

Bike Walk Westfield

Bicycle and Pedestrian Plan

November 2019





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- Town of Westfield
- WSP USA, Inc.
- Susan G. Blickstein (SGB)

01 *Introduction*



The Town of Westfield in Union County has undertaken the development of a bicycle and pedestrian plan as part of the New Jersey Department of Transportation’s Local Bicycle/Pedestrian Planning Assistance Program, which seeks to foster the development of non-motorized transportation modes in accordance with statewide goals and local needs.

Study Background

In July 2018, the Town of Westfield initiated a request to NJDOT to study Central Avenue (CR 613). The Town cited concerns about traffic flow and pedestrian safety along the Central Avenue corridor and a desire to make the corridor safer for pedestrians and bicyclists. In March 2019, NJDOT awarded a planning grant through the Local Bicycle/Pedestrian Planning Assistance Program to Westfield. Through subsequent discussions between the Town and NJDOT, the project study area was expanded to include the entire municipal limits of Westfield, which provides an opportunity to identify and address bicycle and pedestrian issues holistically throughout the town.

The first five chapters of the plan provide an overview of existing conditions for pedestrians and bicyclists in Westfield, along with a summary of input from the community engagement process. Specific tasks include an analysis of crash data, identification of key pedestrian and bicycle traffic generators, assessment of existing infrastructure, and review of key corridors and intersections. The final two chapters of the plan include recommendations for improved facilities to enhance the overall bicycle and pedestrian network and strategies to encourage safe walking and biking, along with conclusions and next steps.

The **Westfield Bicycle and Pedestrian Plan** is a framework plan intended to guide the planning, design, and implementation of future bicycle and pedestrian improvement projects and policies in Westfield. The plan is being developed concurrently with Westfield’s Master Plan Reexamination and Parks & Recreation Strategic Plan, both of which support making Westfield a more walkable and bikeable community. In addition, the Town declared 2019 as the “**Year of the Pedestrian**” with the goal of improving walkability throughout town. This builds on Westfield’s previous commitment to non-motorized traffic through adoption of a Complete Streets Policy in 2013.



02 *Context*

This chapter describes the contextual background information that helped to frame development of the plan, including an overview of Westfield’s geography and transportation network, snapshot of local demographics, and a review of previous studies that could inform the planning process.

Geography and Transportation Network

Westfield is a town in Union County, New Jersey, that encompasses 6.74 square miles and is home to over 30,000 residents. Westfield features a vibrant downtown commercial area in the geographic center of town. Development patterns are fairly compact in and near the downtown, and become less dense and more residential further from the downtown core. Parks, schools, and other public facilities are well-integrated into the Town’s neighborhoods, which enhances the potential for walking and biking trips.

Westfield has strong connections to the regional transportation network. It is well connected to public transportation, with service to New York City, Newark, and points to the west in Somerset County through NJ TRANSIT’s Raritan Valley Line. The Town also features Box Car direct bus service into New York City, along with local transit service via NJ TRANSIT’s bus services. Westfield

is accessible by regional highway connections including NJ 28, which runs through the center of town, NJ 22 to the north, the Garden State Parkway to the south, and several major County routes. Access to the East Coast Greenway is also available via Lenape Park in the northeast section of town.



The Village of Westfield was established in 1720 and incorporated as a town in 1794. The “West Fields” of Elizabethtown (or the Baker tract of land) was what Westfield was referred to in early Colonial times. The original inhabitants of Westfield were the Lenni-Lenape Native Americans, and many of the parks and neighborhoods remain named after them. Westfield is a historic community and has preserved much of the character of its colonial past, while at the same time continuously evolving and growing into a thriving regional center.

Demographics

Population and Employment

Westfield is a community of 30,591 according to the 2013-2017 American Community Survey. Its relatively dense population (4,538 persons per square mile - almost 4 times higher than the state average) and compact downtown help make walking and biking viable alternatives to driving.

Age

Approximately 29% of Westfield’s population is under 18, while 13% of the population is over 65. Both of these age groups are important demographics for walking and biking, as they typically have less access to vehicles/lower driving rates and are more vulnerable from a traffic safety perspective.

Ongoing and Previous Studies

At the time of this study, the Town of Westfield was engaged in two major concurrent planning efforts: a comprehensive Master Plan Reexamination and update to their Parks and Recreation Strategic Plan. Scheduled to be completed at the end of 2019, these two efforts support the Bicycle and Pedestrian plan’s main

Journey to Work and Zero Car Households

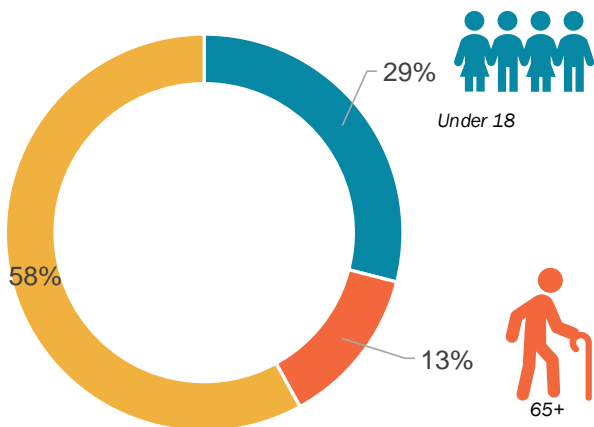
Over 65% of the workers in Westfield drive to work, 22% commute using transit (higher than the 11% state average), and 2.5% walk or bike to work (lower than the 3.3% state average). Approximately 4.1% of households do not own a car, while 25.2% of the households own one car.

School enrollment

The majority of Westfield is a walking school district, which is one of the reasons a safe and connected walking and biking network is vital to the well-being of Westfield residents, both parents and students. Currently, 9,346 students are enrolled in schools and colleges in Westfield, with 6,212 of those enrolled in public schools.

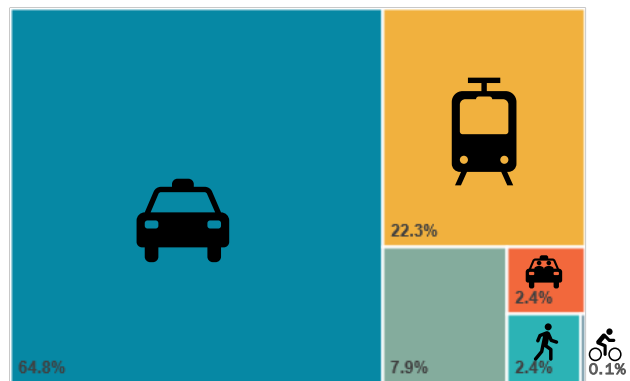
goal of enhancing non-motorized safety and connectivity throughout Westfield.

To further inform the planning effort, related studies were obtained and reviewed during the data gathering phase. Relevant recommendations from each are summarized in this section:



Source: 2013-2017 American Community Survey 5-Year Estimates

Figure 2.1: Age Distribution in Westfield



Source: 2013-2017 American Community Survey 5-Year Estimates

Figure 2.2: Journey to Work by Mode in Westfield

North Avenue Walkable Community Workshop (2019)

In cooperation with the North Jersey Transportation Planning Authority (NJTPA), Rutgers University's Voorhees Transportation Center conducted a walking audit of North Avenue in Westfield between Prospect Avenue and Hillcrest Avenue. North Avenue was selected for the study "due to Westfield's interest in addressing congestion around the train station and creating pedestrian connections to completed and planned commercial developments along the corridor." Recommendations from the walking audit include:

- Install high visibility crosswalks along corridor
- Investigating a road diet along the North Avenue corridor
- Eliminating on-street parking east of Elmer St
- Installing green infrastructure along corridor
- Installing curbside and/or standard bike lanes
- Closing one leg of St. Paul Street to create additional park space
- Completing the sidewalk network and widening sidewalks where possible
- Install curb extensions at some corners along corridor

Union County Transportation Master Plan (2016)

The 2016 Union County Transportation Master Plan prepared for Union County and NJTPA identifies current conditions, challenges, and opportunities, as well as strategies necessary to meet existing and future travel needs. The report incorporates strategies to promote biking and walking including:

- Prioritize connections with existing bicycle and pedestrian facilities such as the East Coast Greenway
- Continue to support Complete Streets implementation in municipalities that have adopted a Complete Streets policy
- Expand implementation of on-road bicycle facilities



North Avenue Walkable Community Workshop

Town of Westfield, Union County, NJ

2019



- Encourage municipalities to install bicycle parking facilities in downtown business districts, near transit, schools, and other destinations
- Utilize crash data to identify high crash corridors and intersections on County roadways and work with municipalities to conduct bicycle and pedestrian audits
- Continue to participate in the development of local bicycle and/or pedestrian plans and studies

Westfield Complete Streets Policy (2013)

The Town of Westfield adopted a Complete Streets Policy in 2013 to reinforce its commitment to creating a comprehensive, integrated, connected roadway network accommodating roadway and public right-of-way users of all abilities for all trips as safely and ably as possible. The policy includes several exemptions to applying the policy consistent with those articulated in NJDOT's statewide policy.

Union County Parks Master Plan (2010)

The Union County Parks Master Plan set out to achieve realistic goals for the enhancement of Union County’s social, cultural, and environmental well-being. The plan outlines five goals focused on providing an interconnected system of high quality, accessible, multi-use trails and greenway corridors. Specific recommendations include:

- Create walking/biking maps with routes and mileages of parks and trails
- Furnish trail systems with appropriate supporting trailhead improvements
- Develop a county greenway system linking residential neighborhoods to community destinations

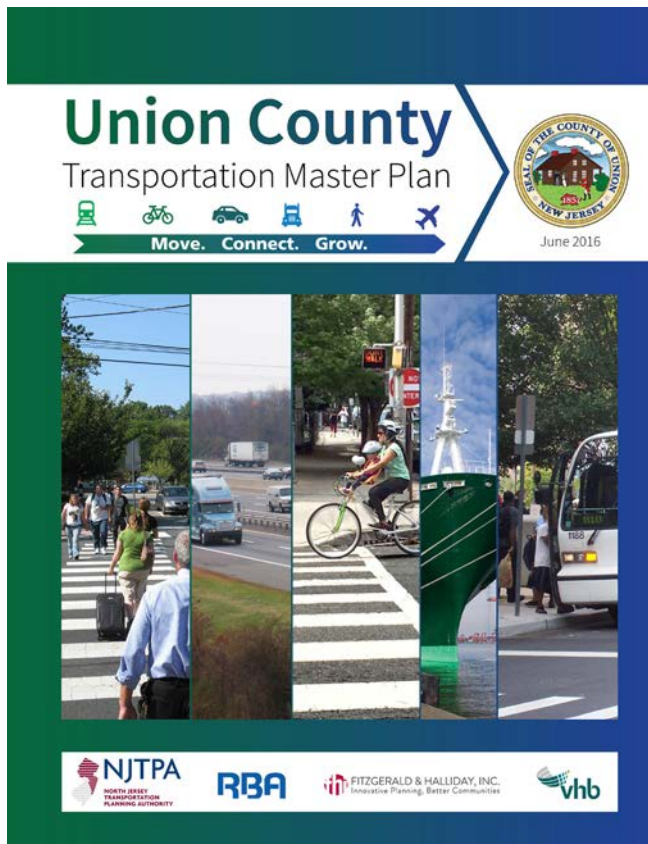
Union County Comprehensive Bicycle Master Plan (2007)

Union County published a Comprehensive Bicycle Master Plan for the County in 2007; the first such countywide document in 25 years. The report acknowledged the change in biking culture as a newly legitimate transportation option and utilized newly available analysis tools to serve as a “blueprint for actions and activities which can transform the County into a bicycle and pedestrian-friendly community consistent with the Vision of the Plan.” Characteristics of roadways countywide were determined to assess bike suitability and existing and future demand projections were calculated using demographic data. In general, Westfield was determined to have relatively low demand, although Rahway Ave, Mountain Ave, and South Ave were identified as high demand corridors, followed by Prospect St, E Broad St, and North Ave.

Westfield Master Plan (2002)

The Town of Westfield’s Master Plan includes a circulation element designed to provide safe and convenient mobility and access for residents, employees, patrons and motorists passing through Westfield. The last comprehensive master plan was developed in 2002, with several updates in the interim. The 2002 plan included the following transportation-related recommendations:

- Intersection improvements at Plaza/South, North/Central, and Lawrence/Dudley
- Pilot study of certain intersections to demonstrate the need for and benefits resulting from balancing vehicular and pedestrian movements at intersections, with an emphasis on traffic calming measures
- Identify other areas where traffic calming is appropriate and incorporate traffic calming measures in all major roadway improvements
- A 2009 Master Plan reexamination provided updates to the 2002 plan, including:

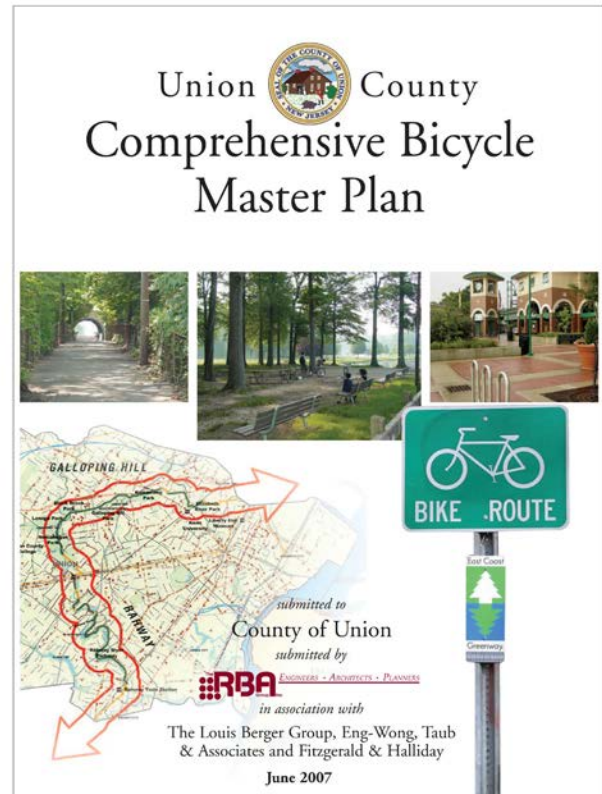


- Completion of the Plaza/South Ave interchange, inclusive of appropriate signage, decorative lighting, paver block sidewalks, and beautification of Plaza Park
- Traffic calming measures that were implemented in key locations on Rahway Ave and areas surrounding Shop Rite on North Ave
- Traffic signals at key intersections on Broad St in downtown were modified to include pedestrian signalization with improved timing
- The Public Safety, Transportation and Parking Committee continues to study and review the intersection of Lawrence and Dudley Ave

Downtown Westfield Improvement Plan (1999)

The 1999 Downtown Westfield Improvement Plan is an urban design guide aimed at improving the look and functioning of Downtown Westfield. Emphasis is placed on improving the attractiveness of downtown to shoppers, in part by improving the safety and comfort of pedestrians and cyclists in the area. Active transportation recommendations include:

- Implement traffic calming devices, bulbouts, and islands at intersections
- Install mid-block pedestrian crossing signs in roadway
- Install bike racks at convenient locations
- Improve the function and appearance of alley walkways for pedestrians



A photograph of a community outreach event. In the foreground, three people are gathered around a table, looking at a large map. A man on the left is pointing at the map, a woman in the middle is holding a red marker, and a woman on the right is pointing at a specific location. The map is titled "Needham" and "Needham Heights" and shows various streets and green spaces. In the background, other people are visible, some standing and some sitting, in a well-lit room with large windows and track lighting. A teal semi-transparent box is overlaid on the right side of the image, containing the text "03 Community Outreach".

03 *Community Outreach*

Public involvement is an essential component of the Westfield Bicycle and Pedestrian Plan. The planning process was designed to elicit meaningful input from stakeholders and community members throughout the plan's development. At early stages in the project, the community provided insights and feedback on existing conditions, areas of need, and helped shape the goals and vision of the project. Later in the project, the community provided important feedback on preliminary recommendations. The result is a plan that is reflective of the priorities and interests of the community and its residents, which will help develop broader support for implementation.

Steering Advisory Committee (SAC)

A local Steering Advisory Committee (SAC) provided input and guidance at key intervals during the planning process. The SAC had over a dozen members including two elected officials; the Town Administrator, planner, and engineer; and representatives from the police department, Union County, the Pedestrian Safety Task Force, the Downtown Westfield Corporation, the Green Team, and NJDOT.

SAC Meeting #1

The study team presented an overview of existing conditions to the SAC on June 4th, 2019 including activity generators, crash history, and assessments of bicycle and pedestrian facilities. The SAC then participated in a visioning exercise designed to guide the study process. Members were asked to envision what success may look like in Westfield, as well as suggest a vision, goals, and challenges/obstacles to success. Members then participated in map markup exercise where they identified and prioritized problem corridors and intersections.



Community Workshop #1

Nearly 40 members from the public attended a community workshop held on July 8th, 2019 between 6:00 and 8:00 pm in the Community Room at Town Hall. The workshop used an open-house format with display boards where attendees could view information about the plan, provide input, and chat with the study team. The stations included vision and goals, study overview, points of interest, bicycle level of traffic stress, and large map markup stations. Also available were computer stations where people could fill out the surveys and add comments on to the wikimap in person.

SAC Meeting #2

The study team met with the SAC on August 29th, 2019 at the Westfield Municipal Building to provide an update on the plan. The study team presented the recommendations and gathered feedback on the proposed improvements.



Community Workshop #2

A second community workshop was held on September 19th, 2019 between 7:00 and 9:00 pm in the Community Room at Town Hall. About 40 participants attended the meeting, which was held in an open-house format with display boards where attendees could view information about the plan, provide input, and chat with the study team. Proposed bicycle and pedestrian improvement concepts were displayed at the meeting for discussion and feedback. A comment form was available at the meeting and was posted online for two weeks following the meeting; eight total comments were received.



Bike Walk
Westfield

Thank you for your interest in the Westfield Bicycle and Pedestrian Plan. Additional input on the existing conditions portions of the plan via the Wikimap is now closed.

For updates on the plan, please visit:
<https://www.westfieldnj.gov/bikeplan>

LEGEND

- Problem Pedestrian Corridor
- Desired Pedestrian Route
- Problem Bike Corridor
- Desired Bike Route
- ▲ Problem Spot
- P Bike Parking Needed

About & Help ▾ Routes Points
Share rucht.shrivastava@wfp.com

Online Interactive Map (Wikimap)

Online Tools

Town Website, Social Media, and Local Press

The Town of Westfield set up a page on their website dedicated to the Westfield Bicycle and Pedestrian Plan. On this page, the Town posted meeting general information about the project, links to the online survey and wikimap (described below), and notices for public meetings. Similar information was posted on the Town’s social media handles, and meeting notices were also advertised through local press outlets including The Patch and Tap-into-Westfield.

Wikimap

An online interactive map (Wikimap) website was created for the Westfield Bicycle and Pedestrian Plan to collect place-based comments about walking and biking in Westfield. The web interface allows users to mark-up a virtual map of the town by identifying corridors and spot locations that are difficult for walking and biking, desired walking and biking routes, and desired

locations for bicycle parking. The Wikimap was open for public comment from June 4th through August 1st, 2019, during which 1,133 interactions were received on the website and 268 individual points and 147 individual lines were drawn on the map. The online map was supplemented by a hardcopy version at the first community meeting.

A primary purpose of the mapping tool was to graphically locate and identify problem areas and opportunities based on local knowledge. Wikimap users identified 77 problem corridors and 244 problem spots, along with 24 points were added to identify locations that need bike parking. Users also identified 76 desired bicycle and pedestrian routes. In general, most problem corridors tended to be along the town’s busier roadways, with many spot locations closer to the downtown. The top 10 corridors and intersections identified through the wikimap and community workshop are listed below and Figure 3.1 presents the location of Wikimap comments.

Table 3.1: Corridors Identified through Wikimap

| Comment Frequency | Corridor |
|-------------------|---------------------------|
| 18 | East Broad St (CR 509) |
| 14 | Dudley Ave |
| 9 | Lawrence Ave |
| 9 | Mountain Ave (CR 613) |
| 9 | South Ave (CR 610) |
| 7 | North Ave (NJ 28) |
| 6 | Lamberts Mill Rd (CR 606) |
| 5 | Summit Ave |

Table 3.2: Intersections Identified through Wikimap

| Comment Frequency | Intersection |
|-------------------|--|
| 22 | Central Ave and North Ave |
| 17 | Central Ave and South Ave |
| 15 | Elm St and North Ave |
| 13 | Traffic Circle between North and South Aves |
| 13 | E Broad St and Prospect St |
| 11 | Lawrence Ave, Mountain Ave, and Park Dr |
| 10 | Clark St and North Ave |
| 9 | N Chestnut St, E Broad St, and S Chestnut St |
| 8 | Nomahegan Dr, E Broad St and Springfield Ave |
| 8 | Crossway Pl, N Scotch Plains Ave and South Ave |



Figure 3.1: Public Input - Meetings and Wikimap

***Bike Walk
Westfield***
Bicycle and Pedestrian Plan

Desired and Problem Corridors

- 1
- 2 - 3
- 4 - 5
- 6 - 7
- 8 - 11
- 12 - 18

Problem Spots

- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 10
- 11 - 15
- 16 - 22

Bike Parking

- 1 - 2
- 3 - 4

Community Survey

A community survey was developed by Susan G. Blickstein (SGB) to gather additional input from residents related to walking and biking preferences, behavior, and desires. Administered through Survey Monkey, the survey was launched on June 7th and remained open through July 31st, 2019. During this time, a total of 447 people responded to the survey with most respondents (92%) saying they are residents of Westfield. This indicates that the survey successfully reached its targeted audience. Results from the survey are detailed in the following section and depicted in the accompanying figures.

Summary of Findings

Survey Demographics: Almost half (45%) of respondents are between 45 to 59 years old with just over one-quarter (27%) between 35 to 44 years old. Twenty-one percent are between 60 to 75 years old, 6% are 34 and under, and only 1% are 75 years or older. More than half of the respondents (54%) live in Westfield and commute outside of the Town for work, and more than one-third (37%) both live and work in Westfield. There are more female respondents (61%) than male respondents (39%).

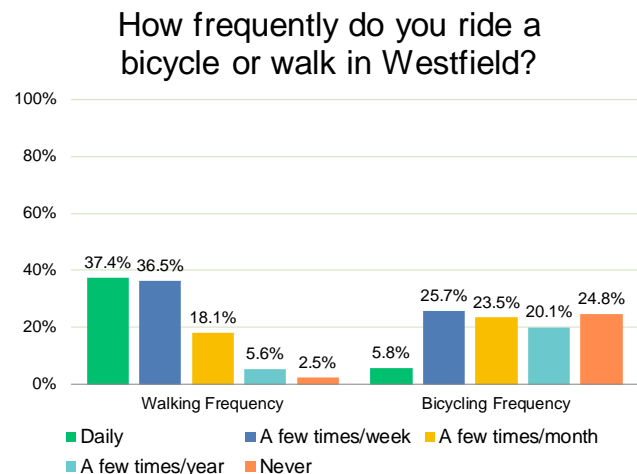
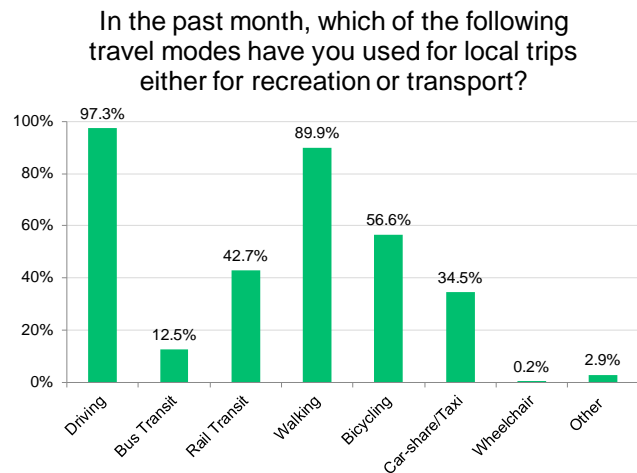
Travel Mode: Driving and walking are the most common modes of transport for local trips, with almost all (97%) respondents driving and walking (90%) within the past month. Over half of respondents (57%) bicycled in the past month.

Frequency of Walking & Bicycling: Almost three-fourths (74%) of respondents walk at least a few times per week and over one-third (37%) walk on a nearly daily basis. While one-third (32%) of respondents bicycle at least a few times per week, one fourth have never bicycled in Westfield. Respondents identified E/W Broad St., Rahway Ave., Boulevard, and North Ave. as streets that they walk and bike most frequently in Westfield.

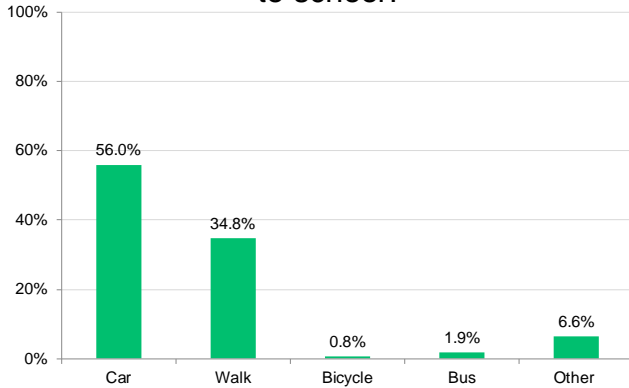
School Age Children & Travel: More than half (58%) of respondents noted they have school-age children. While more than half (56%) of these children are dropped off/driven to school, more

than one-third (35%) walk to school. Among those with children who do not walk or bike to school, the safety of routes/streets for walking and bicycling was the biggest factor (67%) noted, followed by distance to school (46%). In open-ended comments provided, many respondents wrote that their school-age children are too young to walk or bike alone.

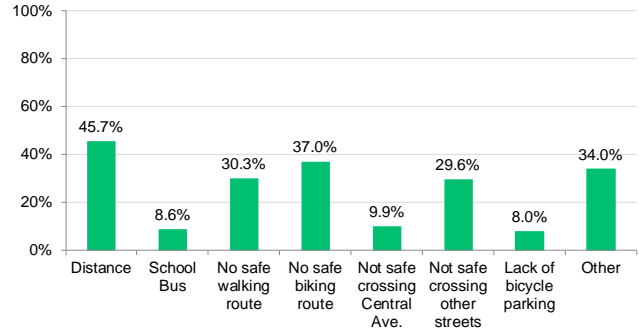
Trip Purposes: Driving is the most common transportation mode for most trip purposes. The most common purpose of bike/walk trips is recreation (54% walk and 64% bike for recreation).



How do your children (under 18) get to school?



Reasons that your school-age children don't walk or bicycle to school



Walking Trends

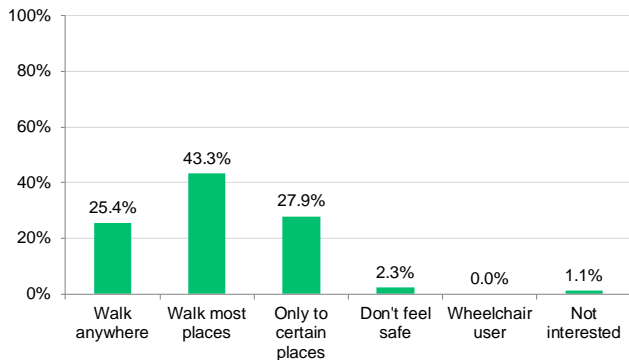
Interest in Walking: One-quarter of respondents identified themselves as avid walkers (will walk anywhere), and 43% noted they will walk most places locally. Only 3% of respondents are not comfortable, not interested, or are physically unable to walk.

Pedestrian Comfort: Two-thirds of respondents (65%) indicated that the speed of traffic has a significant to moderate effect on where they feel comfortable walking. A similar percentage of respondents (64%) also conveyed that the amount/volume of traffic has a significant to moderate effect on where they feel comfortable walking.

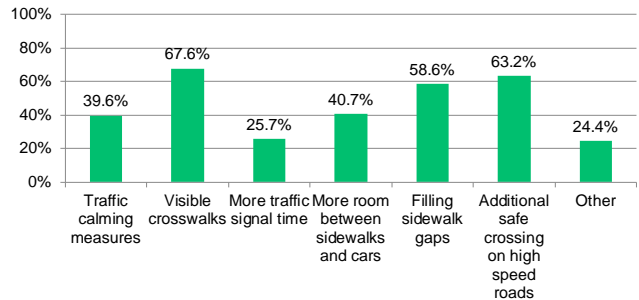
Improvements to Benefit Pedestrian

Accessibility/Safety: Respondents thought that having high visibility crosswalks that are more easily seen by motorists (68%), providing additional safe crossing opportunities on high-speed roads (63%), and filling sidewalk gaps (59%) are the top three improvements that would most benefit pedestrian accessibility and safety.

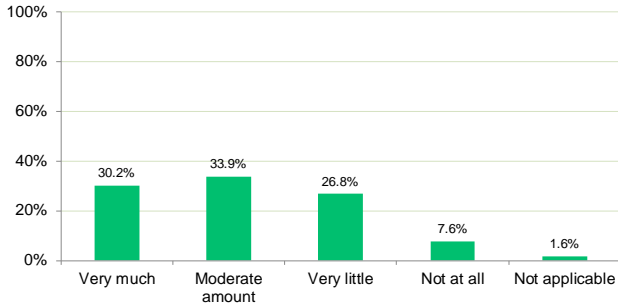
How would you describe yourself in terms of your interest in/ability to walk?



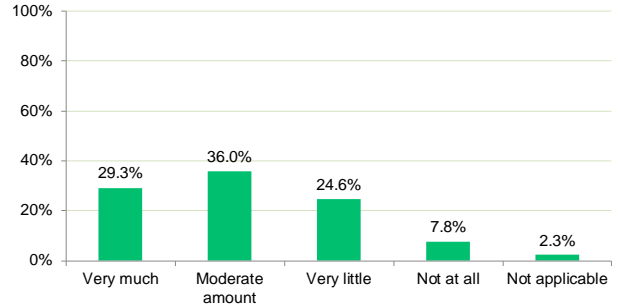
Which of the following improvements would most benefit pedestrian accessibility and safety in Westfield?



How much does the amount/volume of motor vehicle traffic influence where you feel comfortable walking?



How much does the speed of motor vehicle traffic influence where you feel comfortable walking?



Bicycle Trends

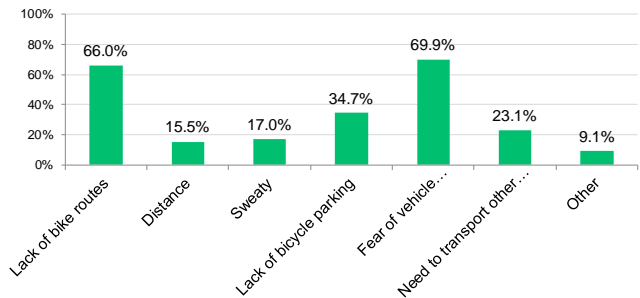
Interest in Bicycling: Fourteen percent of respondents identified themselves as avid bicyclists (will bicycle anywhere), and 21% noted they will bicycle most places locally. Over one-third (36%) of respondents are not comfortable, not interested, or are physically unable to bicycle.

Bicyclist Comfort: Most respondents (78%) indicated that the speed of motorized traffic has a moderate to significant effect on where they feel comfortable bicycling. A higher percentage of respondents (84%) also indicated that the amount/volume of traffic has a moderate to significant effect on where they feel comfortable bicycling.

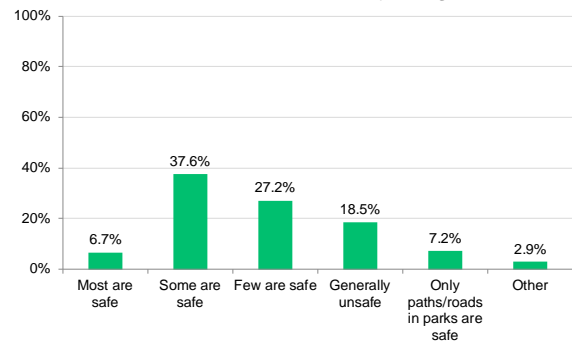
Perceived Safety of Bicycling: Only 7% of respondents perceive most Westfield roads as safe for bicycling, while 38% felt that some roads are safe for bicycling. Almost half (46%) of respondents think few/no roads are safe.

Streets Most in Need of Improvement: Respondents identified East and West Broad Streets, Central Avenue, North Avenue, South Avenue, and Rahway Avenue as the top five streets that most need improvements to make walking and bicycling safer. Except for Rahway Avenue, these are consistent with the highest-ranked corridors identified through the Wikimap.

What prevents you from riding a bicycle more frequently for recreation or transportation?



How safe do you think the streets in Westfield are for bicycling?



