

Roosevelt Boulevard Route for Change Program

FINAL REPORT

May 14, 2021 | City of Philadelphia







Letter from the Mayor

For over 100 years, Roosevelt Boulevard has served as a vital artery for the City of Philadelphia connecting the North and Northeast sections of the City to the rest of the region. Once a picturesque road through farmland, “The Boulevard” has grown to be the central feature of an ethnically diverse mosaic of neighborhoods and continues to support tremendous commercial and industrial activities that our economy depends upon. Many people who live and work along this corridor take tremendous pride in it. My administration is committed to improving safety, opportunity, access, and travel reliability through thoughtful planning and impactful investment along Roosevelt Boulevard.

The need for sustained attention is clear. In a typical year, one out of every 12 crashes resulting in death or serious injury that occur in Philadelphia take place on the Boulevard. As Mayor, I have committed the City to achieving Vision Zero with a goal of zero fatalities by 2030. We must all work together to make the Boulevard safe for everyone, whether they are driving, taking transit, walking, or biking. Over the past four years, we have been proud to partner with PennDOT, SEPTA, DVRPC, elected officials, and countless residents to chart a new course for the Boulevard. During many rounds of community meetings, we presented ideas, listened to feedback, and refined designs. We have looked for the best ideas from within our City and from around the nation. We have run hundreds of computer simulations to test alternatives and refine ideas. We have taken the time to understand the diverse values and aspirations of the communities along the Boulevard. The result is this report that identifies both near term improvements and a long-

term vision for a safe, accessible, and reliable Boulevard.

But we knew we couldn't wait. I instructed my administration to begin making the changes that we could immediately. The Boulevard Direct Bus has provided a transformative improvement in transit service, reducing 88 stops to nine stops and getting more people to more places quicker than they ever could before. We have funded improvements to high crash locations such as “S-curve” near Adams Avenue. We have worked with PennDOT to upgrade the communications infrastructure to support future “intelligent transportation system” improvements. Most significantly, in June 2020, automated speed enforcement cameras became operational on Roosevelt Boulevard which we hope will have immediate benefits in reducing excessive speeds. Speeding is a major factor in some of the worst tragedies seen on the Boulevard in recent years.

The Route for Change program has always been about more than a plan. It has a roadmap for action that started with when my administration took office and will continue until the long-term vision becomes a reality. This report sets a high bar for transformational changes to the Boulevard over the long run. Fifty years ago, the city housed 2 million people, but the population is now under 1.6 million. Still, over the last decade growth has returned to the city and if climate impacts to peer cities match predictions, Philadelphia will need to prepare to accommodate significant growth in a short period of time. The Roosevelt Boulevard corridor may become an important context for intensive changes in land use. In any case we want to ensure a future Boulevard that is safe, accessible, and reliable.

My administration cannot do this alone, nor can the administrations that will follow. This will take the engagement and support of every resident, elected official, and agency. I'm convinced as committed partners we can accomplish a great deal, and so I invite you to join me as we make this journey on the Route for Change for Roosevelt Boulevard.

Sincerely,
James F. Kenney

A handwritten signature in black ink that reads "James F. Kenney". The signature is written in a cursive style.

Mayor



Letter from General Manager

Improving transit in Philadelphia is a group effort. That's why SEPTA has been so proud to partner with the City of Philadelphia on the Route for Change project. Roosevelt Boulevard is one of our most important transit corridors, and tens of thousands of SEPTA customers use buses on the Boulevard every day. SEPTA recognizes the need for change on Roosevelt Boulevard and enthusiastically provided funding for this study, substantial staff support, and led an important early implementation project, Boulevard Direct which introduced elements of Bus Rapid Transit on Roosevelt Boulevard.

Boulevard Direct is a new type of bus service for SEPTA. It provides high-frequency, limited stop service, reducing customer travel time, and has improved the customer experience with enhanced bus stations and branded buses. Importantly, the Direct Bus elevates the visibility of transit on the Boulevard, proving that this street is important for all users – not just drivers. SEPTA once again is partnering with the City to implement additional Direct Bus Service on Roosevelt Boulevard and Hunting Park Avenue due to the project's success.

This is just the first step in transforming Roosevelt Boulevard into a corridor that works for everyone. In SEPTA's Strategic Plan, we lay out how SEPTA is transformative to the economy, environment, social equity, health, and safety. We're looking forward to improving bus stops, supporting pedestrian safety, improving local service, and more. The Route for Change plan fully encapsulates this in both its 2025 and 2040 visions.

SEPTA looks forward to putting transit first on Roosevelt Boulevard making it safer, more welcoming, and more useful for all users.

A handwritten signature in black ink, which reads "Leslie Richards". The signature is fluid and cursive.

Leslie Richards

General Manager, SEPTA



Letter from Secretary of Transportation

I am honored to partner with the City of Philadelphia and SEPTA in presenting the Roosevelt Boulevard Route for Change report. Over four years of in depth traffic and engineering analysis and community conversations have resulted in a roadmap for a safe, accessible, and reliable Roosevelt Boulevard in both the near term and for generations to come. PennDOT's core mission is focused on improving lives and connecting people and I firmly believe that implementing Route for Change recommendations will reconnect communities currently divided by a roadway and provide multimodal connections to Pennsylvanians throughout the region.

Governor Wolf has set forth the ambitious goals of developing 21st Century transportation solutions and keeping Pennsylvanians safe on our roadways. There is no more appropriate place than Roosevelt Boulevard to achieve these goals. We are committed to continuing to work alongside our partners at the City of Philadelphia, SEPTA, and Boulevard stakeholders to a safe, accessible, and reliable Roosevelt Boulevard.


During the five years of 2013-2017, there were 2,846 reportable crashes along Roosevelt Boulevard, or nearly 46 crashes per mile per year. There were 62 fatal crashes, or an average of 12 fatalities per year on the Boulevard. Informed by the findings of Route for Change, PennDOT reaffirms its commitment to improving safety along the Boulevard and assisting the City in meeting its Vision Zero goal.

As an agency, we have several initiatives underway to support the 2025 recommendations, including:

- Refining the 2040 alternatives from the Route for Change, including detailed analysis;
- Performing predictive safety analysis using Interactive Highway Safety Design model for distinct segments of the Boulevard; and
- Developing a bid package for select 2025 alternatives and crossover mitigation.

PennDOT is committed to transforming Roosevelt Boulevard in to the safe, accessible, and reliable corridor put forth in the Route for Change program. We are proud of the results of this study and look forward to continued partnership with the City of Philadelphia and SEPTA to transform the Boulevard.

Sincerely,



Yassmin Gramian, P.E.
Secretary of Transportation

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50 FRANKFORD TRANSPORTATION CTR

1470

8481

8481

SEPTA

THE FIRST SURVIVOR OF
ALZHEIMER DISEASE IS
OUT THERE

SEPTA
Frankford
Line

Executive Summary



Few roads are as iconic and vital, yet complex, as Roosevelt Boulevard in Philadelphia.

One out of three people in Philadelphia live within a mile of the Boulevard, and the tens of thousands of people who use the Boulevard each day face difficult challenges, no matter how they travel. Yet, many who live along the Boulevard or depend on it to get around recognize its potential. In 2016, with support from a U.S. DOT TIGER planning grant, the City of Philadelphia, PennDOT, and SEPTA joined together to develop the Roosevelt Boulevard Route for Change Program to make the Boulevard more safe, accessible, and reliable for all users.

Over the last five years, through 18 community meetings and many more stakeholder conversations, a vision for the Boulevard as safe, reliable, and accessible was crafted. From that vision, near-term improvements and longer-term guiding principles were developed.

Long Term Vision

Roosevelt Boulevard will be safe, accessible, and reliable for all users. The Boulevard will be an attractive and vibrant corridor that unites adjacent communities and offers a diverse and connected network of transportation choices.

Safe

People will be safe and not in danger of death or serious injury when they travel on the Boulevard. Today, Roosevelt Boulevard has one of the highest rates of crashes in the City, accounting for 14 percent of all crash-related fatalities in Philadelphia.

Accessible

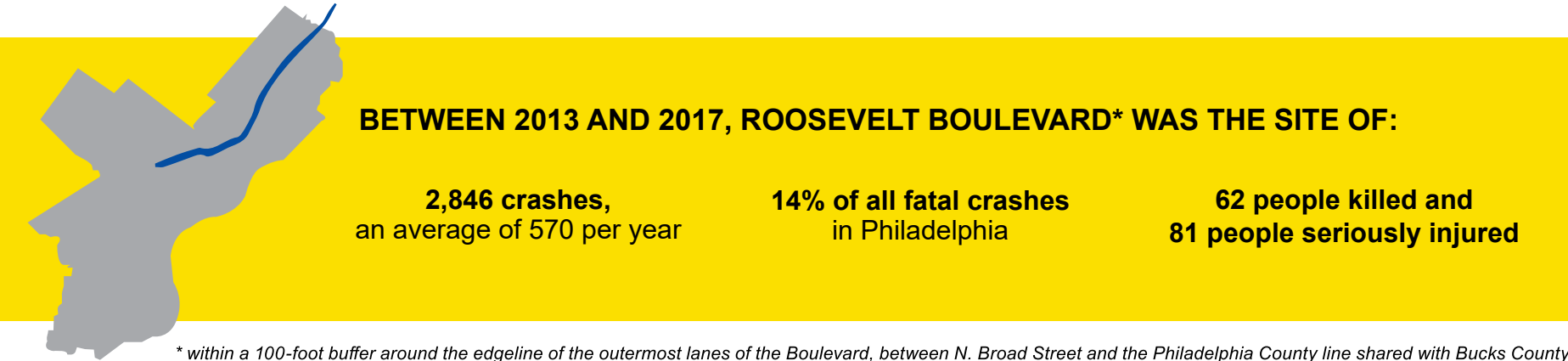
People will be able to use the Boulevard easily by any mode of their choice, including riding transit, driving, walking and biking. Improving bus transit, either implementing Direct Bus or future Bus Rapid Transit (BRT), is a central aspect for increasing accessibility to the hundreds of thousands of jobs and opportunities located on the Boulevard.

Reliable

The Boulevard will be a reliable route for travel, connecting people to neighborhoods, commercial centers, and attractions throughout the city. Today, the frequency of crashes and incidents along the Boulevard makes travel unpredictable for those taking transit or driving.

Commitment to Vision Zero

Despite past incremental safety efforts along, the number and severity of traffic crashes along the Boulevard continue to pose a significant public health threat to Philadelphians. When asked, 70 percent of public meeting participants said that they felt stressed or very stressed about traveling along the Boulevard.



Planning in Action



An important part of the Route for Change program is not just to *plan* for change along the Boulevard, but to *make* change happen. This program focuses on implementing incremental improvements and creating a safe and inviting corridor over the longterm, thereby inspiring Philadelphians to feel more ownership and pride in the Boulevard. As community and transportation needs were uncovered during the planning process, solutions were pursued and implemented to truly demonstrate that change can happen on the Boulevard:

New Bus Stations and Direct Bus Route

In response to identified need to improve bus stops and bus frequency, the City and SEPTA worked together to build eight new high quality bus stations and initiate the City's first Direct Bus Route, Boulevard Direct, which runs buses every 10 minutes during rush hour and every 15 minutes during most other periods.

Camera Automated Speed Enforcement

In response to the persistently high occurrences of severe and fatal crashes on the Boulevard, the Pennsylvania legislature authorized automated speed enforcement cameras along Roosevelt Boulevard in 2018 as part of a five-year pilot program. In 2019, Mayor Kenney signed legislation with support from City Council permitting the pilot program. Active since June 2020, the City and the PPA. The City and the PPA are monitor the program, and anticipate extending it to new locations, as well as making the cameras permanent. Adding automated speed cameras on the Boulevard is one of the most effective steps towards eliminating traffic deaths on the Boulevard.

Section 1: About Roosevelt Boulevard

Section 1 provides the history of the Boulevard and what today's conditions are like for people who drive, walk, bike, or ride transit along it. Crashes on Roosevelt Boulevard are frequent and severe, accounting for 6 percent of all crashes and 14 percent of all fatal crashes in the City.



56

SIGNALIZED
INTERSECTIONS



94

UNSIGNALIZED
INTERSECTIONS

252

NON-INTERSECTION
ACCESS POINTS

Evolution of the Boulevard

Since opening in 1914, the Boulevard and the neighborhoods around it have evolved in North Philadelphia and the Boulevard was extended to to the Far Northeast and Bucks County. Today, more than 20 neighborhoods fall along Roosevelt Boulevard and are home to one in three Philadelphia residents. The communities along the Boulevard continue to diversify; 18 percent of the corridor's residents are born outside the United States, and almost one third speak a language other than English.

Community engagement

Over the past five years, the planning process for the Route for Change Program included five rounds of public forums, totaling 18 meetings, to gather input on ideas for improving Roosevelt Boulevard. Input received in the rounds of public meetings crafted a vision for the Boulevard to be an attractive and vibrant corridor that unites adjacent community and offers a diverse and connected network of transportation choices.

Current function

Most of the Boulevard has 12 lanes of moving traffic, carrying between 39,000 and 90,000 vehicles per day and 10 bus lines for all or a significant portion of their routes. There are sidewalks on both sides for large sections of the Boulevard, but there are also significant gaps the sidewalk network.



1 out of 3

people in Philadelphia live within one mile of the Boulevard



18% of the corridor's residents were born in a foreign country.



Almost **1/3** of the corridor's residents speak a language other than English at home as their primary language.

Section 2: Next 5+ Years 2025 Improvements

Section 2 highlights ways to improve safety, accessibility, and reliability in an incremental approach. Route for Change created a toolbox consisting of near and mid-term improvements with a planning horizon of 2025 and focused on addressing safety concerns that are prevalent along the full corridor. The program will include improvements to transit, safer pedestrian access, intersections, and landscaping.



Local Bus Stop Improvements

Improvements to the Boulevard will include upgrades like bus shelters and new seating at 62 local bus stops.

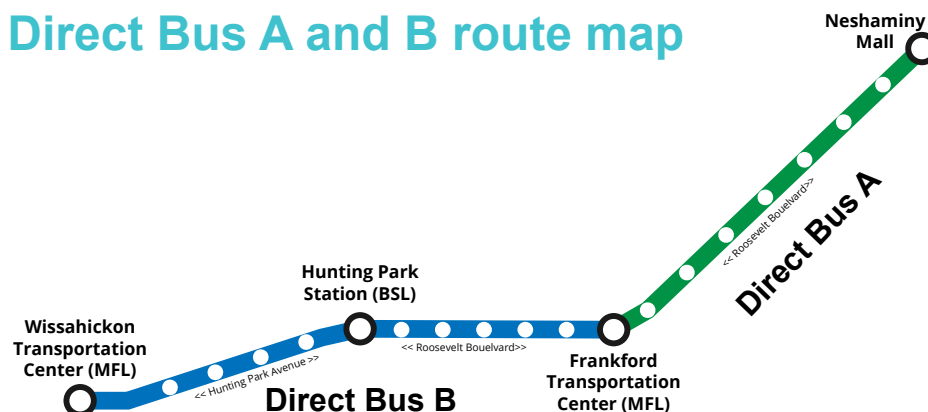
Business Access Transit Lanes (BAT)

BAT lanes will provide designated space for buses to travel separately from general traffic. This will improve accessibility and reliability for transit riders. BAT lanes will support both Direct Bus and local service along the Boulevard while maintaining access to local businesses.

Direct Bus, Phase B

Direct Bus service will be extended to new locations, and connect the Frankford Transportation Center to the Wissahickon Transportation Center with frequent, reliable bus service. Phase B will also focus on elevating the quality and availability of transit service along the Boulevard.

Direct Bus A and B route map



Intersections & Segments

Today, many intersections and roadway segments along the Boulevard have confusing traffic patterns that are especially difficult to navigate for pedestrians and transit users that result in traffic crashes. To address these issues, the program identified six priority roadway segments for improvement. Recommendations to make them safer include curb extensions to shorten crossing distances, realigned crosswalks, realigned lane configurations and turn lanes, upgrades to traffic signals and timing, changes to traffic movements, and new or upgraded transit shelters and stations.

Pedestrian Safety

Route for Change will recommend five types of projects to improve the safety of the Boulevard for people who walk or bike:

- Improve the pedestrian crossing experience and make it easier to walk across the Boulevard safely with the walk signal
- Repaint crosswalks and improve curb ramps
- Build curb extensions to shorten pedestrian crossing lengths/times
- Close sidewalk gaps
- Extend the protected bicycle network to the Boulevard



Example of Intersection Improvements on Roosevelt Boulevard - Summerdale Ave. & Adams Ave. is one of forty-eight intersections that is studied in the plan. (pg. 129)

Crossover Improvements

Today, driving between the outer (local) lanes and the inner (express) lanes is challenging and requires using a crossover lane. In order to accommodate BAT lanes, improve safety, and mitigate congestion, 9 of the 34 total crossovers will be extended or improved.

Landscape & Public Art Improvements

Refer to the full Route for Change report for Landscape and Public Art (pgs. 84-93); Vision Zero Educational Campaign (pg. 180); Signage and Lighting (pgs. 183-184); Transportation Demand Management (pg. 185).

Section 3:

Long-Term Vision

2040 Improvements

The report presents two alternative visions for the future of the Boulevard. Both alternatives are founded upon the same principles and long-term vision, but they differ in specific infrastructure improvements and the cost and time needed for implementation.

Building Blocks for Long-Term Vision

Bus Rapid Transit with dedicated transit lanes

Widened and continuous sidewalks

Reduce posted speed limits for safe driving

Two-way protected bike lane

Alternative 1 “Partially Capped Expressway”

- Build a below-ground expressway and make at-grade connections on top for people driving, taking transit, biking, and walking. Keep the high-speed highway option for people driving.
- **Cost Estimate:** \$10,864,000,000



The Vine Street Expressway is a similar concept to Alternative 1 “Partially Capped Expressway”

Cross-section and aerial view of Alternative 1 “Partially Capped Expressway”



1. Four below-grade expressway lanes (two northbound, two southbound); higher speeds
2. Four at-grade local lanes for local traffic and buses (two northbound, two southbound); slower speeds
3. Two dedicated bus rapid transit (BRT) lanes on the inside next to the medians
4. Two two-way protected bike lanes on the outside near the sidewalks
5. Widened sidewalks along both sides
6. Nine on/off ramps to connect expressway lanes with local lanes (Not pictured)
7. Five fully capped segments; nine BRT stations located on capped segments creating neighborhood scale access hubs (Not pictured)
8. Other segments have depressed lanes with no/partial cap; segments, including everything north of Bowler St., are at-grade (Not pictured)

Alternative 2 “Neighborhood Boulevard”

- Replace some vehicle lanes with other elements including BRT lanes, bike lanes, and wider sidewalks. Add flexible space that can change during time of day for parking or vehicles depending on demand. Build new intersections to make a better grid and safer crossings.
- **Cost Estimate:** \$1,957,000,000



Ben Franklin Parkway is a similar concept to Alternative 2 “Neighborhood Boulevard”

Cross-section and aerial view of Alternative 2 “Neighborhood Boulevard”



Shown at left:

1. Six at-grade vehicle lanes (three northbound, three southbound); local buses use outermost lanes; all have slower speeds
2. Two flex lanes (one northbound, one southbound); off-peak used for local bus boarding, on-street parking, and loading/delivery; peak used for business access transit (BAT) lanes
3. Two dedicated BRT lanes in between at-grade vehicle lanes and next to side median.
4. Two two-way protected bicycle lanes on the outside near sidewalks
5. Widened sidewalks along both sides
6. Twenty-eight signalized intersections that improve safety by reducing long blocks, provide drivers more choices, and build new direct access to adjacent neighborhoods. (Not pictured)
7. Preserves any landscape improvements built in 2025. (Not pictured)

Next Steps



Read the full Route For Change Report at www.phila.gov

Implementation of the Route for Change program depends on multiple government agencies and community partners continuing to work together into the future. While many of the early actions have already been implemented, more is planned in the coming years. These improvements include an improved intersection at Summerdale/Adams to address the high number of crashes occurring on the S-curve, implementation of Direct Bus, Phase B, and cross-over on mitigation in key locations. The full report recommends future studies for Walkable Station Areas around the Boulevard to plan for compact residential, commercial, and employment hubs near transit.

As a next step, partners including PennDOT, the City of Philadelphia, SEPTA, and community members must come together to develop environmental screening parameters for the two 2040 alternatives to secure funding for implementation. The Program developed incremental improvements that can be layered into place, creating a continually more inviting corridor and inspiring Philadelphians to feel more ownership and pride in the Boulevard. We appreciate the support of all who have been involved in this process. Together we will root for change to transform Roosevelt Boulevard.

Section 1

Background



CHAPTER

1

Introduction

This chapter describes the:

- Overview of the Route for Change Program
- Evolution of the Boulevard
- Commitment to Vision Zero
- Themes, Goals, and Objectives
- Public Involvement Process

Overview of the Program

Welcome to the Roosevelt Boulevard Route for Change Program. The City of Philadelphia, in cooperation with the Pennsylvania Department of Transportation (PennDOT), and the Southeastern Pennsylvania Transportation Authority (SEPTA) received a United States Department of Transportation (USDOT) TIGER VI planning grant to develop a program to transform Roosevelt Boulevard. This effort is known as the Roosevelt Boulevard Route for Change Program.

This report documents the planning and analysis completed between 2016 and 2019 to identify multimodal transportation improvements, policies, and programs that will improve safety, accessibility, and reliability along the Boulevard.


The Route for Change Program creates the framework for transformation of Roosevelt Boulevard. As presented in this report, 2025 and 2040 are the two time periods of transformation that will help the City deliver on its broader transportation values of safety, opportunity and access, sustainability, and health, while balancing local and regional travel needs. The Program recognizes there have been many plans over the years that have studied the growing pressures and demands placed along the Boulevard, as outlined in Appendix 1. In fact, several recommendations are still valid and highlighted in the Route for Change Program. However, with its recent commitment to Vision Zero and its priority on reducing the number of traffic deaths to zero by 2030, the City is amplifying the commitment to improving the safety, accessibility, and reliability of travel by all users along the Boulevard, and will be working in partnership with SEPTA and PennDOT. The 14-mile Route for Change Program area spans 12.3 miles of Roosevelt Boulevard in the City of Philadelphia, from N. Broad Street to the Philadelphia County line shared with Bucks County, and an additional 1.7 miles of U.S. 1 in Bucks County to the Neshaminy Mall.

The first segment of Roosevelt Boulevard opened in 1914 in a largely undeveloped


portion of Lower Northeast Philadelphia. The mid-century development in Northeast Philadelphia introduced more suburban, middle class neighborhoods, shopping centers, and industrial parks to the formerly rural landscape. Today, change continues to occur in the over 20 neighborhoods along Roosevelt Boulevard.

This change is exemplified in the shifting demographics along Roosevelt Boulevard (see Appendix 2). Nearly 530,000 people live in a census tract that is within one mile of the Program area, with the vast majority living in Philadelphia. One in three Philadelphia residents live within one mile of Roosevelt Boulevard. In the 1990s and early 2000s, the number of White residents declined and there was a significant increase in African Americans and immigrants from Eastern Europe, Asia, Latin America, and the Caribbean. The area continues to grow and diversify. Many of these trends are evident in the Philadelphia region's Indicators of Potential Disadvantage (IPD), a scoring framework produced by the region's Metropolitan Planning Organization, Delaware Valley Regional Planning Commission (DVRPC) that analyzes demographic data to identify census tracts with relatively high rates of populations of interest under Title VI and Environmental Justice in the region. According to this metric, 43 percent of census tracts in the Program area score above or well-above average for foreign-born population, compared to 30 percent for the city of Philadelphia and 21 percent for the nine-county region.

Compared to the rest of Philadelphia and the region, Roosevelt Boulevard has a very high concentration of people of ethnic minorities, people who are foreign-born, and people who speak limited English, making this one of the most diverse areas in the region. Today, almost one-third of the corridor's residents speak a language other than English at home as their primary language, with 56 percent of the Program area census tracts scoring above or well-above average for IPD's Limited English Proficiency score.

 **1 out of 3**
people in Philadelphia
live within one mile of
the Boulevard

 **18%** of the
corridor's residents
were born in a
foreign country.

 Almost **1/3** of the
corridor's residents speak
a language other than English at
home as their primary language.

There is also greater poverty in the one-mile area around the Boulevard, and a higher number of aging individuals living on fixed incomes than in previous decades. The IPD analysis also shows that poverty in the area around the Boulevard is on par with the city as a whole, but is much higher than in the region. Seventy percent of census tracts in the Program area are above or well-above average for the IPD poverty indicator. The lower portion of Roosevelt Boulevard has the Program's highest concentrations of lower-income, youth, and minority residents, as well as lower rates of car ownership. These populations are often affected disproportionately in traffic crashes. Today's residents are more likely to walk or take transit to reach services and jobs than prior generations, particularly in the southern portion of the corridor.

The current design of Roosevelt Boulevard is unique to Philadelphia, and there are only a few corridors in the United States that share similar characteristics. Most of the Boulevard has 12 lanes of moving traffic, with six outer (local) lanes, three in each direction; and six inner (express) lanes, three in each direction. The corridor has 56 signalized intersections, 94 unsignalized intersections with 129 access points, and 54 crossovers between inner (express) and outer (local) lanes. Four bus lines use the Boulevard for the majority of their routes, six more use it for a significant portion of their routes, and 18 bus routes intersect the Boulevard – together making a network of 28 bus routes. The posted speed limits along the Boulevard vary between 40 MPH and 45 MPH.

Depending on the location, between 39,000 and 89,000 vehicles per day travel along the Boulevard. Roosevelt Boulevard carries roughly 90,000 vehicles per day at its busiest segment between N. Broad Street and Rising Sun Avenue. And overall, the average daily traffic volumes are significantly higher in the section of the Boulevard below Cottman Avenue. However, throughout the entire Program area, traffic crashes and other incidents, and the Boulevard's use as an alternate route for I-95, too often interrupt how reliably everyone gets to their destinations.

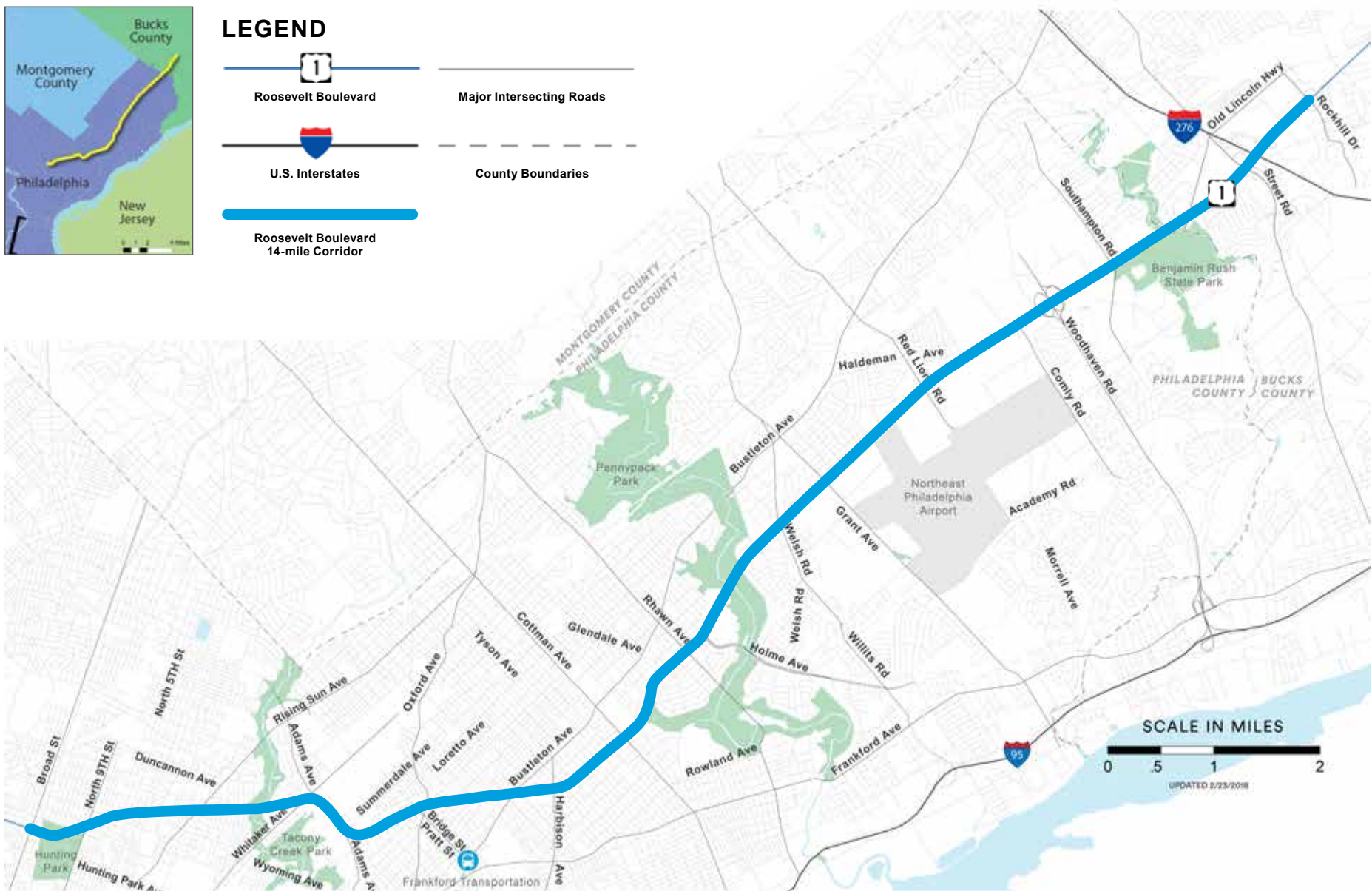
The complex design characteristics of the Boulevard contribute to numerous issues related to safety, accessibility, and travel reliability. For example, the Boulevard provides critical access for low-income and transit-reliant communities, but it is challenging to get to a bus stop or business that is across the street. At many intersections, people riding the bus must cross 300-foot wide intersections, which is the equivalent of a football field. Additionally, because of the closely spaced local bus stops along Roosevelt Boulevard, it can take almost 45 minutes to travel eight miles of the Boulevard by local bus, which is twice as long as commuting by car.

Drivers are also faced with challenges when trying to navigate between inner (express) and outer (local) lanes. These include deficient crossovers, sharing the road with people driving aggressively, traffic crashes requiring temporary lane closures, shared left turn movements with oncoming vehicles, and issues with traffic signal timing.

Figure 1-1. 2040 Vision Statement



Figure 1-2. Route for Change Program Corridor



Evolution of the Boulevard

Theodore Roosevelt Memorial Boulevard, commonly known as “Roosevelt Boulevard” or simply “the Boulevard” has evolved significantly since its inception:

- The initial concept, first proposed in 1902, was to extend 10 miles through Northeast Philadelphia between Broad Street and the Torresdale neighborhood. The roadway’s purpose was to facilitate economic growth and residential development in the predominantly undeveloped Northeast Philadelphia. Initially, the roadway was to be named Torresdale Boulevard after its northeast terminus.
- Designed as a green and monumental roadway at the peak of the City Beautiful movement, the Boulevard was completed in stages. The first stage, opened in 1914, connected Broad Street to a point south of Pennypack Creek. The roadway was renamed Northeast Boulevard as it did not yet extend to Torresdale.
- The Boulevard obtained its current name in 1918 when the roadway was extended to Pennypack Creek, making the roadway seven miles in length.
- The Boulevard was subsequently extended over the next decades into the Far Northeast until it reached its current end point in the late 1950s.
- The first federal interstate highway absorbed the Boulevard in 1926, officially making it part of U.S. 1. The federal government ceded control of roadway maintenance to the City of Philadelphia and in 1937, control went to the Department of Highways, PennDOT’s predecessor.
- In 1936, the Philadelphia City Planning Commission proposed a significant transformation, as documented in the *Roosevelt Boulevard and Bensalem Avenue - Study of Revised Conditions* report. At that time, the Boulevard, between Broad Street and Holme Avenue, was three sets of lanes divided by two side medians. The new design created a fourth set of lanes by introducing a center median. North of Holme Avenue, the road was referred to as Bensalem Avenue and consisted of two sets of lanes separated by a center median. The new design introduced side medians and two outer travel lanes along this segment.
- The roadway was extended again in 1961 via completion of the 3.5-mile Roosevelt Expressway connecting with Interstate 76 (this segment is outside the Program area).

Figure 1-3. Roosevelt Boulevard and adjacent new development in 1927, looking north of Oxford Circle (lower left corner)



Source: <https://why.org/articles/from-above-roosevelt-boulevard-oxford-circle-and-beyond-in-1927/>

The construction of Roosevelt Boulevard facilitated an early- to mid-century development boom that brought houses, shopping centers, and industrial parks to Northeast Philadelphia. For decades, the Boulevard has been the transportation spine that has evolved over time in the attempt to meet the needs of North and Northeast Philadelphia and the surrounding region. Because the land use along the Boulevard was primarily designed for access by motor vehicle, little thought was given to safe access by foot, transit, or bicycle.

Figure 1-4. "Beautifying Roosevelt Boulevard," Nov. 5, 1936



Source: Temple University Libraries

Roosevelt Boulevard's shift in land uses, economic conditions, and demographics has created conflicts between the various modes of travel and increased the difficulty of traveling along the Boulevard. It also increases the difficulty for people in the adjacent 20 neighborhoods along the Boulevard to travel safely and reliably. The Boulevard has never stopped evolving since its inception, and the Route for Change Program is harnessing that experience to transform the Boulevard over the next 20 years.

Figure 1-5. "Autobuses on Roosevelt Boulevard, Philadelphia, PA" circa 1926



Source: [Library Company of Philadelphia](#)

Commitment to Vision Zero

Over the past 20 years, various transportation agencies have implemented incremental safety improvements along Roosevelt Boulevard, including upgrading roadway lights to LED, installing larger speed limit and speed advisory signs, resurfacing lanes and restriping crosswalks, installing Automated Red-Light Enforcement (ARLE) cameras, installing more pedestrian crosswalk countdown timers, and removing unsignalized pedestrian crossings.

Despite these efforts, the number and severity of traffic crashes along the Boulevard continue to be a significant public health threat to Philadelphians and Boulevard travelers. When asked during the first round of Roosevelt Boulevard Route for Change Program public meetings in April 2016, 70 percent of participants said that they felt stressed or very stressed about traveling along the Boulevard. This is not surprising given the volume of traffic crashes along Roosevelt Boulevard between 2013 and 2017. Between N. Broad Street and the Philadelphia County line shared with Bucks County, there were:

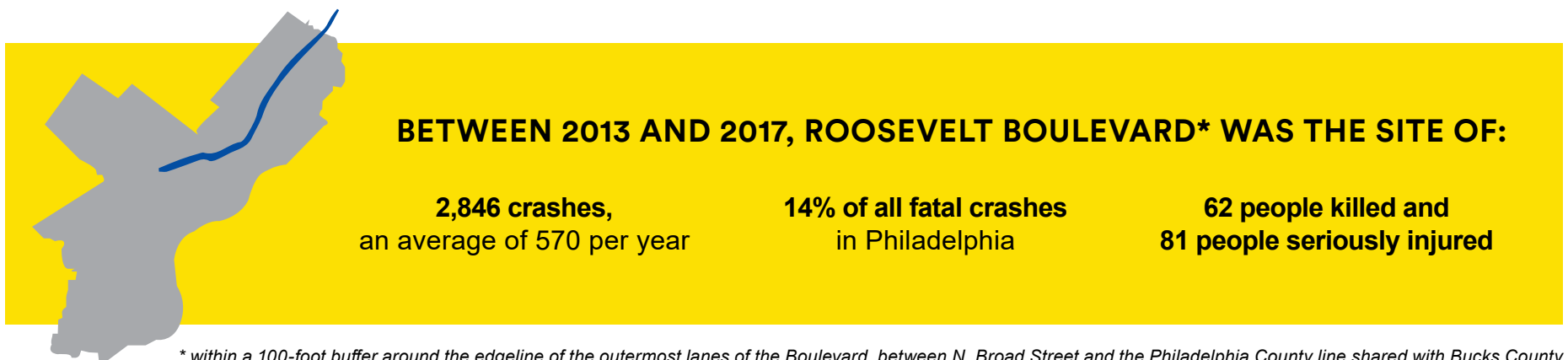
- Over 2,800 reportable crashes, which represents 6 percent of all reportable crashes in Philadelphia.
- 62 deaths due to traffic crashes
- 81 serious injuries to people in cars, on foot, or on bikes

Roosevelt Boulevard's safety-related statistics are the primary reason the City of Philadelphia is looking into why crashes occur and how to address traffic-related deaths and serious injuries. This initiative, called Vision Zero, was first adopted as a national policy in Sweden in 1997, as a strategy to eliminate all traffic-related deaths

and severe injuries, while increasing safety, health, and mobility for all. In Sweden, traffic-related deaths have since dropped by 30%. In the United States, cities of all sizes have adopted Vision Zero policies. Vision Zero focuses on how people naturally behave. People make mistakes, but these mistakes should not be fatal. While preventing all crashes is impossible, putting people first can help prevent the most serious and fatal crashes. Philadelphia, along with other municipalities around the United States, are uniting in the Vision Zero project.

Vision Zero is a strategy to eliminate all traffic-related deaths and severe injuries, while increasing safety, health, and mobility for all. The City of Philadelphia's Vision Zero goal is to reduce traffic related deaths to zero on its streets by 2030. The City has several fundamental principles to guide this initiative, including:

- **Human life takes priority over convenience.** A modest amount of travel delay is worth everyone arriving at their destination alive.
- **Human error is inevitable and unpredictable.** A mistake should not result in a loss of life or a serious injury.
- **Speed is a fundamental predictor of crash survival.** Humans are vulnerable to speed, no matter how we choose to travel. Speed is particularly lethal for people walking and biking. Without the protection of an automobile, the human body has limited tolerance for speeds higher than 20 MPH. To preserve human life, our transportation system should be designed to foster reasonable speeds.



By designing streets for the most vulnerable people including seniors, children, people with disabilities, and for people walking and biking, our streets become safer for everyone. Safety is also a social equity issue. The City recognizes that children, seniors, people living with physical disabilities, and those who live below the poverty line are disproportionately affected by traffic-related fatalities and serious injuries, and the City is committed to prioritizing investments in neighborhoods with the greatest need.

On November 17, 2016, Mayor Jim Kenney signed Executive Order 11-16 creating a Vision Zero Task Force to work towards eliminating traffic-related deaths in Philadelphia by 2030. In September 2017, the Task Force published a Vision Zero Three-Year Action Plan and in November 2020, the Task Force published the City's second Vision Zero Action Plan 2025. The Plan emphasizes systemic change to Philadelphia's transportation system to create a multilayered safety net. The plan emphasizes:

- **Equity** – Ensure equitable traffic safety investments in neighborhoods needing them most.
- **Safe Speeds** – Prevent fatal crashes by managing vehicle speeds.
- **Safe Streets** – Create roads that are predictable and are not confusing to anyone using them.
- **Safe People** – Empower Philadelphians to spread Vision Zero messaging, take community action, and promote a culture of safe driving, walking, and biking.
- **Safe Vehicles** – Support all Philadelphians to use the safest vehicles possible for daily trips - with transit, biking, and walking as the priority.
- **Safety Data** – Use quality data and the latest analytical tools to prioritize actions and track Vision Zero progress.

The five-year crash trend occurring along Roosevelt Boulevard clearly illustrates the urgency for immediate improvements to the Boulevard. Outlined in Section 2 of the report, the Route for Change Program has identified a series of recommendations to move towards implementation by 2025, which are based on Vision Zero principles. More information about the City's Vision Zero strategy is available at www.visionzerophl.com.

Figure 1-6. People walking are among the Boulevard's most vulnerable users.



Themes, Goals, and Objectives

The Route for Change Program strives to transform the Boulevard in order for it to meet its potential as a true multimodal corridor. As the defining piece of transportation infrastructure in Northeast Philadelphia, the Boulevard is not welcoming or comfortable for every type of user and falls short of its ability to bolster the social and economic vibrancy of neighboring communities. The sheer width of the Boulevard presents an opportunity for transformation by addressing three main themes:

Safety is the top priority for Boulevard users across all modes of travel. Human behavior, interaction of modes, and unusual design characteristics of the Boulevard combine to put the traveling public at great risk of harm. Due to long crossing distances and high vehicle speeds, people walking or riding a bike are put at an even higher risk.

Accessibility of destinations is limited because the Boulevard is a physical and psychological barrier between neighborhoods. Due to the Boulevard’s current physical state, it limits the number of destinations and activities people have access to in the region.

Reliability issues affect all travelers along the Boulevard, resulting in unpredictable travel time and frustrating experiences. Drivers and transit users face inconsistent travel times when Roosevelt Boulevard is congested and during crash incidents. People walking experience unexpected delays due to eroding or missing sidewalks. Both people walking and riding a bike are impacted by narrow medians. The lack of bicycle facilities deter people from riding a bike.

The goals for the Route for Change Program will guide both the 2025 recommendations and the 2040 vision for Roosevelt Boulevard. The objectives provide guidance for attaining each goal. Both are checkpoints used for assessing potential solutions and will be used to guide future analysis of the 2040 alternatives.

Table 1-1. The Route for Change Themes, Goals and Objectives

| Theme | Program Goals | Program Objectives |
|----------------------|---|--|
| Safety | Improve transportation safety for all modes of travel along the Boulevard by reducing the number of traffic fatalities to zero. | <ul style="list-style-type: none"> • Attain Vision Zero goals by reducing the number and severity of crashes along Roosevelt Boulevard • Induce drivers to drive the posted speed limit to improve the safety of all travelers, especially people who walk and bike • Increase the number and the quality of places where people can safely walk or bike along or across the Boulevard • Improve bus stops along the Boulevard to provide safe places for riders to wait |
| Accessibility | Better connect the modes of travel using the Boulevard so it is easier to reach more destinations and activities. | <ul style="list-style-type: none"> • Provide seamless connectivity between the various modes of travel along and across the Boulevard • Ensure travel along the Boulevard maximizes the number of destinations and activities people can reach • Provide more transit, pedestrian, and bicycle connections along and across the Boulevard • Ensure transportation options and new development remain affordable • Knit together neighborhoods across the Boulevard by reducing barriers to crossing the Boulevard |
| Reliability | Provide dependable transportation options along the Boulevard. | <ul style="list-style-type: none"> • Maintain consistent vehicular traffic flow along the Boulevard • Improve the frequency and dependability of transit trips along the Boulevard • Incorporate walking, biking, and transit service connections to existing and future land use changes • Provide new transit service that supports future mixed use and walkable station areas • Reduce the number of trips taken by single-occupancy vehicles by making walking, biking, and taking transit the fastest, safest, and most convenient options for travel |

Public Involvement Process

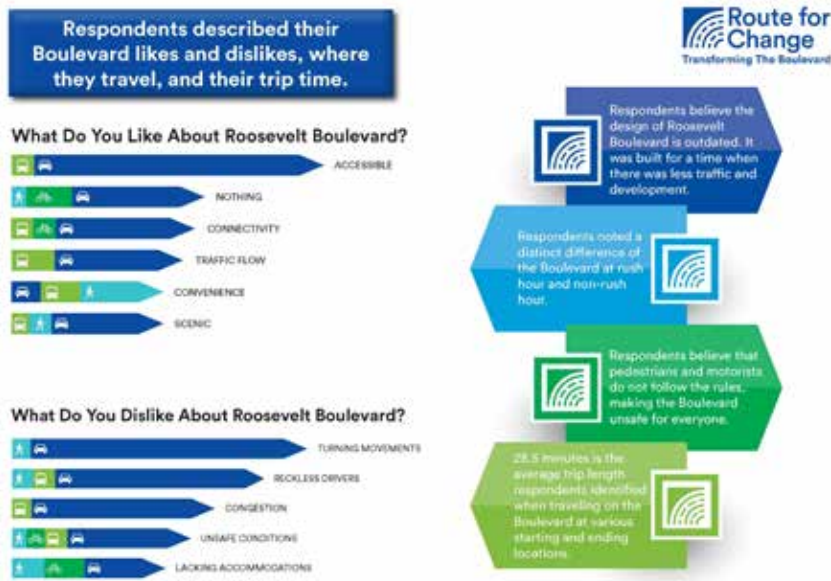
Over the past four years, the planning process for the Route for Change Program included five rounds of public forums, totaling 18 meetings, to gather input on ideas for improving Roosevelt Boulevard. These events, held at various community spaces and event halls along the Boulevard, facilitated two-way communication between the Program and people who live, work, and travel along the Boulevard.

Public Forum Round 1 (April 2016)

At Public Forum Round 1, participants were asked to share their experiences about traveling along the Boulevard. The feedback generated some strong themes, such as:

1. Participants, drivers in particular, like the Boulevard because it is a major transportation link to Center City, adjacent neighborhoods, and the region.
2. Pedestrians and cyclists have the most negative experiences among Boulevard users: 75 percent of pedestrians and cyclists reported negative experiences.
3. Participants disliked the Boulevard's design related to left turn queuing, signal timing for people turning from the Boulevard, and the abrupt crossovers between inner (express) and outer (local) lanes.

Figure 1-7. Public Forum Round 1



4. People who walk and ride a bike felt most vulnerable because of speeding drivers, reckless drivers, and traffic signal timing.
5. The most common accessibility issues included:
 - A need for improved pedestrian/bike facilities,
 - Difficulty making left turns from side streets,
 - A need for improved transit services, and
 - A need to reach more destinations
6. Reliability issues included:
 - Inconsistent transit experiences and length of trips,
 - Traffic congestion, and
 - Inconsistent travel times.

The subsequent four other rounds of Public Forums provided public input and ideas related to the 2025 recommendations and 2040 alternatives.

Figure 1-8. Public Forum Round 4



Public Forum Round 2 (October 2016)

During Public Forum Round 2, participants identified their preferred potential solutions to challenges identified during the first public forum. Participants made suggestions to improve the conditions for people walking, riding a bike, taking transit, or making left turns. Participants also provided ideas for specific intersections, such as Oxford Circle and Cottman Avenue, and roadway segments like Welsh Road to Grant Avenue and 9th Street to 5th Street. These tools for change provided the Program a broad range of ideas for 2025 improvements and two 2040 alternatives.

Public Forum Round 3 (February 2018) and Public Forum Round 4 (November 2018)

Public Forum Round 3 and Round 4 served to:

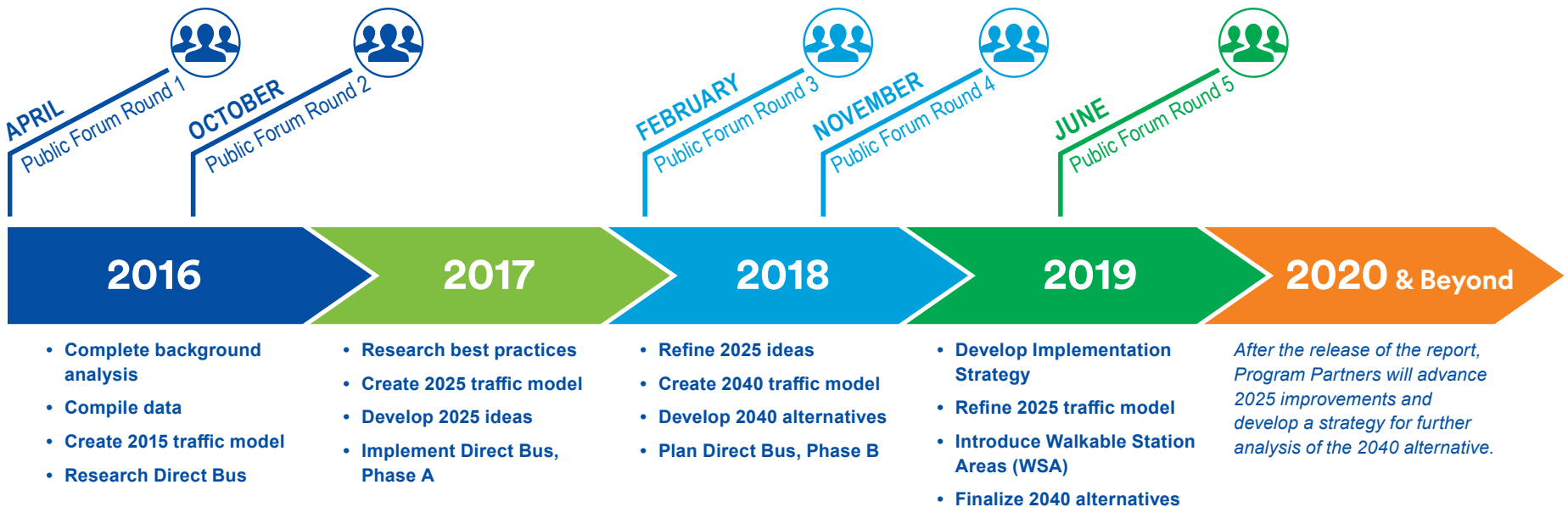
- Introduce participants to the City of Philadelphia’s Vision Zero Initiative, the traffic safety conditions, and crash history that placed the Boulevard in the City’s High Injury Network.
- Share the broad range of improvements recommended for early implementation based on the input from Round 2 feedback and the proposed improvements for safety, accessibility, and reliability.

- Gather feedback about the recently implemented Direct Bus, Phase A, the proposed Direct Bus, Phase B service, and ideas for the station at N. Broad Street.
- Define a vision for 2040 that captures the values of the surrounding communities.
- Present and obtain feedback on two different alternatives for achieving the 2040 Vision.

Public Forum Round 5 (June 2019)

Public Forum Round 5 gave people the opportunity to learn more and provide feedback on the:

- Two 2040 Alternatives
- Concept of Walkable Station Areas (WSAs)
- Concept for 2025 landscape improvements
- Camera Automated Speed Enforcement (CASE) Program along Roosevelt Boulevard



EXIT

Phase B (Comments)

Research Funded Project -
Data Project

Public Health Research -
Data Project

Public Health Research -
Data Project

Public Health Research -
Data Project

VISION ZERO PHILADELPHIA SAFER STR



CHAPTER

2

About Roosevelt Boulevard

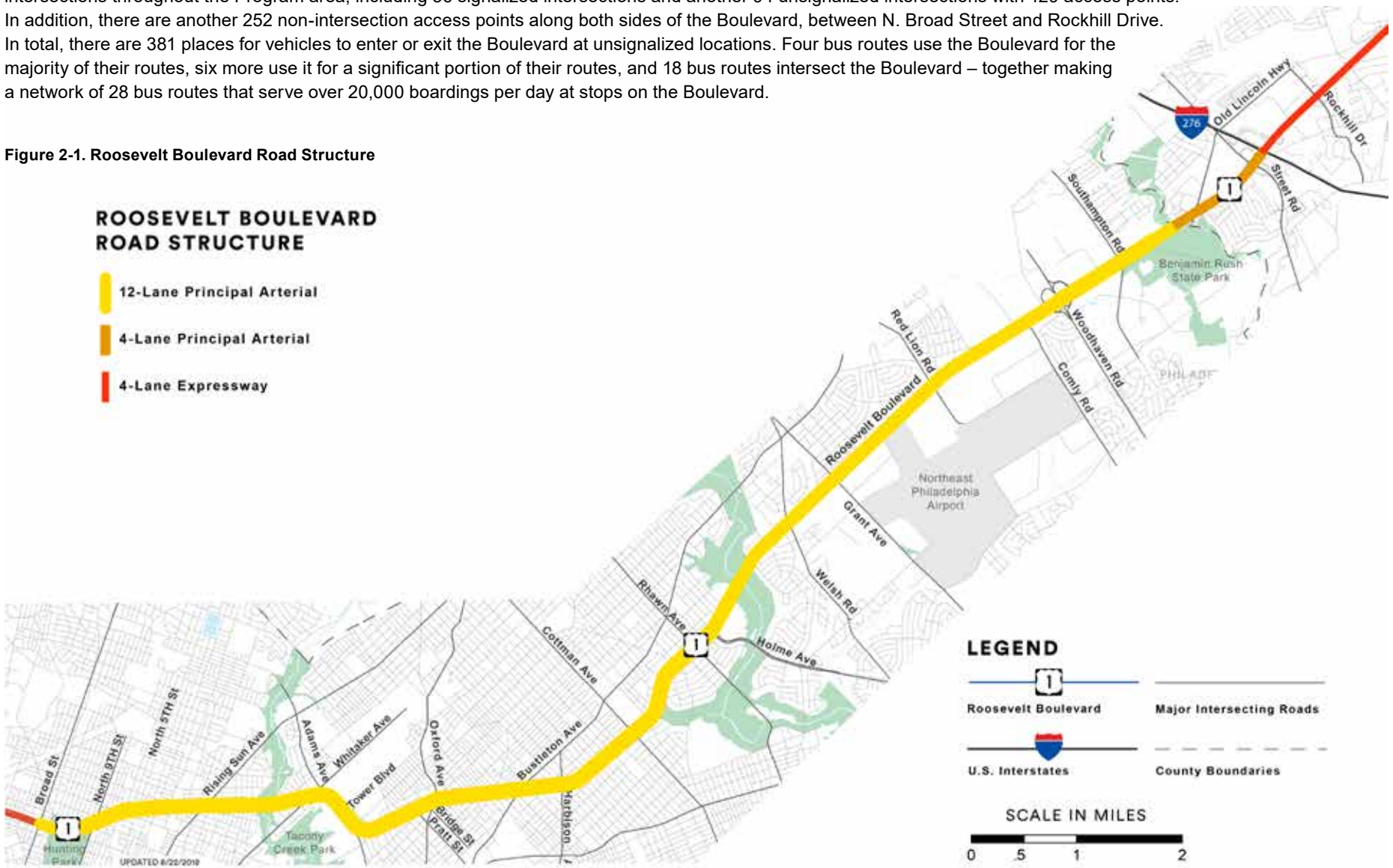
This chapter provides an overview of the:

- Boulevard Design Characteristics
- Traveling along the Boulevard
- Program Segments

Introduction

The Route for Change Program area spans 12.3 miles of Roosevelt Boulevard in the City of Philadelphia, from N. Broad Street to the Philadelphia County line shared with Bucks County, and an additional 1.7 miles of U.S. 1 in Bucks County to the Neshaminy Mall at Rockhill Road. There are a variety of intersections throughout the Program area, including 56 signalized intersections and another 94 unsignalized intersections with 129 access points. In addition, there are another 252 non-intersection access points along both sides of the Boulevard, between N. Broad Street and Rockhill Drive. In total, there are 381 places for vehicles to enter or exit the Boulevard at unsignalized locations. Four bus routes use the Boulevard for the majority of their routes, six more use it for a significant portion of their routes, and 18 bus routes intersect the Boulevard – together making a network of 28 bus routes that serve over 20,000 boardings per day at stops on the Boulevard.

Figure 2-1. Roosevelt Boulevard Road Structure



Design Characteristics

The design of Roosevelt Boulevard alternates between an expressway and principal arterial roadway cross-section throughout the Program area. In the southern end, Roosevelt Boulevard from N. Broad Street and Old York Road consists of four general vehicle lanes (two eastbound and two westbound). It also consists of a westbound lane dedicated for buses and vehicles turning right at Bristol Street. There is a similar lane in the eastbound direction between N. Broad Street and Bristol Street. The short segment between Bristol Street and Old York Lane includes a lane for parking and a lane for vehicles turning left onto Old York Road. The speed limit is 30 MPH.

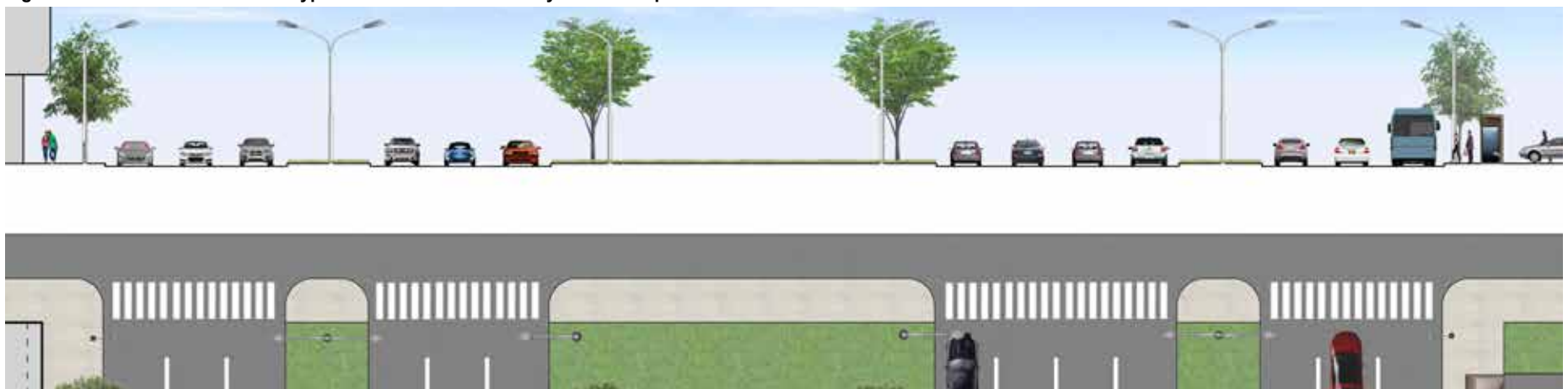
Near Old York Road, Roosevelt Boulevard then transitions to a 12-lane roadway with four sets of three lanes of single-directional traffic, with the inner six lanes functioning as express lanes and the outer six lanes functioning as local lanes (three lanes northbound and three lanes southbound). This typical section extends nearly 12 miles from approximately Old York Road to approximately 2,000 feet north of Southampton Road. Through this section, the right-of-way width is approximately 300 feet with a grassy median width that varies between 12 to 82 feet, depending on the design of left-turn lanes. Right turns to side streets are made from the outer-most lane in each direction and left-turns from Roosevelt Boulevard to the side streets are made from the inner lanes. In the northbound direction, the posted speed limit is 40 MPH from north of N. Broad Street to Ryan Avenue and 45 MPH north of Ryan Avenue. In the southbound direction, the posted speed limit is 40 MPH from north of N. Broad Street to Faunce Street, and 45 MPH north of

Faunce Street. Throughout this 12-mile section of the Boulevard, there are five grade-separated local road intersections: 5th Street goes under the Boulevard's inner (express) lanes, while Oxford Circle, Cottman Avenue, Holme Avenue/Solly Avenue, and Woodhaven Road each go over the depressed inner (express) lanes.

In the northern section of the Program area, Roosevelt Boulevard transitions to six lanes at a point just north of Southampton Road. Here it becomes known as U.S. 1, also known as Old Lincoln Highway. The inner (express) and outer (local) lanes that characterize the majority of the Boulevard merge together as the road transitions into Bucks County, which allows access to local businesses and turning movements within the local roadway network at both signalized and unsignalized intersections. This typical section ends at I-276 and has a posted speed limit of 50 MPH. From I-276 to Rockhill Drive, at the Neshaminy Mall, U.S. 1 again transitions to a four-lane expressway with access to the local street network provided at designated interchanges. The speed limit in this section is 55 MPH. Starting at Old Lincoln Highway, the cross-section of U.S. 1 is under construction as part of PennDOT's U.S. 1 Improvement Project, which is replacing aging bridges and making highway safety enhancements for approximately four-mile of U.S. 1, extending past the Route for Change Program area.

Roadway user behavior is impacted by these varied design characteristics. These shifting cross-sections and designs create driver confusion, increase the number of conflict points between people driving, walking, and biking, and encourages high-speed travel.

Figure 2-2. Roosevelt Boulevard Typical Section within the City of Philadelphia



Source: www.streetmix.net

Unique Geometric Characteristics

Several unique geometric characteristics means the Boulevard acts as a boundary or barrier between neighborhoods on either side:

- Changing center and side median widths;
- Diagonal streets, creating long skewed intersections with the Boulevard;
- Crossovers between inner (express) and outer (local) lanes;
- Prominent roadway curves between Whitaker Avenue and Godfrey Avenue, creating the “S-Curve”; and
- Grade-separated intersections.

Medians

The Boulevard’s distinct layout effectively creates four intersections with each side street, a feature that significantly complicates operations for all users. The layout also creates long crossing distances for people walking and long wait times before crossing is permitted. At some intersections, people need four traffic signal cycles to cross the Boulevard, which could take up to six minutes.

Skewed Intersections

Most sections of the Boulevard are oriented diagonally across the grid street pattern. As a result, many intersections are skewed rather than perpendicular. Skewed intersections create a number of problems, such as:

- Longer distances and more times for people to cross the Boulevard;
- Reduced visibility of people as they cross the street; and
- Bus and truck drivers have difficulty turning.

The **Large Street** intersection on the Boulevard has the longest crossing distance.

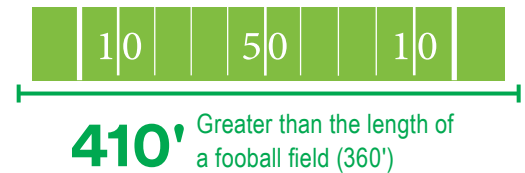


Figure 2-3. Example of a Skewed Intersection



Crossovers

While side streets can generally access inner (express) and outer (local) lanes in at least one direction, drivers along the Boulevard can also transition between inner (express) and outer (local) lanes within the Program area at one of the 54 crossover locations. However, the design of crossovers is inconsistent. Additionally, there are irregular distances between crossovers and they have varying storage capacity. Lanes adjacent to crossovers have frequent delays and conflict points as drivers slow to enter the crossover. In addition, drivers often need to stop or queue in the crossover while waiting for gaps in traffic in order to enter the lane. In some locations, signs for crossovers are missing or illegible, resulting in driver confusion and unexpected moves.

As shown in Table 2-1, there are a total of 54 crossovers along the Boulevard, 25 in the northbound direction and 29 in the southbound direction.

54 CROSSOVERS
25 Northbound | 29 Southbound

Figure 2-4. The S-Curve, between Whitaker Avenue and Godfrey Avenue



Table 2-1. Crossovers by Direction, between N. Broad Street and the Philadelphia County line shared with Bucks County:

| | Outer (local) Lanes to Inner (express) Lanes | Inner (express) Lanes to Outer (local) Lanes | Total Lanes |
|--------------|--|--|-------------|
| Northbound | 12 | 13 | 25 |
| Southbound | 14 | 15 | 29 |
| TOTAL | 26 | 28 | 54 |

S-Curve

As the Boulevard travels past Tacony Creek Park and around historic Friends Hospital, between Whitaker Avenue and Godfrey Avenue, the Boulevard has a distinctive S-Curve, which creates an area of closely spaced signalized intersections with very pronounced skews. The sharp set of curves in this area are paired with a high number of trees and poles, and other fixed objects, such as traffic signals, streetlights, electric poles, signs, and transformer boxes. The high number of drivers speeding, losing control, and hitting fixed objects causes a disproportionate number of crashes, resulting in the S-Curve having one of the highest crash rates along the entire Boulevard.

Grade-Separated Intersections

The Boulevard has five grade-separated intersections: 5th Street, Oxford Circle, Cottman Avenue, Holme Avenue/Solly Avenue, and Woodhaven Road.

- At all of these locations, except 5th Street, the inner (express) lanes go underneath the side street, allowing the Boulevard express lanes to travel in a more free-flow condition.
- At all locations except for Woodhaven Road, the side street and outer lanes of the Boulevard are “at-grade,” where they remain at the natural level of the ground. This unique configuration offers some advantages for intersections with high through volumes of drivers using the inner (express) lanes and high number of people crossing the Boulevard.
- At Woodhaven Road, the inner (express) and outer (local) lanes of the Boulevard are at-grade, with the outer (local) lanes providing access to the elevated Woodhaven Road.

Figure 2-5. Five Grade-Separated Intersections



Traveling along the Boulevard

Driving is the dominant mode of transportation along the Boulevard. At its most extreme, Roosevelt Boulevard's busiest segment - between N. Broad Street and Rising Sun Avenue - carries roughly 90,000 vehicles per day. More typically, existing annual average daily traffic (AADT) volumes along Roosevelt Boulevard range from 39,000 to 89,000 vehicles per day. Within this range, the AADT volumes are significantly higher south of Cottman Avenue compared to volumes north of Cottman Avenue. While participants at the Public Forum Round 1 (April 2016) meetings identified drivers as more likely than other users to feel comfortable using the Boulevard, more than half of the drivers attending the meeting still reported negative feelings about their travel experiences.

To help understand trip characteristics, the Program collected aerial traffic volume data to help document existing traffic patterns. Helicopters surveyed traffic on Tuesday, October 20, 2015. The morning and evening survey periods were 7:30 a.m. to 9:00 a.m. and 4:30 p.m. to 6:00 p.m.

While the perception is that many drivers travel the full length of the Boulevard, the average vehicle trip on the Boulevard is only 2.4 miles. In fact, only four percent of

trips travel the full length of the Program area between N. Broad Street in Philadelphia and Rockhill Drive at the Neshaminy Mall in Bensalem (Bucks County). Eighty-five percent of all trips are less than five miles, indicating that the Boulevard serves local trips in addition to commuters in the peak morning and evening periods.

As shown in Table 2-2, on average, people driving the full length of the corridor require 37 to 43 minutes in the AM peak period and 37 to 39 minutes in the PM peak period. These times represent travel conditions when there are no significant delays due to crashes or incident management.

Table 2-2. Full Length Travel Time, Peak Hour

| | 2015 Existing AM (minutes) | 2015 Existing PM (minutes) |
|--------------------|----------------------------|----------------------------|
| Inner Lanes | | |
| Northbound | 37.1 | 37.1 |
| Southbound | 41.0 | 37.8 |
| Outer Lanes | | |
| Northbound | 38.0 | 38.7 |
| Southbound | 42.6 | 38.4 |

Table 2-3. 2017 Daily Traffic Volumes Along the Boulevard

| NUMBER | SEGMENT START | SEGMENT END | DAILY TRAFFIC VOLUMES* | DISTANCE (Miles) |
|--------|--------------------------------|--------------------------------|------------------------|------------------|
| 1 | N. Broad Street | Rising Sun Avenue | 89,000 | 1.6 |
| 2 | Rising Sun Avenue | Whitaker Avenue | 68,000 | 1.0 |
| 3 | Whitaker Avenue | Oxford Circle | 77,000 | 1.2 |
| 4 | Oxford Circle | Bustleton Avenue | 74,000 | 0.8 |
| 5 | Bustleton Avenue | Harbison Avenue | 60,000 | 0.4 |
| 6 | Harbison Avenue | Cottman Avenue | 68,000 | 0.8 |
| 7 | Cottman Avenue | Rhawn Street | 67,000 | 1.0 |
| 8 | Rhawn Street | Holme Avenue/Solly Avenue | 64,000 | 0.2 |
| 9 | Holme Avenue/Solly Avenue | Welsh Road | 61,000 | 1.2 |
| 10 | Welsh Road | Grant Avenue | 53,000 | 0.6 |
| 11 | Grant Avenue | Red Lion Road | 52,000 | 1.2 |
| 12 | Red Lion Road | Woodhaven Road | 39,000 | 1.3 |
| 13 | Woodhaven Road | Philadelphia/Bucks County Line | 55,000 | 1.2 |
| 14 | Philadelphia/Bucks County Line | Interstate-276 | 53,000 | 1.0 |
| 15 | Interstate-276 | Rockhill Drive | 84,000 | 0.7 |

* Source: PennDOT 2017 Average Annual Daily Traffic (AADT) volumes. AADT is the typical daily traffic on a road segment for all the days in a week, over a one-year period.

Congestion at signalized intersections of major side streets is a problem along Roosevelt Boulevard as drivers experience substantial delay. Traffic volume and associated signal phasing at these intersections cause drivers to back up through intersections and makes left turning to and from the Boulevard a challenge. Feedback from participants at Public Forum Round 1 (April 2016) identified two types of left turn movements that are of particular frustration:

- **Left Turns from the Boulevard:** There is limited amount of room for cars to queue for drivers turning left off the Boulevard from the inner (express) lanes to store in the center median.
- **Left Turns from the Side Streets:** There is a limited amount of room for cars to queue on the side street within the Boulevard intersection for drivers turning left onto the Boulevard.

At some intersections, the left-turn signal phase is not long enough for drivers to clear the queue during the peak hours; vehicles on side streets back up across the Boulevard creating an undesirable condition. In many locations, drivers change lanes while crossing the Boulevard to avoid a left-turning vehicle blocking their path. In addition, the majority of the traffic signals are pre-timed and provide a standard cycle of green time for each direction of travel, no matter if it is needed.

Crashes also create congestion, which is unpredictable and increases driver travel time. In fact on average, one reportable crash occurs every day on the Roosevelt Boulevard.¹

Figure 2-6. A side-street backup caused by vehicles waiting to turn left onto the Boulevard from Grant Avenue.



1 From 2013 to 2017, 2,846 reportable crashes occurred.

Pedestrian Facilities

Volume

Despite driving being the dominant travel mode, there is significant pedestrian activity along the entire Boulevard, as people both want and need to walk to nearby destinations and bus stops. Based on 2014 and 2015 data provided by DVRPC, the 20 intersections with the highest number of people crossing the Boulevard and side streets daily are listed in Table 2-4. These locations see between 500 and over 3,000 people crossing per day.

Table 2-4. Twenty Highest Daily Pedestrian Volume Intersections

| | | Pedestrian - Daily Average | | |
|----|------------------------------------|----------------------------|------------------------|-------------------------|
| | | Across the Boulevard | Across the Side Street | Total Pedestrian Counts |
| 1 | Cottman Avenue | 1,509 | 1,777 | 3,286 |
| 2 | 5th Street | 987 | 979 | 1,966 |
| 3 | Welsh Road | 1,059 | 409 | 1,468 |
| 4 | Rhawn Street | 625 | 791 | 1,416 |
| 5 | Oxford Circle | 852 | 375 | 1,227 |
| 6 | Langdon Street | 664 | 466 | 1,130 |
| 7 | Pratt Street | 490 | 601 | 1,091 |
| 8 | C Street | 564 | 413 | 977 |
| 9 | Rising Sun Avenue | 451 | 385 | 836 |
| 10 | Harbison Avenue | 404 | 378 | 782 |
| 11 | F Street | 391 | 380 | 771 |
| 12 | Grant Avenue | 461 | 279 | 740 |
| 13 | Front Street | 408 | 262 | 670 |
| 14 | 9th Street | 230 | 411 | 641 |
| 15 | Red Lion Road | 396 | 233 | 629 |
| 16 | Devereaux Street | 295 | 324 | 619 |
| 17 | Garland Street/ Whitaker Avenue | 431 | 117 | 548 |
| 18 | Unruh Avenue | 291 | 222 | 513 |
| 19 | Longshore Avenue | 169 | 318 | 487 |
| 20 | Levick Street | 209 | 271 | 480 |

Mid-Block Signalized Pedestrian Crossings

There are ten mid-block signalized pedestrian crossings on the Boulevard, as listed in Table 2-5. Traffic signals at these locations are set to provide a green phase for people to cross the Boulevard, even when people are not present.

Table 2-5. Mid-Block Signalized Pedestrian Crossings

| | Mid-block Signalized Pedestrian Crossings |
|----|---|
| 1 | 2nd Street/Banks Way |
| 2 | Bingham Street |
| 3 | Sanger Street (over outer (local) lanes only) |
| 4 | Unruh Avenue |
| 5 | Longshore Avenue |
| 6 | Friendship Street |
| 7 | Faunce Street / Revere Street |
| 8 | Fulmer Street |
| 9 | Bowler Street |
| 10 | Tomlinson Road |

Figure 2-7. Mid-Block Pedestrian Crossing at Bingham Street



Grade-Separated Pedestrian Bridge Crossings

The Boulevard has two grade-separated pedestrian crossings: one at Sanger Street and the other at Hoffnagle Street.

- The Sanger Street pedestrian bridge is located just south of Oxford Circle. People must walk up a few stairs to cross, and the bridge is above a depressed inner (express) lanes of the Boulevard.
- Just north of the Hoffnagle Street, the pedestrian bridge crosses both the at-grade outer (local) lanes and the depressed inner (express) lanes. The bridge structure includes a set of ramps and stairs; however, the stairs are closed for repair, making the bridge only accessible via the ramp.

There is an additional grade-separated pedestrian crossing that is closed. Located just north of Southampton Road at the former Philadelphia State Hospital, the bridge connected the Hospital's campus on either side of the Boulevard. Colloquially known as Byberry, the Hospital closed in 1990.

Challenges for People Walking

People walking need to be able to safely and conveniently access the same destinations and activities along the Boulevard as drivers. However, people walking along or across the Boulevard face several challenges:

Limited Sidewalk Buffers: People walk along a sidewalk with a limited buffer between a high volume of drivers traveling at a higher speeds.

Long Distances between Signalized Intersections: There are a significant number of intersections that are spaced over 1,000 feet apart.

Numerous Driveways and Access Points: Driveways and other access points bisect sidewalks, creating more conflict points between people driving and people walking.

Figure 2-8. Grade-Separated Pedestrian Bridge Crossing at Sanger Street



Long Crossing Distances: Because of long crossing distances, people walking need more than one traffic signal cycle to cross the Boulevard. This is especially challenging for people who are seniors, disabled, or walking with children. At many intersections, people walking often do not have a comfortable amount of time to cross the Boulevard and must wait on narrow medians between lanes of moving traffic until the next signal cycle. In addition, the amount of time that the DON'T WALK warning signals flash to warn people that the WALK interval is about to end is brief. As a result, people walking have to rush to take refuge in the narrow medians.

Complex Intersections: Complex turning movements and non-perpendicular intersections, combined with heavy traffic volumes, create more opportunity for conflicts between people walking and people driving.

Minimal Pedestrian Refuge Areas: Certain segments of the Boulevard only provide minimal refuge islands for pedestrians, putting them at risk. Existing refuge islands at many locations along the Boulevard are narrow and expose people walking to higher-speed drivers.



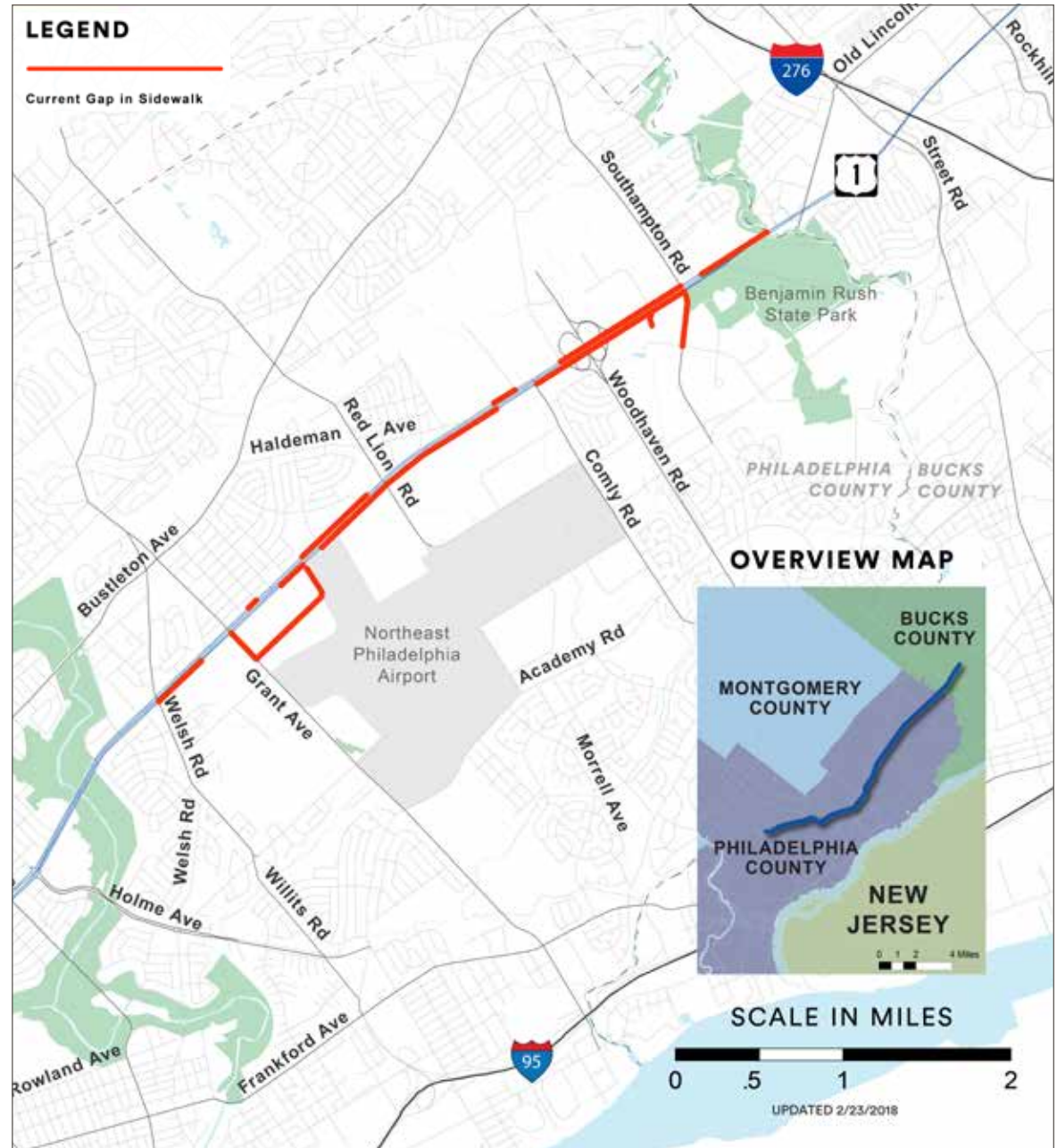
Figure 2-9. Long Crossing Distances and narrow medians at Landgon Street make crossing a challenge.



