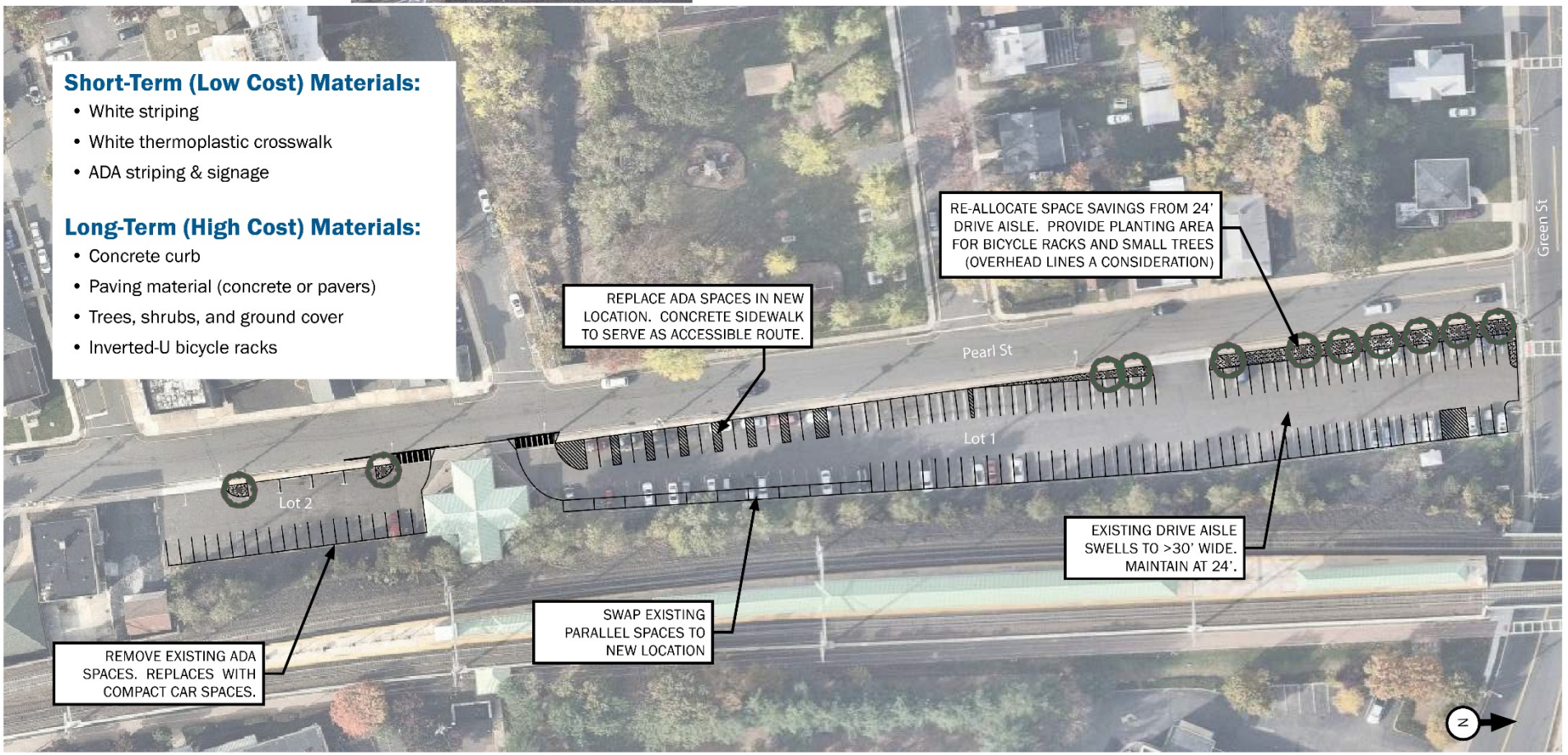
The (15) existing ADA parking spaces in Lot 2 are compact size and lack an accessible route to the station entrance and elevator. By moving the spaces and reconfiguring Lot 1, the ADA spaces can be located adjacent to the sidewalk, which will serve as the accessible route. Long-term measures can be taken in re-striping Lot 1 to normalize the drive aisle width and create space for landscape enhancements and bicycle parking. These proposed changes result in no net loss of parking.

Short-Term (Low Cost) Materials:

- White striping
- White thermoplastic crosswalk
- ADA striping & signage

Long-Term (High Cost) Materials:

- Concrete curb
- Paving material (concrete or pavers)
- Trees, shrubs, and ground cover
- Inverted-U bicycle racks



Concept - Planning Purposes Only

WOODBRIDGE CONCEPT #4
PARKING LOT 4

General Approach:

The Train Station Pathway that connects Lot 4 to the station is an excellent feature. However, the entrance/exit to the pathway from Lot 4 is in need of aesthetic enhancements that would make the pathway more welcoming and accessible, with the capacity to alleviate personal safety concerns (as espoused through Crime Prevention Through Environmental Design approaches).

Short Term Materials:

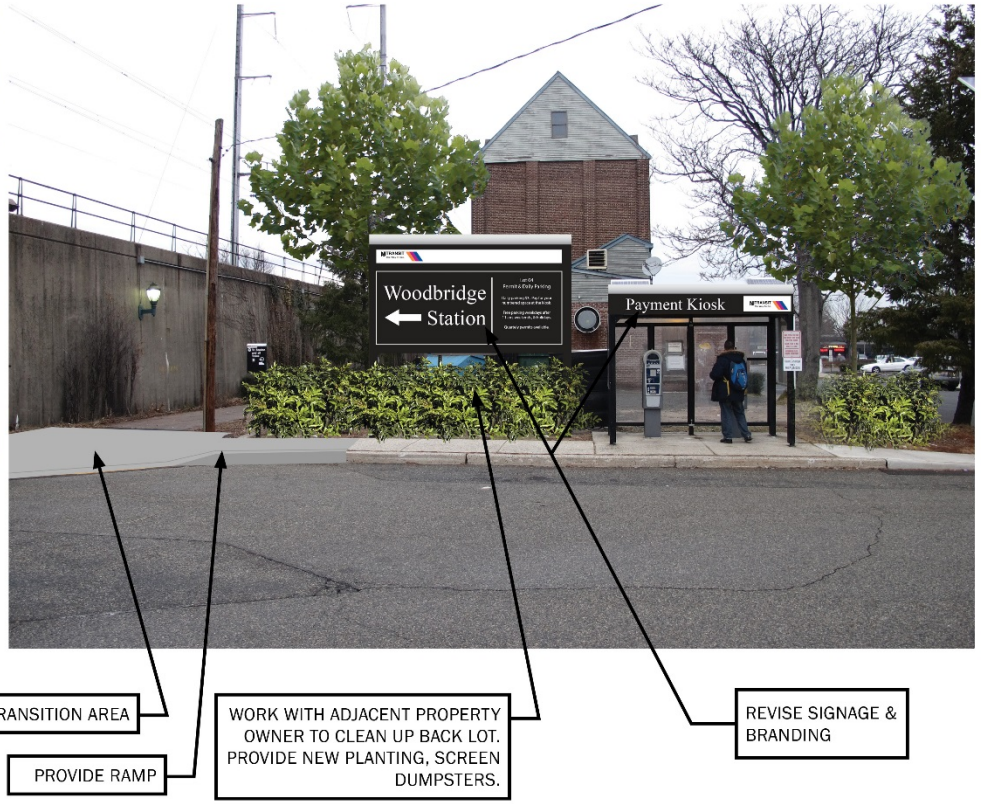
- Signage
- Tree and shrub planting

Long-Term Materials:

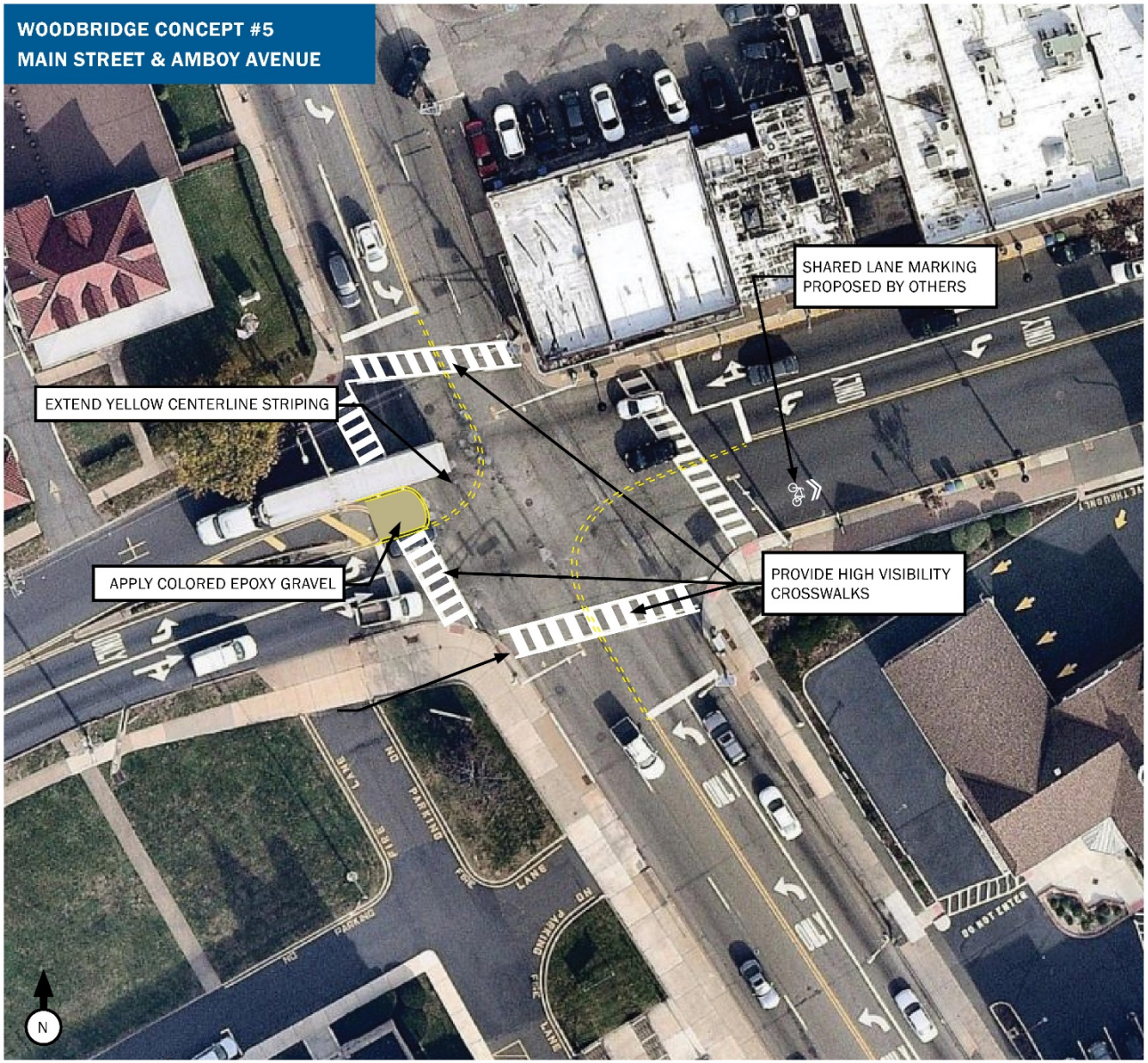
- Concrete curb
- Paving material (concrete or pavers)
- Lighting

Lot 4 Connection Path Entrance, Existing

Lot 4 Connection Path Entrance, Concept



Concept - Planning Purposes Only



Concept - Planning Purposes Only

General Approach:

Provide intersection markings to organize vehicle turning movements, and extend the existing painted median through the crosswalk. Upgrade crosswalks from standard to ladder-style (high visibility).