04 *Vision and Goals*



The study team worked collaboratively with the SAC and community members to develop an aspirational vision for the Westfield Bicycle and Pedestrian Plan describing the future of biking and walking in Town. The resulting Vision Statement is outlined below.

Vision Statement

The Town of Westfield's built and social environment supports walking, biking, and active living and enables people of all ages and abilities to comfortably access jobs, schools, recreation facilities, shopping, and transit by foot or on bicycle as part of their daily lives.

Goals

Likewise, the project team worked with stakeholders to develop a series of goals that would support the vision. The five primary goals that were identified are listed below in the order they were prioritized by SAC members and attendees at first community workshop (see Figure 4.1) first being the most important):

Safety:

Improve safety and driver awareness of bicyclists and pedestrians through enhanced crossings, improved bicycle facilities, traffic calming measures, and other infrastructure improvements and programs/policies consistent with the local context and need

Bike/Walk Friendly Community:

Foster an environment where walking and biking are integral to the community's culture; where the town's livability, sustainability, and overall quality of life are enhanced by more people walking and biking; and where active transportation is safe, convenient, and practical

Connectivity/Access to Destinations:

Support a town-wide network for bicyclists and pedestrians that is comfortable for all ages and abilities and provides convenient access between residential neighborhoods and schools, parks, businesses, and transit

Implementation:

Develop a feasible plan that can be implemented over time, consisting of both short-term and long-term recommendations that can be integrated into capital improvement projects as well as regular maintenance

Sidewalk Maintenance:

Develop and maintain an inventory of sidewalk facilities and their conditions, coordinate with facility owners for maintenance, and monitor conditions at regular intervals

Vision and Goals

Bike Walk
Westfield
Safe and Healthy

Draft Vision

The Town of Westfield's built and social environment supports walking, biking, and active living and enables people of all ages and abilities to comfortably access jobs, schools, recreation facilities, shopping, and transit by foot or on bicycle as part of their daily lives.



Draft Goals

To support this aspirational vision, the Plan seeks to achieve the following goals:

What is most important to you?

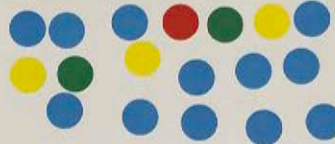
Safety

- Improve safety and driver awareness of bicyclists and pedestrians through enhanced crossings, improved bicycle facilities, traffic calming measures, and other infrastructure improvements and programs/policies consistent with the local context and need



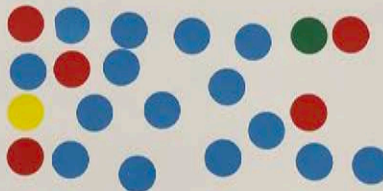
Connectivity/Access to Destinations

- Support a town-wide network for bicyclists and pedestrians that is comfortable for all ages and abilities and provides convenient access between residential neighborhoods and schools, parks, businesses, and transit



Bike/Walk Friendly Community

- Foster an environment where walking and biking are integral to the community's culture; where the town's livability, sustainability, and overall quality of life are enhanced by more people walking and biking; and where active transportation is safe, convenient, and practical



Implementation

- Develop a feasible plan that can be implemented over time, consisting of both short-term and long-term recommendations that can be integrated into capital improvement projects as well as regular maintenance



Sidewalk Maintenance

- Develop and maintain an inventory of sidewalk facilities and their conditions, coordinate with facility owners for maintenance, and monitor conditions at regular intervals



Figure 4.1: Input from Community Workshop

Benefits of Walking and Biking

In the development of active transportation plans, it is very important to articulate the multitude of benefits that walking and biking can provide. The information below was summarized and presented to attendees at the first community workshop.



Transportation Equity

Bicycling and walking are more than recreation. They are a means of getting to work, running errands and seeing friends, particularly for those who are too young, unable, cannot afford or choose not to drive a car. In most communities, 20%-40% of the population does not drive. Short trips of less than one mile can be easily made by bicycle or on foot, yet 60% of these trips are made by car.¹



Environmental Sustainability

Active transportation provides a greener, more sustainable alternative to driving. It has a reduced impact on roadways, both in terms of space consumed and infrastructure maintenance required. Shifts from driving to walking or bicycling reduce vehicle miles traveled and congestion, fuel consumption, and emissions of CO₂, CO, NO_x, and VOCs.



Public Health

Active transportation integrates physical activity into everyday life. This can lead to decreased rates of obesity, diabetes, heart disease, high blood pressure, and other ailments. Children who walk or bike to school are more attentive, better able to concentrate, and have mental alertness one-half school year more advanced than their less active peers.²



Economic Vitality

An increase in bicycling and walking has a variety of positive economic impacts. Customers arriving by bicycle or foot are more likely to shop locally, which is beneficial to the economic strength and stability of the community. Though spending less per trip than motorists, they tend to spend more over the course of a month.³ Pedestrian infrastructure can also support a more vibrant community, boost property values and sales revenues, and spur private investment.



Safety

Safety improvements are an essential component to encouraging more people to walk or bike. Investments in bicycle and pedestrian infrastructure also improve safety for all roadway users. High vehicle speeds can inhibit a driver's ability to react to activities happening along the roadway and narrow a driver's peripheral vision. Traffic calming enhancements reduce crash severity for all modes and create a more attractive environment for active transportation.

¹ National Highway Travel Survey, 2009

² Egelund, N. et al., Mass Experiment, 2012

³ Popovich and Handy, Bicyclists as Consumers, 2014



05 *Existing Conditions*

Early in the planning process, the project team completed a comprehensive, town-wide assessment of existing conditions related to walking and biking in Westfield. Specific tasks included identifying points of interest, inventorying roadway characteristics, conducting a bicycle/pedestrian-focused crash analysis, and assessing the existing pedestrian and bicycle networks. This analysis, combined with community and stakeholder input, played a key role in shaping the recommendations presented later in the plan.

Activity Generators

Locations that attract or generate a high number of pedestrian and/or bicycle trips were inventoried and mapped. Shown in Figure 5.1, these activity generators (also referred to as points of interest) are grouped into the following categories:

Downtown

Westfield features a vibrant downtown commercial area in the geographic center of town, with a very busy commuter rail station and numerous businesses. The downtown is the Town's foremost generator of walking and biking trips, both those walking from nearby neighborhoods as well as downtown visitors that park and then walk to their destination.

Other Commercial Areas

In addition to the downtown area, linear commercial districts extend along the western portion of Central Avenue and the eastern portions of North and South Avenues. The Town recently created affordable housing overlay zones along both North and South Avenue east of the downtown. Future development in these zones will increase opportunities for walking and biking between housing and commercial uses along these corridors.

Transit

For many transit riders, walking and/or biking is their primary access mode to bus stops and train stations. In addition to the Westfield Train Station along the NJ Transit Raritan Valley rail line, the town contains over 40 NJ TRANSIT bus stops.

Schools

Schools are among the largest generators of foot and bicycle traffic. Westfield is a walking school district and most school-children reside within walking distance of the Town's schools. There are 18 schools in the study area, ten of which are public and eight of which are private schools (including preschools).

Parks

Westfield's recreational assets including Echo Lake Park, Mindowaskin Park, Memorial Park, and Tamaques Park are important generators of foot and bicycle traffic. Many town residents bike or walk to these parks for recreation, exercise, and social gatherings.

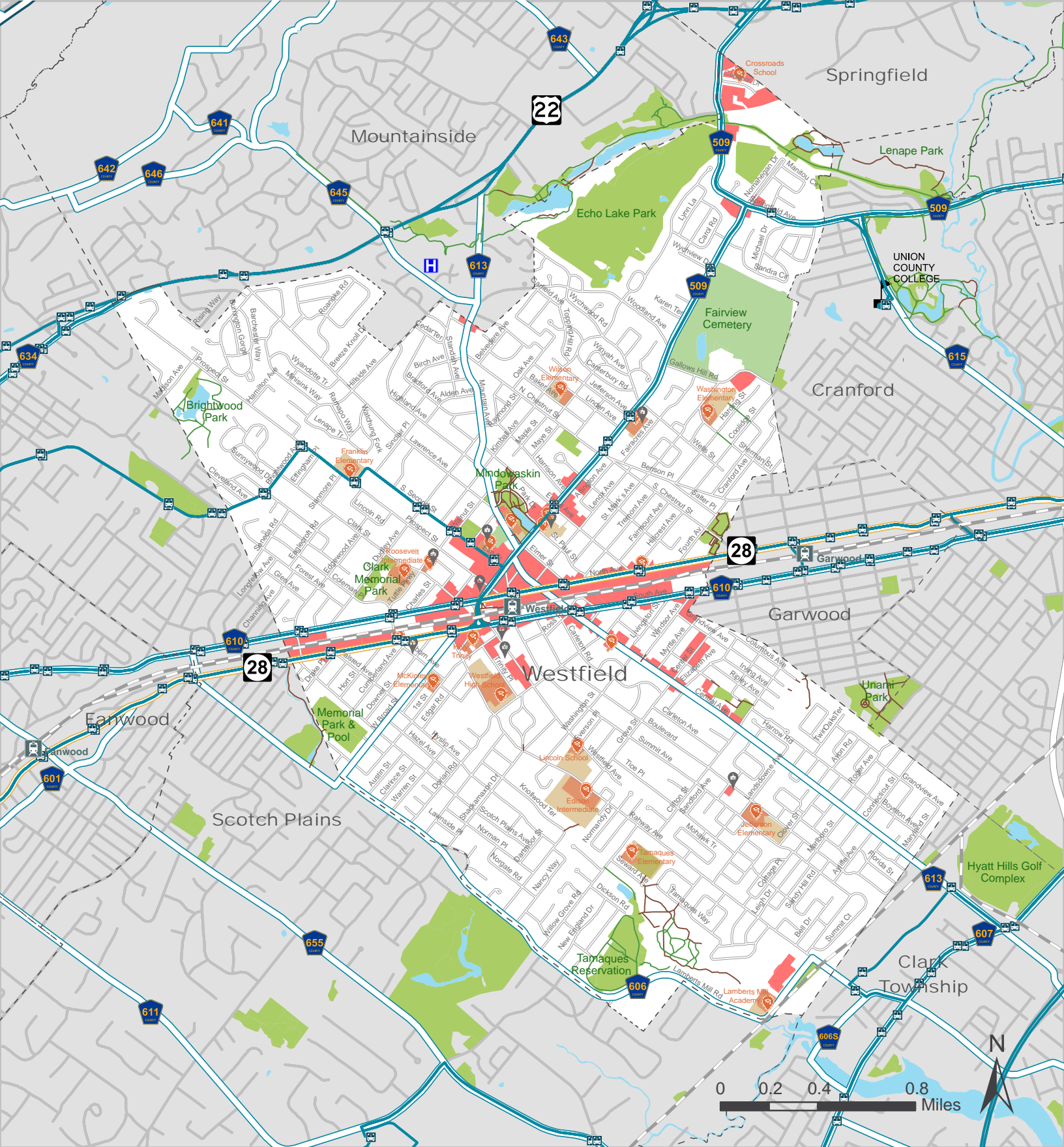





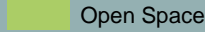


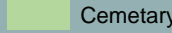


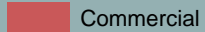
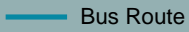




Figure 5.1: Activity Generators

Bike Walk
Westfield
Bicycle and Pedestrian Plan

- | | | | | | |
|---|---------------|---|------------------------|---|------------|
|  | Train Station |  | Hospital |  | Water |
|  | Rail |  | Place of Worship |  | Open Space |
|  | School |  | Existing Bike Facility |  | Cemetery |
|  | Bus Stop |  | Existing Trail |  | Commercial |
|  | Bus Route |  | College |  | School |

Municipal Buildings

The public library, post office, town hall, and other community buildings generate significant foot and bicycle traffic.

Houses of Worship

The eight houses of worship in Westfield serve as community gathering spots for surrounding neighborhoods, with many choosing to walk or bike to these locations.

Roadway Characteristics

When planning for bicycle and pedestrian travel, it is important to understand key characteristics of the existing street network, particularly those that influence circulation patterns and roadway safety. The following section describes existing speed limits, street widths, and traffic volumes on the major roads in Westfield.

Posted Speed Limits

Figure 5.2 shows the posted speed limits for all roadways in Westfield. Speed limits were determined based on NJDOT's Straight Line Diagrams and verified through field visits. The majority of streets in Westfield have a posted speed limit of 25mph. The only streets above 25mph are Central Avenue, Lamberts Mill Road, North and South Avenues, and E Broad Street at 35 mph and the segment of South Avenue between the train station and the town boundary at 30 mph.

Traffic Controls

Based on Straight Line Diagrams and field visits, the project team inventoried the presence of existing traffic controls including signalized intersections, all-way stops, rectangular rapid flashing beacons (RRFBs), and pedestrian hybrid beacons (PHBs). These features are shown in Figure 5.3.

Traffic Volumes

Figure 5.4 shows the existing Average Annual Daily Traffic (AADT) volumes for the major streets in Westfield. These volumes were obtained using NJDOT's Traffic Management

System (TMS), and were only available for North Avenue, Central Avenue, East and West Broad Streets, Mountain Avenue, Rahway Avenue, and Springfield Avenue. The heaviest volumes within the town limits are along North Avenue, Central Avenue, and East Broad Street.

Street Widths

Figure 5.5 shows the curb-to-curb street widths for all roadways in Westfield. These measurements were obtained from NJDOT's Straight Line Diagrams and verified through field visits. The majority of streets in Westfield have street widths between 24-31 feet. There are several streets in Westfield with curb to curb widths between 32-36 feet including Rahway Avenue, West Broad Street, and the western end of North Avenue from the roundabout to the town boundary. Several major streets in Westfield have curb to curb widths between 37-48 feet including Central Avenue, East Broad Street, South Avenue, and Elm Street.

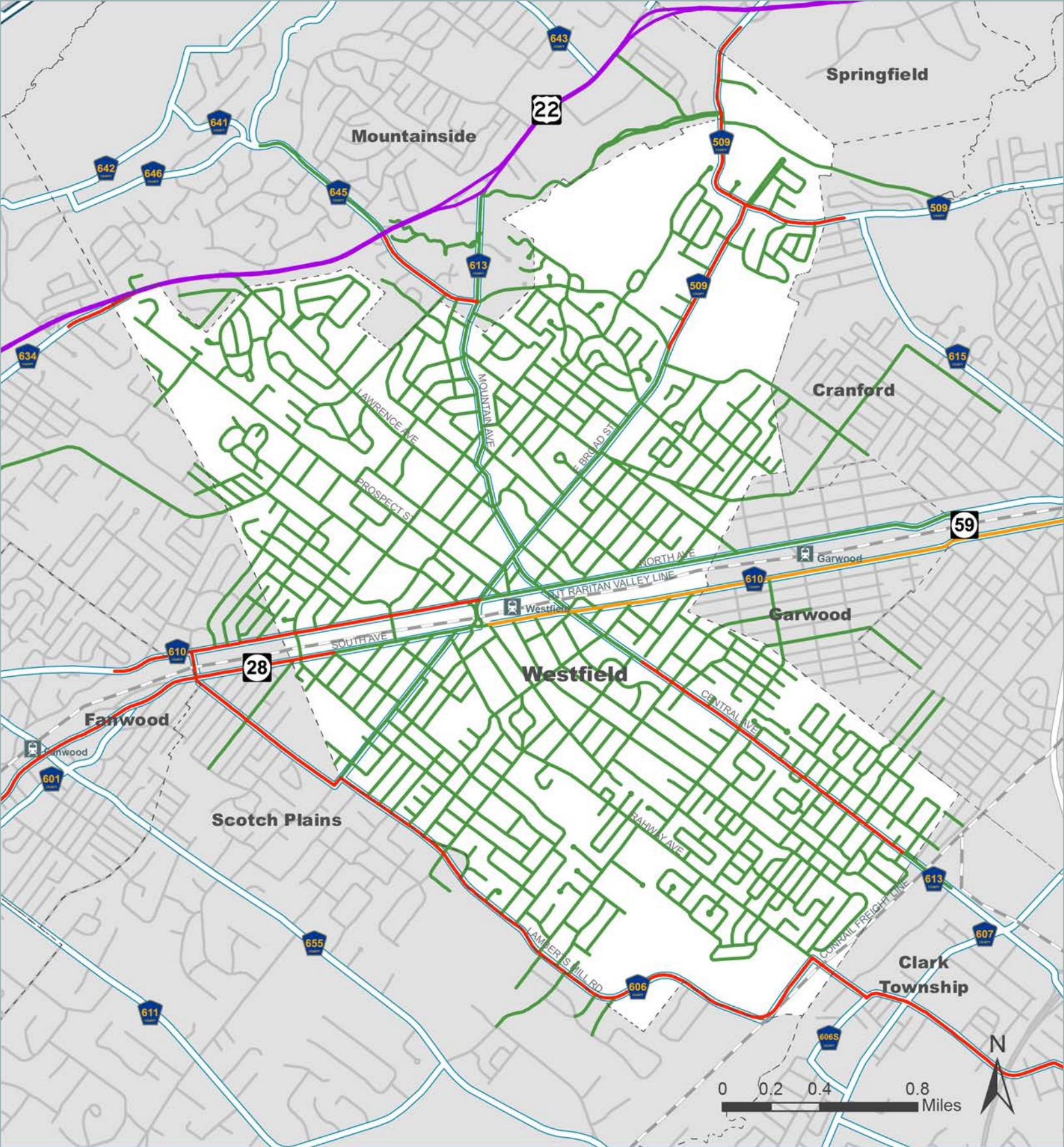


Figure 5.2: Posted Speed Limits

Speed Limit

- 25 MPH
- 30 MPH
- 35 MPH
- 50 MPH

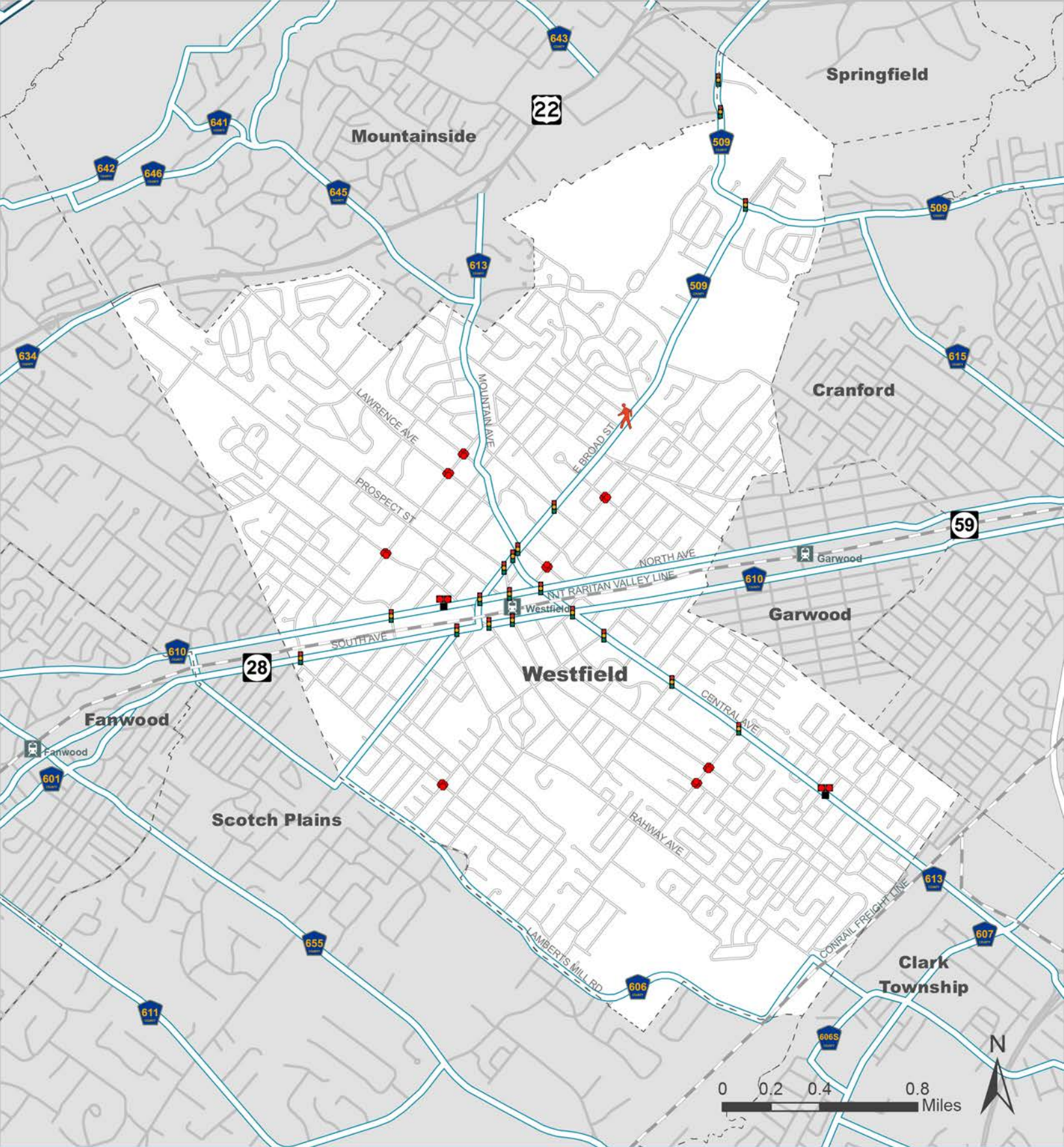






Figure 5.3: Existing Traffic Controls

Traffic Controls

-  Stop Sign
-  Traffic Signal
-  RRFB
-  PHB

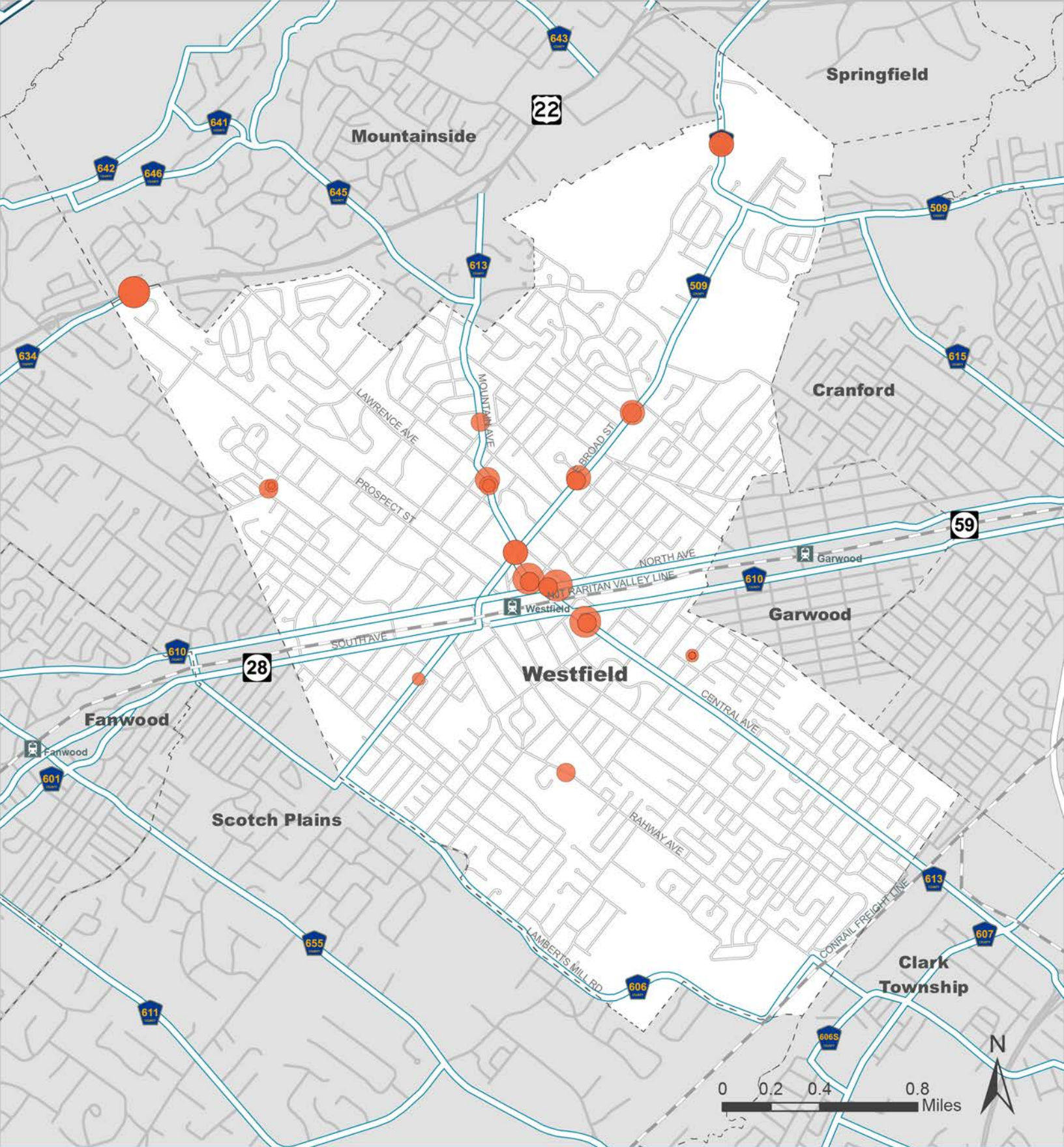


Figure 5.4: Existing Traffic Volumes

**Bike Walk
Westfield**
Bicycle and Pedestrian
Master Plan

Traffic Volumes (AADT)

- 1,247 - 2,500
- 2,501 - 5,000
- 5,001 - 10,000
- 10,001 - 15,000
- 15,001 - 22,733

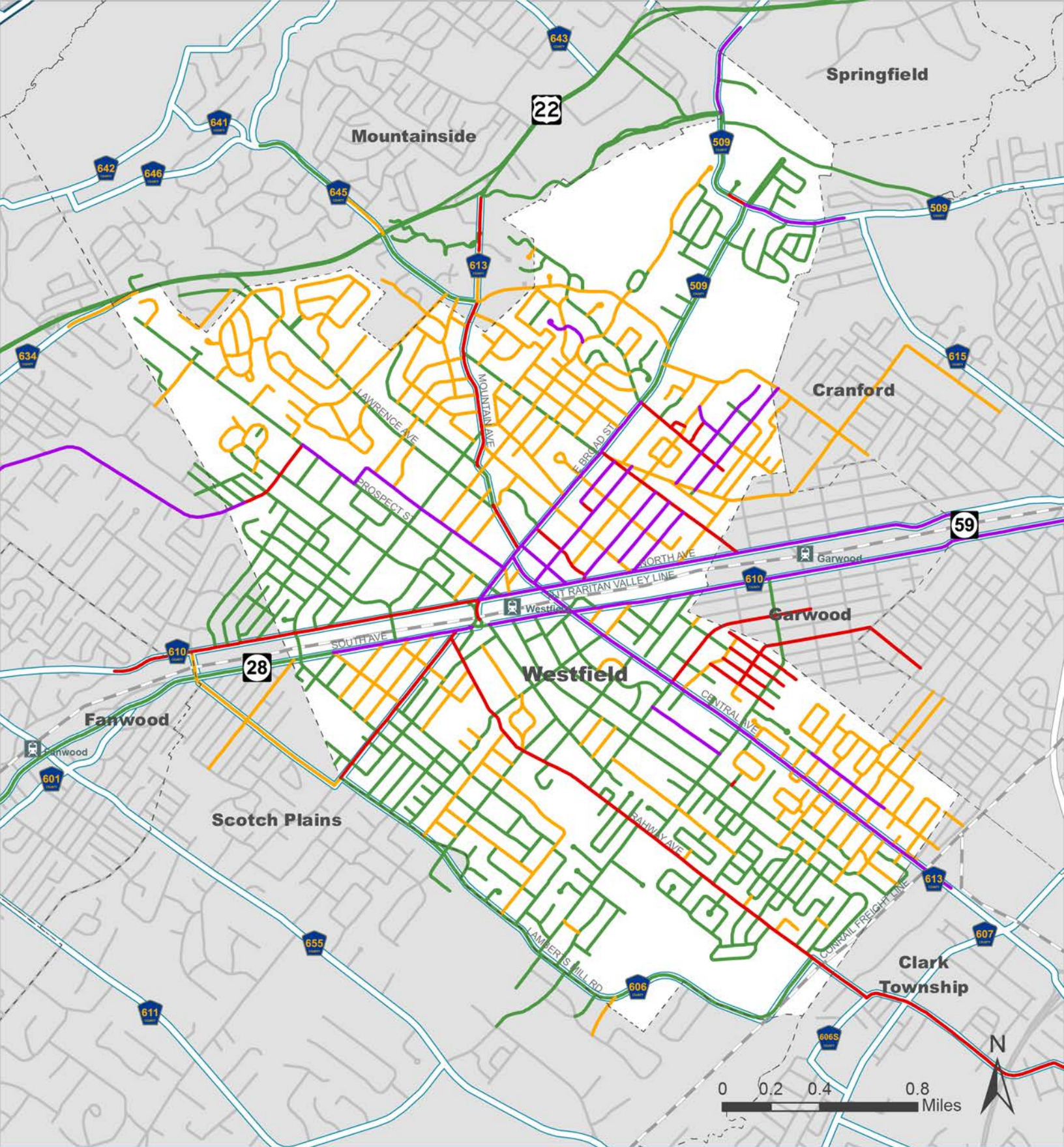


Figure 5.5: Street Widths

**Bike Walk
Westfield**
Bicycle and Pedestrian
Master Plan

Street Width

- ≤ 24
- 25 - 31
- 32 - 36
- 37 - 48

Crash Analysis

The project team reviewed town-wide crash data obtained from NJDOT’s Safety Voyager database to analyze bicycle and pedestrian crashes throughout the town and identify problem areas where repeated crashes have occurred. The analysis included data between 2013 and 2017, with 2017 being the most recent year available with a full set of data. During this 5-year period, there were 72 crashes involving pedestrians and 33 involving cyclists, resulting in two fatalities and five incapacitating injuries.

Crash Characteristics

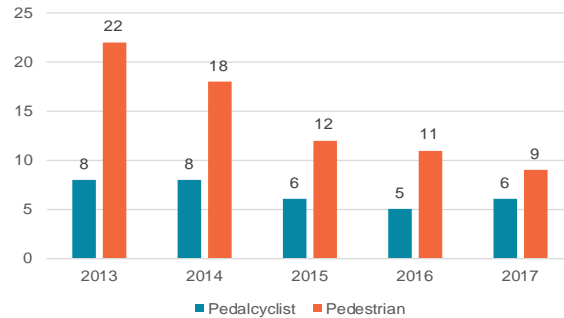
The full set of bicycle and pedestrian crashes was analyzed to determine patterns related to environmental conditions including: lighting, proximity to intersections, age, and gender. Nearly 75% of the total crashes involved pedestrians. Approximately 70% of all crashes occurred in daylight conditions, which is consistent with state-wide averages, and 58% occurred at intersections. Most of the crash victims were older males, with 37% of victims over the age of 45 and 66% of victims being male. However, both pedestrians killed during the study period were women; with one fatality in 2014 and another in 2017.

Pre-Crash Action / Contributing Circumstances

An analysis of pre-crash actions provides an understanding of what the pedestrian, cyclist, or motorist was doing before the crash. Approximately 47% of pedestrian crashes occurred when motorists were traveling straight, while 29% involved the vehicle making a left turn and 11% occurred when the vehicle was backing up. For pedestrians, the highest pre-crash action was crossing at a marked crosswalk (33%), the second highest was walking straight (22%), and the next highest was crossing at unmarked crossings at intersections (8%). Contributing circumstances to bicycle and pedestrian crashes were also analyzed. While 38% of crashes had no contributing circumstance, 31% of crashes involved a failure to yield the right-of-way to a pedestrian and 22% of crashes involved driver inattention, including failure to obey traffic control devices.