Sidewalk Gaps: In general, the sidewalk network is complete south of Welsh Street. As shown in Figure 2-10, there are extensive sidewalk gaps north of Welsh Road within the City of Philadelphia, including:

- Multiple sidewalk gaps restrict pedestrian access to key destinations between Welsh Road and Red Lion Road, such as Northeast Village Shopping Center, Whitman Square, Hayes Memorial Playground and Woods, and The Red Lion Plaza.
- On the west side of the Boulevard, there is a sidewalk gap between Plaza Drive and Bennett Road. There is a sidewalk located on the east side of the Boulevard; however, people walking cannot cross the Boulevard at Bennett Road. Therefore, people walking must plan ahead to cross or double-back on the Boulevard to Plaza Drive to continue to walk in the northbound direction.
- The west side of the Boulevard between Byberry Road and Southampton Road lacks a sidewalk, as does the east side of the Boulevard between Comly Road and Southampton Road. Consequently, there is no pedestrian facility on either side of the Boulevard between Byberry Road and Southampton Road.
- The sidewalk on the west side of the Boulevard north of Southampton does not extend to the Philadelphia County Line shared with Bucks County.
- A sidewalk exists along the west side of U.S. 1 south of Old Lincoln Highway and further north on the east side. The northern segment of U.S. 1 in the program area lacks sidewalks.

Figure 2-10. Philadelphia Current Sidewalk Gaps



Bicycle Facilities

Many of the same challenges faced by people walking along the Boulevard are also faced by people riding a bike. Because the Boulevard’s design does not provide a separation between the high-volume and higher-speed drivers and people biking, traveling across or along the Boulevard on a bike is problematic. While there are currently 14 side streets with bike facilities that connect to the Boulevard, they do not connect to each other and are spaced too far apart to create a bike network. Bike parking is also lacking at key destinations and bus stops.

Despite these deficient or non-existent facilities, people do bicycle along and across the Boulevard, which is not a surprise because the Boulevard is the front door to many jobs, services, and industries. Lack of safe, useful bicycle facilities force people to bike on sidewalks and through parking lots, putting themselves and people walking at risk.

Figure 2-11. People use the sidewalk to ride bikes along the Boulevard.



The current bicycle network in Northeast Philadelphia is sporadic and disconnected. There are major links along and adjacent to the Boulevard that serve those who bicycle, including Rising Sun Avenue, Oxford Avenue, parts of Bustleton Avenue, and several trail links, such as the Tacony Creek Trail, Pennypack Trail, and Benjamin Rush State Park trails. These links are largely painted bike lanes that are adjacent to parked cars. It is noted that the City’s first parking protected bike lane (PPBL) was built in 2016 on Ryan Avenue near the Boulevard, from Lexington Avenue to Rowland Avenue.

Based on 2014 and 2015 data provided by DVRPC, the 10 intersections with the highest number of people biking are listed in Table 2-6.

Table 2-6. Ten Highest Daily Bicycle Volume Intersections

| | | Bike - Daily Average | | |
|----|------------------------------------|----------------------|------------------------|----------------------|
| | | Across the Boulevard | Across the Side Street | Total Bicycle Counts |
| 1 | Cottman Avenue | 95 | 40 | 135 |
| 2 | Rising Sun Avenue | 51 | 39 | 90 |
| 3 | 5th Street | 61 | 18 | 79 |
| 4 | Rhawn Street | 46 | 33 | 79 |
| 5 | Langdon Street | 17 | 56 | 73 |
| 6 | 9th Street | 27 | 40 | 67 |
| 7 | Oxford Circle | 36 | 22 | 58 |
| 8 | C Street | 31 | 17 | 48 |
| 9 | Garland Street/ Whitaker Avenue | 22 | 25 | 47 |
| 10 | Pratt Street | 20 | 23 | 43 |

Transit Facilities

SEPTA operates bus service in the outer-most local lanes of Roosevelt Boulevard in each direction. The Program area's 10 transit routes have over 142 signed SEPTA bus stops. Four bus routes use the Boulevard for most of their routes, six more use it for a significant portion of their routes, and 18 additional bus routes intersect the Boulevard – together making a network of 28 bus routes, some of which are among SEPTA's most frequent. SEPTA Route 1 is the only bus route that operates along the entire length of the Boulevard. The two primary routes that serve Roosevelt Boulevard are SEPTA Route R, serving the southern portion, and SEPTA Route 14, serving the northern portion. Route R connects Frankford Transportation Center (FTC) with the Broad Street Line (BSL) subway via Roosevelt Boulevard and continuing to Wissahickon Transportation Center (WTC). The most transit-heavy portions of the Boulevard host so many overlapping bus routes that they offer a "super frequency" that surpasses even the city's Market Frankford Line (MFL) during the peak hour. As an example, a southbound bus will arrive at Cottman Avenue and Roosevelt Boulevard every two minutes in the AM peak hour.

SEPTA's report, "*Improving Transit on Roosevelt Boulevard*," indicated that despite congestion and reliability issues, the Boulevard is the highest ridership transit corridor that consists exclusively of buses, and the most frequent highest capacity transit corridor in SEPTA's network outside of Center City. This report found that transit is critical to the people-throughput of Roosevelt Boulevard. For example, at Cottman Avenue in the outer (local) lanes at the AM Peak, buses move roughly one-third of people using the Boulevard at that location (Appendix 1).

In 2017, the core bus services operating on Roosevelt Boulevard (R, 1, and 14) together accommodated over 25,000 riders on an average weekday. This was comparable to SEPTA's highest ridership Regional Rail Line, the Paoli-Thorndale Line. SEPTA Route 14 has nearly 12,000 weekday passenger boardings with frequencies as low as five minutes during AM and PM peak hours. SEPTA Route 14 also offers 24-hour service and has an on-time performance of 77 percent. The six secondary bus services that use the Boulevard for a significant portion of their routes (J, K, 8, 26, 20, and 50) had a combined ridership over 34,000 on an average weekday.

Clearly, buses are a crucial mode of transportation on the Boulevard, particularly in the southern section, where people are less likely to have their own vehicle and bus ridership is higher. However, the current configuration of the Boulevard and the amount of traffic at intersections limit the efficiency of SEPTA's bus routes. Despite the remarkable bus volumes operating along Roosevelt Boulevard, there is a perception that buses are not reliable enough for most people who need to

Figure 2-12. Example of a Local Bus Stop



travel along the Boulevard. The most common complaint heard during Public Forum Round 1 (April 2016) was lack of consistency in people's experiences riding the bus, where travel times for local buses can be up to 50 percent longer than traveling in a car due to congestion and incidents of crashes delaying buses.

Another major challenge related to riding a bus along the Boulevard is that it is nearly invisible along the corridor. While there are over 140 signed SEPTA bus stops along Roosevelt Boulevard, only 22 stops have bus shelters. Bus stops along the Boulevard also lack other desired stop amenities, such as bicycle parking, seating, lighting, route maps, and real time information; the vast majority of SEPTA bus stops are designated only by bus route signs, and many stops have limited visibility as parked and moving vehicles and trees obstruct the view of approaching buses. In some cases, bus riders occasionally stand or lean into the road, which put them at risk of getting hit by a driver of a car.

The placement of bus stops is complicated by the Boulevard's layout and significant number of curb cuts, resulting in bus riders waiting in curb cuts or driveways. The visibility of buses on the Boulevard took a major leap when the city constructed new, high-quality bus stations at the Direct Bus stops within the city of Philadelphia, as described below.

Waiting for a bus adjacent to 12 lanes of moving traffic is stressful. Safety while taking a bus is a top concern for bus riders along Roosevelt Boulevard. This includes the experience while waiting for buses, how safe and visible the bus stop is to adjacent traffic, how comfortable and safe it is to walk to and from bus stops, and how easy it is to transfer between bus routes.

Boulevard Direct Bus Service

As a result of a partnership between SEPTA and the City of Philadelphia, the implementation of Boulevard Direct Bus has made a significant transit improvement along the Boulevard.¹ Boulevard Direct is the first route operating under the new SEPTA Direct Bus brand, which offers limited-stop, frequent service at upgraded stations.

Started on October 22, 2017, Boulevard Direct currently operates along 11 miles of the Boulevard and U.S. 1, between FTC in Philadelphia and the Neshaminy Mall on Rockhill Drive in Bucks County. The Boulevard Direct route enhanced the popular SEPTA Route 14, by only making nine stops instead of the over 80 stops between the same destinations. The nine Boulevard Direct stops are located at Frankford Transportation Center (FTC), Cottman Avenue, Rhawn Street, Welsh Road, Grant Avenue, Red Lion Road, Southampton Road, the Neshaminy Interplex, and the Neshaminy Mall.

To enhance the bus service, the City of Philadelphia secured over \$3.5 million in local, state, and federal dollars to construct Boulevard Direct bus stations - not bus stops - at these locations. It was very important for the service to include transit station amenities at a scale that matched the enormity of the Boulevard. Bus

stations feature new plazas and curbs, ADA ramps, bus shelters that serve both Route 14 and Boulevard Direct riders, free-standing benches, pedestrian-scale lighting, landscaping, solar trash and recycling receptacles, and Direct Bus way-finding signage and other branding elements.

During weekday rush hour travel, (between 7 a.m. to 9 a.m. and 3 p.m. to 6 p.m.), Boulevard Direct buses run every 10 minutes, with service every 15 minutes during most other periods. All regular SEPTA fares are accepted on Boulevard Direct. SEPTA also provides free transfers at all designated Boulevard Direct Station stops (except FTC) for connections to and from SEPTA Route 14 service in the same direction of travel, allowing people to take a faster, limited-stop ride up the Boulevard and connect to a local bus to finish the last few blocks of their trip.

The performance of Boulevard Direct has been positive. More frequent buses, coupled with fewer stops, has reduced travel time an average of 28 percent on Boulevard Direct as compared to the Route 14. Overall, there has been a 15 percent increase in ridership at Boulevard Direct stations, which bucks regional and national trends of falling bus ridership. This provides further evidence that the most effective way of growing transit ridership is to provide fast, frequent, and reliable service.

Figure 2-13. Boulevard Direct Bus Features
(source: SEPTA)

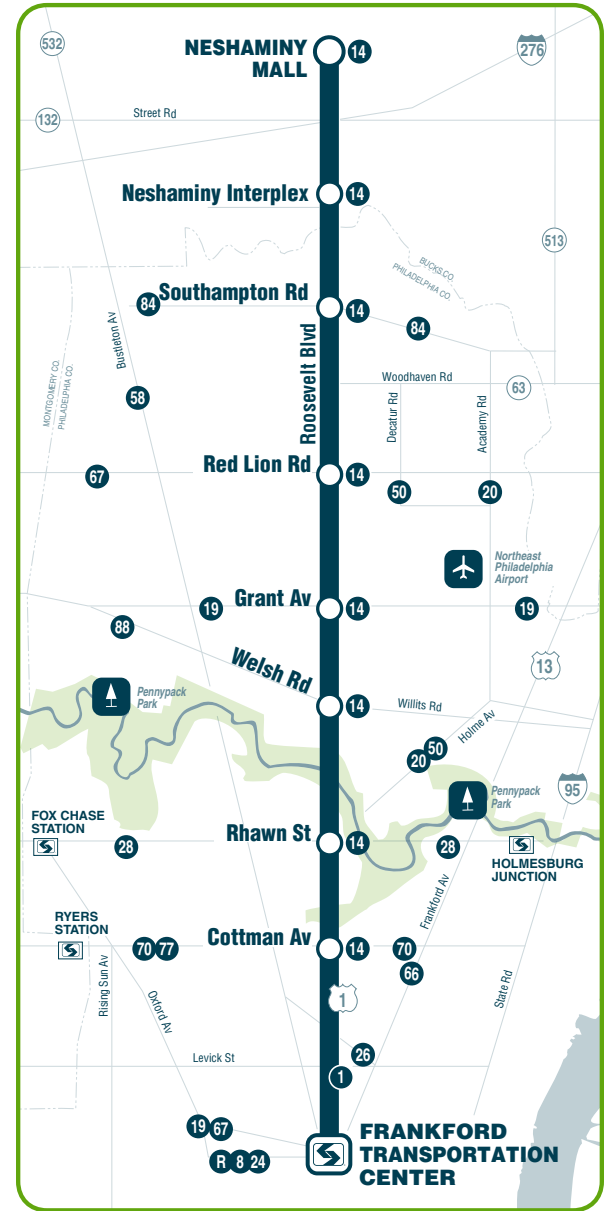


Figure 2-14. Boulevard Direct, Phase A Station and Bus



1 More information on SEPTA's Direct Bus brand can be found at www.septa.org/directbus/index.html.

Freight and Delivery Vehicles

Freight and delivery vehicles make up one to three percent of the overall traffic volume along the Boulevard. While this percentage may seem low and varies by location, freight and delivery services are a critical piece of both the corridor's and region's economic well-being. Numerous retail businesses along the Boulevard require freight service, along with a growing number of light and medium industrial and distribution sites adjacent to the Boulevard. These include two significant clusters of industrial and warehouse distribution land uses: one in the Lawncrest community, near the S-Curve, and the other in the Far Northeast, surrounding Northeast Airport. Further off the Boulevard are two additional industrial/warehouse distribution clusters immediately south of the Program area in Hunting Park. There has also been more development activity at former industrial sites and large office parks along the Boulevard that have been vacant for many years. These industrial/warehouse distribution land uses are highly dependent on safe and reliable travel for freight and delivery vehicles along the Boulevard.

On-Street Parking

Along some sections of the Boulevard, people are permitted to use the outermost (local) lane for on-street parking during off-peak hours. This occurs south of St. Vincent Street in the southbound direction and south of Tyson Avenue in the northbound direction. Despite this, it is common to see cars parking on sidewalks along the Boulevard rather than in the travel lane, especially along lower Roosevelt Boulevard. Some have reported this is a way to protect their car from being sideswiped when parked along the Boulevard, and others have said it provides more protection when getting in and out of the car. The practice results in sidewalk damage and blocks the path of people walking. At the northern end of the Boulevard, on-street parking is not permitted at any time. Parking on sidewalks is also not a common occurrence.

Figure 2-15. Freight vehicles are critical piece of the corridor.



Figure 2-16. Example of On-Street Parking

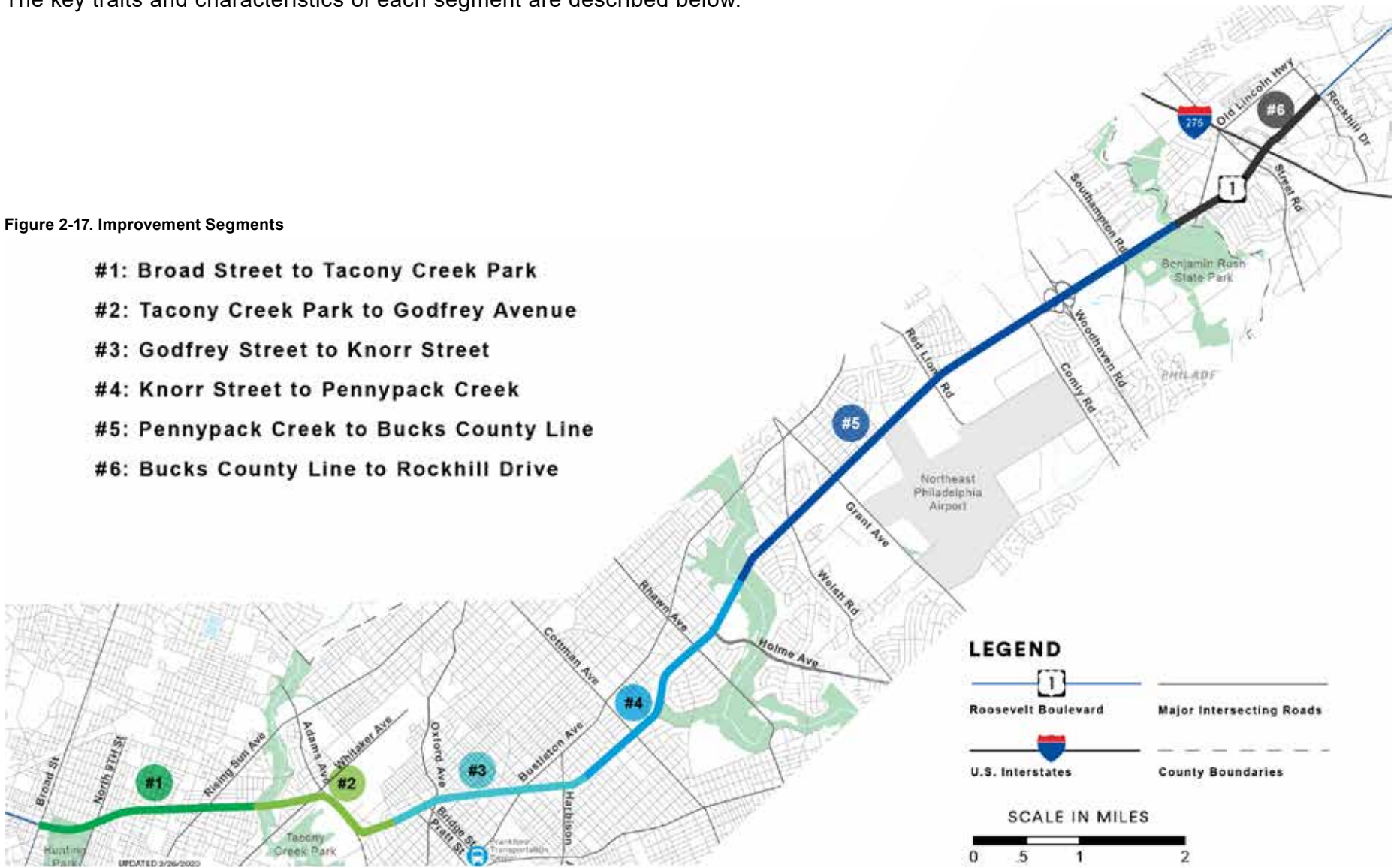


Program Segments

The Program has divided the 14-mile corridor into six segments for recommended improvements. The key traits and characteristics of each segment are described below.

Figure 2-17. Improvement Segments

- #1: Broad Street to Tacony Creek Park
- #2: Tacony Creek Park to Godfrey Avenue
- #3: Godfrey Street to Knorr Street
- #4: Knorr Street to Pennypack Creek
- #5: Pennypack Creek to Bucks County Line
- #6: Bucks County Line to Rockhill Drive



Segment 1: Broad Street to Tacony Creek Park

The Program's southernmost segment is approximately two miles in length and is where the limited-access Roosevelt Expressway ends and the four lanes divide into six inner (express) lanes and six outer (local) lanes. The vast majority of this segment is characterized by three medians:

- An 11-foot wide median that separates the three inner (express) and the three outer (local) in the northbound direction;
- An 80-foot wide grassy center median that separates the three northbound (inner) lanes from the three southbound (inner) lanes; and
- An 11-foot wide median that separates the three inner (express) and the three outer (local) in the southbound direction.

For approximately 1,375 feet, between 6th and 3rd/4th Streets, the inner (express) lanes are elevated and the outer (local) lane are at grade.

Figure 2-18. Intersection of 9th Street and Roosevelt Boulevard, with Logan Triangle in the background.



2 Please visit phila2035.org to read more about the Upper North District Plan and the North District Plan.

This segment has the highest concentration of schools either fronting the Boulevard or within a 10-minute walk of the Boulevard. The posted speed limit is 40 MPH and there are two red light camera enforcement locations in this segment, one at 9th Street and Roosevelt Boulevard and the other at March Street and Roosevelt Boulevard. There is one speed camera location near 2nd Street / Banks Way. On-street parking is prohibited during the peak periods of 7:00 a.m. to 9:00 a.m. in the southbound direction and 4:00 p.m. to 6:00 p.m. in the northbound direction.

In this segment, approximately 110,000 people reside within one mile of the Boulevard, and the region's Indicators of Potential Disadvantage (IPD) analysis identified very high concentrations of youth, racial minority, and low-income residents compared with Segments 3 to Segment 6 of the Boulevard and the nine-county Pennsylvania/New Jersey (PA/NJ) region as a whole. Segment 1 is within three city council districts (the 7th, 8th, and 9th), and it is also the boundary between the Philadelphia Planning Commission's Upper North Planning District and the North Planning District?

Other key landmarks in Segment 1 include:

- Hunting Park, an 87-acre park space, which is one of the largest public parks in the City's park system. While the Boulevard bisects the park, most of the park is on the east side of the Boulevard.

- Fronting southbound Roosevelt Boulevard between 11th and 7th Streets is Logan Triangle, which is a 48-acre group of vacant parcels that lie on top of what was once a ravine for the Wingohocking Creek. The site has been vacant since a gas line explosion in 1986 revealed the severity of the land's instability and homes were demolished. There have been several redevelopment plans over the past 30 years, and the Philadelphia Redevelopment Authority is working on development ideas.
- N. 5th Street is the only street in the Program that crosses under the Boulevard's elevated inner (express) lanes. N. 5th Street has a diverse commercial corridor and knits together several neighborhoods on each side of the Boulevard.
- Banks Way is a signalized pedestrian crosswalk that crosses the Boulevard at 2nd Street. It is named after Samara Banks and her three sons who were killed in July 2013 after being struck by a speeding driver.
- Tacony Creek Park forms the northern edge of this segment. The Park is a riparian buffer and features miles of recreational trails for walking, biking, fishing, and birding. It is home to one of the few urban meadows in Philadelphia.

Like several other segments, Segment 1 of the Boulevard contains many crossovers, which are challenging for drivers, especially those unfamiliar with this type of infrastructure. Segment 1 also poses a challenge for people walking due to several skewed side streets. First, the 9th Street intersection is 375 feet long and the second-longest Boulevard pedestrian crosswalk. The Rising Sun Avenue crosswalk is 360 feet long, which is a main connection between residences and schools on both sides of the Boulevard, resulting in high pedestrian traffic. In this segment, SEPTA bus routes R and 1 run along the Boulevard and there are 29 local bus stops. In addition, the SEPTA routes J and 8 operate north of C Street.

This segment has blocks of residential rowhouses, interspersed with small commercial businesses, that front the Boulevard. Many of these properties do not have off-street parking; therefore, off-peak on-street parking is permitted in the outermost lanes of the Boulevard.

Segment 2: Tacony Creek Park to Godfrey Avenue

The Program's Segment 2 has some of the most complicated geometric design of the Boulevard, all at-grade. The segment begins while crossing the Tacony Creek Park, and then runs along several blocks of residential neighborhoods. The entire 1.3 miles of the segment is characterized by a wide grassy center median separating the inner (express) lanes in each direction, with two smaller grass medians separating the inner (express) and outer (local) lanes running in the same direction. In this segment, left turning lanes cut through many parts of the center median, which are dotted with many mature trees. While there is expansive amount of greenspace to the east, vehicles overwhelm the landscape. This is one of the most challenging segments for people trying to cross the Boulevard because of the amount of time it takes to walk between distant and very wide signalized intersections. Where there is a crossing, it does not follow the path desired by pedestrians.

The most prominent feature in this segment is called the S-Curve, which is between Whitaker Avenue and Godfrey Avenue, and has one of the highest clusters of traffic crashes. Also, Segment 2 is congested consistently during peak periods, which is during the AM for the southbound direction and in the PM for the northbound direction. The posted speed limit is 40 MPH. There are no red light cameras in this segment; however, there is one speed camera near F Street.

Approximately 50,000 people reside within one mile of the Boulevard in Segment

Figure 2-19. Southbound Roosevelt Boulevard Near Wyoming Avenue



2. According to the IPD analysis, this section has the highest concentration of people who are foreign born and have limited English proficiency, with 80 percent of Segment 2 census tracts scoring above or well-above average compared with the nine-county PA/NJ region. Eight percent of census tracts in Segment 2 also have above-average proportions of low-income residents, the highest of any segment. This segment of the Boulevard is within two city council districts (7th and 9th), and it is entirely contained in the Lower Northeast Planning District.³

In addition to the S-Curve, key landmarks in Segment 2 include:

- The Northeast Tower Center fronts most of the S-curve in the southbound direction. Currently a large shopping center with national chain stores and restaurants, it is the site of the frequently reminisced about Sears, Roebuck & Co complex, built in 1920. Sears also constructed a subway station in preparation for an expansion of the SEPTA Broad Street subway, which never came to fruition. With the closure of Sears, the buildings were imploded in 1994, except for the iconic Sears power plant stack, which is still a prominent Northeast Philadelphia landmark, now imprinted with the Home Depot logo.

- Surrounding the Northeast Tower Center are several industrial properties, including Cardone Industries, Thalheimer Brothers, and the Naval Support Activity facility.
- Friends Hospital fronts most of the S-Curve in the northbound direction. The psychiatric institution is the first private non-profit institution in the country,⁴ founded in 1813 by the Quakers. It was included in the National Register of Historic Places by the National Park Service in 1999. Forty-nine of the institution's 100-acre property are in a permanent conservation easement.⁵ Behind Friends Hospital, accessible via Adams Avenue (east) are the Oakland Cemetery and Juanita Golf Course.
- Houseman Playground, a City-owned recreation site, is just west of southbound Boulevard.

There are 15 local bus stops in this segment, served by SEPTA Routes R, 1, 8, J and K. On-street parking is prohibited during the peak periods of 7:00 a.m. to 9:00 a.m. in the southbound direction and 4:00 p.m. to 6:00 p.m. in the northbound direction.

Figure 2-20. S-Curve



3 Please visit phila2035.org to read more about the Lower Northeast District Plan

4 <https://friendshospital.com/>, accessed 1/29/20

5 <https://www.inquirer.com/philly/health/science/friends-hospital-50-acres-preserved-20180906.html> accessed 1/31/20

Segment 3: Godfrey Avenue to Knorr Street

Segment 3, which is 1.8 miles long, is where the Boulevard starts to straighten out after the S-Curve and contains a mix of residential and commercial properties fronting the Boulevard. A wide grassy center median separates the inner (express) lanes in each direction, with two smaller grass medians separating the inner (express) and outer (local) lanes running in the same direction.

At the southernmost edge of Segment 3 are two main arterials, Bridge Street and Pratt Street, which are the paired roads that SEPTA buses use to connect the lower half of Roosevelt Boulevard with Frankford Transportation Center. There is a small section in Segment 3 where the express lanes are depressed under a large multi-lane traffic circle called Oxford Circle. Oxford Circle has nine access points and a significant number of conflict points between people driving, walking, and riding a bike. The Sanger Street pedestrian bridge is located just south of Oxford Circle, where people must walk up a few stairs to use the bridge above the inner

(express) lanes of the Boulevard. Oxford Circle's proximity to schools and services brings many vulnerable travelers to the area, particularly children and seniors. In addition to Oxford Circle, Segment 3's key landmarks include several places of worship that front the Boulevard, along with a stretch of mid-size businesses, retail establishments, restaurants, and apartments. The Max Myers Recreation complex, a City-owned 12-acre facility with a recreational center, is located a few short blocks west of the Boulevard.

This segment also includes the Boulevard's intersection with Large Street, which is the longest intersection crossing measuring at 410 feet long. Just past Large Street is the complex cluster of intersections, including the major arterials of Bustleton Avenue, Levick Street, and Harbison Avenue. These corridors also have many mid-size businesses, retail establishments, and apartments with multiple access points. Levick Street is the main corridor drivers use to access the Tacony-Palmyra Bridge, which connects Northeast Philadelphia to Burlington County, New Jersey. Bustleton Avenue and Harbison Avenue are major corridors connecting neighborhoods on both the east and west sides of the Boulevard. Bustleton Avenue is also the street SEPTA uses for buses, including the new Boulevard Direct, to connect the

Figure 2-21. Segment 3 between Sanger Street and Bridge Street



Figure 2-22. Segment 3 at Oxford Circle



Frankford Transportation Center with the upper Roosevelt Boulevard.

Approximately 90,000 people reside within one mile of the Boulevard in this segment. According to the IPD analysis, Segment 3 has lower concentrations of key indicators of potential disadvantage than Segment 1 and 2; however, Segment 3 still scores higher in all 8 IPD measures than the nine-county PA/NJ region as a whole. This segment of the Boulevard is within three city council districts, (6th, 7th, 9th), and is within three Philadelphia City Planning Commission Districts: Central Northeast, North Delaware, and Lower Northeast Planning Districts⁶ There are 25 local bus stops in this segment, served by SEPTA Routes R, 1, and 8.

In Segment 3, the pattern of many driveways and access points to the Boulevard begins. On-street parking on the outermost lanes is restricted between 7:00 a.m. and 9:00 a.m. in the southbound direction and 4:00 p.m. to 6:00 p.m. in the northbound direction. The posted speed limit in this segment is 40 MPH and there is one red light camera on Roosevelt Boulevard at Levick Street in this segment. There are two speed camera locations, one near Deveraux Avenue and the other near Harbison Avenue.

⁶ Please visit phila2035.org to read more about the Lower Northeast District Plan, Central Northeast District Plan, and North Delaware District Plan

Segment 4: Knorr Street to Pennypack Creek

Segment 4 travels for 2.2 miles in a northeast direction, where it makes a slight curve to go north past a small segment of the Pennypack Park at Sandyford Avenue, and then turns back to a northeast direction at Napfle Street/Hartle Avenue. This segment is where the cross-section of the Boulevard changes multiple times. The southernmost portion is the last location with an 80-foot-wide grassy center median separating the inner (express) lanes going northbound and southbound and with the two smaller grass medians separating the inner (express) and outer (local) lanes in the same direction. Then, the outer (local) lanes split and the inner (express) lanes are depressed for approximately 1,000 feet around Cottman Avenue. Just before a small portion of the Pennypack Park, all 12 lanes (inner and outer) are back at-grade, but this time, the center median has been narrowed to 60 feet and the two outer medians grow to about 18 feet. The inner (express) and outer (local) lanes of the Boulevard split again at Rhawn Street, where the inner (express) lanes are depressed. The Boulevard returns to at-grade at Strahle Street, where the outer (local) and inner (express) lanes begin to traverse over the wide Pennypack Park.

This segment is also where posted speed limits for the Boulevard change. In the northbound direction, the posted speed limit is 40 MPH until Ryan Avenue, where it increases to 45 MPH. In the southbound direction, the posted speed limit changes from 45 MPH to 40 MPH at the intersection of Faunce Street. There are two red light camera locations in this segment, one at Cottman Avenue and Roosevelt Boulevard and the other at Rhawn Street and Roosevelt Boulevard. Additionally, there is one speed camera location near Strahle Street.

There are several key landmarks in Segment 4, including:

- Mayfair Recreation Center, a City-owned recreational site that includes a center and ballfields, is located only a few blocks east of the northbound lanes of the Boulevard at St. Vincent Street.
- Along Cottman Avenue, west of Roosevelt Boulevard, is a regional shopping area with a pedestrian-oriented shopping environment that includes stores, restaurants, offices, and large surface parking lots. The area also includes the Northeast Regional Library and the District Health Center 10, which from an unofficial “town center” of Northeast Philadelphia.
- A very small segment of Pennypack Park is located next to the northbound lanes of Roosevelt Boulevard.
- Two additional recreation sites are a few blocks west of the Boulevard: Bradford Park and Pelbano Playground, which provide a variety of recreational services to the community.

- Nazareth Hospital, part of the Trinity Health Mid-Atlantic, is a major landmark and employer along Roosevelt Boulevard. This medical center is located east of the Boulevard, just off Holme Avenue. In 2015, PennDOT transformed this intersection from a large traffic circle, called Pennypack Circle, by reconstructing a six-lane bridge connecting Holme Avenue to Solly Avenue over the six inner (express) lanes of the Boulevard.
- The northern edge of the segment is formed by Pennypack Park. Part of the City's Fairmount Park system, it has over 1,300 acres of open space and over 60 miles of trails.

Approximately 95,000 people reside within one mile of the Boulevard in Segment 4, and this segment has a high concentration of low-income census tracts, with 76 percent of tracts in the segment having above or well-above average numbers of low-income residents. This segment also has the second-highest concentration of census tracts with above or well-above average populations of ethnic minority, foreign born, and limited English proficiency people, after Segment 2.

North of the shopping center at Cottman Avenue, the houses along the Boulevard largely transition from individual rowhouses and twins to larger multifamily houses. These houses are more likely than those in the southern segments to have access

from side streets, rather than directly off the Boulevard. This segment of the Boulevard is within two city council districts (6th and 10th) and is within two Philadelphia City Planning Commission Districts, the Central Northeast and North Delaware.⁷

The Boulevard's intersection with Cottman Avenue draws many pedestrians and transit users due to its proximity to the regional shopping center, library, and health center; Cottman Avenue has the highest daily volume of people walking in the entire Program area. This area of the Boulevard near Cottman Avenue also has some of the highest bus frequencies along the whole Program corridor. The segment includes the Cottman Avenue Boulevard Direct bus station for Phase A, which started operation in October 2017. There is also a Boulevard Direct bus station at Rhawn Street. This segment has 28 other local bus stops, served by SEPTA Routes 1, 14, 20, and 50.

On-street parking on the outermost lanes is restricted between 7:00 a.m. and 9:00 a.m. in the southbound direction south of St. Vincent Street and 4:00 p.m. to 6:00 p.m. in the northbound direction south of Tyson Avenue. On-street parking is not allowed north of these locations in the remainder of the segment.

Figure 2-23. Segment 4 at Cottman Avenue



⁷ Please visit phila2035.org to read more about the Central Northeast District Plan and North Delaware District Plan

Segment 5: Pennypack Creek to Bucks County Line

Segment 5, by far the longest at nearly five miles, has diverse land uses. The southern portion of this segment, between Pennypack Creek and Welsh Road, is primarily residential. However, north of Welsh Road, the Boulevard is lined with a mix of multifamily housing, commercial businesses, medical facilities, and industrial parks. This segment is where the second most prominent cross section of the Boulevard appears – the center median narrows to 5 to 15 feet at the intersections and is between 20 and 25 feet between intersections. The median between the inner (express) and outer (local) northbound lanes is between 10 and 18 feet, and the median between the inner (express) and outer (local) southbound lanes is approximately 25 feet wide.

The center median along this segment is generally much narrower than the segments south of Pennypack Creek. Drivers can make left turns from the Boulevard directly onto the side street without having to wait in the center median in between the northbound and southbound lanes of the Boulevard. Additionally,

most intersections have dedicated left turn lanes along the Boulevard. On the north end of this segment, there is a cloverleaf interchange between the Boulevard and Woodhaven Road.

This segment contains multiple sections characterized by high frequency of traffic crashes. The high number of turns at side streets combined with the large intersection footprints on the Boulevard at Welsh Road, Grant Avenue, and Red Lion Road results in gridlock. Farther north, frequent bottlenecks occur where the inner (express) and outer (local) lanes merge into one facility, just south of the Philadelphia County line shared with Bucks County.

Since 2017, Boulevard Direct has been making stops at four bus stations within this segment. While people living along this segment, on average, are less likely to rely on buses than residents in the four other segments of the Boulevard in the city, these Direct Bus stations have seen over 10 percent increase in ridership, indicating latent demand for a faster, more reliable transit trip down the Boulevard. There are also three speed camera locations, one near Grant Avenue, Red Lion Road, and Southampton Road.

In addition to Pennypack Park, Segment 5 has these key landmarks:

Figure 2-24. Segment 5 Near Benjamin Rush State Park



- The northbound lanes of Roosevelt Boulevard have several major shopping centers between Tremont Street and Grant Avenue, including the Tremont Plaza, which is slated for redevelopment in the near future; the Northeast Village Shopping Center, which recently had façade renovations, and the Grant @ One Shopping Center, just past Grant Avenue is Whitman Square, a large retail shopping center on the former site of the Whitman Chocolate Factory.
- Behind the Northeast Village Shopping Center is the Welsh Road Branch Library, which opened in 1967 as the first library to be built into a shopping center.
- The Northeast Philadelphia Airport (PNE), opened in the 1930s, is currently operated by the City of Philadelphia, and covers over 1,000 acres of land, just off the northbound lanes of Roosevelt Boulevard. Serving as a relief facility for other major airports, as well as for corporate and general aviation needs.
- Suburban-style industrial parks surround the Northeast Philadelphia Airport and span both sides of Roosevelt Boulevard between Grant Avenue and the Philadelphia County line shared with Bucks County.
- Just south of Red Lion Road, Officer Robert Hayes Memorial Playground and Woods fronts the southbound lanes of the Boulevard. This City-owned recreation area is part of Rebuild, the City’s program to improve parks, recreation centers, playgrounds, and libraries across Philadelphia neighborhoods using bonds made possible by the Philadelphia Beverage Tax. **A new playground is to be constructed at Hayes and is expected to be complete in 2020.**
- There are four Direct Bus stations on each side of the Boulevard in this segment, including: Welsh Road, Grant Avenue, Red Lion Road, and Southampton Road. These bus stations are in the middle of the Direct Bus route and have seen bus ridership numbers increase at each station.
- Benjamin Rush State Park, named after a signer of the Declaration of Independence, is the city’s only State Park in Philadelphia County. It was created in 1975 on 275 acres of land, previously belonging to the Pennsylvania State Hospital (Byberry).

Approximately 85,000 people reside within one mile of the Boulevard in this segment, which has a high proportion of census tracts with above or well-above average residents who are seniors. In addition, 18 out of 19 census tracts in Segment 5 score above average for female residents. This segment of the Boulevard is within two city council districts (6th and 10th) and is within two Philadelphia City Planning Commission Districts: Upper Far Northeast and Lower Far Northeast⁸

Segment 6: Bucks County Line to Rockhill Drive

Segment 6 is the only segment outside of Philadelphia’s city limits, and the road is designated as U.S. 1/Lincoln Highway, rather than Roosevelt Boulevard. This segment does not contain divided inner (express) and outer (local) lanes. Here, the posted speed limit is 45 MPH south of the Pennsylvania Turnpike (I-276) and 55 MPH north of the Turnpike.

Key landmarks in Segment 6 include:

- The suburban style Neshaminy Interplex Business Center, made up of multi-story and single story office buildings, is located on the west side of U.S. 1 at the southern end of the segment. A Radisson Hotel is adjacent to the Interplex at the intersection of U.S. 1 and Old Lincoln Highway.
- A large automobile dealership, Faulkner Toyota Trevoze, is located on west side of the U.S. 1 north of Old Lincoln Highway.
- Roosevelt Memorial Park, a cemetery established in 1928, is located immediately north of the dealership along the west side of U.S. 1.
- Multiple hotels, including the Lincoln Hotel, Neshaminy Inn, Knights Inn, Comfort Inn, and Candlewood Suites are located along the east side of U.S. 1.
- Three large shopping centers, including the Horizon Corporate Center, the Marketplace at Neshaminy, and the Neshaminy Mall, are located at the north end of the segment along Rockhill Drive.

The intersection at Old Lincoln Highway is the first major signalized intersection on U.S. 1 after the inner (express) and outer (local) lanes merge coming from Philadelphia. Commercial driveways do intersect U.S. 1 in this segment south of the PA Turnpike. North of Old Lincoln Highway, U.S. 1 transitions to an expressway, and includes interchanges with Street Road (SR 132), the Pennsylvania Turnpike (I-276), and Rockhill Drive. Currently, PennDOT is constructing the U.S. 1 Improvements Project to replace aging bridges and enhance highway safety on approximately four miles of U.S. 1. The project extends from Old Lincoln Highway in Bensalem Township to just north of the PA 413 (Pine Street) SR 413 overpass in Middletown Township and Langhorne Borough.

⁸ Please visit phila2035.org to read more about the Far Northeast Districts Plan

This segment is significantly less populated than segments within Philadelphia. Approximately 20,000 people reside within one mile of U.S. 1. Contrasting the rowhouses in Philadelphia, this segment in Bucks County is populated with single-family detached houses. Many households have more than one employed resident, have more than one car, and have off-street parking generally accessible from side streets. Six out of the seven census tracts in Section 6 score above or well-above average for low-income residents. Section 6 is similar to the Boulevard's average for census tracts scoring high in rates of residents with a disability, who are foreign born, have limited English proficiency, and are racial minority.

Boulevard Direct bus service continues along this segment and makes two stops: one at Neshaminy Interplex and one at the Neshaminy Mall. The new route provides more reliable and frequent transit service between FTC in Philadelphia and the Neshaminy Mall. Both Direct Bus stations in Bucks County have seen the biggest percentage increase in transit ridership compared to the other Direct Bus stations in the city.

Conclusion

The complex design characteristics of the Boulevard contribute to numerous issues related to safety, accessibility, and reliability and present challenges for all users. The challenges created by these characteristics are readily evidenced by the crash statistics provided in Chapter 3. By understanding the existing conditions, the Program created responsive solutions for 2025.

Figure 2-25. Segment 6 at Neshaminy Mall



CHAPTER

3

Roosevelt Boulevard Crash Analysis

This chapter provides an overview of the:

- Overall Crash Analysis
- Key Contributing Factors
- Crash Clusters
- Crash Pattern Analysis

Introduction

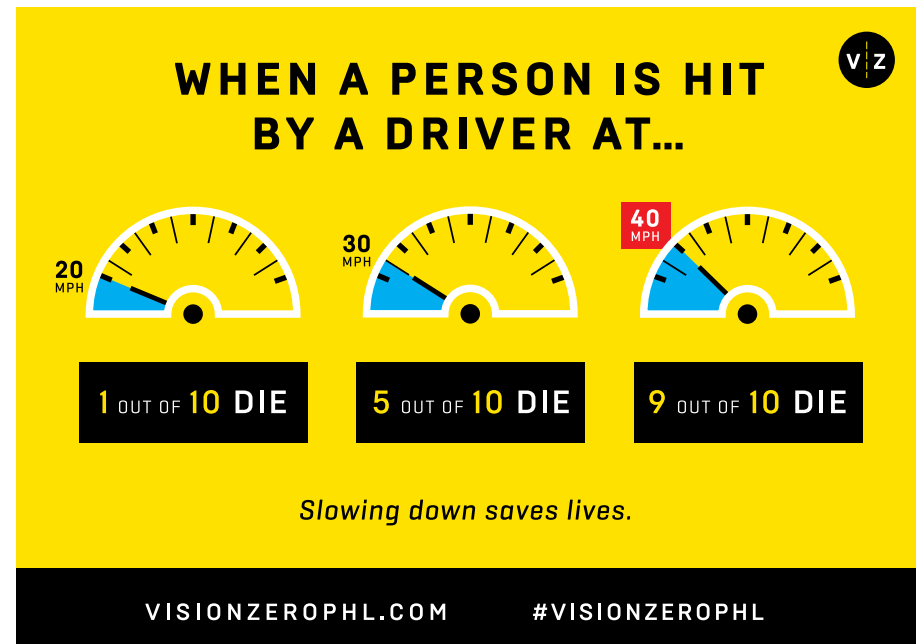
On November 17, 2016, the City of Philadelphia's Mayor Jim Kenney signed Executive Order 11-16, creating a Vision Zero Task Force to work towards eliminating traffic-related deaths in Philadelphia by 2030. The City has since created the Vision Zero Three-Year Action Plan and the Vision Zero Action Plan 2025. As part of the 2025 Action Plan, the City used a five-year trend of PennDOT crash data (2014 to 2019) to identify the non-interstate corridors where fatal crashes and crashes that resulted in serious injury occurred with the most frequency. The result of this analysis is the City's High Injury Network (HIN), which is comprised of 12 percent of Philadelphia streets where 80 percent of all traffic deaths and serious injuries occurred.

Roosevelt Boulevard, from Broad Street in Philadelphia to the Philadelphia County line shared with Bucks County, is one of the highest risk corridors on the City's HIN. The Roosevelt Boulevard Route for Change Program completed a crash analysis to document the corridor-wide safety issues, using PennDOT five-year reportable crash data from 2013 to 2017.¹ The main goals of the analysis were to evaluate the Program area, understand key contributing factors to crashes, and identify the top crash cluster locations along the corridor. The Program applied a methodology to analyze serious injury and fatality crashes, consistent with the City's commitment to Vision Zero and its focus on addressing acute traffic safety challenges along Roosevelt Boulevard (see Appendix 3).

The analysis of crash data along Roosevelt Boulevard indicated several key findings:

- **Speeding** is a common factor in traffic crashes on Roosevelt Boulevard; it occurs consistently throughout the Program area and plays a key role in crash severity. All key findings of the crash analysis relate to excessive speed on Roosevelt Boulevard.
- The **combination of roadway geometry, risky behavior, and vulnerable users** creates a high number of total crashes and a very high fatality and serious injury rate. Driving under the influence (DUIs), reckless driving, aggressive driving, driving while fatigued, and speeding are more likely to end in fatalities or serious injuries along Roosevelt Boulevard compared to elsewhere in the city due to the scale and complexity of the Boulevard.

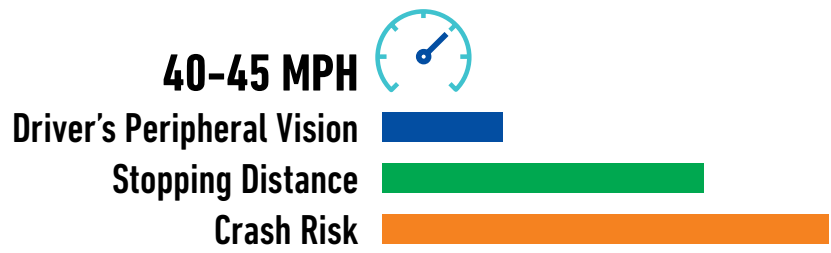
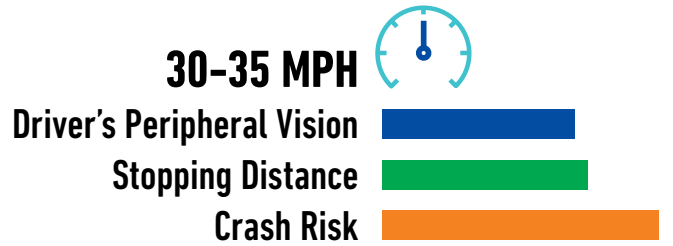
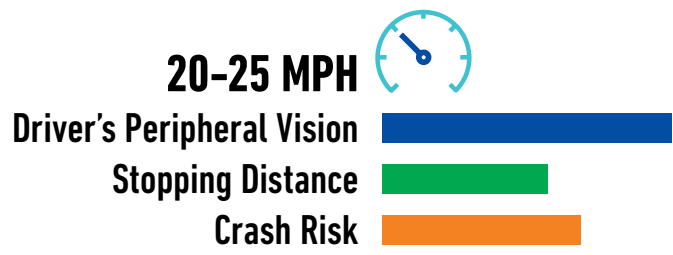
Figure 3-1. Impact of Speed on a Person Hit by a Vehicle



- **Pedestrian crossings**, particularly those that occur outside of crosswalks or against a traffic signal, are more likely to result in death or serious injury along Roosevelt Boulevard compared to elsewhere in the city. People walking across Roosevelt Boulevard are challenged because of long crossing distances requiring multiple signal phases and long distances between signalized crossings.
- **Red light running** also occurs throughout the Program area, though it is reduced at intersections with red-light cameras.
- People in **fixed object crashes**, particularly in the "S-Curve" from Whitaker Avenue/Adams Avenue (west) to Summerdale Avenue/Adams Avenue (east), are more likely to be seriously injured or killed.

¹ A crash is reportable if it involves injury to or death of any person and/or damage to any vehicle to the extent that it cannot be driven under its own power in its customary manner without further damage or hazard to the vehicle, other traffic elements, or the roadway, and therefore requires towing, per Section 3746(a) of Title 75, PA's Consolidated Statutes.

Figure 3-2. Impact of Speed on Driver's Peripheral Vision, Stopping Distance and Crash Risk



“ The severity of pedestrian crashes, a significant concern in urban areas, is greatly increased as speeds increase. ”

—AASHTO Guide for Achieving Flexibility in Highway Design 2004, p.19

Overall Crash Analysis

Crashes along Roosevelt Boulevard were so severe and so frequent that they accounted for significant portions of all crashes and fatalities in Philadelphia. During the five years of crash data analyzed by the Program (2013 to 2017),² there were 2,846 reportable crashes along Roosevelt Boulevard, between 9th Street and the Philadelphia County line shared with Bucks County, or nearly 46 crashes per mile per year. **Of all the fatal crashes that occurred in Philadelphia, 14 percent (54 total) were on the Boulevard**, leading to 62 people dying along the Boulevard from 2013 to 2017. Additionally, 6 percent of all crashes in Philadelphia that resulted in serious injuries were along the Boulevard, resulting in 81 people inflicted with serious injuries in the same five-year timeframe.

Table 3-1. Number of Crashes Comparison: Philadelphia County vs. Roosevelt Boulevard

| | Total # of Crashes | Total # of Fatal Crashes | Total # of Serious Injury Crashes |
|---------------------|--------------------|--------------------------|-----------------------------------|
| Philadelphia | 47,394 | 392 | 1,058 |
| Roosevelt Boulevard | 2,846 (6%) | 54 (14%) | 66 (6%) |

Comparison of crashes with Killed and Serious Injury (KSI) in Philadelphia County and on Roosevelt Boulevard between 2013 and 2017. All crash data provided by PennDOT.

Table 3-2. Number of Crashes Involving People Walking Comparison: Philadelphia County vs. Roosevelt Boulevard

| | Total # of Crashes | Total # of Crashes involving people walking | Total # of Fatal Crashes involving people walking |
|---------------------|--------------------|---|---|
| Philadelphia | 47,394 | 8,073 | 157 |
| Roosevelt Boulevard | 2,846 (6%) | 164 (2%) | 23 (15%) |

Comparison of crashes with pedestrian KSI in Philadelphia County and on Roosevelt Boulevard between 2013 and 2017. All crash data provided by PennDOT.

Pedestrian Vulnerability

Six percent of all crashes along Roosevelt Boulevard involved a person walking (164 crashes), and 43 percent of all fatal crashes (23 total) along the Boulevard resulted in the death of a person walking. In addition, 15 percent of all of Philadelphia's fatal crashes that involved people walking occurred on Roosevelt Boulevard. This imbalance highlights the extreme vulnerability faced by people walking along and across Roosevelt Boulevard, as well as the need to implement improvements that prioritize pedestrian safety.

Roosevelt Boulevard has evolved significantly since its creation as a green and monumental roadway at the peak of the City Beautiful movement. Over several decades, the Boulevard added more lanes and progressively more auto-oriented land-use development occurred, particularly on the upper sections of the Boulevard, which has contributed to people driving faster than the posted speed limit. The multiple lanes, changing lane configurations, and complex intersections create confusion for people driving. Long crossing distances requiring multiple signal phases and large distances between signalized crossings encourage people to cross mid-block or against the signal. The geometry of the "S-Curve," the sharp set of curves between Whitaker Avenues / Adams Avenue (west) and Summerdale Avenue / Adams Avenue (east), creates a hazard for drivers who lose control, especially while speeding, and hit fixed objects along the road.

It is the combination of and interplay between these factors is particularly deadly on the Boulevard, resulting in consistently high numbers of crashes over the years as well as more fatal and injurious crashes along Roosevelt Boulevard than any other street in the city.

2 The crash analysis included reportable crashes within a 100-foot buffer around the edge line of the outermost lanes of the Boulevard.

Key Contributing Factors

The Program's crash analysis also examined crash patterns on the Boulevard (Table 3-3). Patterns on the Boulevard that showed the same or very similar rates across the city and along other HIN corridors were not analyzed further. Crash patterns that stood out as comparatively different or more serious were studied in more detail and are discussed below.

The crash analysis also created a multivariate model of injury severity of all crashes from 2013-2017 along Roosevelt Boulevard. Results indicate that across Roosevelt Boulevard, people involved in red light-running, fixed-object, or head-on crashes were more likely to be seriously injured or killed. In particular, people walking and people riding a bike were much more likely to be seriously injured or killed.

When are Crashes Happening?

The crash analysis covered five years of data, identifying two trends related to time period of crashes.

Year to Year – While crashes remained relatively stable across the city over the five-year period (2013 to 2017), about 9,500 crashes per year, the number of crashes and fatal crashes along Roosevelt Boulevard dropped slightly in 2017. In 2017, Roosevelt Boulevard had 488 crashes, fewer than the average 569 crashes per year in this five-year period for the corridor.

Time of Day – Crashes along Roosevelt Boulevard peaked at 28 percent of all crashes occurring during the evening (7 p.m. to 12 a.m.) and 16 percent during night (12 a.m. to 6 a.m.). While citywide fatal crashes during the evenings occur at a similar rate as the Boulevard, there is a disproportionately high number of fatal crashes occurring at night (34 percent) along Roosevelt Boulevard compared to night (26 percent) citywide. People involved in crashes along the Boulevard that occurred in the evening or at night were more likely to be seriously injured or killed at direct, no skew intersections, like Grant Avenue and Red Lion Road.



Who is Involved in Crashes and Fatal Crashes on the Boulevard?

People who walk – Most crashes along Roosevelt Boulevard involve drivers; Roosevelt Boulevard sees a third of the number of crashes involving people walking compared to the City. However, when a person walking is involved, Roosevelt Boulevard is far deadlier for them than compared to citywide crash rates. The speed of traffic, very long crossing distances, and risky behavior, such as crossing outside a crosswalk or against the signal, create an injurious and deadly environment for people walking. People walking are also particularly vulnerable when people driving make right- or left-hand turns onto or off of Roosevelt Boulevard using channelized turn lanes, such as those at Large Street and Harbison Street.

People walking are very vulnerable on the Boulevard. They were almost 50 times more likely to be killed in a crash on the Boulevard as compared to motor vehicle occupants in crashes on the Boulevard between 2013 and 2017.

Fatalities of seniors who walk – People over the age of 70 walking on the Boulevard were almost five times more likely to be killed during a crash than all people walking who were involved in crashes in Philadelphia between 2013 and 2017. However, it is important to note that only a small number of seniors walking were involved in crashes on Roosevelt Boulevard.



**The pedestrian fatality rate is the percentage of pedestrians involved in crashes that die.*

Percent of People Walking Who Were Killed.*

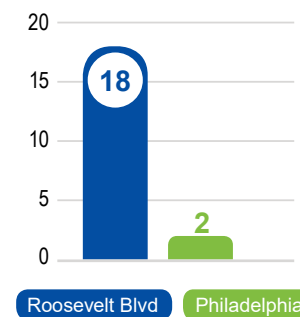


Table 3-3. Crash Pattern Summary Statistics Comparison (2013 to 2017)

| Pattern | Citywide | Roosevelt Boulevard |
|---|--|--|
| When are Crashes Happening? | | |
| Number of all crashes by time of day | Crashes peak in the evening – 31% (7 p.m. to 12 a.m.) and at night – 14% (12 a.m. to 6 a.m.) | Crashes peak in the evening – 28% (7 p.m. to 12 a.m.) and at night – 16% (12 a.m. to 6 a.m.) |
| Number of fatal crashes by time of day | Fatal crashes peak more seriously in the evening – 38% (7 p.m. to 12 a.m.) and at night – 26% (12 a.m. to 6 a.m.) compared to all crashes in the evening | Fatal crashes peak more seriously in the evening – 40% (7 p.m. to 12 a.m.) and at night – 34% (12 a.m. to 6 a.m.) compared to all crashes in the evening |
| Who is Involved in Crashes & Fatal Crashes? | | |
| Fatality rate for people walking | Ten times more likely to be killed in a crash while walking as compared to motor vehicle occupants ⁴ | Fifty times more likely to be killed in a crash while walking as compared to motor vehicle occupants ⁵ |
| Percentage of all crashes involving people riding a bike | 2% | 0.5% |
| What Conditions or Behaviors are Causing Crashes? | | |
| Percentage of all crashes occurring in adverse weather | 18% | 14% |
| Percentage of fatal crashes occurring in adverse weather | 12% | 9% |
| Percentage of all crashes occurring on wet or icy road conditions | 2% | 16% |
| Percentage of fatal crashes occurring on wet or icy road conditions | 14% | 13% |
| Percentage of all crashes where people driving hit fixed object | 12% | 12% |
| Percentage of fatal crashes where people driving hit fixed object | 22% | 32% |
| Percentage of all crashes flagged as speeding related | 15% | 16% |
| Percentage of fatal crashes flagged as speeding related | 27% | 26% |
| Percentage of all crashes flagged for aggressive driving | 49% | 59% |
| Percentage of fatal crashes flagged for aggressive driving | 42% | 38% |
| Percentage of all crashes flagged as red-light running related | 5% | 13% |
| Percentage of fatal crashes flagged as red-light running related | 7% | 9% |
| Percentage of all crashes flagged as “Not Normal” | 6% | 5% |
| Percentage of fatal crashes flagged as “Not Normal” | 11% | 17% |
| Percentage of all rear-end crashes | 23% | 32% |
| Percentage of fatal rear-end crashes | 5% | 4% |
| Percentage of all side-swipe crashes | 13% | 10% |
| Percentage of fatal side-swipe crashes | 7% | 9% |
| Percentage of all angle crashes | 34% | 40% |
| Percentage of fatal angle crashes | 21% | 17% |

4 Fatality rate for crashes in the city involving people walking is defined as the number of people killed in crashes across the city divided by total number of people involved in crashes in the city.

5 Fatality rate for crashes along the Boulevard involving people walking is defined here as total number of people killed while walking along the Boulevard divided by total number of people walking involved in crashes on the Boulevard.

People who ride a bike – Crashes involving people who bike are four times less likely on Roosevelt Boulevard than at the citywide level. This is primarily because there are fewer people biking along the Boulevard compared to the city. However, people riding a bike are more likely to be seriously injured in several of the intersection types, including direct no skew multileg, direct skew, and separated median turns. In the five-year period from 2013 to 2017, there were no fatal crashes involving people riding a bike reported on Roosevelt Boulevard.

Fatalities of Motor Vehicle Occupants – Motor vehicle occupants involved in a crash on Roosevelt Boulevard are twice as likely to be killed compared to the city rate.

Where do Crashes Occur?

The analysis shows that crashes are not confined to just a few intersections or hotspots. Rather, crashes across all modes occur consistently, block after block, intersection after intersection, for the length of the corridor.

One of the worst concentrations of crashes is the S-Curve, where a set of sharp curves between Whitaker Avenue/Adams Avenue (west) and Summerdale Avenue/Adams Avenue (east) and the presence of speeding drivers contributes to a disproportionate number of crashes. The number of trees, poles, and other fixed objects within the S-Curve, as well as the incidence of drivers speeding, losing control, and hitting fixed objects, creates a large number of deadly crashes within the S-Curve. Within the separated median turns, which includes several major intersections of the S-Curve, people involved in fixed-object crashes were more likely to be seriously injured or killed, particularly if the crash was speeding-related.

What Behavior are Causing Crashes?

Risky behavior, including speeding, aggressive driving, red light running, and driving while impaired are commonplace across Roosevelt Boulevard. The combination of these risky behaviors, coupled with the complex geometry, results in a disproportionately high fatality rate along Roosevelt Boulevard.

- **Aggressive Driving and Speeding** – Fifty-nine percent of crashes on Roosevelt Boulevard were due to people driving aggressively and/or speeding, compared to 49 percent at the city level. People driving aggressively often occurs in combination with speeding, and higher speeds are widely understood to increase the likelihood of fatalities in a crash.
- **Speeding** – Any crash is more deadly or injurious as the driver's speed of one or more vehicles involved increases. Speeding alone causes a similar share of crashes on the Boulevard (16 percent) compared to the city (15 percent) and a similar share of fatal crashes on the Boulevard (26 percent) compared to the city (26 percent). However, in crashes reported as speeding-related, people were more likely to be seriously injured or killed in direct mid-block crossings and separated median turns with two curves. High speeds are also contributing to drivers losing control of their vehicles, which is happening throughout Roosevelt Boulevard.
- **Hitting Fixed Objects** – Drivers in crashes that result in hitting a fixed object make up the same percent of all crashes on Roosevelt Boulevard and elsewhere in the city (12 percent). However, motor vehicle occupants involved in fixed object crashes are five times more likely to die in those crashes on Roosevelt Boulevard compared to the city (5 percent compared to 1 percent). Speed, roadway geometry, other behavioral choices, and an abundance of poles, posts, walls, and trees make a very lethal combination.



59%

of all crashes on Roosevelt Blvd are due to aggressive driving



26%

of fatal crashes on Roosevelt Boulevard are speeding-related

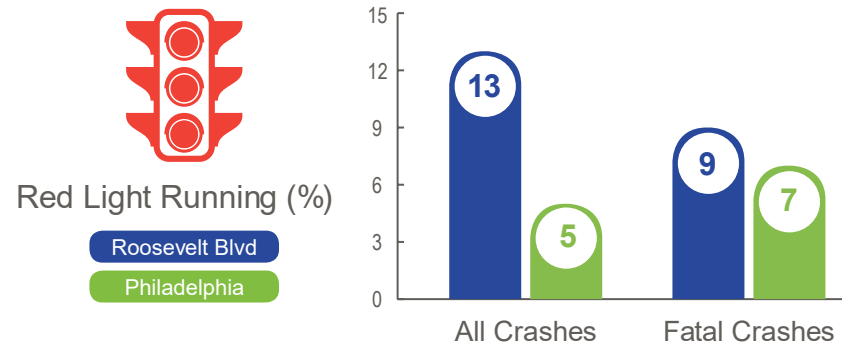
- **Red Light Running** – Red light running is a consistent problem along the Boulevard. Thirteen percent of all crashes and nine percent of fatal crashes on Roosevelt Boulevard are due to red light running, as compared to the city (five percent of all crashes and seven percent of fatal crashes). Automated red-light cameras are located at nine intersections. At these locations there has been a reduction of red light running. People involved in crashes where drivers ran red lights were more likely to be seriously injured or killed in roadway layouts, including direct no skew, direct skew multileg, large T, separated median turns not curved, and expressway below grade. In addition, some drivers try to make it through yellow lights at high speeds approaching the intersection and end up running red lights, seeming to misjudge the distance to and length of intersections.

- **Not Normal Crashes** – “Not normal” is a term PennDOT uses for drivers who are under the influence of alcohol or drugs, having a medical emergency, or are fatigued. There are a similar number of “not normal” crash participants on Roosevelt Boulevard (five percent) compared to citywide (six percent). However, the fatality rate of “not normal” crash participants on Roosevelt Boulevard is 17 percent compared to 11 percent citywide, further showing that the design and operating speed of the Boulevard compounds other issues to create fatal situations.

- **Rear-End Crashes** – Rear-end crashes make up a larger percentage of serious injuries along Roosevelt Boulevard (21 percent) than citywide (12 percent). These rates on the Boulevard are even more than on other High Injury Network (HIN) corridors in the city (21 percent vs. 11 percent). Rear-ends on Roosevelt Boulevard tend to occur at stop bars, rather than in the intersection itself. The most common types of rear-ends include drivers hitting the vehicle in front of them when it slows for a yellow light, or when distracted, or “not normal”, drivers rear ended a vehicle stopped at a red light.

- **Illuminated Dark or Twilight Conditions³** – Both fatal and serious injury crashes are occurring at disproportionately high rates along Roosevelt Boulevard during illuminated dark or twilight conditions (74 percent of fatalities and 52 percent of serious injuries). While still high, the City’s HIN corridors are comparatively lower (60 percent and 44 percent) and citywide rates lower still (58 percent and 44 percent). It is possible that factors other than illumination are involved; the fact that people are more likely to drink at night could play a more direct role than reduced visibility.

3 This is not related to a time, rather, it is about the level of light.



- **Failure to Yield** – At many intersections, there is a general conflict between traffic on side streets turning left onto Roosevelt Boulevard and failing to yield to drivers coming through in the opposite direction from side streets. Drivers turning left are conflicting at the end of the protected phase, during the permitted phase, which most often results in conflict between drivers. There are also grave implications for people walking or biking who are crossing legally in the crosswalk and are being hit by drivers turning left. Several crashes have been caused by drivers failing to stop for emergency vehicles or funerals.

- **Illegal Left Turns** – At some intersections, there is a small, but consistent number of drivers who attempt to turn left from the outer (local) lanes of Roosevelt Boulevard, crossing the inner (express) lanes going in the same direction, often resulting in crashes. While some drivers admit to knowing this maneuver was illegal, crash reports noted that many drivers said they were confused or were instructed by their GPS to make the turn.

Crash Clusters

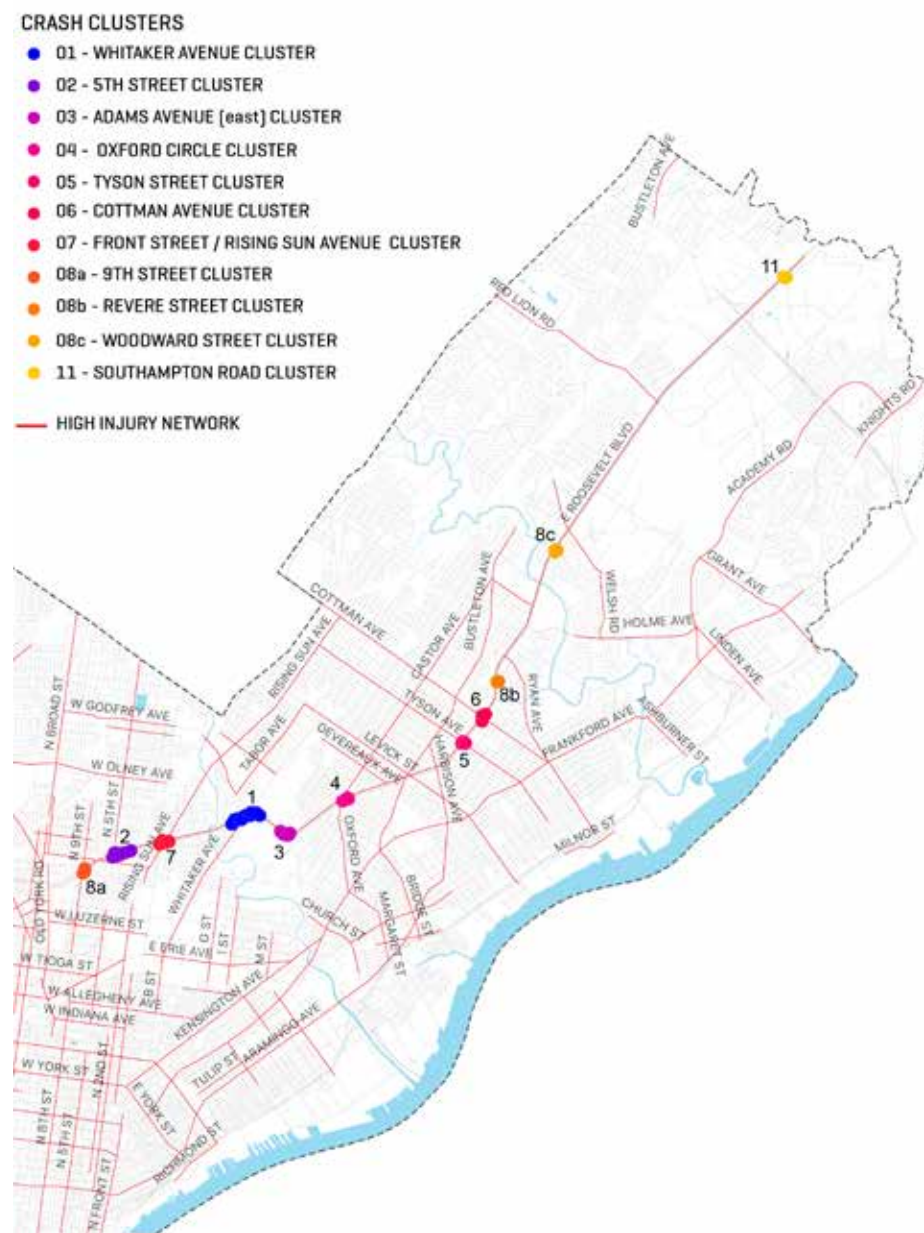
The City of Philadelphia completed a crash cluster analysis to determine the high-risk crash clusters along the Boulevard. Referencing crashes from 2013 to 2017 that resulted in someone being killed or seriously injured as the criteria (called KSI crashes), the Program used a “clustering analysis” approach. A “cluster” was defined as a group of KSI crashes located within 175 feet or less from each other. The threshold distance was determined based on the width of Roosevelt Boulevard and the skewed geometry of some of its intersections. This means that a group of KSI crashes could form a unique cluster if no two crashes in the group are more than 175 feet apart. Using this method, several clusters were identified and a tally of “total number of killed or serious injury crashes per cluster” was used to rank the clusters in order of their level of risk (see Figure 3-3).

As shown in Table 3-4, Whitaker Avenue cluster is the highest ranked cluster, which is around the intersection of Whitaker Street and Roosevelt Boulevard. This cluster starts at Smylie Road and ends at the intersection of Adams Avenue (west). This cluster represents a total of 14 people who died or suffered serious injuries due to traffic crashes from 2013 to 2017.

Table 3-4. Crash Cluster Summary

| Rank | Cluster Name | Total KSI Crashes (# Of Crashes) | Total KSI Count (# Of People) |
|------|--|----------------------------------|-------------------------------|
| 1 | Whitaker Avenue Cluster | 12 | 14 |
| 2 | 5th Street Cluster | 9 | 11 |
| 3 | Adams Avenue (east) Cluster | 6 | 8 |
| 4 | Oxford Circle Cluster | 5 | 5 |
| 5 | Tyson Street Cluster | 5 | 5 |
| 6 | Cottman Avenue Cluster | 4 | 7 |
| 7 | Front Street / Rising Sun Avenue Cluster | 4 | 6 |
| 8a | 9th Street Cluster | 4 | 5 |
| 8b | Revere Street Cluster | 4 | 5 |
| 8c | Woodward Street Cluster | 4 </td <td>5</td> | 5 |
| 11 | Southampton Road Cluster | 4 | 4 |

Figure 3-3. Top 11 Crash Clusters on Roosevelt Boulevard



Crash Pattern Analysis

Roosevelt Boulevard has over 160 intersections, both signalized and unsignalized – a corridor of this magnitude needs to be broken down into a typology, or a system of classification. For this analysis, the Program used a Vision Zero lens by focusing on fatal and serious injury crashes. This approach prioritizes locations where:

- a. deadly or serious crashes are occurring;
- b. people walking are dying or being seriously injured; and
- c. deadly or serious crashes are occurring at a particularly high rate.

This means some intersections with the highest number of total crashes are not necessarily highlighted. System failure is defined as when there is a high number of fatalities and serious injuries, not simply a high number of total crashes.

First, all intersections were first examined to see if they met the minimum criteria under a Vision Zero approach containing either a fatality, serious injury, and/or a crash injuring a person walking. Fifty-nine intersections met these criteria and were further evaluated.

Intersection typologies were based on the following characteristics:

- Land use
- Overall intersection size/width
- Angles/skew
- Number of intersection legs
- Driveways
- Size of side street
- At grade/below grade/above grade

The 59 intersections were then iteratively grouped based on the commonalities they exhibited in order to develop five different typologies:

1. Direct, No Skew Intersections
2. Direct, Skewed Intersections
3. Controlled Mid-block Pedestrian Crossings
4. Separated Median Turns
5. Expressway, Not at Grade

The crash patterns associated with each layout are summarized below. Each intersection layout's crashes are contrasted with all other crashes along Roosevelt Boulevard (2013 to 2017) unless otherwise noted.

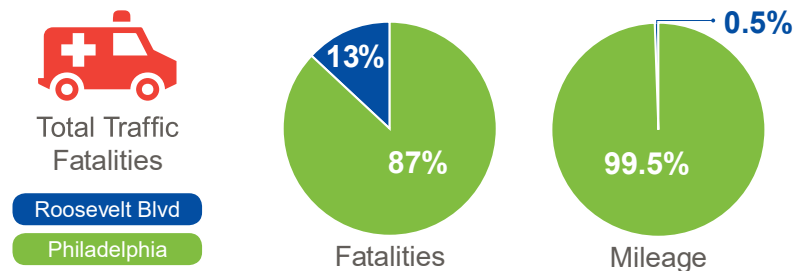
1. Direct No Skew Intersection

Crashes at these intersections reflect many of the corridorwide trends. People involved in crashes where drivers ran red lights were more likely to be seriously injured or killed. People walking involved in crashes were much more likely to be injured or seriously killed.

Crashes in this typology differ from the corridor in the following ways: crashes occurring during the evening or night were more likely to result in serious injuries or fatalities, as well as crashes occurring at the intersection, when compared to the mid-block.

There are three sub-types of direct no skew intersections, and the associated crash patterns include:

1. **Driveway Terminus, Restricted Pedestrian Access** (example: Plaza, Hornig):
 - People walking were much more likely to be injured seriously or killed.
2. **Four-way** (example: Grant, Woodward, Goodnaw, Red Lion, Southampton) and
3. **Multileg** (example: 3rd/4th, F, Harbison):
 - People walking were much more likely to be injured seriously or killed.
 - People involved in crashes where drivers ran red lights were more likely to be injured seriously or killed.



2. Direct Skew Intersection

People walking or riding a bike were much more likely to be injured seriously or killed. People involved in head-on crashes were more likely to be injured seriously or killed.

There are four sub-types of direct skew intersections, and the associated crash patterns include:

1. **Four-way** (example: C, Welsh, Pratt, Tyson):
 - People walking or riding a bike were much more likely to be injured seriously or killed in intersection crashes.
 - People involved in sideswipes were less likely to be injured seriously or killed.
2. **Multileg** (example: Large, 9th, Mascher, Front/Rising Sun, Devereaux/Everett):
 - People walking or riding a bike were much more likely to be injured seriously.
 - People involved in crashes where drivers ran red lights were more likely to be injured seriously or killed.
3. **Hybrid** (example: Bustleton/Levick):
 - People walking were much more likely to be injured seriously or killed.
4. **Large T** (example: Comly/Nabisco, Wyoming/7th, Conwell)
 - People walking or riding a bike were much more likely to be injured seriously or killed.
 - People involved in crashes where drivers ran red lights were more likely to be injured or seriously killed.

3. Controlled Mid-block Pedestrian Crossings

In general, people walking were much more likely to be injured seriously or killed. People involved in crashes at controlled mid-block pedestrian crossings reported as aggressive driving-related were more likely to be seriously injured or killed. People involved in crashes at the mid-block were more likely to be seriously injured or killed.

There are three sub-types of controlled mid-block pedestrian crossings, and the associated crash patterns include:

1. **Elevated** (example: Sanger/Castor, Strahle):
 - People walking were much more likely to be seriously injured or killed.
 - People involved in crashes during the evening or nighttime were more likely to be seriously injured or killed.
2. **Direct** (example: Unruh, Longshore, Bowler):
 - People walking were much more likely to be seriously injured or killed.
 - People involved in crashes reported as speeding-related were more likely to be seriously injured or killed.
3. **Indirect** (Bingham/D, 2nd, Friendship, Faunce/Revere):
 - People walking were much more likely to be seriously injured or killed in intersection crashes.
 - People involved in crashes at the mid-block are more likely to be seriously injured or killed.

4. Separated Median Turns

People who walk or ride a bike were much more likely to be seriously injured or killed at locations with separated median turns. People involved in crashes where a driver hit a fixed object were more likely to be seriously injured or killed, particularly if speeding was involved. People involved in crashes that occurred in dark illumination conditions were more likely to be seriously injured or killed.

There are three sub-types of separated median turns, and the associated crash patterns include:

1. **One Curve** (example: Tower):
 - People involved in crashes where a driver hit a fixed object were more likely to be seriously injured or killed.
2. **Two Curves** (example: Whitaker/Adams (west), Summerdale/Adams (east), Garland/Mayfair):
 - People walking were much more likely to be seriously injured or killed.
 - People involved in crashes where a driver hit a fixed object were more likely to be seriously injured or killed, particularly if speeding was involved.
3. **Not curved** (example: Ryan/Borbeck, Rhawn, Langdon):
 - People walking were much more likely to be seriously injured or killed.
 - People involved in crashes where a driver hit a fixed object were more likely to be seriously injured or killed.
 - People involved in crashes where drivers ran red lights were more likely to be seriously injured or killed.
 - People involved in crashes where drivers were distracted were more likely to be seriously injured or killed.