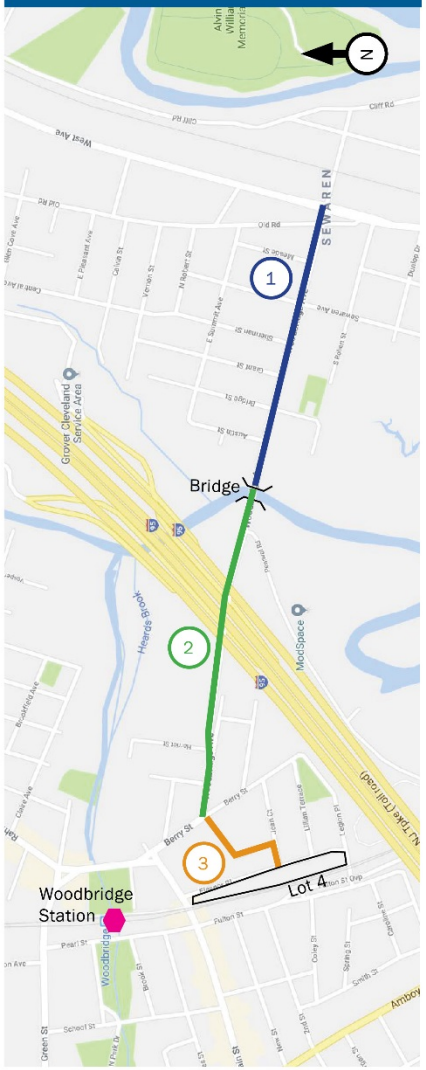
Short-Term (Low Cost) Materials:

- Yellow striping
- Colored epoxy gravel
- White thermoplastic crosswalk

Long-Term (High Cost) Materials:

- Extend concrete curb / full buildout of median and pedestrian refuge

WOODBRIDGE CONCEPT #6
SEWAREN CONNECTION VIA WOODBRIDGE AVENUE



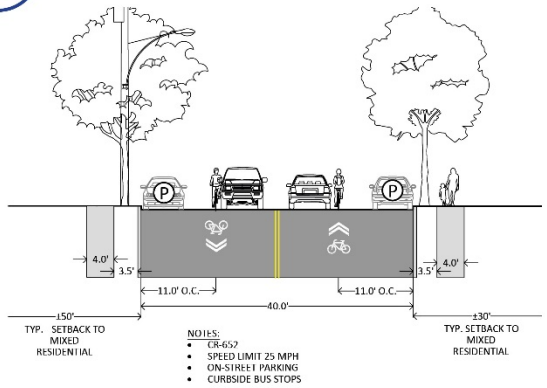
Concept - Planning Purposes Only

General Approach:

The Sewaren community is located within approximately a mile of Woodbridge Station. Woodbridge Avenue is the principal connection between Sewaren and the station area, and is capable of supporting bicycle facilities, including bicycle lanes and shared lane markings, as shown below. From the intersection of Woodbridge Avenue and Gordon Street, a short route on residential roads is proposed to provide a low-stress connection to Lot 4. Additional bicycle parking can be provided in Lot 4, from which the station can be accessed by the Train Station Pathway.

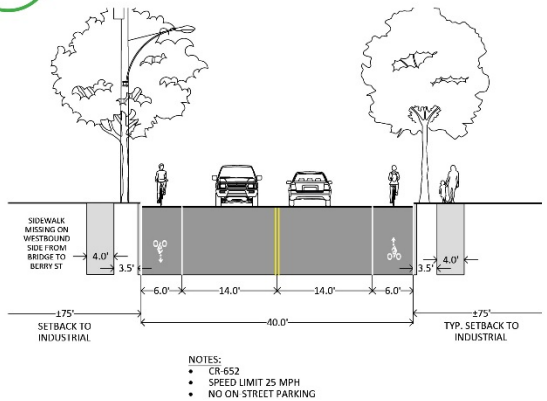
1 Woodbridge Avenue Shared Lane Markings

West Avenue to bridge



2 Woodbridge Avenue Bike Lane

Bridge to Berry Street



Short-Term (Low Cost) Materials:

- Shared lane markings (thermoplastic preferred)
- Bicycle lane markings (thermoplastic preferred)
- Bicycle route signage

Long-Term (High Cost) Materials:

- Fully deployed wayfinding and signage
- Fully constructed traffic calming (as necessary)

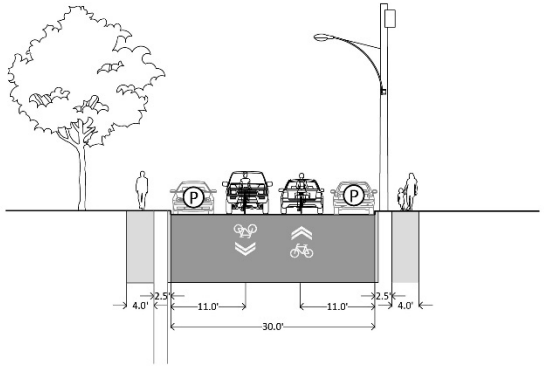
D11-1

D10-1a

D1-2c

NACTO shared lane marking example

3 Gordon Street, Wallace Street, Jean Court - Shared Lane Markings



WOODBRIDGE CONCEPT #7

RECTANGULAR RAPID FLASH BEACONS AT UNSIGNALIZED CROSSINGS

General Approach:

Pedestrian crossings at uncontrolled intersections can feel dangerous and deter people from walking along otherwise safe routes to access destinations.

There are measures available to make pedestrian crossings at uncontrolled intersections safer by increasing pedestrian visibility and alerting motorists to their presence. Such measures include Pedestrian Hybrid Beacons (also known as HAWK signals), Actuated Pedestrian Crossing Signals, and Rectangular Rapid Flash Beacons (RRFBs).

A Pedestrian Hybrid Beacon and an Actuated Pedestrian Crossing Signal have both been utilized in Woodbridge (see examples).

This study proposed installing Rectangular Rapid Flash Beacons at two (2) locations that can impact pedestrian access to Woodbridge Station: the intersection of Port Reading Avenue and Watson Avenue, and the mid-block crossing of Green Street at the railroad tracks. RRFBs are proposed because they are a lower cost solution and can be powered by solar energy.