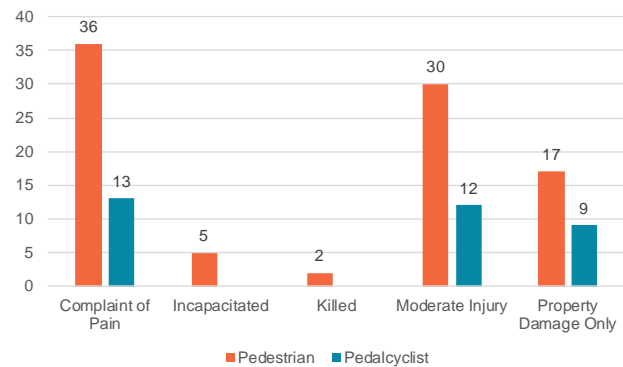
- Total Crashes = 105
 - 72 Pedestrian
 - 33 Bicyclists

Yearly Distribution of Crashes



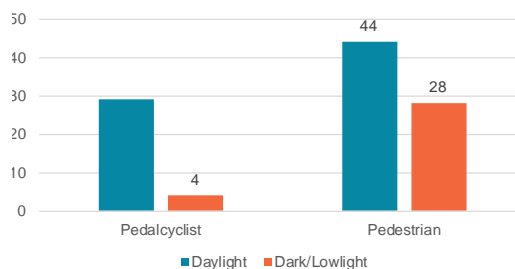
- Total Involved = 124
 - 2 Killed
 - 5 Incapacitated

Crash Severity



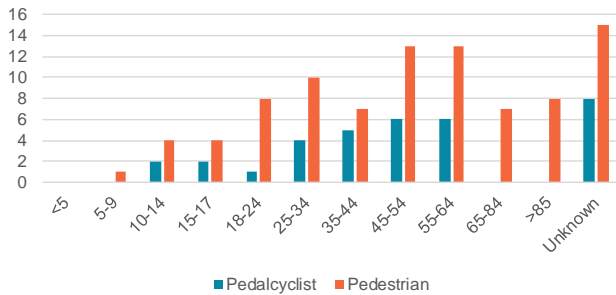
- Total Daylight - 73
- Total Dark - 32

Light Conditions



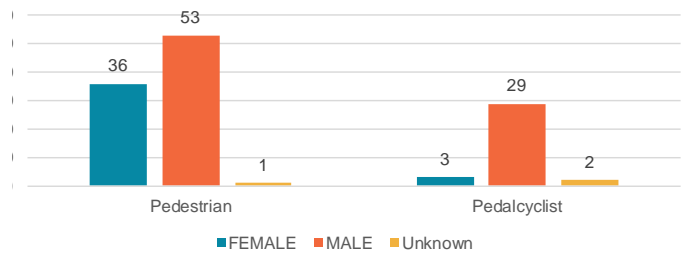
- Total Involved = 124
 - 90 Pedestrians
 - 34 Bicyclists

Crash Distribution by Victim Age



- Total Involved = 124
 - 82 Males
 - 39 Females

Crash Distribution by Gender



Crash Locations and Hotspots

Pedestrian crashes were concentrated in the downtown, as well as along higher volume, higher activity streets such as East Broad, Rahway, Central, and Clark Street. The geographic distribution of bike crashes was slightly different. Though several bike crashes occurred along Central Avenue in the downtown, there was significant clustering along North and South Avenues.

Using the geocoded crash location data from NJDOT’s Safety Voyager database, specific intersections with multiple crashes (i.e. crash hotspots) were identified. These locations are shown in Figure 5.6. Most of the crash hotspots are located either in the downtown area or at intersections along major roads including Broad Street, Central Avenue, and South Avenue (Figure 5.7). The severity of crashes was not considered when determining hotspots.

In addition to public input and field observations, the crash analysis played an important role in prioritizing intersections and corridors for safety improvements. Installing dedicated bicycle facilities helps reduce the likelihood and severity of crashes with bikes by creating space and separating cyclists and motorists. Similarly, the likelihood and severity of pedestrian crashes can often be reduced by installing curb extensions to promote visibility, implementing traffic calming techniques to discourage speeding, and promoting enforcement measures to discourage illegal and dangerous behaviors.

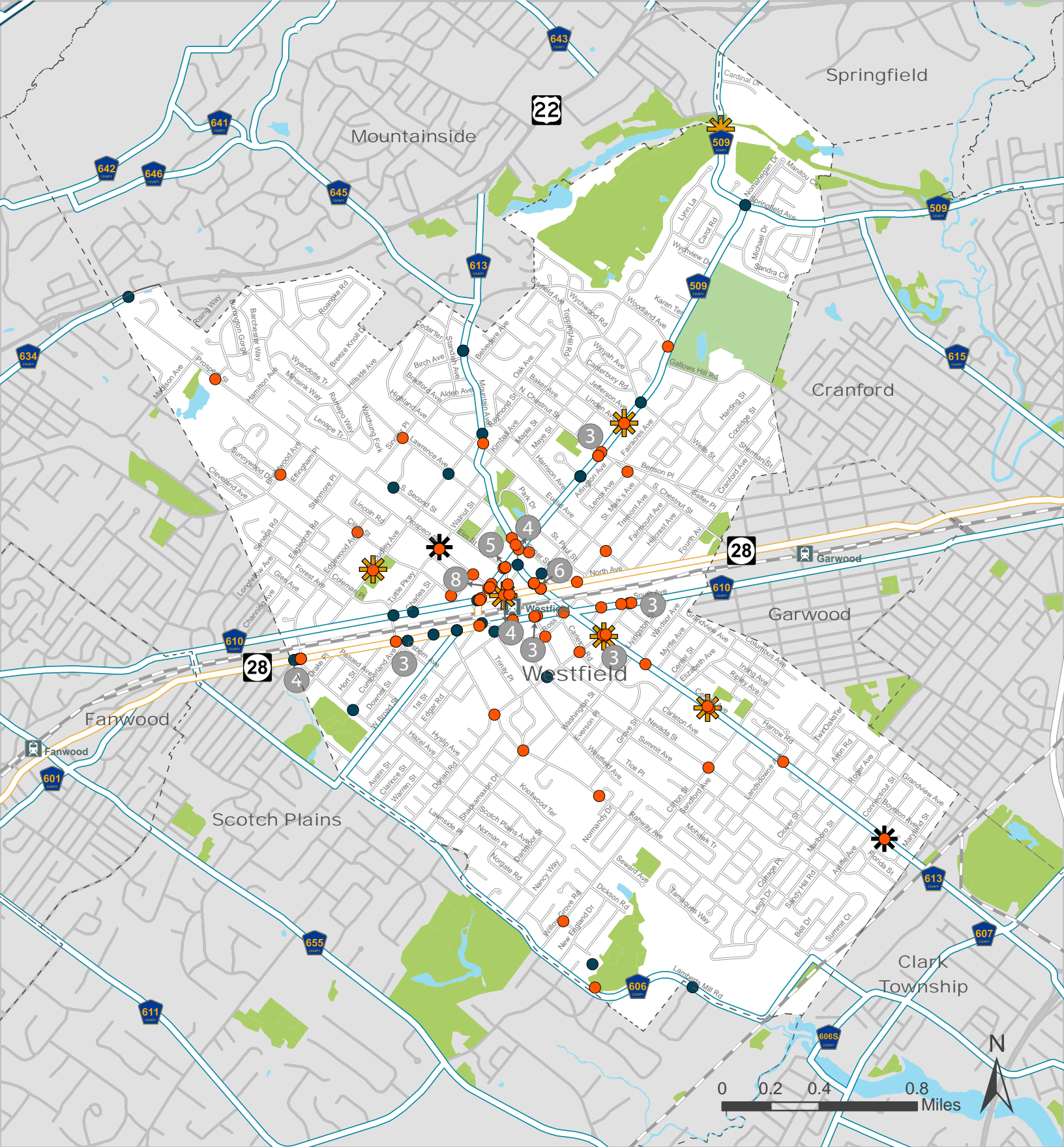


Figure 5.6: Bicycle and Pedestrian Crashes (2013-2017)

- Pedestrian
- Bicyclist
- ★ Incapacitated
- ★ Killed

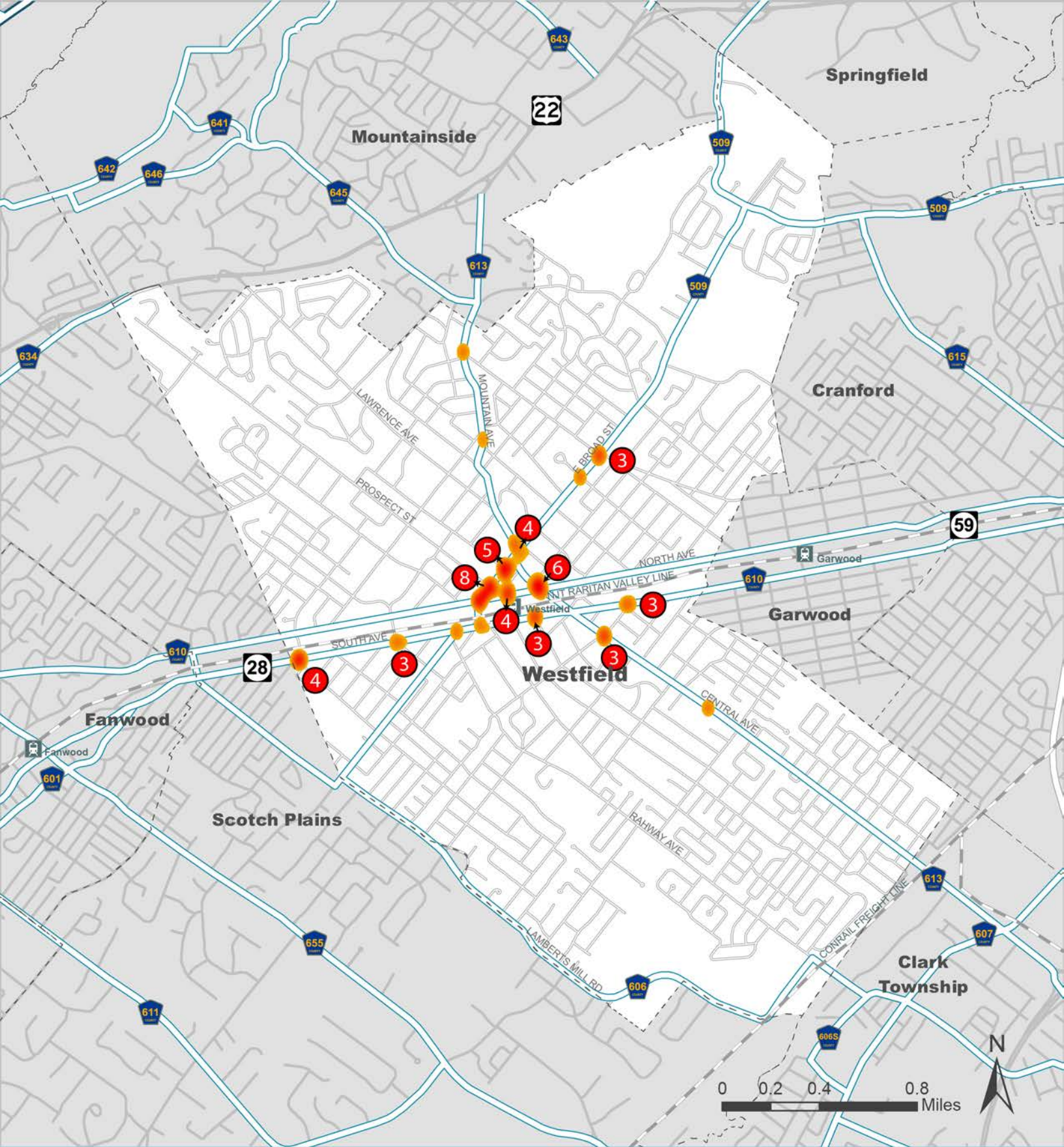


Figure 5.7: Bicycle and Pedestrian Crash Hotspots (2013-2017)

Pedestrian Facility Assessment

As part of the existing conditions analysis, the project team conducted a town-wide inventory of pedestrian infrastructure in Westfield. The inventory consisted of the following two components:

Sidewalk Gap Assessment

The latest satellite imagery from GoogleEarth, combined with targeted field observations, was used to create an inventory of existing sidewalks at a town-wide level. Each roadway within Westfield was classified as having no sidewalks, sidewalks on one side, or sidewalks on both sides of the street. Results of the inventory show that of the 231 miles of roadway in Westfield, 120 miles have sidewalks on two sides, 38 miles have sidewalk on one side, and 73 miles have no sidewalks. As shown in Figure 5.8, the sidewalk network is nearly complete in the downtown area but has gaps and missing segments along major roads and in residential neighborhoods further from the core.

Pedestrian Crossing Assessment

In addition to sidewalk connectivity, the project team assessed the location and spacing of existing pedestrian crossings including signalized intersections, all-way stops, RRFBs, and PHBs. Most of the traffic signals are concentrated in the downtown and along Central Avenue, while beacons have been used in other areas of town to enhance pedestrian crossings. PHBs have been installed at two locations (North Avenue near Lord & Taylor and Central Avenue/Clover Avenue) while RRFBs have been installed in several locations. Despite these improvements, there are still significant gaps in crossing opportunities (600 feet or more) along all the major roads, including Broad Street, Central Avenue, Mountain Avenue, North Avenue, and South Avenue.



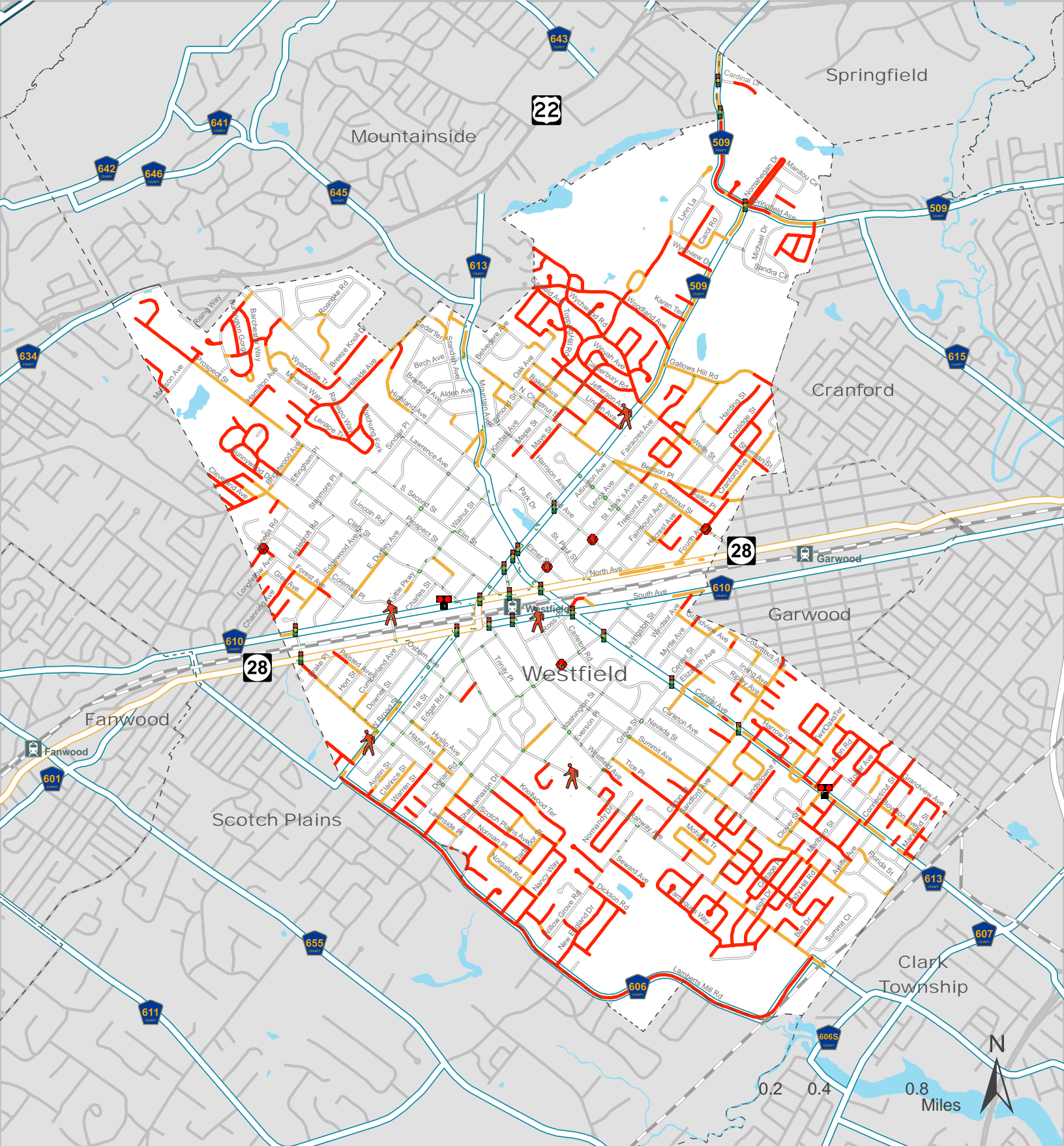



Figure 5.8: Sidewalk Gap Assessment

Bike Walk
Westfield
Bicycle and Pedestrian Plan

-  Stop Sign
-  Traffic Signal
-  RRFB
-  PHB
-  Crosswalk
-  Sidewalk One Side
-  No Sidewalk

Bicycle Facility Assessment

There are several off road trails in parks in Westfield including at Tamaques Park, Mindowaskin Park, and Brookside Nature Trail near Memorial Pool Complex. Currently, there are no on road bicycle facilities in Westfield. Limited bicycle parking is available at Tamaques Park, Memorial Pool Complex, public library, Westfield Train Station and the downtown. There is a need for on and off road bicycle facilities as well bicycle parking at several locations in Westfield.

Bicycle Level of Traffic Stress (LTS)

The current traffic conditions of the roadway. Tolerances towards traffic stress created by volume, speed, and proximity to automobile traffic vary for bicyclists. The underlying principal for the LTS metric is based on the Dutch concept of low-stress bicycle facilities and has proved to be influential in the United States.

In general, lower stress facilities have increased separation between cyclists and vehicular traffic and/or have lower speeds and lower traffic volumes. Higher stress environments generally involve cyclists riding in close proximity to vehicular traffic, multi-lane roadways, and higher speeds or traffic volumes. Four levels of traffic stress were used to evaluate the roadways of Westfield:

- **Level of Traffic Stress 1:** The level most users can tolerate (including children and seniors)
- **Level of Traffic Stress 2:** The level tolerated by most adults
- **Level of Traffic Stress 3:** The level tolerated by "enthusiastic" riders who might still prefer dedicated space
- **Level of Traffic Stress 4:** The level tolerated by the most experienced riders

Four Levels of Traffic Stress

The level of traffic stress analysis categorizes streets based on four levels. These level of stress categories, discussed below, were determined through significant research in the Netherlands, and adapted for the United States by researchers at Northeastern University.



1 | Most Users

Suitable for almost all cyclists, including children. On LTS 1 links, cyclists are either physically separated from traffic, in an exclusive bicycling zone next to slow traffic, or on a shared-street with a low speed differential.



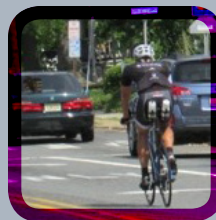
2 | Most Adults

Suitable for most adults, but demands more attention than might be expected from children. Similar cross sections to LTS 1 but with more likelihood for interaction with motor vehicles.



3 | Enthusiastic Riders

Welcoming level for many people currently riding bikes in this country. Cyclists either ride in an exclusive on-street lane next to moderate speed traffic or on shared lanes on non-multi-lane streets.



4 | Experienced Riders

Suitable only for the most experienced riders or not suitable for any riders. Roadway is characterized by high travel speeds, multiple lanes, and/or are lacking in dedicated bicycle facilities.

Level of Traffic Stress Tiers

LTS 1 only



LTS 1 and 2



LTS 1, 2 and 3



All LTS



The existing LTS was evaluated for all roads in Westfield. The project team assessed major roadways and key minor roadways in the study area using a variety of data sources, including base mapping, GIS data files, NJDOT Straight Line Diagrams, and traffic data from NJDOT. Field evaluations were also conducted to confirm measurements and observe actual roadway operations and user behaviors. For many of the local roads in the study area, basic assumptions were made of their typical characteristics.

Figure 5.9 shows results from the existing LTS analysis. Most of the streets in Westfield are residential streets with low traffic speeds and volumes, which classifies them as LTS 1 roadways that are accessible to all users. There are several roadways classified as LTS 2 due to higher volumes, speeds, and more frequent turning movements, including Rahway Ave, Prospect Ave, portions of North Ave and Mountain Ave, West Broad St, and Elm St. The high stress (LTS 3 and LTS 4) roadways within Westfield include higher speed and/or higher volume state and county roadways - Central Ave, Lambert Mill Rd, portions of North Ave, South Ave, and East Broad St. While Central Ave, Lambert Mill Rd, and portions of North and South Ave are considered as higher stress roadways due to their 35 MPH speed limit, E Broad St and Mountain Ave have higher LTS values due to higher traffic volumes. These roadways intersect at the core of the City's downtown and create a high-stress link for any bicycle trips crossing from one side of town to the other.

Connectivity Assessment

The LTS analysis seeks to uncover an “island” effect whereby LTS 1 roadways alone are contained in low-stress “islands” (typically low volume residential areas) and are physically blocked from other portions of the town by high-stress arterial roadways. In general, the LTS analysis highlights the significant challenges that major roads such as North Ave, South Ave, Central Ave, Mountain Ave, and Broad Street present to achieving a low-stress bicycle network. From the perspective of low-stress tolerance cyclists, such as children bicycling to school or senior citizens bicycling to a store or a park, Westfield has a high number of LTS 1 roadways. However, the North Ave and South Ave roadway pair divides Westfield into two distinct areas, while Central Ave, Broad Street, and Mountain Ave further subdivide the neighborhoods and create several low stress “islands” with limited connectivity between them. And while Rahway Ave is considered a LTS 2 facility, high traffic volumes during the peak periods of school arrival and dismissal may result in characteristics of a higher stress roadway. In addition, the lack of a low-stress north-south connection is the most apparent in the eastern half of town, where no LTS 1 roadways cross the pair of North Ave and South Ave.

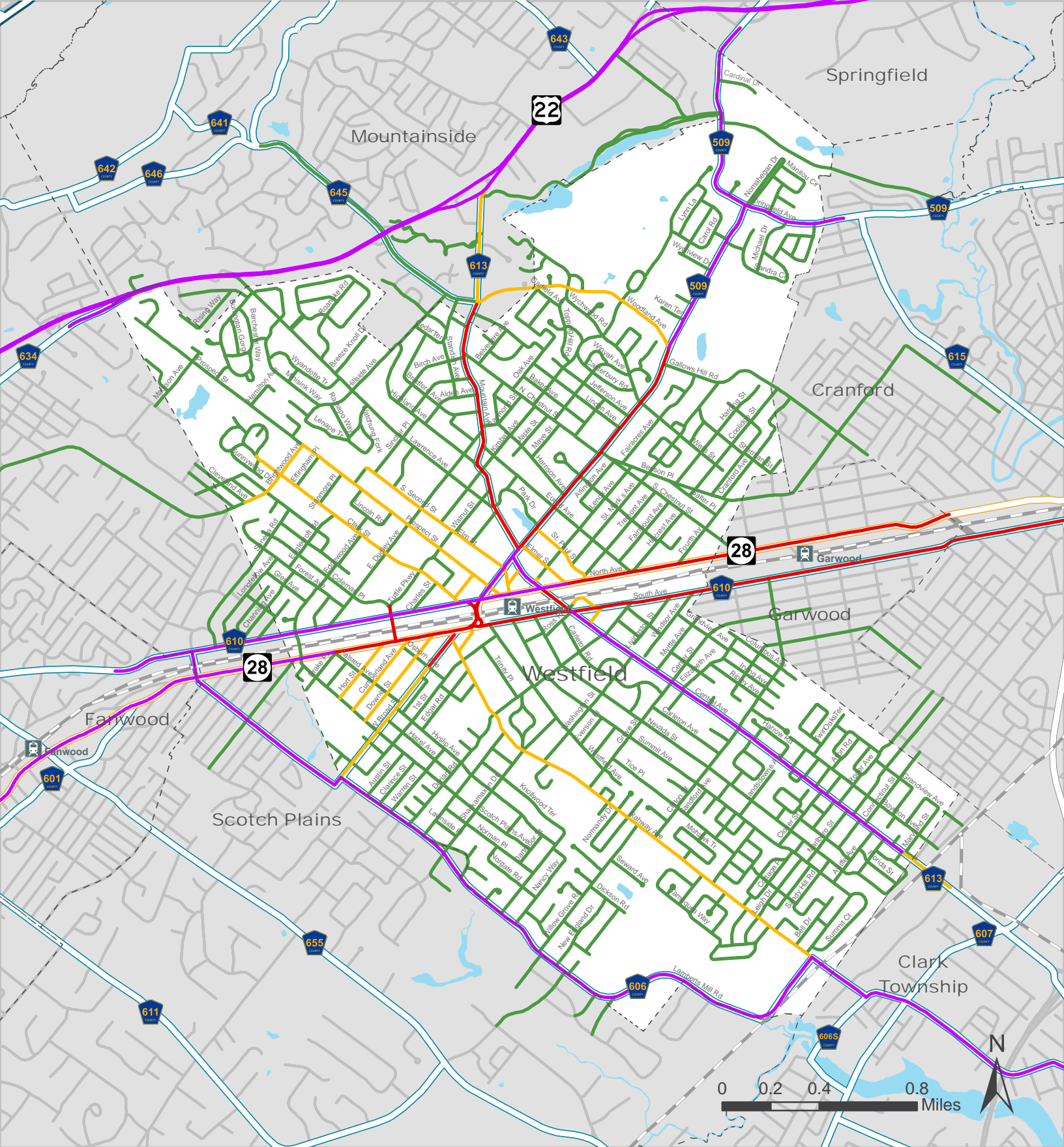


Figure 5.9: Bicycle Level of Traffic Stress (LTS)



A gravel path leads through a dense forest. The path is bordered by wooden railings on both sides. The trees are lush green, and the ground is covered in fallen leaves and twigs. The scene is bright and natural.

06 *Recommendations*

This chapter presents recommendations to enhance the safety, accessibility, and convenience of walking and biking in Westfield. The section first describes infrastructure-focused pedestrian and bicycle improvements, which are followed by policy and program related recommendations.

Pedestrian Network Improvements

Based upon the existing conditions analysis, feedback from the Study Advisory Committee, and public input, proposed concepts were developed to improve comfort, access, and safety for pedestrians. The recommendations outlined in this chapter include general planning and design principles applicable throughout the Town, a prioritized plan for completing gaps in the sidewalk network, and pedestrian crossing enhancements.

The proposed improvements are intended as conceptual recommendations that would likely require varying levels of design or further analysis, depending on the magnitude of the improvement. An effort was made to identify concepts that are implementable and emphasize low-cost options, where applicable, such as restriping of existing roadways or enhanced signage.

Projects may be implemented over time as funding allows. The recommendations may be used to support grant applications, integrate pedestrian projects into the capital improvement pipeline, and/or incorporate pedestrian improvements into routine roadway maintenance and resurfacing projects or development activity to minimize additional costs.

Pedestrian Design Treatments

While the proposed concepts were focused on routes connecting major destinations, many of these improvements include common design elements that would be applicable in other parts of Town and could be incorporated into roadway improvement projects as opportunities arise. These common elements can generally be described using two categories: (1) enhanced pedestrian crossings, and (2) traffic calming measures.

The following sections summarize key elements of these treatments. As the Town implements various roadway projects, it is recommended that pedestrian facility design be based on current best practices and design guidance including:

- *New Jersey Complete Streets Design Guide*
- *NACTO Urban Street Design Guide*
- *FHWA Small Town and Rural Multimodal Networks*
- *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities*
- *Manual on Uniform Traffic Control Devices (MUTCD)*

Enhanced Pedestrian Crossings

Based on the surrounding context, traffic volumes, and traffic speeds, a variety of design elements can be employed to create “enhanced crossings” that improve pedestrian visibility, enhance user comfort, increase driver compliance with the State’s “stop for pedestrians” law, and/or decrease the crossing distance for pedestrians. On low volume and low speed roadways, crosswalk striping is often sufficient. However, on higher volume and/or higher speed roadways, additional treatments are recommended.

Elements of an enhanced pedestrian crossing may include:

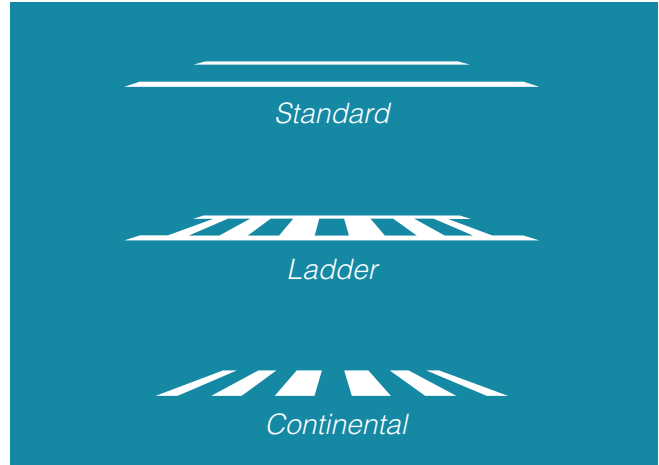
High Visibility Crosswalk Striping

Striping design can significantly enhance the visibility of a crosswalk. Transverse striping, typically a pair of parallel lines oriented perpendicular to the driver, has a very limited visual profile to motorists. Conversely, longitudinal striping (often referred to as “continental” striping) is oriented parallel to motor vehicle travel, which significantly improves the visibility of the crossing to motorists. Typical types of crosswalk striping are illustrated on the right.

Pavers or stamped brick crosswalks are often incorporated into downtown streetscape designs. While these designs may provide additional aesthetic value consistent with an overall streetscape program, they generally do not have the same visibility benefits as the continental striping due to the low color contrast between the pavers and the asphalt. If the brick aesthetic is preferred, it can be combined with higher visibility striping patterns to enhance visibility.

Ergonomic Crosswalks

Ergonomic crosswalks feature a curved design that helps pedestrians stay within crosswalks by more closely matching their desired walking paths (see accompanying examples). In addition to encouraging pedestrians to stay within the crosswalk, this design also increases visibility of the crossing area to motorists. Ergonomic crosswalks are particularly effective at skewed intersections where pedestrians regularly “cut the corner” since the full length of the crosswalk isn’t necessarily the shortest path.



Pedestrian Crossing Signage and Beacons

Signage can further enhance the visibility of a pedestrian crossing and reinforce driver compliance with the State's stop for pedestrian law. Signage options include in-road "Stop for Pedestrian" (MUTCD R1-6a) and pedestrian crossing (W11-2) signs. Both options improve motorist awareness of the crossing and their obligation to stop for pedestrians. Crossings with higher vehicle speeds, higher vehicle volumes, or a higher volume of pedestrians may also be suitable locations for beacons. Pedestrian-actuated rectangular rapid flashing beacons (RRFBs) further improve the visibility of the crossing by combining signage with flashing amber LED lights to encourage motorists to stop for pedestrians. Pedestrian hybrid beacons (PHBs) are closer in operation to a full traffic signal because they require motorists to stop when the red beacon is displayed, thus allowing pedestrians a protected crossing phase.



Pedestrian Hybrid Beacons



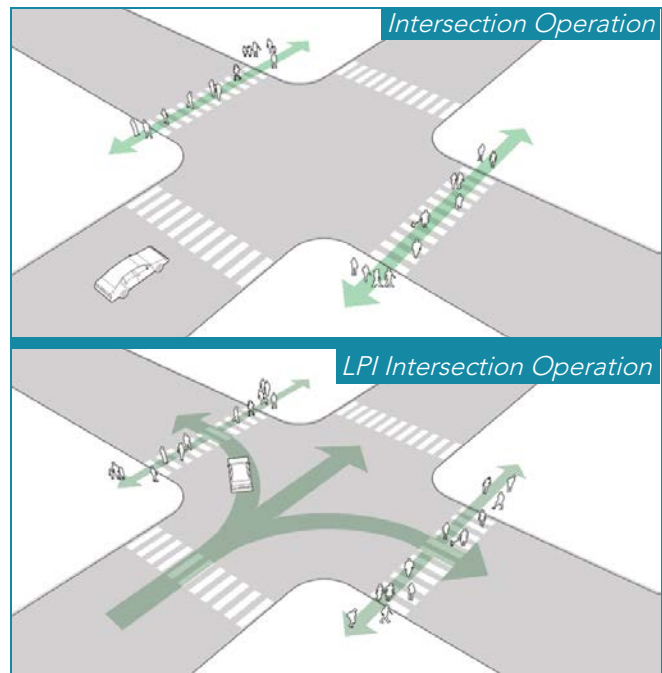
Rectangular Rapid Flashing Beacons



In-road "Stop for Pedestrians" Signs

Leading Pedestrian Interval (LPI)

LPI provides a few seconds of pedestrian crossing time before vehicular traffic gets a green light. Lead time enhances visibility of pedestrians and allows them to establish presence in crosswalk, thereby reducing risk of collisions. LPI operations are depicted in the images below.



Source: Urban Street Design Guide, National Association of City Transportation

Intersection Daylighting

Daylighting an intersection refers to improving the visibility of a crossing by removing obstacles that could obstruct the vision of either the pedestrian or approaching motorists. On-street parking that is located too close to an intersection is a common obstruction to visibility. Daylighting treatments can include short-term installations that are removed seasonally, interim treatments, or permanent, raised curb extensions.