5. Expressway Not at Grade

People walking were much more likely to be seriously injured or killed. People involved in head-on crashes, or crashes where a driver hit a fixed object, were more likely to be seriously injured or killed.

Two types of expressway not at grade and associated crash patterns include:

1. **Intersections below grade** (example: 5th):
 - People involved in crashes where drivers hit a fixed object were more likely to be seriously injured or killed.
 - People involved in crashes where drivers ran red lights were more likely to be seriously injured or killed.
2. **Intersections above grade** (example: Cottman, Holme/Solly):
 - People walking were much more likely to be seriously injured or killed.
 - People involved in head-on crashes or crashes where drivers hit a fixed object were more likely to be seriously injured or killed.

Conclusion

In summary, Roosevelt Boulevard, from N. Broad Street in Philadelphia to the Philadelphia County line shared with Bucks County, is one of the highest risk corridors in Philadelphia, as demonstrated by this five-year crash analysis. The combination of roadway geometry, risky behavior, and vulnerable users creates a high number of total crashes and a very high fatality and seriously injury rate.

In the following chapter, the Program outlines the multi-step traffic modeling approach used to screen ideas to mitigate these crash trends, which shaped the Program's recommendations for 2025 improvements and informed the development of the two alternatives for 2040.

The Program recommends continuing to analyze crashes on Roosevelt Boulevard and create a system for documenting trends before and after an improvement is implemented. It is important to do this as a long-term analysis to better understand crash trends because one year may not present an accurate image of all the issues of a given location. Analyzing five years of data to understand trends identifies systemic issues that persist over time. This will help Program partners determine if changes need to be addressed through engineering, enforcement, evaluation, fleet management, or policy changes.

Section 2

2025 Toolbox



ONE WAY

C ONE WAY

STREET LIGHTS AND SIGNALS

NO PARKING

CHAPTER

4

2025 Improvements Planning Process

This chapter describes:

- Improvement Priorities for 2025 Recommendations
- Screening Process
- Traffic Model Development

Introduction

This chapter provides an overview of the screening process and traffic models used for evaluating priorities for screening recommendations, and the recommendations that resulted from the process. The screening process and resulting recommendations are based on five priorities discussed below. While the highest priority is safety, the resulting recommendations will also improve accessibility and reliability for all users.

Improvement Priorities for 2025 Recommendations

The Roosevelt Boulevard Route for Change Program identified 2015 as the base year, with two horizon years when researching best practices and using traffic modeling tools to make recommendations for potential improvements: 2025 and 2040. The Program’s planning process identified recommendations for improvement projects in the first horizon year, 2025, along the entire 14-mile corridor. Crash statistics and feedback heard during the five rounds of public forums, established the following five priorities for the Program, in order of importance:

1. **Increase safety.** Safety is the highest priority. Preserving human life is more important than convenience, and the Boulevard should be safe for all users, through all neighborhoods. Ensuring the safety of pedestrians crossing the Boulevard and reducing aggressive and speeding drivers is of particular concern. Increasing safety will also reduce the number and severity of crashes along the Boulevard.

Improving safety on the Boulevard means reducing both the frequency and severity of crashes. Priority is placed on the most vulnerable users—people walking and biking across the Boulevard. Aggressive driving and speeding are the primary behaviors to be targeted.
2. **Reduce travel time.** Improvements along the Boulevard will reduce travel time, which will benefit all travelers. Congestion along the Boulevard, especially during the morning and evening peak hours, is one factor that lengthens travel times. Reducing congestion will decrease the amount of delay experienced by people driving and riding transit.

3. **Reduce wait time.** Wait time is a source of frustration for all users, as it increases the perceived travel time along the Boulevard. This includes the time people driving spend waiting to turn to or from side streets, the time spent riding on a bus or waiting at bus stops, and the time people walking wait to cross the Boulevard. Because of this frustration, people may make risky decisions, such as a running a red light or crossing the Boulevard against traffic. Frustration also affects modal choice, as some people are so frustrated that they choose to travel by car in order to reduce perceived travel time.
4. **Reduce confusion.** The complex design of the Boulevard creates confusion for all users. Unclear pavement markings, multiple layers of traffic signage and messaging, limited pedestrian and bicycle facilities, inconspicuous bus stops, complex intersection configurations, and abrupt crossovers heightens the probability of risky behavior.
5. **Manage access.** The Boulevard has over 380 unsignalized access points resulting in a high number of potential conflicts between people on the sidewalk and people driving. These many access points also disrupt the flow of traffic along the Boulevard. The Boulevard is also characterized by many undefined curb cuts, which create opportunities for drivers to bypass traffic signals at many major intersections.

Figure 4-1. Improvement Priorities



Screening Process

The Program used a multi-step traffic modeling screening process to test potential improvement alternatives and inform the recommendations for 2025 improvements for the six segments of Roosevelt Boulevard (Figure 4-3). The five priorities guided the screening process for both corridor-wide improvements and individual intersections. The results of each screening step determined which improvements would move into the next screen and which improvements would be eliminated from further consideration.

To evaluate the results of each screening steps, the Program explored the following questions:

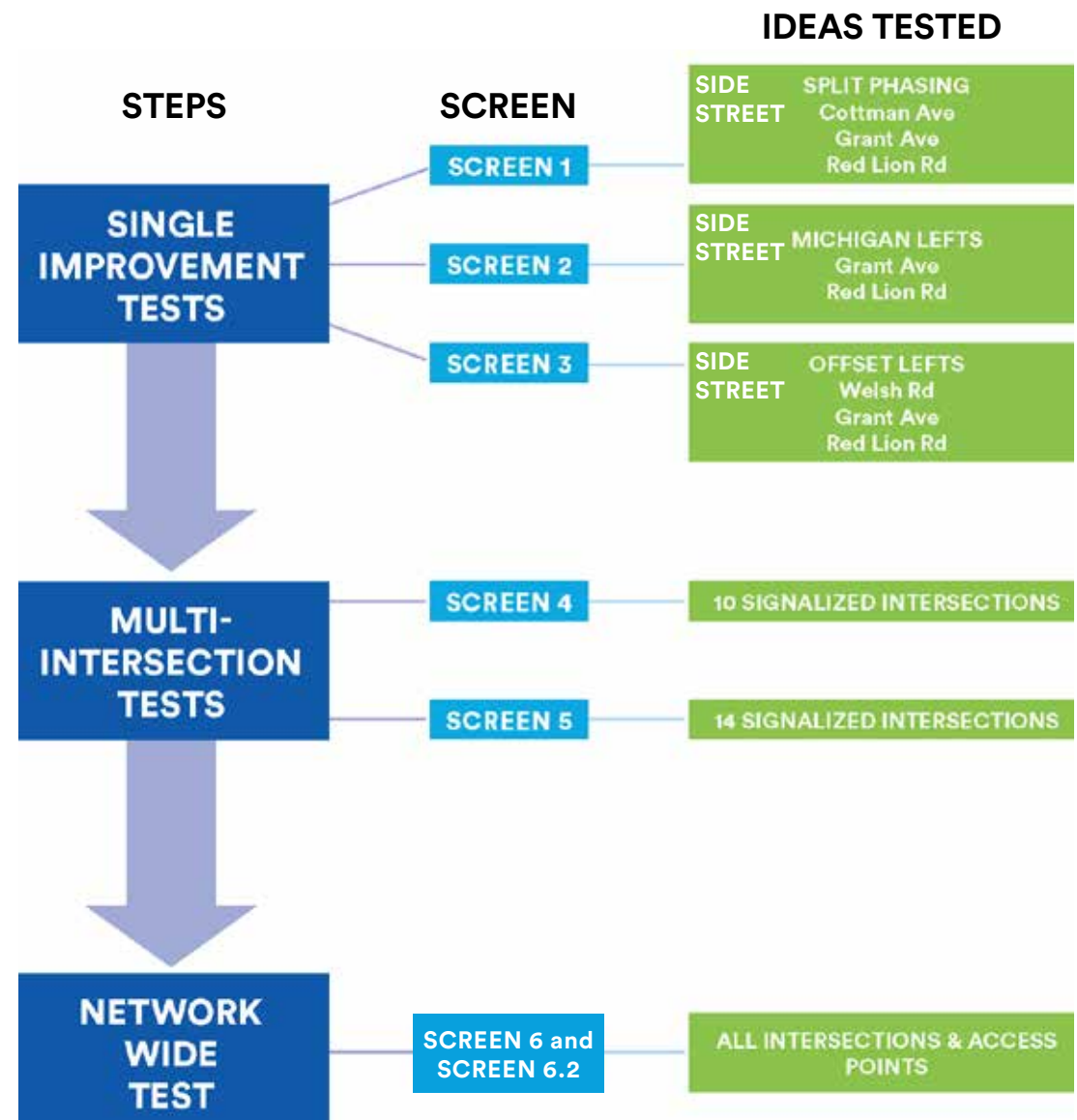
- How do the proposed improvements address the Program's five priorities, with safety as the top priority?
- How do the proposed improvements address the Program's objectives for improved accessibility and reliability?
- How do the proposed improvements address intersection-level problems that were identified by the Program's data analysis and by stakeholders?

Figure 4-2. Vehicles Crossing Roosevelt Boulevard at Grant Avenue



Screen steps 1 through 5 tested a wide range of improvement ideas at 27 signalized intersections along the Boulevard, between Broad Street in Philadelphia and Old Lincoln Highway in Bucks County. The performance of each idea was compared to the 2025 no-build conditions using traffic modeling software, VISSIM Dynamic Traffic Assignment (DTA) Version 9, at the intersection level. The types of improvements that advanced through the first five screens were further refined and then tested as Screen 6 at 30 additional intersections using one networkwide traffic model. While the Program intended Screen 6 to be the final screen step, additional alternatives were identified to improve the network operations, which was finalized in Screen 6.2. The Program used this networkwide traffic model for Screen 6 and 6.2 to evaluate how well each improvement worked together as a system of improvements.

Figure 4-3. Interim Improvement Screening Process



Traffic Model Development

The Program used several types of traffic models to evaluate potential improvements along the Boulevard as part of the 2025 screening process. This allowed a greater number of ideas to be analyzed than would be possible using manual analytical methods.

Traffic modeling began by establishing baseline conditions from 2015, which was the most recent year the following data was available:

- Traffic volumes
- Pedestrian counts
- Bicycle counts
- Origins and destinations of travel
- Traffic signal permit plans and timings
- Past construction plans

The Program also analyzed a five-year period of crash data from 2013 to 2017 between Broad Street and the Philadelphia County line shared with Bucks County. Rather than only looking at a single year of crashes, Federal Highway Administration (FHWA) recommends averaging data across the five-year analysis period to present findings that are more consistent with actual roadway conditions over time.

Data sources included documents and databases such as traffic signal permit plans, signal timing directives and signal controller database; SEPTA bus ridership and schedule information; crash data; and origin-destination data, as well as field observations, photographs, and video. Synchro Version 10, SimTraffic Version 10 and VISSIM Version 9 traffic analysis software were used to build the 2015 baseline model. Together, they provided a comprehensive view of baseline traffic signal operations, travel patterns, and congestion along the Boulevard. While Synchro is specialized to analyze individual signalized intersections, VISSIM emulates roadway conditions with pedestrians, passenger cars, trucks, and buses. Synchro provides a measure of traffic operations at signalized intersections using the methodology from the FHWA's Highway Capacity Manual (HCM, 2010 Edition).

The Program used Synchro and SimTraffic to model Screen 1, while Synchro and VISSIM DTA were used to analyze intersection-specific improvement alternatives in Screens 2 through 5. Unless stated otherwise, the ideas tested in Screen 1 through 5

were evaluated during the weekday evening traffic peak, which is typically when traffic volumes along the Boulevard are the highest. The Synchro model was then used for Screens 6 and 6.2 to analyze the combined effects of improvements that made it through Screen 2, 3, 4, and 5. In addition, VISSIM DTA was used to analyze signal timing changes and to determine the level of congestion and delays at individual intersections in Screens 6 and 6.2. SimTraffic, and VISSIM DTA were used to simulate how traffic operated across multiple intersections. For example, these software packages created a model that enabled vehicles to choose inner (express) or outer (local) lanes based on the changes to traffic congestion and roadway capacity. Screens 6 and 6.2 included both the weekday morning and evening peak hours.

DVRPC used its regional Travel Improvement Model Version 2.0 (TIM 2) Travel Demand Model (VISUM modeling software) to develop the 2025 no-build model. For this model, the calibrated base-year regional model was updated to include transportation projects identified in the DVRPC's Long Range Plan that will be completed by 2025. Some of these projects directly affect travel patterns in the Program area adjacent, such as highway improvement projects on U.S.-1 in Bucks County and improvement projects on I-95.

The Program also decided to include the installation of Business Access and Transit (BAT) Lanes, Phase A as a no-build condition because these BAT lanes are expected to be installed in the next few years. Phase A's limits will run northbound from Bustleton Avenue (north of the intersection) to the Philadelphia County line and southbound from Philadelphia County line to Hellerman Street. The model included the following assumptions about the BAT lane:

- Lanes are located on the outermost lane of the northbound and southbound outer (local) lanes.
- Lanes can only be used by buses and vehicles turning right into businesses or side streets.
- Right turning vehicles are typically allowed to enter the outermost (local) lane approximately 200 feet before intersections; however, specific adjustments were made when modeling based on distance between intersections, driveways, unsignalized intersections, and high turning movement volumes.
- Local buses would only operate in the BAT lanes, but the existing Boulevard Direct bus service can operate in any of the outer (local) lanes.

In addition to these planned projects, the VISUM model was also updated with demographic and employment forecasts for 2025. For the nine-county DVRPC region, population, households, and employment were projected to increase by five to six percent from 2013 to 2025; while forecasted growth was only two to three percent in the one-mile buffer area to Roosevelt Boulevard.

Each screen step used the 2025 no-build model for evaluation because it replicates traffic conditions as if improvements were not implemented along on the Boulevard. This enabled the Program to see the benefits and impacts of the ideas compared to the 2025 no-build condition.

Screen 1 – Testing Split Signal Phasing

Screen 1 tested the idea of split signal phasing – a specific type of traffic signal phasing that reduces vehicle conflicts by alternating the side street-traffic movement. Split signal phasing programs the traffic signals to provide a green light to all traffic coming from one direction on a side street, whether traveling through or making a left or right turn, while opposing traffic is held with a red light. The outcome of this simple signal phasing change could minimize both driver confusion and aggressive behaviors that occur when drivers make quick decisions to find gaps in traffic to make left turns. Participants at the first and second round of public forums voiced support for testing this idea as an early action because people are very frustrated with aggressive driving behaviors and backups occurring because of left turns from both the Boulevard to major side streets, and from major side streets to the Boulevard.

Split signal phasing was tested in Screen 1 at two at-grade Boulevard intersections: Grant Avenue and Red Lion Road. It was also tested in the specific scenario of a grade-separated intersection at Cottman Avenue.

The results of Screen 1 showed that while the vehicular turning movements became more predictable, it significantly increased both driver and pedestrian delay. On average, pedestrians needed to wait over six minutes for their turn to cross the Boulevard, which would likely result in many pedestrians getting impatient and crossing against the traffic signal. Therefore, the Program eliminated this idea from further consideration.

Figure 4-4. Split Phasing of Side Streets

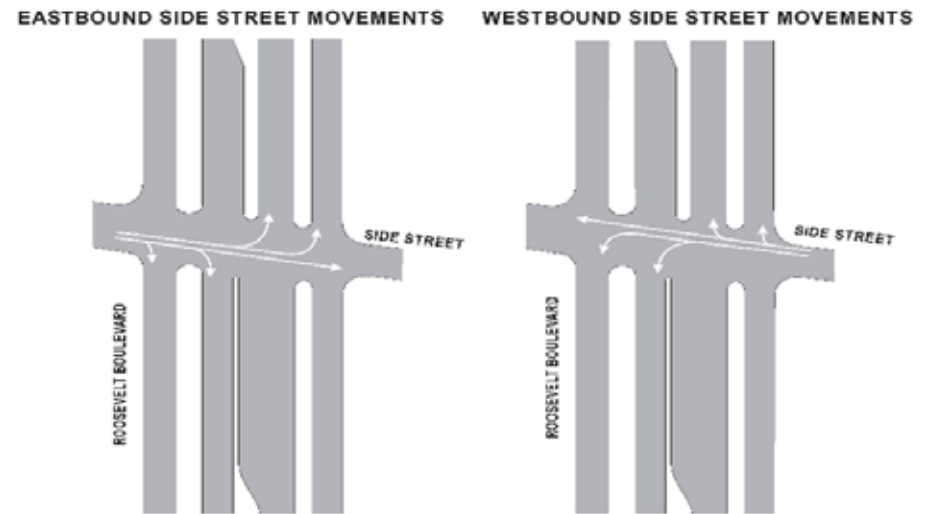


Figure 4-5. Red Lion Road and Roosevelt Boulevard



Screen 2 – Testing Unconventional Intersection Design Ideas

Screen 2 evaluated ideas for two unconventional intersection designs called “Michigan Lefts” and “Super Streets.” Michigan Lefts (named after its frequent use in Michigan since the 1960s) would reroute left-turning vehicles from side streets to first turn right onto the Boulevard inner (express) lanes, and then make a U-turn to continue on the Boulevard in the desired direction (Figure 4-6). Through vehicles would still be able to drive straight through the intersection.

A Super Street is like a Michigan Left, except that both left-turning and through vehicles on side streets would be rerouted (Figure 4-7). Vehicles from a side street would turn right onto the Boulevard inner (express) lanes and then make a U-turn to continue along the Boulevard (inner or outer) in the opposite direction. Drivers who want to continue through on the side street would complete that movement by then turning right at the intersection with the side street.

Both of these alternatives eliminate left turns from side streets onto the Boulevard, which increases safety by reducing the backup caused by left-turning vehicles waiting for gaps in oncoming traffic. These improvements were tested at two intersections: Grant Avenue and Red Lion Road.

The results of Screen 2 showed the improvements reduced the number of conflicts occurring with vehicles making left turns. However, the additional traffic signals needed for this movement would be too closely spaced to operate effectively, and driver confusion would be increased. Additionally, the distance for pedestrians to cross a super street would be longer since they would be required to move diagonally across the Boulevard. This configuration may encourage pedestrians to unsafely attempt to cross the Boulevard in a perpendicular manner. Thus, the Program eliminated these ideas from consideration.

Figure 4-6. Michigan Left at Grant Avenue



Figure 4-7. Super Street at Grant Avenue



Screen 3 – Testing Side Street Offset Lefts and BAT Lanes

Screen 3 analyzed offset left turns from side streets at the Welsh Road, Grant Avenue, and Red Lion Road intersections with the Boulevard. These analyses assumed the BAT lanes existed in the outer most lanes of the Boulevard.

Side-street offset lefts separate the left-turn movements from the through movements but allow the through-traffic to go at the same time. This strategy would reduce the stacking of vehicles waiting to turn left onto the Boulevard by improving sight distance and reducing vehicle conflicts.

Based on the results, the combined off-set lefts with BAT lanes were successful at these three intersections and were advanced to Screens 4, 5, and 6 for consideration at other intersections.

Figure 4-8. Offset Lefts from Side Street

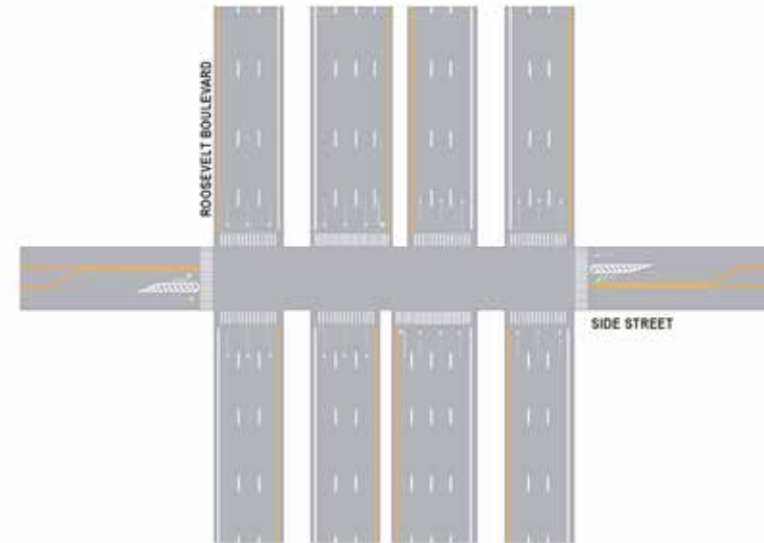


Figure 4-9. Welsh Road and Roosevelt Boulevard



Screen 4 – Testing Combination of Ideas at Key Intersections

Screen 4 tested combinations of corridor-wide and intersection improvement alternatives at ten locations using Synchro and VISSIM. Testing these ideas required including adjacent intersections, expanding the screen to 30 intersections. The number of alternatives and types of potential improvements varied for each intersection.

Improvements that were successfully tested in Screen 4:

- Providing BAT lanes on the southern segment of the Boulevard, between 9th Street and Bridge Street, to improve transit travel time and reliability
- Adding turn restrictions to reduce congestion
- Adding turn modifications to reduce vehicle speeds
- Restriping lanes to provide additional vehicle storage
- Realigning turning lanes to reduce driver confusion
- Extending left-turn bays to reduce congestion

Figure 4-10. Pedestrian Crossing Roosevelt Boulevard

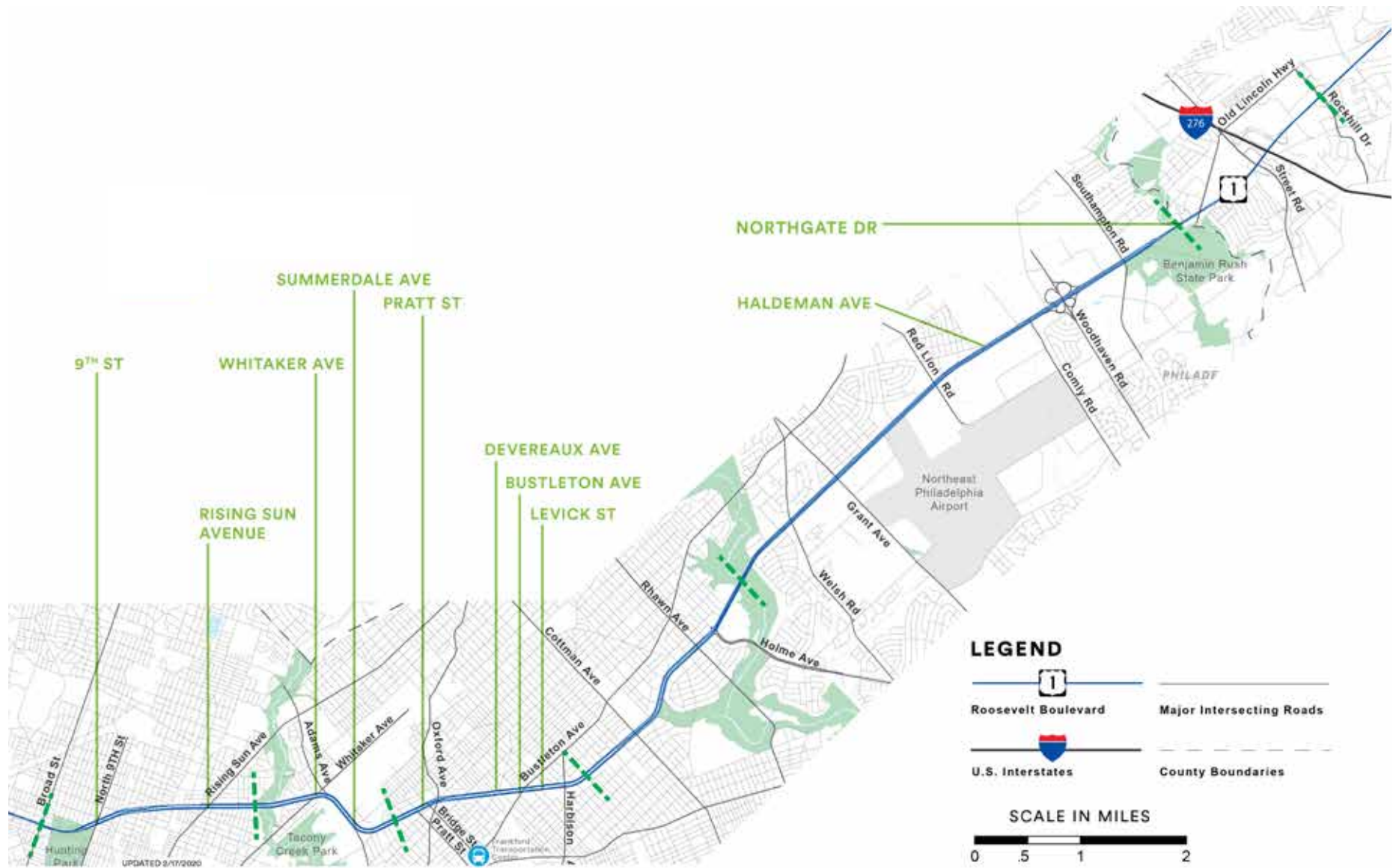


- Providing curb extensions along the Boulevard to reduce pedestrian crossing distances for people walking or biking
- Restricting access between the Boulevard and side streets to improve safety
- Realigning crosswalks to reduce crossing distances for people walking or biking
- Converting 90-second traffic signal cycles to 120-second cycles to change the intersection from a four-stage crossing to a two-stage crossing for people walking or biking.
- Changing signal phases so left turns follow the through movement phase, instead of going before the through movement. This is called changing the signal from a leading to lagging left turn. This allows an increase in time for people walking or biking to cross the Boulevard.

Alternative improvements that were not recommended due to negative impacts:

- Separated Left Turn Lane – Creating separated left turns lanes from the Boulevard to side streets in the center median to reduce congestion, similar to the left turns that currently exist at the Ryan Avenue and Rhawn Street intersections with the Boulevard. This improvement was eliminated because it would require extra time for people walking or biking to cross the Boulevard. In addition, there was little benefit at intersections where the volume of left turns from the Boulevard to side streets was high, but the volumes from the side streets to the Boulevard were not.
- Left-turn couplets – Left turns are allowed only in alternating directions from a pair of side streets to eliminate side street left turn congestion. This was eliminated since it required significant changes in direction of travel on the surrounding road network of Northeast Philadelphia.

Figure 4-11. 10 Locations Analyzed in Screen 4



Screen 5 – Testing Combination of Ideas at Additional Key Intersections

The combination of corridor-wide and intersection ideas that were cleared through Screen 4 were tested at 14 additional locations using Synchro and VISSIM as part of Screen 5. Testing these ideas required including adjacent intersections, expanding the screen to 42 intersections. The number of alternatives and types of potential improvements varied for each intersection.

Improvements from Screen 5 that advanced to Screens 6 include:

- Providing BAT lanes on the southern segment of the Boulevard, between 9th Street and Bridge Street, to improve transit travel time and reliability
- Providing offset left turns for the side streets to eliminate left-turn congestion and improve safety
- Implementing Michigan Left turns from the Boulevard to side street to reduce left turning vehicles from blocking through traffic on the Boulevard

- Restricting access between the Boulevard and side streets to improve safety
- Converting 'X' intersections to "Y" intersections to improve pedestrian safety and reduce side street crossing distances for people walking or biking
- Realigning crosswalks across the Boulevard to reduce crossing distances for people walking or biking
- Converting 90 second traffic signal cycles to 120 second cycles to change the intersection from a four-stage crossing to a two-stage crossing for people walking or biking

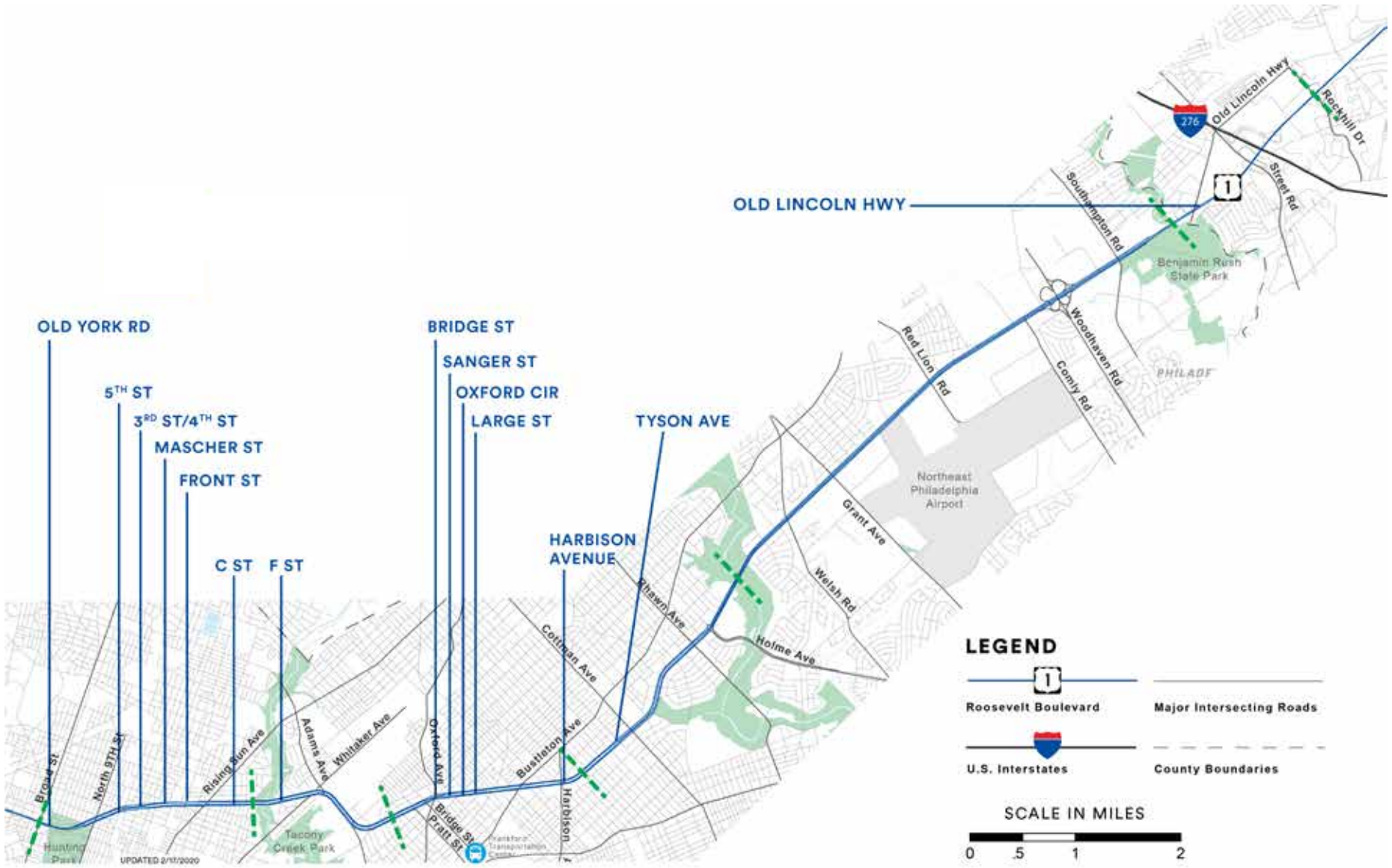
Alternative improvements that were not advanced due to negative impacts include:

- Side Street Curb Extensions – Providing side street curb extensions at side street intersections with the Boulevard were examined to shorten crossing distances for people walking and biking and prevent parking in crosswalks. These improvements were eliminated due concerns about restricting the capacity of vehicles to turn from the Boulevard to side streets and stormwater runoff to drains.
- Rerouting Direct Bus – Explore rerouting to eliminate a service gap between Bridge Street and Bustleton Avenue along the Boulevard. This improvement was eliminated due to increased travel time and limited increase in ridership.

Figure 4-12. 5th Street at Roosevelt Boulevard



Figure 4-13. 14 Locations Analyzed in Screen 5



Screen 6 – Testing the Network

Screen 6 tested all the ideas that advanced through Screens 1 through 5. It also included additional improvements for the 33 remaining intersections and side-street access points. These included ten mid-block pedestrian crossings. Rather than evaluating success at isolated locations, Screen 6 then incorporated all ideas for the 57 intersections into one networkwide VISSIM traffic model to evaluate whether the improvements would be successful when implemented together.

Currently, 24 intersections lack sufficient time for pedestrians to safely cross one direction of travel on the Boulevard to reach the center median. Signal timing adjustments eliminated this issue at 19 of these intersections. Signal timing adjustments combined with crosswalk realignments eliminated this safety issue at the remaining 6 intersections. In addition, compared to the 2025 no build model, Screen 6 found:

- More drivers reached their destinations in less time because of improved operations at many intersections.
- Vehicle travel times in the peak direction (southbound in the a.m., northbound in the p.m.) improved due to signal timing changes and geometric improvements.
- Bus travel time in both the peak and non-peak direction improved due to the BAT lanes, signal timing changes, and geometric improvements.
- Intersection delay was reduced at over half of the 47 signalized intersections (this excludes the 10 mid-block signalized pedestrian crossings) in the peak AM and PM hours.
- Intersection delay increased slightly at four intersections each in the AM and PM peak hours.

The results of Screen 6 analysis are detailed in Appendix 5.

Figure 4-14. Oxford Circle at Roosevelt Boulevard



Screen 6.2 – Updating and Testing the Network

While the Program intended Screen 6 to be the final step, additional alternatives were identified to improve the network operations. Some changes included new ideas to further improve the intersection operations, while others were needed as to address major changes to the Boulevard as a result of planned private development. The Program also completed two other traffic modeling exercises outside the screening, and their results created more refined improvements that were integrated into Screen 6.2. These exercises included the results from a subsequent VISSIM static traffic modeling along the S-Curve (Appendix 6) and the results from a Synchro traffic model that focused on crossover mitigations north of Bustleton Avenue to Woodhaven Road to improve BAT Lanes, Phase A operations (Appendix 7).

The seven new ideas along the Boulevard included:

1. **Bristol Street/Broad Street Intersection:** Converting the on-street parking lane of Bristol Street between Broad Street and the Boulevard to a travel lane to relieve a bottleneck in the AM peak hour. Results found southbound congestion at both Broad Street and Old York Road significantly improved. This improvement is recommended for implementation by 2025.
2. **9th Street:** Realigning 9th Street to shorten the crossing distance for people walking and biking across the Boulevard. The new configuration reduced pedestrian crossing distance across the Boulevard by 140 feet. However, the overall traffic volume and the volume of left turns from the Boulevard to 9th Street increased compared to Screen 6 due to the closure of 10th Street and the Boulevard. As a result, the new 9th Street intersection would become more congested compared to Screen 6 due to increased demand and a shorter storage area for vehicles in the center median of the Boulevard between the southbound and northbound inner (express) lanes. This idea to reconfigure 9th Street is recommended for further analysis to determine if these impacts can be adequately mitigated or if the additional congestion is acceptable.

Figure 4-15. Bristol Street at Roosevelt Boulevard



3. **S-Curve:** The intersections of Langdon Street and Summerdale Avenue/ Adams Avenue were jointly changed from improvements proposed in Screen 6. The changes included eliminating the BAT lane between Langdon Street and Summerdale Avenue/Adams Avenue in the northbound direction on the Boulevard and between Loretto Street and Whitaker Street in the southbound direction. Signal timing at Langdon Street was change to improve operations at this intersection compared to Screen 6. The improvement is recommended for implementation by 2025.
4. There are several changes at the **Summerdale Avenue/Adams Avenue intersection** including reducing the side streets to one through lane in both eastbound and westbound directions. The existing left turn lanes from northbound Boulevard onto Summerdale Avenue were included in Screen 6.2 and the Michigan left turn and pedestrian crosswalks at Allengrove Street proposed in Screen 6 were removed. The left-turn phase for vehicles turning left from the Boulevard to the side streets was changed from leading to lagging to improve operations. These changes resulted in increased congestion for the southbound inner (express) lanes and longer queues on side streets in the AM peak hour; however, these conditions are less than the Existing Conditions.

Figure 4-16. Adams Avenue (west) at Roosevelt Boulevard



There were no major changes to congestion in the PM peak hour. This improvement is recommended for further study to determine if these impacts can be adequately mitigated or if the additional congestion is acceptable.

5. **Comly Road (Private Development):** The former Nabisco site is being developed in phases, and the next phase includes closing Nabisco Drive and converting Comly Road to a full intersection. Results found congestion southbound on the Boulevard may worsen due to the changes proposed at Southampton Road. This improvement at Comly Road is planned for immediate implementation by a private developer; therefore, recommendations for Southampton Road may need further analysis.
6. **Woodhaven Road:** Converting Woodhaven Road westbound to Roosevelt Boulevard northbound to a signalized intersection with access to inner lanes. This change resolves weaving issues that occur at the northbound outer (local) to inner (express) crossover south of Southampton Road. This improvement is recommended for implementation.
7. **Southampton Road (Private Development):** Converting one southbound through lane on the Boulevard to a second southbound left turn lane, adding a second lane on both eastbound and westbound Southampton Road, and converting Southampton Road's eastbound and westbound approaches to the Boulevard to offset left turns reduced AM peak hour traffic to an acceptable level. However, additional analysis may be required to study impacts to Comly Road.

Overall, while some individual movements are congested, no signalized intersections along the Boulevard fail overall in the AM and PM peak hours in Screen 6.2. The traffic model results for Screen 6.2 are provided in Appendix 8.

Conclusion

The net effect of the broad range of the proposed geometric and operational improvement will result in significant improvements in safety, accessibility, and reliability for all users of the Boulevard. Chapters 5 and 6 each provide further details about recommended corridor-wide and specific intersection improvements resulting from the comprehensive screening process.

The screening process and modeling are only the first step in the process of transforming the Boulevard. Chapters 5, 6, and 7 of this report set priorities for implementation over the next five years. As improvements are advanced through design to construction, the Program will continue to engage the community and stakeholders to identify additional improvements or refinements to obtain additional benefits. The networkwide VISSIM model developed in Screen 6.2 will be a valuable tool for analyzing new ideas that are generated by that discussion.

CHAPTER

5

Recommended 2025 Corridorwide Improvements

This chapter describes several types of improvements:

- Pedestrian & Bicycle Safety Improvements
- Transit Accessibility Improvements
- Crossover Improvements
- Landscape Enhancements

Introduction

For the Boulevard to truly be a multimodal corridor that provides safety, accessibility, and reliability for all users, the Program has identified a series of improvements that can be implemented along the majority of corridor. These recommendations provide the opportunity to transform how the Boulevard operates as a system.

The Program’s rounds of public forums provided consistent feedback that improving the safety for all modes of travel is the most important issue, reinforced by the Boulevard’s traffic crash history. The first section of the chapter describes specific

improvements to make people who walk, bike, and ride transit feel both safe and comfortable while traveling along and across the Boulevard.

Public feedback also indicated the Boulevard must also be convenient, complete, and inviting. Next, the chapter outlines recommendations to address problematic crossovers and traffic signal cycles and phasing. Finally, the Program has identified landscape enhancements that reignites the original vision of the Boulevard as an inviting parkway that is pleasant to travel along. Both the original concept of the Boulevard as a parkway and the Program’s recommendations share the common vision that a well-designed roadway can be an asset to communities, not a divisive force.

Figure 5-1. Example of Narrow Pedestrian Refuge inside Median



Pedestrian and Bicycle Safety

The Route for Change Program recommends the following five types of projects to improve the safety of Boulevard travel for people who walk or bike:

- Changing Traffic Signal Cycle Times
- Realigning Crosswalks and Curb Ramps
- Building Curb Extensions
- Closing Sidewalk Gaps
- Extending the Bicycle Network to the Boulevard

Changing Traffic Signal Cycle Times

Crossing the Boulevard can be uncomfortable for people walking. The Boulevard's unique inner (express) and outer (local) lane configuration results in a typical roadway width of 240 feet from curb to curb in most sections, which is significantly larger than most crossings in an urban setting. In addition, several major roads cross the Boulevard at a skew, increasing the full crossing distance to over 300 feet, which is almost the length of a football field. Providing adequate pedestrian crossing time to go from one side to the other is a significant challenge in sections of the Boulevard where the existing traffic signal cycle operates on a 90-second cycle.

A traffic signal cycle is defined as the total time it takes a traffic signal to direct one sequence for all movements at an intersection and therefore define the permitted amount of time a pedestrian has to cross. In the instance of 90-second cycles, most pedestrians are able to cross one section, or three lanes, of the Boulevard per cycle. This means a person walking needs four cycles to cross all 12 lanes of the Boulevard, which could take up to six minutes. This is called a four-stage crossing. When the traffic signal cycle is set to 90 seconds on the Boulevard, people walking should cross three lanes of the Boulevard and then wait for the next cycle. The space for a person to wait is typically on a narrow channelized area between the outer (local) lanes and the inner (express) lanes. Some people naturally walk faster than others, and with the current 90-second cycles, they are often in the crosswalk of the next three inner (express) lanes when the walk time expires, putting them at risk of being hit by vehicles.

In order to improve this situation, the Program recommends increasing the 90-second signal cycle to 120 seconds in order to provide more time for people to cross and to reduce the chance of people getting caught in the middle of travel lanes while crossing. This will improve the safety of pedestrians while also reducing the time and frustration involved for a person crossing the Boulevard.

Currently, there are 25 signalized intersections along the Boulevard that have 90-second signal cycles and are recommended to be changed to 120-second signal cycles. One intersection, Oxford Circle has a 60-second cycle. Table 5-1 lists the 26 intersections recommended for an increase to 120 second signal cycles by peak traffic period. Of these, 20 intersections are recommended to be adjusted to provide sufficient time for people walking to safely cross six travel lanes of the Boulevard to reach the center median. At six other intersections, the Program also recommends increasing the signal cycles to 120 seconds to maintain consistency.

Figure 5-2. Traffic Signals at Wyoming Avenue and Roosevelt Boulevard



Table 5-1. New 120-Second Signal Cycles by Time of Day

| No. | Intersection Name | Segment Number | Peak Period (AM/PM) |
|-----|------------------------------|----------------|---------------------|
| 1 | 9th Street | 1 | AM |
| 2 | 7th Street/Wyoming Avenue | 1 | Both |
| 3 | 5th Street* | 1 | Both |
| 4 | 3rd Street/4th Street | 1 | Both |
| 5 | 2nd Street/Banks Way | 1 | Both |
| 6 | Mascher Street | 1 | Both |
| 7 | Front Street | 1 | Both |
| 8 | Rising Sun Avenue | 1 | Both |
| 9 | B Street | 1 | Both |
| 10 | C Street | 1 | Both |
| 11 | D Street/Rorer Street* | 1 | Both |
| 12 | F Street/Herkness Street | 2 | Both |
| 13 | Whitaker Avenue/Adams Avenue | 2 | Both |
| 14 | Pratt Street | 3 | Both |
| 15 | Bridge Street | 3 | Both |
| 16 | Sanger Street* | 3 | Both |
| 17 | Oxford Circle* | 3 | AM |
| 18 | Large Street | 3 | Both |
| 19 | Devereaux Avenue | 3 | Both |
| 20 | Bustleton Avenue | 3 | Both |
| 22 | Levick Street | 3 | Both |
| 23 | Harbison Avenue | 3 | Both |
| 24 | Unruh Avenue * | 3 | Both |
| 25 | Longshore Avenue* | 4 | Both |
| 26 | Tyson Avenue | 4 | Both |

**Increased to maintain consistent 120 second cycle traffic signals along the Boulevard*

Except for Oxford Circle, which is 60 seconds, all remaining intersection signals on the Boulevard are 120 second cycles. In addition, three intersections near the Boulevard would be increased from 90 second cycles to 120 second cycles: Whitaker Avenue and Adams Avenue, Bustleton Avenue and Levick Street, and Hellerman Avenue and Bustleton Avenue.

Figure 5-3. Skewed Crosswalk at Ninth Street and Roosevelt Boulevard



Realigning Crosswalks and Curb Ramps

Typically, pedestrian crosswalks are oriented at right angles across a street to make the shortest pedestrian crossing distance. This means the pedestrian has less exposure in front of a vehicle, lessening their chance of getting hit by a car. However, many of the Boulevard’s side streets are skewed, resulting in a longer crossing distance for pedestrians, and longer exposure to vehicles when crossing the Boulevard.

Crossing distances would be reduced to provide enough time for pedestrians to safely cross the Boulevard in two signal cycles at 11 intersections. This can be done by straightening crosswalks and adjusting curb ramp locations. This would be done in coordination with increasing the traffic signal cycle to 120 seconds at six intersections. These improvements would reduce pedestrian wait time and improve safety, creating an incentive for pedestrians to cross in the permitted time. Crosswalk realignments are proposed at five other intersections to improve pedestrian safety.

The Program recommends straightening or realigning the pedestrian crosswalks and adjusting curb ramp locations at the intersections listed in Table 5-2. As these intersections move into engineering, the Program recommends the crosswalk design allow pedestrians to walk in the most direct path possible, providing a safer way to cross the Boulevard.

Table 5-2. Crosswalk Realignment Locations

| No. | Intersection Name | Segment Number |
|-----|---------------------------------------|----------------|
| 1 | 9th Street* | 1 |
| 2 | Front Street* | 1 |
| 3 | Rising Sun Avenue* | 1 |
| 4 | Summerdale Avenue/Adams Avenue (east) | 2 |
| 5 | Large Street* | 3 |
| 6 | Devereaux Avenue* | 3 |
| 7 | Bustleton Avenue* | 3 |
| 8 | Revere Street/Faunce Street | 4 |
| 9 | Fulmer Street/Whitman Square | 5 |
| 10 | Haldeman Avenue | 5 |
| 11 | Comly Road | 5 |

** Done in coordination with increasing the traffic signal cycle to 120 seconds.*

Curb ramps, which are a short ramp cutting through a curb in order to provide safe access between a sidewalk and roadway, are critical in making sidewalks and street crossings accessible, especially for people with disabilities. It is difficult for a person using a wheelchair, walker, another type of mobility device, or pushing a stroller to cross a street if there is no curb ramp.

Title II of the Americans with Disabilities Act (ADA) requires state and local governments to make pedestrian crossings accessible by providing compliant curb ramps, which includes specific standards for placement, width, slope, cross slope, and other characteristics. Compliant curb ramps are also needed for medians or traffic islands within the road that are in the path of a crosswalk. PennDOT lists non-compliant curb ramps along the Boulevard in their “Transition Plan for Compliance with the Requirements of Title II of the American with Disabilities Act of 1990.” By Spring 2021, PennDOT expects to begin a project to update over 150 curb ramps at Boulevard intersections. The Program recommends curb ramps to be upgraded as part of any changes to crosswalk locations or intersection modifications.

Building Curb Extensions

The Program recommends curb extensions at ten signalized intersections with crosswalks to order to further reduce pedestrian crossing distances. These ten intersections currently have long pedestrian crossing distances because of the Boulevard's skew relative to side streets. All ten are also within a one-mile section of Roosevelt Boulevard that would not benefit from the installation of BAT lanes because of a limited amount of SEPTA Route 1 local buses that use the Boulevard between Pratt Street and Bustleton Avenue.

Curb extensions along Roosevelt Boulevard, coupled with on-street parking in between the extensions, will create two travel lanes in the outer (local) lanes in both the southbound and northbound direction. This design will reduce driver confusion by providing the same number of outer lanes for non-bus and right-turning traffic as the adjacent segments of the Boulevard that are proposed to have BAT lanes. Curb extensions will reduce the pedestrian crossing distance by up to 24 feet at perpendicular intersections, and an even greater distance at skewed intersections, improving pedestrian safety and reducing crossing time. The Program recommends allowing on-street parking to occur in the outermost lanes of the Boulevard in order to increase the supply of parking and to create a buffer between people waiting to cross and moving vehicles. The curb extensions create a safer and more comfortable crossing experience for pedestrians.

Figure 5-4. Curb Extension Example



Curb extensions are not recommended within the outer lanes of Oxford Circle because of the high volumes of vehicles turning right onto Oxford Avenue, Cheltenham Avenue and Castor Street (northbound only). Along northbound Roosevelt Boulevard, the curb extension treatments end north of the unsignalized intersection with Oakland Street as the outermost lane of the Boulevard is needed as a right turn lane onto eastbound Devereaux Avenue.

Figure 5-5. Proposed Curb Extension Locations



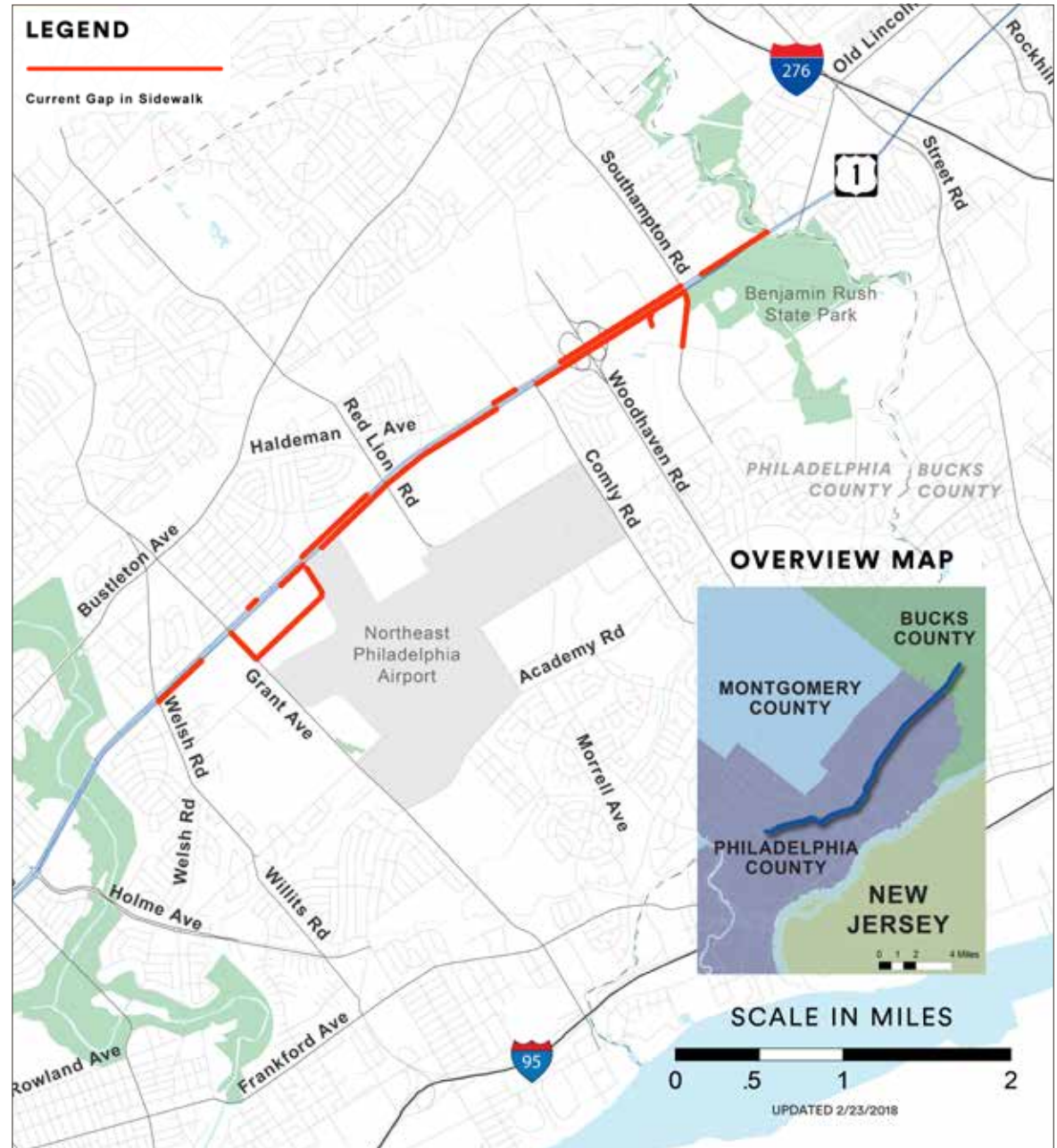
Closing Sidewalk Gaps

As described in Chapter 2, there are numerous generators of pedestrian activity along the Boulevard north of Pennypack Park, and a complete sidewalk network is critical to ensure safer access to and from these businesses and institutions. Transit riders also benefit from a complete sidewalk network because they can safely access bus stops, and sidewalks, curb ramps, and crosswalks provide the safest path for people to take when transferring between bus routes. Without them, people are forced to cross at unsignalized locations, putting them at risk.

It is important to note that, when possible, the Program recommends constructing a 10- to 12-foot-wide asphalt sidepath as an alternative way to fill gaps in the sidewalk network. A sidepath provides space to accommodate both people walking and biking, facilitating safe connections.

The Program recommends working with individual property owners to remedy these gaps and to improve pedestrian safety. Figure 5-6 illustrates the location of sidewalk gaps in the Program area.

Figure 5-6. Current Philadelphia Sidewalk Gaps



Extending the Bicycle Network to the Boulevard

Currently, the speed of vehicles traveling along the Boulevard does not allow for an in-road bicycling environment. Despite non-existent bicycle facilities, people do bicycle because the Boulevard is the front door to many jobs, services, and industries. However, most are forced to bicycle on sidewalks and through parking lots because there are no acceptable facilities, putting themselves and pedestrians at risk.

The existing bicycle network in Northeast Philadelphia is sporadic and disconnected. There are major links along and adjacent to the Boulevard that serve those who bicycle, including Rising Sun Avenue, Oxford Avenue, parts of Bustleton Avenue, and several trail links, such as the Tacony Creek Trail, Pennypack Trail, and Benjamin Rush State Park trails. These links are largely painted bike lanes that are adjacent to parked cars. However, the City's first two-way protected bike lane (PBL) was built in 2016 along Ryan Avenue, between Lexington and Rowland Avenues, which is located just east of the Boulevard, adjacent to Pennypack Park and two schools. A two-way PBL is a safety improvement designed to provide a protected space from moving vehicles, where people bike between the sidewalk and a parking lane. It is separated from the parking lane by a painted buffer and flexible delineator posts. The painted buffer allows passengers to safely enter and exit parked cars without obstructing bicycle traffic.

Confirmed by feedback from participants at Public Forum Round 3 (February 2018) and Public Forums Round 4 (November 2018), the Program developed the 2025 recommendations for bicycle network improvements based on two overarching goals:

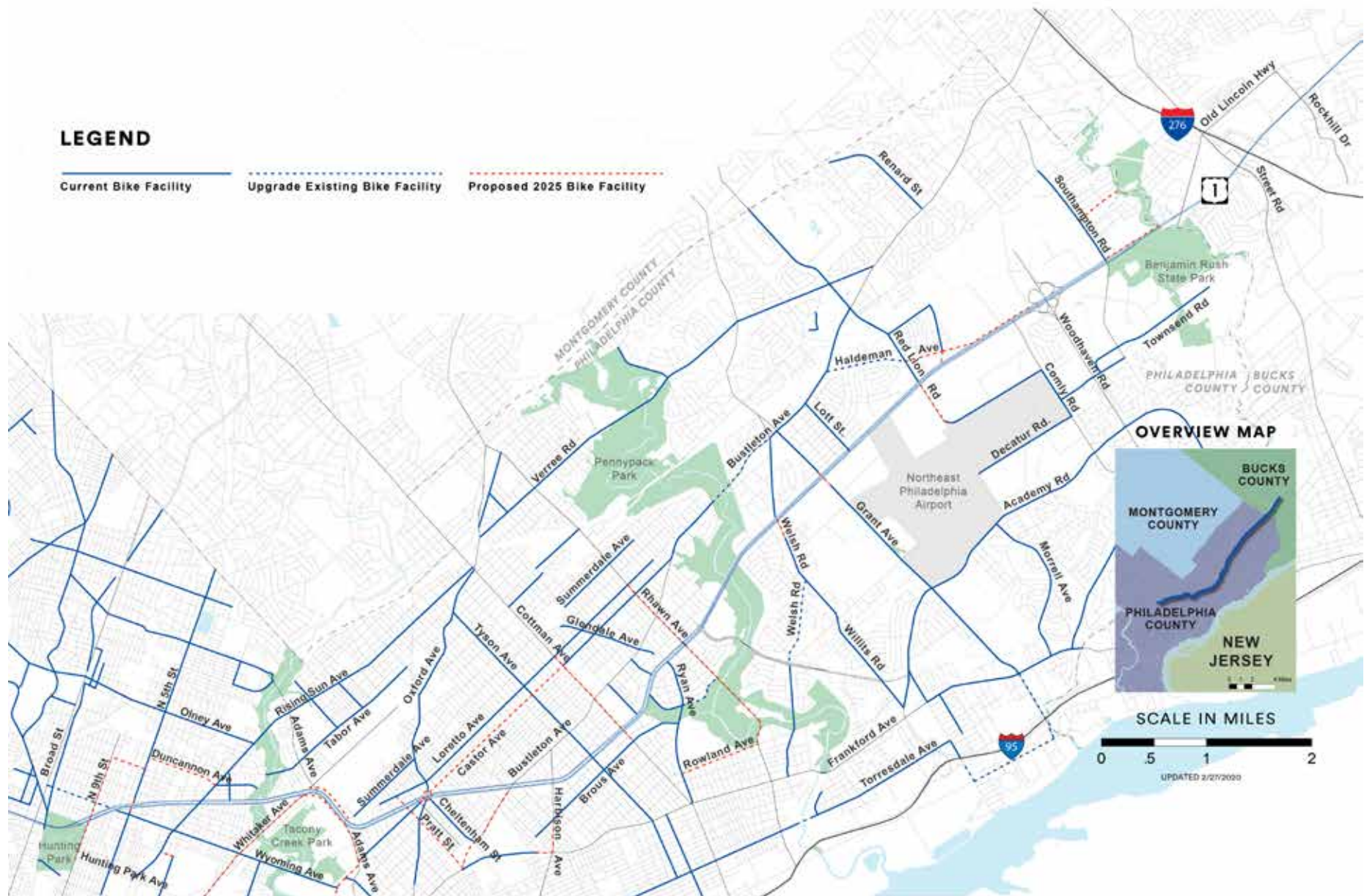
- Increase connections to the Boulevard, especially at existing and proposed Direct Bus stations; and
- Develop a strategy to fill in key bicycle network gaps on roads adjacent to the Boulevard

While the City of Philadelphia's 2012 Pedestrian and Bicycle Plan recommends a sidepath along Roosevelt Boulevard, from 9th Street to the Philadelphia County line shared with Bucks County, engineering best practices and the majority of feedback from Public Forums participants directed the Program to first manage vehicular speeds through engineering and enforcement before introducing bicycle facilities along the Boulevard. Therefore, the Program recommends the City and its partners concentrate its efforts to build out a bike network that connects to the Boulevard before moving forward building a high-quality bike facility along the Boulevard, as illustrated in Figure 5-7.

Figure 5-7. Shared use paths are proposed along N. 5th Street to safely connect cyclists to the Boulevard Direct, Phase B stops.



Figure 5-8. Proposed Interim Bike Network



Transit Accessibility

Despite congestion and reliability issues, Roosevelt Boulevard is one of Philadelphia's most heavily used transit corridors, as it is the most frequent and highest capacity transit corridor in SEPTA's network outside of Center City. Informed by SEPTA's report, "Improving Transit on Roosevelt Boulevard: Focus 2025," Chapter 2 of this report outlined the network of transit service along the Boulevard. While there is a network of 28 bus routes traveling along or crossing the Boulevard, it is remarkable how indiscernible transit is along the Boulevard today.

Currently, there are 142 SEPTA bus stops along Roosevelt Boulevard in Philadelphia, but only 22 stops (or 16 percent) have bus shelters. There are an additional five bus stops along U.S. 1 in Bucks County, but only two have bus shelters. Beyond the shelter itself, bus stops generally are devoid of other desired amenities such as bicycle parking, seating, station lighting, route maps, and real time information. Most SEPTA bus stops are designated only by a standard SEPTA bus route sign, and many stops have limited visibility as vehicles and trees obstruct the view of approaching buses. Making transit more visible along the Program area took a major leap when the City constructed new, high quality bus stations at the Direct Bus, Phase A stops, which set the bar for making more bus stop improvements along the full corridor. The Program recommends three types of transit accessibility improvements: implementation of Direct Bus Phase B, local bus stop enhancements, and Business Access and Transit (BAT) lanes.

Direct Bus, Phase B

Building on the success of Phase A of Direct Bus, Phase B will give transit riders a more frequent and reliable transit option along the southern end of the Boulevard. Phase B will include 11 new local/Direct bus stations at signalized intersections along the Boulevard. The route will leave Frankford Transportation Center (FTC) via Pratt Street to then travel south along the Boulevard to N. Broad Street. The route would then travel along Hunting Park Avenue, Allegheny Avenue, and Ridge Avenue, stopping at a series of local/Direct bus stations, and ultimately connect to the Wissahickon Transportation Center (WTC). The buses would return to FTC by making a right turn off of the Boulevard onto Bridge Street (see Figure 5-9).

Direct Bus, Phase B will make significant improvements to existing local bus stops. New bus stations will serve both the local bus routes and the Boulevard Direct service. Stations will include new plazas, curbs, and ramps, a bus shelter, seating, pedestrian-scale lighting, and trash-recycling combo receptacles. The stations are also being prepared for real time bus arrival information.

During weekday peak rush hour travel (7 to 9 a.m. and 3 to 6 p.m.), Boulevard Direct Phase B buses are expected to run every 10 minutes, with service every 15 minutes during most other periods. All regular SEPTA fares will be accepted on Boulevard Direct.

Figure 5-9. Direct Bus, Phase B Route



In addition to the recommendation to implement Direct Bus Phase B, the Program recommends more significant enhancements at the southbound stop located at the intersection of N. Broad Street and the Boulevard (see Figure 5-10). This intersection is the crossroads of multiple transit lines and serves SEPTA Routes R and 1, which travel along the southern end of the Boulevard. The local bus stop is located on top of SEPTA's Broad Street Line (BSL), and the site of a portal for the Hunting Park station for southbound BSL. The triangle shape, formed by the intersection of Roosevelt Boulevard, N. Broad Street, and Bristol Street, currently is underutilized; however, additional amenities and programming invites more people to use the space alongside transit riders.

In December 2017, the Program held a pop-up meeting on-site at this intersection, where feedback from passersby, along with public input gathered during Public Forum #3 (February 2018) helped shape conceptual design ideas for enhancing the triangle space. As shown in Figure 5-11, ideas in addition to the standard Direct Bus station amenities include additional tree plantings, an upgraded newsstand, circular wooden benches with landscaping, and bike racks. The improved triangle will create a lively gateway to the Boulevard for all users.

The Program recommends implementing Direct Bus Phase B, including the new stations and second bus service, as an early action. In 2018, the City was awarded a PennDOT Multimodal Transportation Fund (PennDOT MTF) grant and a Transportation Alternatives Set-Aside grant to construct eight Direct Bus stations at Pratt Street, Langdon Street, Rising Sun Avenue, and Broad Street. In 2019, SEPTA received funding from FTA as part of its Buses and Bus Facilities Program, which will fund the construction of the Direct Bus stations along Hunting Park Avenue and Ridge Avenue. The City and SEPTA are coordinating the design of both projects, and construction is expected in the next three years.

Figure 5-10. Existing Broad Street Triangle



Figure 5-11. Proposed Direct Bus Phase B Improvements



Local Bus Stop Improvements

To develop a strategy for local bus stop improvements, the City and SEPTA completed a site audit and bus stop ridership analysis to propose recommendations for changes at each of the existing 142 local bus stops along Roosevelt Boulevard, from Broad Street to the Philadelphia County line shared with Bucks County. (See Appendix 9)

The Program recommended one of four actions at each local bus stop:

- Direct Bus Station
 - » Bus stops to be transformed into Direct Bus station
- Improvements Planned or Previously Completed
 - » Relocate the bus stop
 - » Install a new bus shelter
 - » Add seating at the bus stop
 - » Construct a concrete landing pad at the bus stop
- No Change Needed
 - » New shelter previously installed as part of City Street Furniture Program
 - » Bus stop has already been improved with a new bus shelter
 - » Bus stop does not require any other changes
- Stop Elimination
 - » Eliminate bus stops not adjacent to a signalized crossing of the Boulevard and side streets
 - » Eliminate bus stops located very close to another existing bus stop

The site audit focused on rider safety, which provided the framework to decide whether the local bus stop should be improved or eliminated. All local bus stops were reviewed for ADA- accessibility and whether riders can safely cross the Boulevard at a signalized intersection.

The number of riders impacted by the change informed the recommendation. For example, bus stops with over 75 or more daily riders boarding were recommended to have a new bus shelter, where bus stops with between 40 and 75 riders boarding per day were identified as locations to explore seating.

Recommendations to eliminate the bus stop focused on stops where there was

inadequate pedestrian infrastructure, or if the spacing between bus stops was too close, which often disperses a low number of riders to multiple stops, creating operational challenges and increasing travel time. The Program strived to have no more than 1,300 feet between two bus stops.

Of the 142 bus stops on Roosevelt Boulevard, 53 (44 percent) were classified as "Improvements Planned or Previously Completed." This is in addition to the 24 stops (17 percent) that will be or have been transformed into Direct Bus stations. To improve rider safety, 37 stops (26 percent) are proposed to be eliminated; however, these stops serve only 8 percent of boardings per day. Taken together, improved local stops and Direct Bus stations will serve upwards of 95 percent of riders on Roosevelt Boulevard after riders shift from eliminated stops to adjacent, improved stops.

Table 5-3. Local Bus Stop Modifications

| | Number of Stops | Percent of All Stops | Number of Daily Boards | Percent of all Daily Boards |
|--|-----------------|----------------------|------------------------|-----------------------------|
| Direct Bus | 24 | 17% | 13,464 | 58% |
| Improvements Planned or Previously Completed | 62 | 44% | 7,090 | 31% |
| No Change | 19 | 13% | 739 | 3% |
| Stop Elimination | 37 | 26% | 1,791 | 8% |

Prior to making any changes to the local bus stops, the City and SEPTA will develop a public education campaign to communicate the plan. **Once the improvements are complete and recommended bus stops are eliminated for safety, almost every rider will board a bus at either a Direct Bus stop or an improved local bus stop.** This will be a significant improvement for the over 20,000 people who ride the bus along Roosevelt Boulevard.

Figure 5-12. People Waiting for the Bus



Business Access and Transit Lanes (BAT lanes)

Installing Business Access and Transit (BAT) lanes in the outermost (local) lanes in each direction of the Boulevard is another strategy to improve transit services. Called BAT lanes, they provide space for buses to travel separately from general through traffic, only encountering vehicles in the lane that want to make right turns either at a driveway or side street. Right-turning vehicles would typically be allowed to travel in the BAT lane for a short distance before turning, although this length may vary based on right-turn volumes. BAT lanes have been installed to facilitate express bus travel in many cities nationwide, including New York City, Seattle, and Chicago. Figure 5-13 and Figure 5-14 illustrate examples of peer cities pavement markings for BAT lanes. Additional information regarding design options is provided in Appendix 10.

Installation of BAT lanes is expected to reduce bus travel time along the Boulevard, contributing significantly to the improvement of accessibility and reliability for transit riders. Generally, BAT lanes would change the Boulevard's outer (local) lanes to two general traffic lanes in each direction for most of the Program area within the City of Philadelphia. BAT lanes are not recommended between Pratt Street and Bustleton Avenue due to low number of buses traveling in this segment of the Boulevard.

The BAT lane recommendations are broken into two phases:

- Phase A – The City of Philadelphia, PennDOT, and SEPTA are working together to install BAT lanes between Bustleton Avenue and just north of Southampton Road prior to 2025; therefore, the Program included this improvement in the 2025 “no-build” traffic model (see Chapter 4).
- Phase B – The Program recommends the installation of BAT lanes between 9th Street and Pratt Street along the southern end of the Boulevard. BAT lanes are not proposed in southbound direction of the S-Curve between Summerdale Avenue and Adams Avenue (west) and in the northbound direction between Langdon Street and Adams Avenue (east) because it would significantly congest traffic in peak periods (see Appendix 8). The Program recommends additional analysis and community outreach in order to better understand its impact to on-street parking, which is permitted during off-peak hours. Therefore, the Program has included the Phase B recommendations in the 2025 Build traffic model in order to understand how its inclusion works with the other 2025 recommendations.

Figure 5-13. Business Access and Transit (BAT) Lane Example



Figure 5-14. Business Access and Transit (BAT) Lane Example



Crossover Improvements

The Program investigated potential impacts of implementing BAT Lanes Phase A on crossover operations in the northern segment of Roosevelt Boulevard, which includes 34 crossovers (Figure 5-16) north of Bustleton Avenue in both northbound and southbound directions. The purpose of the analysis was to identify modifications needed to the crossovers should there be an increase in the number of vehicles wanting to shift from the outer (local) lanes to the inner (express) lanes due to the BAT lanes.

The detailed analysis (Appendix 7) shows that the majority of the crossovers do not require mitigation. As shown in Table 5-4, five crossovers are identified to be extended to safely accommodate a potential increase in traffic:

Table 5-4. Recommended Crossover Extensions

| Segment | Location | Blvd Direction | Type | Recommended Increase |
|---------|-------------------|----------------|----------------------|---------------------------|
| 4 | Faunce Street | Southbound | Outer to Inner Lanes | 90 Feet to 255 Feet Total |
| 4 | Strahle Street | Southbound | Outer to Inner Lanes | 35 Feet to 120 Feet Total |
| 5 | Winchester Avenue | Northbound | Outer to Inner Lanes | 55 Feet to 200 Feet Total |
| 5 | Michener Street | Southbound | Outer to Inner Lanes | 20 Feet to 120 Feet Total |
| 5 | Fulmer Street | Southbound | Outer to Inner Lanes | 35 Feet to 160 Feet Total |

In addition to these five crossover extensions, the Program recommends mitigation to four additional crossover locations:

1. Bradford Terrace (northbound) – In Segment 3, the mitigation includes relocating the northbound Bradford Terrace (inner to outer) crossover. This location is forecast to have high levels of queuing in the 2025 PM “no-build” traffic model. Adding a BAT lane would result in longer queues at the Harbison Avenue intersection which, in turn, would block the Bradford Terrace crossover. The queues from the Bradford Terrace crossover, in turn, would block the Hellerman Avenue northbound (outer to inner) crossover. To mitigate this bottleneck, the Program recommends moving Bradford crossover north of Unruh St and extending it by 65 feet to 200 feet.
2. Revere Street (northbound) – In Segment 4, the mitigation moves the northbound crossover at Revere Street (outer to inner) a half block south and extends it to 250 feet. The relocation is needed because the existing grade difference between the inner and outer lanes makes it infeasible to safely extend the crossover on the north. As part of the recommendation, the midblock crosswalk south of Revere Street would be re-aligned further north to tie in at Revere Street. The offset of the crosswalk between the northbound and southbound lanes would be maintained to discourage pedestrians from crossing the Boulevard in one traffic signal cycle. The existing northbound bus stop next to the crosswalk would also be moved to Revere Street.

3. Crown Way (northbound) – In Segment 5, the mitigation is for the northbound crossover (outer to inner lanes) near Crown Way, which is recommended to be removed and the terminus of the westbound Woodhaven Road off-ramp to northbound Roosevelt Boulevard would be converted to a signalized intersection. The new intersection would include access through the northbound side median to allow vehicles coming off of the Woodhaven Road off-ramp to have immediate access to the inner northbound lanes of the Boulevard. This improvement resolves the safety concerns related to the weaving that occurs at the Crown Way crossover for vehicles traveling from westbound Woodhaven Road to westbound Southampton Road. It also provides better access to Hornig Road for vehicles coming from westbound Woodhaven Road. Vehicles traveling along the Boulevard’s northbound outer lanes can shift to the inner lanes at the Plaza Drive northbound (outer to inner) crossover, south of the Woodhaven Road interchange.

4. Crown Way (southbound) – In Segment 5, the mitigation is for the southbound Crown Way crossover (inner to outer) to be removed to reduce conflicts and improve safety. This crossover is not necessary as it is only 2,400 feet from the point where southbound Roosevelt Boulevard splits into an inner and outer facility, just after entering the City of Philadelphia. It is also recommended that new signage be installed prior to the split so drivers are better informed about choosing the inner or outer lanes.

A similar traffic simulation analysis of potential crossover mitigations measure should be conducted for the BAT Lane, Phase B described previously.

Figure 5-15. Crossover Example



Landscape Enhancements

The history of parkways suggest that a road can provide both transportation connectivity and a pleasant environment for travelers. The width and length of Roosevelt Boulevard provides the opportunity to make landscape improvements that will enhance the experience of its multimodal travelers, strengthen the Boulevard's aesthetics, and bring attention to its multicultural fabric by providing ecological enhancements and public art statements.

Precedent Analysis

To develop recommendations for landscape improvements, the Program began by defining five key components for landscape recommendations – site elements, planting design, plant maintenance and stewardship, lighting, and signage and wayfinding. Key questions were defined for each component:

Site Elements

- Is there a consistent functional element that can also be monumental and attractive?
- Is there a feature that can become a signature element of the Boulevard to support a positive identity?
- Can a feature help make drivers and pedestrians more aware of each other?

Planting Design

- Is there a planting strategy that could become iconic to the Boulevard?
- Would the location and frequency of trees help visually narrow the road and slow traffic?

Plant Maintenance and Stewardship

- What is the extent of the landscape maintenance being performed along the Boulevard?
- How does maintenance differ along various sections of the Boulevard?
- How can new planting strategies improve the aesthetics and lower the maintenance burden?
- Why were previous plantings along Boulevard Direct unsuccessful?

Figure 5-16. Existing Street Trees



Lighting

- What modifications are needed to the existing lighting along the Boulevard?
- Can lighting be improved to increase visibility for all users?

Signage and Wayfinding

- Where is signage cluttered? How can it be improved?
- What standards should govern signage?
- What signage is not compliant with the governing standards?
- Have active informational signs been considered? Who would manage content?
- Does the inventory of private signs clutter the Boulevard and make it more difficult to navigate?

Figure 5-18. Narrow Side Median without Plantings



Figure 5-17. Mature Trees in the Center Median



Figure 5-19. Narrow Side Median with Mature Trees



The Program then reviewed boulevards around the world for inspiration. Urban multi-way boulevards and parkways, ranging from historic to modern, were examined, with the intent of extracting successful qualities to inform landscape recommendations for the Boulevard. Two boulevards, West Street in New York City and Avenida 9 de Julio in Buenos Aires, provided framework ideas to develop a landscape typology for the Boulevard.

- **West Street, New York City:** While not a multi-way boulevard, West Street carries a similarly high volume of vehicular traffic with pedestrian crossings at signalized intersections as Roosevelt Boulevard. Unlike Eastern Parkway in Brooklyn, most of West Street’s medians are not intended for pedestrian use. Rather, the medians generally have raised plant beds filled with trees and a tapestry of shrubs that create green walls to divide modes of travel. A generously proportioned shared use path parallels the roadway. Low site walls and plantings in the medians create friction to help slow vehicular speeds. The intensity of plantings creates a pleasant pedestrian experience adjacent to a roadway that is much more like a highway than a parkway or boulevard.
- **Avenida 9 de Julio, Buenos Aires:** This extraordinarily wide multi-way thoroughfare is home to many vehicular lanes with complex turning movements, a bus rapid transit system, and wide outer medians with linear park-like elements. While the high-density development surrounding it was unique compared to the examples researched, the Avenida shares common features of other successful roadways, including wide outer medians that are lined with tightly spaced rows of trees traversed by a wide walkway with well-defined pedestrian crossings. Without its dense tree canopy, the feel of this road would be significantly different and quite harsh. Both the pedestrian and vehicular environments are well-lit with clear wayfinding signage. However, in spite of these efforts, such a wide road is inherently difficult to traverse, and separates neighborhoods.

Figure 5-20. West Street



Figure 5-21. Avenida 9 de Julio



Landscape Typologies

The Boulevard was conceptually divided into two basic landscape typologies, which are illustrated in Figure 5-22 and Figure 5-23.

As shown in Figure 5-22, Typology 1 characterizes the southern end of the Boulevard. It is predominantly fronted by well-established residential neighborhoods, and the cross-section is fairly consistent. Generally, the outer refuge median is the smaller of the green spaces and the center median is 60 to 80 feet wide. Based on the principles seen in Frederick Law Olmsted's and Calvert Vaux's vision for Eastern Parkway, the hierarchy of the existing green spaces are in the wrong places. The widest of the green spaces should be at the outer medians, which would be closer to the residential frontage and separate the outer lanes that have slower local traffic with the inner express lanes with faster traffic. As a result, the center median is currently not a place for respite. The outer medians, even at the narrowest locations, primarily provide pedestrian refuge at crosswalks.

