JFK BLVD

SAFETY CORRIDOR STUDY

RECOMMENDATIONS REPORT

HUDSON COUNTY NEW JERSEY

NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Innovative Planning
BETTER COMMUNITIES

Stantec

JUNE 2019

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JFK BLVD

SAFETY CORRIDOR STUDY

EXECUTIVE SUMMARY

HUDSON COUNTY NEW JERSEY

NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

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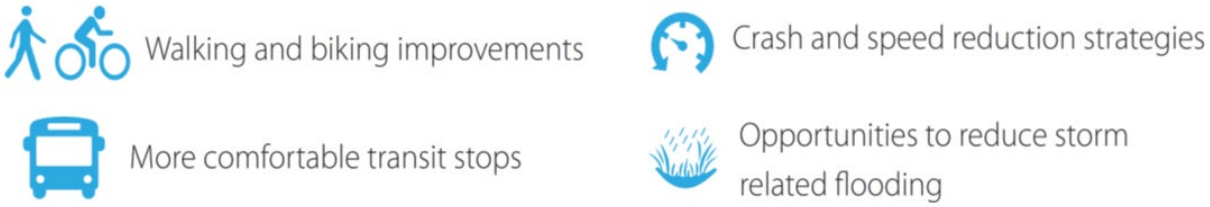
JUNE 2019

STUDY PURPOSE & GOALS

John F. Kennedy Boulevard is a highly-traveled urban corridor in Hudson County that provides interurban connections between the municipalities of Bayonne, Jersey City, Union City, West New York, Guttenberg, and North Bergen. With its commercial establishments, apartment buildings and houses, universities, and 44 schools, Kennedy Boulevard is an important gateway to Hudson County. Its status as a key arterial through much of the county means that this corridor sets the image of its host communities for residents, businesses, and visitors alike.

Kennedy Boulevard has always been a multimodal corridor. Today, the corridor sustains thousands of vehicle, pedestrian, transit, jitney, and bike trips. The John F. Kennedy Boulevard Safety Corridor Study stems from safety concerns of road users and plays an important part in the continued evolution of Kennedy Boulevard. As recommended by a multitude of previous planning documents as well as feedback from municipal stakeholders and the public, Kennedy Boulevard must change to better accommodate road users' need for comfort, efficiency, and safety. Between 2014 and 2016, the corridor saw more than 4,000 crashes, which led to more than 1,100 injuries and 12 fatalities. To address the high frequency of crashes on the corridor as well as stormwater management, this study includes recommendations to identify the following:



The recommendations were developed through an iterative process, using technical analysis to inform stakeholders who then determined the locations and priorities of potential design interventions and policies. At more than 14 miles in length, the entirety of Kennedy Boulevard could not be studied in detail. Therefore, four focus areas were selected for a more nuanced analysis:

- 26th Street to 32nd Street in Bayonne
- Gates Avenue to Danforth Avenue in Jersey City
- Hague Street to 10th Street in Jersey City/Union City/North Bergen
- 37th Street to 43rd Street in Union City/North Bergen

To assist with the technical analysis of each focus area, the project team set up traffic cameras to record 60 hours of footage at one intersection in each focus area. They used video analytics technology to identify road users, track their trajectories, and monitor conflict areas. The results were summarized in a technical memorandum (Appendix A) and are discussed in the recommendations chapter of this report.

Ultimately, input from the public and representatives from all six municipalities was paired with technical analyses to determine the most suitable design interventions and policies to make Kennedy Boulevard a safer place to walk, bike, take transit, and drive. Through segment-by-segment updates to the roadway design, Kennedy Boulevard will be a safer corridor for Hudson County, expediting the County's upward trajectory of being a vibrant, thriving, livable community.

REGIONAL SIGNIFICANCE OF STUDY

Kennedy Boulevard has a rich history which matches much of the growth of Hudson County through the later part of the 19th and 20th centuries.[1] Opened in 1895 with a ceremonial bike parade, it largely served recreational purposes in its early existence. Through the 20th century, the function of this road evolved as the population and immediate area around the boulevard continued to develop. It increasingly became the primary corridor for both long-distance travel to access the Lincoln and Holland Tunnels via NJ-495 and I-78, as well as immediate access for the properties and neighborhoods adjacent to the corridor.