Long-term solutions often consist of installing a curb extension. This extends the sidewalk and streetscape into the parking lane and/or narrows the travel lane. Curb extensions provide an opportunity to integrate green stormwater management strategies and/or enhance the streetscape with street furniture, plantings, or other amenities.

Traffic Calming Measures

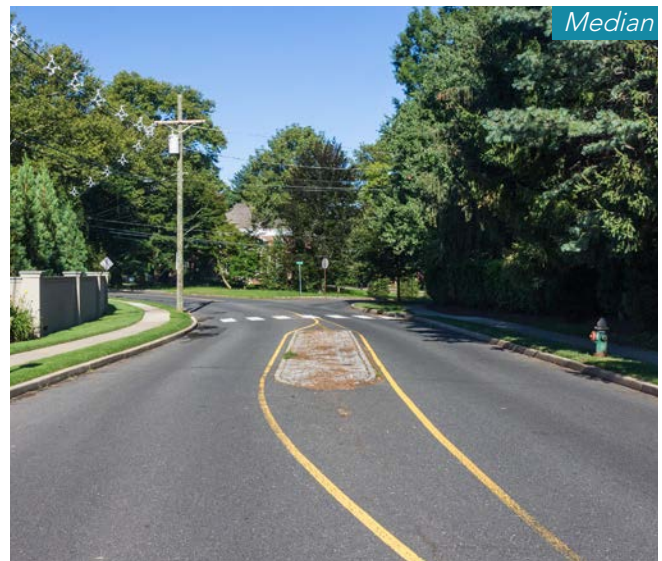
Traffic calming strategies aim to reduce motor vehicle speeds. Lower speeds support a more bicycle- and pedestrian-friendly environment by reducing instances of vehicles overtaking bicyclists, enhancing the drivers' ability to see and react to bicyclists and pedestrians, and reducing the severity and likelihood of crashes for all street users. Reducing vehicle speeds also improves bicyclist comfort by reducing the speed differential between motor vehicles and bicyclists and is a critical element of a bicycle boulevard. Benefits of traffic calming techniques include:

- Decreased motor vehicle speeds
- Decreased crash likelihood and crash severity for all street users
- Improved bicyclist and pedestrian comfort
- Improved conditions for pedestrians and residents by reducing vehicle speeds
- Establishes and reinforces bicycle priority on bicycle boulevards
- Provides opportunity for landscaping and other community features, such as benches, communal space, and artistic painted intersections, benefiting all roadway users and residents

Speed management treatments can be divided into two types: horizontal and vertical deflection. These treatments can be implemented individually or in combination to increase their effectiveness. As with all roadway features, traffic calming elements should be designed to consider the context and needs of the street. Enhanced signing strategies can also support lower traffic speeds. Radar speed signs or driver feedback signs, for example, alert drivers of their speed and the actual speed limit. These relatively low cost, easily implementable tools have been shown to have a moderate impact on reducing 85th percentile speeds, and a significant impact on reducing high-end speeds – those exceeding the speed limit by 10 MPH or more (Spotlighting Speed Feedback Signs, Public Roads/FHWA, 2016). These devices may be applicable as part of a gateway treatment along Central Avenue entering the Town.



Raised Intersection



Median



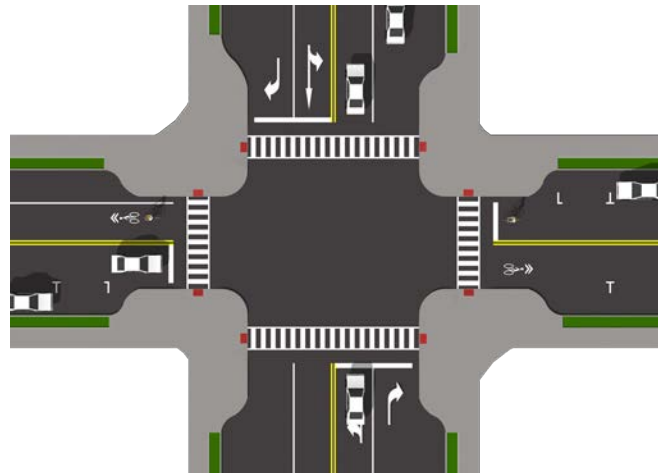
Neighborhood Roundabout

Horizontal Deflection

Horizontal speed control devices are used to slow motorists by either visually narrowing the roadway or deflecting motorists through an artificial curve. Where possible, sufficient space should be provided for bicyclists to pass around the outside of the elements.

Curb Extensions

Curb extensions, or bulb-outs, extend the sidewalk or curb face into the parking lane at an intersection. Curb extensions narrow the roadway at intersections, contributing to lower motor vehicle speeds, as well as reducing the crossing distance for pedestrians and increasing the amount of space available for street furniture and green stormwater management features. They are typically applied at locations with on-street parking and should not extend into bicycle lanes.



Chicanes

Chicanes are a series of raised or delineated curb extensions, edge islands, or parking bays that are placed on alternating sides of a street to create an S-shaped bend in the roadway. Chicanes reduce vehicle speeds by requiring drivers to shift laterally through narrow travel lanes.



Neighborhood Roundabout

Neighborhood roundabouts, or mini roundabouts, are raised or delineated islands used at minor street crossings to reduce vehicle travel speeds by reducing turning radii, narrowing the travel lanes, and, if planted, obscuring the visual corridor along the roadway.

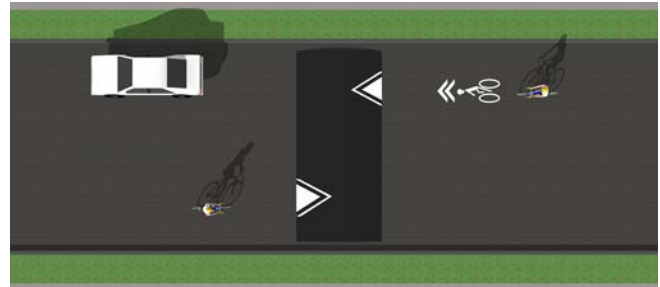


Vertical Deflection Treatments

Vertical speed control measures are composed of wide, slight changes in pavement elevation that self-enforce a slower speed for motorists. Narrow and abrupt speed bumps that are often used in private driveways and parking lots are not recommended for public streets and are hazardous to bicyclists.

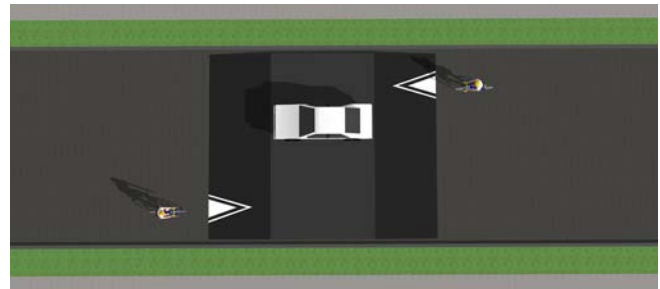
Speed Humps

Speed humps are 3 to 4 inches high and 12 to 14 feet long, with an intended vehicle speed of 15 to 20 mph. Speed hump design should adhere to the guidelines of the New Jersey "Speed Hump Law," (C.39:4-8.9, C.39:4-8.11), which adopted the ITE design standards for speed humps.



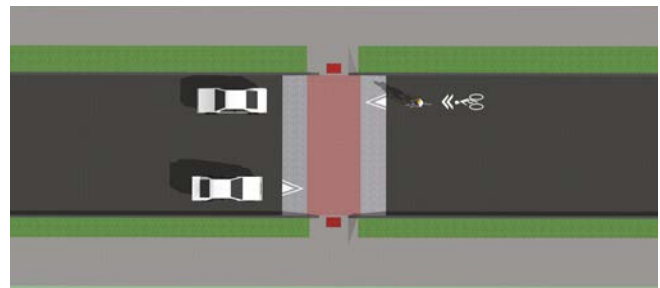
Speed Tables

Speed tables are longer than speed humps and have a flat top, with a typical height of 3 to 3.5 inches and a length of 22 feet. Intended vehicle operating speeds range from 25 to 35 mph, depending on the spacing. Speed tables may be used on collector streets, transit, and/or emergency responder routes.



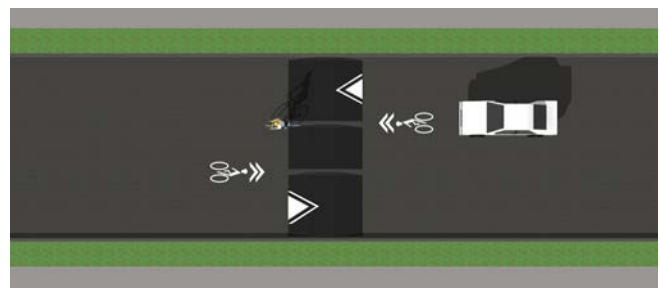
Raised Crosswalk / Raised Intersection

A raised crosswalk is a speed table that is signed and marked as a pedestrian crossing. It extends the full width of the street and is typically 3 inches high. At minor intersections the entire intersection can be raised to reduce motor vehicle speeds in all directions.



Speed Cushions

Speed cushions are speed humps that include wheel cutouts that allow larger vehicles to pass unaffected, but reduce passenger vehicle speeds. They are often used on key emergency response routes to allow emergency vehicles to pass unimpeded. Speed cushions should be used with caution, however, as drivers will often seek out the space in between the humps.



Prioritized Sidewalk Plan

Figure 6.1 presents a prioritized plan to address major gaps in the sidewalk network throughout Westfield. The guiding approach was to provide sidewalk along at least one side of all major streets and most neighborhood streets. Exceptions were made for low-traffic residential streets where the paved street can safely be used for walking in lieu of a sidewalk, or segments of major streets with no adjacent land uses. Sidewalk improvements were categorized as either short-term (high priority) or medium/long-term (lower priority) based on their proximity to activity generators, implementation considerations, and stakeholder input. High priority links include segments of Lamberts Mill Road, Central Avenue, E. Broad St, and Mountain Avenue, with most of these connections providing access to schools. Medium-term priorities include connections on some sections of Lamberts Mill Road, Central Avenue, Prospect Street, Scotch Plains Road, and several other short connections.

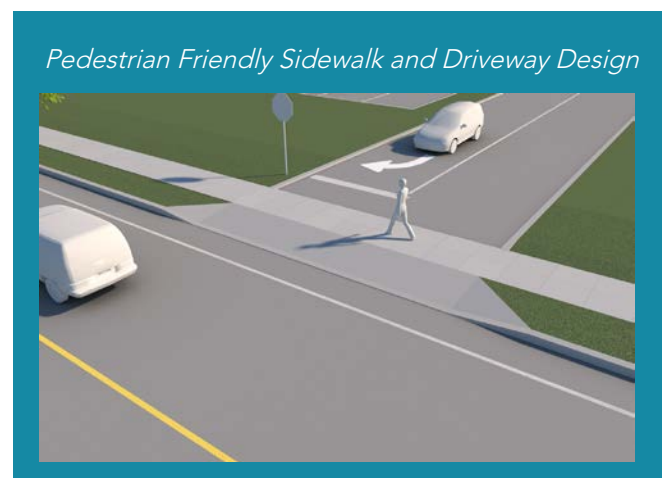
Table 6.1: Sidewalk Improvement Plan

| Street | Destination/ Rationale | Length (ft) | |
|------------------------------|-------------------------------------|-------------|---------------|
| | | Short Term | Med/Long Term |
| Mountain Ave | Major Route | 1,400 | - |
| Broad St | Major Route | 5,200 | 3,200 |
| Central Ave | Major Route | 1,500 | 3,100 |
| North/South Ave | Major Route | 2,100 | - |
| Scotch Plains near South Ave | Westfield Pool Complex | 600 | 1,800 |
| Clifton St | Thomas Edison Intermediate School | 1,900 | 2,400 |
| Dudley Ave | Clark Park & Roosevelt Intermediate | 1,200 | - |
| Lambert's Mill Rd | Tamaques Reservation | 1,900 | 11,100 |
| Near Chestnut/ Kimball | Wilson Elementary School | 3,700 | 700 |

Table 6.1 provides more information on the specific streets included in the sidewalk plan and their rationale for inclusion.

New sidewalks should have a minimum width of five feet, which allows two people to pass each other and is generally sufficient for most residential neighborhoods. In areas with greater pedestrian activity, such as Westfield's downtown or major walking routes to schools, a wider width should be considered. Where right-of-way allows, a planting strip between the sidewalk and curb should be considered to provide an additional buffer between pedestrians and the roadway. These buffers are used along much of the existing sidewalk network in Westfield.

During sidewalk construction, curb ramps compliant with the Americans with Disabilities Act (ADA) must be installed at street crossings to ensure the sidewalk network is accessible for everyone, including seniors, children, families with strollers, and those in wheelchairs or with other mobility impairments. At driveway crossings, design should make it clear and intuitive that the pedestrian has the right-of-way. As illustrated in the image below, the sidewalk should extend through the driveway. A continuous, level sidewalk requires vehicles to cross at sidewalk grade, thereby prioritizing pedestrian movements and encouraging motorists to turn at slower speeds and stop for pedestrians.



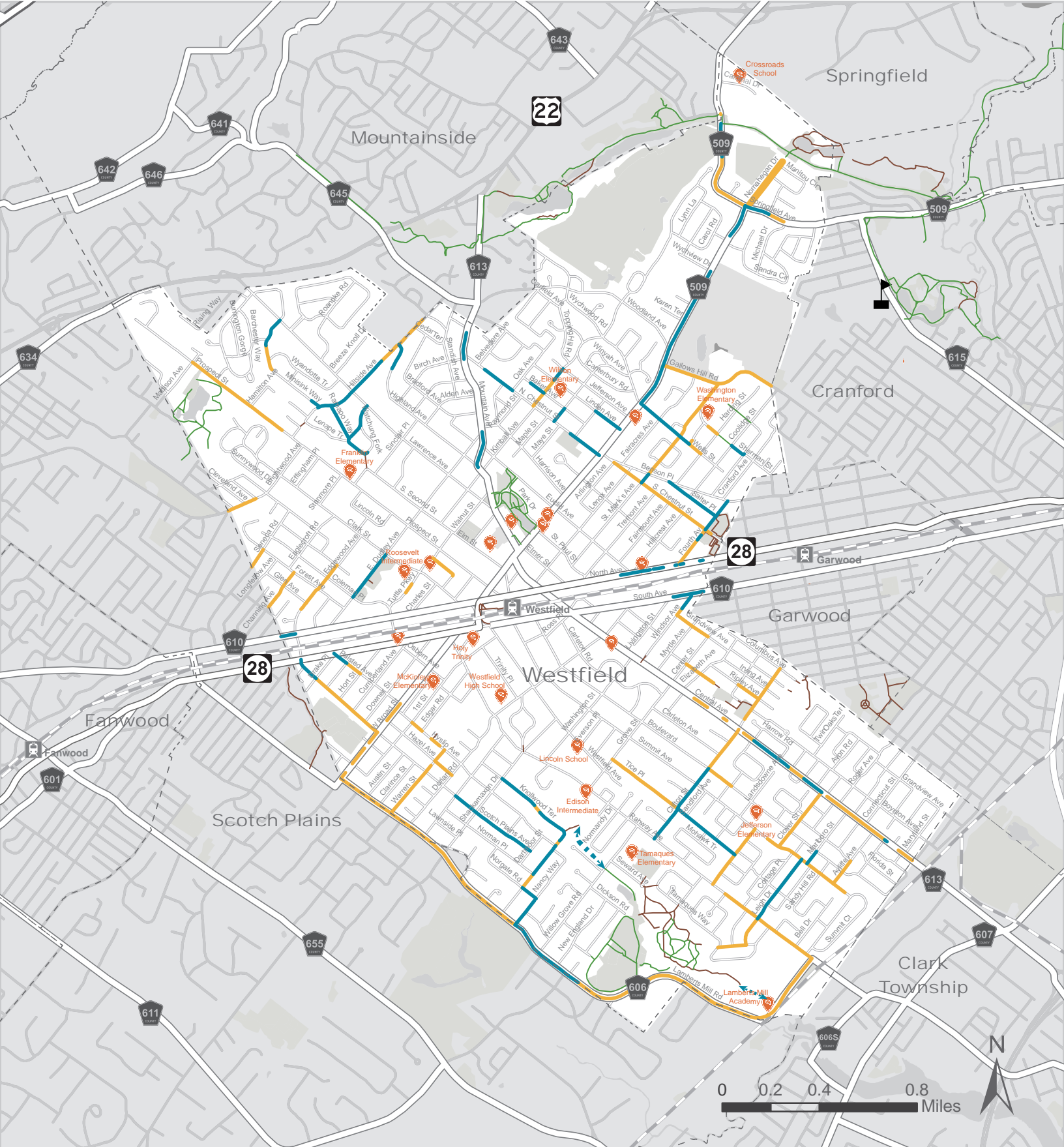


Figure 6.1: Prioritized Sidewalk Plan

**Bike Walk
Westfield**
Bicycle and Pedestrian Plan

Sidewalk Priority

- Short Term (High Priority)
- Medium/Long Term (Low Priority)
- Existing Paths
- - - Proposed Paved Path

Existing Paths

- Unpaved Path
- Paved Path

Central Avenue Sidewalks

Through the existing conditions assessment, Central Avenue was identified as a major barrier for pedestrians and bicyclists, particularly students traveling to the many schools adjacent to the corridor. To address this, conceptual plans were developed to provide continuous sidewalk on at least one side of Central Avenue, with future expansion to both sides. Numerous utility poles, trees, and steep slopes along Central Avenue act as barriers to completing the sidewalk network. The conceptual primary route shown in Figure 6.2 was selected to minimize impacts to these features and thus help reduce costs and facilitate implementation.

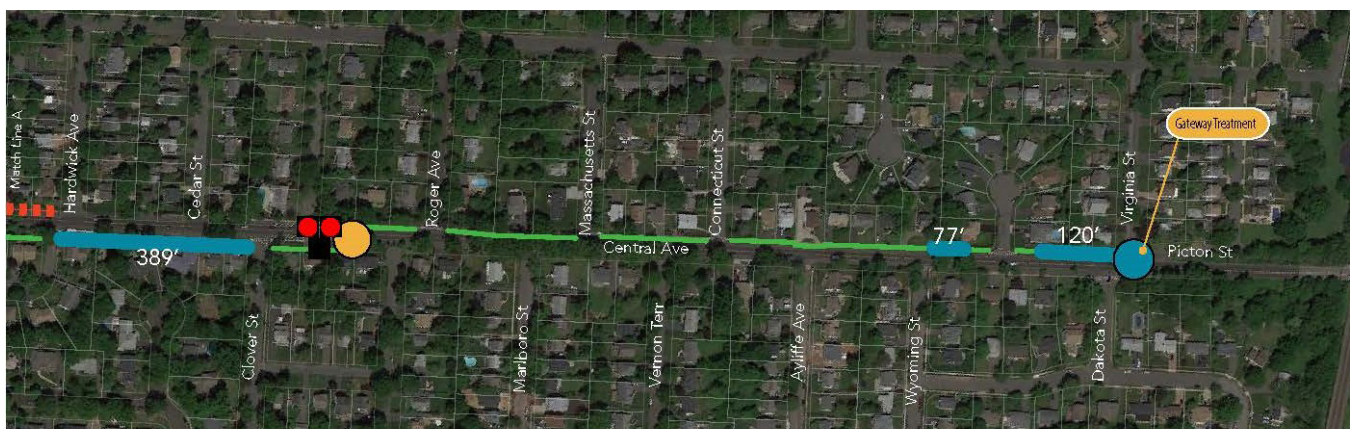
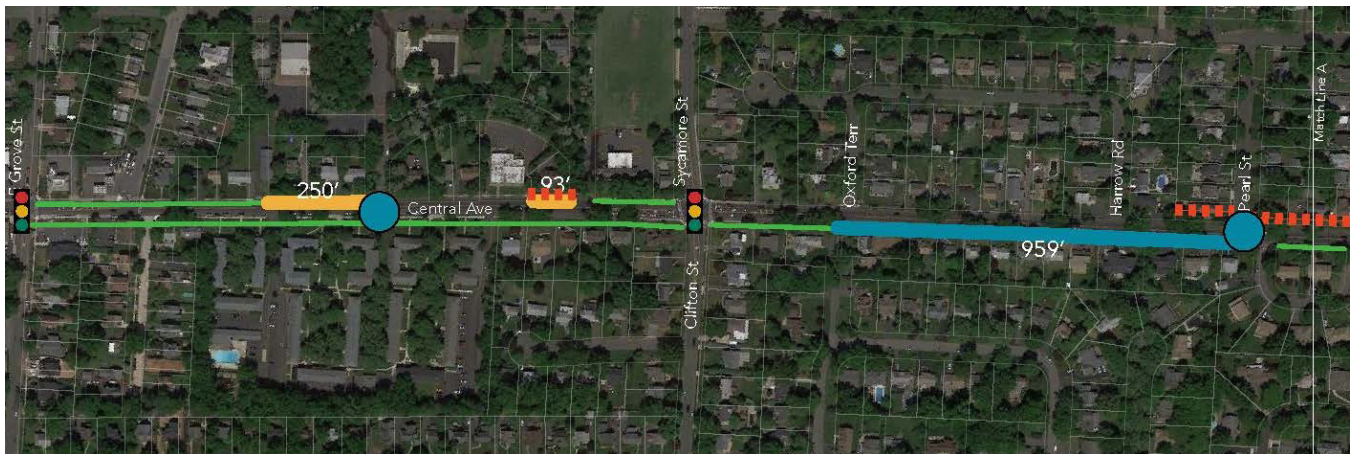
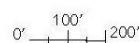


Figure 6.2: Central Avenue Sidewalk Improvements

**Bike Walk
Westfield**
Bicycle and Pedestrian Plan

- Sidewalk High Priority
- Sidewalk Medium Priority
- Existing Sidewalk
- Steep Slope
- Existing Crossing
- Proposed Crossing
- Pedestrian Hybrid Beacon
- Traffic Signal



Town-wide Crossing Improvements

Along with completion of the sidewalk network, it is essential to provide safe and regular crossing opportunities at intersections throughout town. Through the existing conditions assessment, significant gaps (over ~600 or about blocks) in crossing opportunities along major roads were identified and mapped. Figure 6.3 presents recommendations for improving roadway crossings through town, through a combination of:

- New designated crossing locations to address these gaps
- Enhancing existing crossings that would benefit from higher levels of treatment

Table 6.2 summarizes the proposed new and enhanced crossings by corridor. While a lack of marked crossings may be a lower priority at the intersection of low traffic, residential streets, Figure 6.3 demonstrates the need for more marked and/or enhanced crossings along the higher speed, higher volume roads that currently act as barriers. Additional study will be needed to determine the appropriate treatment at each of these locations. *FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2017)* can be used to select treatments based on the number of lanes, posted speed, traffic volumes, and other roadway characteristics.

Three intersections were identified as candidates for traffic signals to improve pedestrian crossings:

- **Prospect St and E Broad St:** At Prospect Street and E. Broad Street, a lack of signalization leads to motorists routinely blocking crosswalks and failing to yield to pedestrians as they attempt to make turns. A signal at this location would also be more consistent with signalization at similar intersections throughout the downtown.
- **Chestnut St and E. Broad St:** Heavy vehicle traffic and the dog-legged interesting street geometry at Chestnut Street and E. Broad Street present challenges for both pedestrians and vehicles trying to cross Broad Street. A signal at this location would benefit pedestrians by providing regular gaps in the traffic stream and allow motorists to make a safer through movement along Chestnut Street.
- **Scotch Plains Ave and W. Broad St:** The Scotch Plains and W. Broad intersection is a candidate due to significant vehicle traffic, inclusion as a potential bicycle route, and proximity to the pool complex. Each of these candidate locations will require further investigation to warrant a traffic signal. Several new RRFB installations that are currently being planned by the Town are also shown on Figure 6.3.

Table 6.2: Crossings Improvement Plan

| Corridor | Existing Crossing (Enhanced) | | New Crossings | |
|--------------|------------------------------|-----------------------------|---------------|--------------------------------------|
| | # | Locations | # | Locations |
| Mountain Ave | 3 | Chestnut, Dudley, Lawrence | 3 | Mountainview, Alden, Kimball |
| Broad St | 3 | St. Paul, Stanley, Osbourne | 3 | Chestnut, Woodland, Scotch Plains |
| Central Ave | 2 | North, South | 3 | Virginia, Pearl, Laurel |
| North Ave | 2 | Clark, St. Paul | 5 | Dudley, Lenox, Elmer, Euclid, Fourth |

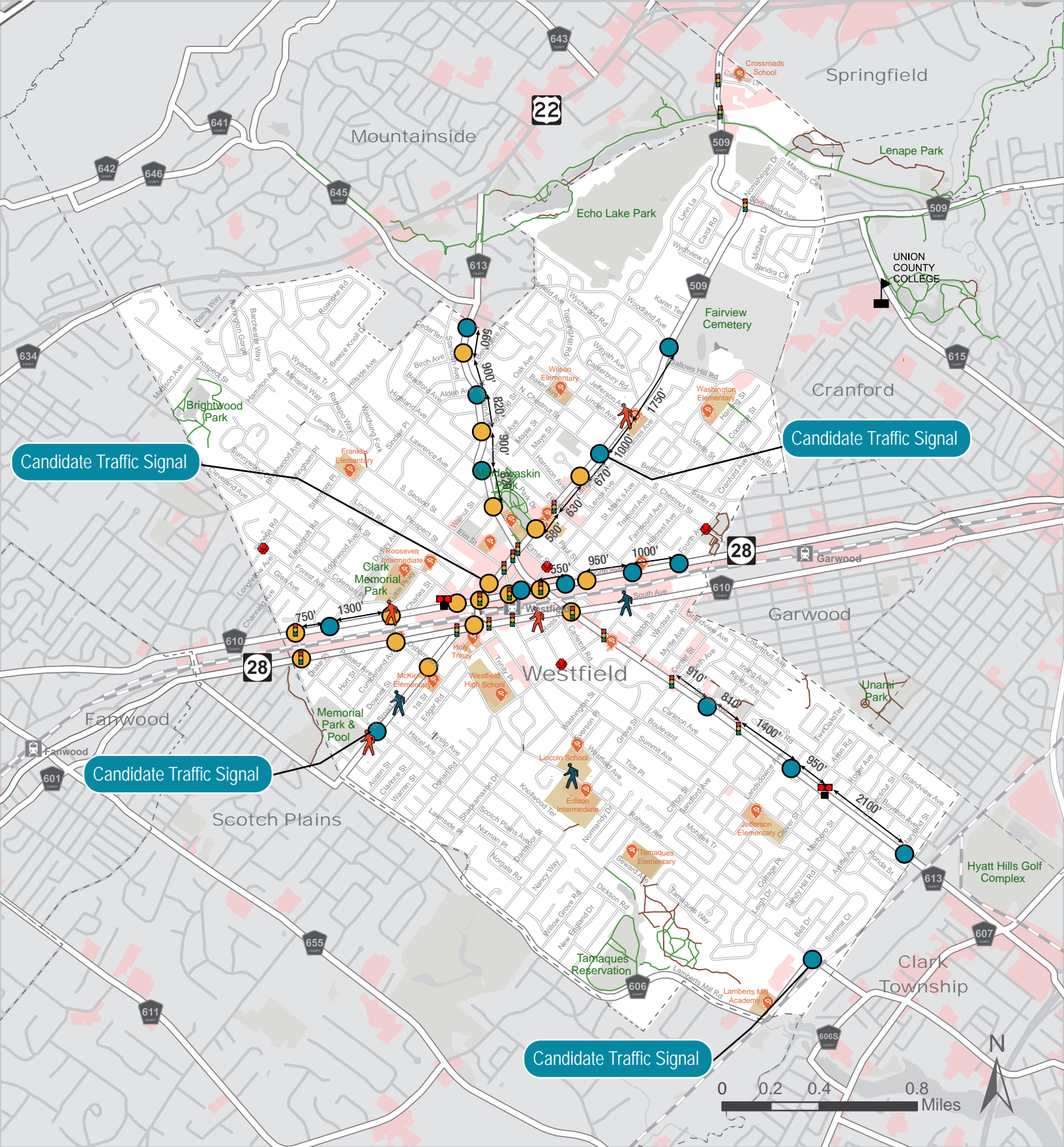


Figure 6.3: Town-wide Crossing Improvements

***Bike Walk
Westfield***
Bicycle and Pedestrian Plan

- | | | | |
|-------------------|-----------------|-----------------|------------------------|
| Proposed | Existing | Existing | Existing |
| Enhanced Crossing | Stop Sign | Train Station | Existing Bike Facility |
| New Crossing | Traffic Signal | Rail | Existing Trail |
| RRFB | RRFB | School | Commercial |
| | PHB | College | School |

Improvements at Problem Intersections

Specific recommendations were for the following “problem intersections” identified through the existing conditions assessment and community outreach effort:

- Central Ave (CR 613) and South Ave (CR 610)
- Central Ave (CR 613) and North Ave (NJ 28)
- Elm St and North Ave (NJ 28)
- E. Broad St (CR 509) and Prospect St
- Roundabout (NJ 28)
- Lawrence Ave and Mountain Ave (CR 613)
- South Ave (NJ 28) and Crossway Place
- Central Ave (CR 613) and Virginia St

Recommendations reflect state-of-the-practice guidance (i.e., NJDOT, NACTO, AASHTO, FHWA) and are consistent with both statewide and national standards for multimodal safety and mobility through implementation of Complete Streets principles. Recommendations for these targeted locations may also serve as templates to help guide future improvements elsewhere in the community. Concept plans were developed for selected locations that would benefit from graphic representation.





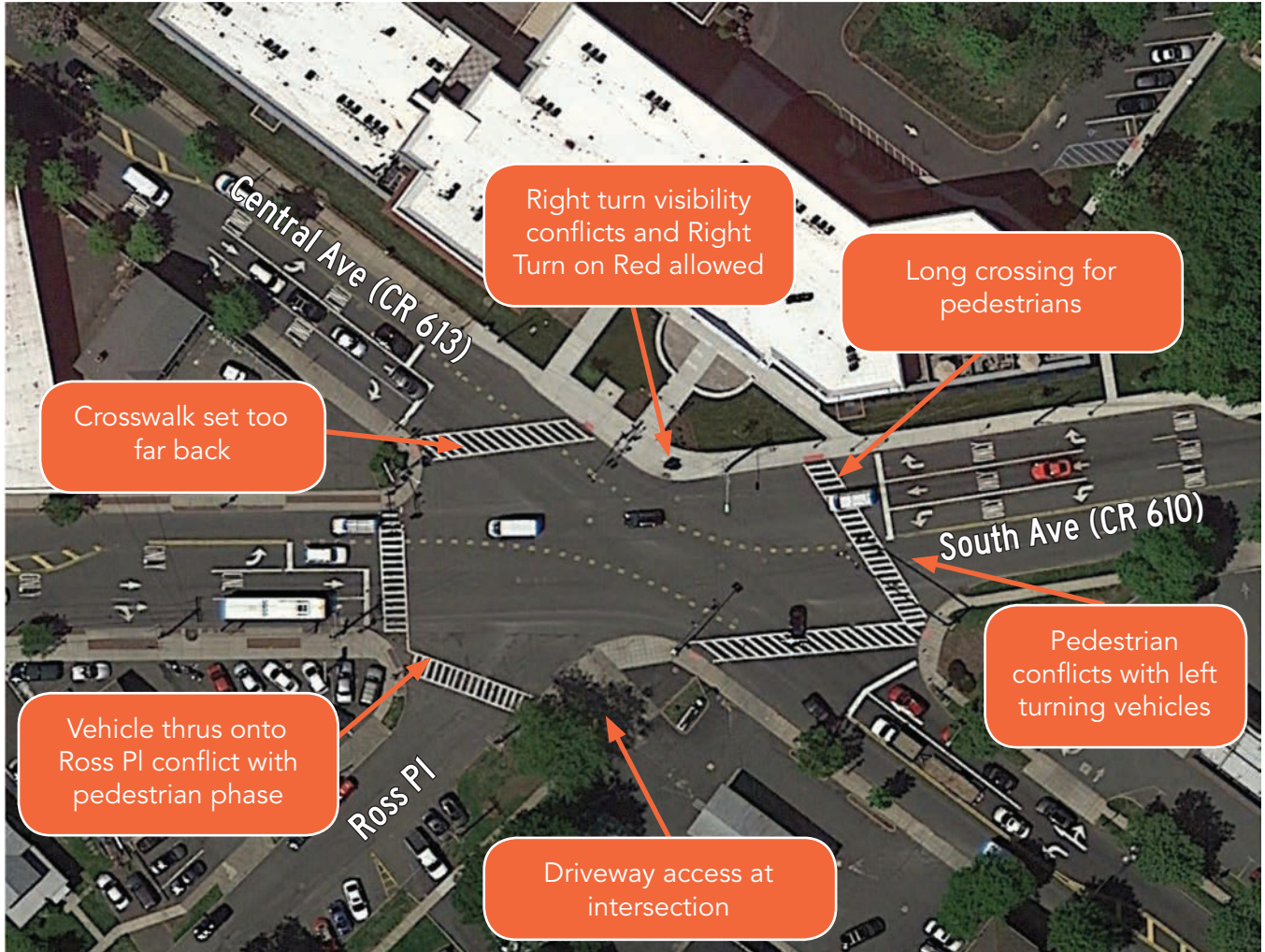


Figure 6.4: Existing Conditions Central Ave and South Ave

Central Ave and South Ave

Existing issues at this intersection are shown in Figure 6.4 above.