Typology 2 characterizes the section of the Boulevard past the Pennypack Park, which was built later (see Figure 5-23). It is much more variable in both its physical makeup and roadway frontage, which is predominantly commercial and retail use. In this typology, a single wide median in the center is not present. Rather, more green space is given to the two side medians. Compared to Typology 1, the center median width is reduced because there are more left turning lanes for the greater density of commercial and retail use. In many locations, both the center and side medians narrow to approximately five feet, which does not provide a comfortable amount of pedestrian refuge from the volume and speed of vehicles along the Boulevard.

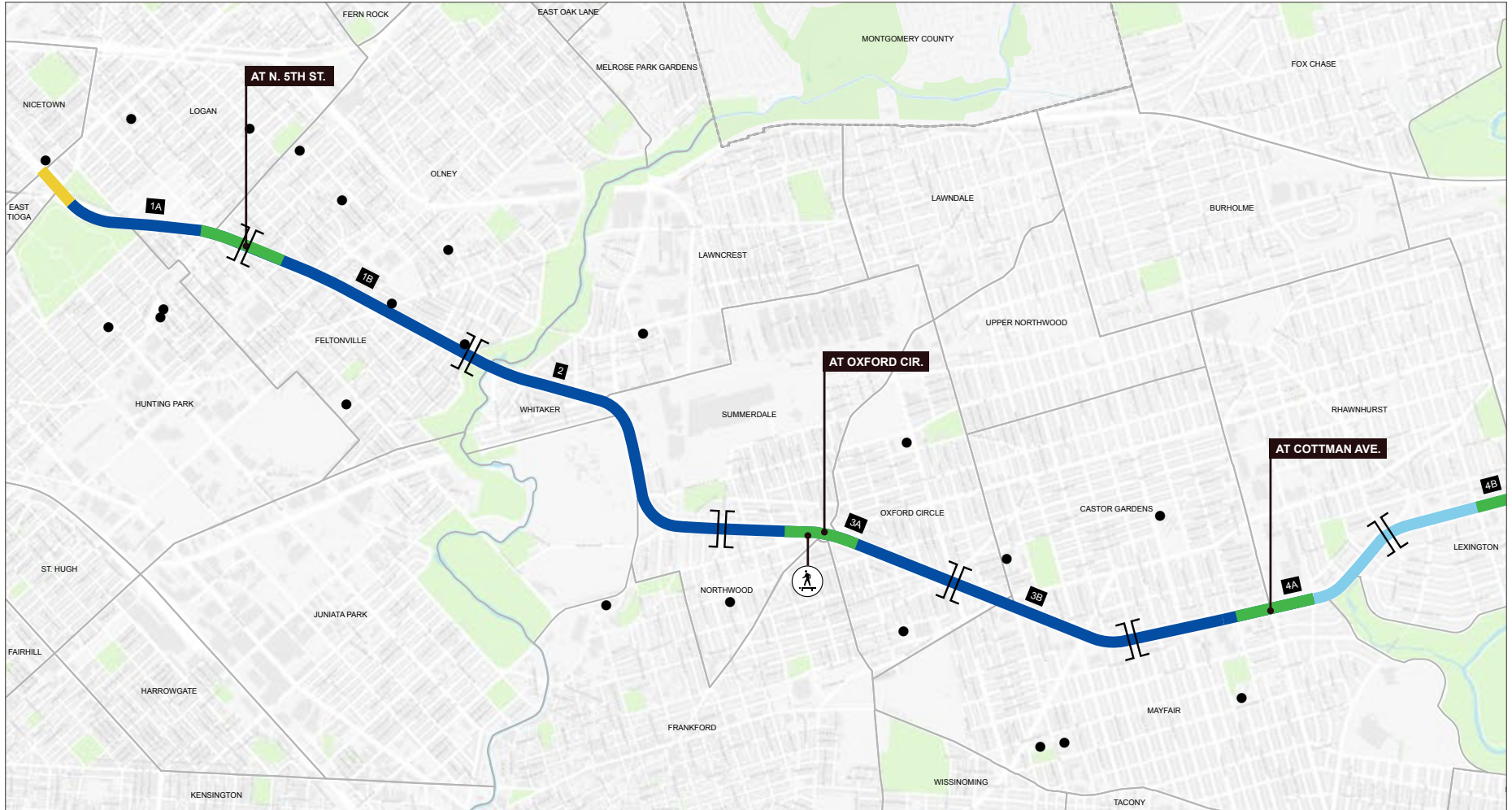
Figure 5-22. Typology 1 Example

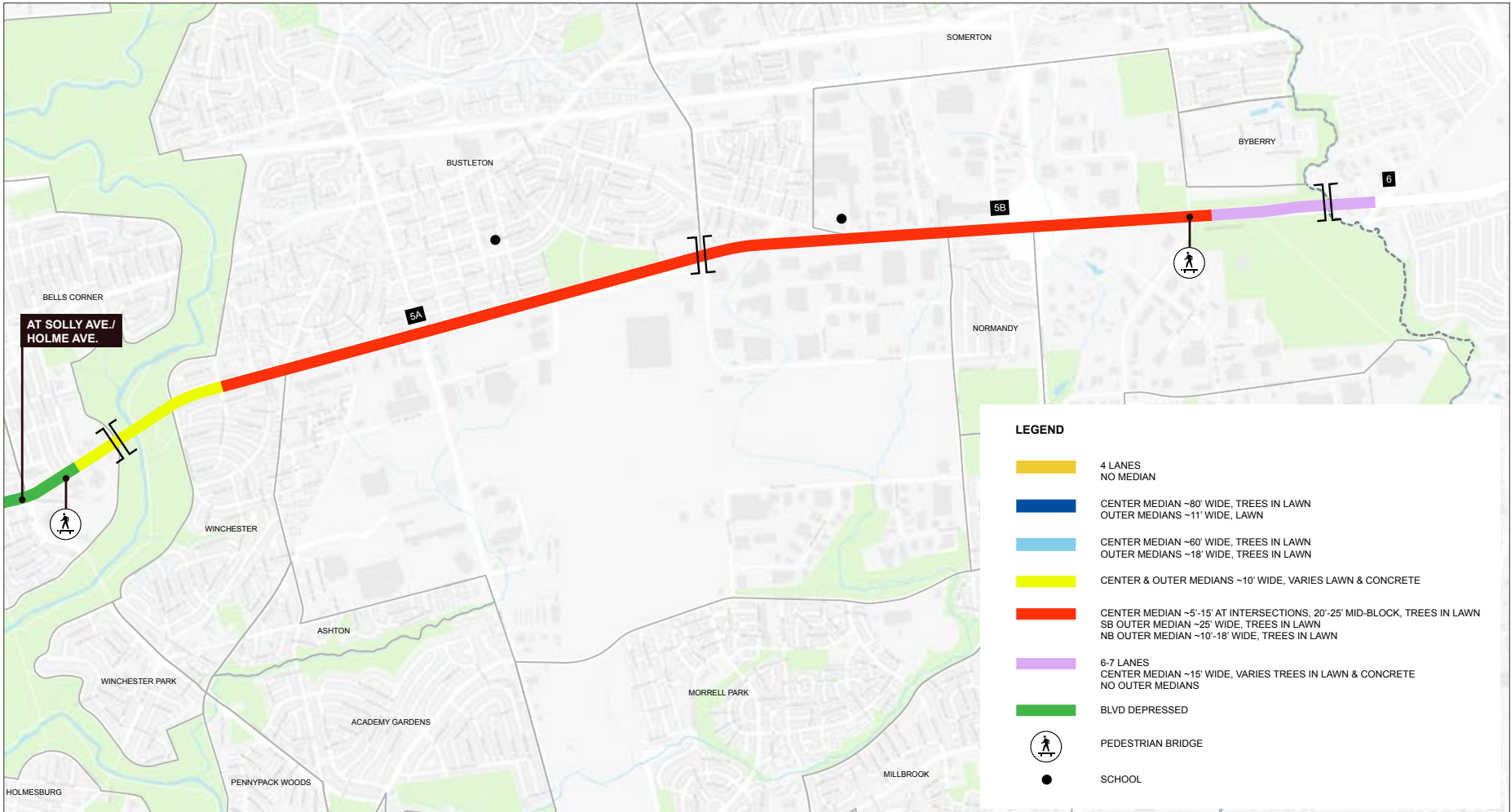


Figure 5-23. Typology 2 Example



Figure 5-25. Boulevard Character Map





A More Ecologically Responsible Boulevard

Aside from the contribution of the canopy trees, the existing Boulevard landscape offers minimal beneficial ecological performance and value. Much of the Boulevard includes underutilized open space, which could be modified to achieve a more positive ecological impact.

The Program identified three basic elements with general recommendations that, when applied to the Boulevard's two main typologies, will make the Boulevard more ecologically responsible:

Canopy Trees – provide shade and reduce heat island effects, intercept and utilize stormwater, and provide habitat. The existing "Boulevard Forest" or large canopy trees should be nurtured to increase the longevity of the mature trees. An on-going

reforestation strategy would transition the canopy cover in locations where trees are in declining health and establish successional plantings. The center median width presents the opportunity to establish a large canopy tree presence. In addition to the reduction of lawn area and incorporation of meadow, the re-introduction of canopy trees provides significant stormwater and urban heat island reduction benefits. Historically, when the Boulevard was first conceived, there were consistently and densely spaced canopy trees. Fragments of this legacy are still visible, but the urban forest along the Boulevard has eroded significantly over the years.

Topography – in locations without tree root conflicts, tree gaps, or declining tree health, the planted medians could be re-graded to accept roadway stormwater runoff in rain garden or bio-retention facilities. The positive environmental impact is amplified in areas of combined sewer overflows (CSOs), which is south of Cottman Avenue. Diverting dirty roadway runoff into bio-retention areas could have a significant water quality impact if spread over the length of the Boulevard.

Figure 5-26. Existing Canopy Trees

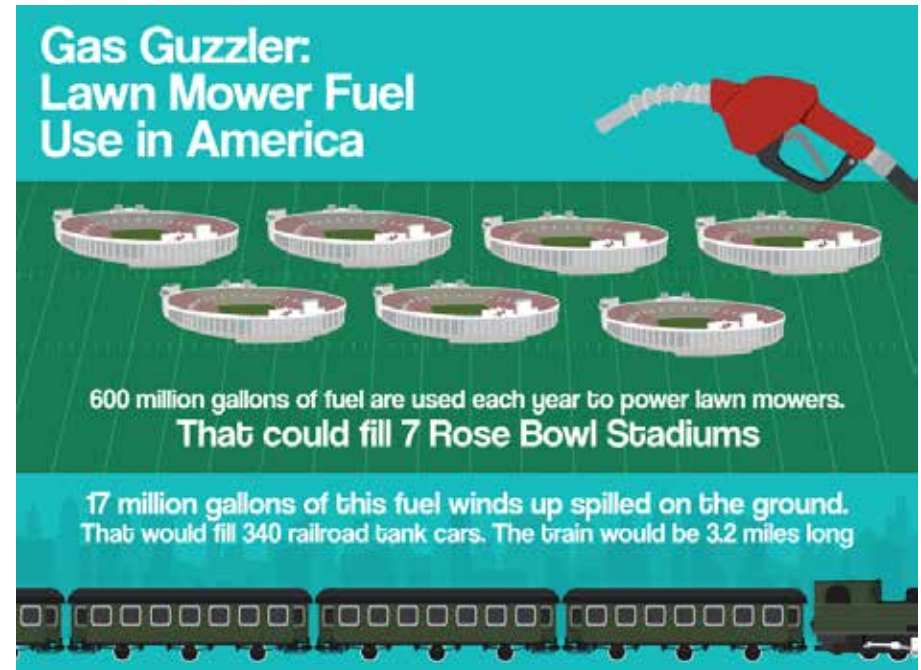


Figure 5-27. Potential Landscape Elements



Meadow – replacement of lawn with meadow requires minimal maintenance and provides valuable environmental benefits. Limiting the need for lawn maintenance can lead to a significant reduction in emissions along the Boulevard and provide a positive ecological impact. Meadow is dominated by tough grassland species, requires little maintenance, and creates valuable habitat for a multitude of birds and insects. Meadow maintenance is generally uncomplicated and can be accomplished with commercial equipment. The medians, currently raised from the road and filled with lawn and trees, can be re-shaped to become valuable stormwater management areas. Beyond the ecological advantages, deploying meadow at a large scale can lead to substantial financial savings for the City by reducing the maintenance burden both in terms of labor and cost. While some may find the look of meadow unkept, if meadow is mindfully utilized, it can become a seasonally dynamic, cohesive aesthetic opportunity that would bring a new character to the Boulevard.

There are environmental concerns with the current mowing practices of the Boulevard's medians. It is estimated lawn equipment emits nitrogen oxide and volatile organic compounds 11 times more toxic than an automobile. According to the U.S. Environmental Protection Agency (EPA), five percent of air pollution in the United States comes from cutting the grass with gas powered equipment. That does not include damage caused by chemical fertilizers, and gas-powered leaf blowers, snow blowers, hedge trimmers, or grass clippers. Under current federal standards, a push mower may produce as much hydrocarbons plus nitrogen oxides (HC+NOx) as a car driven 160 miles – in other words, one lawn mower would equal four cars.



Source: <https://www.fix.com/blog/lawn-mowers-and-greener-lawn-care/>

Public Art Opportunity

The character, history, and continued evolution of the Boulevard's neighborhoods is varied and dynamic, and neighborhood character can be accentuated through the use of public art in the medians. The examples of public art within thoroughfare medians can be a representation of an important person or event, the natural heritage of the land, or the cultural history of the neighborhood. The art can also simply be engaging and uplifting. In New York City, Park Avenue's median (Figure 5-29) showcases a series of public art pieces distributed among several intersections. Given its prominent and highly visible location, Roosevelt Boulevard's median could also create a unique opportunity to incorporate public art that would be accessible to a wide audience in a meaningful way.



In 1959, Philadelphia pioneered the Percent for Art model, which required that one percent of the total budget for all new construction or major renovation projects be dedicated for site-specific public art. This was the first program in the United States to make the commissioning of fine arts an integral part of the urban renewal process. This ground-breaking model has been replicated in cities across the country, reflecting the importance of art in the public landscape. The charge of the City's Percent for Art Program is to commission outstanding and enduring

artworks that respond specifically to public spaces and communities. Recent commission sites include Philadelphia Parks & Recreation facilities, Free Library of Philadelphia neighborhood branches, the Philadelphia International Airport, and civic spaces.^{1,2}



Figure 5-32. Landform, Maine



Figure 5-33. Homage to King, Atlanta

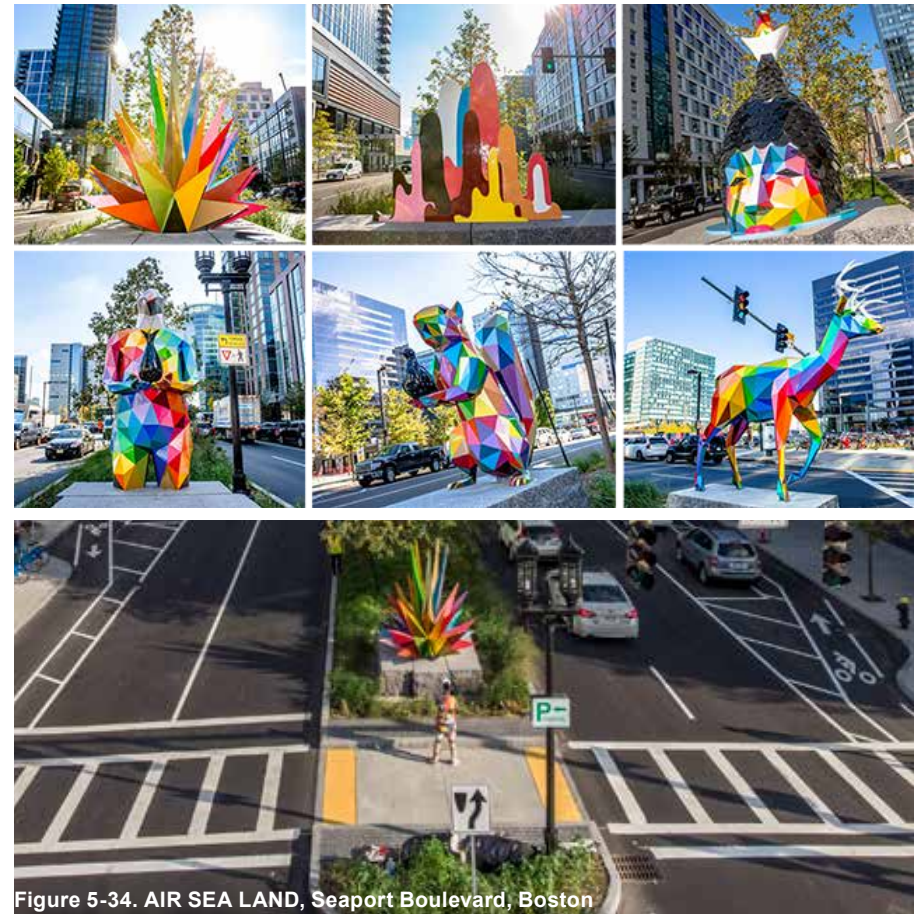


Figure 5-34. AIR SEA LAND, Seaport Boulevard, Boston

1 Source: <http://creativephl.org/percentforart/>
 2 Source: <https://phdcphila.org/community-investment/improving-communities/percent-for-art/>

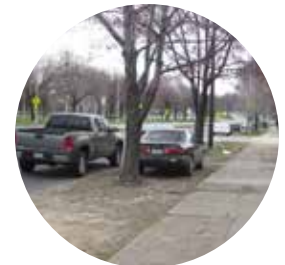
Typology 1

Typical Existing Condition – Corridor

- While substantial segments of the Boulevard have an intact row of trees, many sections only have remnants of the original tightly spaced rows of canopy trees. Long segments have become a patchwork of trees over time.
- The ground plane is predominantly lawn with the occasional shrub massing.

- Crosswalks are generally defined, but medians are narrow.
- Primarily fronted by residential use with modest front yards and frequent access points. Vehicles are often parked on the sidewalk or in the curbside lawn and tree strip.
- Lighting is provided primarily by 30-foot highway light fixtures, generally spaced 120 to 150 feet apart. Nighttime visibility is complicated by different light levels, areas of high contrast, and glare.

Figure 5-35. Typology 1 Typical Existing Condition – Corridor



Typical Existing Condition – Intersection

The pedestrian environment along the Boulevard is not comfortable. Crosswalks do not follow the desired path of a person walking, and curb ramps and sidewalks are in need of repair. Pedestrians are exposed to vehicles when waiting on narrow medians. The landscape is generally utilitarian and unremarkable.



Figure 5-36. Typology 1 Typical Existing Condition – Intersection



Typology 1 Recommendations

Proposed Landscape Framework – Corridor

Restoring a cohesive tree canopy is a major element of the proposed landscape framework for Typology 1. Large canopy trees play a critical role in scaling the Boulevard and defining sections. The trees also help visually narrow the road, which could help slow vehicles. Street tree spacing could be tightened to 25-feet on-center to create greater visual density near the intersection, while the spacing could spread out to approximately 50- to 60-feet on-center at the mid-block.

Figure 5-37. Typology 1 Proposed Corridor Condition



Existing lawn could be replaced with meadow in the center median, reducing mown area by approximately 30 percent. In strategic locations, the meadow could be re-graded and depressed to become a significant linear stormwater management facility. Clusters of flowering understory trees within the meadow would create a dramatic effect when planted at a such a large scale.

Continuous site walls fronted with mown lawn would help visually narrow the road, create a permanent defined edge for the meadow, and introduce an iconic architectural element. Coupled with the more manicured lawn, the proposed wall location is behind existing street trees, which provides a more conventional landscape toward public views and helps buffer the rustic aesthetic of the meadow down the center of the median.

The combination of the site walls and meadow also direct pedestrians to crosswalks and discourages mid-block crossing, and pedestrian-scale lighting is recommended to be placed at intersections with local and Direct Bus stops.



Proposed Landscape Framework – Intersection

A simple palette of elements that compliments the monumentality of the Boulevard will have remarkable impact. Figure 5-38 shows a crosswalk that is shifted off the intersection to provide a small buffer zone for pedestrians from turning vehicles. New curb ramps are paired with crash worthy bollards set in cobble paving, which help define a clear pedestrian zone. When repeated at each intersection, the bollards become an identifying architectural feature of the Boulevard. The bollard could be carved with a subtle graphic that would be appreciated at the pedestrian scale.

The meadow and site walls have been set back from the intersection to create an open, flexible space for public art. The composition of different trees with meadow would create a seasonally dynamic landscape.

Figure 5-38. Typology 1 Proposed Intersection Condition

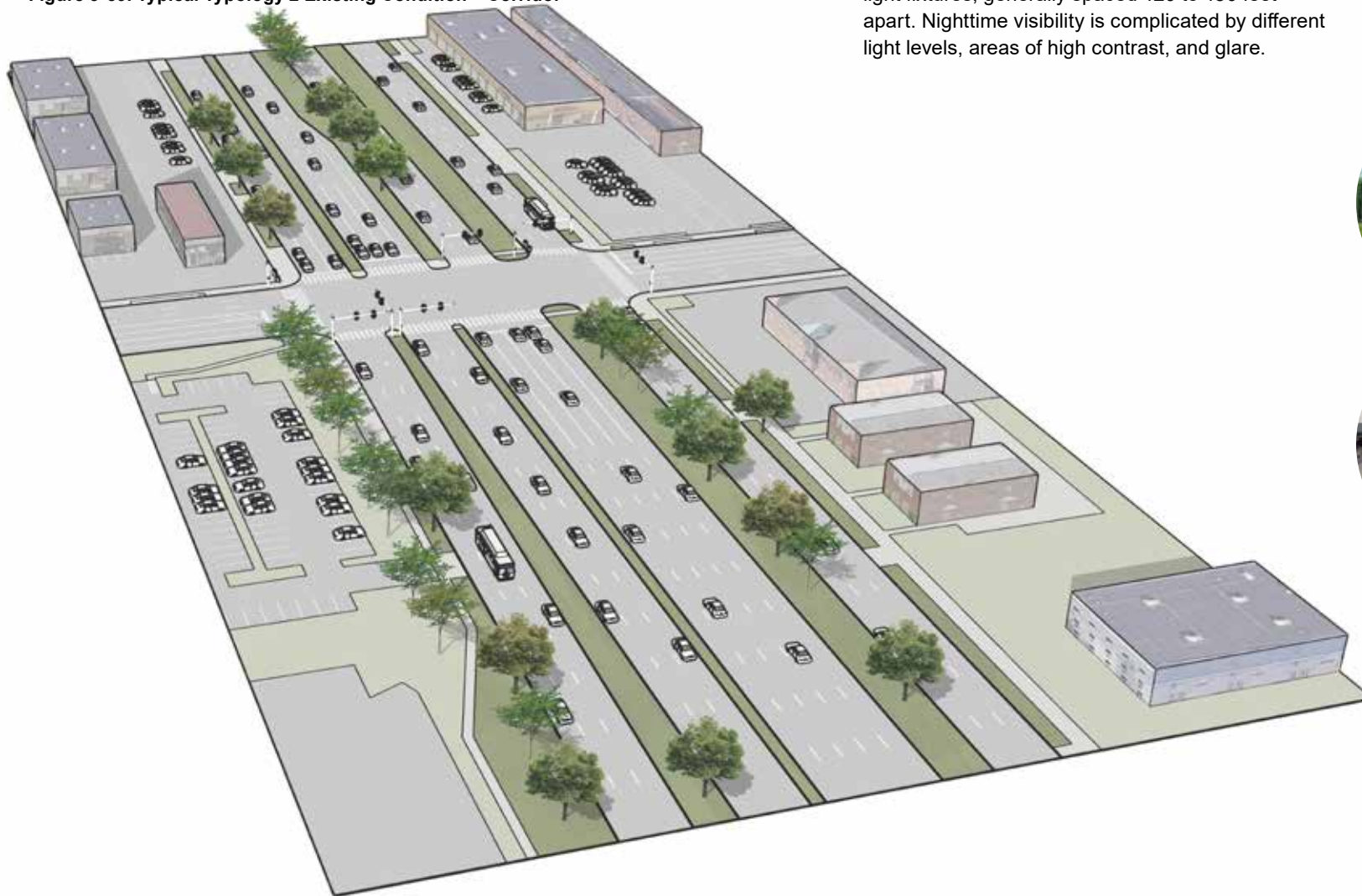


Typology 2

Typical Existing Condition – Corridor

- The integrity of the original street tree plantings has declined and is no longer present in many sections. The median is predominantly lawn with the occasional shrub massing.

Figure 5-39. Typical Typology 2 Existing Condition – Corridor



- Crosswalks are generally defined, but medians for pedestrian refuges are narrow.
- Lighting is provided primarily by 30-foot highway light fixtures, generally spaced 120 to 150 feet apart. Nighttime visibility is complicated by different light levels, areas of high contrast, and glare.



Typical Intersection Condition – Intersection

Typology 2 of the Boulevard is arguably a harsher pedestrian experience than the Typology 1 section. Similarly, crosswalks are tight to intersections, and curb ramps and sidewalks are often in disrepair. In addition, some medians are too narrow for a person in a wheelchair or for a parent with a stroller to comfortably travel between lanes. The landscape is utilitarian and lacks a cohesive identity.



Figure 5-40. Typical Typology 2 Existing Condition – Intersection

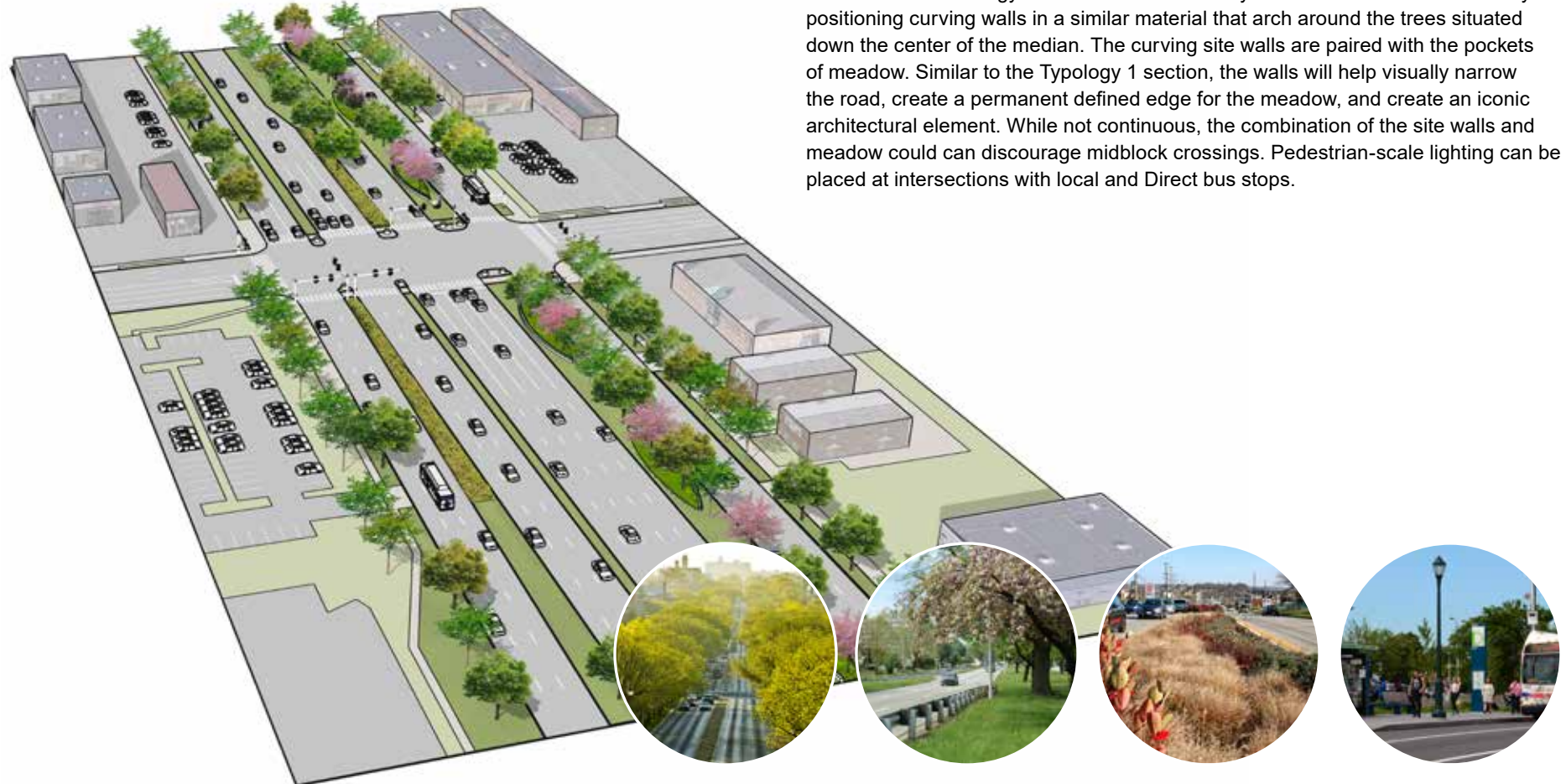


Typology 2 Recommendations

Proposed Landscape Framework – Corridor

The Program is purposeful in proposing similar strategies and features to Typology 1. This will create a cohesive experience and identity along the entire length of the Boulevard, no matter the typology. Restoration of the tree canopy is a key element; however, unlike the Typology 1 section, the median width is variable. Tree organization is shown centered in medians that are approximately 25-feet wide or greater. Street tree spacing is recommended to be tighter, approximately 25-feet on-center at the intersections and 60-feet on-center toward the mid-block areas.

Figure 5-41. Typology 2 Proposed Corridor Condition



The existing lawn is replaced with pockets of meadow at the outer medians, reducing the mown area by up to 25 percent. The pockets of meadow could be depressed for stormwater management, which would have a significant collective capacity. Clusters of flowering understory trees paired with the meadow would continue the dramatic large-scale effect.

Due to the median's variability in width, the Typology 2 segment cannot accommodate the double site walls proposed in Typology 1. However, the Program recommends a strategy to maintain the continuity of this architectural element by positioning curving walls in a similar material that arch around the trees situated down the center of the median. The curving site walls are paired with the pockets of meadow. Similar to the Typology 1 section, the walls will help visually narrow the road, create a permanent defined edge for the meadow, and create an iconic architectural element. While not continuous, the combination of the site walls and meadow could discourage midblock crossings. Pedestrian-scale lighting can be placed at intersections with local and Direct bus stops.

Proposed Landscape Framework – Intersection

Typology 2 utilizes the same simple palette of elements as Typology 1 for a cohesive experience. However, it arranges elements to respond to Typology 2's typical intersection condition. The crosswalk is shifted off the intersection to provide a small buffer zone for pedestrians from turning vehicles. New curb ramps are paired with crash worthy bollards set in cobble paving, which help define a clear pedestrian zone, and continues the architecture feature from Typology 1.

The curving site walls are paired with pockets of meadow with tightly spaced rows of trees. Low-growing flowering shrubs are shown in the narrower median to add interest and help define spaces. The shrubs could revert to manicured lawn in the mid-block section. The composition of different trees, meadow, and shrubs would create a seasonally dynamic landscape. Smaller, but still civic scaled public art could be incorporated in wider medians, such as the example shown in Figure 5-42.

Figure 5-42. Typology 2 Proposed Intersection Condition



Conclusion

The corridor-wide recommendations above will improve the safety, accessibility, and reliability for all users along the Boulevard by 2025. The Boulevard will also be inviting and more ecologically responsible due to the landscape improvements. Collectively, the recommended corridor-wide improvements provide a foundation for individual intersection improvements recommended in Chapter 6. By advancing both the corridor-wide and intersection-specific improvements, people who walk, bike, ride transit, or drive will feel safer and more comfortable while traveling along and across the Boulevard. Please refer to Chapter 10 to learn more about the next steps to move 2025 recommendations forward.

CHAPTER



Recommended 2025 Intersection Improvements

This chapter describes several types of improvements:

- Recommendation on 6 segment maps
- Recommendations at 48 locations

Introduction

This chapter describes the recommended 2025 corridor-wide and intersection specific improvements for the Boulevard, which were tested and refined using a corridor-wide traffic simulation model that generated detailed metrics. Existing conditions and crash history are provided for each intersection proposed for improvement, including the identification of top-11 crash cluster locations, as described in Chapter 3. Traffic operational analysis results are presented in Appendix 8.

Figure 6-1. People Walking Across Roosevelt Boulevard at Welsh Road (see Figure 6-38)



Figure 6-2. Ramona Avenue/Foulkrod Street and Roosevelt Boulevard (see Figure 6-17)



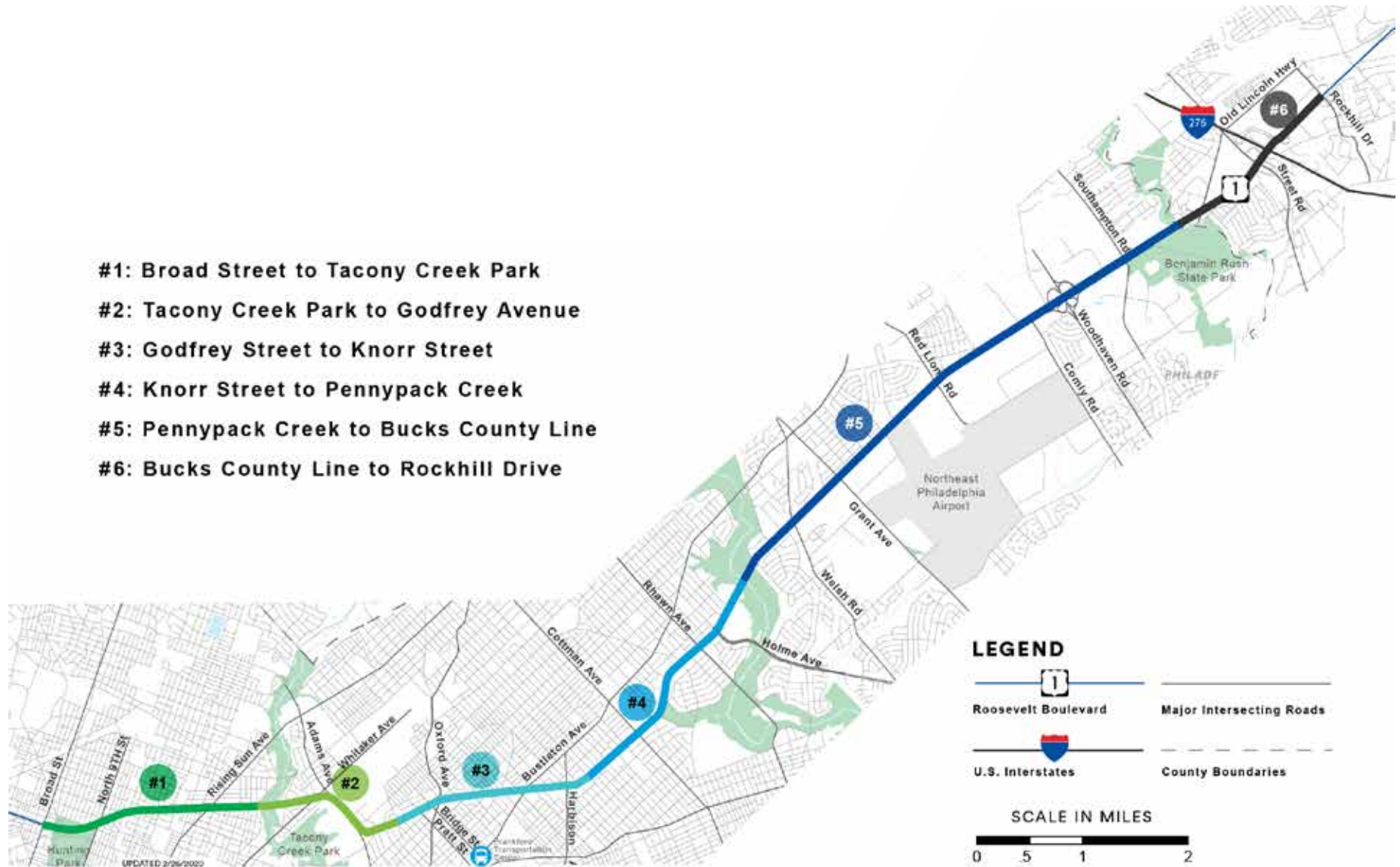
Figure 6-3. W. Bristol Street and Roosevelt Boulevard (see Figure 6-4)



Program Segments

The Program has divided the 14-mile corridor into six segments for recommended improvements as described in this chapter.

- #1: Broad Street to Tacony Creek Park
- #2: Tacony Creek Park to Godfrey Avenue
- #3: Godfrey Street to Knorr Street
- #4: Knorr Street to Pennypack Creek
- #5: Pennypack Creek to Bucks County Line
- #6: Bucks County Line to Rockhill Drive



Segment 1A – N. Broad Street to 3rd/4th Streets



The Program's southernmost segment is approximately two miles in length and is where the limited-access Roosevelt Expressway ends and the four lanes divide into six inner (express) lanes and six outer (local) lanes. This segment has a wide grassy center median separating the express lanes in each direction, with two smaller grass medians separating the inner (express) and outer (local) lanes running in the same direction. Like several others, this segment of the Boulevard contains many crossovers, which are challenging for people driving, especially those unfamiliar with the infrastructure. Segment 1 also poses a challenge for people walking due to several skewed side streets. The posted speed limit is 40 MPH and there are two red light camera locations in this segment, one at 9th Street and the other at Mascher Street; a speed camera location is also near Banks Way (2nd Street). On-street parking during off-peak periods is permitted. Between N. Broad Street and Tacony Creek, traffic along the Boulevard moves in either an eastbound or westbound direction.

Segment 1B – 3rd/4th Streets to Tacony Creek



N. Broad Street (Figure 6-4)

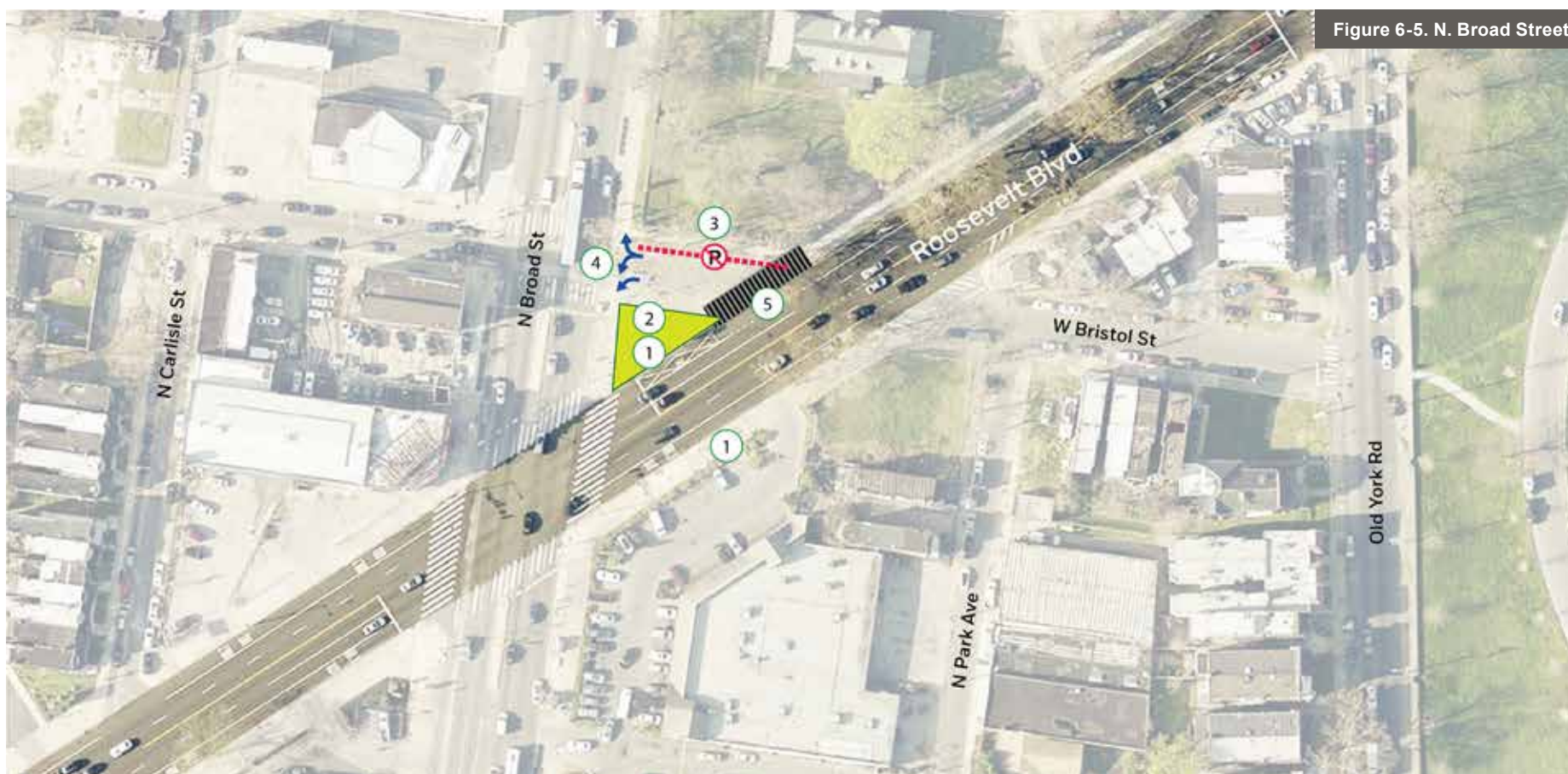
Many people walking and riding transit travel through the intersection of N. Broad Street and the Boulevard because there are stops for several local bus routes and it is the location of the Hunting Park Broad Street Line (BSL) subway station.

Between 2013 and 2017, there were 45 total reportable crashes near the intersections of N. Broad Street and Bristol Street with Roosevelt Boulevard. Five people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 45 crashes, no one was killed, and two people were seriously injured.

1. Construct Direct Bus, Phase B stations at N. Broad Street to improve transit rider

amenities and the safety of transit riders; implement Direct Bus service to improve transit travel time and reliability.

2. Enhance the triangle on the north side of the Boulevard adjacent to N. Broad Street.
3. Eliminate on-street parking on the north side of Bristol Street between the Boulevard and N. Broad Street.
4. Restripe westbound Bristol Street between the Boulevard and N. Broad Street as two lanes with a left-turn lane and a shared left-and-right-turn lane.
5. Reconfigure the intersection of Bristol Street and the Boulevard to reduce the crossing distance for people walking across Bristol Street and to reduce the speed of drivers turning right from the Boulevard onto Bristol Street.

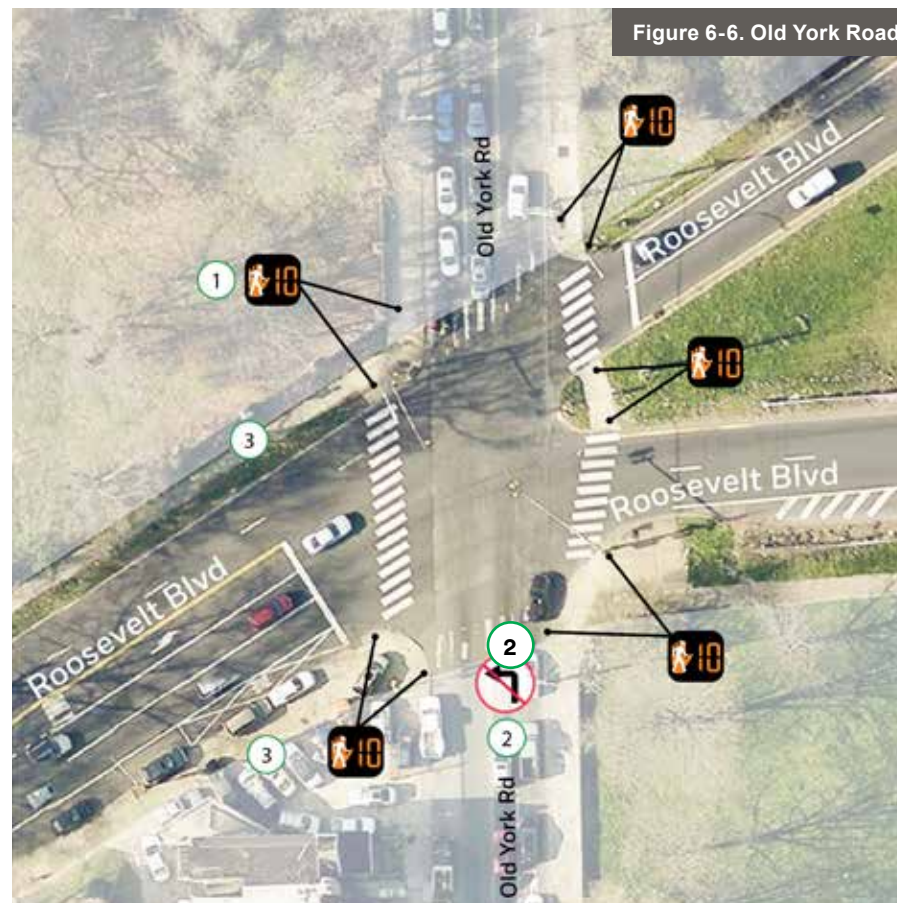


Old York Road (Figure 6-5)

While many people walk across at this intersection, there are no pedestrian countdown signal heads. In addition, even though there is a low number of drivers turning left from northbound Old York Road to westbound Roosevelt Boulevard, these few drivers block northbound through drivers on Old York Road.

Between 2013 and 2017, there were 29 total reportable crashes near the intersection of Old York Road and Roosevelt Boulevard. Two people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 29 crashes, no one was killed or seriously injured.

1. Install pedestrian countdown signal heads to alert people walking when to safely cross.
2. Prohibit left turns from northbound Old York Road onto westbound Roosevelt Boulevard. Instead, people driving northbound on Old York Road can turn left onto W. Bristol Street in order to access N. Broad Street or Roosevelt Boulevard / Hunting Park Avenue.
3. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



9th Street (Figure 6-6)

Crash Cluster Location

Heading eastbound along the Boulevard, 9th Street is the first signalized intersection that has the Boulevard's typical configuration of six inner (express) lanes and six outer (local) lanes. The skew of 9th Street at the Boulevard creates the second-longest pedestrian crosswalk in the Program area. In addition, Courtland Street intersects westbound Boulevard at 9th Street forming a multi-leg intersection. Drivers waiting to turn left from the Boulevard onto 9th Street in both directions often cause other drivers to back up in the center median of the Boulevard, between the eastbound and westbound inner (express) lanes.

Between 2013 and 2017, there were 100 total reportable crashes near the intersection of 9th Street and Roosevelt Boulevard. Seven people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 100 crashes, no one was killed, and five people were seriously injured. Intersections with multiple approaches at skewed angles, such as this location, have elevated rates of fatalities and serious injuries for people walking and riding a bike, and for people involved in crashes where drivers ran red lights.

1. Realign 9th Street to be perpendicular to the Boulevard in order to reduce the crossing distance for people walking.
 2. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or riding a bike and optimize the signal timing to better accommodate side street volumes.
 3. Construct Direct Bus, Phase B stations at 9th Street to improve transit rider amenities and the safety of transit riders; implement Direct Bus service to improve transit travel time and reliability.
 4. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
 5. Create new signalized intersection at 8th Street and Roosevelt Boulevard, connecting W. Courtland Street with 8th Street across the Boulevard.
 6. Close access points at the current 9th Street and 10th Street along westbound Roosevelt Boulevard, and N. Warnock Street at W. Wingohocking Street.
 7. Close access points at W. Wingohocking Street and current 9th Street along eastbound Roosevelt Boulevard.
- Identify a new bike connection on 9th Street



Figure 6-7. 9th Street

Further analysis is needed to determine if other improvements are needed to mitigate the queues at approaches due to the realignment of 9th Street.

7th Street / W. Wyoming Avenue (Figure 6-7)

7th Street / W. Wyoming Avenue is a T-intersection with Roosevelt Boulevard; it approaches Roosevelt Boulevard from the west at a skew and intersects all lanes of the Boulevard. W. Wyoming Avenue travel one way southbound, and along the south side of W. Wyoming Avenue is a crosswalk that crosses all lanes of the Boulevard. Drivers in the outermost lane of westbound Boulevard can turn right in order to access both W. Wyoming Avenue and 7th Street.

Between 2013 and 2017, there were 31 total reportable crashes near the intersection of 7th Street/W. Wyoming Avenue and Roosevelt Boulevard. Three people walking were involved in these crashes. Of all the people involved in the 31 crashes, two people were killed, and there were no people seriously injured.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Move and improve the local bus stop along eastbound Roosevelt Boulevard to W. Wyoming Street; implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



Figure 6-8. 7th Street / W. Wyoming Avenue

W. Wyoming Avenue & N. Fairhill Street (Figure 6-8)

W. Wyoming Avenue and N. Fairhill Street are closely spaced unsignalized access points to and from the outer (local) lanes of eastbound Roosevelt Boulevard.

Between 2013 and 2017, there were two total reportable crashes near the intersection of W. Wyoming Avenue & N. Fairhill and Roosevelt Boulevard. In these two crashes, no one walking or riding a bike was involved, and no one was killed or seriously injured.

1. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Consolidate access points by extending the island along westbound W. Wyoming Avenue and eastbound Roosevelt Boulevard. This change reduces confusion for people driving and increases the safety of people walking by reducing the crosswalk length.
3. Convert N. Fairhill Street to right-in and right-out only with a channelizing island and a concrete center median along W. Wyoming Avenue. This change reduces conflicts between drivers and improves the safety of people driving. W. Wyoming Avenue will remain a two-way street with access to eastbound Roosevelt Boulevard outer (local) lanes.



5th Street (Figure 6-9)

Crash Cluster Location

The inner (express) lanes of the Boulevard travel over 5th Street, while the outer (local) lanes of the Boulevard are at-grade and create a signalized intersection with 5th Street. People wanting to drive along 5th Street are often stuck behind drivers waiting to turn left onto eastbound or westbound Roosevelt Boulevard. In addition, the segment of 5th Street that passes under Roosevelt Boulevard is dark, overgrown with vegetation, and has drainage issues. While this segment of 5th Street is identified as a bicycle route, there are no bicycle facilities under the elevated inner (express) lanes, and the pavement markings along 5th Street are faded.

Between 2013 and 2017, there were 41 total reportable crashes near the intersection of 5th Street and Roosevelt Boulevard. Two people walking and four people riding a bike were involved in these crashes. Of all the people involved in the 41 crashes, three people were killed and two people were seriously injured.

1. Increase signal cycle length to 120 seconds to improve intersection optimization.
2. Upgrade current bus stops at 5th Street to become Direct Bus, Phase B stations to improve transit rider amenities and provide a safe place for transit riders to wait for the bus; implement Direct Bus service to improve transit travel time and reliability.
3. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
4. Maintain vegetation to improve sight lines and increase safety.
5. Install sidepaths adjacent to northbound and southbound 5th Street to provide a safe space for people riding a bike.
6. Improve lighting and add public art along 5th Street, under the elevated inner (express) lanes, to improve safety and comfort for people walking and riding a bike.
7. Restripe two lanes (one left-turn and one through lane) in each direction under the elevated inner (express) lanes to improve safety and reduce confusion for people driving.



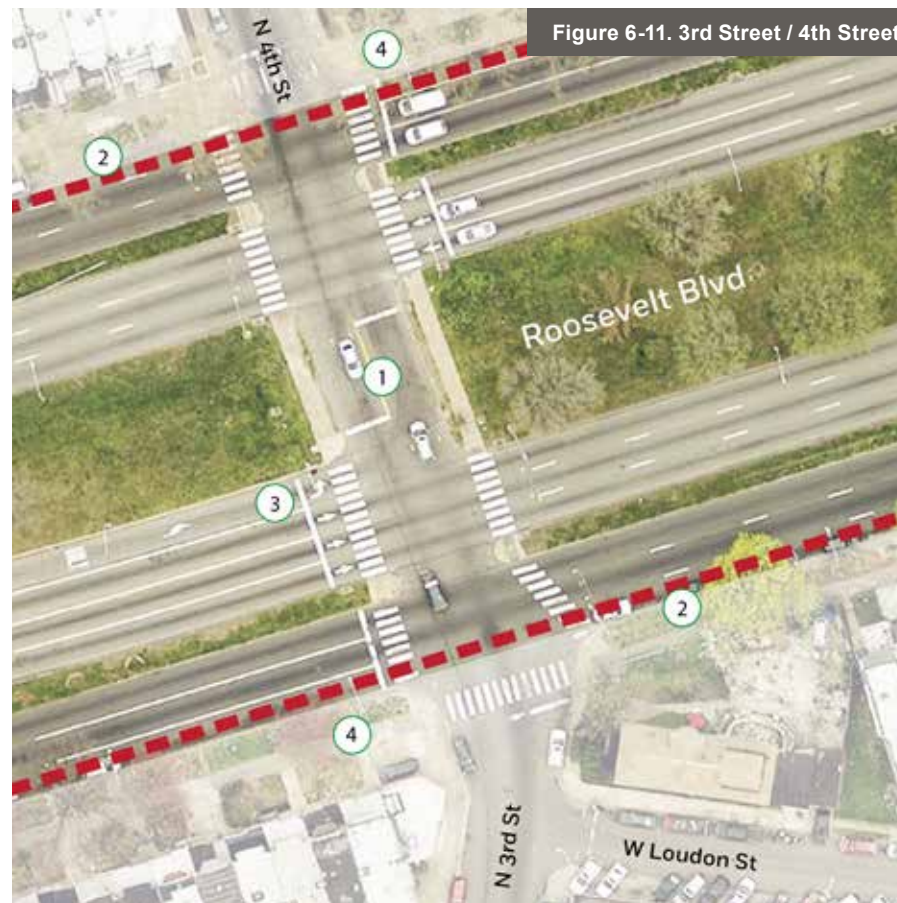
Figure 6-10. 5th Street

3rd Street / 4th Street (Figure 6-10)

3rd Street / 4th Street intersect Roosevelt Boulevard as part of a multileg intersection. Drivers turning at this intersection store in the center median of the Boulevard, between the eastbound and westbound inner (express) lanes and often cause other drivers to back up into the innermost lanes of the Boulevard in both directions.

Between 2013 and 2017, there were 38 total reportable crashes near the intersection of 3rd Street/4th Street and Roosevelt Boulevard. Three people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 38 crashes, no one was killed or seriously injured. Multileg intersections with no skew, such as this location, have elevated rates of fatalities and serious injuries for people walking or riding a bike, and for people involved in crashes where drivers ran red lights and in crashes at night.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Provide additional signal time for left turns from eastbound Boulevard onto northbound 4th Street.
4. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



2nd Street / Banks Way (Figure 6-11)

Challenging conditions exist for people driving and people walking in this area because there are closely spaced stop-controlled access points to and from outer (local) lanes of the Boulevard – one at Eleanor Street on the eastbound side and the other at 2nd Street and W. Rockland Street on the westbound side. There is a signalized mid-block pedestrian crossing of Roosevelt Boulevard, just east of 2nd Street, called Banks Way.

Between 2013 and 2017, there were seven total reportable crashes near the intersection of 2nd Street (including Banks Way) and Roosevelt Boulevard. Five people walking were involved in these crashes. Of all the people involved in the seven crashes, four people were killed, and no one was seriously injured.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Close Eleanor Street at the eastbound outer (local) lanes of the Boulevard using a mountable curb to improve the safety of people walking and to reduce confusion for people driving. People driving eastbound on Roosevelt Boulevard would turn right at 2nd Street instead of Eleanor Street.
4. Extend the curb along westbound Boulevard between 2nd Street and W. Rockland Street to reduce conflict between drivers and improve the safety of people walking.
5. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



Mascher Street (Figure 6-12)

Mascher Street intersects Roosevelt Boulevard at a skew, as part of a multileg intersection. Drivers can access both Mascher Street and W. Rockland Street from eastbound Boulevard.

Between 2013 and 2017, there were 41 total reportable crashes near the intersection of Mascher Street and Roosevelt Boulevard. One person walking was involved in these crashes. Of all the people involved in the 41 crashes, no one was killed, and one person was seriously injured. Intersections with multiple approaches at skewed angles, such as this location, have elevated rates of fatalities and serious injuries for people walking or riding a bike, and for people involved in crashes where drivers ran red lights.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Close W. Rockland Street at the eastbound outer (local) lanes of the Boulevard using a mountable curb to reduce confusion for people driving and to eliminate a conflict point between people walking and people driving. People driving eastbound would turn right at Mascher Street instead of W. Rockland Street. Make W. Rockland Street two-way, west of Mascher Street, to provide drivers access to and from the properties along W. Rockland Street.
4. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



Front Street, Rising Sun Avenue, A Street, and B Street (Figure 6-13)

Crash Cluster Location

The signalized intersections of Roosevelt Boulevard with Front Street and Roosevelt Boulevard and Rising Sun Avenue are very close, which presents a challenge to efficient traffic operations and safety for all modes. At Rising Sun Avenue, the problem is compounded with a skew, which contributes to a long crossing distance for people walking. Both A Street and B Street are unsignalized side roads east of Rising Sun Avenue, and these streets access the outer (local) lanes of eastbound Boulevard.

Between 2013 and 2017, there were 81 total reportable crashes between Front Street and B Street on Roosevelt Boulevard. Nine people walking and two people riding a bike were involved in these crashes. Of all the people involved in the 81 crashes, two people were killed and four people were seriously injured.

Common crash causes at this intersection included cases where drivers attempted left turns from the Boulevard's outer (local) lanes, drivers ran red lights, or people drove aggressively. These intersection are heavily used by people walking or people riding a bike. Due to the distance between signalized intersections of Rising Sun Avenue and C Street, people cross mid-block regularly. Skewed, multileg intersections, such as this location, have elevated rates of fatalities and serious injuries for people walking and people riding a bike and for people involved in crashes where drivers ran red lights.

1. Increase signal cycle length to 120 seconds at Front Street and Rising Sun intersections to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Add a second eastbound left-turn lane in the Boulevard median and adjust the signal time to accommodate the additional left-turning traffic onto northbound Front Street.
3. Straighten and realign crosswalks at the west side of the Front Street intersection across the eastbound and westbound Boulevard to mitigate the impact of the additional left turn lane on the crossing distance for people walking and riding a bike.
4. Straighten and realign crosswalks along the west side of Rising Sun Avenue as it intersects with eastbound Boulevard and along the east side of Rising Sun Avenue as it intersects with westbound Boulevard to reduce the crossing distance for people walking and riding a bike.
5. Provide a side street curb extension at A Street to reduce the crossing distance for people walking and riding a bike.
6. Construct Direct Bus, Phase B stations at Rising Sun Avenue to improve transit rider amenities and the safety of transit riders; implement Direct Bus service to improve transit travel time and reliability.
7. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
8. Expand the island along E. Ruscomb Street to reduce the crossing distance for people walking across E. Ruscomb Street while maintaining the on-street parking along the street.
9. Install a signalized pedestrian crossing at B Street to provide a safe place for people to walk across the Boulevard between the other signalized pedestrian crossings at Rising Sun Avenue and C Street; install a crosswalk across B Street to improve the safety of people walking.
10. Remove left turn lane and prohibit drivers from making left turns from eastbound Roosevelt Boulevard inner (express) lanes onto northbound Rising Sun Avenue. Instead, people driving eastbound (except trucks) would turn left onto northbound Front Street, approximately 350 feet west of Rising Sun Avenue. Prohibiting drivers from making this turn reduces the potential for conflicts between people driving and people walking; it also reduces the crossing distance for people walking across the Boulevard at Rising Sun Avenue by eliminating the left turn lane.
11. Adjust on-street parking along Front Street, between westbound Roosevelt

Boulevard and Albanus Street, to provide two lanes for drivers turning left from eastbound Roosevelt Boulevard.

- 12. Install a signalized Michigan left at B Street to accommodate left turns for people driving trucks eastbound. People driving trucks would be prohibited from turning left from eastbound Roosevelt Boulevard to Front Street.
- 13. Eliminate the crossover from inner (express) to outer (local) lanes on westbound Boulevard to accommodate the Michigan left at B Street. Drivers wanting to cross from the inner (express) to outer (local) lanes can use the Bingham Street crossover further to the east or Rockland Street crossover further to the west.

- 14. Move and improve the local bus stop along eastbound Roosevelt Boulevard from a nearside stop to be a farside bus stop at Front Street; implement local bus stop improvements along westbound Roosevelt Boulevard to provide a safe place for transit riders to wait for the bus.



Figure 6-14. Front Street, Rising Sun Avenue, A Street, and B Street

C Street, D Street, and Bingham Street / Rorer Street (Figure 6-14)

Drivers waiting to turn left from westbound Boulevard onto southbound C Street often cause other drivers to back up in the center median of the Boulevard. Common crash causes at this intersection included cases where drivers attempted left turns from outer (local) Boulevard lanes (particularly eastbound), drivers ran red lights (particularly eastbound), or drivers failed to yield to other drivers while turning left from C Street. Skewed, four-way intersections, such as this location, have elevated rates of fatalities and serious injuries for people walking and people riding a bike, and for people involved in head-on crashes.

D Street and Bingham Street merge to form one large intersection with westbound Boulevard. Traffic from D and Bingham are stop controlled, while westbound Boulevard traffic is controlled by a traffic signal. The radius between D Street and Bingham Street creates a 100-foot pedestrian crossing, exposing people walking to drivers turning onto or off of the Boulevard.

Between 2013 and 2017, there were 75 total reportable crashes between C Street and the midblock signalized pedestrian crossing at Bingham Street / Rorer Street on Roosevelt Boulevard. Five people walking and two people riding a bike were involved in these crashes. Of all the people involved in the 75 crashes, seven people were killed and one person was seriously injured. At intersections with an

indirect signalized mid-block pedestrian crossing, such as this location, people walking were much more likely to be seriously injured or killed in crashes.

1. Increase signal cycle lengths at the intersection of C Street and the Boulevard and at the signalized mid-block pedestrian crossing of Rorer Street / Bingham Street to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Provide additional signal time for left turns from westbound Boulevard onto southbound C Street. This change will clear drivers stopped in the center median of the Boulevard, between the eastbound and westbound inner (express) lanes, and reduce the number of drivers spilling into the through lanes of westbound Boulevard.
4. Extend the curb between D Street and Bingham Street to reduce confusion for people driving, improve visibility of people walking, and provide a safe refuge for people walking.
5. Implement improvements at the local bus stops to provide a safe place for transit riders to wait for the bus along eastbound Roosevelt Boulevard at C Street and in both directions of the Boulevard at the intersection of Bingham Street / Rorer Street.

Figure 6-15. C Street, D Street, and Bingham Street / Rorer Street



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Segment 2 – Tacony Creek to Godfrey Avenue



Segment 2 has some of the most complicated geometric design of the Boulevard, all at grade. The segment begins while crossing the Tacony Creek Park, and then runs along several blocks of residential neighborhoods. The entire 1.3 miles of the segment is characterized by a wide grassy center median separating the inner (express) lanes in each direction, with two smaller grass medians separating the inner (express) and outer (local) lanes running in the same direction. In this segment, left turn lanes cut through many parts of the center median, which are dotted with many mature trees. While there is expansive amount of greenspace to the east, vehicles overwhelm the landscape. This is one of the most challenging segments for people trying to cross the Boulevard because of the amount of time it takes to walk between signalized intersections and, where there is a crossing, it does not follow the path desired by people walking. The posted speed limit is 40 MPH and there are no red light camera locations in this segment; there is one speed camera location near F Street. On-street parking during off-peak periods is permitted. Starting at Tacony Creek, traffic along the Boulevard moves in a northbound or southbound direction.

F Street / Herkness Street (Figure 6-15)

F Street crosses all lanes of the Boulevard at a right angle, and then F Street and Herkness Street split adjacent to northbound Boulevard. Drivers waiting to turn in both directions at this intersection store in the center median of the Boulevard, between the southbound and northbound inner (express) lanes, and often cause other drivers to back up into the left/through lanes of the Boulevard.

Between 2013 and 2017, there were 64 total reportable crashes near the intersection of F Street/Herkness Street and Roosevelt Boulevard. One person walking and two people riding a bike were involved in these crashes. Of all the people involved in the 64 crashes, no one was killed or seriously injured. Multileg intersections with no skew, such as this location, have elevated rates of fatalities and serious injuries for people walking and riding a bike, and for people involved in crashes at night, and in crashes where drivers ran red lights.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase B along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Extend the curb at the intersection of northbound Roosevelt Boulevard with Herkness Street and F Street to reduce the crosswalk length.
4. Modify the island between Herkness Street and F Street to provide green space.
5. Extend the left-turn bay on northbound Boulevard so drivers turning left onto westbound F Street have a more space to line up without blocking drivers along northbound Roosevelt Boulevard; provide additional signal time for drivers turning left from northbound Boulevard onto westbound F Street to clear drivers from the center median of the Boulevard, between the southbound and northbound inner (express) lanes.
6. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



S-Curve (Whitaker Avenue, Adams Avenue (west), Tower Boulevard, Langdon Street, Summerdale Avenue, and Adams Avenue (east))

The Boulevard's S-Curve is comprised of two sharp curving sections with closely spaced signalized intersections at Whitaker Avenue, Adams Avenue (west), Tower Boulevard, Langdon Street, Summerdale Avenue, and Adams Avenue (east). Garland Street and Mayfair Street are unsignalized intersections along southbound Roosevelt Boulevard within the S-Curve. The Friends Hospital entrance is an unsignalized intersection along northbound Roosevelt Boulevard, which has limited sight distance and poor visibility due to the S-Curve. The Northeast Tower Shopping Center along southbound Boulevard, where the Boulevard intersects with Langdon Street, has over 600 people a day walking across the Boulevard. Several local bus stops are located along the S-Curve.

Not all signalized intersections have crosswalks; as a result, people crossing mid-block at unsignalized locations is frequent. A further complication is that Adams Avenue through traffic converges with Roosevelt Boulevard traffic for roughly one-third of a mile, creating congestion along the Boulevard. The combination of the closely spaced intersections, high number of drivers turning, peak hour congestion, high volume of people crossing, and sharp curves contribute to high crash rates.

The S-Curve's left turn geometry and signal phasing is unique compared to adjacent Boulevard intersections, where left turns can be completed in a single movement.

Due to the complexity of the S-Curve, the recommended intersection specific improvements are discussed in two sub-segments: S-Curve South and S-Curve North.

S-Curve South (Figure 6-16)

Crash Cluster Location

Currently, northbound and southbound Whitaker Avenue cross the Boulevard at two separate signal locations. Drivers from northbound Whitaker Avenue who want to access westbound Adams Avenue have to cross several northbound Boulevard lanes in a short distance. Meanwhile, the skew of southbound Whitaker Avenue with southbound Boulevard creates long distances for people to walk across both Roosevelt Boulevard and Whitaker Avenue.

Between 2013 and 2017, there were 124 total reportable crashes in the area between Garland Street/Whitaker Avenue and Adams Avenue (west) and Roosevelt

Boulevard. Eleven people walking and two people riding a bike were involved in these crashes. Of all the people involved in the 124 crashes, five people were killed and four people were seriously injured.

Common crash causes included people speeding and driving under the influence. Many crashes involved drivers rear-ending other drivers stopped at traffic signals or colliding with fixed objects. Collisions with fixed objects are more likely to result in fatalities or serious injuries, especially when drivers are speeding. Intersections along the S-Curve also have elevated rates of fatalities and serious injuries for people walking.

1. Install BAT Lanes, Phase B in certain sections of S-Curve South to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets. BAT lanes are not recommended along this southbound section of the Boulevard north of Whitaker Avenue because all outer lanes are needed for efficient traffic operations.
2. Extend the curb at Garland Street to reduce the crossing distance for people walking.
3. Add green space near the left turn from southbound Boulevard to southbound Whitaker Avenue.
4. Realign the northbound Whitaker Avenue approach so it intersects the Boulevard at the existing traffic signal that also controls left turns from southbound Boulevard to southbound Whitaker Avenue. This change eliminates a redundant traffic signal. It also provides more space for drivers to cross multiple lanes to access Adams Avenue (west) from northbound Whitaker Avenue. This realignment slows down drivers making the turn from northbound Whitaker Avenue onto northbound Boulevard.
5. Retime the traffic signal at the intersection of Whitaker Avenue and Adams Avenue (west) to provide two phases and a 120-second signal cycle length to increase the safety of people walking. The first phase would be dedicated to people walking. The second phase would be for drivers, resulting in no conflicting movements.
6. Prohibit drivers from making left turns from westbound Adams Avenue to southbound Whitaker Avenue by removing the channelization island and extending the green space. This change reduces conflicts between drivers.
7. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus on northbound Roosevelt Boulevard at Whitaker Avenue and on southbound Roosevelt Boulevard at Garland Street.
8. Eliminate local bus stops at northbound Roosevelt Boulevard at the private

driveway into Friends Hospital and southbound Roosevelt Boulevard west of Tower Boulevard. There are no signalized pedestrian crossings adjacent to these bus stops.

- 9. Install a sidepath adjacent to the northbound and southbound outer (local) lanes of the Boulevard, north of Whitaker Avenue.

In addition, further analysis is needed to determine if eliminating the through movement of drivers on southbound Whitaker Avenue at Adams Avenue (west) and converting the approach from Whitaker Avenue at Adams Avenue (west) to right-in / right-out only, along with prohibiting drivers from making the left turn from eastbound Adams Avenue (west) to northbound Whitaker Avenue will reduce conflicts between drivers.

Further analysis is also needed at Adams Avenue (west) and Roosevelt Boulevard to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.

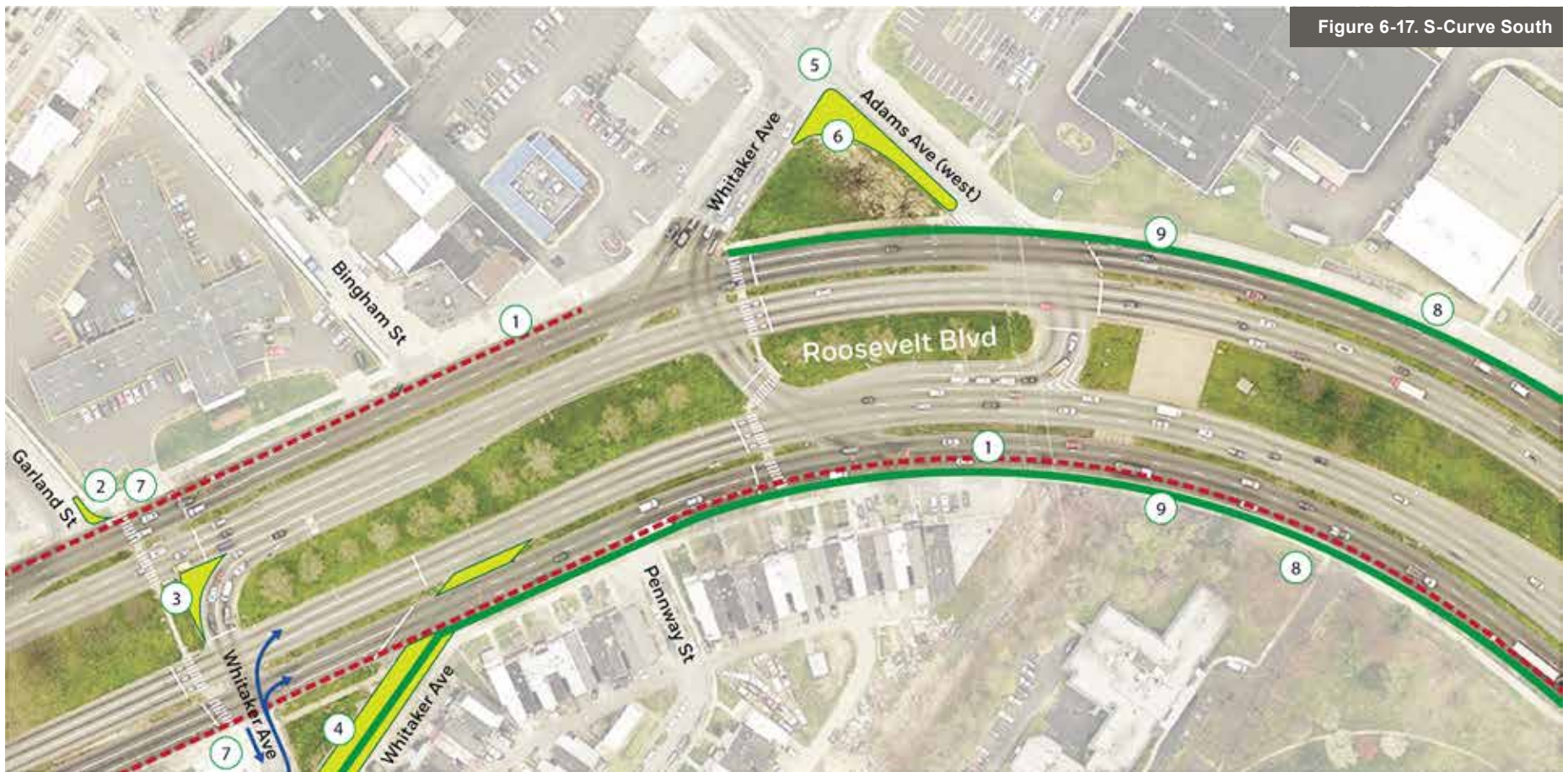


Figure 6-17. S-Curve South

S-Curve North (Figure 6-17)

Crash Cluster Location

The intersection of the Boulevard at Summerdale Avenue / Adams Avenue (east) currently has visibility challenges due to the complex geometry. These avenues also have high turning volumes to and from the Boulevard. The proposed improvements relocate some of these turns to adjacent intersections to improve the safety of people driving and how the intersection operations. Currently, crosswalks are not provided across the Boulevard at Tower Boulevard or in the area immediately north of the S-Curve.

Crashes are frequent in this vicinity. Common crash causes at the intersection of Summerdale / Adams Avenue (east) included people speeding and driving under the influence. Between 2013 and 2017, there were 183 total reportable crashes in the area between Tower Boulevard and Allengrove Street on Roosevelt Boulevard. Four people walking and two people riding a bike were involved in these crashes. Of all the people involved in the 183 crashes, four people were killed and five people were seriously injured. Intersections with separated left turns along straight sections of the Boulevard, such as the intersection of Langdon Street and Roosevelt Boulevard, have elevated rates of fatalities and serious injuries for people walking and for people involved in crashes with fixed objects. These types of intersections also have elevated rates of fatalities and serious injuries for people involved in crashes when drivers ran red lights or were distracted.

1. Install BAT Lanes, Phase B in certain sections of the S-Curve North to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets. BAT lanes are not recommended south of Loretto Avenue along southbound Roosevelt Boulevard and BAT lanes are not recommended between Langdon Street to Adams Avenue (east) along northbound Roosevelt Boulevard.
2. Construct Direct Bus, Phase B stations at Langdon Street to improve transit rider amenities and the safety of transit riders; implement Direct Bus service to improve transit travel time and reliability.
3. Add a new traffic signal at the intersection of Tower Boulevard and Roosevelt Boulevard to control traffic and provide a signalized crosswalk for people walking.
4. Install a signalized Michigan left turn at Tower Boulevard to allow drivers along southbound Boulevard to access Friends Hospital and Adams Avenue (east). On northbound Roosevelt Boulevard, move the left turn lanes from outer (local) to inner (express) lanes further north of Tower Boulevard to accommodate the new Michigan left turn.
5. At Langdon Street, change the northbound left-turn phase from pre-timed to allow people walking to request a pedestrian crossing phase when needed. In addition, change the left-turn phase from leading to lagging in order to provide additional time for people to comfortably walk across the Boulevard within two signal phases. Add new crosswalks and associated pedestrian countdown signal heads along the north side of Langdon Street.
6. Realign the crosswalk at Summerdale Avenue and Adams Avenue (east) so people walk across southbound Boulevard lanes along the intersection's north side. This change eliminates the conflict between people walking and drivers turning right from southbound Summerdale Avenue to southbound Boulevard, increasing the safety of people walking.
7. Tighten the right turn radius from northbound Boulevard to Adams Avenue (east) and reduce the number of through lanes along westbound Adams Avenue (east) from two lanes to one. These changes will slow down drivers, provide better visibility of people walking across Adams Avenue (east), and reduce the crossing distance for people walking across Adams Avenue (east).
8. Eliminate left turn lanes from the intersection of Summerdale Avenue and the intersection of Langdon Street with southbound Roosevelt Boulevard; direct drivers to make left turns at the new Michigan left turn at Tower Boulevard to reduce the number of signals requiring left turn phases.
9. Modify traffic signal phasing at northbound Boulevard and Summerdale Avenue to have drivers turning left onto northbound Summerdale Avenue go after through vehicles on southbound Boulevard.