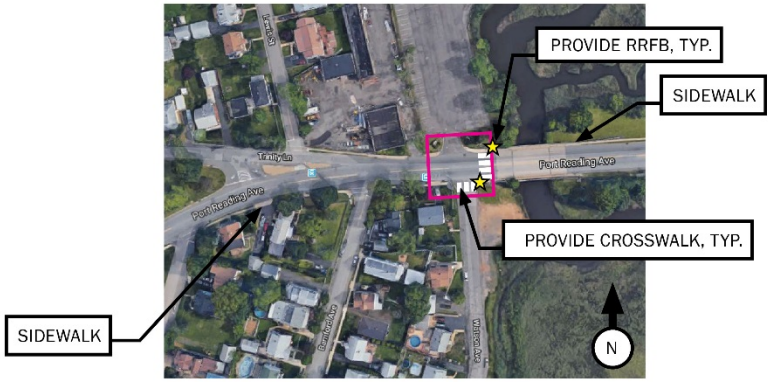
Examples:

Pedestrian Hybrid Beacon on Port Reading Avenue

Actuated Pedestrian Crossing Signal on Main Street

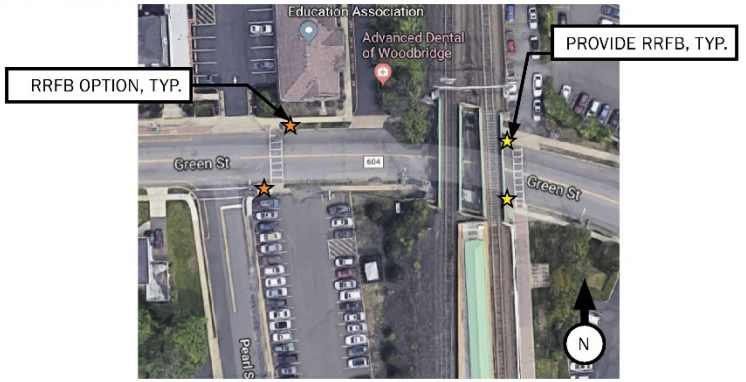
RRFB on Broad Street in Summit, NJ

Proposed RRFB at Port Reading Avenue & Watson Avenue



East of Watson Avenue, there is sidewalk present on the north side of Port Reading Avenue. West of Watson Avenue, the sidewalk on Port Reading Avenue switches to the south side. Pedestrians would have to cross at the uncontrolled intersection of Port Reading Avenue and Watson Avenue in order to stay on the sidewalk. Pedestrian safety will be enhanced by providing a crosswalk and RRFB in this location.

Proposed RRFB at Green Street



Pedestrians access Woodbridge Station by crossing Green Street at two (2) locations. It may not be feasible to provide RRFBs at both locations. In this case, the crossing directly adjacent to the tracks is preferred.

Concept - Planning Purposes Only

5. Cost Estimates

This section includes cost estimates, recommendations for project phasing (short-, medium-, or long-term), and identifies funding sources that are most appropriate or accessible for each design concept.

Refer to the Study Overview Report for additional information on funding sources that municipalities may consider pursuing.

These cost estimates include general material and installation costs. A contingency of 30% has been added to calculate the total estimated cost and account for price increases over time and price premiums that may apply to small projects. A phasing sequence with short-, medium-, and long-term time frames is provided to help the municipalities plan for implementation.

Item	**Concept 1: Bicycle Parking at Woodbridge Station**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Concrete surface (as shown in concept)	300	SF	$12.00	$3,600	Long	NJ TRANSIT Capital / Maintenance programs AND/OR Local efforts
2	Bicycle racks	12	EA	$400.00	$4,800	Long	
				SUBTOTAL	$8,400		
				CONTINGENCY (30%)	$2,520		
				TOTAL	**$10,920**		

Item	**Concept 2: Pearl Street Pick-Up/Drop-Off**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White striping	295	LF	$1.60	$472	Short	Safe Streets to Transit
2	White thermoplastic crosswalk	265	SF	$3.20	$848	Short	
3	Yellow striping	150	LF	$1.60	$240	Short	
4	Colored epoxy gravel	530	SF	$7.50	$3,975	Medium	
5	Signage	4	EA	$360.00	$1,440	Short	
				SUBTOTAL	$6,975		
				CONTINGENCY (30%)	$2,093		
				TOTAL	**$9,068**		

Item	**Concept 3: Lots 1 & 2**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	White striping	4000	LF	$1.60	$6,400	Medium	NJ TRANSIT Capital / Maintenance programs AND/OR Local efforts
2	White thermoplastic crosswalk	330	SF	$3.20	$1,056	Medium	
3	ADA striping & signage	1	LS	$4,500.00	$4,500	Medium	
				SUBTOTAL	$11,956		
				CONTINGENCY (30%)	$3,587		
				TOTAL	**$15,543**		

Item	**Concept 4: Parking Lot 4**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Signage	1	LS	$4.000.00	$4,000	Medium	NJ TRANSIT / local efforts
2	Tree and shrub planting	1	LS	$3,000.00	$3,000	Short	
				SUBTOTAL	$7,000		
				CONTINGENCY (30%)	$2,100		
				TOTAL	**$9,100**		

Item	**Concept 5: Main Street & Amboy Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Yellow striping	245	LF	$1.60	$392	Short	County Aid
2	Colored epoxy gravel	145	SF	$7.50	$1,088	Medium	
3	White thermoplastic crosswalk	825	SF	$3.20	$2,640	Short	
				SUBTOTAL	$4,120		
				CONTINGENCY (30%)	$1,236		
				TOTAL	**$5,355**		

Item	**Concept 6: Sewaren Connection via Woodbridge Avenue**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Shared lane markings (1 SLM every 250’ in both directions on 3,050’ of roadway)	25	EA	$100.00	$2,500	Short	County Aid
2	Bicycle lane striping (2,400’of roadway with bicycle lanes on both sides)	4,800	LF	$1.60	$7,680	Short	
3	Bicycle lane markings (1 bicycle lane marking every 500’ in both directions on 2,400’ of roadway)	10	EA	$120.00	$1,200	Short	
4	Bicycle route signage (1 sign every 500’ in both directions on 5,450’ of roadway)	22	EA	$120.00	$2,640	Medium	
				SUBTOTAL	$14,020		
				CONTINGENCY (30%)	$4,206		
				TOTAL	**$18,226**		

Item	**Concept 7: Rectangular Rapid Flash Beacons**	QTY	UNIT	UNIT PRICE	COST	PHASING	FUNDING
1	Rectangular Rapid Flash Beacons at Unsignalized Crossings	6	EA	$15,000.00	$90,000	Medium	Safe Streets to Transit
				SUBTOTAL	$90,000		
				CONTINGENCY (30%)	$27,000		
				TOTAL	**$117,000**		