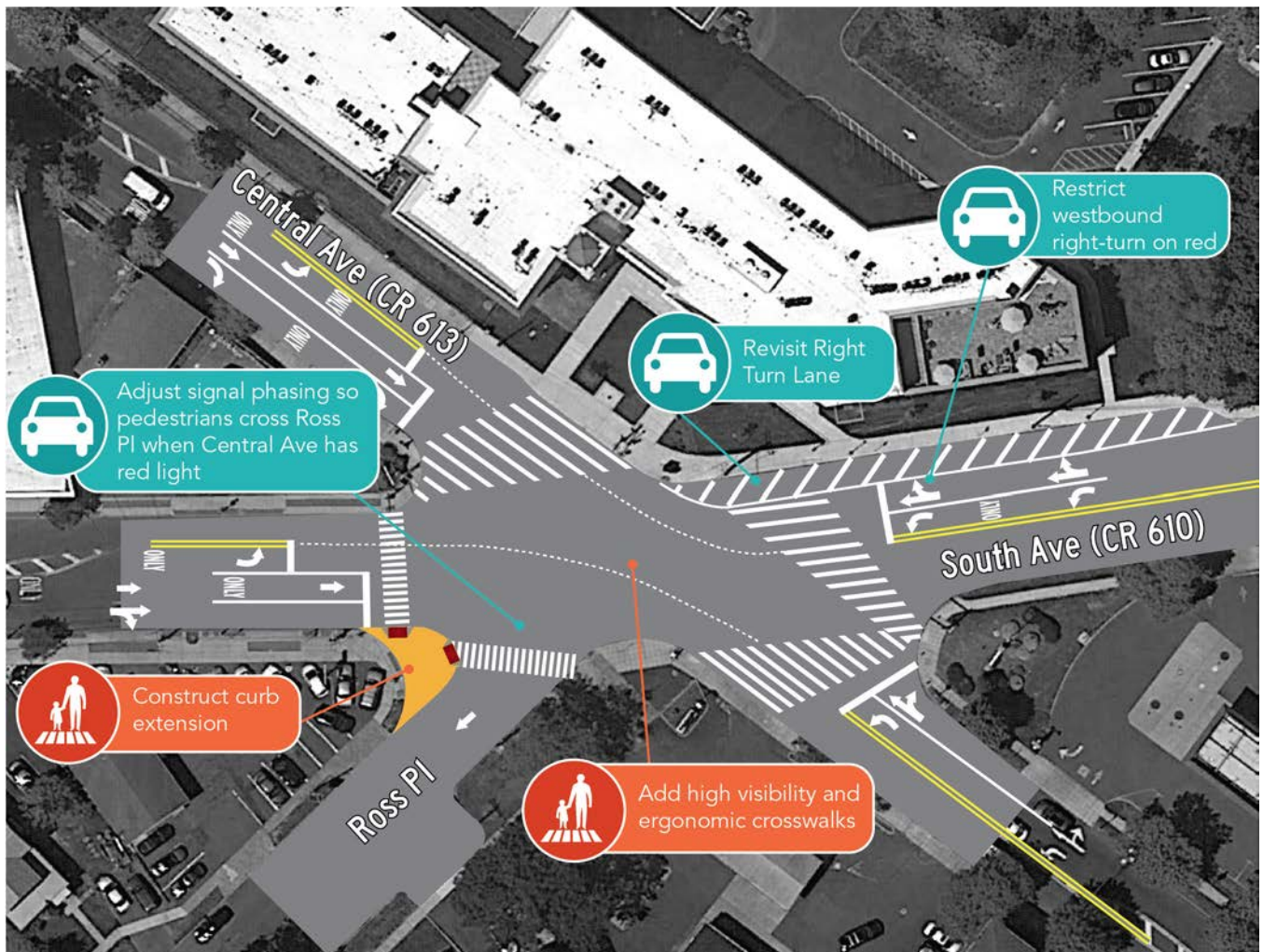


Figure 6.5: Proposed Improvements Central Ave and South Ave

Central Ave and South Ave

Proposed improvements at this intersection are shown in Figure 6.5 above.

Short-Term Recommendations

- Adjust signal phasing so pedestrians cross Ross Place concurrent with South Ave through traffic (i.e. Central Ave traffic is stopped)
- Restrict westbound right-turn on red
- Construct curb extension on southwest corner of intersection
- Add high visibility and ergonomic crosswalks on all legs

Long-Term Recommendations

- Evaluate feasibility of removing right turn lane from westbound South Ave to Central Ave

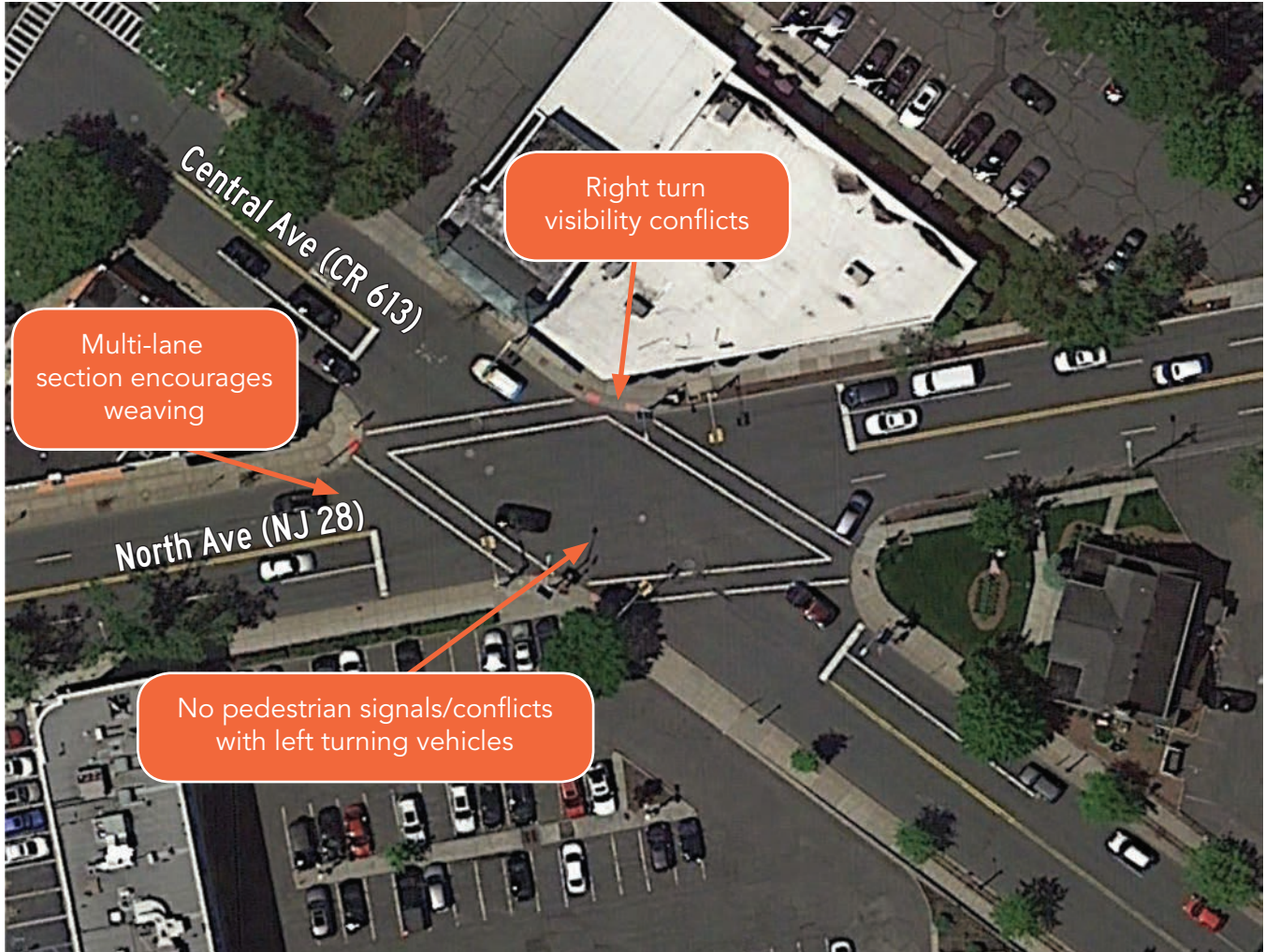


Figure 6.6: Existing Conditions North Ave and Central Ave

Central Ave and North Ave

Existing issues at this intersection are shown in Figure 6.6.

Recommendations

- Install pedestrian signal heads
- Consider implementing a Lead Pedestrian Interval (LPI)
 - Would need to change from lead to lag lefts
- Add high visibility and Ergonomic Crosswalks on all legs

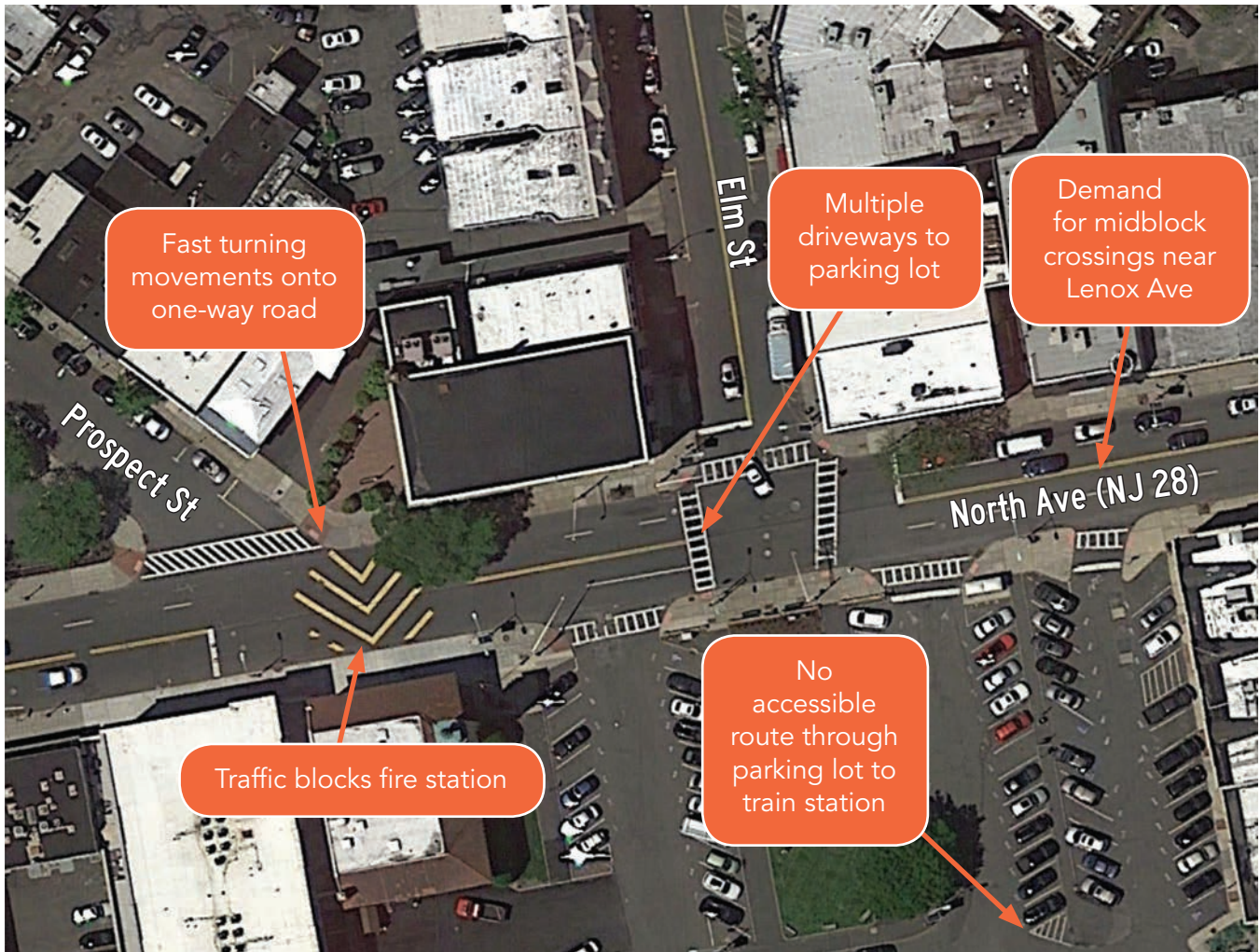


Figure 6.7: Existing Conditions North Ave and Elm St

North Ave and Elm St

Existing Issues at this intersection are shown in Figure 6.7 above.

Recommendations

- Pedestrian signal heads and timing improvements at Elm St and North Ave intersection
- Create ADA accessible pathways at train station
- Evaluate potential to add new midblock pedestrian crossing near Lenox Ave
- Evaluate feasibility of a road diet through this section (refer to bicycle improvements section for more details)
- Long term recommendations to be developed through the Master Plan Update

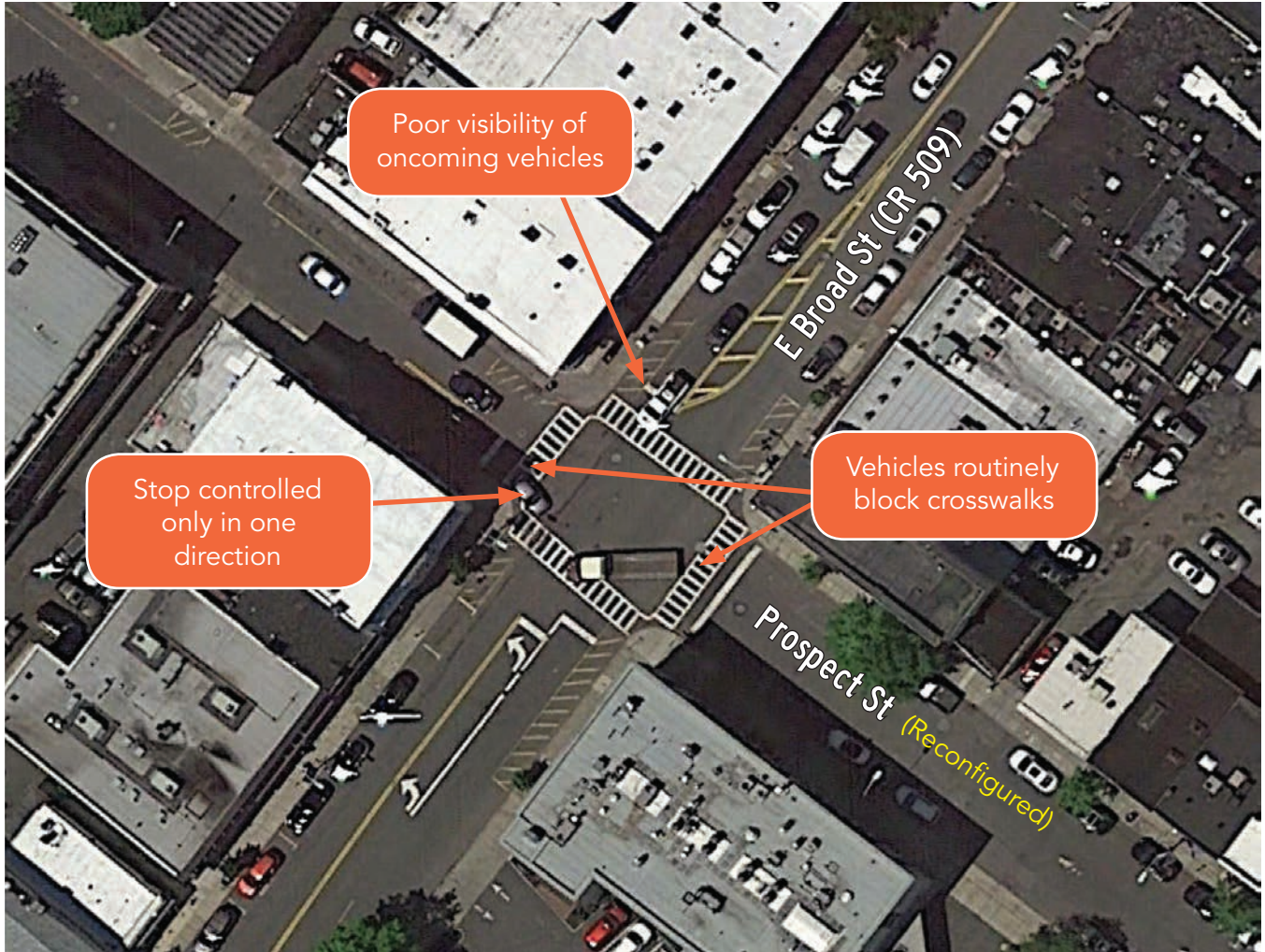


Figure 6.8: Existing Conditions North Ave and Central Ave

East Broad St and Prospect St

Existing Issues at this intersection are shown in Figure 6.8 above.

Recommendations

- Candidate for signalization
- Coordinate with signal at North & E. Broad
- Striped area created by angled parking could provide room for signal equipment



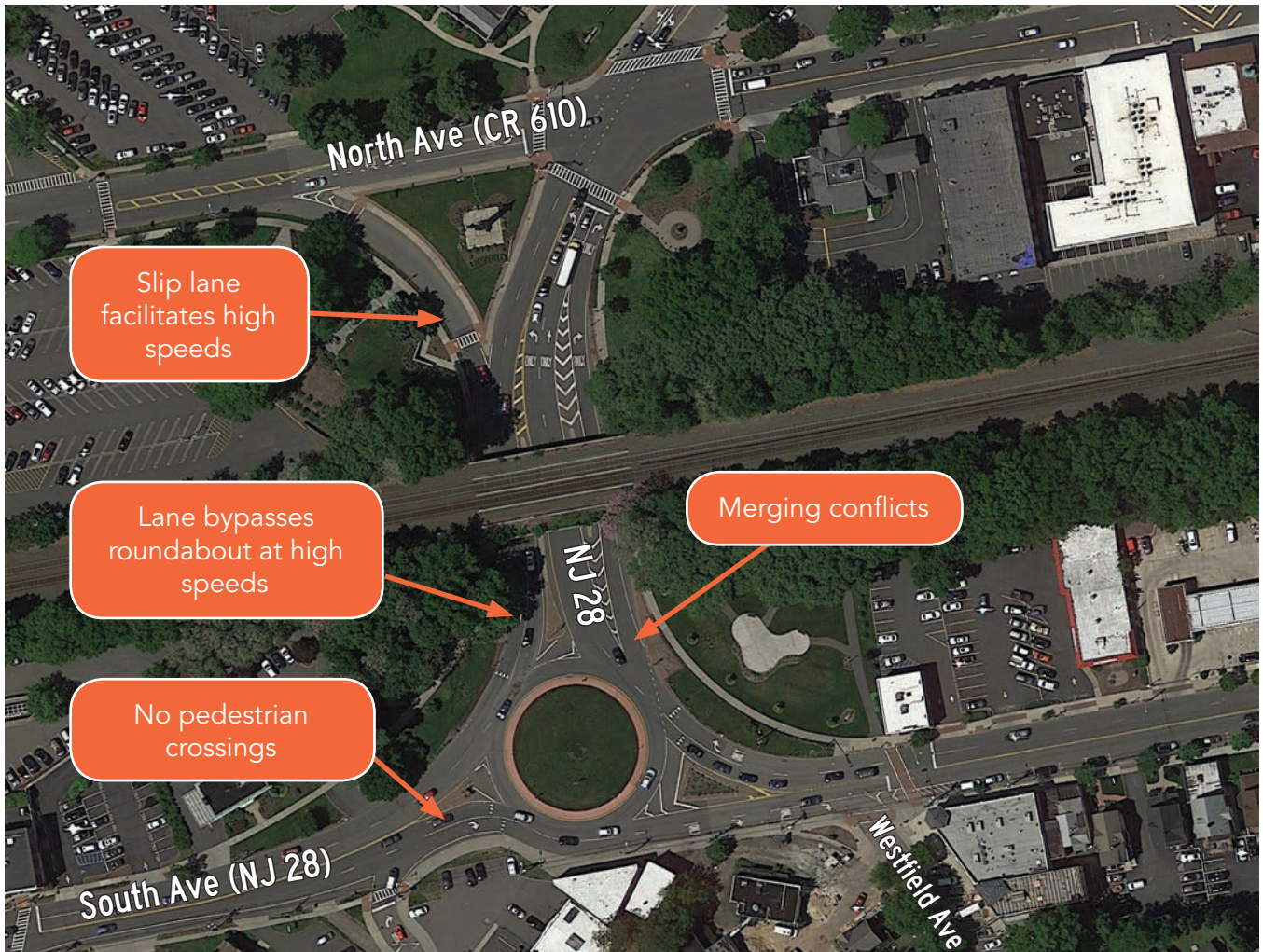


Figure 6.9: Existing Conditions North Ave and Elm St

South Ave and North Ave Roundabout

Existing Issues at this intersection are shown in Figure 6.9 above.

Short Term Recommendations

- Investigate alternatives to add pedestrian crossing of western approach

Long term Recommendations

- Consider re-designing roundabout to reduce speeds and create one-lane on all approaches

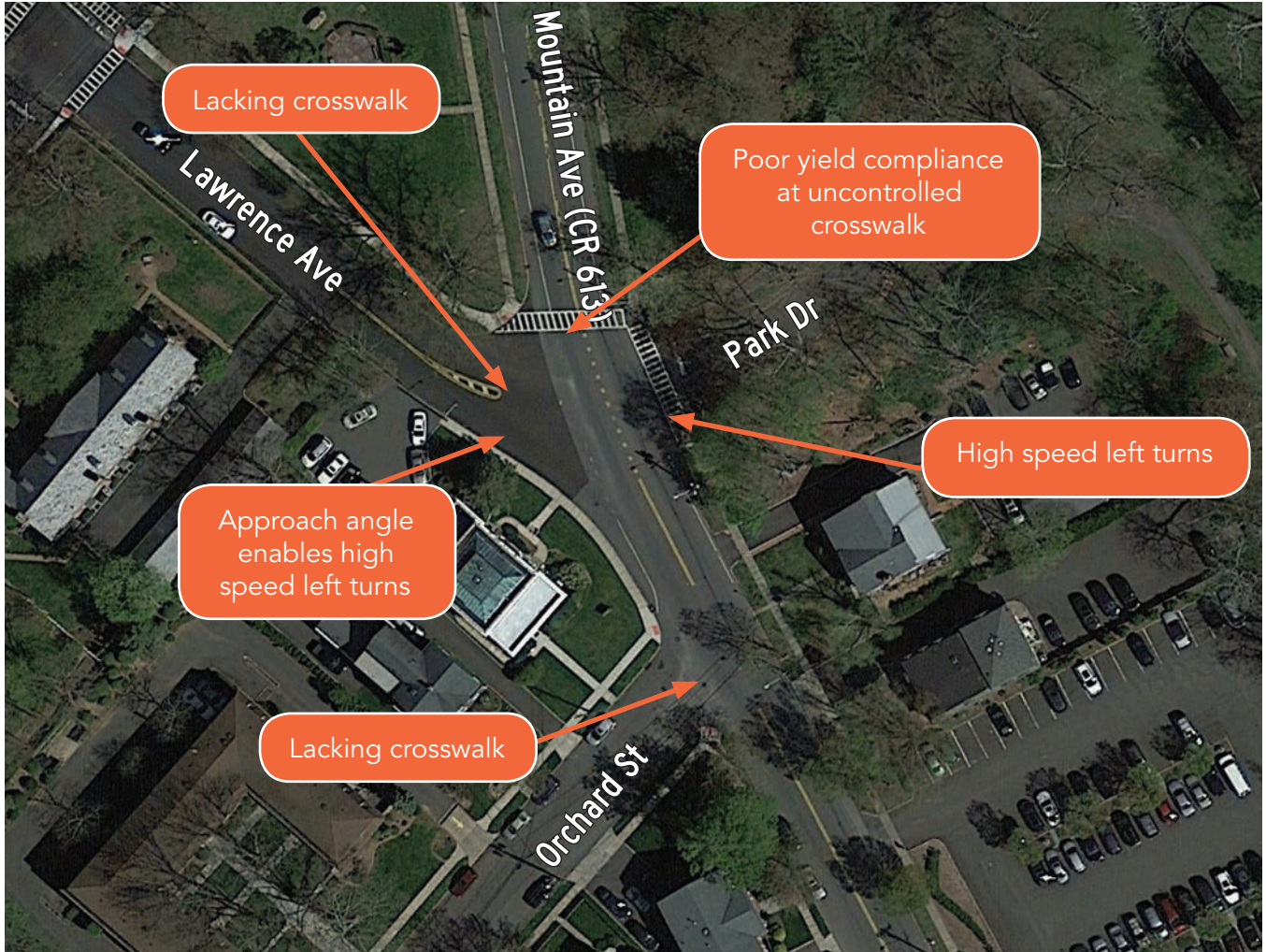


Figure 6.10: Existing Conditions Mountain Ave, Lawrence Ave, and Park Dr

Mountain Ave, Lawrence Ave, and Park Dr

Existing Issues at this intersection are shown in Figure 6.10 above.

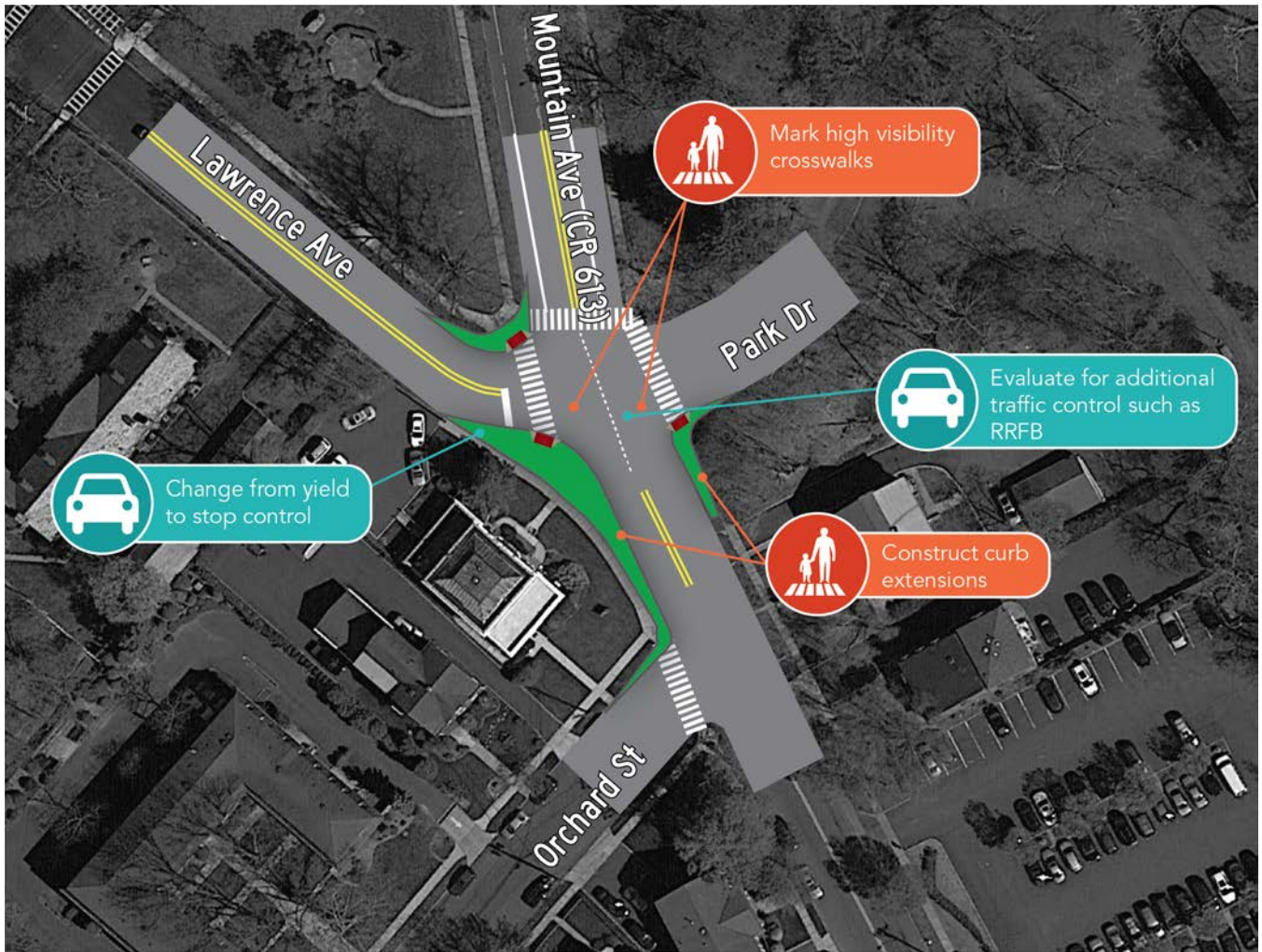


Figure 6.11: Proposed Improvements at Mountain Ave, Lawrence Ave, and Park Dr

Mountain Ave, Lawrence Ave, and Park Dr

Proposed recommendations at this intersection are shown in Figure 6.11. The Town is currently working with the County to upgrade the yield control on Lawrence Ave to Stop control. Additional longer term recommendations at this intersection include:

Long-Term Recommendations

- Mark high visibility crosswalks on all legs
- Construct curb extensions on northwest, southwest, and southeast corners
- Evaluate intersection for additional traffic control such as RRFB

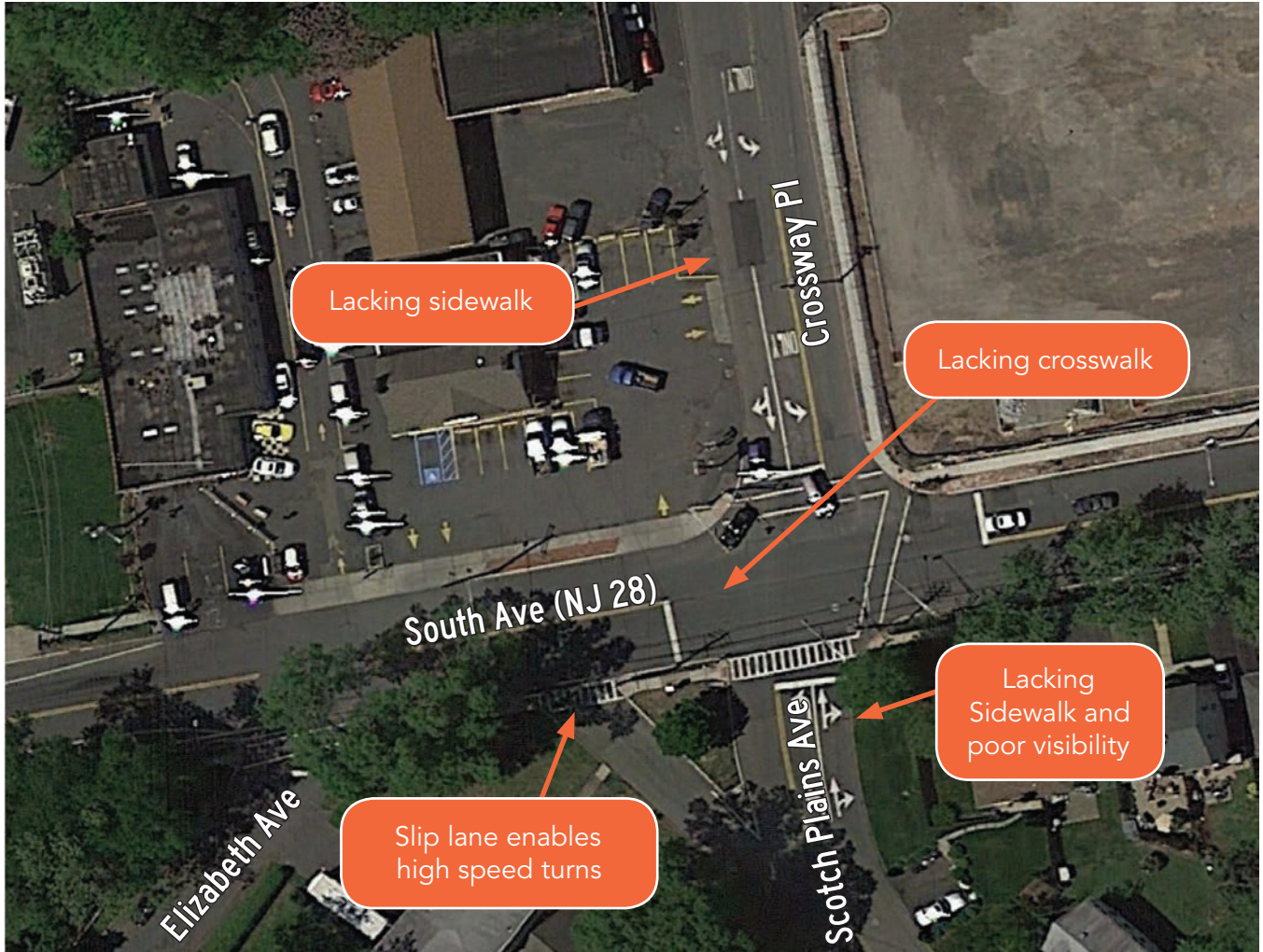


Figure 6.12: Existing Conditions Scotch Plain Ave, Crossway Pl, and South Ave

Scotch Plains Ave, Crossway Pl, and South Ave

Existing Issues at this intersection are shown in Figure 6.12 above.