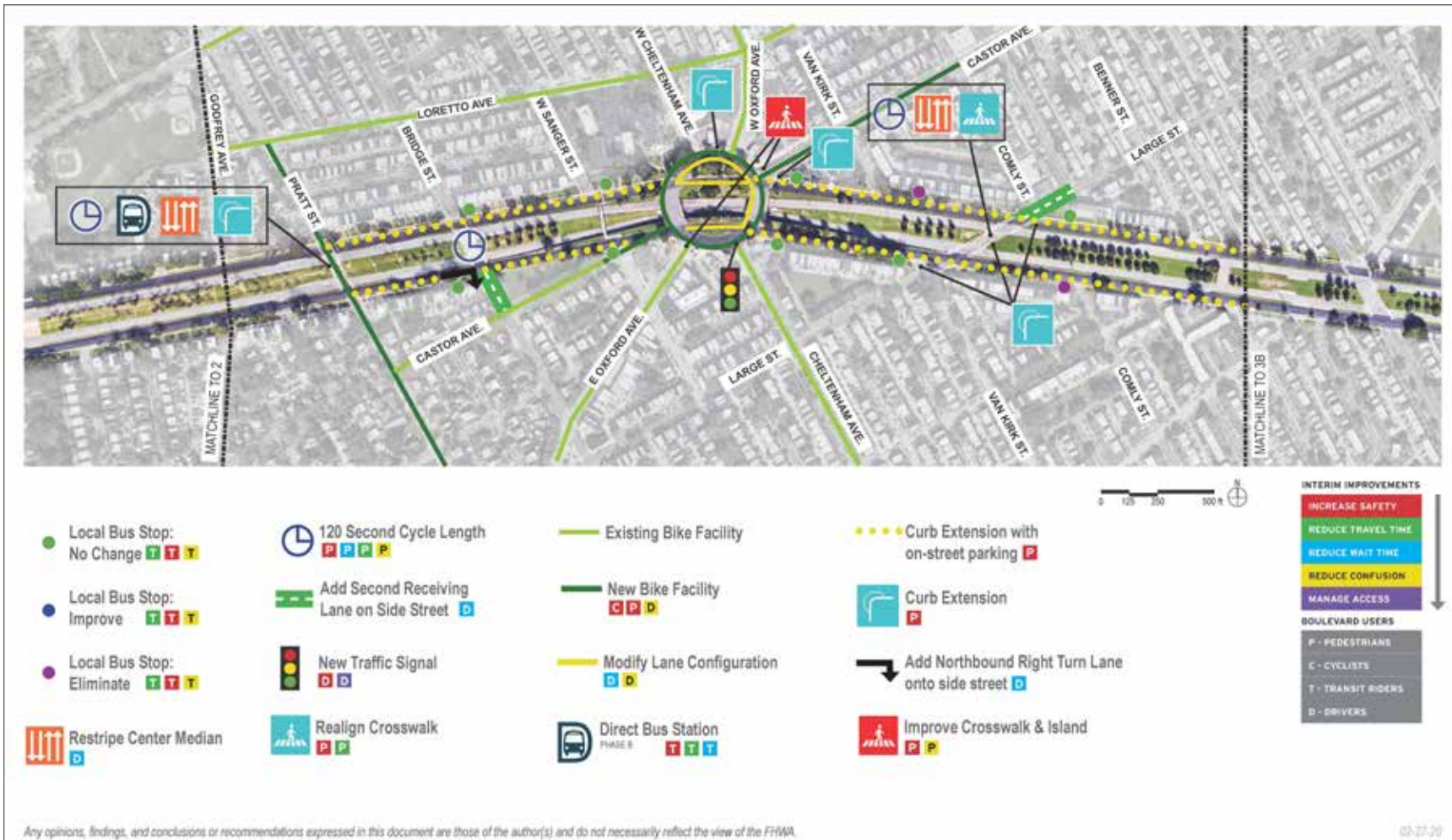
- 10. Consolidate the two access points of Foulkrod Street and Ramona Avenue by extending the curbs to create a single access point onto northbound Boulevard, install crosswalk along northbound Boulevard.
- 11. Eliminate local bus stops along both sides of the Boulevard between Ramona Avenue and Godfrey Avenue. There is no signaled place for people to walk across the Boulevard adjacent to these bus stops.

- 12. Install sidepaths adjacent to the northbound and southbound outer (local) lanes of the Boulevard.



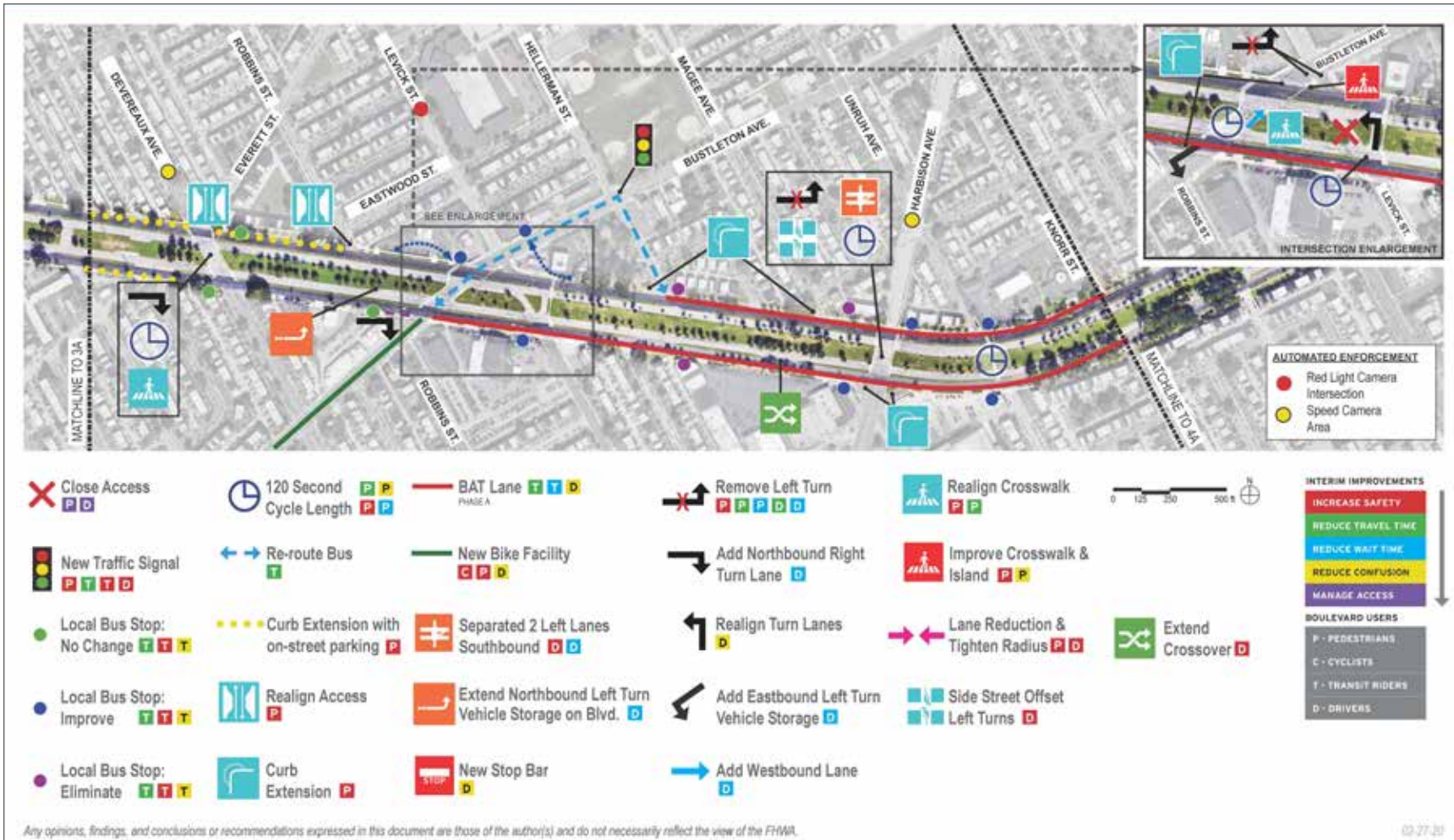
Figure 6-18. S-Curve North

Segment 3A – Godfrey Avenue to Devereaux Avenue



Segment 3, which is 1.8 miles long, is where the Boulevard starts to straighten out after the S-Curve and contains a mix of residential and commercial properties fronting the Boulevard. A wide grassy center median separates the express lanes in each direction, with two smaller grass medians separating the inner (express) and outer (local) lanes running in the same direction. This segment also includes the Boulevard’s intersection with Large Street, which is the longest intersection measuring 410 feet long. The posted speed limit in this segment is 40 MPH and there is one red light camera location on Roosevelt Boulevard at Levick Street in this segment; there are two speed camera locations, one near Devereaux Avenue and one near Harbison Avenue. On-street parking during off-peak periods is permitted. In Segment 3, traffic along the Boulevard moves in either a northbound or southbound direction.

Segment 3B – Devereaux Avenue to Knorr Street

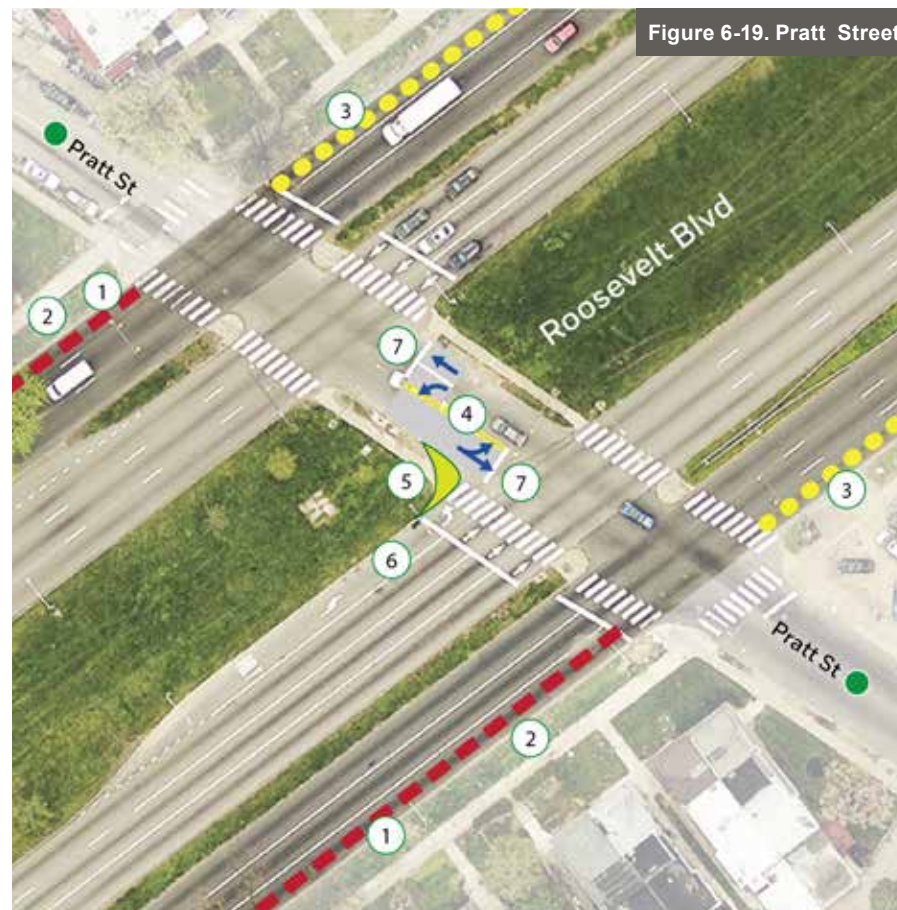


Pratt Street (Figure 6-18)

Pratt Street intersects with the Boulevard's six inner (express) and six outer (local) lanes at a skewed angle that creates long crossing distances for people walking. Drivers waiting to turn left from the Boulevard onto Pratt Street in both directions often cause other drivers to back up in the center median of the Boulevard, between the southbound and northbound inner (express) lanes. Faded line striping in the Boulevard median area contributes to delay and confusion between drivers.

Between 2013 and 2017, there were 48 total reportable crashes near the intersection of Pratt Street and Roosevelt Boulevard. Five people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 48 crashes, one person was killed and one person was seriously injured. Skewed, four-way intersections, such as this location, have elevated rates of fatalities and serious injuries for people walking and riding a bike.

1. Install BAT Lanes, Phase B along both sides of the Boulevard, up to the south side of Pratt Street, to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
 2. Construct Direct Bus, Phase B stations at Pratt Street to improve transit rider amenities and the safety of transit riders; implement Direct Bus service to improve transit travel time and reliability.
 3. Install curb extensions, with on-street parking, along both sides of the Boulevard, starting at the north side of Pratt Street to reduce the crossing distance for people walking, increase on-street parking supply, and maintain two lanes of travel, similar to Boulevard segments with BAT lanes.
 4. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or riding a bike.
 5. Tighten the curb radius on the east side of northbound Boulevard's center median to reduce the crossing distance for people walking.
 6. Provide additional left turn signal time from northbound Boulevard onto westbound Pratt Street. This change will clear drivers stopped in the center median of the Boulevard, between the southbound and northbound inner (express) lanes.
 7. Restripe the Boulevard's center median for one eastbound lane and two westbound lanes: one for left turns and the other for through movements. These markings will reduce confusion for people driving.
- Identify a new bike connection on Pratt Street.



Bridge Street (Figure 6-19)

Bridge Street intersects with the Boulevard's six inner (express) and six outer (local) lanes at a skewed angle, creating long crossing distances for people walking. Drivers waiting to turn left from northbound Boulevard onto westbound Bridge Street often cause other drivers to back up in the center median of the Boulevard, between the southbound and northbound inner (express) lanes. Unclear markings in the center median contribute to confusion between drivers. Just east of its intersection with the Boulevard, Bridge Street also intersects with Castor Avenue, where the limited storage space between the Boulevard and Castor Avenue creates a long line of drivers.

Between 2013 and 2017, there were 56 total reportable crashes near the intersection of Bridge Street and Roosevelt Boulevard. There were no people walking or riding a bike involved in these crashes. Of all the people involved in the 56 crashes, one person was seriously injured.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install curb extensions at the intersection (except at the southeast corner of northbound Boulevard and Bridge Street), with on-street parking, to reduce the crossing distance for people walking, increase on-street parking supply, and maintain two lanes of travel, similar to Boulevard segments with BAT lanes.
3. Provide additional signal time for left turns from northbound Boulevard onto westbound Bridge Street. This change clears drivers stopped in the center median of the Boulevard, between the southbound and northbound inner (express) lanes waiting to turn left.
4. Restripe the center median of the Boulevard to show two westbound lanes and two eastbound lanes – one lane in each direction for left turns, and the other for through movements. These markings will reduce confusion between drivers.
5. Add a second eastbound lane on Bridge Street immediately east of the intersection with northbound Boulevard in order to receive drivers approaching from the center median of the Boulevard and drivers turning right from northbound Boulevard. Adjust on-street parking along Bridge Street between the Boulevard and Castor Avenue to create this additional lane.
6. Install a right-turn bay on the outermost lane of northbound Boulevard at the southeast corner to accommodate the high number of drivers making right turns onto eastbound Bridge Street.



Oxford Circle, Sanger Street, and Castor Avenue (Figure 6-20)

Crash Cluster Location

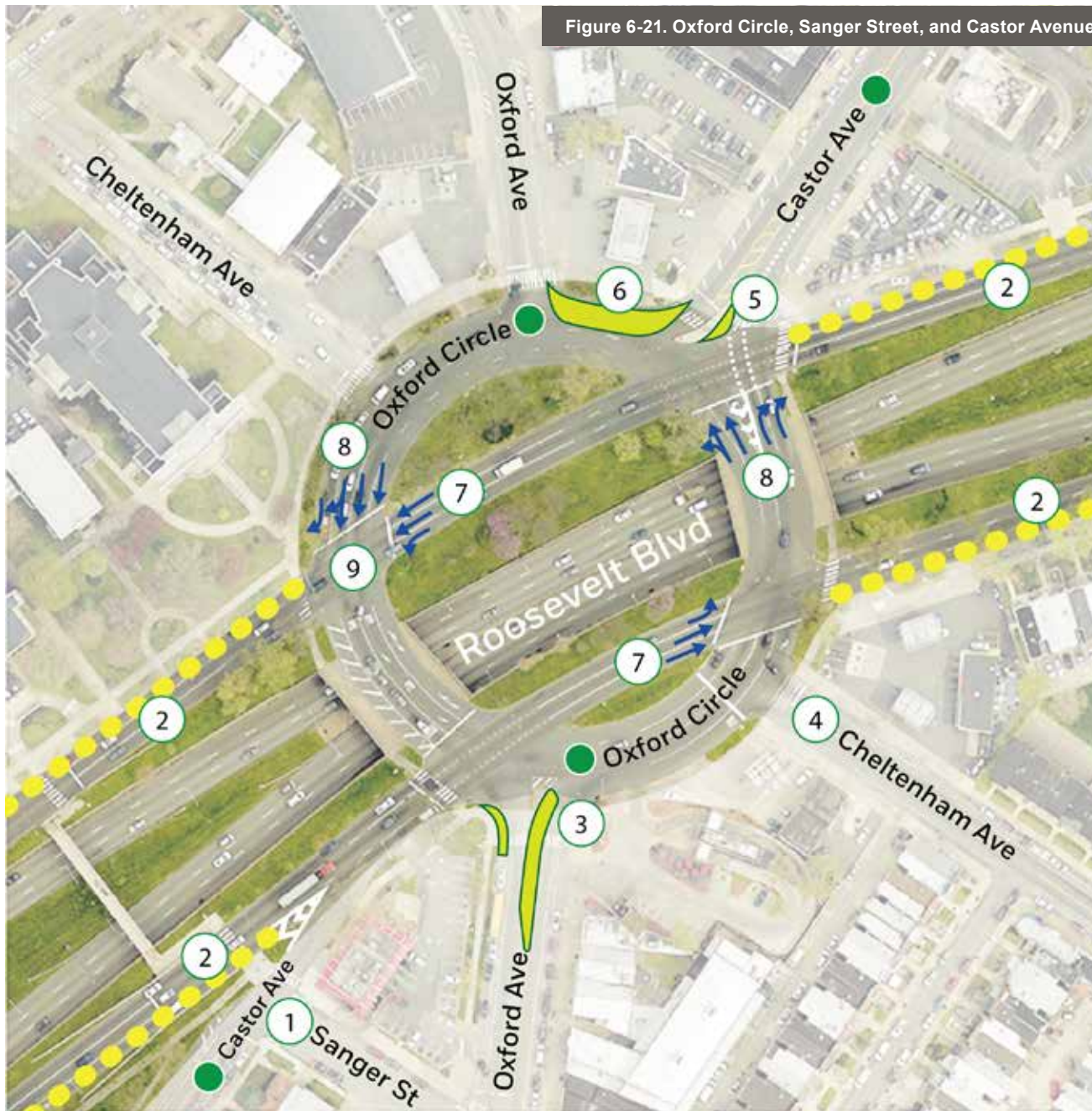
Oxford Circle is confusing for people driving, people walking, and people riding a bike. There are three Roosevelt Boulevard lanes passing through the circle both northbound and southbound. There are an additional three lanes traveling around the circle's perimeter to provide access to and from the converging side streets. Access to the circle from side streets is controlled by stop or yield signs. Castor Avenue, Oxford Avenue, and Cheltenham Avenue all converge at the circle. The Boulevard's six express lanes pass beneath Oxford Circle for through drivers. This non-typical geometry causes confusion for drivers and creates multiple conflict point between drivers and people walking.

Along the outer (local) lanes of southbound Boulevard, Sanger Street ends at a stop-controlled intersection with the Boulevard's southbound outer (local) lanes. Castor Avenue, which runs parallel to northbound Roosevelt Boulevard, intersects with Sanger Street at a traffic signal. There is a grade-separated pedestrian bridge over the inner (express) lanes of northbound and southbound Roosevelt Boulevard, south of Oxford Circle. The northbound and southbound outer (local) lanes of the Boulevard are signalized to provide access for people walking to and from the above-grade pedestrian bridge.

Between 2013 and 2017, there were 80 total reportable crashes around Oxford Circle and its approaches, including the intersection of Sanger Street and Castor Avenue. Five people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 80 crashes, one person was killed and four people were seriously injured.

1. Increase signal cycle length at the intersection of Sanger Street and Castor Avenue to 120 seconds to improve intersection operations.
 2. Install curb extensions, with on-street parking, along the outermost lanes of northbound and southbound Boulevard, to reduce the crossing distance for people walking and increase on-street parking supply. Stop the curb extension on the northbound outer (local) lanes of the Boulevard at Sanger Street heading towards the Circle. This leaves the rightmost lane for drivers to merge from the northbound outer (local) lanes to turn right on to Oxford Circle or for drivers to merge onto the Boulevard from Castor Avenue. This change reduces confusion between drivers.
 3. Restripe the crosswalks and enhance the median island crossing Oxford Avenue on the east side of Oxford Circle. These changes will improve access and safety for people walking.
 4. Install a new traffic signal and stop bar at Cheltenham Avenue on the east side of Oxford Circle. This change enables people driving along Cheltenham Avenue to safely enter Oxford Circle.
 5. Enhance the median island crossing Castor Avenue on the west side of Oxford Circle. This change will improve access and safety for people walking.
 6. Install a curb extension on the west side of Oxford Circle between Castor Avenue and Oxford Avenue. This change will reduce confusion for people driving and discourage drivers from weaving.
 7. Restripe the outer (local) Boulevard lanes that go through the middle of Oxford Circle to provide one left-turn lane and two through lanes. This change reduces confusion for people driving by keeping this section consistent with other sections of the Boulevard.
 8. Restripe the outer (local) Boulevard lanes that travel the perimeter of Oxford Circle to show four lanes. Generally, two lanes are for drivers making right turns and two lanes are for drivers making through or left turns. This change will reduce delay and confusion between drivers.
 9. Modify the signal cycle lengths on the Circle, both northbound and southbound, from 60 seconds all day to 120 seconds during the AM peak and 60 seconds during the PM peak to improve intersection operations.
- Identify a new bike connection around Oxford Circle and Castor Avenue.

Figure 6-21. Oxford Circle, Sanger Street, and Castor Avenue



Large Street (Figure 6-21)

Large Street intersects with Roosevelt Boulevard at a pronounced skew that produces a 410-foot long crosswalk, which is the longest crossing distance of the Boulevard in the Program Area. Drivers waiting to turn left from northbound Boulevard onto westbound Large Street often cause other drivers to back up in the center median of the Boulevard, between the southbound and northbound inner (express) lanes.

Between 2013 and 2017, there were 34 total reportable crashes near the intersection of Large Street and Roosevelt Boulevard. Four people walking were involved in these crashes. Of all the people involved in the 34 crashes, two people were killed and no one was seriously injured. Common crash causes at Large Street included drivers attempting illegal left turns from the outer (local) lanes of the Boulevard, or drivers rear-ending other drivers stopped at traffic signals. Drivers turning right from northbound Roosevelt Boulevard onto eastbound Van Kirk Street also conflict with people driving southbound Large Street and people walking. Intersections with multiple approaches at skewed angles, such as this location, have elevated rates of fatalities and serious injuries for people walking and people riding a bike, and for people involved in crashes where drivers ran red lights.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Realign the crosswalks along the south side of Large Street across southbound and northbound Boulevard to reduce the crossing distance for people walking.
3. Install curb extensions at the intersection, with on-street parking, to reduce the crossing distance for people walking, increase on-street parking supply, and maintain two lanes of travel, similar to Boulevard segments with BAT lanes.
4. Expand the islands in the northeast and southwest corners of the Large Street intersection with northbound and southbound Boulevard's outer (local) lanes. This change improves safety for people walking by reducing the crossing distance.
5. Restripe the center median of the Boulevard, between the southbound and northbound inner (express) lanes, for two lanes in each direction, one lane for drivers making left turns or through movements, and the other lane for drivers making through movements only. This change will reduce confusion between drivers.
6. Add a second lane for westbound Large Street to receive drivers approaching from the center median of the Boulevard, between the southbound and northbound inner (express) lanes. Adjust on-street parking along Large Street to make room for the second lane.
7. Provide additional signal time for left turns from northbound Boulevard onto westbound Large Street. This change will clear drivers stopped in the center median of the Boulevard, between the southbound and northbound inner (express) lanes.
8. Eliminate the nearside local bus stop on northbound Boulevard at Comly Street and the nearside local bus stop on southbound Boulevard at Van Kirk Street. These bus stops are located at unsignalized intersections and riders are in close proximity to the bus stops at the signalized intersection of Large Street.

Figure 6-22. Large Street



Devereaux Avenue (Figure 6-22)

Devereaux Avenue intersects with Roosevelt Boulevard at a pronounced skew. Devereaux Avenue and Everett Street converge to intersect with the Boulevard's outer (local) southbound lanes; this convergence creates confusion between drivers and creates a very long crossing distance for people walking.

Between 2013 and 2017, there were 82 total reportable crashes near the intersection of Devereaux Avenue and Roosevelt Boulevard. Two people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 82 crashes, one person was killed and two people were seriously injured. Skewed, multileg intersections, such as this location, have elevated rates of fatalities and serious injuries for people walking and people riding a bike, and for people involved in crashes where drivers ran red lights.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Realign crosswalks across northbound Boulevard lanes to reduce the crossing distance for people walking.
3. Install curb extensions, with on-street parking, along the outermost lanes of northbound and southbound Boulevard, to reduce the crossing distance for people walking, increase on-street parking supply, and maintain two lanes of travel, similar to Boulevard segments with BAT lanes. Stop the curb extensions on northbound Boulevard at Oakland Street to maintain a lane for drivers turning right onto Devereaux Avenue.
4. Close driver access between Everett Street and southbound Boulevard outer (local) lanes. Drivers can access Everett Street using either Robbins Street or Devereaux Avenue. This improvement will reduce confusion for people driving and reduce the exposure of people walking to drivers turning off of southbound Boulevard.



Figure 6-23. Devereaux Avenue

Robbins Street & Eastwood Street (Figure 6-23)

Eastwood Street and Robbins Street are two very closely spaced unsignalized access points to and from the southbound Boulevard's outer (local) lanes. Between 2013 and 2017, there were two total reportable crashes near the intersection of Robbins Street & Eastwood Street and Roosevelt Boulevard. In these two crashes, there were no people walking or riding a bike involved, and no one was killed or seriously injured.

1. Eliminate the current concrete triangle and extend the curbs in order to consolidate Eastwood Street and Robbins Street access points and crosswalks. This change will reduce confusion for people driving and improve the safety of people walking.
2. Install curb extensions south of the modified access point of Robbins Street and Eastwood Street to reduce the crossing distance for people walking and reduce confusion between drivers.
3. Install a stop sign for eastbound Robbins Street to improve the safety of people driving and walking.



Bustleton Avenue, Levick Street, and Hellerman Street (Figure 6-24)

The area where Roosevelt Boulevard, Bustleton Avenue, and Levick Street converge exemplifies many of the Boulevard's challenges: closely spaced intersections controlled by a cluster of interdependent traffic signals with complex signal phasing, long crossing distances for people walking, high volumes of people driving, issues with transit maneuverability, and a high number of crashes. Drivers turning left from southbound Boulevard to eastbound Bustleton Avenue often cause other drivers to back up along southbound Boulevard travel lanes, leaving them exposed to through traffic along eastbound Bustleton Avenue. Adjacent to northbound Boulevard, Robbins Street converges with Bustleton Avenue. Further north, Hellerman Street joins the southbound outer (local) lanes of the Boulevard at an angle that creates a wide radius for drivers turning right from southbound Boulevard onto Hellerman Street, which creates a long crossing distance for people to walk across Hellerman Street.

Between 2013 and 2017, there were 107 total reportable crashes between Bustleton Avenue and Hellerman Street on Roosevelt Boulevard. Seven people walking and three people riding a bike were involved in these crashes. Of all the people involved in the 107 crashes, two people were killed and one person was seriously injured. Common crash causes included drivers running red lights on both Roosevelt Boulevard and the cross streets, even though this intersection is monitored by red-light cameras. Some drivers attempt illegal left turns from the Boulevard's outer (local) lanes onto side streets. Intersections with multiple approaches at skewed angles and a separated median turn, such as this location, have elevated rates of fatalities and serious injuries for people walking.

1. Increase signal cycle length at the intersections of the Boulevard with Bustleton Avenue and Levick Street to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Realign the crosswalks at Bustleton Avenue across the outer (local) lanes of southbound Boulevard to reduce crossing distances for people walking. Extend the median between the outer (local) and inner (express) lanes of southbound Boulevard.
3. Install BAT Lanes, Phase A along northbound Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets. Along southbound Boulevard, BAT Lane, Phase A is only north of Hellerman Street.
4. Extend the island along the Boulevard's northbound outer (local) lanes at Robbins Street and Bustleton Avenue. This change will improve safety of people walking by reducing the crossing distance.
5. Restripe lanes along Bustleton Avenue:
 - d. Add a left-turn bay on eastbound Bustleton Avenue for drivers turning onto Robbins Street. This change will improve driver safety by reducing the number of drivers spilling back into the Boulevard because they are waiting to make this turn.
 - e. Add a third westbound lane in the center median of the Boulevard at Bustleton Avenue, providing one lane for left turns onto southbound Boulevard, and two lanes for drivers traveling through on Bustleton Avenue. This change reduces delay and confusion between drivers.
 - f. Prohibit drivers from turning left onto Bustleton Avenue from either westbound Levick Street or eastbound Robbins Street. Drivers will make the left turns from the Boulevard rather than the jug-handle maneuvers currently used to access Bustleton Avenue. This change will make the Bustleton intersections less congested, reduce delay and confusion between drivers, and improve the safety of people walking.
6. Realign westbound Levick Street within the center median of the Boulevard between the southbound and northbound inner (express) lanes to eliminate the current fork in the median. There will be a total of four lanes: two lanes for drivers turning left onto the inner (express) lanes of southbound Boulevard and two lanes for drivers either turning left onto the outer (local) lanes of southbound Boulevard or continuing through on westbound Levick Street. This will eliminate the need for the southbound Boulevard traffic signal at Levick Street.

7. Extend the left-turn lane from northbound Boulevard onto westbound Bustleton Avenue. This will improve driver safety by providing more storage space for drivers turning left.
 8. Modify the channelization island adjacent to southbound Boulevard outer (local) lanes between Bustleton Avenue and Levick Street to clearly separate drivers on these three roads, improving driver safety.
 9. Add a new traffic signal at the intersection of Bustleton Avenue and Hellerman Street. Re-route buses that currently travel along southbound Boulevard and use Levick Street to get onto eastbound Bustleton Avenue to instead make a right turn onto Hellerman Street. A new traffic signal will enable buses to then make the left turn onto eastbound Bustleton Avenue and cross all 12 lanes of the Boulevard more safely.
 10. Relocate the local bus stop from southbound Boulevard to the existing bus stop on Bustleton Avenue at Levick Street.
 11. Provide additional signal time for left turns from southbound Boulevard onto eastbound Bustleton Avenue at peak travel times. This change will clear drivers stopped in the center median of the Boulevard and reduce wait time.
 12. Install a curb extension on the south side of Hellerman Avenue, along southbound Roosevelt Boulevard, to significantly reduce the crossing distance of people walking.
 13. Improve the local bus stop on northbound Roosevelt Boulevard at Levick Street to provide a safe place for transit riders to wait for the bus.
 14. Eliminate the mid-block local bus stop on northbound Roosevelt Boulevard, north of Levick Street, and the local bus stop on southbound Roosevelt Boulevard at Hellerman Street. These bus stops are in close proximity to local bus stops at the signalized intersection of Harbison Avenue.
- A new bike connection on Bustleton Avenue, east of Roosevelt Boulevard.



Harbison Avenue & Unruh Avenue (Figure 6-25)

Harbison Avenue is a six-lane road that intersects with Roosevelt Boulevard at a right angle. Magee Avenue, which is one-way eastbound at this point, intersects with Harbison Avenue just downstream of Harbison Avenue's intersection with northbound Boulevard. Westbound Harbison Avenue has a channelized roadway for right turns onto northbound Boulevard.

Drivers turning left from southbound Boulevard onto eastbound Harbison Avenue use the center median of the Boulevard, between the southbound and northbound inner (express) lanes, and often cause other drivers to back up into the through lanes of southbound Boulevard.

Between 2013 and 2017, there were 96 total reportable crashes between Harbison Avenue and the mid-block pedestrian crossing at Unruh Avenue on Roosevelt Boulevard. Fourteen people walking and two people riding a bike were involved in these crashes. Of all the people involved in the 96 crashes, three people were killed. Crashes were caused by drivers running red lights (particularly on southbound Boulevard), drivers cutting across through traffic to make left turns from Harbison Avenue to the Boulevard, and drivers recklessly changing lanes on the Boulevard. Crashes were also noted at the separated short merge area connecting westbound Harbison Avenue to northbound Roosevelt Boulevard and the stop-controlled merge connecting eastbound Magee Avenue to southbound Roosevelt Boulevard. Intersections with multiple approaches with no skew, such as this location, have elevated rates of fatalities and serious injuries for people walking and people riding a bike, and for people involved in crashes at night and in crashes where drivers ran red lights.

Unruh Avenue intersects with the outer (local) lanes of Roosevelt Boulevard, both northbound and southbound, but does not cross the full Boulevard or provide drivers access to the inner (express) lanes. A full signalized pedestrian crosswalk at Unruh Avenue extends across both the inner (express) and outer (local) lanes of the Boulevard. Signalized mid-block pedestrian crossings, such as this location, have elevated rates of fatalities and serious injuries for people walking, as well as for people involved in speed-related crashes.

1. Modify signal phasing and increase signal cycle length at the intersections of Roosevelt Boulevard with Harbison Avenue and Unruh Avenue to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Reduce the channelized right-turn to one lane from westbound Harbison Avenue to northbound Boulevard, which will reduce the crossing distance for people walking and slow down drivers merging onto northbound Boulevard.
4. Implement offset left turns on Harbison Avenue in both directions. Offset lefts provide better sight distance for drivers and eliminate conflicts between drivers turning left and drivers coming in the opposite direction, which will create a safer environment.
5. Add a fourth lane on westbound Harbison Avenue between Magee Avenue and the Boulevard, providing one lane for drivers making offset left turns, two through lanes for drivers continuing on Harbison Avenue, and one for drivers turning right onto the inner (express) lanes of northbound Boulevard. Adding the fourth lane will reduce the number of right turning drivers blocking through traffic on westbound Harbison Avenue.
6. Provide a separate two-lane left-turn bay for drivers from southbound Boulevard onto eastbound Harbison Avenue. This change will reduce the number of drivers lined up along southbound Boulevard through lanes in the PM peak who want to turn left onto eastbound Harbison Avenue.
7. Stripe a crosswalk across the new southbound left-turn lanes and add pedestrian countdown signal heads to improve the safety of people walking.
8. Prohibit drivers from making left turns from northbound Boulevard onto westbound Harbison Avenue. Drivers can make left turns at Bustleton Avenue to the south and Longshore Avenue to the north of this intersection.
9. Prohibit drivers from making U-turns from southbound Boulevard. These changes will reduce confusion between drivers in the center median of the Boulevard, between the southbound and northbound inner (express) lanes.
10. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus at the intersections of the Boulevard with Harbison Avenue and Unruh Avenue.

Figure 6-26. Harbison Avenue & Unruh Avenue



Segment 4A – Knorr Street to Napfle Street



Segment 4 travels for 2.2 miles in a northeast direction, where it makes a slight curve to go north past a small segment of the Pennypack Park at Sandford Avenue, and then turns back to a northeast direction at Napfle Street / Hartel Avenue. This segment is where the cross section of the Boulevard changes multiple times. The southernmost portion is the last location with 80-foot-wide grassy center median separating the express lanes going northbound and southbound with the two smaller grass medians separating the inner and outer lanes in the same direction. Then, the outer (local) lanes split from the inner (express) local lanes and are depressed for approximately 1,000 feet. Just before a small portion of the Pennypack Park, all 12 lanes (inner and outer) are back at-grade, but this time, the center median is narrowed to 60 feet and the two outer medians grow to approximately 18 feet. The inner and outer lanes of the Boulevard split again at Rhawn Street, where the inner (express) lanes are depressed. All lanes of the Boulevard return to at-grade at Strahle Street, where the outer (local) and inner (express) lanes then begin to traverse over the wide Pennypack Park.

Segment 4B – Napfle Street to Pennypack Park



Segment 4 is where the posted speed limits for the Boulevard change. In the northbound direction, the posted speed limit is 40 MPH until Ryan Avenue, where it increases to 45 MPH. In the southbound direction, the posted speed limit of 45 MPH changes to 40 MPH at the intersection of Faunce Street. There are two red light camera locations on Roosevelt Boulevard, one at Rhawn Street and the other at Cottman Avenue; there is one speed camera location near Strahle Street. On-street parking is permitted during off-peak in the southbound direction, south of St. Vincent Street and during off-peak period in the northbound direction, south of Tyson Avenue. On-street parking is not allowed north of these locations for the remainder of the segment. In Segment 4, traffic along the Boulevard moves in either a northbound or southbound direction.

Longshore Avenue (Figure 6-26)

Longshore Avenue intersects with the outer (local) lanes of Roosevelt Boulevard, both northbound and southbound, but does not cross the full Boulevard. A full pedestrian crosswalk extends across both the inner (express) and outer (local) lanes of the Boulevard and is controlled by a traffic signal.

Between 2013 and 2017, there were 14 total reportable crashes near the mid-block signalized pedestrian crossing at Longshore Avenue. Two people walking were involved in these crashes. Of all the people involved in the 14 crashes, no one was killed, and one person was seriously injured. Intersections with a signalized mid-block pedestrian crossing, such as this location, have elevated rates of fatalities and serious injuries for people walking, and for people involved in speed-related crashes.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



Figure 6-27. Longshore Avenue

Tyson Avenue (Figure 6-27)

Crash Cluster Location

Tyson Avenue, which is a four-lane divided roadway, intersects the Boulevard at a right angle. Drivers turning left from southbound Boulevard to eastbound Tyson Avenue use the center median of the Boulevard, between the southbound and northbound inner (express) lanes, and often cause other drivers to back up into the southbound Boulevard travel lanes. In addition, there is no buffer between the travel lane and the existing Tyson Avenue westbound bike lane in the center median of the Boulevard.

Between 2013 and 2017, there were 92 total reportable crashes near the intersection of Tyson Avenue and Roosevelt Boulevard. Four people walking and three people riding a bike were involved in these crashes. Of all the people involved in the 92 crashes, one was killed and four were seriously injured. Four-way intersections with no skew, such as this location, have elevated rates of fatalities and serious injuries for people walking or riding a bike.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Restripe the area of the center median of the Boulevard between the southbound and northbound inner (express) to provide a buffer area between people riding a bike and people driving, improving safety.
4. Replace faded stop bars in the center median of the Boulevard between the southbound and northbound inner (express) to reduce confusion between drivers.
5. Provide additional signal time for drivers making left turns from southbound Boulevard onto eastbound Tyson Avenue. This change allows drivers to clear the center median of the Boulevard between the southbound and northbound inner (express) lanes.



Figure 6-28. Tyson Avenue

Friendship Street (Figure 6-28)

Friendship Street intersects with the outer (local) lanes of southbound Roosevelt Boulevard. An indirect signalized mid-block pedestrian crossing extends across the Boulevard through the large center median.

Between 2013 and 2017, there were three total reportable crashes near the mid-block signalized pedestrian crossing at Friendship Street. Two people walking were involved in these crashes. Of all the people involved in the three crashes, no one was killed, and one person was seriously injured. Indirect signalized mid-block pedestrian crossings, such as this location, have elevated rates of fatalities and serious injuries for people involved in the crash, especially people walking.

1. Increase signal cycle length to 120 seconds to reduce a four-stage crossing to a two-stage crossing of Roosevelt Boulevard for people walking or biking.
2. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.



Figure 6-29. Friendship Street

Cottman Avenue (Figure 6-29)

Crash Cluster Location

The Boulevard's six inner (express) lanes pass beneath Cottman Avenue, while the six outer (local) lanes create at-grade intersections with Cottman Avenue. In 2017, the City constructed Direct Bus Phase A stations at the intersection, and SEPTA started Boulevard Direct express bus service between FTC and the Neshaminy Mall in October 2017.

Between 2013 and 2017, there were 83 total reportable crashes near the intersection of Cottman Avenue and Roosevelt Boulevard. Five people walking and one person riding a bike were involved in these crashes. Of all the people involved in the 83 crashes, one person was killed and three people were seriously injured.

Intersections with at-grade outer (local) lanes and below-grade inner (express) lanes, such as this location, have elevated rates of fatalities and serious injuries for people walking, and for drivers involved in head-on crashes or crashes where drivers hit a fixed object.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
 2. Improve lighting across the Cottman Avenue bridge structure over the Boulevard inner (express) lanes.
 3. Explore wider sidewalks when the Cottman Avenue bridge structure is rehabilitated.
- Identify a new bike facility along Cottman Avenue, including across the bridge structure.



Sandyford Avenue (Figure 6-30)

Sandyford Avenue originates east of Roosevelt Boulevard, and has access to and from the outer (local) lanes of northbound Boulevard. It provides connections between the Boulevard and several schools to the east. At the Boulevard, Sandyford Avenue is stop-controlled and has on-street parking along both sides.

Between 2013 and 2017, there were no reportable crashes near the intersection of Sandyford Avenue and Roosevelt Boulevard.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Construct a pedestrian refuge in the middle of Sandyford Avenue at its intersection with northbound Boulevard to provide a safe refuge for people walking.

Lexington Avenue & Brous Avenue (Figure 6-31)

Both Lexington Avenue and Brous Avenue give drivers access to and from the outer (local) lanes of northbound Boulevard, with drivers turning right from the northbound Boulevard onto one-way eastbound Brous Avenue and drivers turning right from one-way westbound Lexington Avenue onto northbound Boulevard at a stop-controlled intersection. The crosswalks across these two avenues have a combined length of 60 feet, and the median is an additional 60 feet. Between 2013 and 2017, there was one total reportable crash near the intersection of Lexington Avenue, Brous Avenue, and Roosevelt Boulevard. One person walking was involved in this crash.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Eliminate the existing concrete median and extend the curbs on each side in order to consolidate Lexington Avenue and Brous Avenue access points and crosswalks. This change will reduce confusion between drivers and reduce the crossing distance for people walking along northbound Boulevard.



Faunce Street / Revere Street (Figure 6-32)

Crash Cluster Location

Faunce Street meets the outer (local) lanes of southbound Boulevard in a T-intersection. There is an indirect mid-block signalized pedestrian crossing of all 12 lanes, and connecting, between Lexington Avenue and Revere Street.

Between 2013 and 2017, there were 20 total reportable crashes near the mid-block signalized pedestrian crossing at Faunce Street / Revere Street. Four people walking were involved in these crashes. Of all the people involved in the 20 crashes, two people were killed, and one person was seriously injured.

Other common crash causes at this intersection included drivers failing to yield while using the crossovers and merging onto the inner (express) lanes. People driving northbound Boulevard in the inner (express) lanes have also attempted to use the northbound outer to inner crossover to turn right onto Revere Street. Indirect signalized mid-block pedestrian have elevated rates of fatalities and serious injuries for people walking.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Relocate the northbound crossover from outer (local) to inner (express) lanes further south of Revere Street (closer to Lexington Avenue) to improve the safety of people walking. This change also ensures the crossover operates safely and efficiently with the installation of BAT Lanes, Phase A.
3. Realign the signalized mid-block pedestrian crosswalk across the Boulevard to connect to Revere Street. Maintain the crosswalk offset between the northbound and southbound lanes of Roosevelt Boulevard to discourage people from walking across the Boulevard in one traffic signal cycle.
4. Relocate the existing northbound local bus stop from its current mid-block location to Revere Street and implement local bus stop improvements at northbound and southbound stops to provide a safe place for transit riders to wait for the bus.



Ryan Avenue / Borbeck Avenue (Figure 6-33)

Borbeck Avenue west of Roosevelt Boulevard is Ryan Avenue east of Roosevelt Boulevard. This intersection uses the Boulevard's large median for a separate lane for drivers turning left onto eastbound Ryan Avenue or westbound Borbeck Avenue. Currently, drivers making left turns from the Boulevard go before through traffic in the opposite direction.

Between 2013 and 2017, there were 37 total reportable crashes near the intersection of Ryan Avenue/Borbeck Avenue and Roosevelt Boulevard. Two people walking were involved in these crashes. Of all the people involved in the 37 crashes, no one was killed, and one person was seriously injured. Intersections with separated left turn lanes in the center median with no curve, such as this location, have elevated rates of fatalities and serious injuries for people walking, for people involved in crashes with fixed objects, and in crashes where drivers ran red lights or were distracted.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Rhawn Street (Figure 6-34)

Rhawn Street intersects with the Boulevard at a right angle, creating a standard signalized intersection. This intersection uses the Boulevard's large median for a separate lane for drivers turning left onto either eastbound or westbound Rhawn Street. In 2017, the City constructed Direct Bus Phase A stations at the intersection, and SEPTA started Boulevard Direct express bus service between FTC and the Neshaminy Mall in October 2017.

Between 2013 and 2017, there were 52 total reportable crashes near the intersection of Rhawn Street and Roosevelt Boulevard. Five people walking were involved in these crashes. No one was killed or seriously injured. Intersections with separated left turn lanes in the center median with no curve, such as this location, have elevated rates of fatalities and serious injuries for people walking, for people involved in crashes with fixed objects, and in crashes where drivers ran red lights or were distracted.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.

- Identify a new bike connection on Rhawn Street.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Solly Avenue / Holme Avenue (Figure 6-35)

In 2015, PennDOT transformed this intersection from a large traffic circle, called Pennypack Circle, to a six-lane bridge that connects Holme Avenue to Solly Avenue over the six depressed inner (express) lanes of the Boulevard. The outer (local) lanes of northbound and southbound Boulevard are at-grade.

Between 2013 and 2017, there were 26 total reportable crashes near the intersection of Solly Avenue / Holme Avenue and Roosevelt Boulevard. Two people walking were involved in these crashes. Of all the people involved in the 26 crashes, one person was killed, and one person was seriously injured. Intersections with at-grade outer (local) lanes and below-grade inner (express) lanes have elevated rates of fatalities and serious injuries for people walking and for people involved in head-on crashes or crashes where drivers hit a fixed object.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.



Strahle Street (Figure 6-36)

Strahle Street approaches Roosevelt Boulevard from the west at a right angle, crossing both outer (local) and inner (express) southbound lanes and the inner (express) northbound lanes. Along the north side of Strahle Street is a pedestrian crosswalk that crosses all 12 lanes of the Boulevard. Drivers turning left from northbound Boulevard often wait in the center median to complete the turn onto Strahle Street. Drivers are not able to make left turns from southbound Boulevard because there is a full median between the northbound Boulevard inner (express) and outer (local) lanes.

Between 2013 and 2017, there were 15 total reportable crashes near the intersection of Strahle Street and Roosevelt Boulevard. In these 15 crashes, no one was killed, and one person was seriously injured.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Extend the curbs on the west side of Strahle Street along the Boulevard's southbound outer (local) lanes to reduce the crossing distance for people walking.
3. Implement local bus stop improvements to the southbound stop to provide a safe place for transit riders to wait for the bus.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.

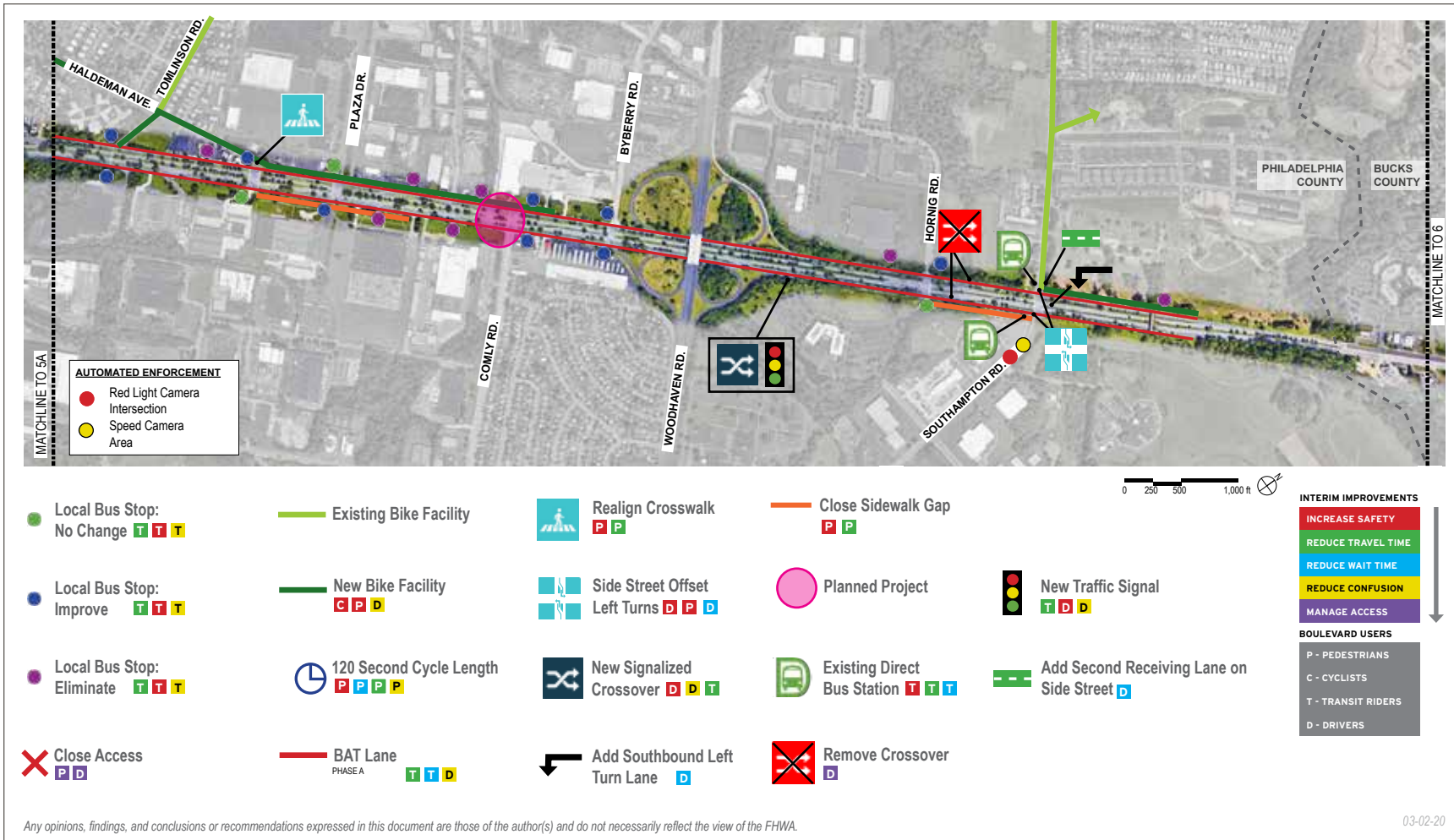


Segment 5A - Pennypack Park to Red Lion Road



Segment 5 is, by far, the longest segment at nearly five miles. This segment is where the second most prominent cross section of the Boulevard appears – the center median is no longer 80 feet wide; it now narrows to 5 to 15 feet at the intersection and is between 20 and 25 feet between intersections. The median between the inner (express) and outer (local) northbound lanes is between 10 and 18 feet, and the median between the inner (express) and outer (local) southbound lanes is approximately 25 feet wide. The posted speed limit in this segment is 45 MPH and there are four red light camera locations on Roosevelt Boulevard: Welsh Road, Grant Avenue, Red Lion Road, and Southampton Road. There are also three speed camera locations, near Grant Avenue, near Red Lion Road, and near Southampton Road. On-street parking is not permitted in this segment. In Segment 5, traffic along the Boulevard moves in either a northbound or southbound direction.

Segment 5B - Red Lion Road to Philadelphia/Bucks County Line



Woodward Street (Figure 6-37)

Crash Cluster Location

Woodward Street intersects with Roosevelt Boulevard at a right angle. Drivers turning left from Woodward Street onto the Boulevard conflict with drivers turning left from the opposite direction of Woodward Street; poor sight distance creates challenging conditions for people driving. In addition, drivers turning left from either direction of the Boulevard onto eastbound or westbound Woodward Street often wait in the narrow center median and often cause other drivers to back up into the Boulevard's travel lanes.

Between 2013 and 2017, there were 24 total reportable crashes near the intersection of Woodward Street and Roosevelt Boulevard. Of all the people involved in the 24 crashes, three people were killed, and one person was seriously injured. Most of the crashes involved drivers rear-ending other drivers stopped at traffic signals or people driving aggressively. The area around the intersection of Woodward Street and Roosevelt Boulevard is one of the top 11 Crash Cluster locations along the Boulevard. Here, there was a cluster of four killed or serious injury crashes that resulted in five people either killed or seriously injured. Four-way intersections perpendicular to the Boulevard, such as this location, have elevated rates of fatalities and serious injuries for people walking, and for people involved in crashes where drivers ran red lights.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Implement offset left turns on Woodward Street. Offset lefts provide better sight distance for drivers and eliminate conflicts between drivers turning left and drivers coming in the opposite direction, which will create a safer environment.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.

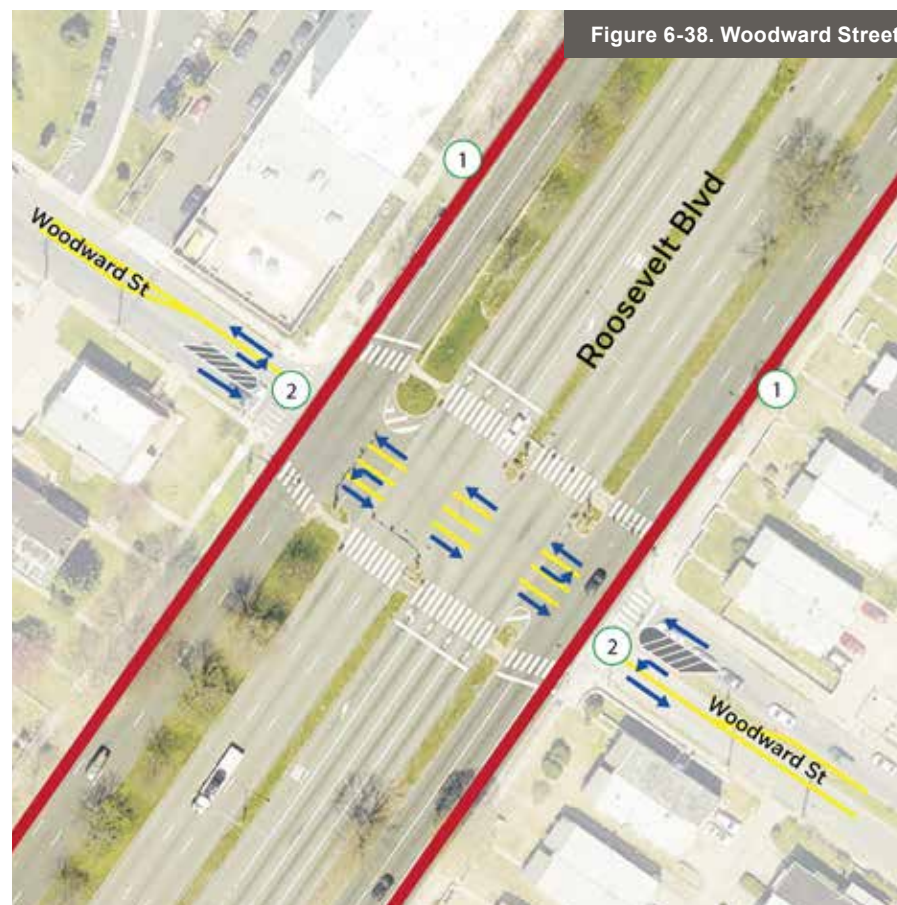


Figure 6-38. Woodward Street

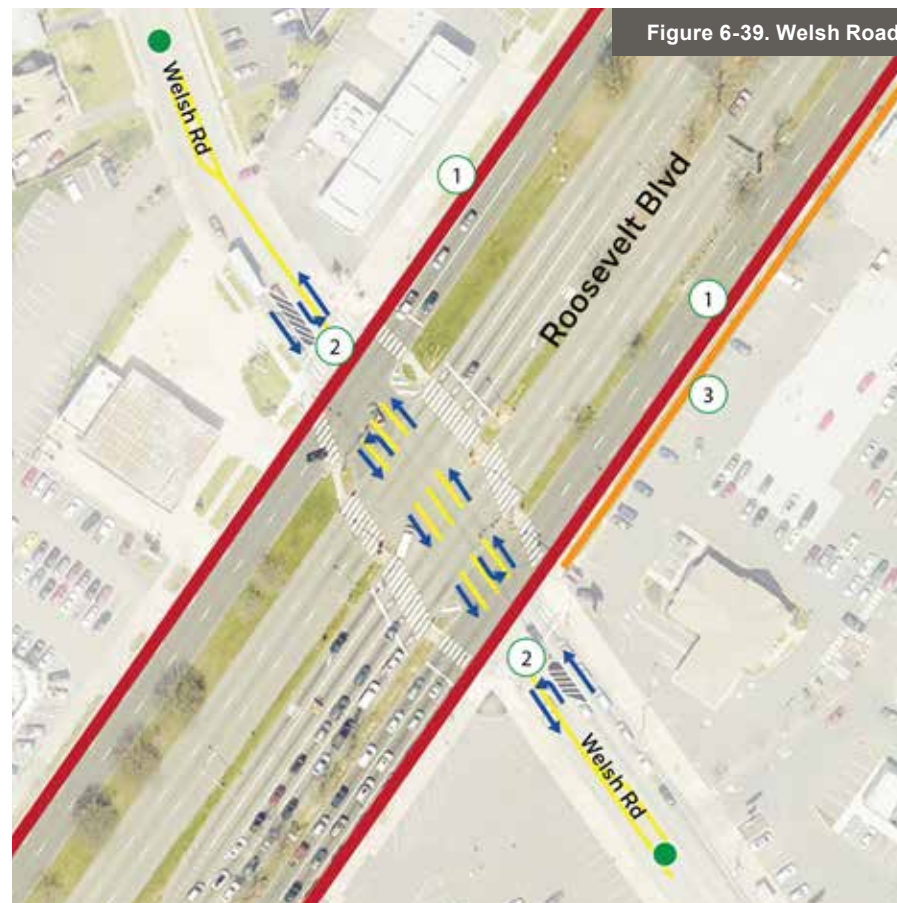
Welsh Road (Figure 6-38)

The Welsh Road intersection with the Boulevard is skewed, creating long crossing distances for people crossing the Boulevard. Drivers turning left from Welsh Road onto the Boulevard conflict with drivers turning left from the opposite direction; poor sight distance creates challenging conditions for people driving. In addition, drivers turning left from either direction of the Boulevard onto eastbound or westbound Welsh Road often wait in the narrow center median and often cause other drivers to back up into the Boulevard's travel lanes. In 2017, the City constructed Direct Bus, Phase A stations at the intersection, and SEPTA started Boulevard Direct express bus service between FTC and the Neshaminy Mall in October 2017.

Between 2013 and 2017, there were 45 total reportable crashes near the intersection of Welsh Road and Roosevelt Boulevard. Three people walking were involved in these crashes. Of all the people involved in the 45 crashes, one person was killed and one person was seriously injured. Skewed, four-way intersections, such as this location, have elevated rates of fatalities and serious injuries for people walking.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
 2. Implement offset left turns on Welsh Road. Offset lefts provide better sight distance for drivers and eliminate conflicts between drivers turning left and drivers coming in the opposite direction, which will create a safer environment.
 3. Work with property owner(s) to close sidewalk gap adjacent to outer (local) lanes of northbound Boulevard.
- Identify a new bike connection with Welsh Road

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Goodnaw Street (Figure 6-39)

Goodnaw Street intersects with Roosevelt Boulevard at a right angle. Goodnaw Street, east of the Boulevard, provides direct access to the Northeast Village Shopping Center. Drivers turning left from either direction of the Boulevard onto either eastbound or westbound Goodnaw Street often wait in the narrow center median and often cause other drivers to back up into the Boulevard's travel lanes.

Between 2013 and 2017, there were 21 total reportable crashes near the intersection of Goodnaw Street and Roosevelt Boulevard. Two people walking were involved in these crashes. Of all the people involved in the 21 crashes, no one was killed or seriously injured. Four-way intersections perpendicular to the Boulevard, such as this location, have elevated rates of fatalities and serious injuries for people walking and for people involved in crashes where drivers ran red lights.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus.
3. Work with property owner(s) to close sidewalk gap adjacent to the outer (local) lanes of northbound Boulevard.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Grant Avenue (Figure 6-40)

Grant Avenue is a four-lane divided roadway that intersects with Roosevelt Boulevard at a right angle. Drivers turning left from Grant Avenue onto the Boulevard conflict with drivers turning left from the opposite direction; poor sight distance creates challenging conditions for people driving. In addition, drivers turning left from either direction of the Boulevard onto eastbound or westbound Grant Avenue often wait in the narrow center median and often cause other drivers to back up into the Boulevard travel lanes. In 2017, the City constructed Direct Bus Phase A stations at the intersection, and SEPTA started Boulevard Direct express bus service between FTC and the Neshaminy Mall in October 2017.

Between 2013 and 2017, there were 125 total reportable crashes near the intersection of Grant Avenue and Roosevelt Boulevard. Two people walking were involved in these crashes. Of all the people involved in the 125 crashes, no one was killed, and one person was seriously injured. Four-way intersections perpendicular to the Boulevard, such as this location, have elevated rates of fatalities and serious injuries for people walking and for people involved in crashes where drivers ran red lights.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Implement offset left turns on Grant Avenue. Offset lefts provide better sight distance for drivers and eliminate conflicts between drivers turning left and drivers coming in the opposite direction, which will create a safer environment.
3. Move the pedestrian signal heads from the south side from the side medians to the center median to alert people to walk across the Boulevard in two signal cycles.
4. Expand the pedestrian refuge on the center median between the southbound and northbound inner (express) lanes on the north side of Grant Avenue to provide a safe refuge for people walking.
5. Install a sidepath adjacent to westbound Grant Avenue.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.

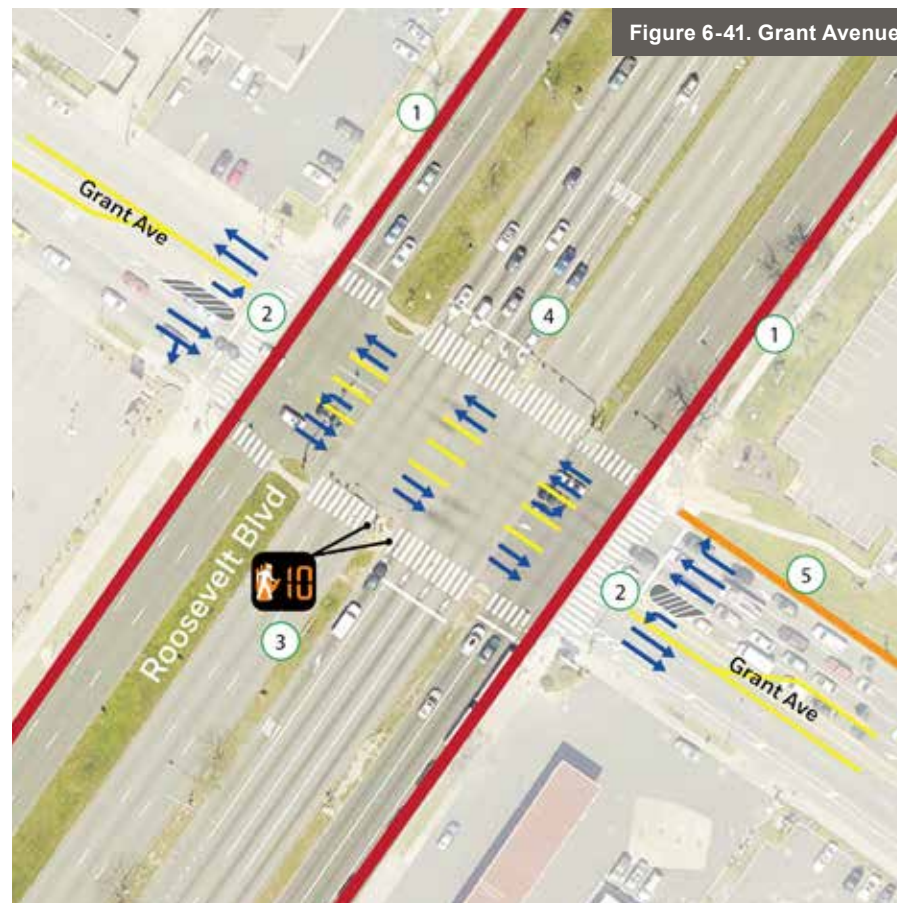


Figure 6-41. Grant Avenue

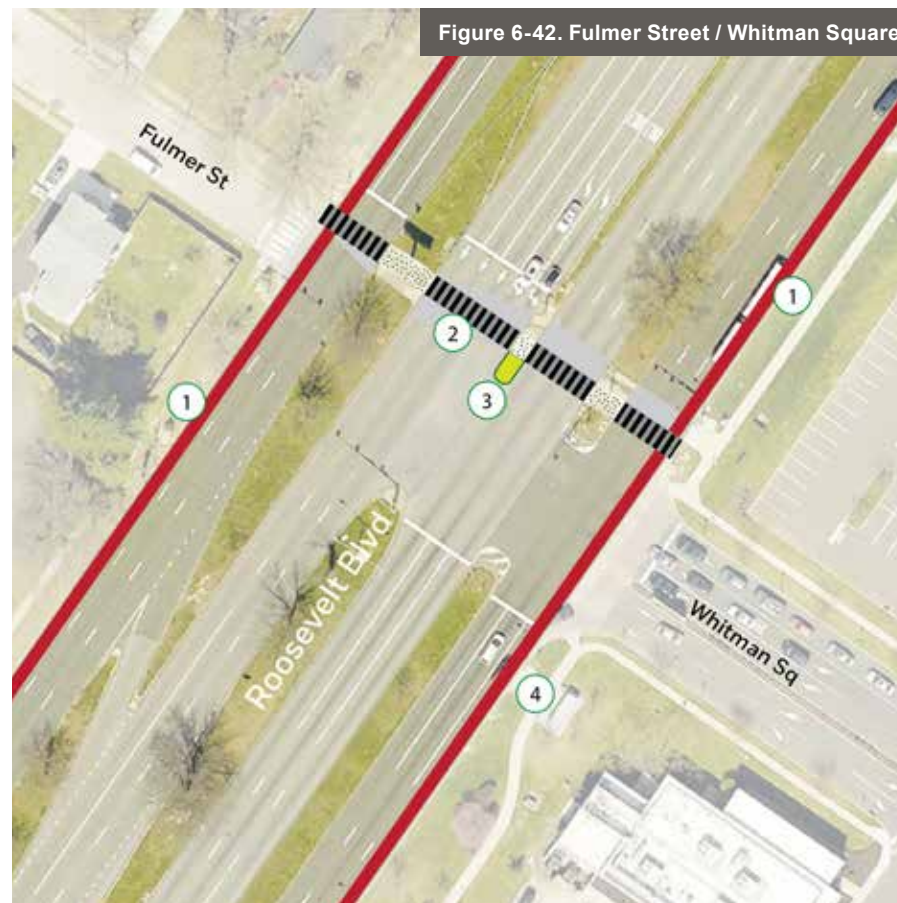
Fulmer Street / Whitman Square (Figure 6-41)

Fulmer Street has stop-controlled access to the outer (local) lanes of southbound Boulevard. The Whitman Square driveway intersects with the inner (express) lanes in both directions and with the outer (local) lanes of northbound Boulevard. The Whitman Square driveway is offset from Fulmer Street, so the crosswalks across the Boulevard are skewed, creating a long crossing distance for people walking. The Whitman Square Shopping Plaza draws a high number of people driving and people walking.

Between 2013 and 2017, there were 17 total reportable crashes near the mid-block signalized pedestrian crossing at Fulmer Street (Whitman Square). One person walking was involved in these crashes. Of all the people involved in the 17 crashes, no one was killed or seriously injured.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Realign the crosswalks on the north side of Fulmer Street / Whitman Square to reduce the crossing distance for people walking across the Boulevard.
3. Extend the center median between the southbound and northbound inner (express) lanes on the north side of Fulmer Street / Whitman Square to provide a safe refuge for people walking.
4. Extending the landing pad at the local bus stop along northbound Roosevelt Boulevard to provide more space for the bus to unload passengers from the back door.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Lott Street, Bowler Street and Conwell Avenue (Figure 6-42)

Approaching from the west, both Lott Street and Conwell Avenue intersect with the Boulevard's outer (local) southbound lanes and both sets of inner (express) lanes, ending at the Boulevard's northbound inner (express) lanes. Drivers turning left from northbound Boulevard often wait in the narrow center median. Between Lott Street and Conwell Avenue is Bowler Street, which intersects only with the outer (local) southbound lanes; however, a signalized pedestrian crosswalk extends across all 12 lanes of the Boulevard.

Between 2013 and 2017, there were 59 total reportable crashes between Lott Street and Conwell Avenue on Roosevelt Boulevard. Two people walking were involved in these crashes. Of all the people involved in the 59 crashes, two people were killed, and two people were seriously injured. Bowler Street has elevated rates of fatalities and serious injuries for people walking and for people involved in crashes identified as speeding related. Large T-intersections, such as Conwell Avenue, have elevated rates of fatalities and serious injuries for people walking and for people involved in crashes where drivers ran red lights.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus at Bowler Street and Conwell Avenue.
3. Eliminate local bus stops at Lott Street because of its close proximity to local bus stops at Bowler Street and Fulmer Street / Whitman Square.
4. Work with property owner(s) to close sidewalk gap adjacent to outer (local) lanes of northbound Boulevard.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Figure 6-43. Lott Street, Bowler Street and Conwell Avenue

Red Lion Road (Figure 6-43)

Red Lion Road is a multi-lane undivided roadway that intersects with Roosevelt Boulevard at a slight angle. The intersection has high volumes of people driving and people walking. Drivers turning left from Red Lion Road onto the Boulevard conflict with drivers turning left from the opposite direction; poor sight distance creates challenging conditions for people driving. In addition, drivers turning left from either direction of the Boulevard onto eastbound or westbound Red Lion Road wait in the narrow center median and often cause other drivers to back up into the Boulevard's travel lanes. In 2017, the City constructed Direct Bus Phase A stations at the intersection, and SEPTA started Boulevard Direct express bus service between FTC and the Neshaminy Mall in October 2017.

Between 2013 and 2017, there were 93 total reportable crashes near the intersection of Red Lion Road and Roosevelt Boulevard. Four people walking were involved in these crashes. Of all the people involved in the 93 crashes, no one was killed, and one person was seriously injured. Four-way intersections perpendicular to the Boulevard, such as this location, have elevated rates of fatalities and serious injuries for people walking and for people involved in crashes where drivers ran red lights.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
 2. Move the pedestrian signal heads from the south side from the side medians to the center median to alert pedestrians to cross the Boulevard in two signal cycles.
 3. Expand the pedestrian refuge on the center median between the southbound and northbound inner (express) lanes on the south side of Red Lion Road to provide a safe refuge for people walking.
 4. Implement offset left turns on Red Lion Road. Offset lefts provide better sight distance for drivers and eliminate conflicts between drivers turning left and drivers coming in the opposite direction, which will create a safer environment.
- Identify new bike connections on Red Lion Road.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Haldeman Avenue & Tomlinson Road (Figure 6-44)

Tomlinson Road intersects only with the outer (local) lanes of southbound Boulevard; however, a signalized pedestrian crosswalk extends across all 12 lanes of the Boulevard, just south of the intersection with Tomlinson Road. From the west, Haldeman Avenue ends at Roosevelt Boulevard's southbound outer (local) lanes at an angle that creates a wide radius for drivers turning right from southbound Boulevard. Drivers tend to make this turn at high rates of speed, endangering people walking across Haldeman Avenue in the crosswalk.

Between 2013 and 2017, there were 23 total reportable crashes between Tomlinson Road and the intersection of Haldeman Avenue and Roosevelt Boulevard. One person walking was involved in these crashes. Of all the people involved in the 23 crashes, no one was killed or seriously injured.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
 2. Realign crosswalks across Haldeman Avenue along southbound Boulevard to significantly reduce the crossing distance for people walking and add a pedestrian-actuated signal.
 3. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus at Tomlinson Road.
 4. Eliminate local bus stop between southbound Boulevard and Haldeman Avenue because of its close proximity to the local bus stops at signalized crossing at Tomlinson Road and at Haldeman Avenue.
 5. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus on southbound Boulevard at Haldeman Avenue.
- Identify new bike connections on Tomlinson Road between Roosevelt Boulevard and Haldeman Avenue and on Haldeman Avenue.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.

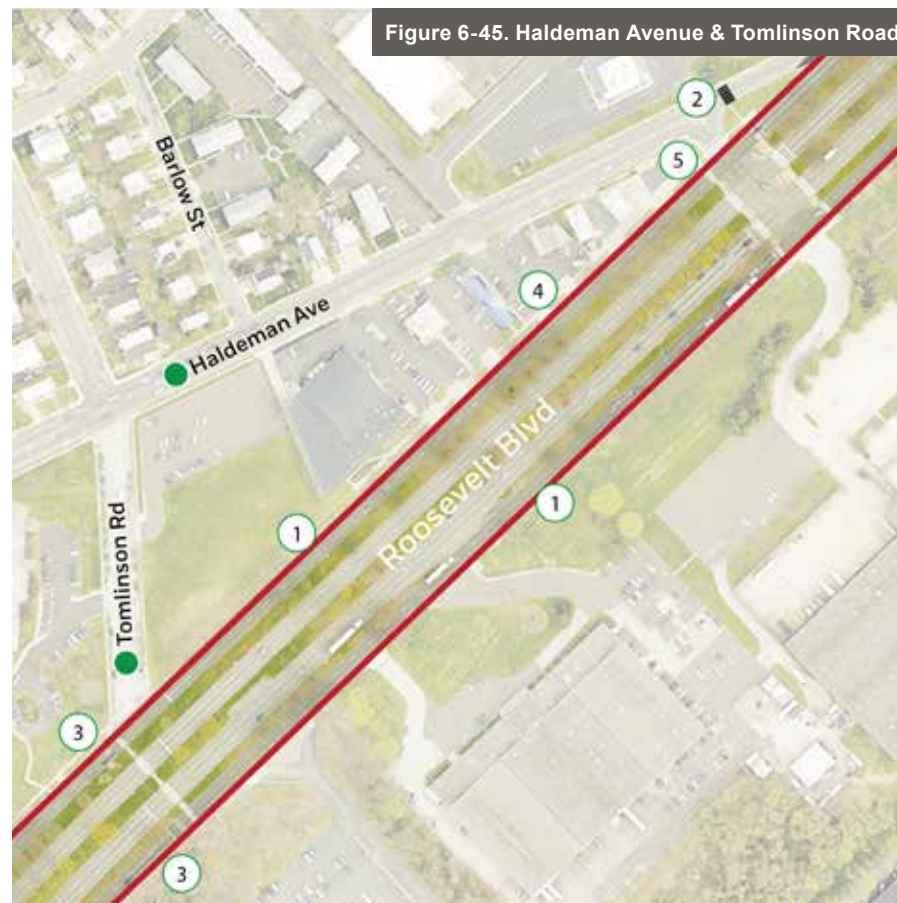


Figure 6-45. Haldeman Avenue & Tomlinson Road

Plaza Drive (Figure 6-45)

Plaza Drive intersects with Roosevelt Boulevard at a right angle. Drivers turning left from either direction of the Boulevard onto eastbound or westbound Plaza Drive wait in the narrow center median and often cause other drivers to back up into the Boulevard's travel lanes. Plaza Drive on the east of northbound Roosevelt Boulevard provides vehicular and large freight truck access to several industrial sites.