Woodbridge Station Report Appendix

June 2018

Appendix Contents

Traffic Counts

Field Observations

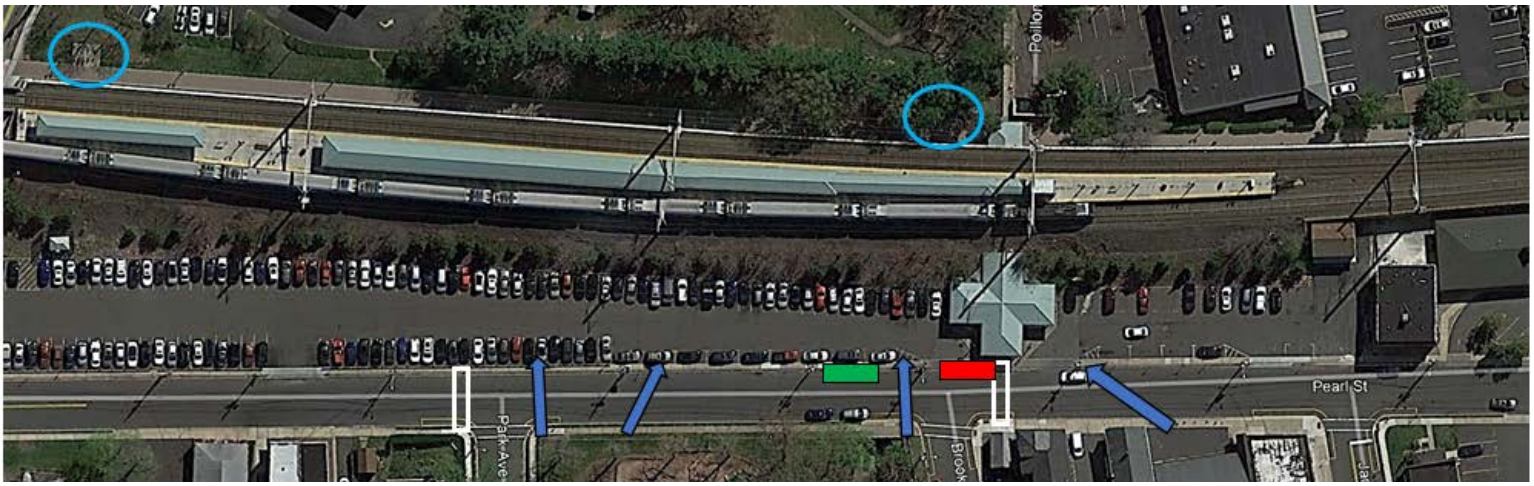
Bicycle and pedestrian counts were manually collected in the field during two-hour peak periods in the AM and PM. These counts identified bicycle parked at the station at the start of the count period, with a count at each hour to include additional bicycles parked or removed during each peak hour.

Date: Thursday, May 10th, 2018
Time: AM Peak: 7:00 AM to 9:00 AM
Location: Woodbridge, NJ 07095 (Woodbridge Train Station)
Weather: 53° & Cloudy

Pedestrian Count: 326
Bicycle Count 7:00 AM: 4
Bicycle Count 9:00 AM: 8

Notes:

- Multiple lightbulbs inside train tunnel need replacing to ensure public safety during dusk/nighttime hours of operation.
- Most irregular crossing patterns were observed in front of the station along Pearl Street and were consistent throughout observation. A suggestion would be to have a crosswalk placed at mapped locations during future projects if possible.
- Two (2) separate shuttle busses blocked part of an entrance/exit, even though there is a designated area for shuttle drop offs/pick-ups, interrupting normal traffic flow. Possibly contact NJ Transit Police or local police to enforce the usage of the proper drop off area to prevent this issue in the future.
- NJ Transit Police were present throughout the observation and interacting with pedestrians (i.e. general greetings, answering questions, etc.) They could play a part in any enforcement of rules, new signage, etc. affiliated with future projects.



= Bicycle Rack Locations
= Observed Crossing Pattern
= Reserved Shuttle Drop Off Location
= Suggested Crosswalk Locations (mapped in white)
= Observed Shuttle Drop Off Location

Date: Thursday, May 10th, 2018
Time: PM Peak: 5:00 PM to 7:00 PM
Location: Woodbridge, NJ 07095 (Woodbridge Train Station)
Weather: 74° Partly Cloudy

Pedestrian Count: 293
Bicycle Count 5:00 PM: 5
Bicycle Count 7:00 PM: 4

Notes:

- Crosswalk along Main Street, connecting Lot 4 to the station, was used as intended however; button usage was not as consistent as in AM observation, causing some motorists to quickly brake for pedestrian crossings.
- Motorists pulling out of the Pearl Street parking lot did so very quickly and were not looking for pedestrians using the sidewalk. A "Yield for Pedestrians" or a stop sign is recommended.
- Most of the pedestrians on the Pearl Street side of the station crossed irregularly and consistently; this was due to their rides waiting for them in the designated "15 Minute" wait zones depicted below. Suggested crosswalk placement, as identified in the AM observation, to possibly combat this issue.
- One (1) shuttle bus blocked the same entrance/exit as observed in the AM. Local authorities should enforce drop off zone, as suggested in AM observation.
- Observed irregular crossing patterns along the Green Street side of the station; patterns were consistent throughout the observation. It is suggested to install an ergonomic crosswalk in place of the current crosswalk marked (depicted below).
- NJ Transit Police were not present during this observation as in AM observation.

Digital Traffic Camera Counts

To supplement live field observations of pedestrian movements at the various train stations, NV5 staff installed portable digital traffic cameras (known as MioVision cameras) at key locations at each station. The cameras are temporarily installed on a telescoping pole at an intersection or crossing area and record video from a 'bird's eye' view to observe pedestrian and vehicle travel movements. For this project, video was collected during two weekdays. This video helped to inform pedestrian patterns in the vicinity of the train stations while minimizing the number of field staff needed at a given location. When actual pedestrian volume data was desired, key times of the video were sent into Miovision for automated processing to determine the pedestrian, bicycle and vehicle volumes present.