Figure 6.13: Proposed Improvements at Scotch Plain Ave, Crossway Pl, and South Ave

Scotch Plains Ave, Crossway Pl, and South Ave

Proposed recommendations at this intersection are shown in Figure 6.13.

Recommendations

- Upgrade all crosswalks to high visibility striping
- Mark crosswalk and construct ADA-compliant curb ramp on west leg
- Install pedestrian signal heads on all approaches
- Install sidewalk on east side of Elizabeth Ave, and east side of Scotch Plains Ave south of South Ave
- Close slip lane from South Ave to Scotch Plains Ave while retaining driveway access
- Trim vegetation on southeast corner to improve visibility
- Install pedestrian-scale lighting on Crossway Pl below New Jersey Transit bridge

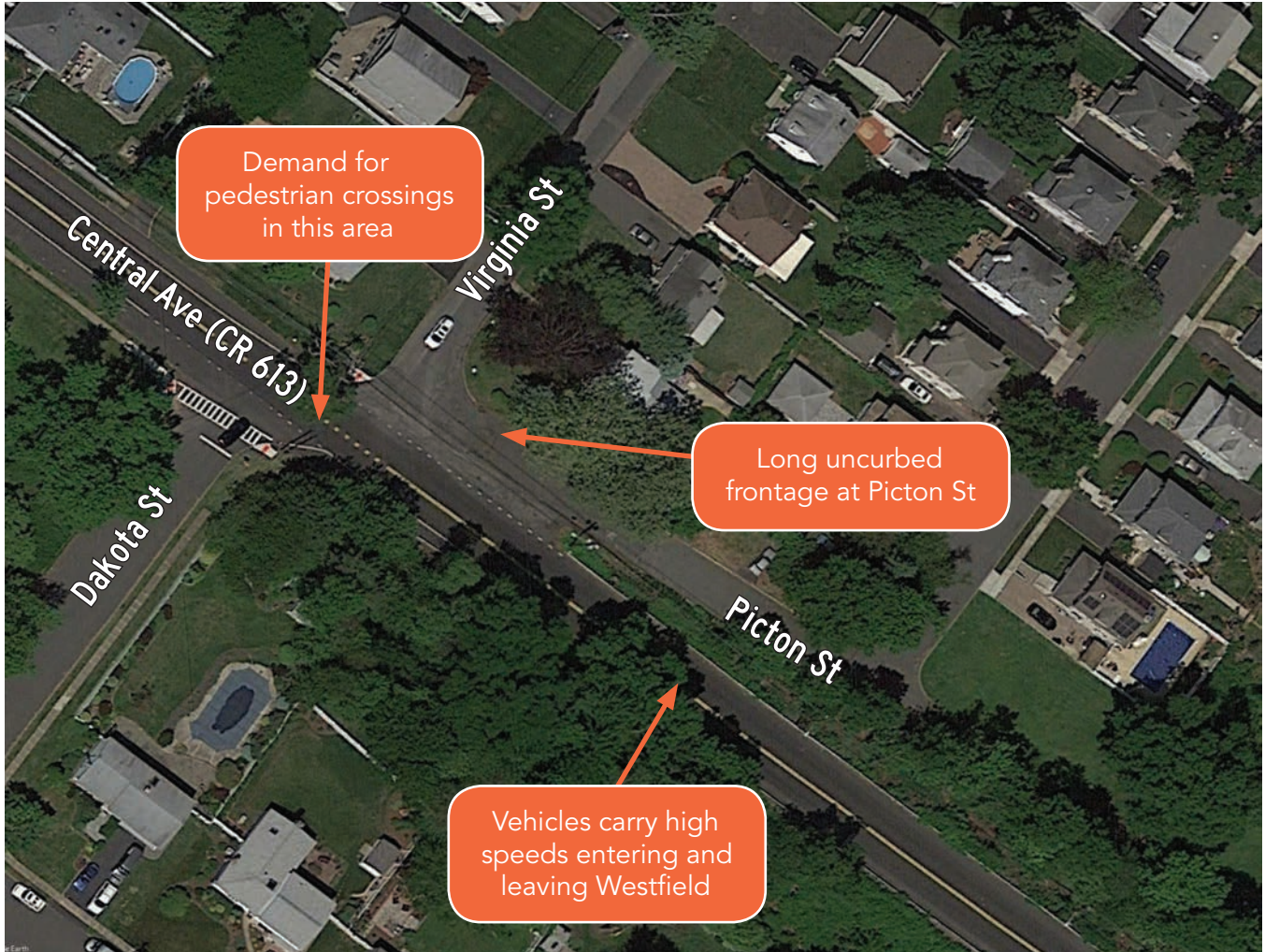


Figure 6.14: Existing Conditions Central Ave, Virginia St, and Picton St

Central Ave, Virginia St, and Picton St

Existing Issues at this intersection are shown in Figure 6.14 above.

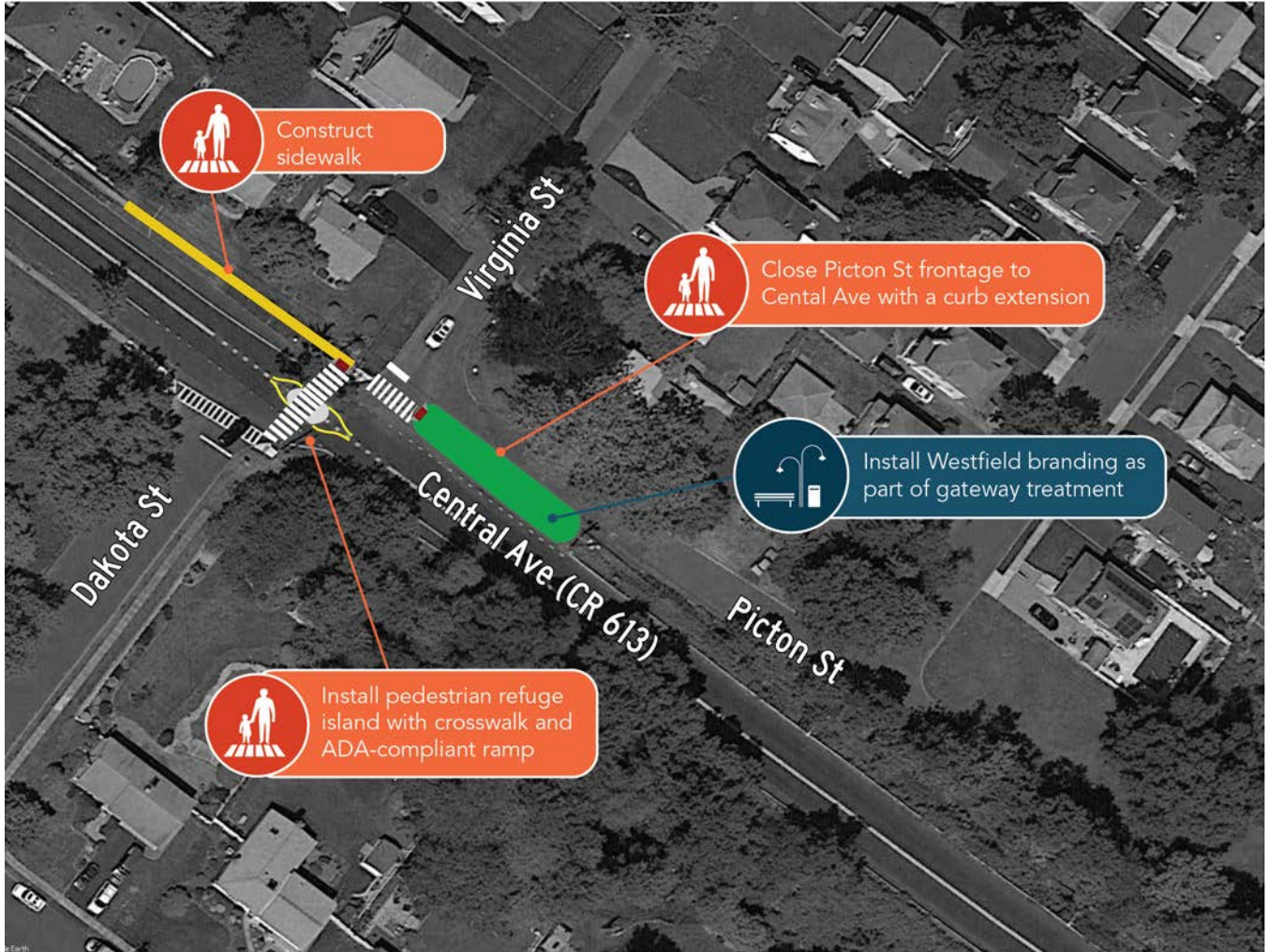


Figure 6.15: Existing Conditions Central Ave, Virginia St, and Picton St

Central Ave, Virginia St, and Picton St

Proposed recommendations at this intersection are shown in Figure 6.15.



Other Recommendations

Enhanced Crossings (Example North Ave and Clark St)

Many of the intersections along North and South Avenue have long crossing distances due to the skewed geometry. This includes the intersection of North Avenue and Clark Street, which has an existing crossing distance of 110 feet. Long crossing distances increase a pedestrian's exposure to turning vehicles.

As shown in Figure 6.16, curb extensions can be used to significantly decrease crossing distances at these type of intersections while also slowing vehicle approach and turns speeds. At North Avenue and Clark Street, the proposed

curb modifications as shown would decrease the pedestrian crossing distance to 40 feet. This treatment can be applied to several other intersections throughout town to create safer and more comfortable pedestrian crossings.

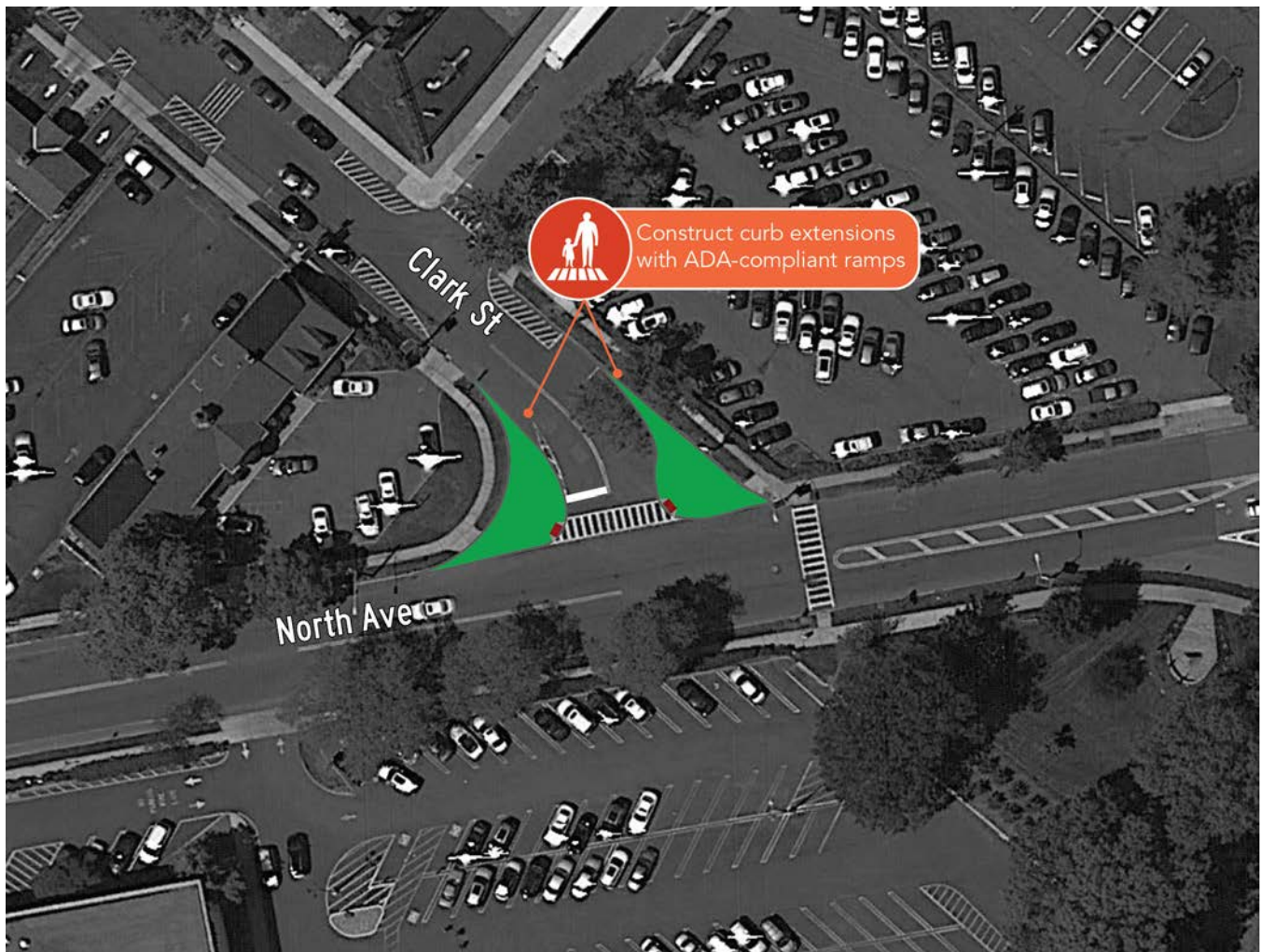


Figure 6.16: Enhanced Crossing at North Ave and Clark St

Pedestrian Plazas and Gathering Spaces

Providing comfortable and inviting public gathering spaces is an important aspect of encouraging more walking and biking. Westfield should explore opportunities to expand the pedestrian realm within the downtown and other commercial zones. One way to accomplish this is by using curb extensions to convert unused space at oversized intersections to sidewalk space. Both permanent/curbed installations as well as interim treatments such as textured pavement or striping can be used to create these spaces. In addition, public art can be applied to sidewalks, crosswalks, and parking areas to enhance their identity and visibility as public spaces. An important consideration with public

spaces is providing adequate opportunities to rest and gather in the form of benches or other seating arrangements.

Creating new gathering spaces can also involve temporarily closing streets to traffic, whether for special events such as festivals or regular annual closures. Open Streets initiatives temporarily close streets to automobile traffic so that people may use them for walking, bicycling, playing, socializing, and other activities. The Town has done this along Quimby Street and could potentially extend these events to other streets in the downtown area.



New Brunswick Ciclovía, 2013



Colorful crosswalk in Silver Springs, MD (www.montgomeryplanning.org)



Residents installing a painted intersection in Boulder, CO (www.bouldercolorado.gov)

Bicycle Network Improvements

With its compact layout and network of low-speed, low-volume residential streets, Westfield has the potential to be an attractive community for bicycling. The proposed bicycle network presented in this section builds upon the community's strengths and existing assets by improving cyclist safety and comfort, enhancing non-motorized access to key destinations, and providing linkages to the regional bicycle network. This section begins by providing an overview of different types of bicycle facilities, and then outlines recommended bicycle-related improvements for Westfield.

Bicycle Facility Design

Bicycle treatments should be implemented in a standardized manner to create uniform, effective, and recognizable treatments throughout town. Adhering to national design guidance and best practices for bicycle facilities promotes a universal understanding of bicyclist and motorist behavior and expectations for a given facility type among all roadway users. As the Town implements elements of the Plan, facility design should refer to current best practice guidance for more detailed information, including:

- *New Jersey Complete Streets Design Guide*
- *NACTO Urban Bikeway Design Guide*
- *FHWA Small Town and Rural Multimodal Networks*
- *AASHTO Guide for the Development of Bicycle Facilities*
- *Manual on Uniform Traffic Control Devices (MUTCD)*

The following section summarizes the main characteristics, applications, and benefits of the following common types of bicycle facilities:

- Conventional bicycle lanes
- Buffered bicycle lanes
- Separated bicycle lanes
- Bicycle boulevards
- Shared-lane markings

While some of these treatments may not be applicable to Westfield under current conditions, they are included to illustrate the range of bicycle treatments that are available today to meet differing contexts, needs, and constraints.



Conventional Bicycle Lane

Bicycle lanes provide an exclusive space for bicyclists through the use of pavement markings and signage. They enable bicyclists to ride at their preferred speed, free from interference from motorists, and help facilitate predictable behavior and interaction between bicyclists and motorists. Bicyclists may leave the bicycle lane to pass other bicyclists, make turns, or avoid obstacles and conflicts. Motorists may pass through the bicycle lane to access parking or make other turning movements, but they may not stand or park in the lane.



Fair Haven, NJ

Buffered Bicycle Lane

Buffered bicycle lanes can enhance conventional bicycle lanes by providing a marked buffer space and creating additional horizontal separation between bicyclists and motorists. This buffer space also helps to calm traffic by visually narrowing the travel lanes. While buffers are typically used between bicycle lanes and travel lanes to increase bicyclist comfort, they can also be used between bicycle lanes and parking lanes to discourage cyclists from riding too close to parked vehicles, decreasing the risk of conflicts with drivers opening their car door.



Newark, NJ

Separated Bicycle Lane

A separated bicycle lane provides vertical separation to improve safety, prevent encroachment, and deter double-parking. Physical separation from passing traffic can be provided by bollards, planters, on-street parking, curbing, or medians. This extra separation from motor vehicle traffic makes a separated bicycle lane more attractive for bicyclists of all ages and abilities. Typically used to enhance bicyclist comfort on streets with higher traffic speeds and/or volumes, they require additional street width and careful consideration of sight distance at intersections and street maintenance needs.



Newark, NJ (source: City of Newark)



Bicycle Boulevard

Bicycle boulevards, also referred to as neighborhood greenways or quiet streets, are traffic calmed streets that prioritize bicycle travel and create a more comfortable bicycling environment. While bicyclists share the street with motor vehicles, the low speed and low volume character of a bicycle boulevard creates a low-stress facility for bicyclists of all ages and all abilities. Many neighborhood, residential streets provide the basic components of a bicycle boulevard. These streets can be enhanced to create a bicycle boulevard by a variety of design treatments that deter high vehicle speeds and discourage through trips by motor vehicles. Many of these treatments benefit not only bicyclists, but by creating a safe and quiet environment, they benefit all users of the street. Where constraints prevent bicycle improvements on arterial roadways, utilizing parallel neighborhood streets as bicycle boulevards can often provide convenient, attractive alternative routes for bicyclists. Key elements of a bicycle boulevard include:

- **Reduced Speed Limits:** The preferred speed limit of a bicycle boulevard is 20 mph, can be implemented on neighborhood streets in Westfield
- **Signage and Markings:** Pavement markings and wayfinding signage highlight the corridor as a priority route for bicyclists and that the roadway is intended as a shared, slow street
- **Speed Management:** Traffic calming elements appropriate for the context, such as curb extensions, speed cushions, chicanes, or mini-roundabouts, should be used to reinforce the low speed limit and discourage cut-through traffic
- **Access Management:** Depending on the context, elements such as diverters or medians can be used to deter or prevent vehicular through-traffic, while still accommodating local access and prioritizing bicycle through-trips
- **Intersection Crossings:** Appropriate intersection treatments, especially at crossings of major streets, are crucial to minimize bicyclist delay and ensure a safe, comfortable street for bicyclists of all ages and all abilities



Princeton, NJ



Newark, NJ

Shared-Lane Markings

On roadways where it is not feasible or appropriate to provide dedicated bicycle facilities, shared-lane markings may be used to indicate a shared environment for bicycles and automobiles. Shared-lane markings alone do not reduce bicycle level of traffic stress or create an “all ages and abilities” facility; however, they can provide several benefits, including:

- Assert the legitimacy of bicyclists on the roadway
- Provide directional and wayfinding guidance
- Direct bicyclists to ride in the most appropriate location on the roadway
- Provide motorists with visual cues to anticipate the presence of bicyclists

Shared-lane markings can be used to complete gaps in a bicycle network and provide connections to major destinations where there is limited cartway width or other constraints that limit implementation of other bicycle facilities. Shared-lane markings are typically applied on streets with a speed limit of 25 mph or less. The markings typically consist of a bicycle and chevron symbol (photo above right). Shared-lane markings should also be paired with traffic calming treatments to reinforce the low

speed limit and support a more comfortable environment conducive to sharing the roadway with motorists and other traffic.

To increase the visibility and effectiveness of the marking, the marking can be applied on a green background, such as the example from Newark shown to the right. This “enhanced” or “green back” shared-lane marking is particularly useful on streets with higher traffic volumes and more activity, which may benefit from the improved visibility.

Proposed Bicycle Network

The proposed Westfield bicycle network provides a framework to support the goals of this Plan. The network utilizes several of the bicycle facilities summarized in the previous section, where feasible, and identifies a series of improvements guided by:

- **Major destinations:** Seeks opportunities to provide convenient access to key destinations
- **Public input:** Incorporates input from the Study Advisory Committee, Wikimap, community survey, and public meetings on existing issues and desired routes
- **Roadway constraints:** Prioritizes easily implementable improvements that can be constructed within existing roadway widths with minimal disruption to current roadway configurations and existing on-street parking. Westfield is a built-out community, with very limited opportunities for new path connections or widening of existing streets.
- **Bicycle level of traffic stress (LTS):** Utilizes the existing conditions LTS analysis as a guide to identify high traffic stress roadways and develop targeted recommendations to improve user comfort and connectivity of the low stress network

- **Potential trail connections:** Builds upon and connects to existing trails (including the East Coast Greenway) to enhance network connectivity and leverage existing infrastructure

The proposed bicycle network is illustrated in Figure 6.17. When planning for bicycle travel, the constrained nature of Westfield's street system requires a thorough evaluation of the needs of various roadway users including bicyclists, motorists, and parked cars. On many streets, implementing dedicated/separated bicycle facilities can only be accomplished by restricting on-street parking and/or reducing the number of travel lanes. The following section summarizes recommendations for the primary corridors comprising the bicycle network, by facility type, and in the process highlights some of these trade-offs:

The Five C's

Bicycle routes should be:

Following the "Five C's" approach helps ensure that bicycle routes accommodate cyclists of all ages and abilities.



- ✓ *Continuous*
- ✓ *Connected*
- ✓ *Convenient*
- ✓ *Complete*
- ✓ *Comfortable*

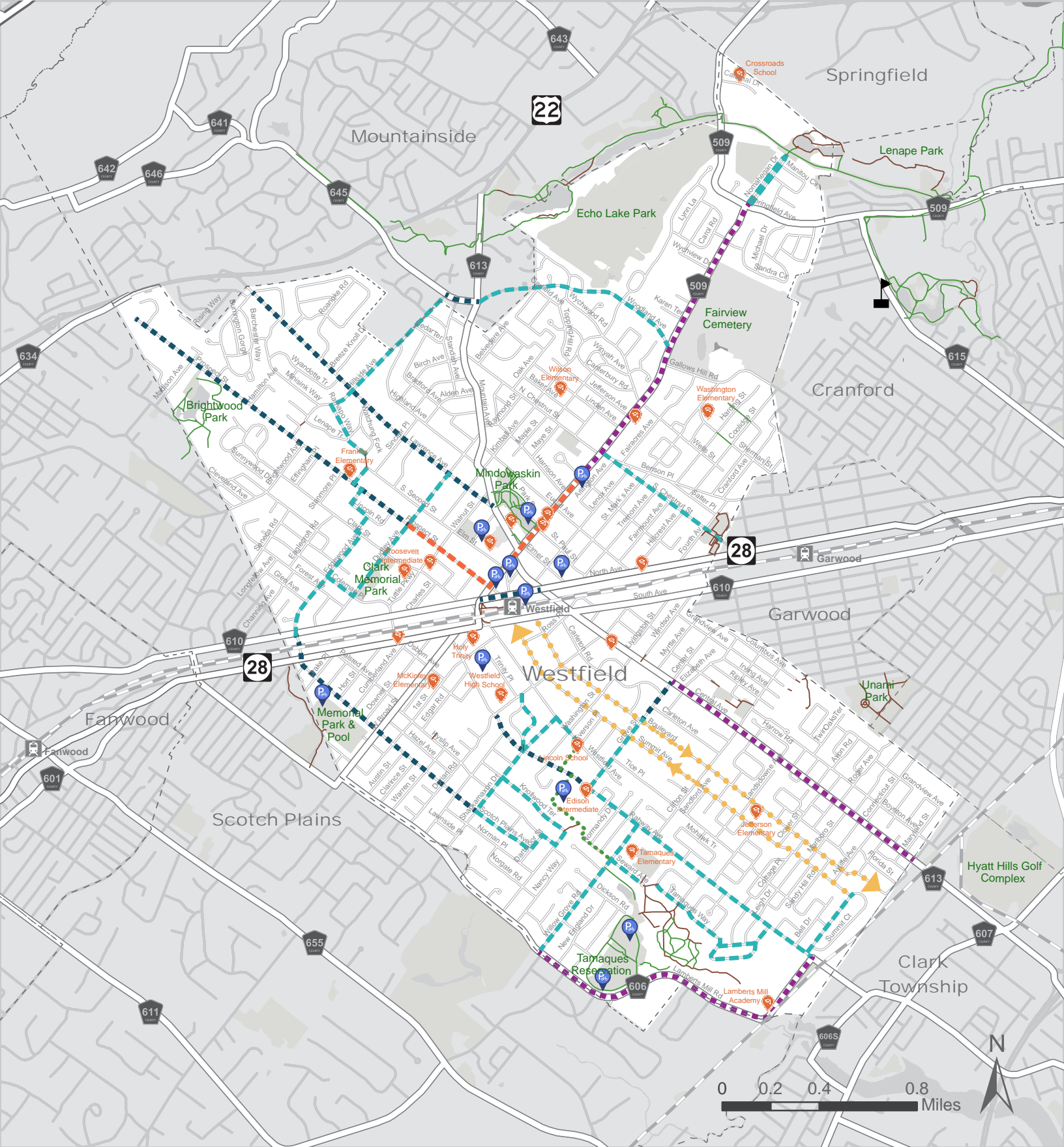


Figure 6.17: Proposed Bicycle Network

Bike Walk Westfield

Bicycle and Pedestrian Plan

Proposed

- ■ ■ ■ Buffered Bike Lane
- ■ ■ ■ Bike Lane
- ● ● ● One Way Bike Lane
- — — — Bike Boulevard
- ● ● ● Off Road Sidepath
- — — — Shared Lane Markings



Proposed Bike Parking

Existing

- Pedestrian Connection
- Multi Use Path



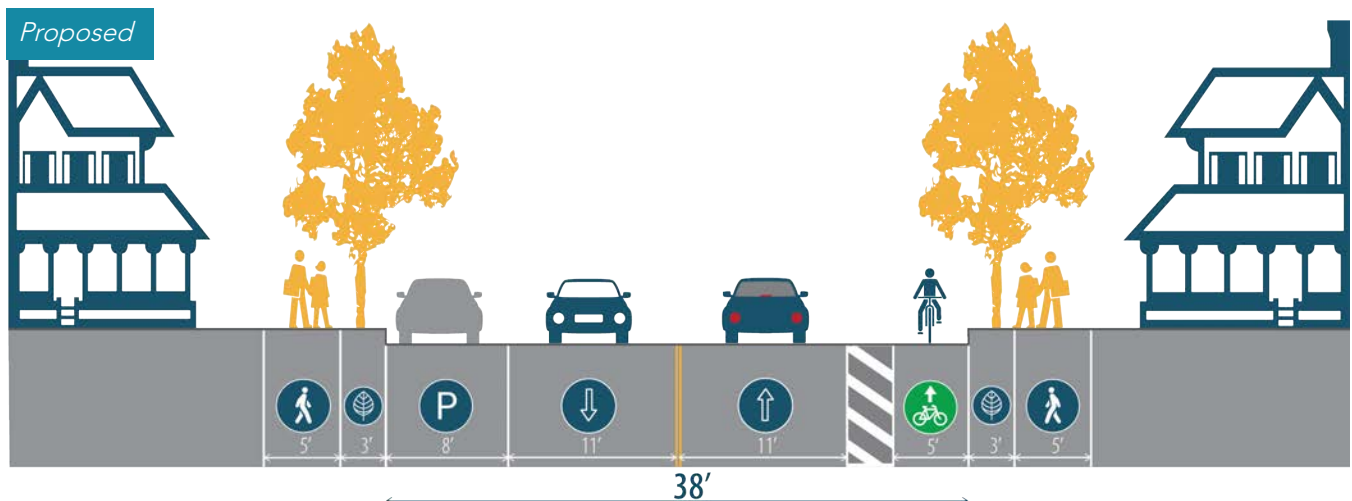
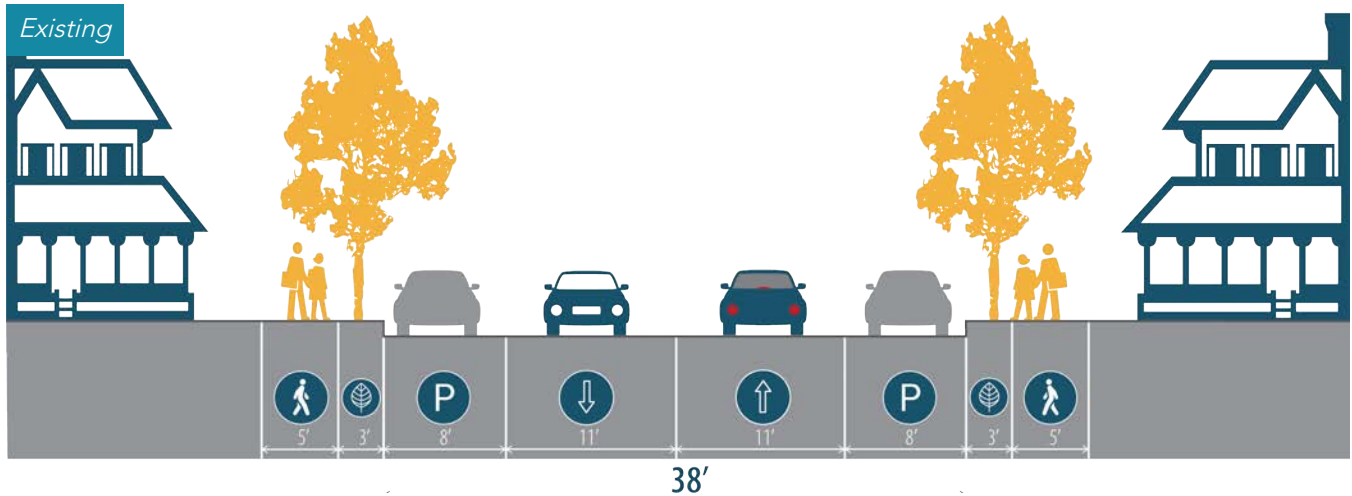
One-Way Bicycle Lanes

This category of bicycle facilities is recommended for streets where parking is allowed on both sides, but is not fully utilized with significant gaps between parked vehicles. On these streets, the recommendation is to consolidate the on-street parking to one side of the street (thereby restricting parking on the other side) and use the extra 8-feet to stripe a one-way buffered bike lane. This lane would be paired with a buffered bike lane on a parallel street in the opposite direction.

Candidate streets for one-way bicycle lanes are:

- Summit Ave
- Boulevard

Existing and proposed cross sections are shown below.