Between 2013 and 2017, there were 16 total reportable crashes near the intersection of Plaza Drive and Roosevelt Boulevard. One person walking was involved in these crashes. Of all the people involved in the 16 crashes, one person was killed and one person was seriously injured.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus on northbound Roosevelt Boulevard at Plaza Drive.
3. Work with property owner(s) to close sidewalk gap adjacent to outer (local) lanes of northbound Boulevard.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Figure 6-46. Plaza Drive

Comly Road & Nabisco Drive (Figure 6-46)

In 1950, Nabisco-Kraft foods build a manufacturing plant at 12000 East Roosevelt Boulevard, just south of Byberry Road. In 2012, Mondelez International Inc. operated the site as a baking and distribution center until 2015. In 2016, the 27.5-acre site was purchased by a development partnership, which has demolished the factory buildings and constructed a large gas station. The project is currently converting the remaining site into strip-retail and restaurants, including a major golf entertainment complex. As part of this project, Nabisco Drive is expected to close and the T-intersection of Comly Road will convert into a full signalized intersection. As the development of the property progresses, the City and PennDOT will continue to review and provide comment on the proposed pedestrian and traffic operations at this intersection.

Currently, Comly Road intersects with northbound Boulevard's six inner (express) and six outer (local) lanes, but ends at Roosevelt Boulevard's southbound outer (local) lanes. Drivers turning left from southbound Boulevard onto eastbound Comly Road wait in the narrow center median and often cause other drivers to back up into southbound Boulevard's travel lanes. Nabisco Drive is another T-intersection coming from southbound Boulevard, and it currently ends at the Boulevard's northbound outer (local) lanes.

Between 2013 and 2017, there were 29 total reportable crashes near the intersection of Comly Road and Roosevelt Boulevard. One person walking was involved in these crashes. Of all the people involved in the 29 crashes, no one was killed, and one person was seriously injured. Large T-intersections along the Boulevard, such as this location, have elevated rates of fatalities and serious injuries for people walking and for people involved in crashes where drivers ran red lights.

1. Realign crosswalks to reduce the crossing distance for people walking across the Boulevard.
2. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
3. Make Comly Road a full intersection by creating through access into the property along southbound Roosevelt Boulevard.
4. Add a left turn lane from northbound Roosevelt Boulevard to westbound Comly Road.
5. Eliminate Nabisco Drive and shift people wanting to use Nabisco Drive to the full intersection of Comly Road.



Figure 6-47. Comly Road & Nabisco Drive

6. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus at Comly Road.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.

Byberry Road (Figure 6-47)

Approaching from the west, Byberry Road intersects with the Boulevard's southbound outer (local) lanes and all six inner (express) lanes; it terminates at the median between northbound Boulevard's inner (express) and outer (local) lanes. The intersection's proximity to the on-ramp to Woodhaven Road causes the crosswalk to offset, creating a long crossing distance for people walking. Drivers turning left from northbound Boulevard wait in the narrow center median and cause other drivers to back up in the Boulevard's travel lanes.

Between 2013 and 2017, there were 13 total reportable crashes near the intersection of Byberry Road and Roosevelt Boulevard. In these 13 crashes, there was no one walking or riding a bike, and no one was killed or seriously injured.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Extend the landing pad at the local bus stop along northbound Roosevelt Boulevard; make improvements local bus stops to provide a safe place for transit riders to wait for the bus on southbound Roosevelt Boulevard.

In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.



Figure 6-48. Byberry Road

Woodhaven Road (Figure 6-48)

Woodhaven Road (PA 63) is a segment of the planned Woodhaven Expressway, which was built in 1962 to link I-95 to Roosevelt Boulevard. Construction of the Expressway halted in 1972 and was never continued due to community opposition. A grade-separated cloverleaf interchange provides access between the two facilities and then stops abruptly to the west of the Boulevard.

Between 2013 and 2017, there were three total reportable crashes near the intersection of Woodhaven Road and Roosevelt Boulevard. In these three crashes, there were no people walking or riding a bike involved, and no one was killed or seriously injured.

1. Install BAT Lanes, Phase A along the Boulevard to improve transit travel time and reliability, while allowing drivers to make right turns into businesses and side streets.
2. Convert the terminus of the off-ramp of westbound Woodhaven Road to northbound Roosevelt Boulevard to a signalized intersection. This will allow drivers to access Roosevelt Boulevard inner (express) lanes and be able to turn left at Southampton Road. This change also ensures drivers exiting Woodhaven Road can enter the Boulevard safely with the installation of BAT Lanes, Phase A.



Hornig Road and Southampton Road (Figure 6-49)

Crash Cluster Location

Hornig Road, along southbound Roosevelt Boulevard, primarily serves light industrial properties. While Hornig Road intersects all lanes of the Boulevard, on the northbound side is a private driveway. At this intersection, drivers often wait in the narrow center median to make left turns from the Boulevard onto either Hornig Road or the private driveway.

Between 2013 and 2017, there were 97 total reportable crashes from Hornig Road to Southampton Road on Roosevelt Boulevard. Three people walking were involved in these crashes. Of all the people involved in the 97 crashes, two people were killed and three people were seriously injured. Intersections with a leg formed by a driveway, such as this location, have elevated rates of fatalities and serious injuries for people walking.

The next intersection north is Southampton Road, which intersects with Roosevelt Boulevard at a right angle. In 2015, the City installed new bus shelters at the intersection, and SEPTA added Southampton as a stop on the Boulevard Direct express bus service in February 2018. This intersection is adjacent to the Byberry East and West Industrial Parks, which was established by the City on the former site of the state-owned hospital and surrounding farmland. Also at this intersection is Benjamin Rush State Park, which was created on 275 acres formerly belonging

to the former hospital. It is the only state park within Philadelphia's city limits.

There were 72 reportable crashes at this intersection from 2013 to 2017. The area around the intersection of Southampton Road and Roosevelt Boulevard is one of the top-11 Crash Cluster locations along the Boulevard. Here, there was a cluster of four killed or serious injury crashes that resulted in four people either killed or seriously injured.

One cause of crashes is that the signal phase for drivers turning left from Roosevelt Boulevard onto Southampton Road is too short, causing drivers to crash into each other. Drivers making left turns from Southampton Road onto the Boulevard are also an issue. Many crashes involved drivers rear-ending other drivers stopped at traffic signals. There are also a few crashes where drivers hit wildlife. Four-way intersections with no skew, such as this location, have elevated rates of fatalities and serious injuries for people walking and for people involved in crashes where drivers ran red lights.

The Program recognizes there is an effort to redevelop the vacant land along southbound Roosevelt Boulevard, north of Southampton Road. As with any redevelopment of property that fronts the Boulevard, the developer is required to present plans to the surrounding communities, which may impact the final design of the intersection. The City and PennDOT will also review the plans as part of the permitting process, taking into account community input and traffic impacts.

1. Install BAT Lanes, Phase A along the Boulevard, up to where the inner (express) and outer (local) roadways merge, to improve transit travel time and reliability while allowing drivers to make right turns into businesses and side streets.
 2. Convert the existing southbound through lane on the Boulevard into a second southbound left turn lane onto eastbound Southampton Road. This will maintain the existing crossing distance for people walking while reducing the back up of drivers waiting to turn left.
 3. Add a second receiving lane on both eastbound and westbound Southampton Road.
 4. Implement offset left turns on Southampton Road. Offset lefts provide better sight distance for drivers and eliminate conflicts between drivers turning left and drivers coming in the opposite direction, which will create a safer environment.
 5. Install a new bike facility along Southampton Road.
 6. Implement local bus stop improvements to provide a safe place for transit riders to wait for the bus at Hornig Road on southbound Boulevard.
 7. Install a sidepath adjacent to the southbound outer (local) lanes of the Boulevard.
- In addition, further analysis is needed to determine if modifying the traffic signal phasing to allow drivers turning left from the Boulevard to move after through drivers in the opposite direction would improve traffic operations on the Boulevard in both directions.

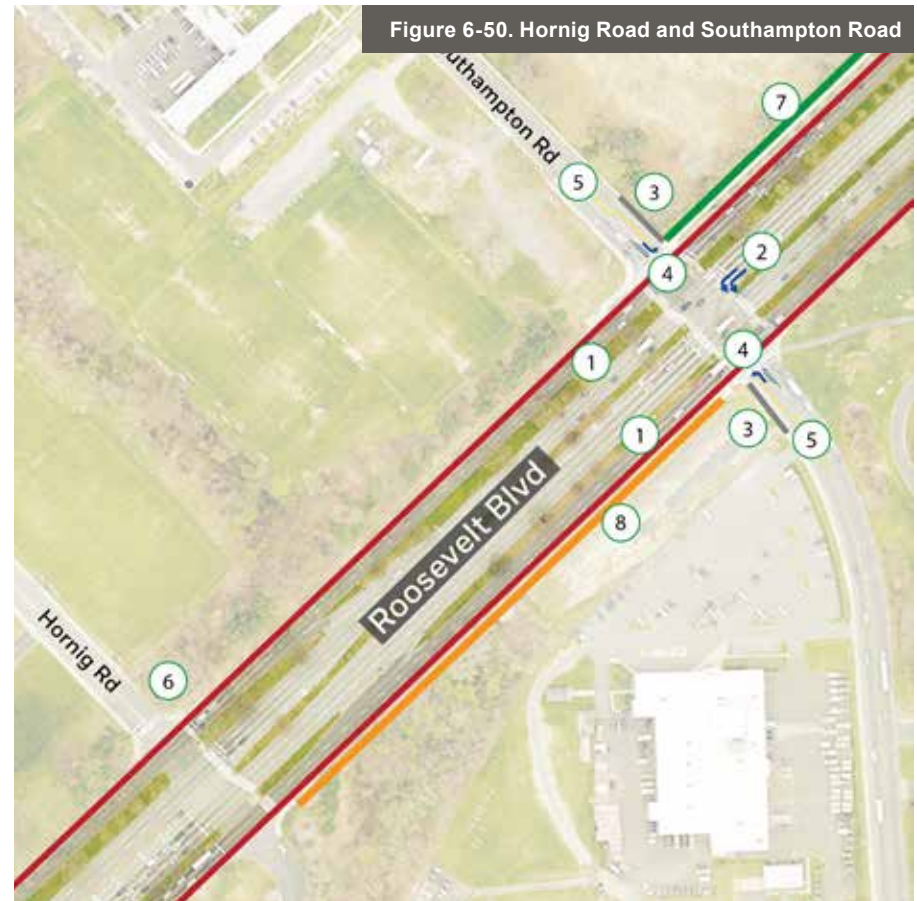
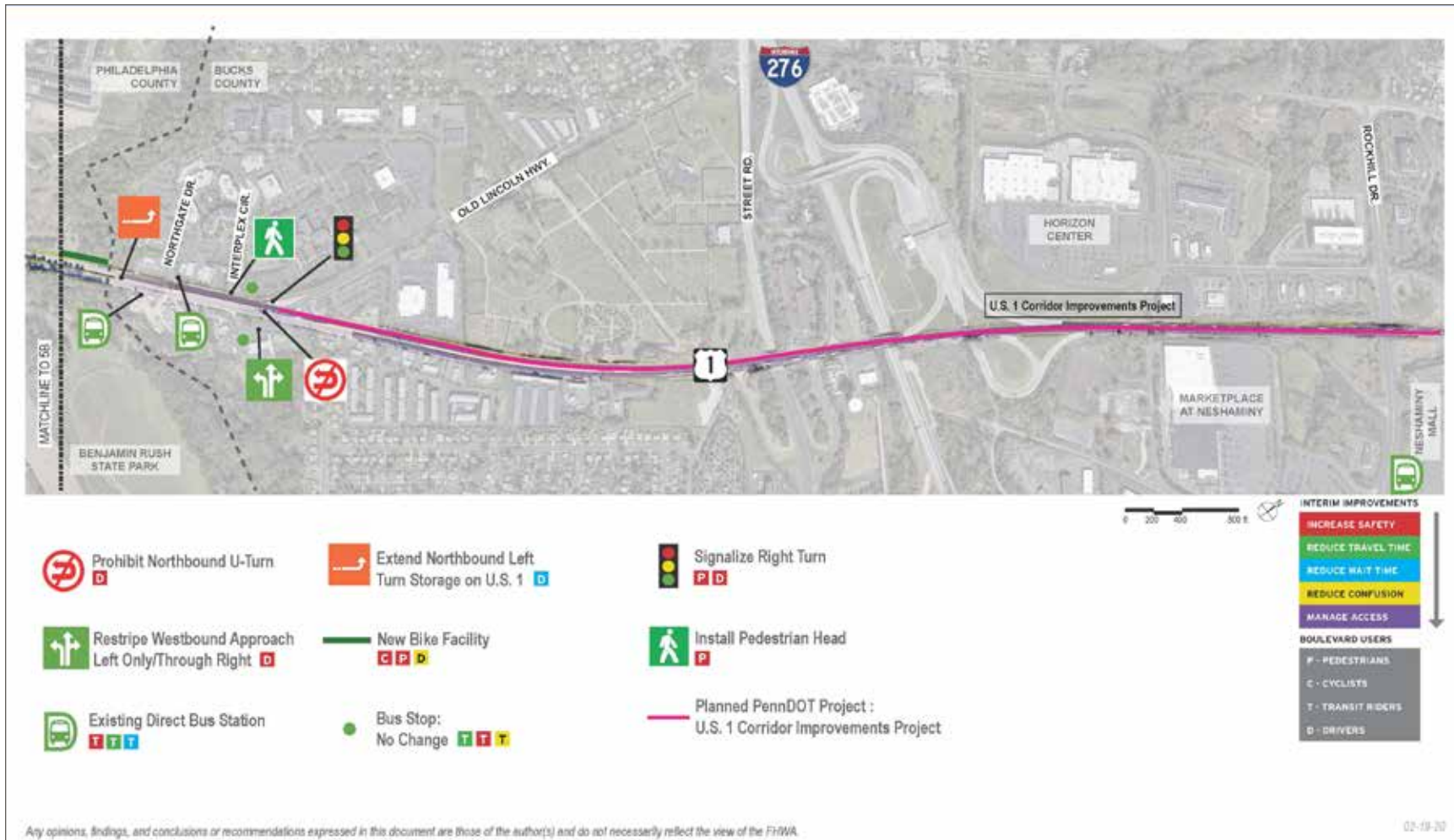


Figure 6-50. Hornig Road and Southampton Road

Segment 6 – Philadelphia/Bucks County Line to Rockhill Drive



Segment 6 is the only segment outside of Philadelphia city limits, and the road is referred to as U.S. 1 (Lincoln Highway), rather than Roosevelt Boulevard. This segment does not contain divided inner (express) and outer (local) lanes. Here, the posted speed limit is 45 MPH south of the Pennsylvania Turnpike (I-276) and 55 MPH north of the PA Turnpike. The first major signalized intersection is at Old Lincoln Highway after the lanes merge together. North of Old Lincoln Highway, U.S. 1 transitions to an expressway and includes interchanges with Street Road (SR 132), the PA Turnpike (I-276), and Rockhill Drive. In Segment 6, traffic along U.S. 1 moves in either a northbound or southbound direction.

PennDOT is actively constructing the U.S. 1 Improvements Project to replace aging bridges and enhance highway safety on approximately four miles of U.S. 1. The project extends from Old Lincoln Highway in Bensalem Township to just north of the PA 413 (Pine Street) overpass in Middletown Township and Langhorne Borough.

Northgate Drive, Interplex Circle, and Old Lincoln Highway (Figure 6-50)

While Northgate Drive intersects all lanes of U.S. 1, on the other side is a private driveway along northbound U.S. 1. There are three lanes southbound and three lanes northbound, where drivers waiting to turn left onto Northgate Drive from northbound U.S. 1 often cause other drivers to back up into the through lanes. SEPTA started Boulevard Direct express bus service between FTC and the Neshaminy Mall in October 2017, which stops at Northgate Drive (Neshaminy Interplex).

Interplex Circle intersects with southbound U.S. Route 1 and there is a concrete median that restricts access to northbound U.S. Route 1. There is no crosswalk and associated ramps crossing Interplex Circle along southbound U.S. 1.

Old Lincoln Highway intersects U.S. 1 at a skewed angle. People driving on eastbound Old Lincoln Highway turn right onto southbound U.S. 1 at the unsignalized intersection, often at a high rate of speed, putting people walking across Old Lincoln Highway and people driving along Old Lincoln Highway at risk.

1. Extend the existing left-turn bay of northbound U.S. 1 to provide more space for drivers turning left onto Northgate Drive; modify the signal timing to provide more time for northbound left turns.
2. Install a crosswalk along southbound U.S. 1 across Interplex Circle to improve the safety of people walking.
3. Add a traffic signal for drivers turning right from eastbound Old Lincoln Highway onto southbound U.S. 1. This change would improve the safety of people walking by allowing people to cross Old Lincoln Highway. The improvement also eliminates conflicts between drivers on eastbound Old Lincoln Highway, drivers on southbound U.S. 1, and drivers turning right onto Interplex Circle.
4. Restripe westbound Old Lincoln Highway at northbound U.S. 1 to provide one lane for left turns and a separate lane for through and right-turn movements to reduce the number of drivers waiting to turn.
5. Prohibit U-turns from northbound U.S. 1. People driving along northbound U.S. 1 and wanting to go south are directed to use the jug-handle to westbound Old Lincoln Highway in order to turn left onto southbound U.S. 1.



U.S. 1 (Lincoln Highway)

PennDOT's U.S. 1 Improvements Project begins where Old Lincoln Highway and U.S. 1 (Lincoln Highway) split, and focuses on the replacement of aging bridges and highway safety enhancements of an approximately four-mile segment of U.S. 1. PennDOT subdivided the overall U.S. 1 Improvement Project into three sub-projects to allow for the delivery of successive smaller projects. The Route for Change Program includes all of sub-project RC-1 and the southern portion of sub-project RC-2, south of Rockhill Drive.

Sub-project RC-1, which started construction in Fall 2018, extends from Old Lincoln Highway to just north of the PA Turnpike Interchange. It includes improvements to:

- U.S. 1 Expressway (Lincoln Highway)
- Street Road (SR 0132)
- U.S. 1 and Street Road Interchange (SR 8017)
- U.S. 1 and PA Turnpike Interchange (SR 8019)
- Bristol Road (SR 2025)

Sub-project RC-2, anticipated to start in Fall 2021, extends from south of the Rockhill Drive Interchange to just north of the Penndel Interchange. It includes improvements to:

- U.S. 1 (Lincoln Highway)
- Rockhill Drive (SR 2044)
- U.S. 1 and Rockhill Drive (Neshaminy) Interchange (SR 8055)
- U.S. 1 and Business Route 1 (Penndel) Interchange (SR 8067)

Sub-project RC-3 extends from just north of the Penndel Interchange to just north of the PA 413 (Pine Street) overpass.

Conclusion

The recommended 2025 intersection specific improvements for the Boulevard will improve safety, accessibility, and reliability for all users. Combined with the 2025 corridorwide improvements in Chapter 5 and the 2025 strategies in Chapter 7, they provide the foundation for transforming the Boulevard over the long-term. Please refer to Chapter 10 to learn more about the next steps to move 2025 recommendations forward.

CHAPTER

7

Recommended 2025 Programmatic Strategies

This chapter identifies strategies to improve safety for all with:

- Automated Speed Enforcement (ASE) Program
- Vision Zero Educational Program
- Signage Inventory & Evaluation
- Lighting Assessment
- Transportation Demand Management (TDM)

Introduction

As evidenced by the crash statistics presented in Chapter 3, safety is a paramount concern. Additional strategies discussed in Chapter 7 can help to improve "Safety for All" beyond the recommendations included in Chapters 5 and 6. In addition, Transportation Demand Management strategies can reinforce the attractiveness of traveling by modes other than single occupancy vehicles (SOV) and using the walking, biking, and transit improvements recommended in Chapters 5 and 6. The predominance of SOV trips contributes to congestion in the peak periods, which impacts the accessibility and reliability of travel for all users. The TDM strategies presented in this chapter will help address this issue.

Safety For All

To help ensure the Boulevard can safely be traveled by all users, the Program recommends supporting four initiatives to raise awareness about risky travel behaviors and improve travel along the corridor. The Program recommends these initiatives be developed for implementation by 2025:

- Camera Automated Speed Enforcement (CASE)
- Roosevelt Boulevard Vision Zero Educational Program
- Signage Inventory & Evaluation
- Lighting Assessment & Strategy

Camera Automated Speed Enforcement (CASE)

Between 2013 and 2017, 62 people lost their lives and another 77 were seriously injured in traffic crashes on the Roosevelt Boulevard from 9th Street to the Philadelphia County line shared with Bucks County. In response to these sobering numbers, the Pennsylvania legislature authorized the use of automated speed cameras along this section of Roosevelt Boulevard in October 2018 as part of a five-year pilot program. On June 19, 2019, Philadelphia Mayor James F. Kenney signed local legislation to add a new chapter 12-3400 in The Philadelphia Code to provide for the use of automated speed cameras along this segment of Roosevelt Boulevard. Currently, the system administrator, the Philadelphia Parking Authority (PPA), is installing the cameras for the Roosevelt Boulevard Camera Automated Speed Enforcement (CASE) Program. The CASE Program began its warning period on June 1, 2020, with violations commencing after 60 days.

As of February 2021 according to the Insurance Institute for Highway Safety (IIHS), over 156 communities across the United States have implemented automated speed enforcement devices in school zones and along high crash corridors.¹ This is because humans are vulnerable to speed – the higher the speeds are in a crash, the more likely someone is to be killed or seriously injured. As documented in the National Transportation Safety Board's report "Reducing Speeding-Related Crashes Involving Passenger Vehicles (adopted July 25, 2017), "several federal agencies consider ASE to be one of the most effective speeding countermeasures."² First, the National Highway Traffic Safety Administration (NHTSA) evaluated eight speeding countermeasures and gave CASE their highest rating for effectiveness.³ Additionally, the Centers for Disease Control and Prevention notes that ASE can reduce crashes substantially and includes CASE as the only speeding-related countermeasure in their Motor Vehicle Prioritizing Interventions and Cost Calculator for States (MV PICCS), an online tool for states to choose cost-effective interventions to prevent motor vehicle related deaths. Based on several studies of ASE programs operational in the United States and other countries, the National Transportation Safety Board concludes that "ASE is an effective countermeasure to reduce speeding-related crashes, fatalities, and injuries."

In the first four years of its automated speed enforcement program, New York City measured a 63 percent reduction in speeding and a 55 percent reduction in fatal crashes at fixed speed camera locations.⁴

The use of automated speed enforcement is also common in Europe and Australia.⁵ A systematic review of speed camera effectiveness in Europe and Australia reported:

- 14- to 65-percent reduction in drivers speeding more than 10 MPH above the posted speed limit, and
- 11- to 44-percent reduction in crashes involving fatalities and serious injuries near camera sites

Adding automated speed cameras to manage speeds on this High Injury Network (HIN) corridor is critical to reducing crashes and moving towards zero traffic-crash related deaths in Philadelphia. When signing the local ordinance in June 2019, Mayor Kenney said, "at the beginning of my administration, I committed to taking action on the Roosevelt Boulevard. Adding automated speed cameras on the Boulevard is one of the most effective steps that we can take towards eliminating traffic deaths."

The planned speed camera locations will operate as a system to manage speeds along the entire 12-mile corridor. In the northbound direction, the posted speed limit is 40 MPH from north of Broad Street to Ryan Avenue and 45 MPH north of Ryan Avenue. In the southbound direction, the posted speed limit is 40 MPH from north of Broad Street to Faunce Street and 45 MPH north of Faunce Street. Using cameras to automate speed enforcement ensures uniform enforcement to change the current speeding patterns.

1 <https://www.iihs.org/topics/speed/speed-camera-communities>

2 <https://www.nts.gov/safety/safety-studies/Documents/SS1701.pdf>

3 <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812202-countermeasuresthatwork8th.pdf>

4 <http://www.nyc.gov/html/dot/downloads/pdf/speed-camera-report-june2018.pdf> (Exec Summary)

5 Wilson 2010, "Speed Cameras for the Prevention of Road Traffic Injuries and Deaths."

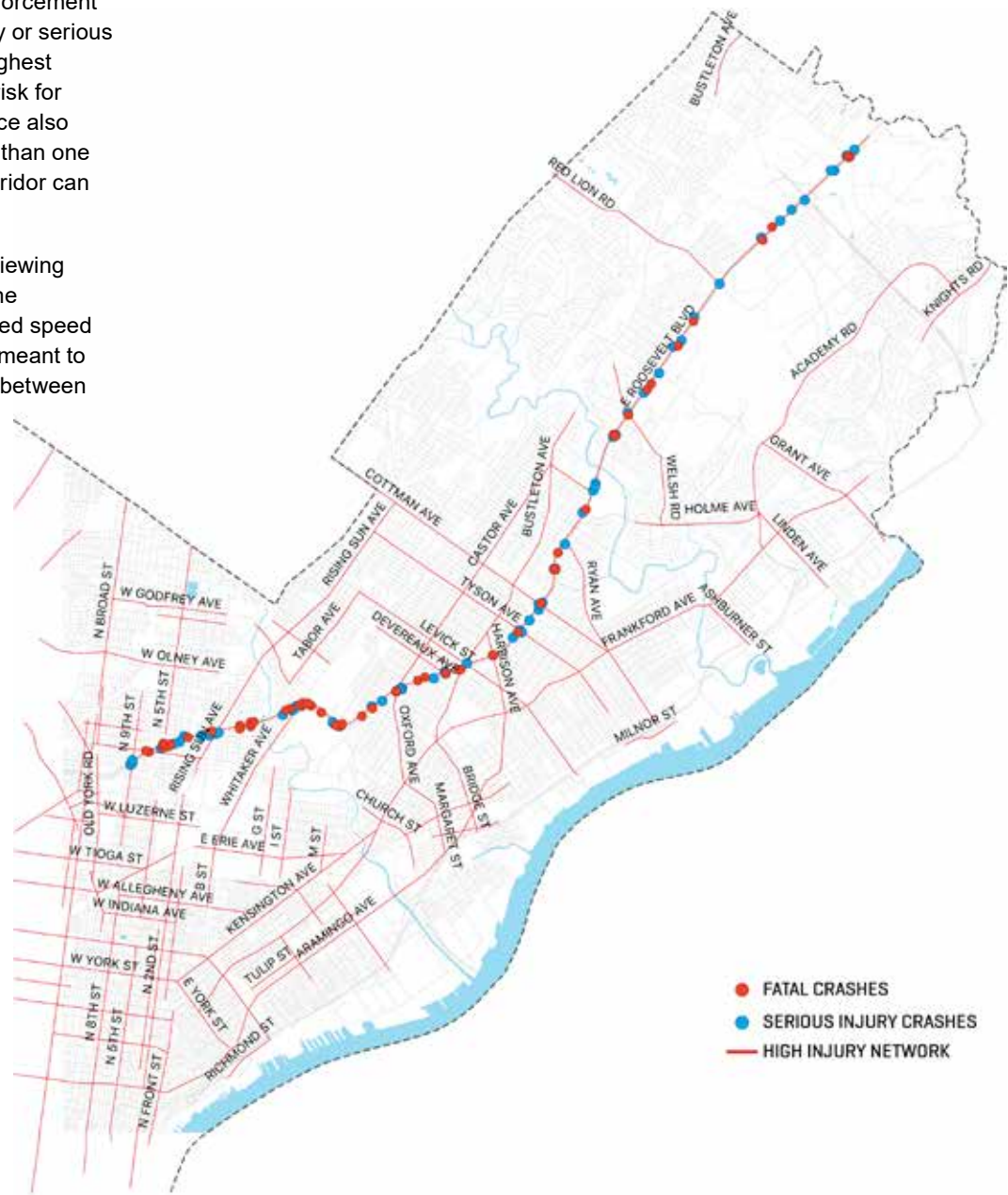
Locations for speed cameras were selected using a methodology that balanced consistent camera spacing throughout the corridor with concentrated enforcement in areas experiencing the greatest cluster of crashes resulting in a fatality or serious injury. This methodology was influenced by FHWA guidance that, “the highest priority enforcement sites should be located where there is the greatest risk for speeding-related crashes, injuries, and fatalities.” In addition, the guidance also confirmed that, “if the speeding-related safety problem extends for more than one mile, the presence of numerous enforceable sites on the problematic corridor can have the greatest overall deterrent effect.”⁶

A long list of possible locations was generated and then screened. In reviewing potential locations, crash reports from 2013 to 2017 were evaluated for the presence of speeding and/or aggressive driving. Locations near the posted speed limit change were avoided to reduce confusion. The speed cameras are meant to act as a system controlling speeds not only at camera locations but also between cameras. Eight camera locations were ultimately chosen for the initial system deployment. The ASE Program along Roosevelt Boulevard will be evaluated with the option of adding additional locations if speeds increase dramatically between initial camera locations. The final placement of the speed cameras was decided by construction and operational feasibility. Speed camera locations were placed closed together on the lower portion of the Boulevard, where fatal and serious injury crashes occur more frequently (see Figure 7-1). However, the spacing of the cameras throughout the entire corridor will manage speeds and create a safer Boulevard for all who use it.

Speed cameras are being installed at these eight locations along Roosevelt Boulevard, near these eight intersecting roads:

1. Banks Way (2nd Street)
2. F Street
3. Devereaux Street
4. Harbison Avenue
5. Strahle Street
6. Grant Avenue
7. Red Lion Road (near Whitten Street)
8. Southampton Road (near Horning Road)

Figure 7-1. Fatal and Serious Injuries Crash Map (2013 to 2017)



6 FHWA Speed Enforcement Camera Systems Operational Guidelines, 2008

The camera locations are posted on the Philadelphia Parking Authority's website, and roadway signage is installed along the Boulevard to clearly communicate to drivers about the presence of automated speed cameras.

The ASE Program will begin with a 60-day warning period, where vehicles identified as speeding at least 11 MPH over the posted speed limit will be issued a warning, without a fine. After the 60-day warning period, the ASE Program will begin issuing the following violations:

- \$100.00 – 11 to 19 MPH over the posted speed limit
- \$125.00 – 20 to 29 MPH over the posted speed limit
- \$150.00 – 30 MPH or more over the posted speed limit

Up to three violations may be issued to a single motor vehicle within any 30-minute period. Violations will be mailed to the motor vehicle owner whose license plate was captured from the rear. In order to protect privacy, the law states that any information and images relating to speed camera violations are for the exclusive use of this enforcement program and are not subject to public release as a public record.

The law mandates that the speeds cameras are continually calibrated to ensure accuracy and that cameras are correctly recording speeds. In addition, there are clear defenses set out in the state law to contest the violation within 30 days of receipt to enable recipients to demonstrate that they were not driving the car at the time, that they no longer own the vehicle, or that the vehicle was reported stolen prior to the time of the violation. Violation recipients will be provided with documentation that clearly explains the hearing process for contesting the fine. Points will not be added to a violator's license. In addition, speeding identified by the automated speed cameras will not be deemed a criminal act and cannot be the subject of an insurance company's merit rating or result in a rate surcharge.

The fines collected from violations will be used to cover the Program's costs, including equipment, administration, and police officers dedicated to reviewing the violations. Remaining funds will be used for a transportation safety grant program. The aim of the Roosevelt Boulevard ASE Program is to improve safety and reduce deaths and serious injuries resulting from speeding, not serve to as a generator of revenue. Every year of the ASE Program, the PPA will submit an annual report to the Chair and Minority Chair of both the Pennsylvania House and Senate Transportation Committees documenting the number of violations and fines issues, along with the speeds of the vehicles. The report will also include the number of vehicular crashes resulting in death and serious injuries along Roosevelt Boulevard. The results documented in these reports will allow the agencies to make informed decisions related to adjustments to the ASE Program along Roosevelt Boulevard,

as well as provide valuable insights on expanding the Program to other corridors in Philadelphia needing a countermeasure to speeding.

By bringing automated speed enforcement to Roosevelt Boulevard, the City is actively making this road safer for people who drive, take transit, ride bicycles, and walk along or across the Boulevard each day.

Figure 7-2. ASE Program Speed Camera Public Service Announcement

The image is a public service announcement for the ASE Program Speed Camera. It features a background image of two hands shaking in a firm grip, symbolizing safety and agreement. The text is overlaid on this image. At the top, a yellow-bordered box contains the text "SPEED CAMERAS SAVE LIVES" in white, bold, sans-serif font. Below this, a yellow horizontal band contains the text "SLOWER = SAFER" in large, bold, black, sans-serif font. Underneath the yellow band, the text "Over 140 people have been killed or seriously injured in crashes on Roosevelt Boulevard since 2013." is written in a smaller, italicized, black font. Below this, the text "To learn more about how speed cameras save lives, visit VisionZeroPHL.com." is written in a smaller, black font. At the bottom, there are three logos: the Philadelphia Parking Authority logo, the VISION ZERO logo, and the City of Philadelphia logo.

Vision Zero Educational Campaign

As discussed in previous chapters, Vision Zero is the City of Philadelphia’s strategic initiative to reduce traffic related deaths to zero by 2030. The underlying principle of Vision Zero is that preserving human life takes priority over convenience and that traffic deaths are preventable and unacceptable. Education is one of the City’s five core priorities identified in the City’s Vision Zero Three-Year Action Plan.

Education includes sharing information to raise awareness about Vision Zero and urge people to change their behavior on the streets. The recommendations below provide a framework for 2025 Vision Zero education efforts as part of the Route for Change Program. Additional information about potential education strategies is provided in Appendix 11.

Targeting the Message

Neighborhoods around the Boulevard vary greatly in their characteristics. Around lower Roosevelt Boulevard, near N. Broad Street, the surrounding neighborhoods are majority Black and Hispanic and lower income. Households in this area have a lower rate of car ownership. In contrast, around upper Roosevelt Boulevard, the surrounding neighborhood is majority White, higher-income, and households have a higher rate of car ownership. However, compared to the larger region, the Boulevard is diverse, with high proportions of racial and ethnic minorities, people with limited English proficiency, people who are foreign-born, youth, and seniors. The metrics show large concentrations of indicators of potential disadvantage throughout the Program area, indicating the need for investment in equitable transportation solutions.

Building upon the solid foundation of educational materials developed by the City’s Office of Complete Streets, the Program recommends a more nuanced approach for a deeper understanding of each community in order to develop effective Vision Zero and Boulevard safety educational campaign. As part of the creative process, it is important to pretest campaigns and messaging with the target audiences and evaluate whether they resonate and have the intended effects.⁷

The target audiences for the education outreach can be broadly divided into two categories:

1. Vulnerable users, people walking and people biking – and especially those who are young or old – who are more likely to be severely injured or killed if involved in a crash.
2. People who drive, a very broad but important group who are involved in most crashes along Roosevelt Boulevard.

The education outreach should also focus geographically around the top crash cluster locations along the Boulevard:

1. Whitaker Avenue Cluster
2. 5th Street Cluster
3. Adams Avenue (east) Cluster
4. Oxford Circle Cluster
5. Tyson Street Cluster
6. Cottman Avenue Cluster
7. Front Street / Rising Sun Avenue Cluster
8. Tied for 8th:
 - a. 9th Street Cluster
 - b. Revere Street Cluster
 - c. Woodward Street Cluster
11. Southampton Road Cluster

Content

The Program recommends creating a multichannel campaign that promotes a clear safety message across multiple channels in order to maximize opportunities to reach people. Vision Zero and safety on the Boulevard should be the umbrella message; however, content can build upon the “Safety Six”, which was created as part of Philadelphia’s Vision Zero Action Plan. This highlights the six most common violations that result in severe injuries and deaths along the City’s High Injury Network (HIN). As one of the highest risk corridors on the HIN, education and

⁷ https://www.researchgate.net/publication/251590277_Improving_the_effectiveness_of_road_safety_campaigns_Current_and_new_practices

enforcement efforts along Roosevelt Boulevard could educate people about the Safety Six violations:

- Reckless or careless driving, including speeding and drag racing
- Red light and stop sign running
- Driving under the influence
- Failure to yield – focusing on driver left turn movements and yielding to pedestrians
- Parking enforcement (on or within 20 feet of crosswalks, on a sidewalk, or in a bike lane)
- Distracted driving

Materials for the Roosevelt Boulevard Vision Zero Educational Campaign should establish brand recognition in the community and create opportunities for feedback and sharing. Content should include community storytelling, share data, promote safety reminders, publicize upcoming public meetings, and provide construction project updates. Additionally, educational materials should promote the benefits of Automated Speed Enforcement and safe driving behaviors along the Boulevard.

Figure 7-3. City of Philadelphia Vision Zero Fact Sheet in English and Spanish

VISION ZERO
CITY OF PHILADELPHIA

OUR CITY & OUR FAMILIES DESERVE SAFER STREETS.

Zero traffic deaths by 2030.

“
When I took office, I pledged my commitment to making Philadelphia streets safe for everyone, regardless of age, physical ability, or choice of transportation. Each year, there are approximately 100 traffic-related deaths in Philadelphia, including drivers, passengers, and people walking and biking. Every day in Philadelphia, four children are involved in a traffic crash. Philadelphians deserve better.
”

Mayor James F. Kenney

IMAGINE losing someone you love while they were walking in their own neighborhood

IMAGINE having someone in your community be confined to a wheelchair for the rest of their life

IMAGINE leaving your loved ones at home for the last time. All because of a preventable traffic crash

IMAGINE a city coming together to work toward zero traffic deaths

TAKE THE PLEDGE. VISIT OUR WEBSITE.

VISIONZEROPHL.COM #VISIONZEROPHL

VISION ZERO
CITY OF PHILADELPHIA

NUESTRA CIUDAD Y NUESTRAS FAMILIAS MERECE CALLES MÁS SEGURAS.

Cero muertes por choques de tránsito para el año 2030.

“
Cuando asumí el cargo, prometí que haría más seguras las calles de Filadelfia para todos, sin importar la edad, la capacidad física o la opción de transporte. Cada año, ocurren aproximadamente 100 muertes relacionadas con el tráfico en Filadelfia, lo que incluye conductores, pasajeros, ciclistas y peatones. Cada año en Filadelfia, cuatro niños están involucrados en un choque de tránsito. Los residentes de Filadelfia merecen algo mejor.
”

Alcalde James F. Kenney

IMAGINE perder a un ser querido mientras está caminando por su propio vecindario.

IMAGINE que alguien en su comunidad quede postrado en una silla de ruedas por el resto de su vida.

IMAGINE despedirse de sus seres queridos en su hogar por última vez. Todo debido a un choque de tránsito evitable.

IMAGINE una ciudad unirse para trabajar hacia cero muertes por choques de tránsito.

ASUMA EL COMPROMISO. VISITE NUESTRO SITIO WEB.

VISIONZEROPHL.COM #VISIONZEROPHL

Partnering Strategies

An effective educational campaign requires partnership with other organizations to create and share a more multifaceted program that is interesting and compelling. Key partnerships with groups like healthcare providers, major employers, senior centers, and schools, along with sister agencies, will play an important role in creating a culture of safety along Roosevelt Boulevard.

Health Care Providers

There are three hospitals and health centers within a half-mile of the Program area. The hospitals include: Eastern Regional Medical Center, Friends Hospital, and Nazareth Hospital. There are also health centers in the area, including Quality Community Health Care's Cooke Family Health Center, Philadelphia Department of Public Health (PDPH) Health Center 10, and Esperanza Health's Hunting Park location. All three are community-based health care providers and identified as Federally Qualified Community Health Centers, which provide free or low-cost comprehensive primary care for children, adults, pregnant women, and seniors. As reliable sources of information, health care professionals can provide information on the benefits of walking and bicycling and tips for staying safe on the road, regardless of travel mode. The Program recommends building a coalition with the three hospitals and other healthcare providers and supplying materials they can share with their visitors and staff.

Chamber of Commerce & Major Employers

Throughout the Program's development, the Greater Northeast Philadelphia Chamber of Commerce (GNPCC) has helped promote public forums and has invited the Program to make presentations. The Program recommends continuing to work with GNPCC to bridge the connection between the Program and major employers because approximately two-thirds of people in the Program area drive. Major employers in North and Northeast Philadelphia can help distribute information to their employees and explore ways to incentivize employees to make non-single occupancy vehicle trips. In addition, the Program recommends partnering with the growing industrial development occurring in Northeast Philadelphia to share traffic safety information specific to large vehicle drivers with freight distribution and parcel delivery companies.

Senior Centers

Senior Centers and other organizations that provide services for seniors can help provide Vision Zero educational materials to seniors. They can host workshops, help identify infrastructure concerns, and provide alternative transportation options. These organizations are an effective forum for reaching seniors to understand when it is time to stop driving and share mobility resources that will allow seniors to still reach services, visit family, and explore their community while maintaining independence. The Program recommends reaching out to senior centers and hosting a brainstorming session to determine the best way to partner and share information.

Schools

There are over 50 schools and education centers within a half-mile of the Program area, serving students in preschool through high school. Approximately half of the schools are public schools within the School District of Philadelphia, and the highest concentration of schools along the Boulevard is south of Pennypack Park. Educational outreach efforts at schools have the potential to reach not only students, but parents and school staff as well.

The Program recommends collaborating with Safe Routes Philly, which is a school and community-based program of the City of Philadelphia that helps educators create safe, healthy environments for students to actively commute to and from school. This partnership could develop specific pedestrian safety curriculum for educators and support the growth of community events like Walk to School Day and walking school busses.

Agency Collaborators

In addition, the Program encourages the transportation agencies to partner with sister state and local agencies to promote the Vision Zero message. While the term Vision Zero is familiar to some, it is critical that other public-facing departments understand its meaning in order to share correct information. In addition, there are numerous municipally managed resources along the corridor, including four fire stations, two police substations, four libraries, eight swimming pools, and dozens of playgrounds, parks, and recreation centers. These are great venues to post information about Vision Zero, and agencies can incorporate safety messages in their own communications to community members.

Signage Inventory & Evaluation

The Program recommends completing a comprehensive sign inventory along the Boulevard and intersecting side streets (see Appendix 12). This inventory should document the existing sign designation, size, and retroreflectivity, or the ratio of light returned from a sign to a driver that assist in nighttime visibility. If necessary, the Program recommends creating a signage upgrade plan to replace signs that do not meet standards in order to provide consistency and clarity in the signed messaging along the corridor. Improved signage can help reduce confusion by drivers and improve safety along Roosevelt Boulevard.

Signs at Intersections

As part of the inventory, the Program recommends exploring the following signage improvements to provide consistency of intersection signing along the corridor.

- **Movement prohibition** signs should be placed at intersections that have turn restrictions.
- **Intersection lane control** signs should be added to the leftmost inner

(express) lane on Roosevelt Boulevard to indicate to the driver whether the lane is a left-turn only or shared through/left-turn lane. Pavement marking arrows can also be used to indicate the permitted movements from a lane group.

- **No Left Turns (from outer, local lanes) / No Right Turns (from inner, express lanes) signs** signs indicating that left turns are generally not permitted from the service lanes and that right turns are not permitted from the express lanes should be installed periodically throughout the corridor in the median space between the service lanes and the express lanes. This information will make people driving more aware that they need to use the crossovers in order to make their desired turn,
- **No Crossover** signs should be installed at all locations where there is a break in the median between the inner (express) and outer (local) lanes and crossovers are not permitted.
- **Use Crosswalk** signs should be installed at intersections that have only one crosswalk across Roosevelt Boulevard to direct people walking to the side of the intersection with the crosswalk.

Figure 7-4. Existing Signage Examples



Figure 7-5. Typical Crosswalk and Sidewalk Lighting Fixture



Crossover Signage

Crossovers on Roosevelt Boulevard enable drivers to cross between the inner (express) lanes and outer (local) lanes in order to give drivers access to turn onto local streets. The crossover signage needs to serve two functions – one is to alert people driving to the location of the crossover and the other is to inform people driving of the upcoming side streets that can be accessed through the crossover. The Program recommends the following:

- Upgrade the existing crossover signs to conform to recommended sizing in the Manual on Uniform Traffic Control Devices (MUTCD).
- Install diagonal pointing arrows on the crossover signs in the direction of the crossover and have a consistent size of sign for the name of the side street that is accessible via the crossover.
- Install crossover signs in two locations – the first being located a quarter mile in advance of the crossover locations and the other just before the location of the crossover. Where the placement of a quarter mile is not possible due to a closely spaced intersection or additional crossover, the advance crossover sign should be placed as far in advance of the crossover as practical.
- Install yield signs at crossovers to alert drivers to entering a crossover that they do not have the right of way.

Bus Stop Signage

The sign inventory should also identify and replace any signs missing at local bus stops and ensuring the route information is updated.

Signing for People Riding a Bike

The Program recommends developing a bicycle wayfinding signage program as part of the Northeast Philadelphia bike network project. These wayfinding signs should be consistent with the MUTCD and the City of Philadelphia's bicycle network wayfinding sign standards, which could include information relating to connections to other bicycle routes, connections to local destinations, such as parks, libraries, and trails, and average travel time information.

Lighting Assessment

Street lighting is a key tool to improve visibility of the road. It enhances the experience and improves the safety of people driving, walking, riding a bike, or riding a bus along Roosevelt Boulevard. Currently, the City is in the process of converting its High-Pressure Sodium (HPS) streetlights to Light Emitting Diodes (LED). This change will produce energy and cost savings while improving visibility for all users.

General Corridor Lighting

The Program recommends a comprehensive lighting assessment be completed along the Boulevard (see Appendix 13). As part of regular maintenance operations, the existing nighttime lighting levels should be measured in order for the City to develop a comprehensive strategy for upgrading and supplementing lighting to meet the recommended Uniformity Ratio and Illumination Levels. The strategy should prioritize locations that fall short of the standards, locations with high crash rates, and locations with high volumes of people walking. This lighting improvement strategy may include trimming vegetation or removing vertical elements that currently obstruct lights.

Lighting at Intersections, along Sidewalks, and at Local Bus Stops

As part of FHWA's Pedestrian Safety Guide, lighting of crosswalks should also reduce glare for drivers. Lighting should be placed in advance of crosswalks on both approaches, which will illuminate the front of the person walking and eliminate their shadow. The analysis will determine whether moving the light pole from its current location will achieve the preferred lighting luminance; however, underground utilities may restrict changes to light pole locations. Intersections with high ambient lighting may consider higher lumen output in order to provide improved visibility of people walking.

The lighting inventory should also document the light levels along sidewalks, especially in locations with curb cuts and driveways. In addition, lighting at local bus stops should make bus riders feel comfortable and secure while improved lighting will help bus operators see passengers waiting to be picked up. When lighting along sidewalk segments and at bus stops do not meet the standards, the Program recommends developing an improvement plan.

Transportation Demand Management (TDM)

As noted in Chapter 2, between 43,000 and 89,000 vehicles travel along the Boulevard each day. Most of these trips are in single-occupancy vehicles (SOV), where the driver is the only person in the car. The predominance of SOV trips contributes to congestion in the peak periods, which impacts the accessibility and reliability of travel for all users.

Transportation Demand Management (TDM) strategies are policies, programs, and incentives that seek to reduce SOV trips, allowing the corridor to operate more efficiently and reduce the environmental harm caused by traffic congestion (see Appendix 14). Multiple TDM strategies are generally implemented as packages to help increase the attractiveness of walking, biking and riding transit to destinations and activities.

Figure 7-6. Queuing Caused by SOV Trips



TDM has historically focused on reducing traffic congestion by targeting trip generators, such as employment locations or high-density residential areas that adds traffic to local roads. While TDM programs traditional focus on commuting to and from work, programs may target other groups of drivers, such as college students, medical and industrial shift workers, and seniors.

Boulevard TDM Strategies

Organizations known as Transportation Management Associations (TMA) often implement TDM programs and receive a mix of funding from grants, membership, and formula funding. TMA often champion infrastructure and policy changes and promote travel behavior change through marketing campaigns.

The Greater Philadelphia region has several TMAs that operate independently with their own staff. PennDOT administers the State's overall TMA program, which is managed by the region's municipal planning organization, Delaware Valley Regional Planning Commission (DVRPC). Currently, TMA Bucks, which has its office with the Program Area at the Neshaminy Interpex, provides transportation management services and solutions that impact Bucks County. While TMA Bucks does not service Northeast Philadelphia, the Boulevard and Direct Bus Phase A are heavily utilized by people and employers in their service area.

The Program recommends exploring the creation of Boulevard-specific TDM strategies that focuses on the entire 14-mile corridor that cut through North and Northeast Philadelphia and Bensalem Township in Bucks County and explore the legal and organizational structure needed to implement the TDM program ideas.

Below are some TDM topics to explore for Roosevelt Boulevard:

- Improving and promoting the use of bicycle and pedestrian facilities
- Developing carsharing and vanpooling programs
- Facilitating employer-based TDM Programs with major employers along the Program area, such as employer-sponsored transit benefits
- Improving and promoting transit service and infrastructure enhancement
- Advertising non-SOV ways to travel along the Boulevard

Conclusion

The recommended 2025 improvements and strategies provide a solid foundation for achieving the long-term vision for Roosevelt Boulevard. The four "Safety for All" initiatives set forth in this chapter will help ensure the Boulevard can safely be traveled by all users by raising awareness about risky travel behaviors and improving travel along the corridor. The TDM policies, programs, and incentives will help to reduce SOV trips, allowing the corridor to operate more efficiently and reduce the environmental harm caused by traffic congestion. Please refer to Chapter 10 learn more about the next steps to move the 2025 recommendations forward.

Section 3

2040 Playbook



CHAPTER

8

2040 Alternatives to Transform the Boulevard

This chapter presents two ideas for long-term change, including:

- Guiding Principles for 2040 Alternatives
- Building Blocks for 2040 Alternatives
- 2040 Alternative 1: Partially Capped Expressway
- 2040 Alternative 2: Neighborhood Boulevard
- Measures of Effectiveness

Introduction

For Roosevelt Boulevard to welcome every mode of travel and to bolster the social and economic vibrancy of neighboring communities, a long-term transformation is necessary. The Program proposes two alternative concepts for the Boulevard's future, which builds on the improvements recommended for 2025 to improve safety, accessibility, and reliability. The guiding principles used to develop the two 2040 alternatives, and the emerging benefits and impacts of each alternative, are described in this chapter.

As part of the roadway transformation, the Program also introduces the idea of Walkable Station Areas (WSAs) as a way to advance land use and adjacent street network changes to create more walkable neighborhoods around future transit stations along the corridor. Discussed more in Chapter 9, WSAs align with the recommendation for a dedicated transit right-of-way, which is in both alternatives.

It is important to note that the Program does not recommend one preferred alternative. Rather, the Program has identified two compelling alternatives for the project partners to further analyze and explore with neighborhood stakeholders.

Guiding Principles for 2040 Alternatives

The Program developed a set of Guiding Principles to shape the creation of the two 2040 alternatives, which were based on the overall Vision for the Boulevard and the Program's themes, goals, and objectives described in Chapter 1. The Program used the following principles to screen ideas and to help set the framework for the two 2040 alternatives.

Overall Principles

- Prioritize ideas that support the goal of zero traffic fatalities (Vision Zero interventions)
- Connect neighborhoods that are separated by the Boulevard
- Build upon the 2025 improvements
- Provide a series of consistent treatments in order to provide more predictability for travel
- Maintain physical separation between inner (express) and outer (local) lanes

Principles to support people walking

- Increase the width of side medians to provide more space for people waiting for the next signal cycle to finish walking across the Boulevard
- Reduce the distance for people walking across the Boulevard
- Add more locations for people to walk across the Boulevard

Principles to support people riding a bike

- Build a two-way cycle track on both sides of the Boulevard that is separated from moving traffic, adjacent to the northbound and southbound outer (local) lanes of the Boulevard
- Close remaining gaps in the adjacent bicycle network

Principles to support people riding transit

- Provide dedicated transit lanes in the right-of-way
- Maintain the current location of Frankford Transportation Center (FTC)
- Place transit stops and stations at-grade to activate intersections
- Move transit through first before allowing drivers to turn left off the Boulevard.

Principles to support people driving

- Reduce posted speed limits for people driving
- Maintain one-way outer (local) lanes
- Move crossovers to intersections to allow drivers to change between inner and outer lanes during a dedicated traffic signal phase

Building Blocks for 2040 Alternatives

The Program then identified four key building blocks that would give people more transportation options when traveling along the Boulevard:

1. Reduced Posted Speed Limits
2. Bus Rapid Transit (BRT) along dedicated transit lanes
3. Two-Way Cycle Track for people biking
4. Widened and Continuous Sidewalks

In both alternatives, these four building blocks work together to provide people more choice for travel. By elevating the quality of infrastructure for all modes, the existing gap between travel modes will be less stark, and people will have more comparable choices to determine what works best: walking, riding a bike, riding a bus, or driving.

These building blocks are the foundation for transforming the Boulevard into a “Great Street.” As defined in CONNECT, the City’s Strategic Transportation Plan, a Great Street is one where everyone is welcome. A Great Street is not merely a transportation facility, but also a civic space where neighbors interact. Philadelphia is one of the most walkable cities in the country; however, walking is not prioritized uniformly in every neighborhood. By designing the Boulevard to safely accommodate vulnerable users, including people who walk, ride bikes, and are children and seniors, the Program can improve the safety for all users and create a Great Street.

How safe the Boulevard is for walking, biking, and taking transit, whether it be real or perceived, can impact travel decisions. If people decide not to use these active transportation options, it could lead to poor health. Data shows the risk of obesity increases six percent for each hour spent in a car, but decreases almost five percent for every 0.6 miles walked.¹ Over one-third of Americans age two to 19 are overweight or obese, and the rate of obesity for all Americans has tripled since 1980.²

Within Philadelphia:

- Approximately three in ten adults have obesity (defined as a body mass index more than 30);
- Non-Hispanic Blacks and Hispanic adults have significantly higher rates of obesity than non-Hispanic White adults;
- Approximately one in three adults with low income have obesity, compared to only one in five among the highest income group.³

By reducing the distances people have to cross intersections, they will be more comfortable walking and biking, which will increase a person’s physical activity.

1. Reduce Posted Speed Limits

People are inherently vulnerable, and speed is a fundamental predictor of crash survival. As discussed in Chapter 3, small reductions in speed have big impacts on fatality rates. A person walking has more chance of survival the slower the driver is going. In addition, distracted driving at any speed is dangerous, but there is a much narrower field of eyesight for people driving at higher speeds, resulting in poor reaction time. Also, more people are driving sport utility vehicles, which are harder to stop, have a higher front end that is more likely to hit a pedestrian in the chest or head causing more life-threatening injuries.⁴

Higher speeds also impact vulnerable users, such as younger and older people, people walking and people biking, who are more likely to be severely injured or killed if involved in a crash. Transportation systems should be designed for speeds that minimize risk to human life, where reducing the posted speed limits on the Boulevard will dramatically reduce the severity of crashes.

1 Frank, L., et. al. (2004). Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars. American Journal of Preventative Medicine 27(2).

2 Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. Journal of the American Medical Association 2014;311(8):806-814, Centers for Disease Control and Prevention

3 <https://www.phila.gov/media/20181106124517/chart-v3e2.pdf>

4 <https://www.aarp.org/auto/driver-safety/info-2018/suv-pedestrian-dangers.html>

2. Bus Rapid Transit (BRT)

In May 2016, Delaware Valley Regional Planning Commission (DVRPC) released its “Alternatives Development for Roosevelt Boulevard Transit Enhancements” report,⁵ which took a fresh look at transit on the Boulevard and developed improvement strategies that could be achieved at-grade within the existing cross section of the roadway, at comparatively lower cost and in a shorter timeframe than the subway or elevated line, which has been the focus of previous Boulevard transit planning efforts. This report guided the Program in its development of Direct Bus⁶ on Roosevelt Boulevard as an immediate action and identified Bus Rapid Transit (BRT) as the longer-term, at-grade option to implement along the Boulevard in a separated busway in tandem with local bus service.

According to the Bus Rapid Transit Standard,⁷ BRT is a “high-quality bus-based transit system that delivers fast, comfortable, and cost-effective services at metro-level capacities. It does this through the provision of dedicated lanes, with busways and iconic stations typically aligned to the center of the road, off-board fare collection, and fast and frequent operations.”

Research conducted by the Institute for Transportation and Development Policy (ITDP) states that BRT is a viable way to provide public transit. BRT is easy to scale, is low cost, and has operational and implementation advantages. BRT vehicles operate on rubber tires along exclusive paved lanes and are self-powered, meaning there are no overhead lines, as shown in Figure 8-1. Passenger amenities include high quality stations (see Figure 8-2), ticket vending machines at stations, all-door boarding and exiting, raised platforms, and very frequent service. BRT vehicles are also given priority at traffic signals in order to maintain schedules and reduce the overall travel time for riders. BRT service typically attracts more riders than local bus service because it gets people to places faster and more comfortably, as does light rail transit (LRT).⁸ BRT benefits also extend beyond people who ride the bus. The trip time for other people driving on the Boulevard may be reduced because buses in their own dedicated right of way do not hold up traffic while picking up and dropping off passengers, and as the BRT service attracts more people, fewer people will drive, resulting in less congestion.

Figure 8-1. BRT bus operating in its dedicated right of way



Figure 8-2. Kansas City MAX BRT Station



5 Report is available at <https://www.dvrpc.org/Reports/13072.pdf>

6 The Report refers to this mode to be implemented in the short term as BRT-lite or Enhanced Bus Service (EBS), which later became known as Direct Bus.

7 <https://www.itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/what-is-brt/>

8 Light-Rail Transit (LRT) is a rail-based rapid transit system that uses predominantly exclusive, but not grade-separated, rights-of-way. Like BRT systems, LRTs can have a wide range of passenger capacities and performance characteristics.

An important benefit of BRT is that it is less expensive to build than LRT.⁹ There is no need for tracks or overhead power lines for buses, and the vehicles are less expensive. BRT can be designed and constructed more quickly than LRT so passengers and the public benefit sooner. BRT systems also allow trunk and feeder networks, where BRT can branch off of the core and provide more extensive local service beyond the corridor; however, the costs to operate BRT tend to run higher than LRT, especially on high-demand routes, as more BRT drivers are required to move the same number of passengers and fuel costs are higher. Ultimately, BRT offers a middle ground between traditional local bus service and LRT with lower capital costs, somewhat higher operational cost, but also more operational flexibility.

Design of the BRT service must be deliberate in order to gain the most benefit. Nine features and their benefits are described in Table 8-1.

Table 8-1. BRT Features and Benefits

| | Feature | Description | Benefit |
|---|---|---|--|
| 1 | BRT buses travel in a dedicated lane | BRT buses are given their own lane instead of driving in the same lane as local buses and other vehicles. | Dedicated lanes reduce ride time by minimizing interaction with other traffic. Time savings can be one to three minutes per mile. ¹⁰ Time savings are related to the amount of congestion, so high traffic areas result in greater time savings. BRT buses can avoid the delays that occur when other drivers are turning right, dropping off passengers, or parallel parking. Other drivers also benefit because they are not impacted by stopped BRT buses. |
| 2 | BRT buses have a low floor | The BRT bus floor is at the same height as the sidewalk at a BRT station. | Easier and faster entry and exit of the BRT bus reduces the amount of time a bus is stopped. Riders find the experience more comfortable; low floors are especially convenient for people with strollers or grocery carts, or people who use wheelchairs. |
| 3 | BRT buses are branded | BRT buses have a unique brand that has a different look and feel compared to local buses. BRT buses can be differentiated through paint, bus type, and logo. | Making BRT buses look different alerts riders that the service is reliable, fast, and frequent. |
| 4 | BRT buses get priority at intersections | Other drivers can be restricted from turning in front of the dedicated bus lane. BRT buses can also have signal priority, where if a BRT bus is approaching a signal that is about to turn yellow or red, the signal will stay green until the BRT bus passes. BRT buses can also be given the priority to move through an intersection first after the red light changes to green. | Prioritizing BRT buses results in faster, more reliable trips for riders. Reliability also means people riding the BRT bus can accurately predict when it will arrive at a stop. |
| 5 | BRT bus stations are comfortable | BRT stations include shelters, seating, arrival time information for buses, and provide a safe, well-lit place to wait. | Riders who feel safe waiting at BRT stations will ride more frequently. Real-time arrival information will take the guesswork out of taking transit. |

9 Government Accountability Office. 2012. Bus Rapid Transit Projects Improve Transit Service and Can Contribute to Economic Development. Report to the Committee on Banking, Housing, and Urban Affairs, U.S. Senate. <https://www.gao.gov/products/gao-12-811>

10 National Academies of Sciences, Engineering, and Medicine. 2003. Bus Rapid Transit, Volume 2: Implementation Guidelines. TCRP Report 90. Washington, DC: The National Academies Press. <https://doi.org/10.17226/21947>

| | Feature | Description | Benefit |
|---|---|---|---|
| 6 | BRT stations are spaced further apart | BRT stations are spaced further apart than stops on local bus routes. | Stopping less often, BRT provides more efficient service by minimizing the amount of time spent slowing down, stopping, and speeding up again. |
| 7 | BRT stations are at the appropriate intersections | BRT stations are located at intersections with other transit service and where there is a mix of land uses and density. | Locating BRT bus stations in proximity of other transit service will facilitate easy transfers, giving riders the ability to reach more activities and designations. Stations in close walking distance to many destinations and activities and residential neighborhoods allows people to go about their business without needing a car. |
| 8 | Fares are collected at the BRT station | People riding the BRT bus pay their fare at the station before the bus arrives, rather than paying on the bus. | Having every person pay on the bus is time consuming, and the cumulative effect increases the length of the trip. This impact on travel time is minimized when riders pay at the BRT station. |
| 9 | Passengers can use all doors to board BRT buses | People riding the BRT bus can use both the front and rear doors to board. | Because riders have paid their fare at the BRT station, they do not need to only board at the front door where fares are traditionally paid on local buses. Rather, inspectors can check for tickets while the bus is moving, which reduces the trip time. |

A study of BRT systems found that trips were 23 to 47 percent shorter than before the described features were implemented.¹¹ Overall, BRT brings considerable travel time savings and improved reliability for buses, resulting in attracting more riders. In Cleveland, the HealthLine BRT system on Euclid Avenue includes a dedicated lane for the buses. The increased speed and reliability led to a 48 percent increase in passengers in the first year.¹² In Seattle, corridors with RapidRide BRT saw a 35 percent increase in passengers compared to corridors with regular bus service.¹³ In Richmond, Virginia, officials expected to carry 3,500 passengers daily on the new Pulse BRT, but three months after opening, the BRT carried almost double that amount at 6,000 passengers daily.¹⁴

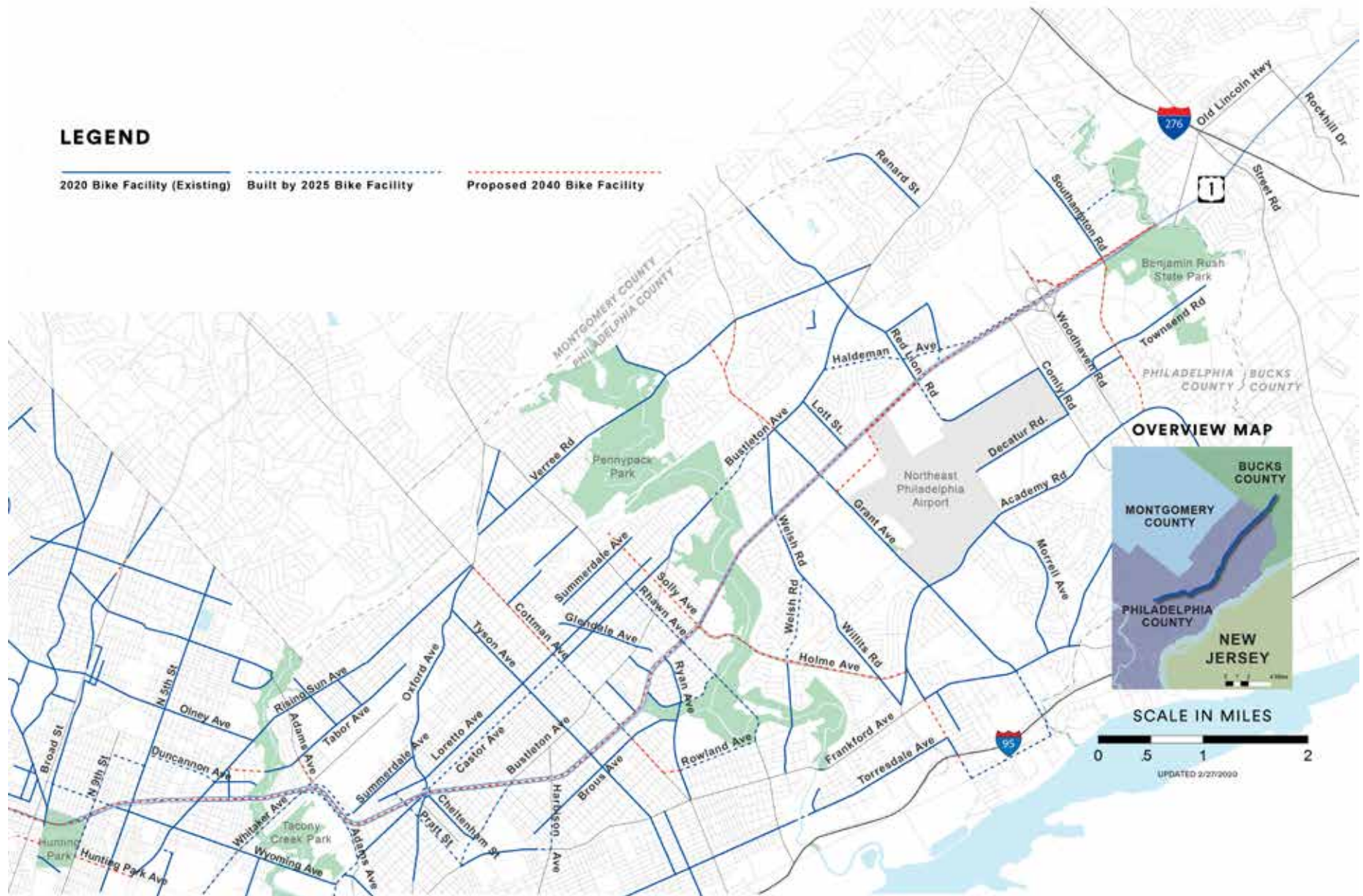
Figure 8-3. BRT Bus Operating in its Dedicated Right of Way



Source: <https://ggwash.org/view/69056/xx-photos-of-richmonds-new-brt>

- 11 National Academies of Sciences, Engineering, and Medicine. 2003. Bus Rapid Transit, Volume 2: Implementation Guidelines. TCRP Report 90. Washington, DC: The National Academies Press. <https://doi.org/10.17226/21947>
- 12 Urban Land Institute. 2016. Building Healthy Corridors: Transforming Urban and Suburban Arterials into Thriving Places. Washington, D.C. <https://uli.org/wp-content/uploads/ULI-Documents/Building-Healthy-Corridors-ULI.pdf>
- 13 Stewart, O.T.; Moudon, A.V.; Saelens, B.E. 2017. The Causal Effect of Bus Rapid Transit on Changes in Transit Ridership. Journal of Public Transportation, 20(1): 91-103. doi: 10.5038/2375-0901.20.1.5
- 14 GRTC Pulse ridership continues to exceed expectations three months in. September 21, 2018. <http://ridegrtc.com/news-initiatives/press-releases/grtc-pulse-ridership-continues-to-exceed-expectations-three-months-in>

Figure 8-4. 2040 Bike Facility Network



3. Two-Way Cycle Track

While allowed, riding a bike in the outermost travel lane of the Boulevard is very intimidating because it is shared with higher speed traffic, which significantly affects bicycling stress on a roadway. It not only creates a risky situation where drivers pass a person riding a bike, faster traffic increases the number of vehicles that will pass a person riding a bike and the risk of serious or fatal injury if a crash occurs.

A two-way cycle track looks like a smaller version of a two-way street for cars: it has two lanes, one in each direction, but it is dedicated for people riding a bike or skating. The two lanes are usually divided by a dashed yellow line. Its separation from vehicular traffic inherent with a two-way cycle track also prevents it from being blocked by people making deliveries, people dropping off or picking up passengers, Walkable Station Areas (WSAs), and people double parking, which often occurs when bicycle facilities are not physically separated. A two-way cycle track is typically located adjacent to the curb on one side of the street and separated from car traffic by a physical barrier.

The proposed two-way cycle track provides a separate dedicated space for people riding a bike that is physically separated from people driving and at the same height as the sidewalk. The purpose of installing a two-way cycle track is to increase the number of people who feel comfortable and safe riding a bike to work, school, and other destinations and activities. The two-way cycle track can benefit everyone who uses the corridor, regardless of mode. Stress felt by people both driving and

Figure 8-5. Example of Two Way Cycle Track



walking will be reduced because each person now has their own dedicated space for travel.

The addition of a two-way cycle track on each side of the Boulevard creates the spine of the 2040 high-quality bike network in North and Northeast Philadelphia (see Figure 8-5).

4. Widened and Continuous Sidewalks

Sidewalks are primarily used by people walking, people pushing a stroller, or people using a wheelchair. However, sidewalks are not just a place for moving; they provide space for resting, engaging neighbors, or playing. In fact, when people explore neighborhoods to move into, the third most important factor they consider is walkability.¹⁵

Sidewalks along the Boulevard typically range between four and eight feet; the narrower the sidewalk, the harder it is for several people to walk together. A sidewalk that is six feet wide only provides enough space for two people to walk side by side or for one person to pass another person in the opposite direction. The existing width of Boulevard sidewalks in some locations makes it difficult or uncomfortable to walk. In addition, the condition of some sidewalk segments is in disrepair (see Figure 8-6 and 8-7). Lastly, while some sidewalks on the Boulevard

15 Belden Russonello & Stewart. 2003. Americans' Attitudes Toward Walking and Creating Better Walking Communities. Washington, DC. <http://brspoll.com/uploads/files/walkingrelease.pdf>

meet the legal width requirements, it is important to provide sidewalks scaled appropriately to the adjacent roadway. The very wide cross-section of Roosevelt Boulevard requires wider sidewalks to create a comfortable public realm than do narrower streets.

Based on these factors, the 2040 alternatives recommend a minimum of ten-foot wide sidewalks on each side of the Boulevard. A wider sidewalk is especially desirable in commercial areas or where a higher number of people walk along the Boulevard, such as by schools or high-ridership local bus stops. Wide, comfortable sidewalks allow more people to walk, resulting in better health, and contribute to higher housing values in most cities.¹⁶ Widened sidewalks can also better accommodate street furniture, such as transit signage, trash cans, benches, and bike racks, while maintaining enough space for people walking. Furthermore, the scale of the Boulevard requires a comparable sidewalk width.

The combination of these four building blocks will give people more effective options when traveling along the Boulevard. The next section will describe how these four key building blocks are incorporated into each alternative.

Figure 8-7. Example of Poor Condition Sidewalk Along the Boulevard



Figure 8-6. Example of Poor Condition Sidewalk Along the Boulevard



Figure 8-8. Ten-Foot Wide Sidewalk along the Benjamin Franklin Parkway, Philadelphia



16 Joe Cortright, *Walking the Walk: How Walkability Raises Housing Values in U.S. Cities* (Chicago: CEOs for Cities, 2009), 3. https://nacto.org/docs/usdg/walking_the_walk_cortright.pdf

Alternative 1 – Partially Capped Expressway

Alternative 1, called the Partially Capped Expressway, includes the following key improvements:

1. Four below-grade expressway lanes – two northbound and two southbound. The posted speed limit will increase to 50 MPH for these expressway lanes.
2. Four at-grade local (outer) lanes – two northbound and two southbound. The posted speed limit will decrease to 25 MPH for these outer (local) lanes.
 - Local buses will travel and stop in the outermost lane.
 - New entrance and exit ramps will connect the below-grade expressway lanes with the at-grade local lanes at nine key locations.
3. Two dedicated BRT lanes – one northbound and one southbound. BRT lanes will be located between the side and center medians of the Boulevard.
4. Two two-way cycle tracks – one adjacent to northbound Boulevard and one adjacent to southbound Boulevard, buffered from traffic by landscaping and at the same height as the sidewalk.
5. Widened sidewalks along both sides of the Boulevard.

In Alternative 1, the inner (express) lanes of the Boulevard become a below-grade limited access expressway for approximately nine miles between a location near Old York Road and Bowler Street. The expressway would return to at-grade at bridge crossings over both the Tacony Creek Park and the Pennypack Creek and Park. Since the inner (expressway) lanes do not intersect with side streets, the speed limit would be increased to 50 MPH on the expressway.

In addition, five segments of the Boulevard are proposed to be fully capped, as shown in Figure 8-9. The purpose of the caps is to knit adjacent neighborhoods together and minimize the visual impact of the below-grade expressway. Nine BRT bus stations, are located along the five capped segments. The caps are strategically located at key intersections on the Boulevard, creating an attractive community hub with BRT bus stations. The cap provides many opportunities for public art and creative use of the new space created by the cap. Coupled with the proposed 25 MPH posted speed limit on the four at-grade outer (local) lanes, the

speed and character of the roadway is transformed to a more traditional boulevard.

The exit and entrance ramps are preliminarily located in nine general locations, as shown in Figure 8-12, and are spaced approximately one mile apart. The Program selected these general ramp locations to avoid placing ramps near proposed BRT stations in order to reduce potential conflict between people driving and people walking or biking to and from the BRT stations.

These general locations were used to model Alternative 1's impacts on traffic and accessibility using the DVRPC's Regional Travel Demand model, as described in Chapter 4. The traffic model indicates congestion would occur at ramp locations if the number of lanes was not adequate. As a next step, the Program recommends further analyzing the optimal ramp locations and necessary design characteristics as Alternative 1 advances into the environmental analysis.

Alternative 1 reduces the number of general traffic lanes on the Boulevard from 12 to eight lanes. However, the Program anticipates the proposed higher capacity and speed of the four-lane, below-grade expressway will be able to move a similar number of vehicles as the six at-grade inner (express) lanes in the 2040 No-Build alternative. In addition, drivers on side streets and people crossing at intersections would cross only four at-grade travel lanes in Alternative 1, compared to the 12 lanes in the No Build condition.

Alternative 1 also proposes a two-way cycle track adjacent to the northbound and southbound outermost (local) lanes. Landscape upgrades will provide a soft green buffer between people biking and people driving. The alternative also proposes wider sidewalks, which will provide enough space for people walking and street furniture.

When describing this alternative at public forums, the Program used the Vine Street Expressway (I-676) in Center City, Philadelphia to visualize the alternative (see Figure 8-10). The capped segments proposed in nine locations along the Boulevard could look similar to the recently improved Logan Circle segment over the Vine Street Expressway, where the multi-lane expressway is capped with new green space and pedestrian pathways. Another example of a partially capped expressway is Klyde Warren Park in Dallas, Texas, which was built over Texas Highway 366 (see Figure 8-11).¹⁷ Since the Park was completed in 2012, property values in the surrounding area have increased and 1,500 new apartments were built.¹⁸

¹⁷ <https://www.dallasnews.com/arts-entertainment/architecture/2018/12/20/>

¹⁸ <https://klydewarrenpark.org/>

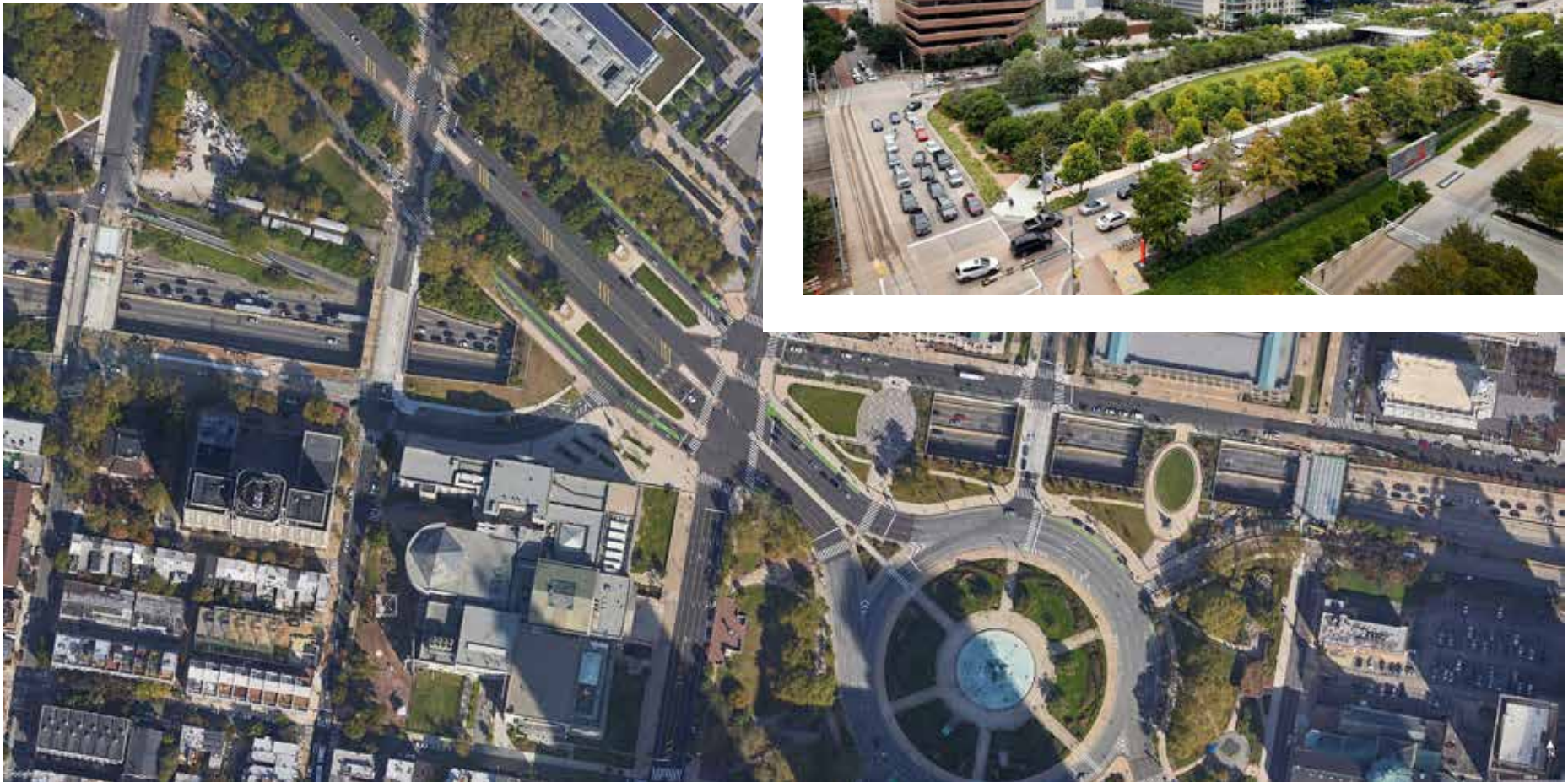
Figure 8-9. Alternative 1 – Section and Plan View



Figure 8-11. Klyde Warren Park in Dallas, Texas



Figure 8-10. Vine Street Expressway (I-676) Cap in Philadelphia, PA



Alternative 1 – Cost Estimate

In order to understand the magnitude of investment needed for Alternative 1, the Program created an exploratory cost estimate that considered major construction activities, such as mobilization, demolition, excavating, paving, drainage, new road infrastructure, new BRT and local bus infrastructure, lighting, and landscaping, and other major construction activities. The estimate is based on current (2020) unit costs, which were then adjusted for the cost of inflation by applying a 3 percent inflation rate each year for 20 years. The Program will further explore where to create signalized full intersections as Alternative 1 advances into the environmental analysis.