Date: Wednesday, April 11, 2018

Location: Pearl St. and Brook St. Woodbridge, NJ 07095 (Woodbridge Train Station)

PEDESTRIANS		
Start Time	SE Roundabout Crosswalk Westbound	Se Roundabout Crosswalk Eastbound
7:00	5	2
7:15	0	6
7:30	0	5
7:45	3	8
18:00	6	0
18:15	16	0
18:30	19	0
18:45	0	1
TOTAL	**49**	**22**

BICYCLES		
Start Time	SE Roundabout Crosswalk Westbound	Se Roundabout Crosswalk Eastbound
7:00	0	0
7:15	0	0
7:30	0	0
7:45	0	0
18:00	0	0
18:15	0	0
18:30	0	0
18:45	0	0
TOTAL	**0**	**0**

Cross Sections

The following cross sections were developed for priority walking and bicycling routes. These cross sections are representative of existing conditions observed January 22, 2018 and were used to assess the suitability of pedestrian and bicycle facilities, and to inform concept design development.

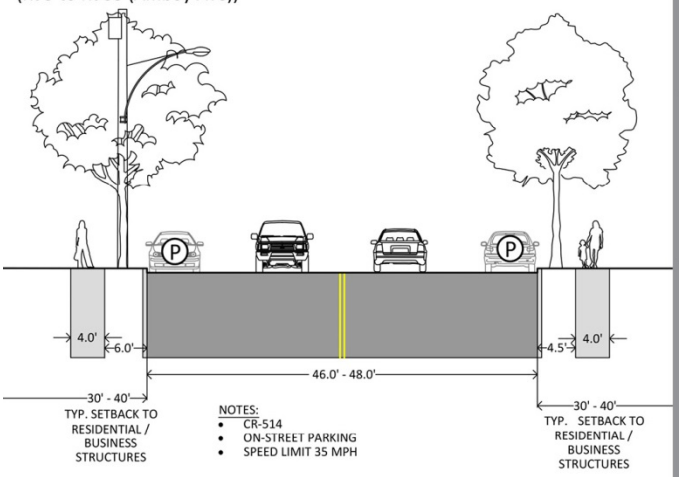
The following cross sections are included:

1.0 Main Street
  1.1 Route 9 to Route 35 (Amboy Avenue)
  1.2 Route 35 (Amboy Avenue) to Pearl Street
2.0 Woodbridge Avenue (West Avenue to Berry Street)
3.0 Port Reading
  3.1 Port Reading Avenue (Rahway Avenue to 6th Avenue)
  3.2 6th Avenue, Langford Avenue, 5th Avenue, Grand Avenue (Port Reading Avenue to Blair Road)
  3.3 Blair Road (Grand Avenue to Homestead Avenue)
4.0 Rahway Avenue (Green Street to Homestead Avenue)
5.0 Green Street (Oakwood Avenue to Pearl Street)
6.0 Pearl Street (Main Street to Green Street)

Cross Section 1.1

Main St — Woodbridge

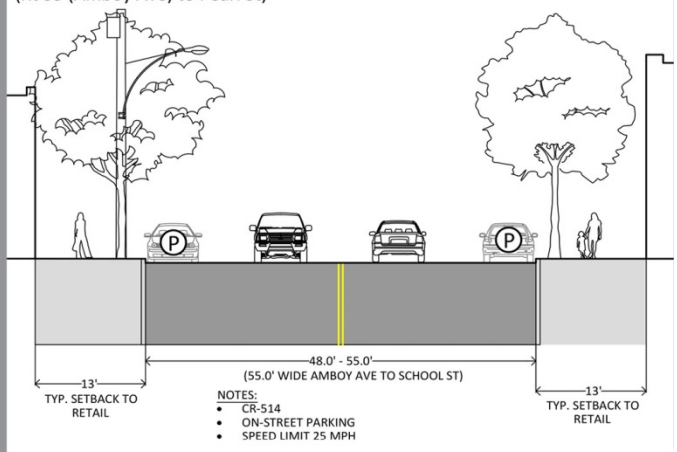
(Rt 9 to Rt 35 (Amboy Ave))



Cross Section 1.2

Main St — Woodbridge

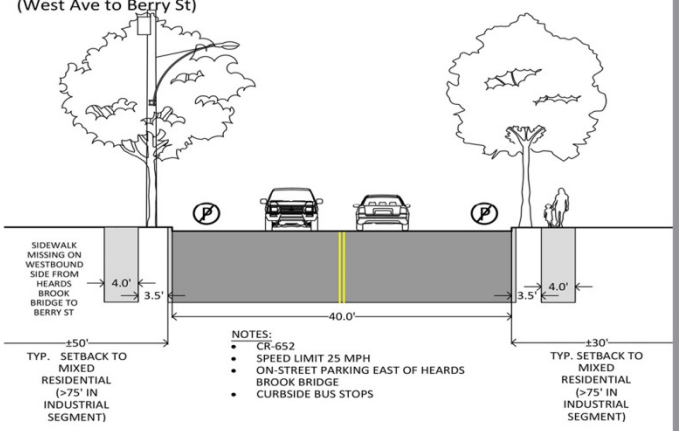
(Rt 35 (Amboy Ave) to Pearl St)



Cross Section 2

Woodbridge Ave — Woodbridge

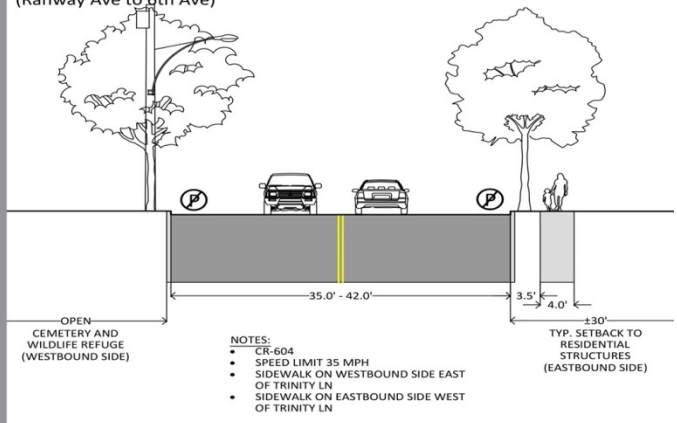
(West Ave to Berry St)