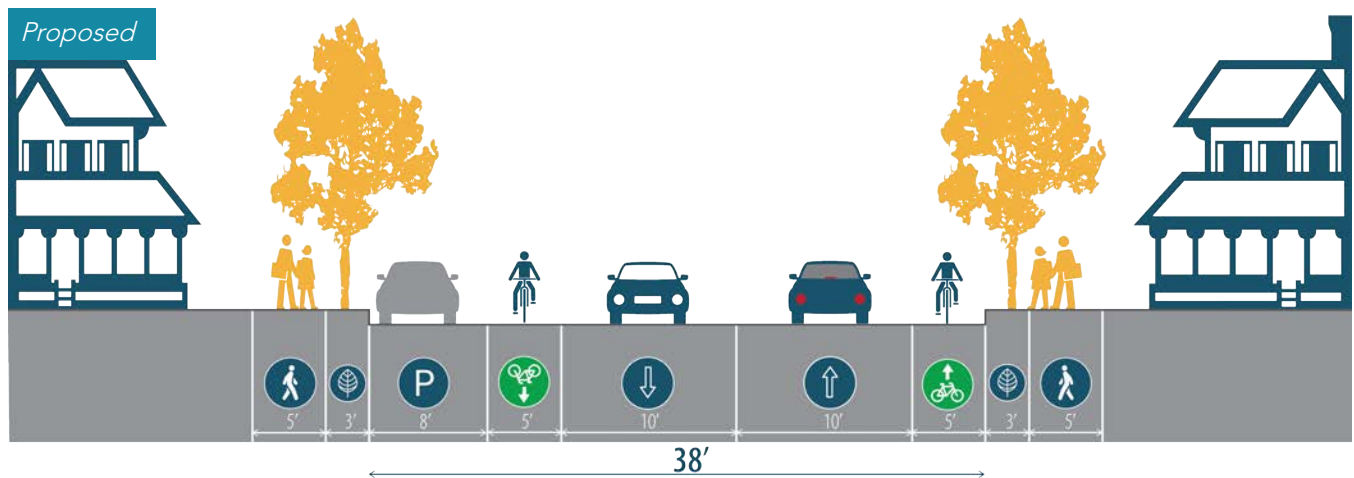
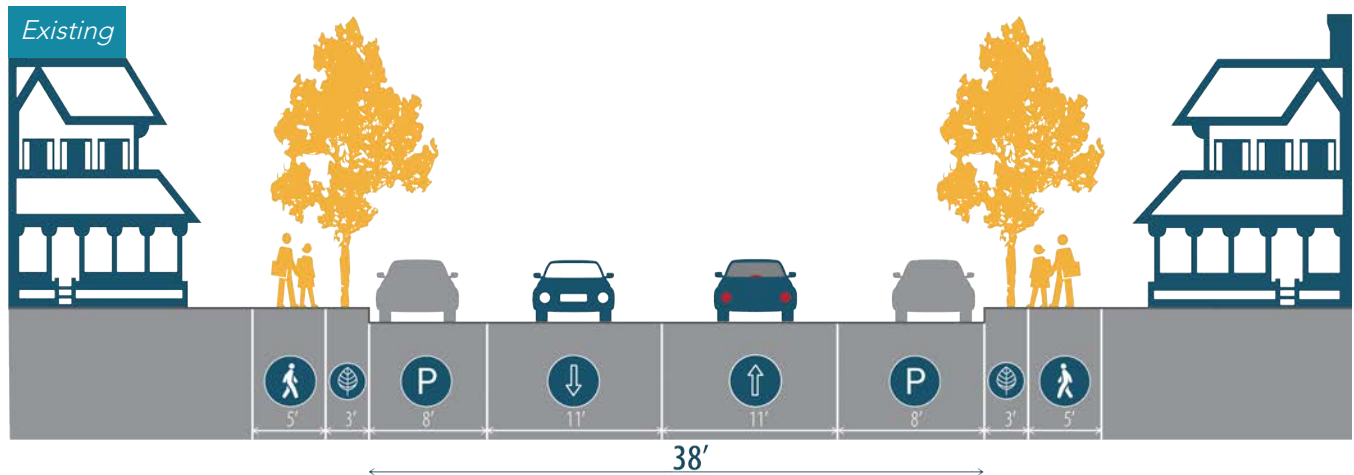
Bicycle Lanes

This category of bicycle facilities is also recommended for streets where parking is allowed on both sides, but is not fully utilized. The extra space gained from consolidating parking to one side would be used to stripe bicycle lanes in both directions on the same street.

Candidate streets for bicycle lanes are:

- Scotch Plains Ave
- Prospect Ave
- Lawrence Ave

Existing and proposed cross sections are shown below.



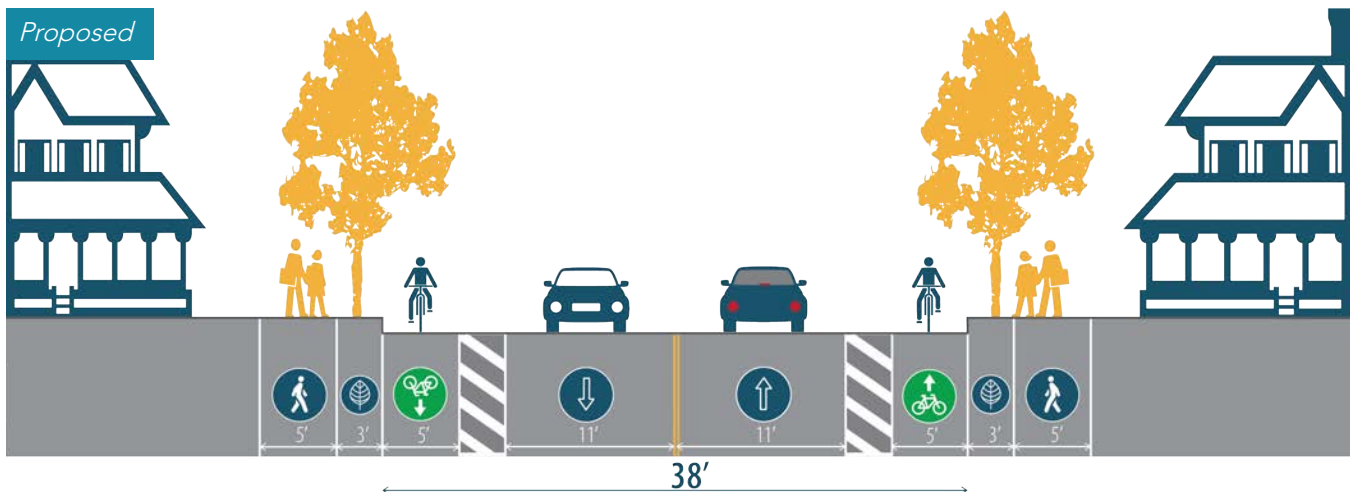
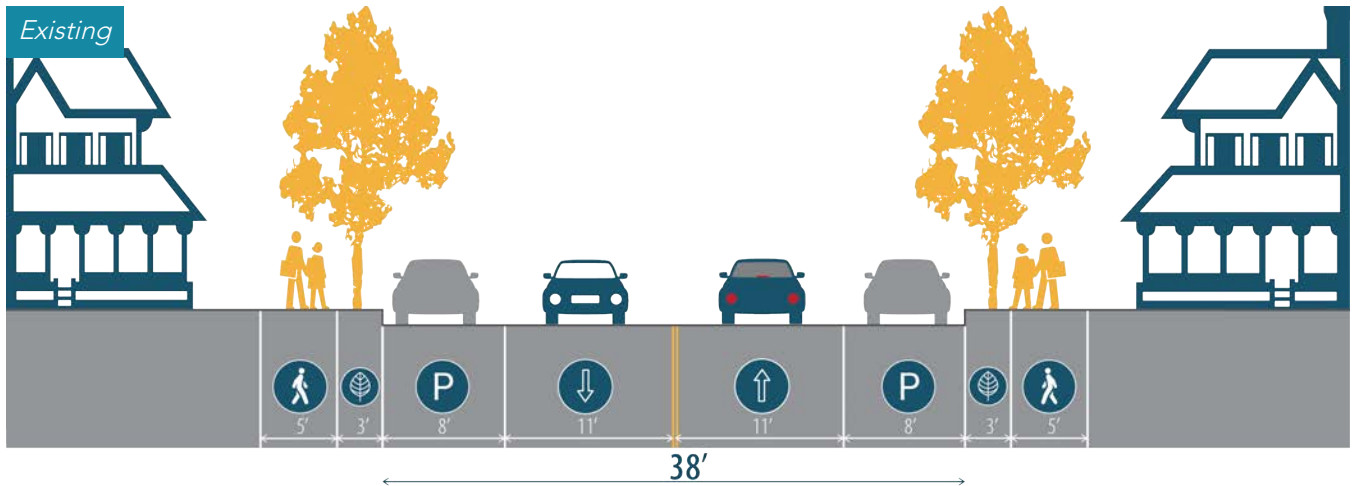
Buffered Bicycle Lanes

This category of bicycle facilities is recommended for streets where parking is allowed on both sides, but is very lightly used or not used at all. On these streets, the recommendation is to restrict parking on both sides of the street and convert the parking lanes to buffered bike lanes in each direction.

Candidate streets for buffered bicycle lanes are:

- Central Ave (CR 613)
- E Broad St (CR 509)
- Lamberts Mill (CR 606)

Existing and proposed cross sections are shown below.

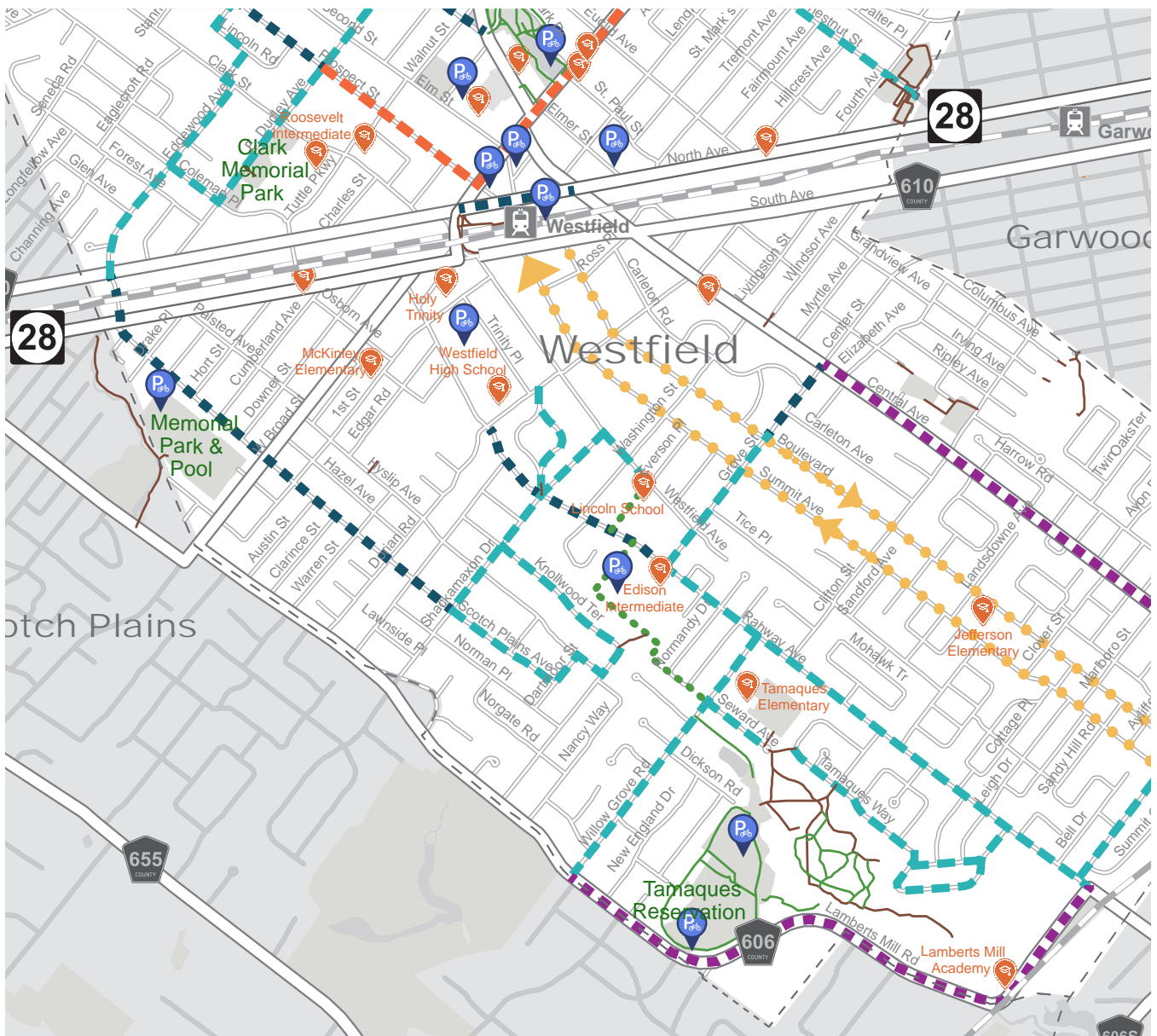


Bicycle Boulevards/Shared Lanes

Bicycle boulevards and/or shared lanes are recommended on segments of roads throughout town to provide continuity in the bicycle network. In general, these are segments where limited cartway widths and high demand for on-street parking make adding dedicated bicycle facilities challenging. As noted under the facility descriptions, design treatments including signage and striping should be used on these streets to help calm traffic and increase their visibility as bicycle routes.

Off Road Sidepaths/Trails

Due to the built-out nature of Westfield, there are limited opportunities to add new trails or sidepaths within town. However, it is recommended that existing informal paths be formalized through paving and other upgrades, most notably the weaving pathway behind Thomas Edison Intermediate School. The bicycle network plan also includes recommendations for short segments of new path between cul-de-sacs and other dead-end streets to enable shorter walking and biking trips between disconnected neighborhoods.

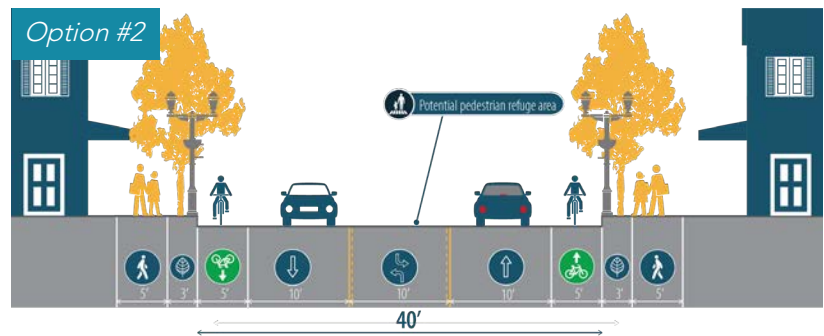
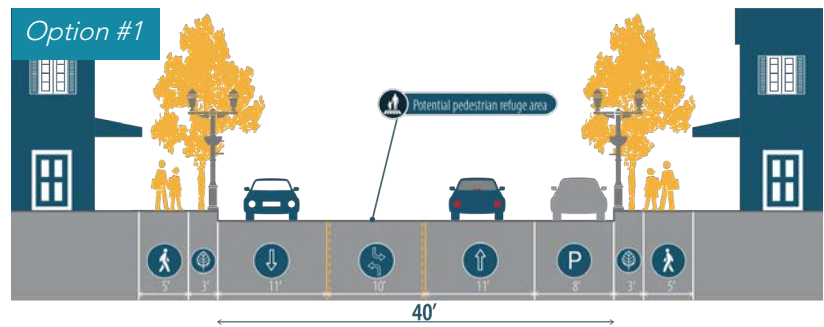
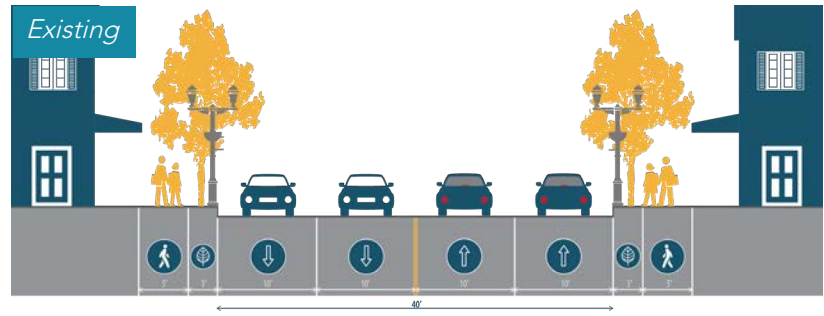


North Avenue Road Diet Options

The *North Avenue Walkable Community Workshop (2019)* report recommended investigating a road diet along approximately ½ mile of North Avenue between E. Broad Street and Elmer Street. This segment of North Avenue currently has two lanes in each direction, which does not allow room for on-street parking or bicycle facilities. This plan supports the road diet recommendation as a means to increase safety and multimodal travel through the downtown area; however, the proposed reconfiguration options shown below differ from what is shown in the workshop report:

The primary difference from the workshop recommendation is that the center median area would be widened to at least 10 feet to accommodate left turn lanes at the signalized intersections (E. Broad, Elm, and Central). While further study is needed, these turn lanes should help to mitigate any degradation in traffic operations resulting from the reduction in travel lanes. Where turn lanes are not needed, the center median area could be used as a pedestrian refuge for midblock crossings (for instance, at Lenox Avenue).

The options also differ in how they repurpose the extra width gained from the road diet. Option #1 would reconfigure the cross section to one lane in each direction with a center turn lane and use the extra space for on-street parking on one side of the road. Option #2 would provide a similar reconfiguration of the travel lanes, but would use the extra space to provide bicycle lanes in each direction. It should be noted that the bicycle lanes shown in the proposed bicycle network plan are contingent on implementing Option #2.



Both options are included in this plan for further consideration by the Town, which would include a more detailed traffic and circulation analysis.

Bicycle Parking

Bicycle parking facilities are needed to extend bicycle use from an opportunity for recreation to a feasible mode of transportation. Providing adequate, secure bicycle parking is an important measure to accommodate and encourage cycling. Proper parking facilities increase the convenience of cycling for commuting, utilitarian, or recreational purposes while also alleviating the threat of theft. Appropriate infrastructure design and siting standards, additional bicycle parking capacity, and a bicycle parking ordinance can all help improve options for bicycle parking in Westfield.

Rack Design

Parking should be conveniently located, well lit, and easily visible for cyclists arriving at a destination. There are a variety of bicycle parking racks available to meet different capacity needs or accommodate space constraints. The majority of existing bicycle racks in Westfield are an older design. As they are replaced and additional capacity is added, new racks should meet the following guidelines provided by the Association of Pedestrian and Bicycle Professionals (APBP):

- Be intuitive to use
- Support the bicycle upright by its frame in two locations
- Prevent the wheel of the bicycle from tipping over
- Enable the frame and one or both wheels to be secured
- Accommodate a variety of bicycles and attachments, including bicycles without a diamond shaped frame and horizontal top tube
- Allow both front-in and back-in parking with a U-lock through the frame and front or rear wheel
- Resist the cutting or detaching of any rack element with hand tools

Older style racks, such as the “comb”/ “schoolyard”, “toast”, and “wave” are not recommended because they do not properly support the bicycle frame, generally do not

facilitate locking of the frame to the rack, and frequently cause interference between the handlebars of adjacent bikes when the rack is near capacity. The preferred rack is the “inverted U,” while other acceptable designs include the “post and ring”, and “wheelwell secure.” These rack types are illustrated in the figure on the following page. Bike racks should also be properly spaced to allow easy, independent access to each bike. This includes providing sufficient space between racks and buildings, walls and parked cars, as well as between other bikes. Additional guidance on bike rack design and placement can be found in the APBP guide *Essentials of Bicycle Parking* (2015).

Priority Locations

The inventory of existing conditions indicated that there are opportunities to expand bicycle parking throughout the community. Key locations include:

- **Schools:** while there is bicycle parking provided at the Town’s schools, additional capacity could be provided to accommodate students who bike to school as well as to encourage biking to schools
- **Parks:** Tamaques Park, Mindowaskin Park, and Memorial Park and Pool
- **Public Library**
- **Train Station**
- **North Avenue Downtown Businesses:** Limited existing capacity exists through the downtown; encourage and work with local businesses to implement additional parking

Enhanced Bicycle Parking Options

Covered Parking

To further enhance bicycle parking options, the Town should consider providing covered bicycle parking at the local schools. Covered parking helps protect bicycles from inclement weather and is particularly appealing for people parking for longer periods of time, such as students, commuters, or employees. Having covered parking available can make bicycling a more practical and attractive option if rain is forecast during the day, but not during commuting or travel times.

While covered parking requires more capital investment than racks alone, a variety of pre-fabricated shelters are available for a relatively low cost. Installation of covered parking could be a long-term improvement, either implemented incrementally or integrated into larger capital projects at the schools.

Bicycle Corrals

Bicycle corrals are rows of bike racks installed in the parking lane of the street instead of on the sidewalk. Bicycle corrals help provide highly visible and ample bicycle parking without occupying sidewalk space, making them particularly useful in areas with constrained sidewalk space and/or high pedestrian activity. They can convert a parking space for a single automobile to parking for 8 to 12 bicycles, creating more convenient access for more customers of nearby businesses. Additionally, bicycle corrals help “daylight” an intersection by preventing motor vehicles from parking close to the intersection. This helps improve the visibility of all road users at the intersection and creates an easier crossing for pedestrians. Corrals are also temporary, and can be easily removed during the winter.

Bicycle corrals are one tool to provide additional parking in the downtown. Bicycle corrals can be an amenity for local shops and cafes, and there may be opportunities for businesses to partner with the Town or sponsor corrals adjacent to them.



Bike Corral, Newark NJ

Bicycle Parking Ordinance

The Town should consider adopting a bicycle parking ordinance to further integrate bicycling into the Town’s planning process and development regulations. The ordinance would ensure that appropriate bicycle parking is provided as redevelopment occurs, supporting additional parking capacity throughout the community and increasing the convenience of bicycling. Similar to automobile parking requirements, the ordinance should reflect different demands for different types of land uses and scaled based on an appropriate metric for the land use, such as square footage, number of bedrooms, or number of employees. The ordinance should also address both short-term and long-term parking needs. While customers or visitors making quick trips may require a simple bicycle rack, employees and residents often desire more secure parking options protected from the weather.

In addition to setting capacity requirements, the ordinance should stipulate the design standards summarized in this chapter and reference best practice design guidelines from the APBP. As an incentive, the Town may want to consider allowing developers to provide additional bicycle parking and/or higher quality facilities (e.g., covered parking) to offset vehicular parking requirements.



RECOMMENDED BIKE RACK DESIGNS

Preferred Design



Inverted U

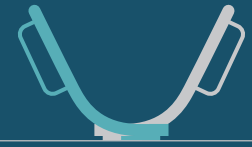
Common style appropriate for many uses; two points of ground contact. Can be installed in series on rails to create a free-standing parking area in variable quantities. Available in many variations.

Other Acceptable Designs



Post and Ring

Common style appropriate for many uses; one point of ground contact. Compared to inverted-U racks, these are less prone to unintended perpendicular parking. Products exist for converting unused parking meter posts.



Wheelwell Secure

Includes an element that cradles one wheel. Design and performance vary by manufacturer; typically contains bikes well, which is desirable for long-term parking and in large-scale installations (e.g. campus); accommodates fewer bicycle types than other recommended designs.



RACKS TO AVOID

Wave

Not intuitive or user-friendly; real-world use of this style often falls short of expectations; supports bike frame at only one location when used as intended



Wheelwell

Racks that cradle bicycles with only a wheelwell do not provide suitable security, pose a tripping hazard, and can lead to wheel damage.



Schoolyard (comb)

Does not allow locking of frame and can lead to wheel damage. Inappropriate for most public uses, but useful for temporary attended bike storage at events and in locations with no theft concerns.



Coathanger

This style has a top bar that limits the types of bikes it can accommodate.



Spiral

Despite possible aesthetic appeal, spiral racks have functional downsides related to access, real-world use, and the need to lift a wheel to park.



Bollard

This style typically does not appropriately support a bike's frame at two separate locations, which limits its framelock capability and bicycle stability.



Images and descriptions courtesy of APBP *Essentials of Bicycle Parking*

Policy & Program Recommendations

The bicycle and pedestrian recommendations outlined in this plan are designed to provide safe and convenient access to activity generators for non-motorized forms of transportation. While “engineering” solutions can go a long way to meet this need, a successful bicycle and pedestrian program also incorporates policy and program-related recommendations. Program recommendations can improve conditions for bicyclists and pedestrians through education, encouragement, and enforcement actions, while policy actions that benefit bicycle and pedestrian travel can have long-lasting effects with minimal or even no financial cost.

Education

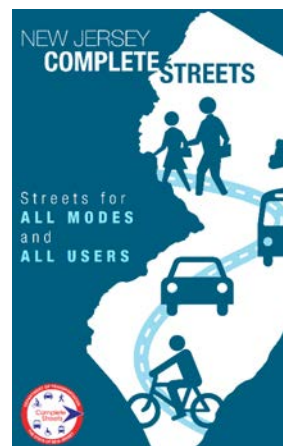
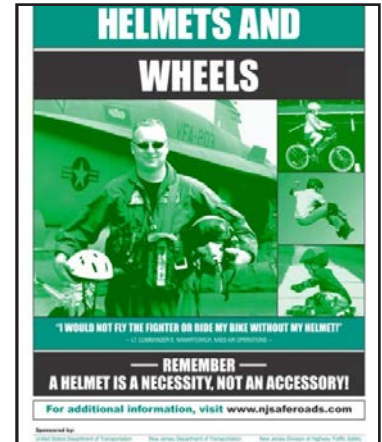
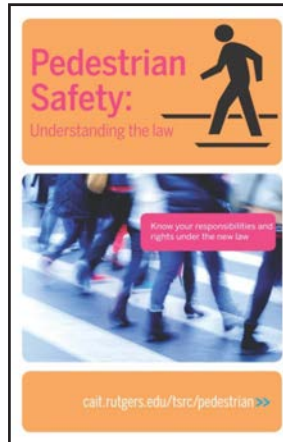
Crash data analysis shows that engineering improvements alone will not reduce the incidence of pedestrian injuries and fatalities. Sustained education, coupled with encouragement and enforcement, has proven over time to be highly effective in changing behaviors and improving safety. The goal of an effective education program is to increase public awareness of non-motorized travel modes, and to teach safe behavior to walkers, cyclists, and motorists.

Pedestrians, cyclists, and motorists all need to be taught how to co-exist safely, and that each is a legitimate user of the road. Successful education strategies can help motivate a change in specific behavior, and teach safety skills that can reduce the risk of injury. These programs also help raise awareness of pedestrian and bicycle issues.

Westfield should consider partnering with Union County to implement the Street Smart NJ campaign, which is a public education, awareness, and behavioral change pedestrian safety campaign created and coordinated by the North Jersey Transportation Planning Authority (NJTPA). This program has proved successful at changing travelers’ behavior so that they are making smarter, safer decisions on the road. Education is geared towards all users - motorists, bicyclists, and pedestrians.

Street Smart, NJ

The Street Smart NJ campaign was first piloted in 2013 in five New Jersey communities – Hackettstown, Jersey City, Long Beach Island, Newark, and Woodbridge – and demonstrated the value of community-based efforts to change pedestrian and motorist behavior to improve safety. The program was expanded in 2016 to include the NJ Shore communities of Asbury Park, Bay Head, Bradley Beach, Long Branch, Manasquan, and Point Pleasant. The campaign uses radio, outdoor, and transit advertising – along with grassroots public awareness efforts and law enforcement – to address pedestrian safety. Communities and organizations can use the strategies and materials that are available on NJTPA’s website to create their own campaigns that build on the successes realized in the initial pilot communities.



Enforcement

Enforcement is a key component of a successful bicycle and pedestrian program. After the engineering recommendations are implemented, and in conjunction with education and encouragement efforts, new roadway conditions require enforcement for patterns of behavior to change. A common problem with enforcement actions is that one side is labeled the enemy and the other a victim, creating animosity among users. An effective program focuses on awareness and education, and enforces legal behavior among all users. Enforcement alone will not always yield behavioral changes. Quite often, there is a physical condition that influences behavior. For example, a straight road with multiple and/or wide lanes often results in high speeds, regardless of the posted speed (portions of Central Avenue and North Avenue are good examples). In these situations, ticketing will not necessarily reduce speeds, and a change to the physical roadway is often required.

Enforcement should always be paired with education and encouragement to improve the bicycle and pedestrian environment. Without encouraging and increasing bicycle and pedestrian activity, motorists will not expect them to be in the roadway, and will be less prepared for their presence. Similarly, engineering efforts will be wasted without users of the bicycle and pedestrian improvements.

Encouragement

Many strategies can be used to encourage people to walk or bike instead of driving, especially for short trips. Bicycle and pedestrian education programs for children help to encourage walking and cycling at an early age. Westfield should partner with the local transportation management association – Meadowlink TMA – to develop and maintain bicycle/pedestrian programs at the local schools. Outreach to the adult population is



Example mobile radar unit in Highland Park, NJ



equally important. The health benefits of active transportation can be a powerful encouragement tool when advertised and reinforced regularly. To reach town residents, Westfield should publish materials explaining the health benefits of biking and walking on municipal and partner websites (Green Team, School District, Police Department, etc.).

Bicycle Maps & Brochures

Maps and/or brochures showing the bicycle network can help encourage cyclists to use designated routes – while also teaching motorists to expect cyclists on these routes. As the bicycle network in Westfield begins to develop, the Town should create accompanying materials that identify existing bicycle and pedestrian routes, both local routes and connections to regional destinations. By highlighting preferred routes for walking and biking, these maps can be useful to both residents and visitors. Maps can also contain information about the benefits of non-motorized transportation, walking and biking safety tips, relevant traffic laws, bicycle parking locations, and information about local biking or walking groups.

Modifications to Municipal Codes

The portions of Westfield’s municipal code that cover walking, biking, and street design were reviewed to understand how these regulations influence bicycle and pedestrian conditions. Several modifications to the Town’s code (all under Chapter 25 – Subdivisions) are recommended to improve conditions for bicycle and pedestrian travel, both now and with future land development decisions. These include:

- **Sidewalk Width:** The code currently requires a minimum sidewalk width of four feet; however, four feet is not wide enough for two people to pass comfortably. Increase the minimum width to five feet to align with current best practices including design guidance (AASHTO/ITE) and accessibility guidance (Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way).

- **Curb Radii:** The code currently requires curb radii to be not less than 25 feet. Allow curb radii less than 25 feet – particularly on local streets – since smaller radii reduce pedestrian crossing distances and help to calm traffic
- **Driveway Treatments:** For subdivisions and new commercial developments, require pedestrian zones across driveways to be treated as continuous sidewalks (with concrete) instead of road crossings (with asphalt, crosswalks, ramps).

Westfield should also develop a bike parking ordinance to further support bicycling trips throughout the city. Bike parking ordinances typically require that bicycle parking is provided with new development and redevelopment. The number of required bike parking spaces is usually based on development characteristics such as square footage, number of residential units, number of employees, number of auto spaces, and/or minimum spaces per use (i.e. restaurants).

Maintenance

Maintenance of sidewalk facilities is an important consideration for both the comfort and safety of walking throughout Town, and was included as one of the Plan’s primary goals. In addition to keeping the pavement regular and even, it is important to trim any vegetation that may be intruding on sidewalk corridors. While sidewalk maintenance is ultimately the responsibility of adjacent property owners, the Town should explore options to incentivize timely and adequate maintenance. Approaches range from the “carrot” approach of providing financial and/or logistical incentives (for instance, providing advice on how to engage contractors), to the “stick” approach of using fines or other penalties to discourage non-compliance.

Maintenance of bicycle facilities is also an important consideration. New bicycle facilities will require active maintenance to keep dedicated bicycle pathways free of debris and snow, particularly during inclement weather months. Bicycle racks also need to be maintained so they provide stable and secure parking.



Elm St

NO TURN ON RED

WVU-95J

07

*Next Steps and
Implementation*



MEGAN'S PLAYGROUND
DEDICATED IN LOVING MEMORY OF MEGAN BECK (1984-2003)
A PLAYGROUND COUNSELOR FOR THE WESTFIELD RECREATION DEPARTMENT.
WE LOVE YOU, MISS YOU AND WILL ALWAYS REMEMBER YOUR SMILE,
YOUR KINDNESS AND YOUR LOVE OF CHILDREN.
DONATIONS FROM MEGAN'S FAMILY, HER FELLOW COUNSELORS, PLAYGROUND
PARTICIPANTS AND PARENTS, COMMUNITY ORGANIZATIONS AND THE WESTFIELD
RECREATION DEPARTMENT MADE THIS PLAYGROUND POSSIBLE.
Dedication 7/17/08

This chapter describes how the recommendations for establishing a network of safe pedestrian and bicycle facilities in Westfield can be achieved. The range of actions necessary to implement this plan varies based on the recommended facility type and character of the existing street (or corridor). Improvements may be as simple as adding pavement markings or signage, or may require more complex actions such as reconfiguring street cross-sections or constructing new sidewalks and curb modifications. Some of the recommendations will require additional planning and engineering efforts and may take years to implement, while others could be achieved in a shorter timeframe. The plan also contains policy and program recommendations, some of which can be implemented at little to no cost.