Table 8-2. Alternative 1 Cost Estimate

| Alternative 1 -Partially Capped Expressway | Total Cost (Millions) in 2040 Dollars |
|---|--|
| Engineering (survey, design & permitting) | \$903 |
| Environmental Clearance | \$121 |
| Construction | \$6,015 |
| Construction Inspection | \$722 |
| Subtotal | \$7,761 |
| 40% Contingency | \$3,103 |
| Total Estimated Cost (2040) | \$10,864 |

Alternative 2 – Neighborhood Boulevard

Alternative 2, called the Neighborhood Boulevard, includes the following key improvements:

1. Six at-grade general-purpose lanes – three northbound and three southbound.
 - In each direction, two inner (express) lanes will be separated from the outer (local) by the BRT bus lane and side median.
 - Local buses will travel and stop in the outermost general-purpose lane during off-peak hours.
 - The posted speed limit will decrease to 25 MPH for these six at-grade lanes.
2. Two flex lanes – one northbound and one southbound in the outermost position.
 - During non-peak hours, the flex lanes are used to pick up bus riders at local bus stops, for on-street parking, and for loading/delivery.
 - During peak hours, the flex lanes are converted to Business Access and Transit (BAT) lanes.
3. Two dedicated BRT lanes – one northbound and one southbound. In each direction, the BRT lanes will be located between the side median and the pair of travel lanes.
4. Two two-way cycle tracks – one adjacent to northbound Boulevard and one adjacent to southbound Boulevard, buffered from traffic by landscaping and at the same height as the sidewalk.
5. Widened sidewalks along both sides of the Boulevard.

In Alternative 2, the number of existing travel lanes for Roosevelt Boulevard is reduced and some lanes are used for other transportation needs, such as transit, on-street parking, and deliveries. While the overall crossing distance would remain similar to the 2040 No-Build condition of the Boulevard, drivers on side streets and people crossing at intersections would cross 10 at-grade lanes in Alternative 2, compared to the 12 lanes in the existing condition. While this doesn't seem like a significant reduction, the proposed 25 MPH posted speed limit on all lanes will significantly transform the operation and character of the roadway, creating a much more comfortable environment for crossing, whether the person is driving, walking, or riding a bike.

Depending on the time of day, up to four of the 10 lanes would be dedicated to transit. Similar to Alternative 1, the two BRT lanes remain in place 24 hours a day. However, new in Alternative 2 is that the two outermost flex lanes would operate

as BAT lanes during the peak AM and PM periods, allowing for local bus travel and drivers to make right turns into businesses and side streets. In the non-peak hours, these two outermost flex lanes would be used for on-street parking, and loading, deliveries, and local buses would pull into these lanes to pick up and drop off riders. Other potential activities in the two outermost (local) lanes could include electric charging stations for vehicles and ride hailing pick-up and drop-off locations.

Alternative 2 proposes 28 new signalized intersections that cross all six at-grade lanes (see Figure 8-15). These full intersections serve three key purposes. The first is to reduce the long block face between signalized intersections by providing more places for people to safely cross the Boulevard, reducing the risk people take when crossing at unsignalized locations. The second is to provide drivers more choices on where to make left turns to get on and off of the Boulevard, which will help reduce the queueing and safety issues occurring at major intersections. The third purpose is to make the Boulevard more permeable by providing more direct access into adjacent neighborhoods.

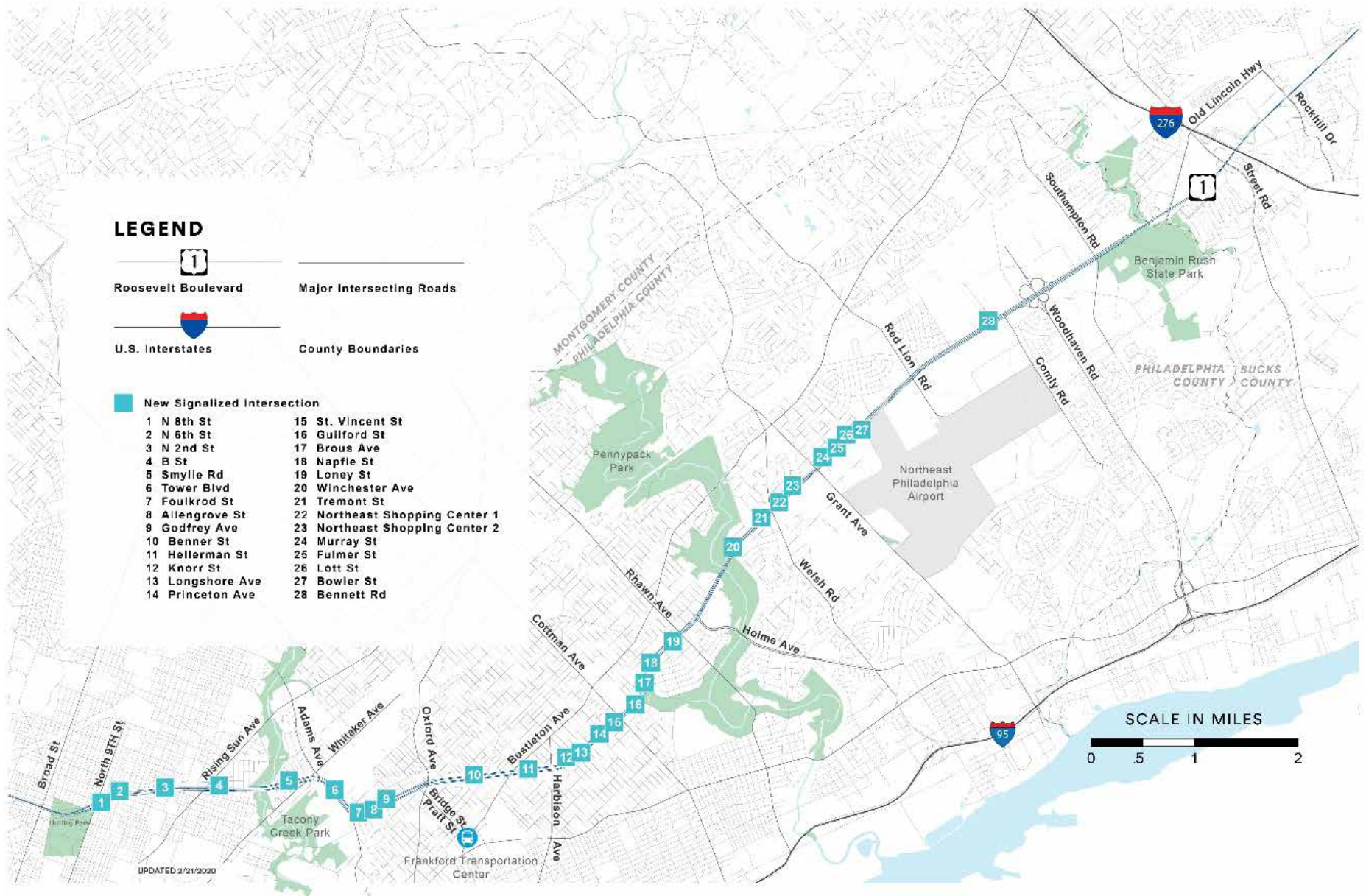
Figure 8-13. The Benjamin Franklin Parkway illustrates the character of Alternative 2.



Figure 8-14. Alternative 2 – Section and Plan View



Figure 8-15. Proposed New Signalized Intersection Locations



In addition, Alternative 2 provides the opportunity to preserve the landscape improvements and aesthetic improvements implemented as part of the 2025 recommendations and creates opportunities for green stormwater infrastructure (GSI) to mitigate the impacts that occur from the combined sewer service areas south of Cottman Avenue.

Similar projects that have reduced the number of travel lanes have spurred economic development. For instance, on La Jolla Boulevard in San Diego, California, travel lanes were reduced from five to two and sidewalks were significantly improved, alongside other work. After implementation, traffic crashes decreased by 90 percent, demonstrating safety benefits. The corridor also attracted new development, including a pharmacy and a 139-unit condominium project.¹⁹ Reducing the number of travel lanes can also attract new investments in housing by creating places where people safely walk through their neighborhood more comfortably, as there is both less traffic and slower moving traffic.

Walking is also more enjoyable and attractive because there is less traffic noise. When proposed in other cities, lane reduction projects have raised concerns that the transformed road would lead to increased congestion. However, the Congress for the New Urbanism (CNU) found that substantial investment in making alternative transportation attractive and realistic, along with providing appropriate transportation management tools, can equip existing streets to accommodate traffic while building a better public environment.²⁰ In addition, CNU noted by reclaiming land used for highways, roadways can promote a strong public life, contribute to the civic character of a city, promote economic development, and reduce the health risks for people exposed to highly concentrated traffic.

BRT in Alternative 1 and Alternative 2

It is important to note that both Alternative 1 and Alternative 2 recommend two separate BRT routes along the Boulevard. In fact, implementing Direct Bus and the long-term vision for BRT in both 2040 alternatives follow the recommendation to make a high-quality transit connection between the Broad Street Line (BSL) Hunting Park subway station and the Market Frankford Line (MFL / “the El”) station at FTC, set forth in the DVRPC Alternatives report. This alignment was selected because those stations provide enormous transfer opportunities to multimodal

¹⁹ Congress for New Urbanism. 2019. Freeways Without Futures.

²⁰ Congress for New Urbanism. 2019. Freeways Without Futures.

facilities located proximate to Roosevelt Boulevard and have an existing high frequency of service.

As reflected in the Program’s guiding principles for 2040 to build upon the 2025 improvements, Alternative 1 and Alternative 2’s two BRT routes follow the routes of Phase A and Phase B of Direct Bus. The northern BRT segment is approximately 9.5 miles between Frankford Transportation Center (FTC) and the Neshaminy Mall at Rockhill Drive. The southern BRT segment is 4.3 miles along the Boulevard between FTC and N. Broad Street. This southern BRT route will continue another 3.5 miles along Hunting Park Avenue and Ridge Avenue to reach Wissahickon Transportation Center (WTC).

In total, the two BRT services will have 15 stops along the Boulevard, with 29 new BRT bus stations, as shown in Figure 8-16. Different from Direct Bus, a new stop is recommended at Harbison Street, because there is a relatively high population density withing a 10-minute walk of the intersection. All other station locations are the same as Direct Bus Phases A and B.

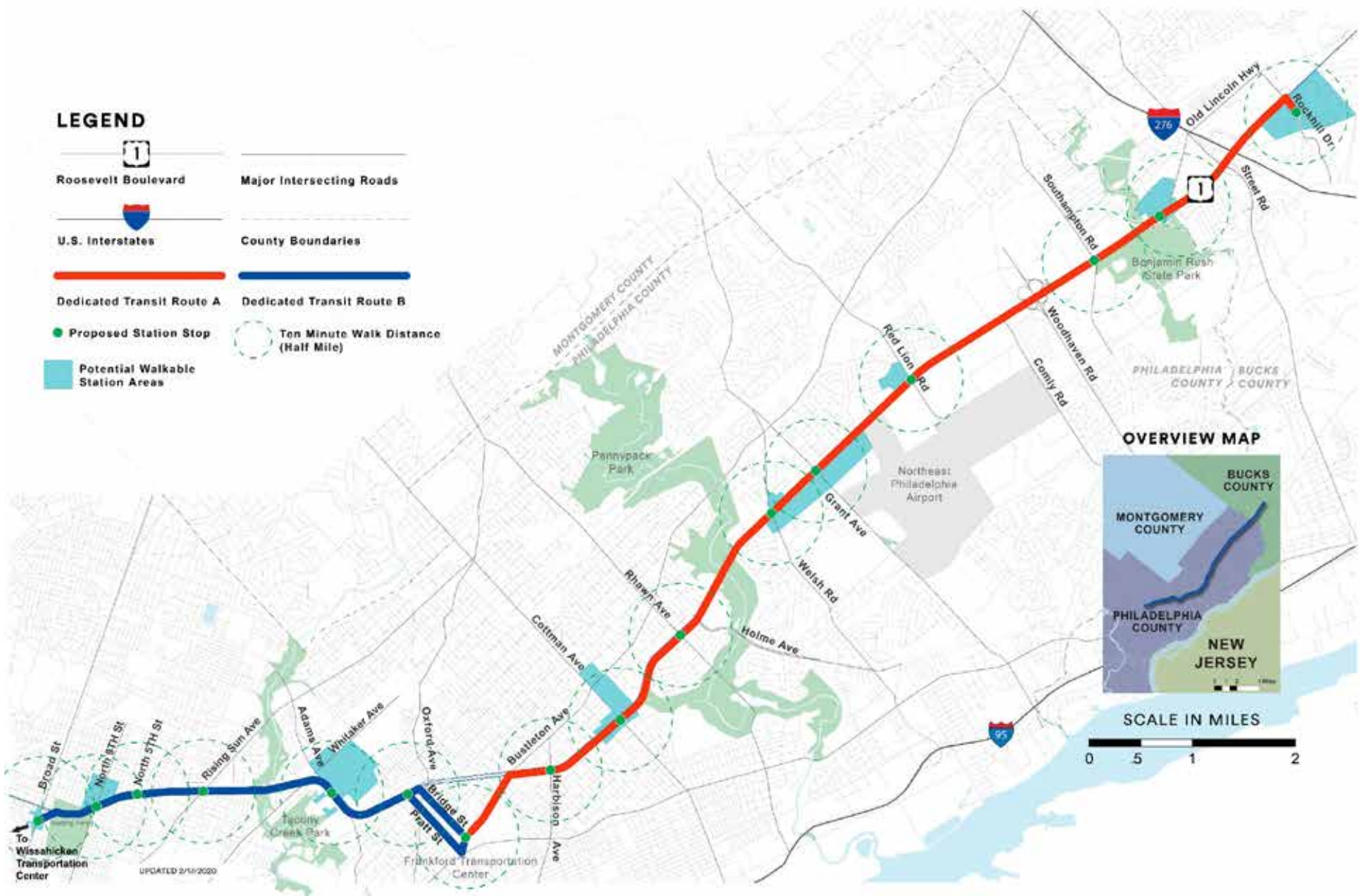
Alternative 2 – Cost Estimate

In order to understand the magnitude of investment needed for Alternative 2, the Program created an exploratory cost estimate that considered major construction activities, such as mobilization, demolition, excavating, paving, drainage, new road infrastructure, new BRT and local bus infrastructure, lighting, and landscaping, and other major construction activities (see Appendix 15). The estimate is based on current (2020) unit costs, which were then adjusted for the cost of inflation by applying a 3 percent inflation rate each year for 20 years.

Table 8-3. Alternative 2 Cost Estimate

| Alternative 2 - Neighborhood Boulevard | Total Cost (Millions) in 2040 Dollars |
|---|---------------------------------------|
| Engineering (survey, design & permitting) | \$163 |
| Environmental Clearance | \$22 |
| Construction | \$1,084 |
| Construction Inspection | \$130 |
| Subtotal | \$1,399 |
| 40% Contingency | \$558 |
| Total Estimated Cost (2040) | \$1,957 |

Figure 8-16. BRT Station Locations



Transition Area between Grant Avenue & Southampton Road

Recommendations for both Alternative 1 and Alternative 2 are focused on the 9-mile segment of Roosevelt Boulevard, between N. Broad Street and Grant Avenue. The Program considers the remaining 3.3 miles of the Boulevard in the city an area of transition, starting at Grant Avenue and ending at Southampton Road, where the width of the Boulevard would remain as three travel lanes in each direction just before the Philadelphia County line shared with Bucks County. The configuration of this transition area will be driven by detailed design considerations determined as part of a more granular engineering analysis that is best addressed as a next step.

For example, in Alternative 1, the distance needed for the transition between Grant Avenue and Southampton Road will depend on the slope of the decent to the below-grade expressway lanes and approach infrastructure, especially in the southbound direction, where people driving will approach the first split between the on-ramp to the expressway lanes and the local lanes at Bowler Street. Similarly, for Alternative 2, when traveling southbound on the Boulevard, the reduction in the number of lanes at Grant Avenue required to achieve a neighborhood boulevard will depend on the demand for turns onto adjacent parcels and the ability to “drop” lanes at driveways or potentially create service drives adjacent to future land uses. That opportunity will need to be coordinated with redevelopment proposals for the subject properties.

While the Program recognizes that a back-up of vehicles may occur in this transition area in both alternatives, the length and frequency will depend both on the geometry and the signal management techniques employed, which will also be the topic of further analysis once preliminary design of either alternative is underway.

Based on these factors, it should be recognized that an essential next step for the two alternatives will be to analyze queue length and develop appropriate mitigations. With that in mind, the Program recommends including the four building blocks as part of the plans for the transition area between Grant Avenue and Southampton Road. These includes:

- Reducing Posted Speed Limits
- Implementing BRT in dedicated transit lanes
- Installing a two-way cycle track along each side of the Boulevard for people biking
- Widening and filling in sidewalk gaps.

Measures of Effectiveness

The Program developed a series of Measures of Effectiveness (MOEs) to better examine the benefits and impacts of each alternative. As defined by FHWA, MOEs are ways to quantify the achievement of a project's objectives. For purposes of the comparison, the Program completed the following comparisons:

- Alternative 1 (Partially Capped Expressway) vs. 2040 no-build scenario
- Alternative 2 (Neighborhood Boulevard) vs. 2040 no-build scenario

The typical lane configuration for the 2040 no-build scenario²¹ is shown in Figure 8-17.

The Program selected 11 MOEs to compare to the two alternatives to the 2040 no-build scenario. For each alternative, the MOE is assigned a score reflecting how it compares to the 2040 no-build scenario (see Tables 8-4 and 8-5).

- -2: the alternative significantly worsened the MOE compared to the 2040 no-build scenario
- -1: the alternative worsened the MOE compared to the 2040 no-build scenario
- 0: the alternative had no change on the MOE compared to the 2040 no-build scenario
- +1: the alternative improved the MOE compared to the 2040 no-build scenario
- +2: the alternative significantly improved the MOE compared to the 2040 no-build scenario

Figure 8-18 illustrates the overall scoring for Alternatives 1 and 2 based on the MOEs.

Figure 8-17. Typical 2040 No-Build Lane Configuration – Section and Plan View



²¹ The 2040 no-build scenario is the 2025 build scenario with the background growth figures.

More detailed information about the data used to rate the alternatives is provided below. In addition to the traditional MOE comparisons, such as traffic volumes and vehicle miles traveled, the Program also took a closer look into how each alternative impacted the number of jobs a person could reach by a particular travel mode in a set amount of time. Research completed by the Accessibility Observatory at the University of Minnesota found that job access is correlated to access to other activities, such as

services and education. This means that job accessibility data can also be a broad indicator to how attractive a place is to fulfill other needs.²²

Refer to Appendix 16 for additional detail on the MOEs obtained from DVRPC's Travel Demand Model.

Table 8-4. Alternative 1 MOE Scores

| Alternative 1 - Partially Capped Expressway | Comparison to 2040 No Build | Score |
|--|-----------------------------|-------|
| Traffic Volume on the Boulevard | Worsens | -1 |
| Traffic Volume on Adjoining Road Network | No Change | 0 |
| Vehicle Miles Traveled on the Boulevard | Worsens | -1 |
| Vehicle Miles Traveled on Adjoining Road Network | No Change | 0 |
| Congested Miles on the Boulevard | Worsens | -1 |
| Congested Miles on Adjoining Road Network | No Change | 0 |
| Transit Ridership on the Boulevard | Significantly Improves | +2 |
| Access to Jobs by Driving | No Change | 0 |
| Access to Jobs by Riding Transit | Improves | +1 |
| Access to Jobs by Riding a Bike | Significantly Improves | +2 |
| Access to Jobs by Walking | No Change | 0 |

Table 8-5. Alternative 2 MOE Scores

| Alternative 2 - Neighborhood Boulevard | Comparison to 2040 No Build | Score |
|--|-----------------------------|-------|
| Traffic Volume on the Boulevard | Significantly Improves | +2 |
| Traffic Volume on Adjoining Road Network | Worsens | -1 |
| Vehicle Miles Traveled on the Boulevard | Significantly Improves | +2 |
| Vehicle Miles Traveled on Adjoining Road Network | Worsens | -1 |
| Congested Miles on the Boulevard | Significantly Improves | +2 |
| Congested Miles on Adjoining Road Network | Worsens | -1 |
| Transit Ridership on the Boulevard | Significantly Improves | +2 |
| Access to Jobs by Driving | Worsens | -1 |
| Access to Jobs by Riding Transit | Improves | +1 |
| Access to Jobs by Riding a Biking | Significantly Improves | +2 |
| Access to Jobs by Walking | Improves | +1 |

22 Wood, Jeff (host). (2019, August 8). Access as a Metric [Audio podcast]. <https://usa.streetsblog.org/2019/08/08/talking-headways-podcast-access-as-a-metric/>

Figure 8-18. Alternatives 1 and 2 MOEs Summary



Traffic Volumes – On the Boulevard & On Adjoining Road Network

Using DVRPC’s Travel Demand Model, this MOE determined the estimated changes to traffic volumes on the transformed segments of the Boulevard and the overall Boulevard/U.S. 1 corridor compared to the 2040 no-build scenario and the adjoining road network compared to the 2040 no-build scenario. The adjoining roadway network includes all roads in the Travel Demand Model’s traffic analysis zones (TAZs) within a one-mile buffer of the Boulevard.

| Traffic Volumes: Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|---|-------------------------------|-----------|
| Impacts on the Boulevard | | |
| <p>Alternative 1 – Partially Capped Expressway</p> <ul style="list-style-type: none"> For the segment of the Boulevard between with the new below-grade expressway, the total traffic volume on the inner (expressway) and (local) lanes increased approximately 15 to 20 percent in the AM and PM peak periods. Volumes increased about 50-60 percent on the inner (expressway) lanes and decreased about 30-50 percent on the outer (local) lanes. For the overall Boulevard/U.S. 1 corridor, overall traffic volumes on the inner (expressway) and (local) lanes increased approximately 15 to 20 percent in the AM and PM peak periods, but there was no significant change on the Boulevard/U.S. 1 segment, north of Woodhaven Road. | Worsens | -1 |
| <p>Alternative 2 – Neighborhood Boulevard</p> <ul style="list-style-type: none"> For the segment of the Boulevard with the Alternative 2 design treatment, the overall traffic volume on the combined inner (express) and outer (local) lanes decreased approximately 60 percent in the morning and evening peak periods. The lower volume was primarily due to the reduced speed limit on this segment of the Boulevard. In addition, people made shorter driving trips along the Boulevard under Alternative 2 as a result of the reduced speed limit. For the overall Boulevard/U.S. 1 corridor, traffic volumes decreased approximately 60 percent in both the AM and PM peak periods; however, there was little impact on the segment of Boulevard/U.S. 1, north of Woodhaven Road. | Significantly Improves | +2 |
| Impacts on Adjoining Road Network | | |
| <p>Alternative 1 – Partially Capped Expressway</p> <ul style="list-style-type: none"> Traffic volumes decreased very slightly on the parallel segments of I-95, Frankford Avenue (U.S. 13), and Bustleton Avenue (PA-532). | No Significant Change | 0 |
| <p>Alternative 2 – Neighborhood Boulevard</p> <ul style="list-style-type: none"> Volumes increased slightly on the parallel segment of I-95. Volumes increased more considerably on other roads, including many local neighborhood streets. | Worsens | -1 |

Vehicle Miles Traveled – On the Boulevard & On Adjoining Road Network

Using DVRPC’s Travel Demand Model, this MOE examined the changes in total vehicle miles traveled (VMT) on the Boulevard/U.S. 1 corridor compared to the 2040 no-build scenario and the adjoining roadway network compared to the 2040 no-build scenario. The adjoining roadway network includes all roads in the Travel Demand Model’s traffic analysis zones (TAZs) within a one-mile buffer of the Boulevard.

| Vehicle Miles Traveled (VMT): Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|---|-------------------------------|-----------|
| Impacts on the Boulevard | | |
| Alternative 1 – Partially Capped Expressway <ul style="list-style-type: none"> Overall, VMT increased 11 percent in the AM peak period and eight percent in the PM peak period. The VMT increased significantly on the inner (expressway) lanes and decreased significantly on the outer (local) lanes. . | Worsens | -1 |
| Alternative 2 – Neighborhood Boulevard <ul style="list-style-type: none"> Overall, VMT decreased approximately 40 percent in the AM and PM peak periods on the inner (express) and outer (local) travel lanes | Significantly Improves | +2 |
| Impacts on Adjoining Road Network | | |
| Alternative 1 – Partially Capped Expressway <ul style="list-style-type: none"> VMT on the adjoining roadway network remained approximately the same. | No Significant Change | 0 |
| Alternative 2 – Neighborhood Boulevard <ul style="list-style-type: none"> VMT increased by 11-13 percent in the AM and PM peak periods on the adjoining roadway network.. | Worsens | -1 |

Congested Miles – On the Boulevard & On Adjoining Road Network

Using DVRPC’s Travel Demand Model, this MOE analyzed how many miles of congestion would occur on the overall Boulevard/ U.S. 1 corridor compared to the 2040 no-build scenario and on the adjoining roadway network compared to the 2040 no-build scenario. The adjoining roadway network includes all roads in the Travel Demand Model’s TAZs within a one-mile buffer of the Boulevard.

| Congested Miles: Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|--|-------------------------------|-----------|
| Impacts on the Boulevard | | |
| <p>Alternative 1 – Partially Capped Expressway</p> <ul style="list-style-type: none"> The congested miles on the Boulevard increased approximately six miles (50 percent) in the AM peak period, mainly on the inner (expressway) lanes. This increase in congestion could be due to the modeling assumption that exit ramps would have one lane of capacity. Congested miles did not increase in the PM peak period since the Boulevard was already congested in the 2040 No-Build Scenario. | Worsens | -1 |
| <p>Alternative 2 – Neighborhood Boulevard</p> <ul style="list-style-type: none"> The congested miles decreased 2.6 miles (20 percent) in the AM peak period and 13 miles (44 percent) in the PM peak period on the Boulevard. | Significantly Improves | +2 |
| Impacts on Adjoining Road Network | | |
| <p>Alternative 1 – Partially Capped Expressway</p> <ul style="list-style-type: none"> Congestion on the adjoining network did not change in either the morning or evening peak period. | No Significant Change | 0 |
| <p>Alternative 2 – Neighborhood Boulevard</p> <ul style="list-style-type: none"> Congestion increased approximately 12 to 15 miles (10 percent) on the adjoining road network. Much of this increased congested occurred on local neighborhood streets. | Worsens | -1 |

Transit Ridership – On the Boulevard

Using DVRPC’s Travel Demand Model, this MOE examined the changes in transit ridership on the Boulevard/U.S. Route 1 corridor for both alternatives compared to the 2040 no-build scenario. Modeling results are the same for both alternatives since the ridership forecast is based on the frequency of service, which is assumed to be the same in both 2040 alternatives.

| Transit Ridership: Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|---|-------------------------------|-----------|
| Impacts on the Boulevard | | |
| <p>Alternative 1 – Partially Capped Expressway</p> <ul style="list-style-type: none"> • Bus ridership increased 27 percent in AM peak period and 38 percent in PM peak period for all bus routes including the BRT on the Boulevard. • This alternative resulted in more and longer transit trips happening along the Boulevard. | Significantly Improves | +2 |
| <p>Alternative 2 – Neighborhood Boulevard</p> <ul style="list-style-type: none"> • Bus ridership increased 27 percent in AM peak period and 38 percent in PM peak period for all bus routes including the BRT on the Boulevard. • This alternative brought about a significant shift from personal vehicle to transit. | Significantly Improves | +2 |

Number of Jobs Accessible by Driving

Using DVRPC’s Travel Demand Model, this MOE determined the changes in the number of jobs accessible within 30 minutes of driving compared to the 2040 no-build scenario. It should be noted that 30 minutes in a car covers significantly more area than either 30 minutes on a bus or 15 minutes biking or walking; therefore, the number of jobs reflected by this MOE is significantly higher than for the other accessibility MOEs.

| Jobs Accessible by Driving: Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|--|-----------------------|-------|
| Alternative 1 – Partially Capped Expressway <ul style="list-style-type: none"> There was no significant change in the number of jobs accessible within 30 minutes of driving. | No Significant Change | 0 |
| Alternative 2 – Neighborhood Boulevard <ul style="list-style-type: none"> There was a 5 to 25 percent decrease in the number of job accessible within 30 minutes driving. The largest decreases were for trips originating between Solly Avenue/Holme Avenue and Woodhaven Road. | Worsens | -1 |

Number of Jobs Accessible by Riding Transit

Using DVRPC’s Travel Demand Model, this MOE determined the changes in the number of jobs accessible within 30 minutes of transit travel time compared to the 2040 no-build scenario.

| Jobs Accessible by Riding Transit: Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|---|------------|-------|
| Alternative 1 – Partially Capped Expressway <ul style="list-style-type: none"> There is a 5 to 25 percent increase in the number of jobs that can be reached by transit in 30 minutes for TAZs immediately adjacent to the Boulevard. The largest increases were concentrated between Cottman Avenue and Bowler Street and in Bucks County along U.S. 1. | Improves | +1 |
| Alternative 2 – Neighborhood Boulevard <ul style="list-style-type: none"> There is a 5 to 25 percent increase in the number of jobs that can be reached by transit in 30 minutes for TAZs immediately adjacent to the Boulevard. The largest increases were concentrated between Cottman Avenue and Bowler Street and in Bucks County along U.S. 1. | Improves | +1 |

Number of Jobs Accessible by Riding a Bike

Using DVRPC's Travel Demand Model, this MOE determined the changes in the number of jobs accessible within 15 minutes of riding a bike compared to the 2040 no-build scenario.

| Jobs Accessible by Riding a Bike: Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|---|------------------------|-------|
| Alternative 1 – Partially Capped Expressway <ul style="list-style-type: none"> The number of job accessibility by biking increased significantly (13 percent) due to the addition of the two-way cycle track along both sides of the Boulevard. | Significantly Improves | +2 |
| Alternative 2 – Neighborhood Boulevard <ul style="list-style-type: none"> The number of job accessibility by biking increased significantly (13 percent) due to the addition of the two-way cycle track along both sides of the Boulevard. | Significantly Improves | +2 |

Number of Jobs Accessible by Walking

Using DVRPC's Travel Demand Model, this MOE determined the changes in the number of jobs accessible within 15 minutes of walking compared to the 2040 no-build scenario

| Jobs Accessible by Walking: Alternative vs. 2040 No-Build Scenario | Comparison | Score |
|---|------------|-------|
| Alternative 1 – Partially Capped Expressway <ul style="list-style-type: none"> Overall, the number of jobs accessible by walking increased by 1 percent. The number of jobs accessible by walking only increased in the vicinity of Napfle Street and Winchester Avenue because one existing T-intersection in each of those locations would become full intersections across all lanes of the Boulevard. This assumption was made to accommodate traffic at ramps to and from the inner (expressway) lanes. | No Change | 0 |
| Alternative 2 – Neighborhood Boulevard <ul style="list-style-type: none"> Overall, the number of jobs accessible by walking increased by 1 percent. The number of jobs accessible by walking increased significantly in two locations along the Boulevard: between (1) Cottman Avenue and Ryan Avenue/Borbeck Avenue and (2) Winchester Avenue and Grant Avenue because one existing T-intersections in each of those locations would become full intersections across all lanes of the Boulevard. | Improves | +1 |

Conclusion

Alternative 1 and Alternative 2 for 2040 offer very different paths to transforming the Boulevard into an attractive and vibrant corridor that unites adjacent communities and offers a diverse and connected network of transportation choices. The Program recommends moving both alternatives forward for additional analysis and stakeholder engagement, in order to identify the preferred alternative to transform the Boulevard. Please refer to Chapter 10 to learn more about the next steps for analysis of the two 2040 Alternatives.

CHAPTER

9

Walkable Station Areas

This chapter describes:

- What is a Walkable Station Area (WSA)
- Supporting Plans & Policies
- Potential Locations
- WSA Typologies
- FTA Capital Improvement Grants Program

Introduction

The 2040 Vision includes using a portion of Roosevelt Boulevard’s right-of-way for dedicated high-quality transit service. Both 2040 Alternative 1 and Alternative 2 propose Bus Rapid Transit (BRT) to provide quality, high-capacity transit service that increases travel choices. It should be noted that Light Rail Transit (LRT) may be considered instead of BRT in either Alternative, if ridership forecasts, land use changes, and available funding supports this mode.

Both 2040 alternatives include the development of two surface transit routes along the Boulevard, "A" and "B". The "A" service is the same route as the current Boulevard Direct Phase A and will run transit between Frankford Transportation Center (FTC) in Northeast Philadelphia and the Neshaminy Mall in Bensalem Township (Bucks County). The "B" service, which is currently being planned as Boulevard Direct Phase B, will travel via Roosevelt Boulevard between FTC in Northeast Philadelphia to the Hunting Park Broad Street subway station in North Philadelphia. After stopping at a new transit facility at the Broad Street subway station, the service will continue to Northwest Philadelphia via Hunting Park Avenue, and will terminate at the new Wissahickon Transportation Center, which is currently in the design phase.

Transit’s effectiveness depends on its ability to draw ridership. Land use and street patterns play a key role in shaping a transit system’s success. Density, the mix of uses, and connectivity to the surrounding neighborhoods all affect how people travel within a community. In the same way, transit design and operation affect the feasibility and efficacy of land use decisions. As a result, it is important to consider land use decisions, street grid design, and transit investment in a coordinated manner, which is described in this report as a Walkable Station Area (WSA).

Figure 9-1. Transit Station and Public Plaza in a WSA



What is a Walkable Station Area?

A Walkable Station Area (WSA) is defined as moderate to higher-density, compact, mixed-use development, located within an easy five- to ten-minute (approximately one-quarter to one-half mile) walk of a transit station, with the purpose of bringing transit riders closer to transit service. The mix of land uses around the transit station also makes walking and taking transit more attractive than driving in a single-occupancy vehicle. The benefits of WSAs are maximized when the areas around the transit station exhibit characteristics such as:

- A mix of residential, commercial, and employment land uses that provides housing choices, good jobs, and access to shopping and services
- Compact and higher densities than typical development
- A high-quality transit station that serves as a hub of activity for the surrounding community
- Easy access by all modes of travel but prioritizing walking, biking and transit
- Limited and managed vehicle parking

It is important to note that just having development near transit stations does not automatically make a WSA. For instance, when development near transit has the same parking ratio, roadway design, and vehicular usages as conventional development, the ridership at the transit station will most likely fall short. Supportive land-use planning and regulations for development around transit station can promote successful WSA characteristics.

Benefits of WSAs

A successful WSA provides long-term benefits to both the community and the transit system. Creating a mix of uses within a WSA promotes activity throughout the entire day. This, in turn, promotes more frequent transit use, including travel in both directions and during non-peak periods. In addition, people who live within a ten-minute walk of a transit station are five times more likely to commute by transit than other residents.¹ People living and working in WSAs typically walk more, use transit more, and drive less than people who live more than ten minutes from a transit station.

According to the Federal Transit Administration (FTA),² dense, walkable, mixed-use development near transit has the following benefits:

- increased ridership and associated revenue gains for transit systems
- incorporation of public and private sector investment
- revitalization of neighborhoods
- a larger supply of affordable housing
- economic returns to surrounding landowners and businesses
- congestion relief and associated environmental benefits
- improved safety for pedestrians and cyclists through non-motorized infrastructure

Encouraging WSAs at transit station locations along high-quality transit has many advantages. They provide more people with convenient access to transit. Walkability and diverse services in the transit station area create travel choices for people of all ages, abilities, and income level. These advantages also benefit the Greater Philadelphia regional transportation system by improving accessibility and reducing congestion, pollution, and greenhouse gases. Increased ridership also contributes to a healthier bottom line for SEPTA, as well.

WSAs can influence not just the area directly adjacent to transit stations, but also development patterns across the entire corridor in the long-term. Because the characteristics of a WSA support higher density development patterns, concentrating investment around stations can help reduce the need for expanding other parts of the region's transportation system.

1 Arrington, G.B. and Cervero, R., *Effects of TOD on Housing, Parking and Travel*, Transit Cooperative Research Program Report 128, Transportation Research Board of the National Academies, Washington, DC 2008.

2 <https://www.transit.dot.gov/tod>. Accessed January 2019.

Contributing Factors to the Success of WSAs

Public support is one of the most important factors leading to successful implementation of WSA development, regardless of the transit mode. This support can take the form of:

- Political support
- Visioning and rezoning
- Proactive outreach to developers
- Marketing
- Land Assembly
- Environmental clean-up
- Financial incentives, such as density bonuses, tax incentives, or low-interest loans
- Streamlined development review process
- Siting of transit stations in locations conducive to development

As the Program continues the planning process to introduce a new BRT system and WSAs into the corridor’s development future. The development potential of the station areas should be evaluated. The real estate dynamics of each station area present unique challenges and opportunities. Ultimately, market fundamentals will govern whether private investment will occur at transit station locations. As a result, supportive real estate market conditions are required for WSAs to thrive. Simply providing high quality transit service, even when it is supported by an appropriate regulatory framework, is not enough. Therefore, as a next step, a more detailed market feasibility study of potential transit station locations is critical.

The market studies would provide the insight required by developers and property owners to determine whether their project is even ‘feasible’ to continue. Most real estate developers will conduct such a study to determine if the project is worth the time and money to continue.

The recommended market feasibility study would explore each station areas’ past demographic, economic, and real estate market trends as well as regional forecasts in order to estimate each station’s future market-supportable development. It would

Figure 9-2. Multistory Mixed Use in a WSA



Figure 9-3. Mid-rise Mixed Use in a WSA



also examine current real estate market conditions and assess future market demand for office, housing, local-serving retail, and hotels. The region's economic outlook, competing urban and suburban centers throughout the region would be considered as part of the assessment. Lastly, a feasibility study would highlight the requirements needed in order to successfully navigate the many issues that arise in both developing on vacant land or redeveloping existing structures at each station area.

A feasibility study may also assess the costs associated with the overall project. In some feasibility studies, there may be a sales forecasts to help clarify the budget and give needed insight into the potential revenue streams as well as the costs associated with construction.

In addition to analyzing market factors, a feasibility study can test scenarios for redevelopment along the proposed BRT that expand on traditional estimates of market support. These market scenarios would move beyond current build-out estimates, rather than relying solely on market trends and the historic nature of development. Such scenarios would consider opportunities to expand development capacity along the proposed BRT corridor to accommodate future demand generated by this major transit infrastructure upgrade.

Figure 9-4. Townhome Residences in a WSA



3 Breakthrough Technologies Institute, *Bus Rapid Transit and Transit Oriented Development: Case Studies on Transit Oriented Development Around Bus Rapid Transit Systems in North America and Australia*, Washington, DC, 2008.

A 2008 study that reviewed BRT in North America and Australia³ identified other contributing factors to the success of WSAs, including:

- Cooperation among key stakeholders, including public agencies, non-profit development organizations, property owners, and private developers, is critical to success.
- Developers appeared much more interested in an expedited permitting or rezoning process than receiving financial incentives for development near BRT stations, as time is a significant factor in making development projects financially viable.
- Frequency, speed, and convenience of the transit service are important to many developers and property owners. These features differentiated BRT from conventional local bus service, which is generally not considered appealing for WSA.
- Streetscape improvements that accompany BRT may be as important as the transit service for attracting new investment.
- Developers and properties owners invest in WSAs due to higher investment returns that result building near high quality BRT infrastructure.

Figure 9-5. Public Park in a WSA



Supporting Plans and Policies

The City of Philadelphia and the region has adopted multiple plans and policies in recent years that support the characteristics of WSAs. A brief summary of each is provided below:

- DVRPC Connections 2045 (2017)
- Philadelphia2035 Citywide Vision (2011) and several Philadelphia2035 district plans
- CONNECT: Philadelphia's Strategic Transportation Plan (2018)
- Housing for Equity: An Action Plan for Philadelphia (2018)
- Philadelphia Code, Section 14-513, TOD, Transit-Oriented Development Overlay District (2018)

DVRPC Connections 2045 (2017)

In 2017, DVRPC adopted the Connections 2045 Plan for Greater Philadelphia, the region's long-range plan developed to "achieve a more sustainable and prosperous future for Greater Philadelphia". The Plan includes five core, integrated principles:

- Sustain the Environment
- Develop Livable Communities
- Expand the Economy
- Advance Equity and Foster Diversity
- Create an Integrated, Multimodal Transportation Network

The 2045 Plan reinforces the concept of WSA along the Boulevard in several ways. For example, it envisions that livable centers:

- Can be created and supported by investing in and redeveloping centers and
- Promote affordable housing in appropriate locations.

This concept of livable centers, defined as places where growth is concentrated, is a cornerstone of the 2045 Plan. The density and mix of uses within centers can enhance the feasibility of walking, biking, and public transit as an alternative to the automobile. The 2045 Plan identified two centers along the Boulevard:

- The Boulevard/Grant Avenue/ Woodhaven Road vicinity is categorized as a "Suburban Town Center." This category acknowledges a dependency on automobiles rather than transit-oriented and pedestrian-scale character. These Suburban Town Centers also typically have more jobs than residents. The 2045 Plan recommends working to improve the jobs-housing balance in Suburban Town Centers. This can be done through the principles of WSAs. The limits of the Boulevard/Grant Avenue/ Woodhaven Road Suburban Town Center encompass three potential WSA locations including the Welsh Road, Grant Avenue, and Red Lion Road transit station areas.
- The Boulevard/Cottman Avenue vicinity is identified as a "Neighborhood Center." This category refers to recognizable places with a mix of commercial, retail, institutional, and residential land uses. These Neighborhood Centers have a main street or focal point, are walkable, and have a unique history or sense of community. The limits of the Boulevard/Cottman Avenue Neighborhood Center include the Cottman Avenue transit station area.
- As a strategy to invest in centers, the 2045 Plan recommends updating local regulatory documents to support transit-oriented economic development, such as mixed-use overlay districts, density bonuses, and codes that set separate standards with areas identified for infill and redevelopment.

The 2045 Plan also sets forth affordable housing strategies related to mixed-use environments including the need to:

- Increase and preserve the supply of affordable, accessible housing units in areas served by public transit and close to essential jobs and services.
- Increase employment in places where affordable housing opportunities currently exist.
- Create accessible, pedestrian-friendly neighborhoods where families with children, seniors, and people with disabilities can safely walk, bike, or take public transit to jobs and services.

- Another key goal of the 2045 Plan is to provide access to essential services for vulnerable populations, which includes individuals who are low-income, older, or who have a physical or mental disability. Research indicates vulnerable populations are more likely to be transit dependent than the overall population. Thus, strategies to promote equitable access to transportation for vulnerable persons should include creating WSAs with affordable housing and essential services.

It is also important to note that the 2045 Plan identifies a transit line along the Boulevard between Lower Bucks County and Frankford Transportation Center, as well as between Frankford Transportation Center and Broad Street as a new regional transit system expansion project.

Philadelphia2035 Citywide Vision (2011)

Philadelphia2035 is the comprehensive plan for managing growth and development in the City of Philadelphia, where the Citywide Vision establishes broad planning goals. The Citywide Vision defined three key strengths of the city:

- a strong metropolitan center,
- diverse and authentic neighborhoods, and
- the intended renewal and transformation of its industrial legacy areas.

There are two key elements of the *Philadelphia2035* Citywide Vision that supports BRT and WSA along Roosevelt Boulevard, including:

- 4.1.2 – Major Transit Improvement Proposals, which highlights rapid transit along Roosevelt Boulevard with neighborhood centers at stations.
- 2.1.3 – Reinforce the Far Northeast Regional Center in the Far Northeast District: After the completion of the Citywide Vision of the Philadelphia City Planning Commission completed plans for 18 districts, which outline specific land use and capital investment recommendations. The completed District Plans that have a portion of the Boulevard in their district are discussed below.

District Plans

A portion of Roosevelt Boulevard is within six different District Plans, and each include recommendations that support improved transit and walkable communities along the Boulevard.

Lower Northeast District Plan (2012)

The Lower Northeast District Plan area covers approximately 6 square miles, is bisected by Roosevelt Boulevard and includes the neighborhoods of Frankford, Northwood, Summerdale, Lawncrest, and Oxford Circle. The 2035 Citywide Vision Plan recommends creating a "neighborhood center" surrounding Frankford Transportation Center (FTC). FTC is located 0.6 miles from the Boulevard and serves as the major transportation hub in the area and is the termini of both the "A" and "B" transit routes.

To develop the center, the District Plan recommends multiple actions. One key action is to strengthen Frankford Avenue's commercial node by changing the existing mix of land uses to CMX-3 Community/Commercial Mixed-Use zoning to spur growth and development. This zoning district reflects the density and mix of uses typically needed to support a WSA at FTC.

Central Northeast District Plan (2014)

Roosevelt Boulevard traverses from the southeast to northeast section of the Central Northeast District. This District is home to several important commercial corridors, including 1.6 million square feet of commercial space located at Cottman Avenue and Roosevelt Boulevard. The Plan identifies the Cottman and Boulevard Regional Center as a focus area, with the aim of transforming the shopping area into a vibrant town center. Key recommendations include rezoning for commercial mixed-use and creating a mixed-use regional center. The Plan also calls for an attractive and convenient transit station at this location as part of the recommendation for faster and more frequent transit service along the Boulevard.

North Delaware District Plan (2016)

Roosevelt Boulevard travels along the northern boundary of the Mayfair neighborhood in the western section of the North Delaware District. To improve transit service and attract new riders, the District Plan included advancing enhanced bus service along Roosevelt Boulevard, as well as forthcoming recommendations from this effort, the Roosevelt Boulevard Route for Change Program.

Upper North District Plan (2016)

The 48-acre Logan Redevelopment Area (Logan Triangle) at the intersection 9th Street and Roosevelt Boulevard is one of the largest concentrations of vacant land in the city. A priority recommendation of the Plan is the redevelopment of Logan Triangle, through high-quality design, a mix of land uses, and integrating high quality transit.

North District Plan (2017)

Roosevelt Boulevard is the northern boundary of the North District in the Hunting Park and Feltonville neighborhoods. The District Plan notes, “originally an area of factories and dense workforce housing, the North District has ‘strong bones’ for a multimodal transportation system where residents can live comfortably and conveniently without automobiles.”

The District Plan recommends increasing the allowable housing density with changes to the base zoning and a TOD overlay near major transit stations. This includes the area surrounding the intersection of Broad Street and Roosevelt Boulevard.

Far Northeast District Plan (2017)

The Boulevard serves as the north-south spine of the Far Northeast District. The District is the most recently developed (post World War II) portion of the Boulevard and has a suburban and auto-oriented development pattern.

The Plan encourages transit-supportive development through zoning and capital investments to allow transit areas, such as the Boulevard Direct bus stations, to become vibrant neighborhood modes. The Plan envisions this segment of the Boulevard to include three high-quality transit stations at Welsh Road, Grant Avenue, and Red Lion Road. It also recommends creating a street grid to improve traffic circulation and wayfinding at the Northeast Village Shopping Center at Welsh Road and the Boulevard.

Philadelphia Code, Section 14-513, TOD, Transit-Oriented Development Overlay District (2018)

In 2018, the City adopted a zoning code amendment to encourage compact urban growth patterns and more opportunities for increased transportation mode choice, to reduce reliance on the automobile, and to create a safe and pleasant pedestrian environment. Section 14-513 of the Philadelphia City Code establishes a Transit-Oriented Development (TOD) Overlay District, currently identifying four stations along the Market-Frankford Line. The regulations help ensure an attractive streetscape, a functional mix of complementary uses, and provision of amenities that support the use of transit, bicycles, and pedestrian facilities. The district standards apply to new construction and expansions of more than 30 percent of gross floor area on lots located within TOD districts designated in the code.

The code simply defines a uniform radius for TODs relative to stations (i.e., 500 feet from entrances) and allows new TOD areas to be added to the code through an amendment. In addition, the TOD Overlay District:

- Increases development potential in TOD areas
- Encourages better pedestrian environments
- Provides greater incentives for public benefits
- Reduces parking requirements

Amending the current TOD Overlay District to include transit stations along Roosevelt Boulevard would encourage the creation of walkable station areas. However, other zoning tools that encourage compact urban growth patterns around transit stations along Roosevelt Boulevard should also be explored, with an explicit goal of ensuring it would not negatively impact the development of adjacent commercial corridors in Northeast Philadelphia.

CONNECT: Philadelphia's Strategic Transportation Plan (2018)

CONNECT is the City's strategic transportation plan for the next seven years (2019 – 2025) and will guide the City in creating a transportation system that is safe, affordable, accessible, and reliable at moving Philadelphians, visitors, and commerce so neighborhoods thrive, people are healthy, and the economy grows. The Plan focuses on investing in transportation infrastructure so that all people can affordably connect to opportunities, including education and employment, and have the ability to fully participate in their communities and the economy. This is reinforced by one of the Plan's five goals: "Transit First – moving people equitably, affordably, and reliably around a growing city."

CONNECT highlights that Philadelphians are highly reliant on public transit. Forty percent of residents get to work without a car, most of whom use transit. One third of total residents, and one half of residents in poverty, do not have a car; these residents depend on transit. CONNECT further notes that improving and expanding frequent, reliable transit service is critical to connecting communities in need with jobs, education, and other activities and strives at making transit the most convenient option for people from all backgrounds and for all trip purposes. More specifically, CONNECT recommends the City partner with PennDOT and SEPTA to implement dedicated bus facilities along Roosevelt Boulevard by 2020.

Housing for Equity: An Action Plan for Philadelphia (2018)

The Action Plan outlines several strategies to promote housing that addresses the needs of residents at all income levels. Two of the key themes included in the Action Plan that are related to WSAs include:

- Preserving and Protecting Long-Term Affordability
- Encouraging Equitable Growth without Displacement

These themes include key strategies to harness Philadelphia's growth to benefit all residents:

- Establish a Housing Accelerator Fund to Preserve Affordable Housing: create a new fund to finance the acquisition and rehabilitation of affordable housing and to provide working capital for Low-Income Housing Tax Credit (LIHTC) projects.
- Plan for Growth: zone for greater density in neighborhoods with strong market and for transit-oriented development near transit access points. For example, the Transit Oriented Development (TOD) section of the zoning code offers increased height, density and reduced parking to incentivize this type of development.
- Explore Ways to Capture the Value Created by Up-Zoning or Increases in Allowable Density to Fund Citywide Housing Programs: Ideas include developing a tool to measure the value added due to upzoning a property, and based on the value, develop recommendations for supporting affordable housing.
- Continue to Preserve Long-Term Affordability in Strengthening Markets: continue the collaboration between the City and Philadelphia Housing Authority (PHA) on large-scale community revitalization efforts and work towards the goal of preserving and/or redeveloping units on a one-for-one basis.

As discussed later in this chapter, successful applications to the Federal Transit Administration (FTA) for transit lines and stations funding requires applicants to have measures in place to increase and protect the supply of affordable housing near the proposed transit stations. Implementing recommendations from the Action Plan along Roosevelt Boulevard will strengthen the competitiveness of applications for federal funding assistance.

Potential Locations

As shown on Figure 9-6, two transit routes are planned for the Roosevelt Boulevard corridor in both 2040 alternatives,

The Program selected nine transit station locations as examples to explore visions for WSAs. The locations were identified based on current clusters of underdeveloped land or large-footprint commercial properties within a ten-minute walk of the proposed transit stations.

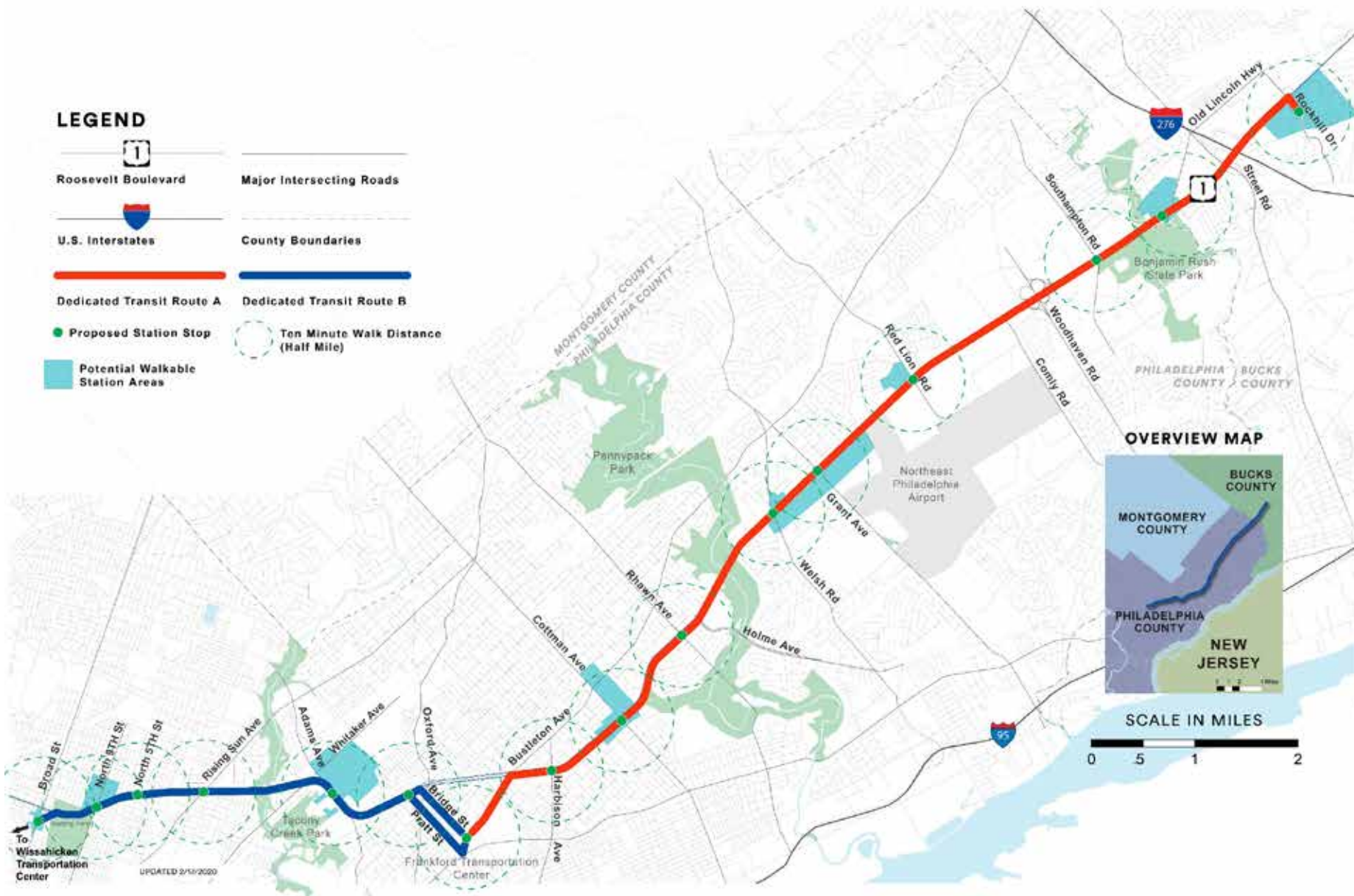
The "A" service (currently Boulevard Direct Phase A) will connect Frankford Transportation Center in Northeast Philadelphia and the Neshaminy Mall in Bensalem Township, Bucks County. For the 2040 alternatives, the service is proposed to have ten transit stations in each direction. Of these ten stations, the Program explored characteristics of WSAs at six locations:

- Cottman Avenue transit stop (Philadelphia)
- Welsh Road & Grant Avenue transit stops – in one shared vision (Philadelphia)
- Red Lion Avenue transit stop (Philadelphia)
- Neshaminy Interplex transit stop (Bensalem Township)
- Neshaminy Mall transit stop (Bensalem Township)

The "B" service, currently being planned as Boulevard Direct Phase B, will run between Frankford Transportation Center in Northeast Philadelphia to the Hunting Park Broad Street subway station in North Philadelphia, with a total of seven stops in each direction. This route will ultimately connect to the Wissahickon Transportation Center in Northwest Philadelphia via Hunting Park Avenue. Of these seven stations along Roosevelt Boulevard, the Program explored characteristics of WSAs at three station locations:

- Broad Street transit stop (Philadelphia)
- 9th Street transit stop (Philadelphia)
- Northeast Tower Center transit stop (Philadelphia)

Figure 9-6. WSA Station Locations – 2040 Alternatives



WSA Typology

To develop a WSA, the idea is not to take a one-size-fits-all approach, but rather that the vision for each station area along Roosevelt Boulevard will be shaped by a mix of site-specific factors. Development around each transit station faces unique challenges and requires tailored strategies to be successful. There are several similar traits and functions of WSAs that categorize a typology, or a system of classification. This typology provides stakeholders – including the public, government agencies, elected officials, community groups, developers, SEPTA, and others – with a common understanding of potential future development around key transit stations along the Boulevard.

To better illustrate the WSA opportunities at stations along the Boulevard, a typology was created for Roosevelt Boulevard, with recommendations for:

- Land use mix
- Density and massing
- Building placement and location
- Street grids
- Urban design

The WSA typology for Roosevelt Boulevard includes three station categories, with differing ratios of residents and jobs:

- Mixed-Use Transit Center – Balanced Ratio of Residents and Jobs
- Medium Density Center – High Ratio of Residents to Jobs
- Residential Neighborhood – Higher Ratio of Residents to Jobs

The land use and design considerations for the three typologies are explained below, and potential transit station locations for each typology are also identified. Two or more typologies may be appropriate at some transit station areas to allow better transitions to adjacent land uses or to better support infill and redevelopment visions.

Figure 9-7. Vicinity of Welsh Road and Roosevelt Boulevard is a Potential WSA



Figure 9-8. Vicinity of Cottman Avenue and Roosevelt Boulevard is a Potential WSA



Mixed Use Transit Center

| Potential Land Uses | Urban Design Considerations |
|---|---|
| <ul style="list-style-type: none"> • Regional scale retail • Office buildings • Hotels • Multiple-family dwellings • Civic buildings • Vertical mixed-use buildings • Research and development • Civic building and community facilities including government offices, public safety buildings, colleges, primary and secondary schools • Commercial/Mixed use | <ul style="list-style-type: none"> • Four to eight story buildings with no setbacks from the street • Highly connected street pattern • Formal, pedestrian scale streetscape with similar tree types • Pedestrian-scale street lighting • A very high percentage of first-floor uses are shops and storefronts • The ground floors of buildings with street frontages have doors and windows that make up 70 percent or more of the facade • Varied sidewalk materials, like brick, concrete, granite, slate, to provide a visually interesting walkway • Sidewalks are provided on every street • Structured parking is encouraged with entrances not located on the main streets • Where structured parking is not feasible, parking should be located away from the main streets and behind buildings • Underground utilities |

Figure 9-9. Example of a Mixed-Use Transit Center



The mixed-use commercial center at the Clarendon Metro Station in Arlington, Virginia, features a continuous row of shopfronts at street level with upper floor apartments. Pedestrian scale lighting and plantings are key features of this redevelopment of a former strip retail site.

Medium Density Center

| Potential Land Uses | Urban Design Considerations |
|--|---|
| <ul style="list-style-type: none">• Single family attached, high density single family detached, or multifamily• Office• Light manufacturing• Mixed-use developments including big box retail/office/residential uses• Neighborhood-level retail and convenience uses within pedestrian walksheds• Civic building and community facilities including government offices, public safety buildings, colleges, primary and secondary schools | <ul style="list-style-type: none">• Multistory (two to five stories) buildings with no or shallow setbacks from street• Highly connected street pattern• Formal pedestrian scale streetscape with similar types of trees in commercial and high-density residential areas• Pedestrian-scale street lighting• Very high percentage of first floor uses should be shops and storefronts• In the core area around the station, the ground floors of buildings with street frontages have doors and windows that make up 70 percent or more of the facade• Varied sidewalk materials, like brick, concrete, granite, slate to provide a visually interesting walkway.• Parking should be located away from the main streets, behind buildings, and allowed on-street. Off-street structured parking is preferred• Sidewalks are provided on all streets |

Figure 9-10. Example of a Medium Density Center Typology



Redevelopment at the Clarendon Metro Station in Clarendon, Virginia, incorporates attached single-family housing as a transition between the Mixed Used Transit Center and detached single family Residential Neighborhood typologies.

Residential Neighborhood

| Potential Land Uses | Urban Design Considerations |
|---|---|
| <ul style="list-style-type: none">• Single family attached, high-density single family detached, or multifamily• Neighborhood-level retail and convenience uses within pedestrian walksheds• Small-scale civic building and community facilities including government offices, public safety buildings, colleges, primary and secondary schools | <ul style="list-style-type: none">• Multistory (two to three story) buildings with shallow setbacks from street• As a residential neighborhood, a lower percentage of first floor uses are used for shops and storefronts• Highly connected street pattern• Formal pedestrian scale streetscape with similar types of trees in commercial and high-density residential areas• Pedestrian-scale street lighting• Varied sidewalk materials including brick, concrete, granite, slate to provide a visually interesting walkway• Parking should be located behind buildings and allowed on-street• Sidewalks are provided on all streets |

Figure 9-11. Example of Residential Neighborhood Typology



High-density detached single family homes follow traditional urban neighborhood designs such as this example in Stapleton, Colorado. Garage parking is provided off rear alleys to enhance the streetscape.

WSA Concepts

The Roosevelt Boulevard Route for Change Program developed concepts for nine WSAs using the typologies described above.

Existing conditions and the potential WSA concepts for the nine stations are included in Figures 9-12 to 9-27 to provide an example vision of transformation at the station locations.

Figure 9-12. Broad Street Existing Land Uses and Road Network

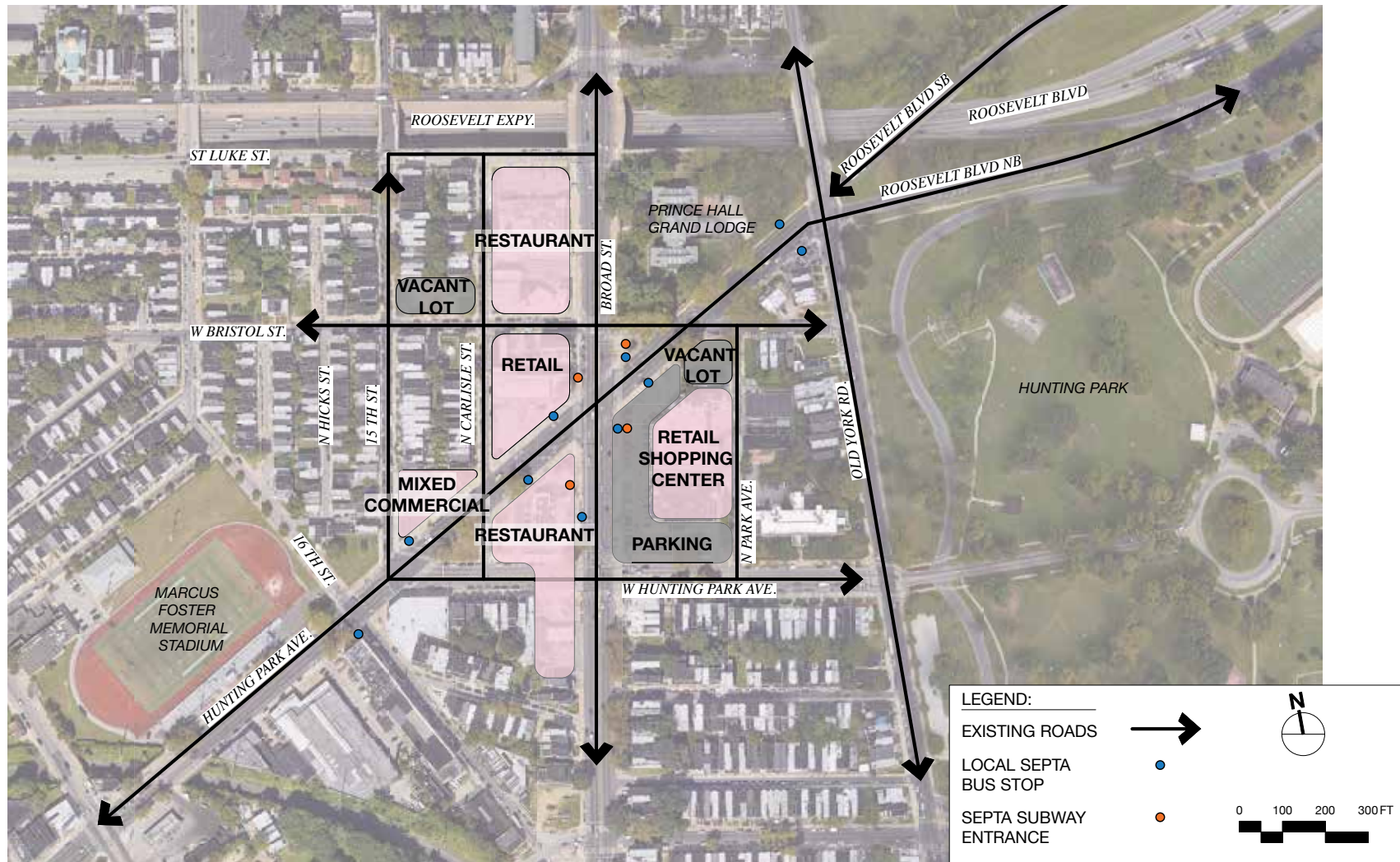


Figure 9-13. Broad Street Walkable Station Area Typologies and Proposed Road Network

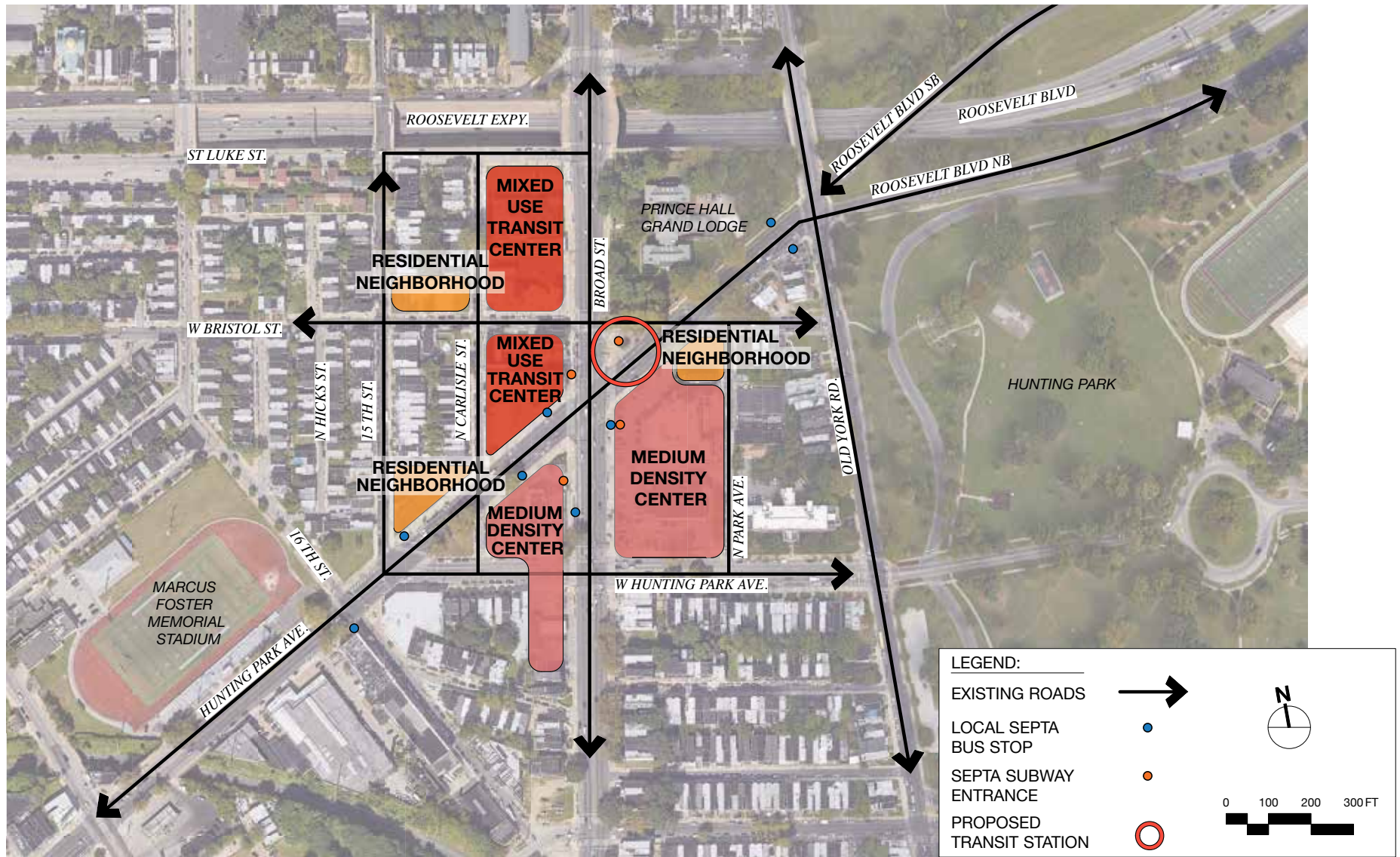


Figure 9-14. 9th Street Existing Land Uses and Road Network

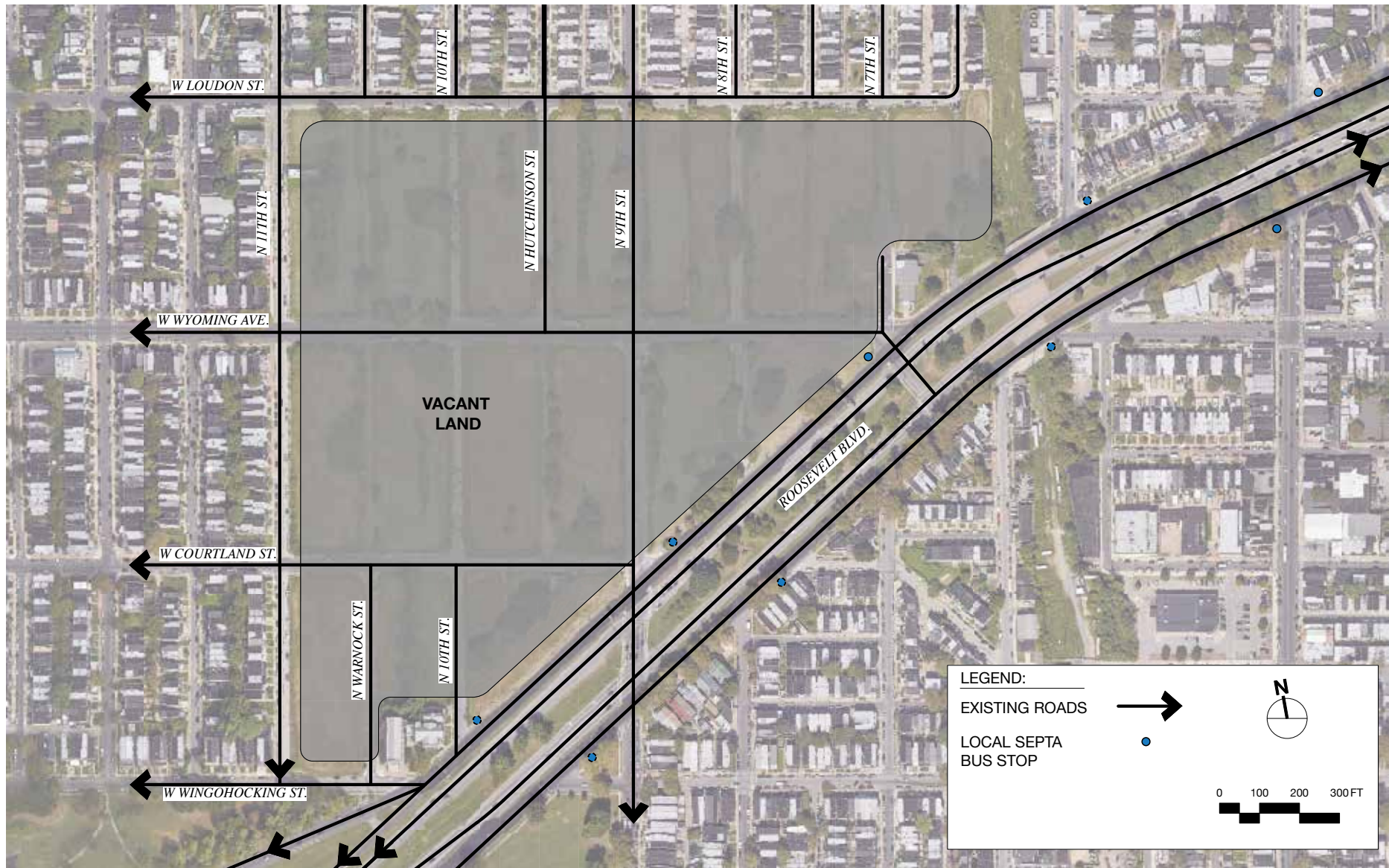


Figure 9-15. 9th Street Walkable Station Area Typologies and Proposed Road Network