Cross Section 3.1

Port Reading Ave — Woodbridge

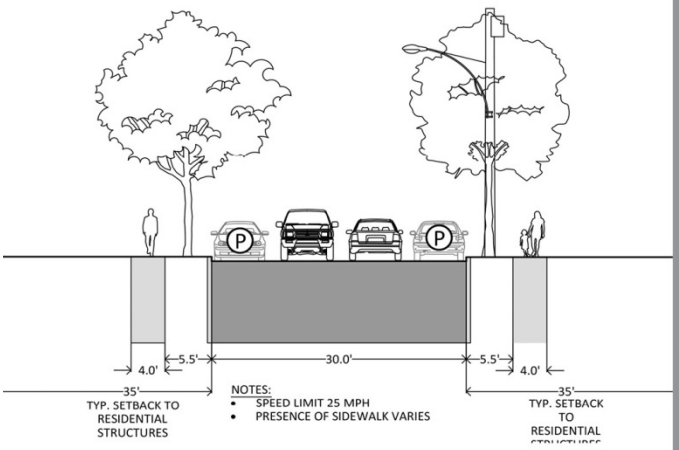
(Rahway Ave to 6th Ave)



Cross Section 3.2

6th Ave, Langford Ave, 5th Ave, Grand Ave

(Port Reading Ave to Blair Rd)

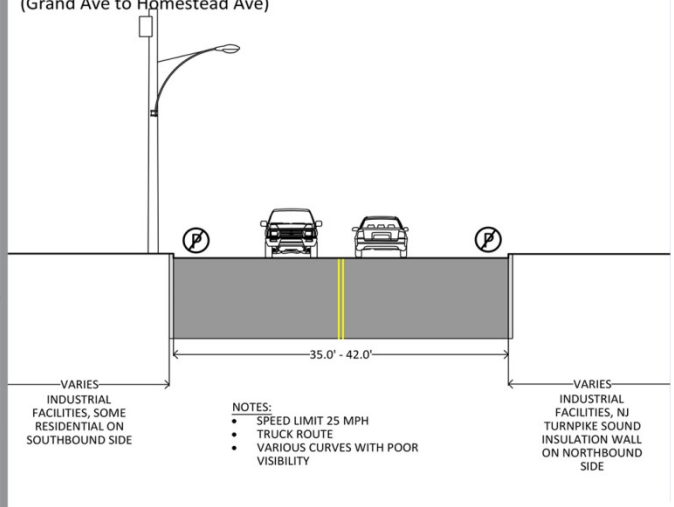


Cross Section 3.3

Blair Rd

Woodbridge

(Grand Ave to Homestead Ave)

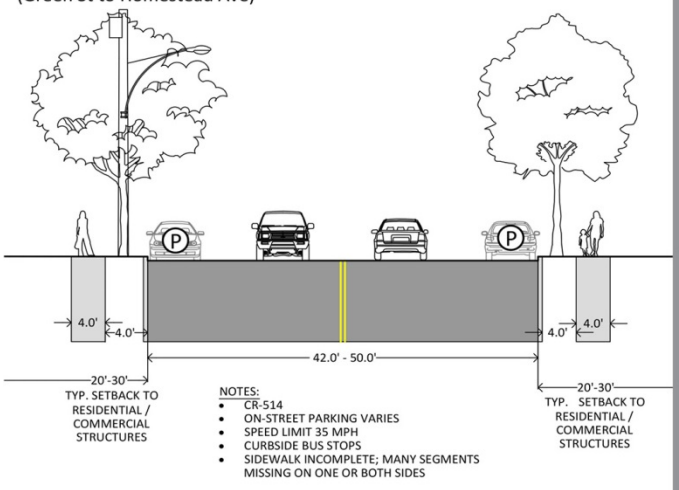


Cross Section 4

Rahway Ave

Woodbridge

(Green St to Homestead Ave)

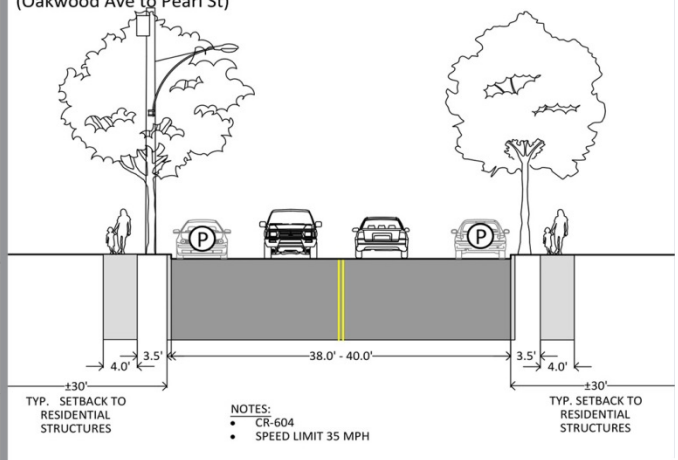


Cross Section 5

Green St

Woodbridge

(Oakwood Ave to Pearl St)

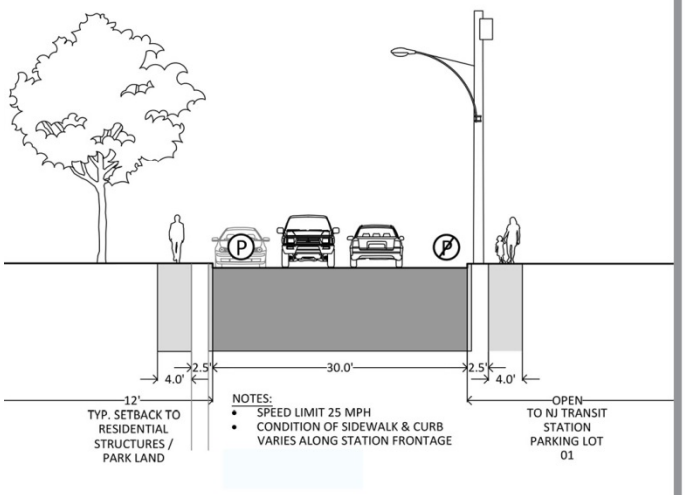


Cross Section 6

Pearl St

(Main St to Green St)

Woodbridge



Municipal Meeting Record

Municipal Meeting: Woodbridge Township
1 Main Street Woodbridge NJ 07095 - 3RD FLOOR
February 26, 2018 – 9:30 AM

Attendees

1. Woodbridge Township – Jeffrey Mayerowitz
2. Woodbridge Township – Marta Lefsky
3. Woodbridge Township – Michael Gelin
4. NJ TRANSIT – Jen Buison, Mike Viscardi
5. NJTPA – Keith Hamas
6. NV5 –Chris Lucas, Kevin Perry
7. 4WARD PLANNING – Todd Poole

Purpose of meeting

The purpose of the meeting is to review findings from the street audit and brainstorm recommendations. The project team will have concept starter ideas to review with you. The goal is to leave on the same page about recommendations for specific locations.