Next Steps

The concepts and recommendations presented in this plan were developed in accordance with current design guidance, but are not fully engineered. Implementation of many of the recommendations will require engineering studies to refine design elements related to traffic warrants, right of way, drainage design, utilities, and other considerations. This study did not investigate whether existing curb ramps or other pedestrian features are compliant with current ADA standards.

Recommendations from this study will also need to be advanced in accordance with state and federal regulations that govern environmentally-sensitive areas, which include coastal zones, wetlands, woodlands, and preserved open space. Projects adding new paved areas will also need to meet NJDEP Stormwater Management (SWM) Rules for groundwater recharge and runoff quantity. The use of pervious paving – whether asphalt, concrete, or gravel – can help to

mitigate potential environmental impacts related to stormwater runoff.

An implementation table was developed to summarize the major plan recommendations (see Table 7.1). This table provides a brief description, order-of-magnitude, cost, timeframe, and jurisdiction for each recommendation. The table also provides an estimate of the complexity of each project to aid in the decision-making process.

Project Phasing

Since the projects and programs presented in this plan would be developed over many years, phasing of the recommendations is an important consideration. Recommended timeframes for major plan elements are included in the implementation table. Several of the project and program recommendations in this plan could be implemented soon after it is adopted. These immediate action items will improve

pedestrian and bicycle conditions in specific areas, creating early successes. These items will also build momentum for implementing the other recommendations.

Project Funding

Multiple federal and state programs can be used to fund bicycle and pedestrian projects. Included in the Appendix is a presentation outlining the most common bicycle/pedestrian funding programs with basic information about each. Additional sources of funding could include regional, county, local, or philanthropic organizations. Westfield can also pursue implementation of plan recommendations for locally-owned streets through their planning and engineering policies and roadway resurfacing program.

Table 7.1: Implementation Matrix

| Category | Location | Recommendation | Cost | Time-Frame | Jurisdiction |
|--|-------------------------------------|---|------|------------|--------------|
| New Sidewalk | Town-wide | Install new sidewalk per prioritized sidewalk plan | \$\$ | M | W, U & NJ |
| Town-wide Crossing Improvements | Mountain Ave (CR 613) | New crossings at Mountainview, Alden, Kimball | \$\$ | M | W & U |
| | | Enhanced crossings at Chestnut, Dudley, Lawrence | \$ | S | W & U |
| | E Broad St (CR 509) | New crossings at Chestnut, Woodland, Scotch Plains | \$\$ | M | W & U |
| | | Enhanced crossings at St. Paul, Stanley, Osbourne | \$ | S | W & U |
| | Central Ave (CR 613) | New crossings at Virginia, Pearl, Laurel | \$\$ | M | W & U |
| | | Enhanced crossings at North, South | \$ | S | W & U |
| | North Ave (CR 610 / NJ28) | New crossings at Dudley, Lenox, Elmer, Euclid, Fourth | \$\$ | M | W & U |
| | | Enhanced crossings at Clark, St. Paul | \$ | S | W & NJ |
| | Prospect St & E Broad St (CR 509) | Candidate Traffic Signal | \$\$ | M | W & U |
| | N Chestnut St & E Broad St (CR 509) | Candidate Traffic Signal | \$\$ | M | W & U |

Table 7.1: Implementation Matrix contd.

| Category | Location | Recommendation | Cost | Time-Frame | Jurisdiction |
|--|--|---|--------|------------|--------------|
| Pedestrian Improvements @ Focus Intersections | Central Ave (CR 613) & South Ave (CR 610) | Adjust signal phasing for Ross Pl | \$ | S | W & U |
| | | Add high visibility and ergonomic crosswalks | \$ | S | W & U |
| | | Restrict westbound right-turn on red | \$ | M | W & U |
| | | Investigate removing right turn lane | \$\$ | M | W & U |
| | | Construct curb extension on south-west corner | \$\$ | M | W & U |
| | Central Ave (CR 613) & North Ave W (NJ 28) | Mark ergonomic crosswalks | \$ | S | W, U & NJ |
| | | Consider implementing a Lead Pedestrian Interval (LPI) | \$ | M | W, U & NJ |
| | | Install pedestrian signal heads | \$\$ | M | W, U & NJ |
| | Elm St & North Ave W (NJ 28) | Create ADA accessible pathways at train station | S | S | W & NJ |
| | | Evaluate new midblock crosswalk near Lenox Ave | \$ | M | W & NJ |
| | | Pedestrian signal heads and timing improvements | \$\$ | M | W & NJ |
| | | Long term recommendations through master plan | \$\$\$ | L | W & NJ |
| | South Ave (NJ 28) at Roundabout | Investigate adding pedestrian crossing of western approach | \$\$ | M | W & NJ |
| | | Consider roundabout re-design to create one-lane approaches | \$\$\$ | L | W & NJ |
| Pedestrian Improvements @ Focus Intersections | Mountain Ave (CR 613), Lawrence Ave, & Park Dr | Mark high visibility crosswalk | \$ | S | W & U |
| | | Change from yield to stop control (on-going) | \$ | S | W & U |
| | | Construct curb extensions | \$\$ | M | W & U |
| | | Evaluate for additional traffic control such as RRFB | \$\$ | M | W & U |
| | South Ave (NJ 28) & Scotch Plains Ave/ Crossway Pl | Upgrade crosswalks to high visibility | \$ | S | W & NJ |
| | | Mark crosswalk on 4th leg | \$ | S | W & NJ |
| | | Trim vegetation to improve visibility | \$ | S | W & NJ |
| | | Install pedestrian signal heads on all approaches | \$\$ | M | W & NJ |
| | | Install sidewalk along Scotch Plains & Elizabeth Ave | \$\$ | M | W & NJ |
| | | Install pedestrian-scale lighting under NJT bridge | \$\$ | M | W & NJ |
| | Central Ave (CR 613) & Virginia St | Construct continuous sidewalk on one side of Central Ave | \$\$ | M | W & U |
| | | Install Gateway Treatment and new crossing at Picton St | \$\$ | M | W & U |

Table 7.1: Implementation Matrix contd.

| Category | Location | Recommendation | Cost | Time-Frame | Jurisdiction |
|------------------------------|--|--|---------|------------|--------------|
| Bicycle Facilities | Mountain Ave (CR 613) | Install buffered bike lane | \$-\$\$ | M | W & U |
| | E. Broad Street (CR 509) | | \$-\$\$ | M | W & U |
| | Lamberts Mill Road (CR 606) | | \$-\$\$ | M | W & U |
| | Summit Ave | | \$-\$\$ | M | W |
| | Boulevard | | \$-\$\$ | M | W |
| | Scotch Plains Ave | Install standard bike lane | \$ | S | W |
| | Prospect Ave | | \$ | S | W |
| | Lawrence Ave | | \$ | S | W |
| | Various Locations | Install bike boulevards/shared lane markings | \$ | S | W & U |
| | North Ave (NJ 28) between E. Broad & Elmer | Investigate feasibility of road diet | \$\$ | M | W, U & NJ |
| | Bike Parking | Install additional bike parking at selected locations | \$ | S | W |
| Other Recommendations | Bicycle parking ordinance | New ordinances regulating bike parking | NA | S | W |
| | Bicycle and Pedestrian safety and education campaign | | NA | S | W & U |
| | Modification to municipal codes | Modification to sidewalk, curb radii, and driveway design treatments | NA | S | W |

LEGEND

Jurisdiction

W = Town of Westfield
 U = Union County
 NJ = NJDOT

Timeframe

S = Short (1 to 3 years)
 M = Medium (3 to 5 years)
 L = Long (5 years +)

Cost

\$ = Low
 \$\$ = Medium
 \$\$\$ = High



DO NOT
ENTER

North Ave

A man in a blue polo shirt and glasses is looking at a map on a table. The map is a street map with various colored lines and markers. There are several other people in the background, some looking at maps on easels. The setting appears to be a public meeting or a community planning session. An orange semi-transparent box is overlaid on the right side of the image, containing the text '08 Appendices' and a list of sub-sections.

08 *Appendices*

8.1 Bicycle Level of Traffic Stress Analysis Criteria

8.2 Funding Resources

8.3 Public Outreach Materials

8.4 Wikimap Comments at Key Intersections

8.1 Bicycle Level of Traffic Stress Criteria

Criteria for Level of Stress in Mixed Traffic

| Posted Speed Limit | Street Width | | |
|--------------------|--------------|-----------|-------|
| | 2-3 Lanes | 4-5 Lanes | 6+ |
| Up to 25 mph | LOS 1 or 2 | LOS 3 | LOS 4 |
| 30 mph | LOS 2 or 3 | LOS 4 | LOS 4 |
| 35 + mph | LOS 4 | LOS 4 | LOS 4 |

Level of Stress for Mixed Traffic in the Presence of a Right Turn Lane

| Configuration | Level of Stress |
|--|--------------------|
| Up to 25 mph Single right-turn lane with length \leq 75 ft. and intersection angle and curb radius limit turning speed to 15 mph | (no effect on LOS) |
| Single right-turn lane with length between 75 and 150 ft., and intersection angle and curb radius limit turning speed to 15 mph | LOS \geq 3 |
| Otherwise | LOS = 4 |

Level of Stress for Unsignalized Crossings Without a Median Refuge

| Speed Limit of Street Being Crossed | Width of Street Being Crossed | | |
|-------------------------------------|-------------------------------|-----------|-------|
| | 2-3 Lanes | 4-5 Lanes | 6+ |
| Up to 25 mph | LOS 1 | LOS 2 | LOS 4 |
| 30 mph | LOS 1 | LOS 2 | LOS 4 |
| 35 + mph | LOS 2 | LOS 3 | LOS 4 |
| 40 + mph | LOS 3 | LOS 4 | LOS 4 |

Source: Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012

Criteria for Bike Lanes Alongside a Parking Lane

| | LTS ≥ 1 | LTS ≥ 2 | LTS ≥ 3 | LTS ≥ 4 |
|---|----------------|-------------|-----------------|----------------|
| Street width (through lanes per direction) | 2 | (no effect) | 4 or more | (no effect) |
| Sum of bike lane and parking lane width (includes marked buffer and paved gutter) | 15 ft. or more | 14 ft. | 13.5 ft or less | (no effect) |
| Speed limit or prevailing speed | 25 mph or less | 30 mph | 35 mph | 40 mph or more |
| Bike lane blockage (typically applies in commercial areas) | rare | (no effect) | frequent | (no effect) |

Note: (no effect) = factor does not trigger an increase to this level of traffic stress

Criteria for Bike Lanes Not Alongside a Parking Lane

| | LTS ≥ 1 | LTS ≥ 2 | LTS ≥ 3 | LTS ≥ 4 |
|---|----------------|---|-------------------------------------|----------------|
| Street width (through lanes per direction) | 2 | 4, if directions are separated by a raised median | 5, or 4 without a separating median | (no effect) |
| Bike lane width (includes marked buffer and paved gutter) | 6 ft. or more | 5.5 ft. or less | (no effect) | (no effect) |
| Speed limit or prevailing speed | 30 mph or less | (no effect) | 35 mph | 40 mph or more |
| Bike lane blockage may apply in commercial areas) | rare | (no effect) | frequent | (no effect) |

Note: (no effect) = factor does not trigger an increase to this level of traffic stress

Source: Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012

Volume Adjustment

| Volume Threshold | Min. LTS |
|------------------|----------|
| - | 1 |
| 5,000 | 2 |
| 10,000 | 3 |
| 15,000 | 4 |

8.2 Funding Resources



Funding Complete Streets Implementation



Funding Sources

Federal Sources

- + **US Department of Transportation (USDOT)**
 - + Better Utilizing Investments to Leverage Development (BUILD)
- + **Federal Highway Administration (FHWA)**
 - + Transportation Alternatives Program (TAP)
 - + Safe Routes to School (SRTS)
 - + Surface Transportation Program (STP)
 - + Highway Safety Improvement Program (HSIP)
 - + Local Safety / High Risk Rural Roads Program (HRRR)
 - + Congestion Mitigation and Air Quality Improvement (CMAQ)
 - + National Highway Performance Program (NHPP)
 - + National Highway System (NHS)
 - + Recreational Trails Program
 - + Federal Lands Access Program (FLAP)
 - + Emergency Relief



| Funding Sources

Federal Sources

- + **National Highway Traffic Safety Administration**
 - + Section 402 State Highway Safety Program
 - + Section 405 Non-Motorized Safety Grants
- + **Federal Transit Administration**
 - + Fixed Guideway Capital Investments Grants
 - + Bus and Bus Facilities Formula Grants
 - + Enhanced Mobility of Seniors and Individuals with Disabilities
 - + Urbanized Area Formula Program (UZA)
- + **Department of Homeland Security**
 - + Transit Security Grant Program (TSGP)



| Funding Sources

State Sources

- + Municipal Aid
- + County Aid
- + Local Aid Infrastructure Fund
- + Urban Aid
- + Safe Streets to Transit
- + Bikeways
- + NJ Division of Highway Traffic Safety
- + County Capital Programs
 - + Open Space and Farmland Preservation
 - + Municipal Capital Programs
- + Technical Assistance Partnerships
- + New Jersey Trails Program
- + Regional / Local CMAQ Initiatives
- + Transit Village
- + Local Bridges
- + Safe Corridors Highway Safety Funds



Federal Funding

Basics

- + **Provided on a reimbursement basis**
 - + Costs incurred prior to authorization of funds NOT eligible for reimbursement
- + **Project must receive authorization within 2 years of notification of project selection**
- + **NJDOT serves as the pass-through**



Federal Funding

Transportation Alternatives Program

- + **Community Based Projects**
- + **Eligible Applicants**
- + **Highly Competitive**
 - + \$14.1 million available in 2018
- + **Seven Eligible Categories**
- + **Selection Criteria**
- + **Bonus Criteria**
- + **Five Major Requirements**
- + **2018 Applications Due by August 23, 2018**





Federal Funding

Safe Routes to School

- + **Encourage and enable grades K-8 to walk and bike to school**
- + **Eligible Applicants**
- + **Highly Competitive**
 - + \$5.59 million available in 2018
- + **Selection Criteria**
- + **Extra Consideration**
- + **Extra Points**
- + **Five Major Requirements**
- + **2018 Applications Due by August 23, 2018**



Federal Funding

Highway Safety Improvement Program (HSIP)

- + **\$57 million annually**
 - + 40% state highway, 60% county and municipal roadways
- + **Data driven**
- + **Focus on lane departure, intersections, and pedestrians**
 - + Areas identified with NJDOT screening tools
- + **Project Types**





Federal Funding

Complete Streets Technical Assistance

- + **Available through NJTPA**
- + **Supports 9 municipalities implementing Complete Streets**
- + **Direct technical assistance available**
- + **Application Deadline: Friday, July 27, 2018**
- + <http://www.sustainablejersey.com/grants-resources/complete-streets-technical-assistance-program/>
- + **Email Renee Haider at haiderr@tcnj.edu with a "cc" to Douglas Greenfeld, dgreenfeld@njtpa**



State Funding

Municipal Aid

- + **All 565 municipalities eligible**
- + **Transportation-based grants to supplement transportation programs**
- + **\$158.75 million annually until 2024**
- + **Up to 2 applications per year**
- + **7 Eligible Categories**
- + **Selection Criteria**
- + **Urban Aid**
 - + 60 eligible municipalities
 - + \$5 million annually





State Funding

County Aid

- + **Counties eligible**
- + **\$158.75 million annually until 2024**
- + **Allocation based on formula**
- + **Any public road or bridge**
- + **Same improvement types as municipal aid**




State Funding

Local Aid Infrastructure Fund

- + **\$7.5 million annually**
- + **Emergencies and regional needs**
- + **Open to counties and municipalities**
- + **Approved at discretion of Commissioner**
- + **Open at all times**





State Funding

Safe Streets to Transit

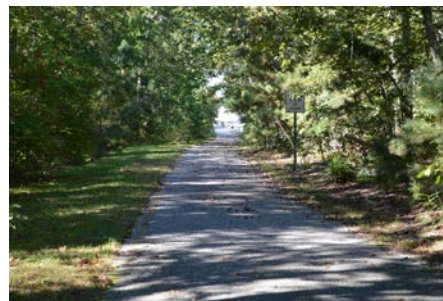
- + Counties and municipalities
- + \$1 million annually
- + Pedestrians ONLY
- + Improve access to transit facilities and all nodes of public transportation
- + Eligible Projects
- + Selection Criteria



State Funding

Bikeways

- + Counties and municipalities
- + \$1 million annually
- + Support goal of 1,000 new miles of dedicated bike paths
- + Projects seeking funding under other aid programs will not be considered
- + Eligible Projects
- + Selection Criteria





State Funding

NJ Division of Highway Traffic Safety

- + **Counties, municipalities, law enforcement agencies, and non-profits**
- + **Local traffic safety needs**
- + **Pedestrian Safety, Enforcement and Education Fund Grant Program**
 - + \$425,000 annually
- + **State and Community Highway Safety Grant Project**
 - + \$14 million annually



State Funding

Assistance Program

- + **Design Assistance Program**
- + **Bike/Pedestrian Planning Assistance**
- + **Transportation Management Associations**
- + **VTC Workshops**



8.3 Public Outreach Materials
Meeting Flyers - Community Workshop #1

Bike Walk Westfield

Bicycle and Pedestrian Plan



Please join us at the first
Community Workshop
for the
Westfield Bicycle and Pedestrian Plan



WHAT

The Town of Westfield is currently developing a town-wide Bicycle and Pedestrian Plan. Please join us at our first Community Workshop to help identify issues and opportunities related to bicycle and pedestrian travel in Westfield. The meeting will be conducted in an “open house” format with stations and display boards, so feel free to drop in when you can during the hours below. Funding for this effort is being provided by the New Jersey Department of Transportation.



WHERE

Town Hall Community Room
425 East Broad Street,
Westfield, NJ 07090

Get Involved!



Draw on our **Interactive Map**:
<http://bit.ly/wbpmp>



Take the **Survey** here:
<https://www.surveymonkey.com/r/BikeWalkWestfield>



WHEN

Monday, July 8, 2019
6:00 PM - 8:00 PM



Meeting Flyers - Community Workshop #2

Bike Walk Westfield

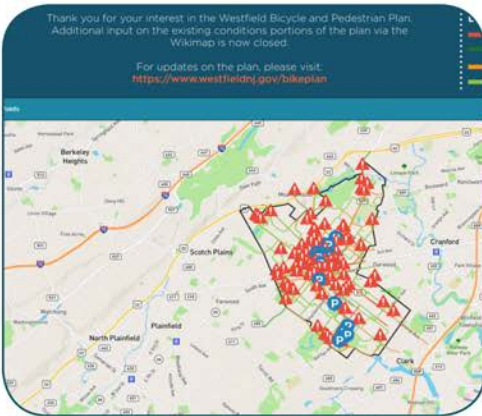
Bicycle and Pedestrian Plan

Please join us at the final
Community Workshop
 for the
Westfield Bicycle and Pedestrian Plan



WHAT

The Town of Westfield is currently developing a town-wide Bicycle and Pedestrian Plan. Please join us at our final Community Workshop to view preliminary recommendations and provide feedback on the draft plan. The meeting will be conducted in an “open house” format with stations and display boards, so feel free to drop in when you can during the hours below. Funding for this effort is being provided by the New Jersey Department of Transportation.



WHERE

Town Hall Community Room
 425 East Broad Street,
 Westfield, NJ 07090

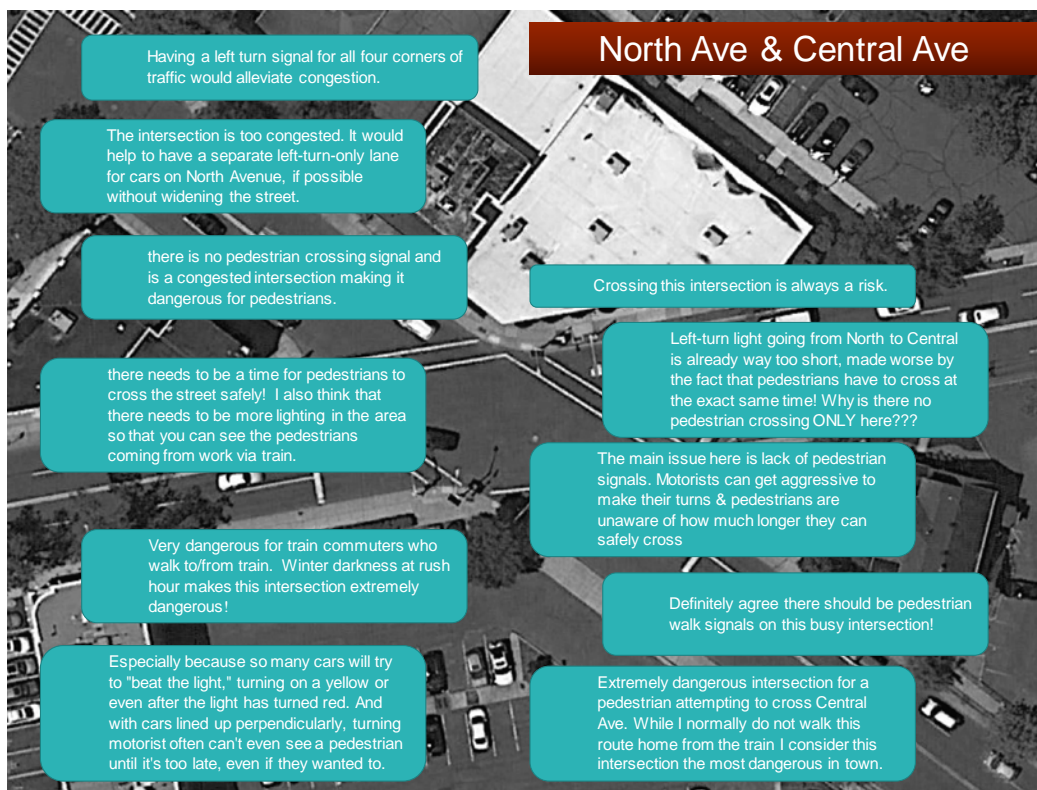
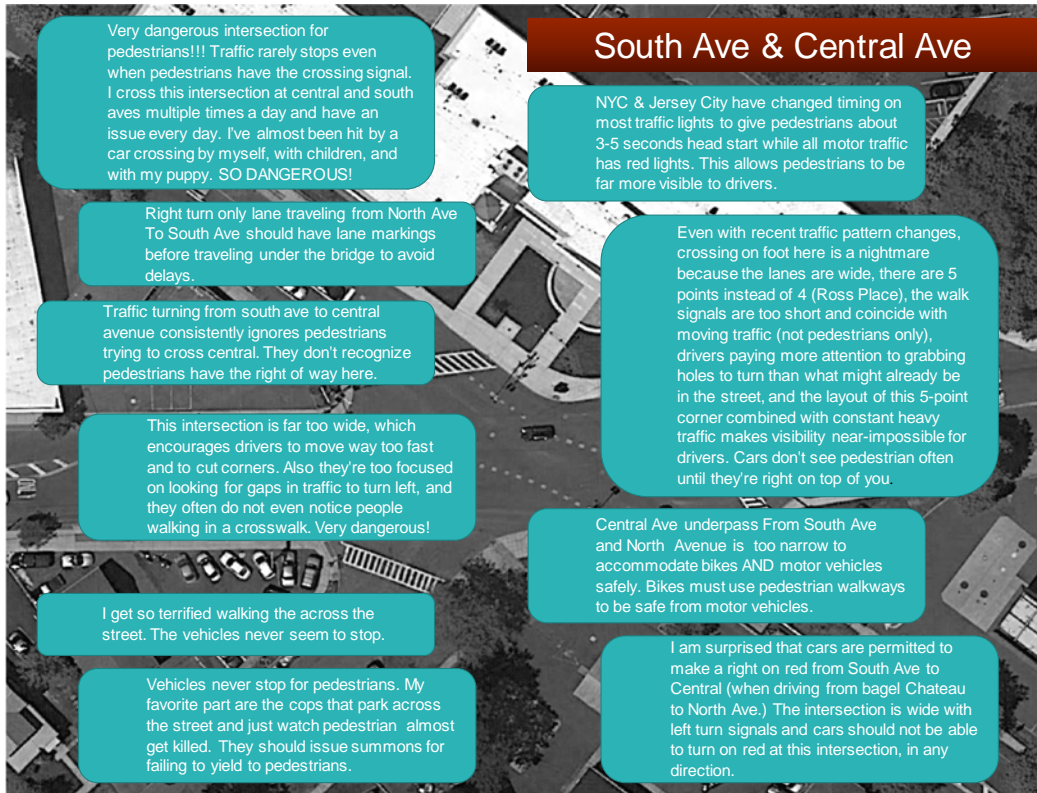


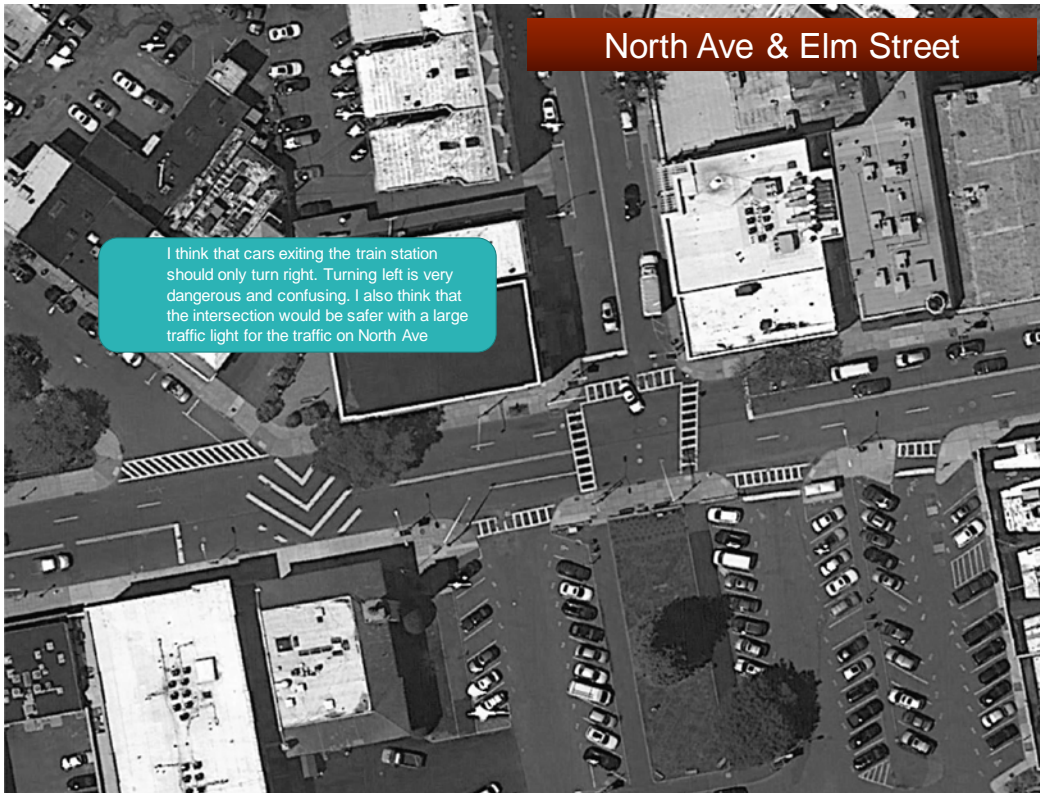
WHEN

Thursday, September 19, 2019
 7:00 PM - 9:00 PM



8.4 Wikimap Comments at Key Intersections





North Ave & Elm Street

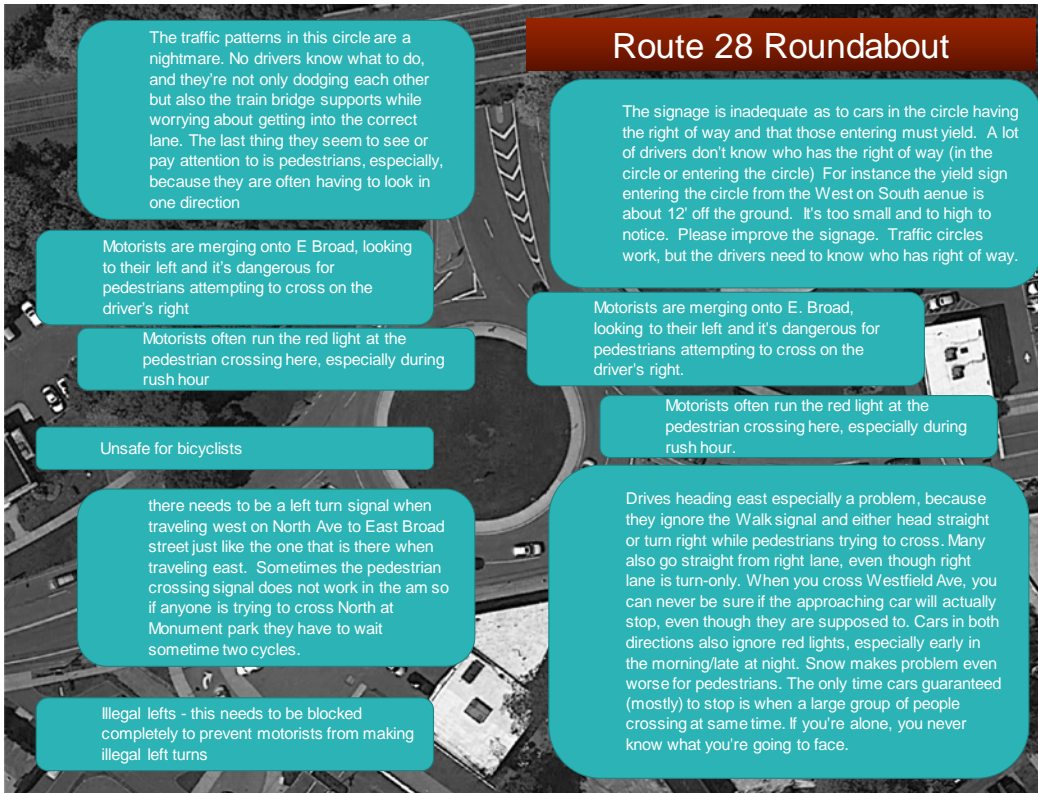
I think that cars exiting the train station should only turn right. Turning left is very dangerous and confusing. I also think that the intersection would be safer with a large traffic light for the traffic on North Ave



E. Broad & Prospect

Bike route to Brightwood Park would be nice

Bump outs of corners can create both a safety area for pedestrian and a parking spot for bicycles. Currently many of the corner blocks have signage of do not park by order of police, raising that area to curb level would allow pedestrians to have a more forward view of cars and vice versa, and also would allow for some bicycle parking areas.



Route 28 Roundabout

The traffic patterns in this circle are a nightmare. No drivers know what to do, and they're not only dodging each other but also the train bridge supports while worrying about getting into the correct lane. The last thing they seem to see or pay attention to is pedestrians, especially, because they are often having to look in one direction

The signage is inadequate as to cars in the circle having the right of way and that those entering must yield. A lot of drivers don't know who has the right of way (in the circle or entering the circle) For instance the yield sign entering the circle from the West on South avenue is about 12' off the ground. It's too small and to high to notice. Please improve the signage. Traffic circles work, but the drivers need to know who has right of way.

Motorists are merging onto E Broad, looking to their left and it's dangerous for pedestrians attempting to cross on the driver's right

Motorists are merging onto E. Broad, looking to their left and it's dangerous for pedestrians attempting to cross on the driver's right.

Motorists often run the red light at the pedestrian crossing here, especially during rush hour

Motorists often run the red light at the pedestrian crossing here, especially during rush hour.

Unsafe for bicyclists

there needs to be a left turn signal when traveling west on North Ave to East Broad street just like the one that is there when traveling east. Sometimes the pedestrian crossing signal does not work in the am so if anyone is trying to cross North at Monument park they have to wait sometime two cycles.

Drives heading east especially a problem, because they ignore the Walk signal and either head straight or turn right while pedestrians trying to cross. Many also go straight from right lane, even though right lane is turn-only. When you cross Westfield Ave, you can never be sure if the approaching car will actually stop, even though they are supposed to. Cars in both directions also ignore red lights, especially early in the morning/late at night. Snow makes problem even worse for pedestrians. The only time cars guaranteed (mostly) to stop is when a large group of people crossing at same time. If you're alone, you never know what you're going to face.

Illegal lefts - this needs to be blocked completely to prevent motorists from making illegal left turns



Mountain Ave & Lawrence Dr/Park Place

Mountain Ave is a nasty road to cross



*Bike Walk
Westfield*
Bicycle and Pedestrian Plan