Figure 9-16. Tower Center Existing Land Uses and Road Network

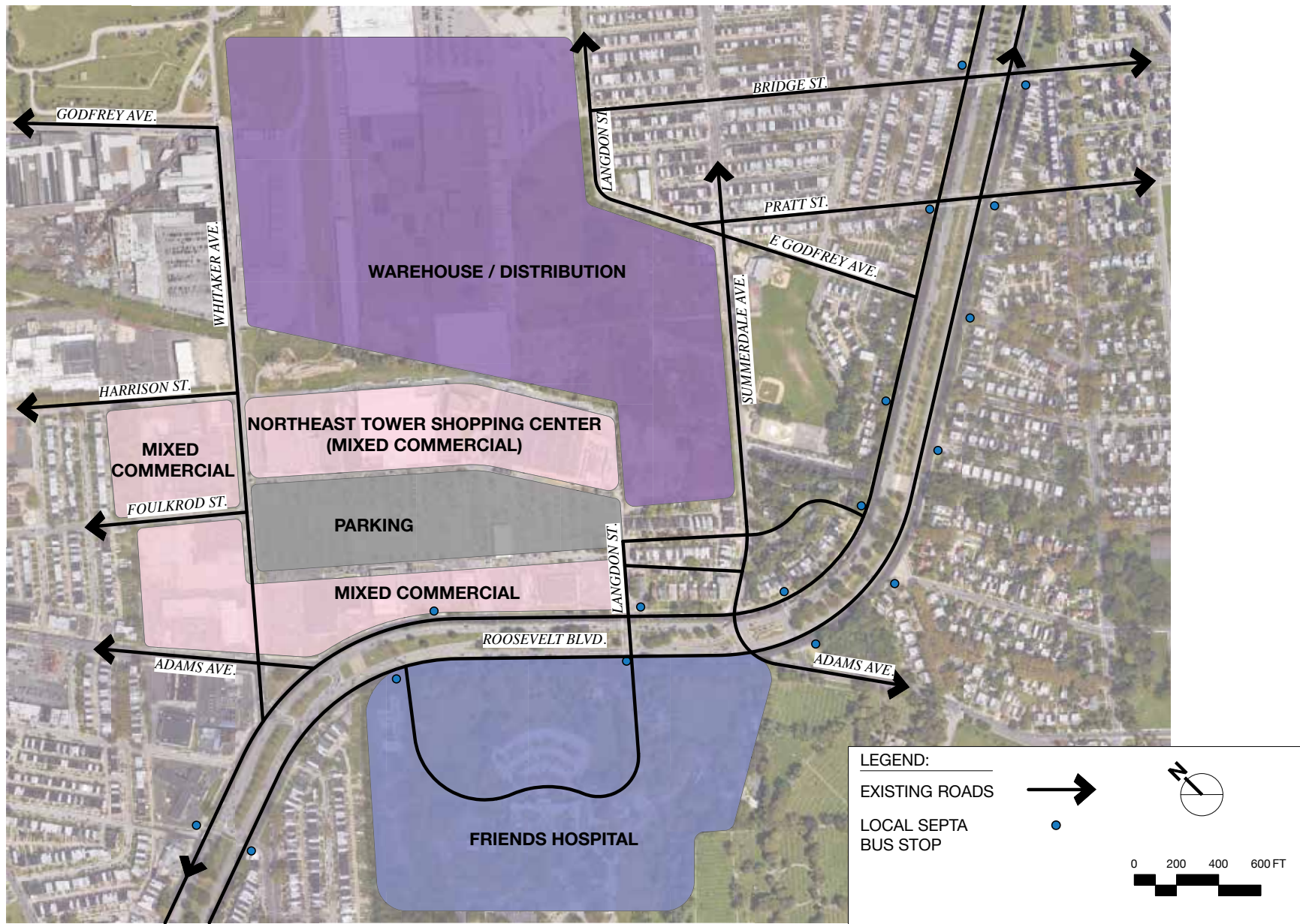


Figure 9-17. Tower Center Walkable Station Area Typologies and Proposed Road Network

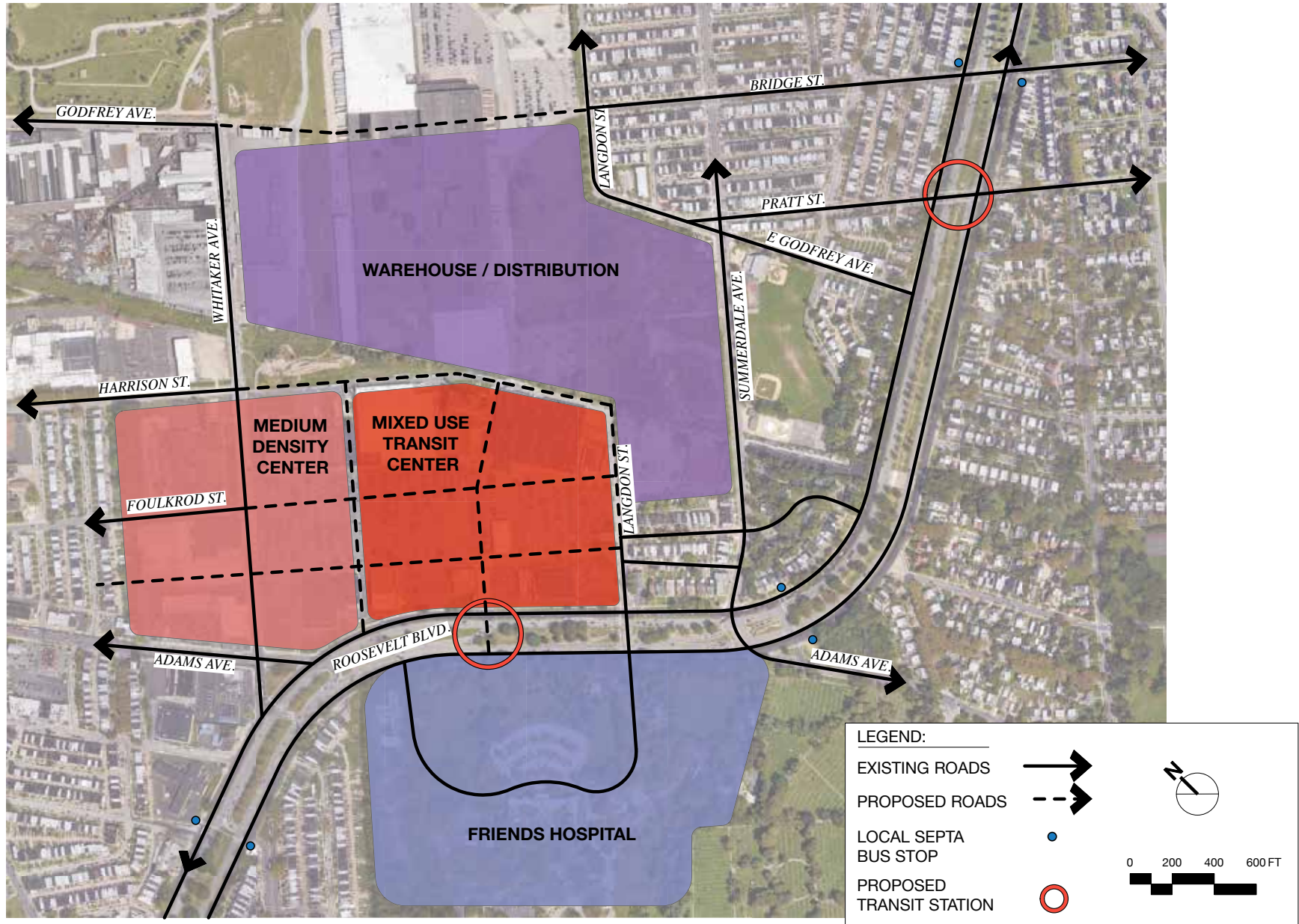


Figure 9-18. Cottman Ave Existing Land Uses and Road Network

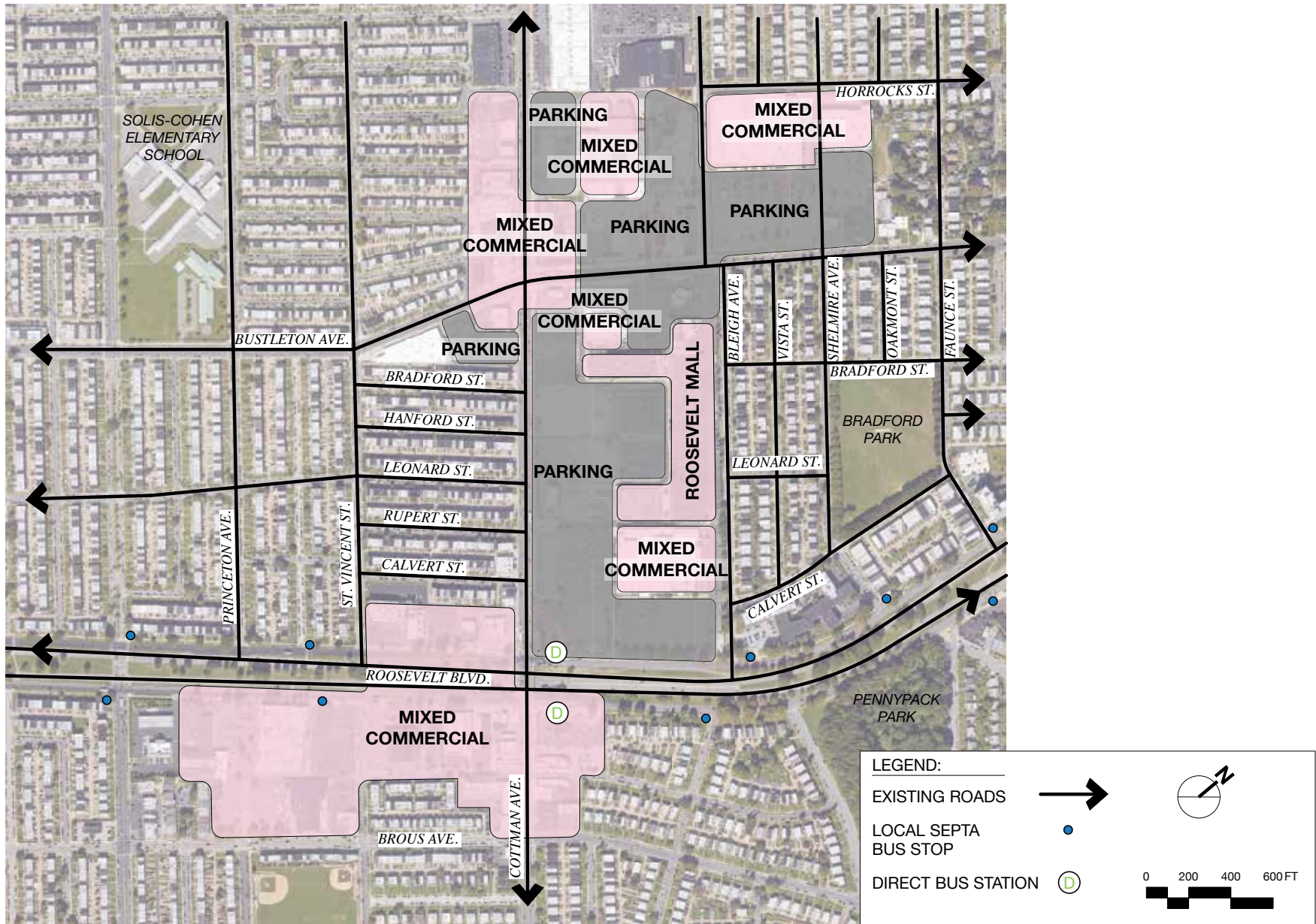


Figure 9-19. Cottman Ave Walkable Station Area Typologies and Proposed Road Network

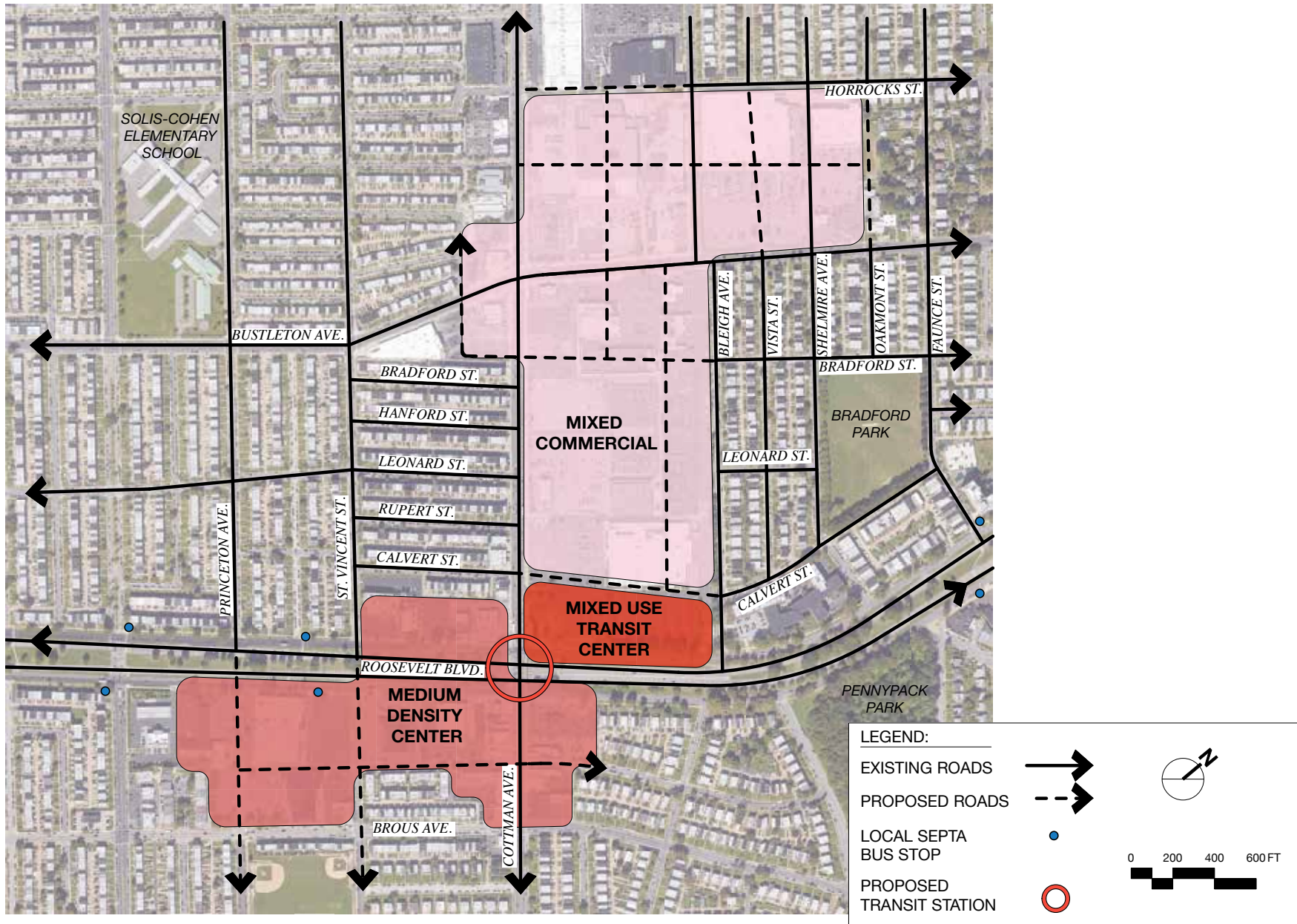


Figure 9-20. Grant Avenue / Welsh Road Existing Land Uses and Road Network

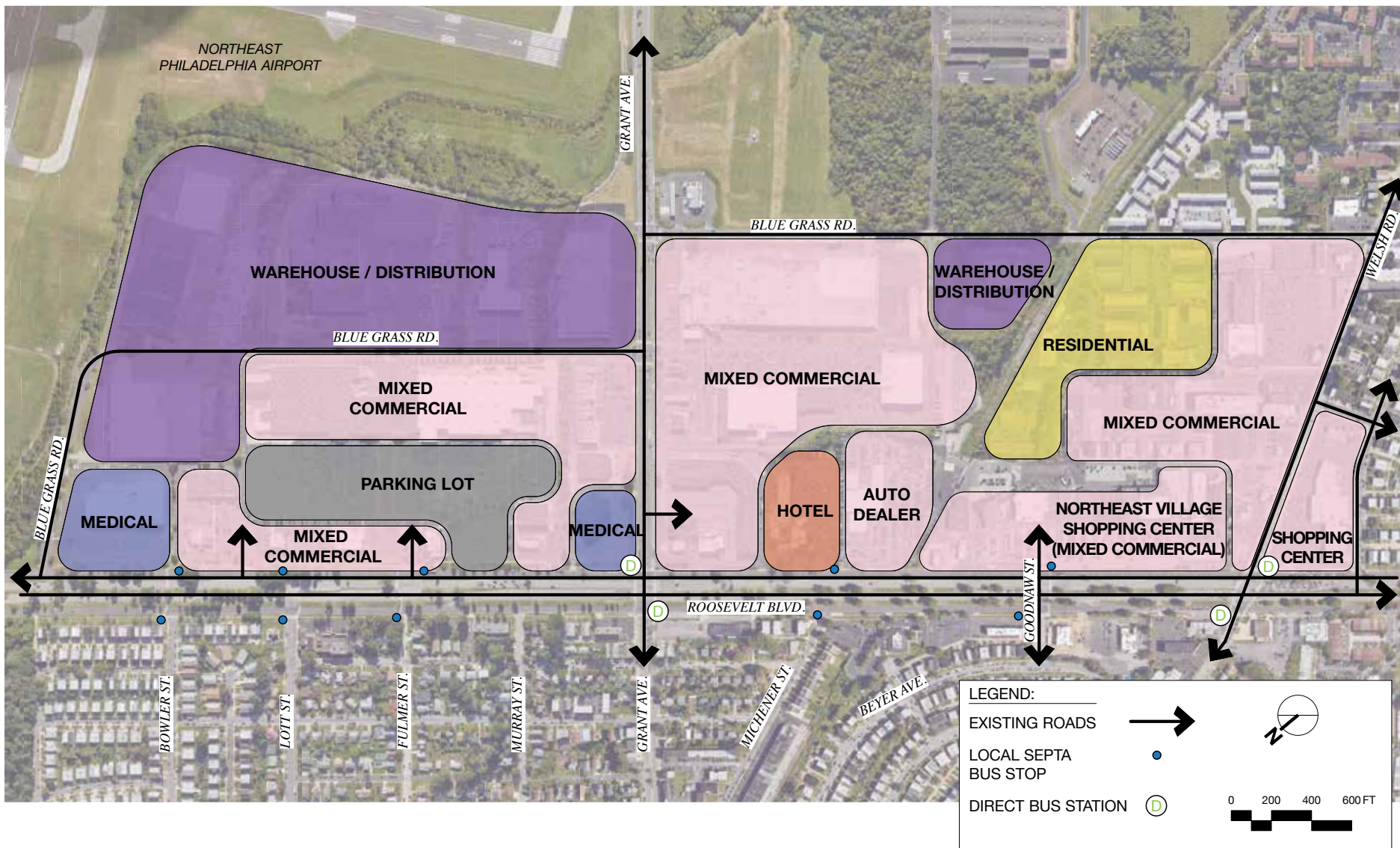


Figure 9-21. Grant Avenue / Welsh Road Walkable Station Area Typologies and Proposed Road Network

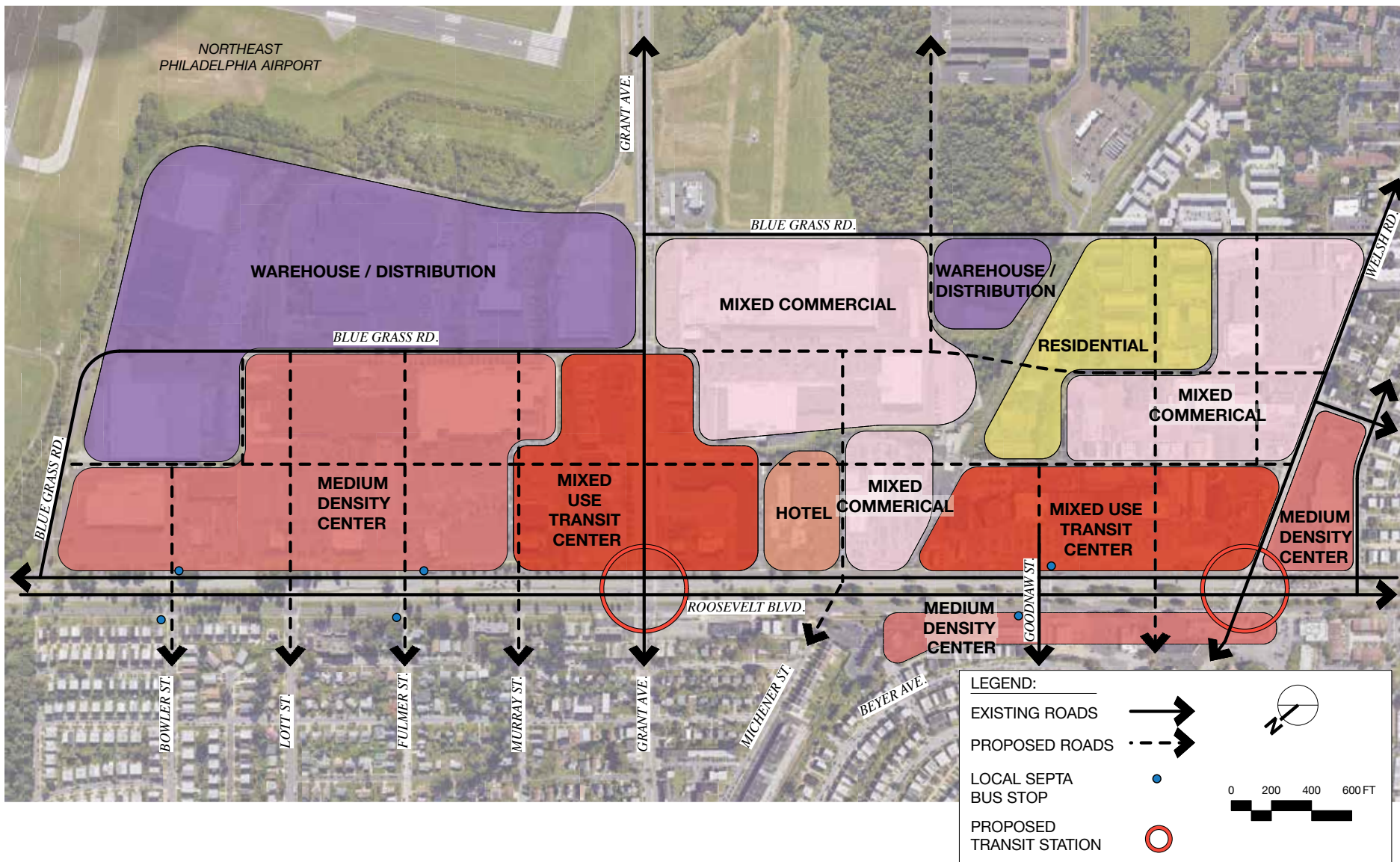


Figure 9-22. Red Lion Road Existing Land Uses and Road Network

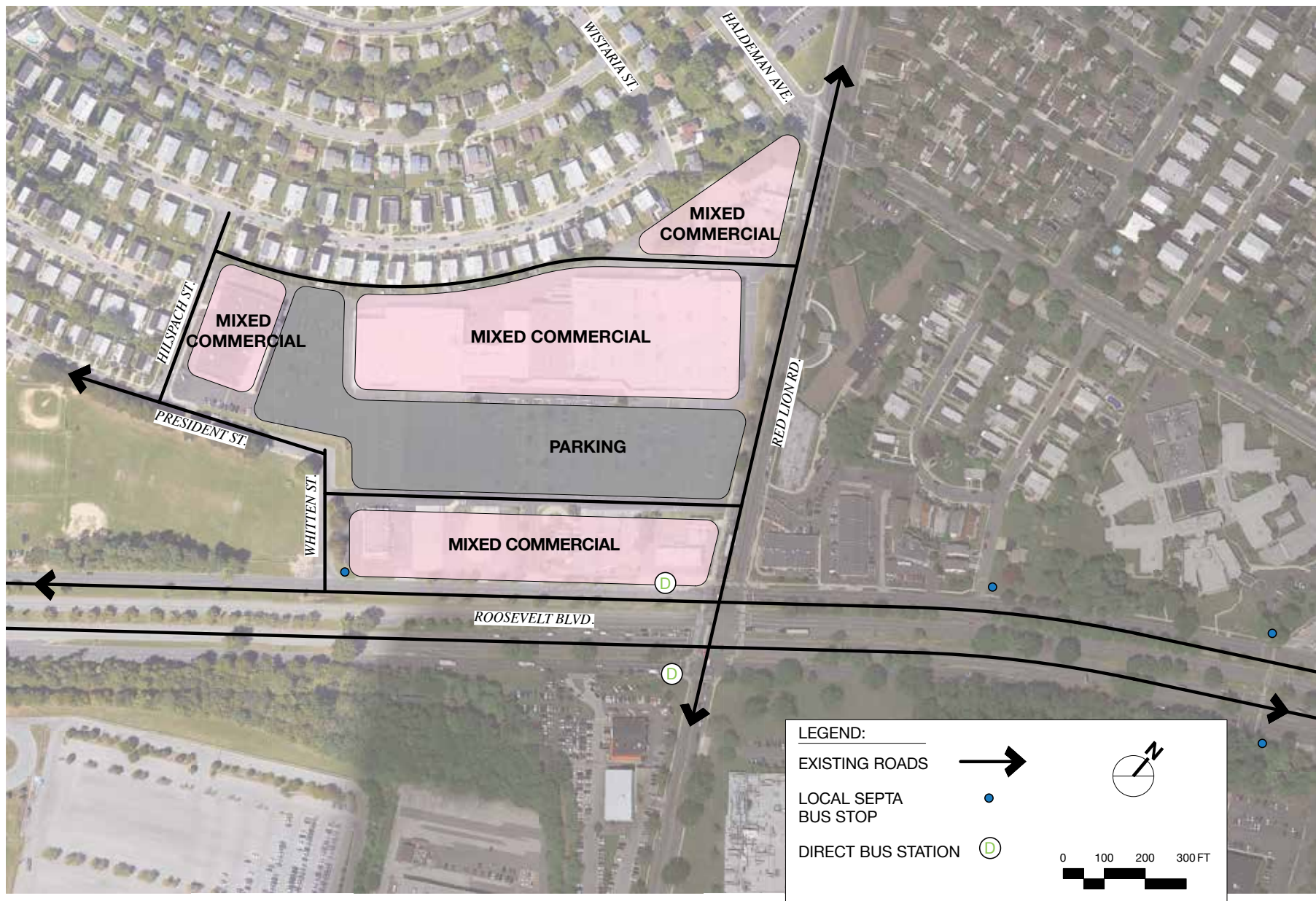


Figure 9-23. Red Lion Road Walkable Station Area Typologies and Proposed Road Network

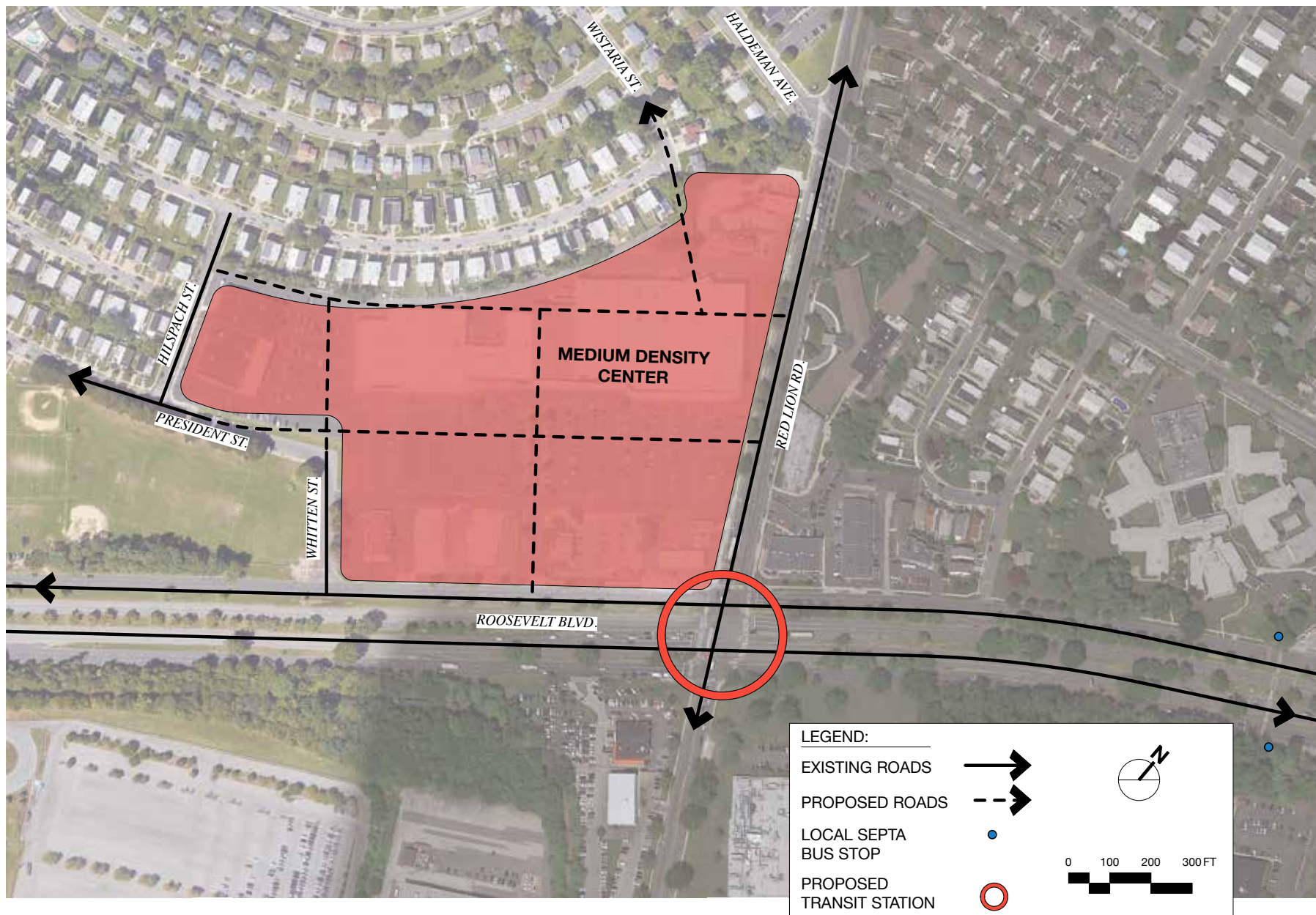


Figure 9-24. Interplex Existing Land Uses and Road Network

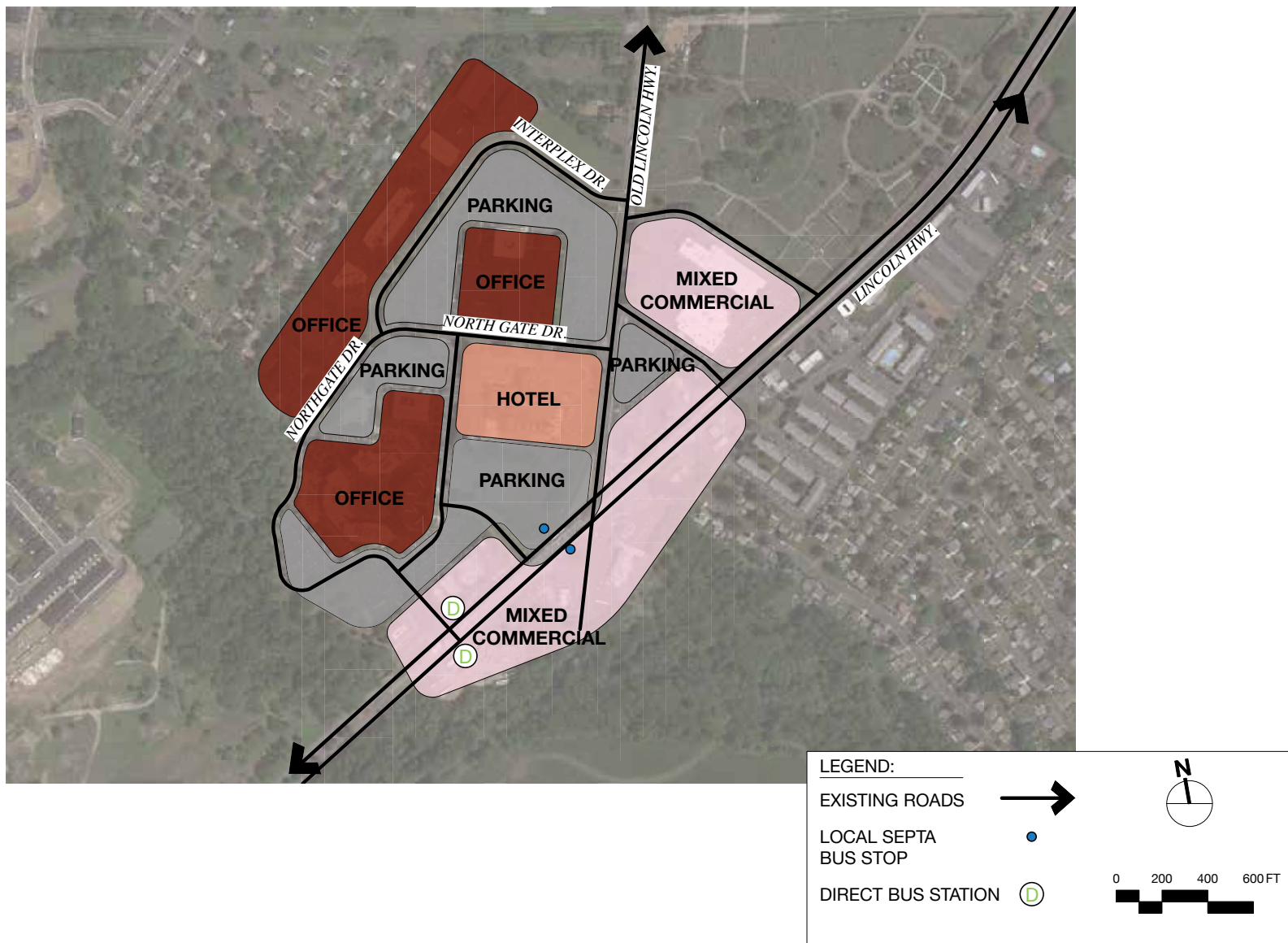


Figure 9-25. Interplex Walkable Station Area Typologies and Proposed Road Network



Figure 9-26. Neshaminy Mall Existing Land Uses and Road Network

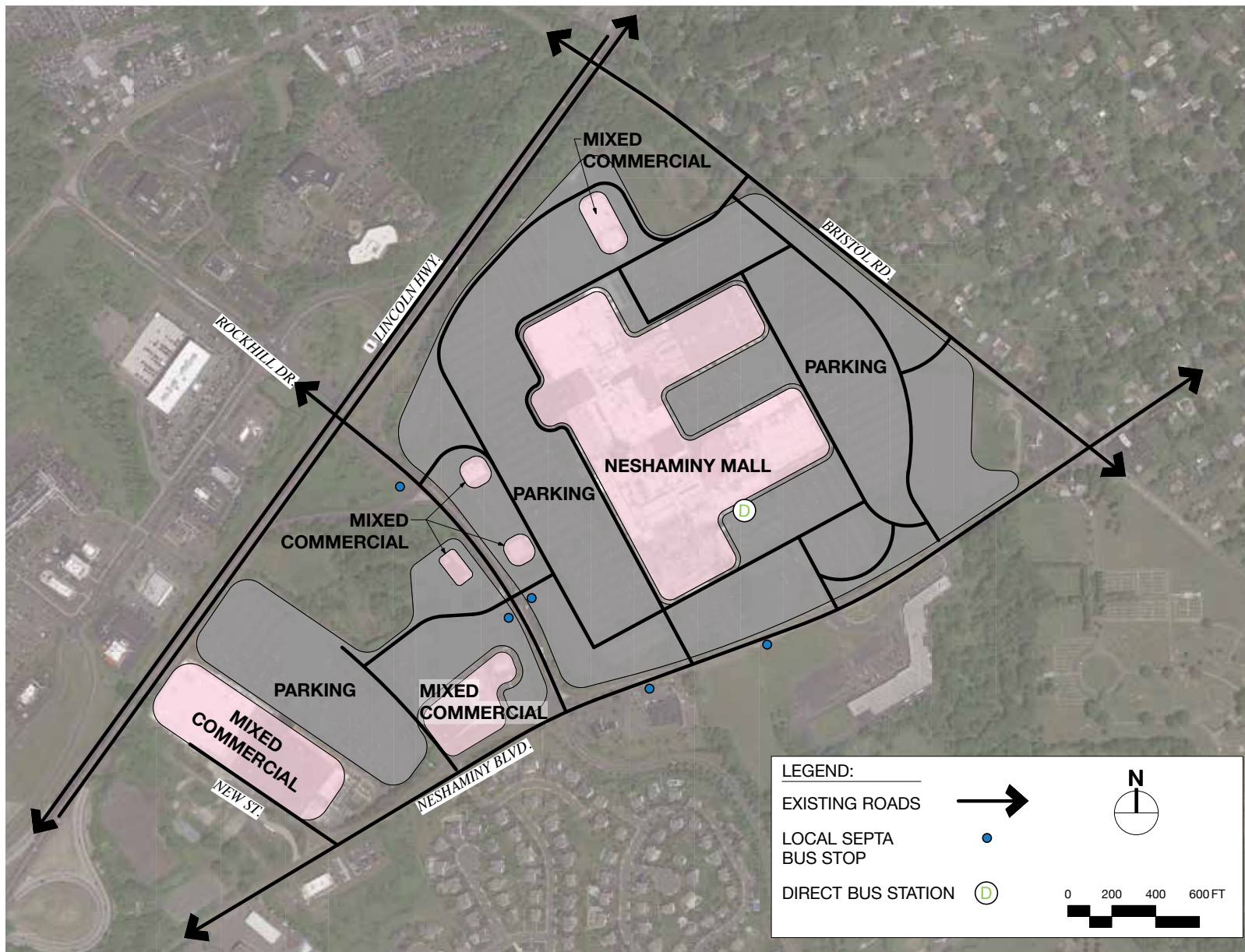


Figure 9-27. Neshaminy Mall Walkable Station Area Typologies and Proposed Road Network



Federal Transit Administration Capital Improvements Grant Program

The Federal Transit Administration's (FTA) Capital Improvement Grant (CIG) program can be used to support BRT investments, such as those envisioned in the 2040 alternatives. These funds are commonly known as New Starts and Small Starts funding. The CIG program is a discretionary grant program that historically has had significantly more funding requests than available funding. To create a level playing field for all projects seeking CIG funds, the FTA has developed a series of criteria to measure the effectiveness of each application. As part of this evaluation, applicants are required to document existing land use and economic development conditions and the project's effects on both.

The land use measure includes an examination of:

- Existing development along a proposed BRT route and station areas forecast of future population, employment and dwelling unit supply
- BRT route and station area development character
- Existing pedestrian facilities, including access for people with disabilities around the transit station
- Existing BRT route and station area parking supply

FTA also considers a comparison of the proportion of existing "legally binding affordability restricted" housing within one-half mile of transit station areas to the proportion of "legally binding affordability restricted" housing in the counties through which the project travels.⁴

A preliminary analysis was performed for the transit "A" and "B" corridors to assess how the projects would perform based on the CIG land use criteria (see Appendix 16).

Figure 9-28. Vicinity of Broad Street and Roosevelt Boulevard is a Potential WSA



4 Federal Transit Administration, Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects, 2013.

Population, Employment, and Dwelling Units

The FTA's Quantitative Element Rating Guide⁵ (referred to hereafter as the FTA Rating Guide) sets forth the ratings and thresholds for employees served by a BRT route and the average population density (persons per square mile) within a half mile of the stations. The ratings and thresholds are presented in Table 9-1.

Table 9-1. FTA Employment, Population, and Dwelling Rating Thresholds

| Rating | Employees Served by System | Average Population Density (persons per square mile) | Residential Dwelling Units per Acre |
|--------------------|----------------------------|--|-------------------------------------|
| High | > 220,000 | > 15,000 | > 25 |
| Medium-High | 140,000 – 219,999 | 9,600 – 15,000 | 15 – 25 |
| Medium | 70,000 – 139,999 | 5,760 – 9,599 | 10 – 15 |
| Low-Medium | 40,000 – 69,999 | 2,561 – 5,759 | 5 – 10 |
| Low | < 40,000 | < 2,560 | < 5 |

Using FTA criteria, the 2015 existing conditions and 2035 forecast conditions for the corridors and stations using these three criteria were assessed for the BRT Routes "A" and "B."⁶ The FTA requires a 20 year forecast from the base census year, thus 2035 was evaluated instead of 2040. A half mile distance from the BRT routes was used to determine the number of employees served by the transit system. Employment, population, and residential dwelling unit densities are based on a half-mile radius from the proposed transit stations and do not assume any increases due to WSAs

Key findings comparing 2035 forecast conditions to the FTA thresholds are summarized in Table 9-2.

Table 9-2. FTA Employment, Population, and Dwelling Rating Thresholds – Existing Conditions

| Corridor | Employees Served by System | Average Population Density (persons per square mile) | Residential Dwelling Units per Acre |
|--------------------|----------------------------|--|-------------------------------------|
| BRT Route A | Low | Medium-High | Low-Medium |
| BRT Route B | Low | Medium-High | Low-Medium |

Existing conditions and 2035 forecast conditions by stations and corridor (without implementation of WSA elements) for BRT Route "A" are presented in Table 9-3 and for BRT Route B in Table 9-4.

The average population density and residential dwelling unit per acre ratings for each route can be enhanced by encouraging WSAs with higher densities than currently planned at the nine key transit stations. Ultimately, this is a policy decision that should be made with substantial public and property owner input during the analysis process.

It is important to note that improving the employment rating beyond the predicted level of 2035 is likely to be more challenging. For example, attaining a medium-high rating would require approximately 23,000,000 square feet of additional commercial development on each route.⁷ This is a significant increase above the existing supply, especially compared with other employment centers, such as the downtown Philadelphia office market. On the other hand, increasing the average population density and residential dwelling unit per acre is possible by encouraging the development of WSAs at key transit stations.

5 Federal Transit Administration, *Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects*, 2013.

6 DVRPC Demographic and Employment Forecast Zonal Data - 2010 to 2040

7 Assuming approximately 200 square feet per employee.

Table 9-3. BRT Route "A" Employment, Population Density, and Housing Density

| STATION STOP | 2015 | | | 2035 | | |
|-----------------------------------|-----------------------------|---|------------------------------|-----------------------------|---|------------------------------|
| | Employment Served by System | Average Population Density (persons per sq.mi.) | Residential DU (HH) per acre | Employment Served by System | Average Population Density (persons per sq.mi.) | Residential DU (HH) per Acre |
| FRANKFORD T.C. | 2,003 | 20,873 | 12 | 2,182 | 21,749 | 12 |
| HARBISON AVE | 2,089 | 22,312 | 12 | 2,152 | 23,095 | 12 |
| COTTMAN AVE* | 2,076 | 15,675 | 9 | 2,148 | 16,206 | 9 |
| RHAWN ST | 3,645 | 10,637 | 7 | 3,786 | 11,032 | 7 |
| WELSH RD* | 1,865 | 11,056 | 9 | 1,948 | 11,524 | 9 |
| GRANT AVE* | 2,964 | 5,083 | 4 | 3,095 | 5,280 | 4 |
| RED LION RD* | 2,917 | 5,094 | 3 | 3,047 | 5,284 | 3 |
| SOUTHAMPTON RD | 2,226 | 477 | 0 | 2,327 | 494 | 0 |
| NESHAMINY INTERPLEX* | 3,131 | 2,396 | 1 | 3,337 | 2,558 | 1 |
| NESHAMINY MALL* | 1,590 | 1,483 | 1 | 1,699 | 1,585 | 1 |
| ROOSEVELT BLVD BRT Route A | 24,506 | 9,443 | 6 | 25,721 | 9,813 | 6 |

*Potential WSA Locations

Table 9-4. BRT Route "B" Employment, Population Density, and Housing Density

| STATION STOP | 2015 | | | 2035 | | |
|---|-----------------------------|---|------------------------------|-----------------------------|---|------------------------------|
| | Employment Served by System | Average Population Density (persons per sq.mi.) | Residential DU (HH) per acre | Employment Served by System | Average Population Density (persons per sq.mi.) | Residential DU (HH) per acre |
| WISSAHICKON T.C. | 3,041 | 6,624 | 5 | 3,182 | 6,876 | 5 |
| MIDVALE AVE | 667 | 6,598 | 5 | 695 | 6,855 | 5 |
| RIDGE AVE | 1,170 | 7,225 | 5 | 1,241 | 7,556 | 5 |
| ALLEGHENY AVE | 1,348 | 9,534 | 6 | 1,431 | 9,990 | 6 |
| WISSAHICKON AVE | 1,505 | 8,842 | 5 | 1,596 | 9,263 | 5 |
| GERMANTOWN AVE | 1,425 | 15,213 | 10 | 1,510 | 15,939 | 10 |
| BROAD STREET & ROOSEVELT BLVD * | 765 | 12,564 | 7 | 806 | 13,116 | 7 |
| 9TH STREET & ROOSEVELT BLVD * | 989 | 23,409 | 12 | 1,033 | 24,382 | 12 |
| 5TH STREET & ROOSEVELT BLVD | 1,354 | 21,582 | 11 | 1,410 | 22,435 | 11 |
| RISING SUN AVE & ROOSEVELT BLVD | 2,147 | 23,005 | 11 | 2,236 | 23,971 | 11 |
| TOWER CENTER/FRIENDS HOSPITAL ROOSEVELT BLVD* | 3,332 | 6,001 | 3 | 3,450 | 6,264 | 3 |
| PRATT STREET & ROOSEVELT BLVD | 1,431 | 20,490 | 11 | 1,482 | 21,385 | 11 |
| FRANKFORD T.C. | 2,003 | 20,981 | 12 | 2,074 | 21,860 | 12 |
| ROOSEVELT BLVD BRT Route B | 21,177 | 13,908 | 8 | 22,144 | 14,504 | 8 |

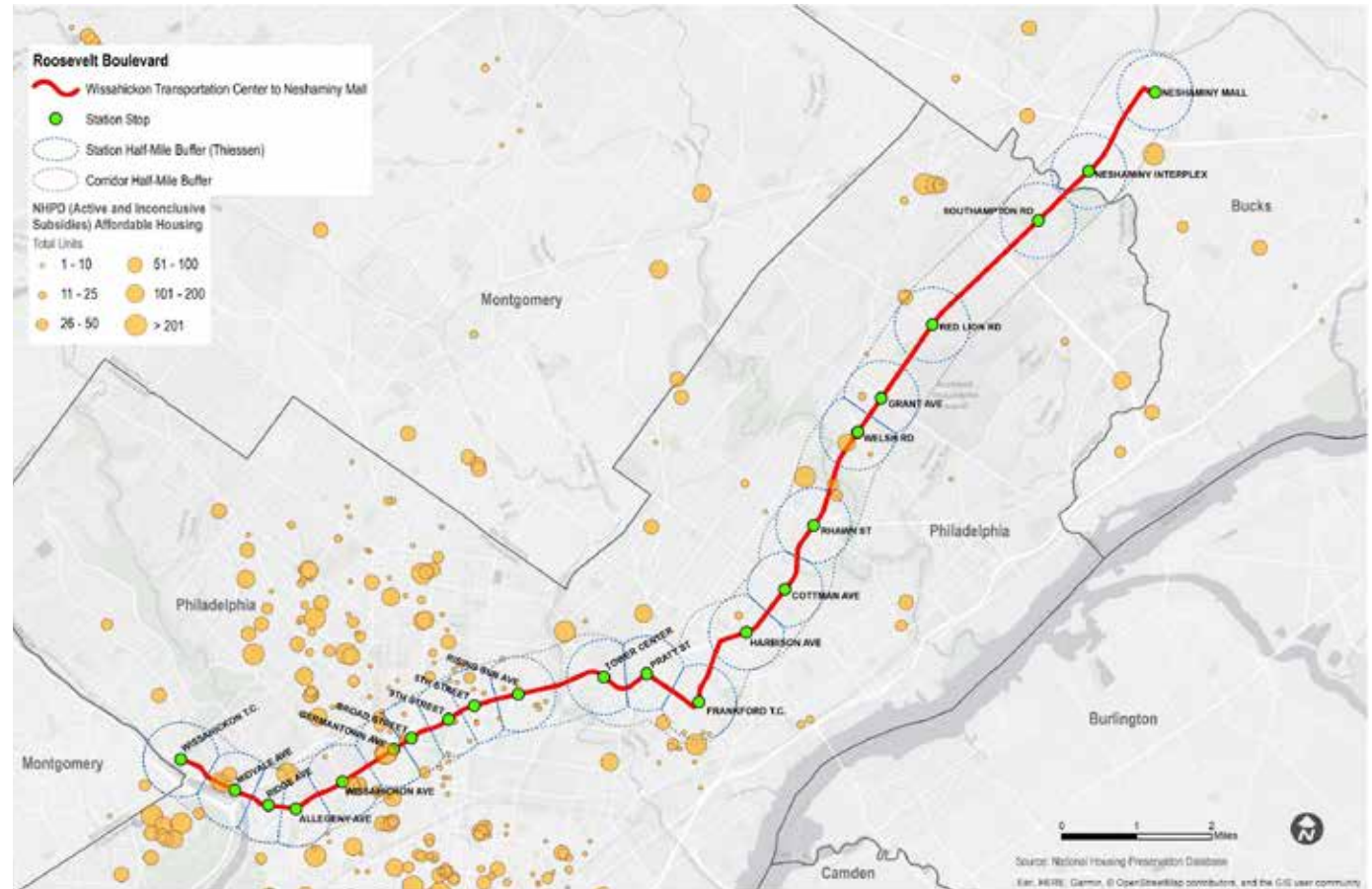
*Potential WSA Locations

Affordable Housing

FTA evaluates affordable housing in the land use criterion so that neighborhoods surrounding proposed transit stations have tools in place to ensure that as transit service is improved over time, there is a mix of housing options for existing and future residents. One measure of the readiness of a community to accept a new transit investment and preserve housing affordability is the presence of “legally binding affordability restricted” units. These units have protections in place so that they will continue to be available to low- and moderate-income households after the BRT transit corridors are implemented.

Figure 9-29 shows the supply of affordable housing compared to the half-mile radius from each proposed transit station.⁸ Currently, transit station areas (half-mile radius) along both BRT corridors have a relatively low supply of legally binding affordable housing compared to other neighborhoods in Northeast Philadelphia and lower Bucks County. Increasing the supply of restricted affordable housing within a half-mile radius of the station areas would improve both BRT routes in terms of the FTA CIG land use criteria. It would also meet DVRPC’s Connection 2045 aspirations for linking transit and affordable housing for vulnerable populations.

Figure 9-29. Affordable Housing Units



⁸ Data obtained from the National Housing Preservation Database (NHPD) was used to screen the supply of “legally binding affordability restricted” housing. The data in the NHPD come from the US Department of Housing and Urban Development (HUD) and the US Department of Agriculture (USDA), and include ten federally subsidized programs. The database does not include data from any State of Pennsylvania or City of Philadelphia subsidized programs.

Conclusion

The integration of a high-quality BRT transit system and WSAs will help advance the vision set forth in several of the City's long-range land-use, transportation, and housing plans. Implementation of both increases options on where and how to travel along the Boulevard, discourages vehicle dependence and congestion, improves housing choices, and promotes a more environmentally sustainable community. Four key actions are recommended to guide the implementation of the integrated BRT and WSA concepts.

- **Establish a working group to focus on advancing WSAs.** Working groups provide a forum for open communication among developers, the City, SEPTA, and the communities in the station areas. This will make it easier to coordinate and develop a consensus vision for a corridor or station area. In addition, through working groups, developers can help set expectations regarding the level and character of retail that a WSA could support. Over time, working groups can build trust among the members so that collaboration can occur on an ad hoc basis. Through constant communication, members will better understand the needs and interests of each other.
- **Introduce the Route for Change Program to the FTA.** Applicants for FTA's CIG funding are encouraged to coordinate with the FTA to discuss the corridor's transportation problem, the long-term alternatives to address such, determine the required environmental documentation as discussed in Chapter 10, and define the appropriate CIG grant category based on the project costs. This early coordination will also enable the Program to better understand the overall process for ultimately obtaining FTA approval of a CIG grant application and develop a corresponding plan for delivering the required documentation.

- **Conduct a detailed market feasibility study of potential transit station locations.** The market studies would provide the insight required by developers and property owners to determine whether their project is even feasible to continue. Most real estate developers will conduct such a study to determine if the project is worth the time and money to continue. The recommended market feasibility study would estimate each station's future market-supportable development enabling the Program to further refine the vision for each station area.
- **Determine the appropriate local policies and tools for delivering WSAs.** Potential zoning policies and tools for making WSAs attractive for investment and compatible with community visions are needed. Tools are also required to ensure a broad range of housing choices, particularly affordable housing, are available within the WSAs. Increasing the supply of restricted affordable housing within the WSAs would improve the competitiveness of a FTA CIG grant application. It would also strengthen the link between transit and affordable housing.

Please refer to Chapter 10 to learn more about the next steps to move WSAs forward.

Section 4

Implementation

CHAPTER

10

Next Steps

This chapter describes the next steps for:

- 2025 Recommendations
- 2040 Alternatives Analysis

Introduction

The previous nine chapters document the existing conditions and the outcomes of traffic modeling and analysis, which identified a series of multimodal transportation improvements, policies, and programs. While the first step in transforming the Boulevard is developing a plan, transformation does not happen with just a plan. Rather, this process has identified a series of next steps to continue the momentum and partnerships developed during the Program's process.

The Boulevard is the most complex corridor in Philadelphia. While some recommendations can move into preliminary engineering, others call for additional analysis; in either case, continued community engagement is key to moving projects forward in a successful manner.

This chapter highlights key environmental screening steps that may need to be completed, followed by a list of actions for the next six years.

2025 Recommendations

The following chapters included recommendations to advance towards implementation by 2025. This section outlines key environmental screening steps that may need to occur, followed by a list of actions for the next six years.

- Chapter 5 – Recommended 2025 Corridorwide Improvements
- Chapter 6 – Recommended 2025 Intersection Improvements
- Chapter 7 – 2025 Programmatic Strategies

Environmental Screening for 2025 Projects

The Program anticipates that the 2025 engineering improvements recommended in Chapters 5 and 6 will likely be funded by a combination of sources including both local and state funds. Projects that are state-funded are required to comply with the Pennsylvania Act 120, and the Pennsylvania Department of Transportation (PennDOT) is the lead agency for these transportation projects. The following outlines the environmental evaluation and documentation process for state-funded projects.

There are two types of environmental documentation for state funded projects: an Environmental Evaluation Report (EER) or an Environmental Documentation (ED). Generally, EERs are prepared for projects that have the potential to have significant effect or the extent of project effects is unknown. These projects are similar to

the federal system's EIS or EA described in Appendix 17. Additionally, EERs are required by PA Act 120 if both of the following conditions exist:

- The project is a transportation route or program. Note, this does not include any action that would be classified as a CE by FHWA; and
- The project requires new or additional right-of-way. Note, the Program does not anticipate the 2025 recommendations will require new or additional right-of-way.

An ED is prepared for projects that are smaller in scope and do not have the potential for significant effects to the environment. PennDOT utilizes the CE Expert System for documenting projects¹. Prior to initiating any project into an environmental process, the Program should coordinate with PennDOT to confirm environmental classification.

There are several cultural and environmental resources present throughout the Program area that may need to be considered during the design phase of the project. These resources, the typical course of action taken to resolve them, and their potential impact to the project's schedule are discussed in further detail in Appendix 17.

Based on the limited footprint of the 2025 improvements, minimal effect is anticipated to the surrounding resources. Once the scope of work and limits of disturbance have been finalized for a project, a full assessment can be made as to the specific studies and coordination needed in support of the environmental documentation.

1 <http://www.dotdom2.state.pa.us/ceea/ceeainmain.nsf>

2025 Next Steps

Below are the next steps for key recommendations identified by the Program in Chapter 5, 6, and 7.

Program Recommendations

1. **Vision Zero Educational Campaign** – As described in Chapter 7, the Program recommends developing a comprehensive Vision Zero Educational Campaign to target the top 11 crash cluster locations along the Boulevard identified in Chapters 3 and 6.
 - a. **Strategic Plan:** Year 1 and 2
2. **Transportation Demand Management (TDM)** – As recommended in Chapter 7, the Program recommends exploring the creation of Boulevard-specific TDM strategies for the Program area.
 - a. **Strategic Plan:** Year 3 to 6

Multimodal Engineering Recommendations

1. **Automated Speed Enforcement (ASE) Program** – As described in Chapter 7, the ASE system administrator, the Philadelphia Parking Authority, is currently installing speed cameras at eight locations along the Boulevard, between 9th Street and the Philadelphia County line shared with Bucks County.
 - a. **Construction:** Underway
2. **Local Bus Stop Changes** – In Chapter 5, the Program described recommendation to improve rider safety at local bus stops along the Boulevard in Philadelphia. The City will use its 20-year concessionaire agreement to implement new bus shelters. Prior to making any changes to the network of local bus stops, the City and SEPTA will develop a public education campaign to communicate the plan.
 - a. **Construction:** Year 1 and 2 / Early Action
3. **Direct Bus, Phase B** – As described in Chapter 5, the Program recommends implementing Direct Bus Phase B, including the new stations and bus service, as an early action. In 2018, the City was awarded \$1.9M from a PennDOT Multimodal Transportation Fund (PennDOT MTF) grant and a Transportation Alternatives Set-Aside grant to construct eight Direct Bus stations, two at Pratt Street, Langdon Street, Rising Sun Avenue, and N. Broad Street. In 2019, SEPTA received \$2M in funding from FTA as part of its Buses and Bus Facilities

Program, which will fund the construction of the Direct Bus stations along Hunting Park Avenue and Ridge Avenue. The City and SEPTA are coordinating on the design of both projects.

- a. **Design:** Underway
 - b. **Construction:** Year 3 to 6
4. **Summerdale Avenue and Adams Avenue (east) Intersection Improvement** – In Chapter 6, the Program describes recommendations for the intersection, which is one of the top 11 crash cluster locations along Roosevelt Boulevard. This improvement is the first phase to be implemented as part of the larger recommendations for S-Curve North (Fig 6-17). The City has secured \$1.6M in PennDOT and Department of Community and Economic Development Multimodal Transportation Funds (DCED MTF) to construct this project.
 - a. **Design:** Underway
 - b. **Construction:** Year 3 to 6
 5. **Signal Retiming** – Outlined in Chapters 5 and 6, the Program recommends changing the signal timing at 26 intersections from 90-second cycles to 120-second cycles. Further analysis is required to determine the level of capital investment needed for new signal infrastructure in order to implement this recommendation.
 - a. **Analysis:** Year 1 to 2 / Early Action
 - b. **Design and Construction:** Year 3 to 6
 6. **Green Stormwater Infrastructure (GSI) Analysis and Pilot Landscape Improvement Project** – In 2019, the Philadelphia Water Department (PWD) began an analysis of the potential for Green Stormwater Infrastructure (GSI) along Roosevelt Boulevard. This work will produce planning-level Stormwater Management Practice (SMP) footprints and make recommendations about where “green” surface expression would be most feasible. The Program will build upon the GSI analysis to identify a small segment of the Boulevard to pilot landscape improvements, creating opportunities for the City and other stakeholders to invest in green infrastructure, public art, and other recommendations outlined in Chapter 5.
 - a. **Analysis:** Underway
 - b. **Design:** Year 3 to 6

7. **Roosevelt Boulevard Crossover Mitigation, Phase A** – Outlined in Chapter 5, the Program identified the crossovers north of Bustleton Avenue that require updates to mitigate a possible increase in the number of vehicles wanting to shift from the outer (local) lanes to the inner (express) lanes due to the implementation of BAT Lanes Phase A. In 2019, PennDOT received a \$1.5M Congestion Mitigation and Air Quality (CMAQ) grant to implement crossover mitigations.
 - a. **Design:** Year 1 and 2 / Early Action
 - b. **Construction:** Year 3 to 6
8. **BAT Lanes, Phase A** – As recommended in Chapter 5 and 6, the Program and its partners will start the preliminary engineering for the BAT lanes north of Bustleton Avenue. This process will identify a preferred pavement marking and roadway signage plan.
 - a. **Design:** Year 1 and 2 / Early Action
 - b. **Construction:** Year 3 to 6
9. **Intersection Modification Program** – Chapter 6 illustrates several intersection improvements that include consolidating access points and extending curbs. The Program recommends developing a plan to coordinate the design, engineering, and implementation of these recommendations.
 - a. **Analysis:** Year 1 to 2 / Early Action
 - b. **Construction:** Year 3 to 6
10. **BAT Lane, Phase B and Crossover Mitigation** – In Chapter 5, the Program recommends the installation of BAT lanes in key segments between 9th Street and Pratt Street. Additional analysis and community outreach is needed to better understand the potential impacts and mitigations to on-street parking, which is permitted during off-peak hours. The analysis will also model the operations and safety of crossovers in this segment of the Boulevard in order to determine changes needed to the existing crossover design and/or the location of the crossover. The analysis should follow the Program’s methodology developed in coordination with PennDOT for the BAT Lanes Phase A analysis.
 - a. **Analysis:** Year 1 to 2 / Early Action
 - b. **Design:** Year 3 to 6
11. **Offset Left Turns** – Chapter 6 recommends offset left turns in six locations to provide better sight distance for people driving and eliminate conflicts between drivers turning left and drivers coming from the opposite direction. The City and PennDOT will select one intersection to undertake a pilot to test the effectiveness of offset left turns at reducing congestion on the side streets. The outcome of the pilot will determine implementation at other locations.
 - a. **Analysis:** Year 1 to 2 / Early Action
 - b. **Design and Construction:** Year 3 to 6
12. **Traffic Signal Phasing** – In Chapter 6, the Program recommends further analysis of traffic signal phasing at 16 intersections to allow people to make left turns after the through movement of drivers in the opposite direction. This will increase the amount of time for people to cross the Boulevard. This analysis will determine if operations improved in both directions and whether new signal infrastructure is needed to implement this change.
 - a. **Analysis:** Year 1 to 2 / Early Action
13. **Crosswalks and Curb Ramps** – Identified in Chapter 5, the Program recommended straightening or realigning crosswalks and adjusting curb ramps at 11 intersections. Six of these locations should be done in coordination with the Signal Retiming project.
 - a. **Design and Construction:** Year 3 to 6
14. **Curb Extensions** – In Chapter 5, the Program recommends building curb extensions, coupled with on-street parking, at ten signalized intersections to further reduce crossing distances for people walking.
 - a. **Design and Construction:** Year 3 to 6
15. **5th Street Underpass Improvements** – As described in Chapter 6, the Program recommends planning with adjacent communities to improve safety and enhance the appearance of 5th Street as it passes under the elevated inner (express) lanes. This project should also advance plans for bike facilities and promote Direct Bus service.
 - a. **Design and Construction:** Year 3 to 6

16. **Complex, Multi-Intersection Projects** – There are five complex, multi-intersection projects where design and engineering of the recommended improvements should be done in a coordinated manner. Described in Chapter 6, these locations include: Front Street/Rising Sun Avenue (Fig. 6-13); S-Curve north and south (Fig. 6-16 and 6-17); Oxford Circle (Fig. 6-20); Bustleton Avenue/Levick Street/Hellerman Street (Fig. 6-24); Harbison Avenue/Unruh Avenue (Fig. 6-25).

a. **Design:** Year 3 to 6

17. **Crash Analysis Update** – The Program completed a comprehensive crash analysis from 2013 to 2017, described in Chapter 3 and referenced in Chapter 6. The Program recommends completing another five-year period crash analysis and incorporating findings from the automated speed enforcement program. The analysis can help determine whether more safety improvements should be incorporated along Roosevelt Boulevard and also inform the 2040 Alternatives Analysis.

a. **Analysis:** Year 3 to 6

18. **Route for Change 2025 Bike Network Action Plan** – The Program recommends the City and its partners develop an action plan and conceptual designs for the bike facilities, including sidepaths that will close sidewalk gaps, identified as a potential 2025 bike network connection to the Boulevard in Chapter 5. The development of this action plan will include stakeholder engagement.

a. **Analysis and Design:** Year 3 to 6

19. **Street Lighting Assessment** – In Chapter 7, the Program recommends completing a comprehensive street lighting assessment along the roadway and sidewalks, especially in locations with curb cuts and driveways, and at local bus stops.

a. **Assessment and Improvements:** Year 3 to 6

20. **Roadway Signage Assessment** – In Chapter 7, the Program recommends completing a comprehensive sign inventory along the Boulevard and intersecting side streets. If necessary, create a signage upgrade plan to replace signs that fall short of standards in order to provide consistency and clarity in the signed messaging along the corridor.

a. **Assessment and Improvements:** Year 3 to 6

In addition to these recommendations, the Program recognizes a need for on-going coordination and communication with administrators of other projects. As described in Chapter 6, the Program will continue to coordinate with on-going design and construction projects administered by PennDOT, including the Hunting Park Avenue south exit ramp reconstruction (Segment 1A), the U.S. 1 Corridor Improvements Project Sections RC-1 and RC-2 (Segment 6), and the GR-8 Intelligent Transportation System improvements along the Boulevard associated with the 95 Revive reconstruction program. PennDOT also has plans to upgrade over 150 ADA ramps along Roosevelt Boulevard, with construction expected in 2021.

The Program also recommends coordinating with private development projects, such as the large vacant property at 9th Street and Roosevelt Boulevard (Fig. 6-6), the former Nabisco site at Comly Road (Fig. 6-46), and the light industrial development at Southampton Road (Fig. 6-49). In addition, when possible, the Program recommends the City work with property owner(s) to remedy the sidewalk gaps along the Boulevard.

2040 Alternatives Analysis

The following chapters describe two different alternatives to fulfill the Boulevard's long-term vision to create an attractive and vibrant corridor that unites adjacent communities and offers a diverse and connected network of transportation choices. This section outlines key environmental screening steps that may need to occur, followed by a list of actions for the next six year.

- Chapter 8 – 2040 Alternatives to Transform the Boulevard
- Chapter 9 – Walkable Station Areas (WSA)

Environmental Screening for 2040 Alternatives

Due to their magnitude and cost, implementing either of the two 2040 alternatives will likely require a significant amount of federal funding and/or federal permits. Projects that use federal funding or need federal permits are required to have a lead federal agency as the project sponsor and be responsible for compliance with the National Environmental Policy Act of 1969 (NEPA). Given the types of potential improvements in the two 2040 alternatives, the Federal Highway Administration (FHWA) and/or Federal Transit Administration (FTA) will likely be the lead federal agency; however, the NEPA process requires coordination and consultation with all of the federal agencies with jurisdiction over the resources that may be affected by the project.

Whichever alternative moves forward, the project will likely be funded by a combination of federal, state, and local sources. Based on the significant role of BRT in both alternatives, it is anticipated that FTA would be designated as the lead federal agency for a NEPA evaluation. However, prior to initiating any project into an environmental process, additional coordination with both FTA and FHWA is needed to confirm the lead agency and the environmental classification.

The Program expects to pursue federal funding for the 2040 improvements through the FTA Capital Improvements Grants (CIG) program. Identification of a Locally Preferred Alternative (LPA) is a critical step as part of the pursuit of CIG funding. The selection of an LPA tells FTA which alternative the Program expects to be the most competitive in achieving support at the local, regional, and federal levels. FTA approval to complete the CIG Project Development phase includes the completion of the environmental review process. This includes developing and reviewing alternatives, selecting a locally preferred alternative (LPA), and adopting it as part of

the Delaware Valley Regional Planning Commission's (DVRPC) fiscally constrained long-range transportation plan. By identifying the LPA in pre-NEPA phase, the NEPA process can potentially be expedited. However, the Program can wait to determine the LPA based on the environmental analyses described below.

At the start of the NEPA process, the lead federal agency and the Program would develop a final purpose and need statement, based on the Program's preliminary purpose and need statement included in Appendix 18. The two 2040 alternatives would be evaluated and documented based on the Program's final purpose and need. Through the scoping process, the lead federal agency and the Program would also document the alternatives that were previously considered and eliminated since they did not meet the Program's goals, objectives, and criteria. Additionally, the lead federal agency may introduce new alternatives designed to eliminate or reduce environmental impacts or to better meet the purpose and need. The new alternatives would be evaluated along with the No-Build Alternative and the Program's two 2040 Build Alternatives. Ultimately, the lead agency and the Program would identify a final preferred alternative by the end of the NEPA process.

The Program's two 2040 alternatives vary in size, complexity, and potential to affect the environment. To account for the variability of potential project impacts, three basic "classes of action" could be considered to determine NEPA compliance and documentation requirements for the project:

- Class I Actions – An Environmental Impact Statement (EIS) is prepared for projects expected to have a significant effect on the environment. EIS documents are issued in both draft and final formats and require formal public involvement. The EIS will evaluate various alternatives, document the potential impacts, and propose mitigation measures. NEPA compliance is confirmed with the issuance of a Record of Decision (ROD).
- Class II Actions – An Environmental Assessment (EA) is prepared for projects in which the significance of the environmental impact is not clearly established at the outset of a project. Should environmental analysis and interagency review during the EA process find a project to have no significant impacts on the quality of the environment, a Finding of No Significant Impact (FONSI) is issued. If, as a result of the EA, it is determined that there are significant effects or controversy on environmental grounds, an EIS will be prepared.

- Class III Actions – Categorical Exclusions (CEs) are issued for actions that do not individually or cumulatively have a significant impact on the environment. The joint FHWA and FTA regulation² outlines the types of projects that typically qualify for a CE determination.

Due to the scale and complexity of both Alternative 1 and Alternative 2, the Program anticipates that an EA would be required as the minimum level of documentation. Key environmental features that are likely to require evaluation are summarized in Appendix 17.

2040 Next Steps

Technical analyses, best practice research, and input from local stakeholders created the 2040 Vision for Roosevelt Boulevard. The Vision provides the framework for two 2040 alternatives that transform the Boulevard into a safer multimodal facility. Both alternatives will require construction of new facilities, have significant construction costs, require considerable time to implement, and are likely to affect the environment. As a result, the Program recommends further study to better understand the benefits and impacts of the two alternatives. The actions described below are anticipated to occur over the next six years in order for a preferred alternative be funded, designed, and constructed by 2040.

Years 1 to 2

1. **Interactive Highway Safety Design Model (IHSDN)** – IHSDN is a suite of software analysis tools used to evaluate the safety and operational effects of geometric design decisions on highways. In particular, the analysis would be done using the IHSDN’s Crash Prediction Module (CPM).³ The CPM estimates the frequency of crashes expected on a roadway based on its geometric design and traffic characteristics. The crash prediction algorithms consider the effect of a number of roadway segment and intersection variables.

As part of the analysis, a no-build model would be built. The predicted crashes would then be compared to the existing safety analysis discussed in Chapter 3 to establish a baseline of how the predicted safety compares to the real-world experience. The tools can then be used to forecast the expected safety and operational performance of each alternative compared to the no-build alternative and to each other. It can also be used to improve the design of the alternatives.

The results of the analysis can be used by the Program to help select an LPA as discussed above.

In anticipation of this analysis, PennDOT District 6 successfully secured \$950,000 in the FY21 Statewide Highway Safety Improvement Program (HSIP) to use the IHSDM CPM on two pilot segments of the Boulevard, and expects to begin this analysis in the next few years.

2. **Traffic Operations Model** – Traffic operations modelling of both alternatives can be initiated as a pre-NEPA activity to ensure that potential traffic impacts are identified and avoided, or mitigated. This may lead to changes to assumptions for ramp locations and/or number of travel lanes (Alternative 1) or new signalized intersection locations (Alternative 2) that were used to test the two 2040 alternatives with the DVRPC travel demand model, as described in Chapter 8. This more detailed traffic modeling would also analyze and identify ways to mitigate impacts experienced at the transition area between Grant Avenue and Southampton Road, also discussed in Chapter 8. The analyses would use a traffic simulation software, such as VISSIM. The Program recommends refining the Measurements of Effectiveness (MOEs) using the results of the VISSIM model.
3. **WSA Market Feasibility Study** – As the Program continues the planning process to introduce a new transit system, the corridor’s land use and development potential at station areas should be evaluated. This market feasibility studies would provide the insight to determine whether the proposed WSAs are ‘feasible’. Studies would be performed for each WSA discussed in Chapter 9 and would include the following:
 - Explore each station areas’ demographic, economic, and real estate market trends, as well as regional forecasts in order to estimate each station’s future market-supportable development.
 - Examine current real estate market conditions and assess future market demand for office, housing, local-serving retail, and hotels. Consider the region’s economic outlook, competing urban and suburban centers throughout the region.
 - Highlight the steps needed to successfully navigate the many issues that arise in both developing on vacant land or redeveloping existing structures at each station area.

2 <https://www.fhwa.dot.gov/legsregs/directives/fapg/cfr0771.htm>

3 This incorporates the crash prediction methods documented in the American Association of State Highway and Transportation Officials’ (AASHTO) First Edition (2010) Highway Safety Manual (HSM).

- Assess the costs associated with the overall project. In some feasibility studies, there may be sales forecasts to help clarify the budget and give insight into potential revenue streams, as well as the costs associated with construction.
 - Test scenarios for redevelopment along the proposed BRT routes that expand on traditional estimates of market support. These market scenarios would move beyond current build-out estimates, rather than relying solely on market trends and the historic nature of development. Such scenarios would consider opportunities to expand development capacity along the proposed BRT corridor to accommodate future demand generated by this major transit infrastructure upgrade.
4. **Policies and Tools for Local Land Use and Housing** – Determine the appropriate local policies and tools for delivering WSAs. Potential zoning policies and tools for making WSAs attractive for investment and compatible with community visions are needed. Tools are also required to ensure a broad range of housing choices, particularly senior and affordable housing, available within the WSAs.

Years 3 to 6

1. **Benefit Cost Analysis (BCA)** – The Program would complete a BCA for both 2040 alternatives to help select an LPA. A BCA estimates the benefits that are expected to accrue from a project over a specified period and compares them to the anticipated costs of the project. The benefits are typically based on the forecast impacts of the alternative on both users and non-users of the new roadway, valued in monetary terms. Examples of some potential benefits include:

- Safety Benefits
- Travel Time Savings
- Shift in Mode Choice
- Operating Cost Savings
- Emissions Reduction
- Quality of Life
- Property Value Increases

Anticipated costs would include both the monetary amount required to construct an alternative and the costs of maintaining the alternative over time. While a BCA is just one of many tools that can be used to select an LPA, it is a useful method to evaluate and compare alternatives.

2. **Pre-FTA Project Development** – Potentially, the Program will pursue federal funding for the 2040 preferred alternative through the FTA Capital Improvements Grants (CIG) program. This discretionary grant program funds transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and BRT. The Program currently assumes BRT will be the appropriate mode of transit based on future land use and funding availability. However, if land use conditions and funding outlook improves, the Program would explore whether the investment of LRT is appropriate.

Federal transit law requires transit agencies seeking CIG funding to complete a series of steps over several years. For New Starts, the FTA requires completion of two phases prior to award of a construction grant agreement – Project Development and Engineering. For Small Starts projects, FTA requires completion of one phase in advance of awarding a construction grant agreement – Project Development. Projects are required to be rated by FTA at various points in the process in order to evaluate the project justification and local financial commitment.

There are steps the Program can take during pre-Project Development to ensure the transit project can advance more readily through the CIG process. The pre-Project Development process typically takes one to two years. Following completion of pre-Project Development activities, which includes obtaining local or state funding to pay for Project Development, the Program can request permission from FTA to enter into Project Development.

Initially, the Program would jointly determine with FTA whether the proposed transit project qualifies as a New Starts or a Small Starts. Proposed New Starts projects must be new fixed guideway projects or extensions to existing fixed guideway systems with a total estimated capital cost greater than \$300 million or that are seeking \$100 million or more in CIG program funds. The Program's two recommended BRT projects could be classified as a New Starts project if either meet these thresholds. Alternatively, one or both BRT project could be classified as a Small Starts project. Proposed Small Starts projects must be new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based BRT projects. Small Starts projects must have a total estimated capital cost of \$300 million or less and must be seeking less than \$100 million in CIG program funds.

The Project Development phase for a proposed New Starts project must be completed within a two-year timeframe. FTA encourages project sponsors to perform whatever work is necessary prior to requesting entry into Project Development to help meet this timeframe. For example, prior to requesting entry into Project Development, the Program may wish to conduct early planning work and initiate the environmental review process under the NEPA, including early scoping.

Unlike for New Starts projects, FTA does not specify a timeframe for when Small Starts project sponsors must complete the Project Development phase. However, the Program can conduct early planning work and initiate the environmental review process as part of the NEPA process described above. This can include early scoping prior to requesting entry into Project Development to ensure the Program can meet FTA's requirements for making sufficient progress during this phase.

Conclusion

By implementing the 2025 recommendations and selecting a preferred alternative for 2040, Roosevelt Boulevard will begin a dramatic transformation to become an attractive and vibrant corridor that unites adjacent communities and offers a diverse and connected network of transportation choices. Though the transformation is ambitious, continued community engagement and strong partnerships between agencies will ensure success.

Acknowledgments

The Roosevelt Boulevard Route for Change Program is for everyone. As indicated by its clever title, the report will inspire people to enthusiastically root for change that will create a safe, attractive, and vibrant Roosevelt Boulevard.

The Program appreciates those who participated in a Public Forum and helped shape the recommendations. Your input is valued and welcomed as the Program moves into its next phase.

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