Agenda

1. Review of Street Audit Findings
    - What the project team documented: pedestrian amenities such as pedestrian ramps and crosswalks; bicycle facilities
2. Concept Development Discussion
    - Pedestrian Improvements
    - Bicycle Improvements
    - Traffic Calming
    - Off-road
    - Other recommendations
3. Next Steps
    - Counts: MioVision and Manual
    - Public outreach event

Meeting Notes

Overview provided by Chris.

- Woodbridge officials weren't too keen on caged bicycle racks. Kevin stated that this type of bicycle rack is being considered in Summit.
- NJ Transit stated where other stations have different enclosed bicycle rack systems. Woodbridge asked who is going to pay for it. Mentioned naming rights.
- Woodbridge is pursuing a bicycle share program. Has gotten a contract in place with a bicycle share program. Woodbridge is more interested in the Bicycle station with acrylic panels. Definitely not interested in a cage.
- It was asked by Woodbridge how easy or hard it is to hang bicycles in a shelter. Chris stated that, from personal experience, "that it's not the easiest thing in the world to do."
- Transit said they would be able to provide the "U racks" for free, as long as they were not placed on NJ Transit property.
- Federally funded project called Bicycle Connect is in latter stages of striping design with portions of the proposed work within the concept area of the current NJ TRANSIT study.
- It was expressed that this is not a capital plan, but simply a concept plan.
- Woodbridge asked is parallel parking and straight in parking are compatible together.
- Chris talked about ensuring pedestrian safety and comfort, with respect to restriping crosswalks

Public Input Record

A Public Information Center for this study was hosted at Woodbridge Train Station on Thursday, April 24, 2018 from 5-7 PM.

Comments Collected at Public Information Center

- Bicycle storage facility is needed
- Bicycle lanes are needed to and from the station
- More 803 bus to Woodbridge
- Would like yellow flashing light @ Green Street crossing near stairs
- Would like to have heated shelters
- Need safer way to cross street
- Frequent bus service 803 or mall
- Charging cell phone stations
- Slow traffic on Green Street near funeral home & place yellow flashing light at crosswalk
- Connection to Middlesex Greenway
- Sidewalk connection needed from 4th and Main Street
- Lack of crossing for pedestrians on Berry Street
- Barry/Woodbridge Intersection is a dangerous crossing. Vehicles don't use turn signals
- Path transitions were smoother – Added signs to show shared roadway
- Driver education were increased, Township communications were tied into this communications out-of-towners were educated about this (NY license plates!)

Comments Collected via Email

4/26/18

GREEN STREET (CR 604)

- This appears to be a candidate road for bike lanes, more so than Main Street, due to lighter traffic
- At the pedestrian crossings that flank the NJ TRANSIT railroad bridge overpass:
    - Need electronic (solar powered?) flashers that warn motorists to stop for pedestrians crossing
    - Suggest bold graphics directly applied on the Green Street asphalt approaching the crosswalks -
    - This portable stop sign, currently in use, appears insufficient in stopping cars when people want to cross. Too many motorists ignore this sign.

- At the Pearl Street intersection: consider installation of a traffic light to improve traffic flow during rush hour. During some funerals at the Costello-Greiner Funeral Home at 44 Green Street, the police have flashing lights atop their parked patrol cars to calm vehicular traffic. That is a big clue that cars travel too fast here.
- Consider curbing bump-outs into Green Street and speed bumps between Rahway Avenue and Barron Avenue (or even Amboy Avenue/Rte. 35) to calm traffic on this street.

MAIN STREET (CR 514)

- Bike lanes on Main Street/CR 514 might be tough to integrate with street parking/narrow street width
- Restore electronic (solar powered?) flashers that warn motorists to stop for pedestrians crossing near JJ Bittings' brew pub restaurant
- Suggest bold graphics directly applied on the Green Street asphalt approaching the crosswalks

BICYCLING

- Existing bike rack location near Walgreens' seems underused; is it fully publicized?
- If Green Street gains a bike lane, it can link up several miles to the west to the Middlesex County Greenway
- Coordinate with Woodbridge Twp. Bikesharing initiative

GENERAL (not necessarily related to your effort)

- Need additional NJ TRANSIT signage identifying nearby #116 NJ TRANSIT bus stop serving Perth Amboy and New York City; that bus line is crucial link to New York City during rail service disruptions
- Need additional waste/recycling receptacles on the station platform

4/18/18

1. Cleaning the stairways for the Green street exit. The stairways are rarely cleaned and collect garbage, food, etc.

2. Police the area better. There has been an increase in homeless people sleeping on the benches in the warming areas which is inappropriate.

3. Add additional safety precautions for crossing Green Street. Over by the Main street exit there are lights on the street that signal drivers to stop. I have personally almost been run over by drivers not stopping on Green Street on more than one occasion and it is very dangerous. Any additional safety measures would be helpful. If a police car is present that also seems to help.

4/17/18

You take your life in your hands crossing Main Street to the station. I have complained many times to the Woodbridge police, but to no avail. The new flashing lights do not seem to be a deterrent for drivers to blow through the crosswalk – some actually speed up or make an obscene jester as the plough through. Also, the NJT bus that stops in the morning also ploughs thru the crosswalk. I have come close to being hit by it a couple of times. The drivers do not care.

Is it possible to install a camera? I'm sure the township would appreciate the revenue from the tickets.

Also, the elevator at the station usually stinks of urine and smoke. We try not to think what we're standing in when you see the puddles on the floor. On one occasion, we even found human feces in the corner. It is not the carelessness of the person who cleans the elevator. I have seen him many times trying to deal with the mess he finds, but he can't stand guard all day, especially at the evening commute.

Lastly, the protected areas with the benches really don't provide much protection from the wind and cold in the winter. There is an opening at the bottom of the walls where the cold and wind blow through. Is it possible to close them up with pavers or something where the wind couldn't get through?

4/24/18

#1. Not enough cross walks especially on Rahway Avenue #2. Cross walks that exist are not enforced and very rarely do vehicles yield or stop for pedestrians.

End of Woodbridge Train Station Report