A typical cross section of Kennedy Boulevard at 6th Street in Union City/North Bergen

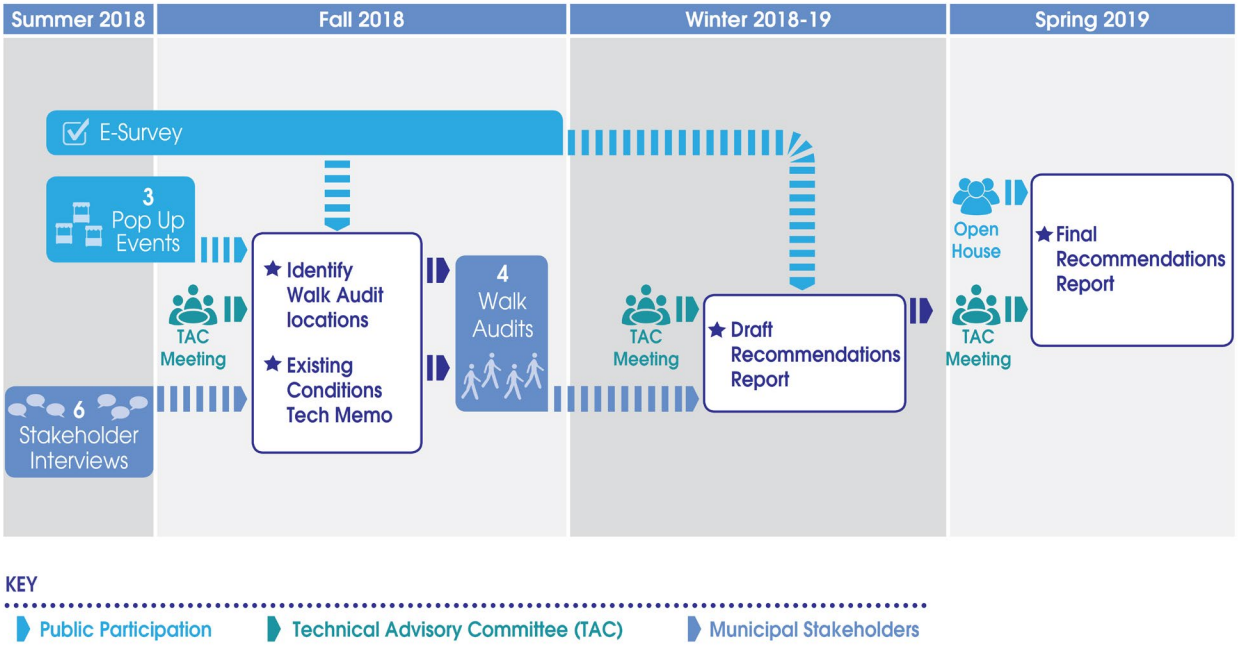
Today, the corridor is surrounded by a diverse set of neighborhoods. These range from dense mixed-use neighborhoods such as Journal Square to quieter residential neighborhoods in Bayonne. As Hudson

[1] *1895 opening of Hudson Boulevard changed county forever*
https://www.nj.com/jerseyjournal150/2017/04/1895_opening_of_hudson_boulevard_changed_county_fo.html

County's population grows, there has been increased pressure to build housing, build a more resilient community, and provide more transportation options to travel from one end of the county to the other. Numerous studies and plans from Hudson County, municipalities, and the North Jersey Transportation Planning Authority (NJTPA) have pointed toward a corridor that better accommodates pedestrians, bicyclists, and transit users. The John F. Kennedy Boulevard Safety Corridor Study works within this larger context, aiming to improve safety for all road users.

PUBLIC INVOLVEMENT

Throughout the study, the project team employed many approaches to welcome and incorporate feedback from stakeholders and the general public. Each outreach initiative considered Limited English Proficiency (LEP) stakeholders by having translated materials and interpretation services available in Spanish. Below is a brief summary of the public outreach initiatives carried out for study.



As shown in the diagram above, the public and stakeholder involvement process helped directed the project team as they developed project deliverables. The approach was three-pronged:

- **Public Participation.** The public had an opportunity to provide input through the e-survey, at pop-up information tables held at existing community events, and at the public open house.
- **Technical Advisory Committee (TAC).** Comprised of representatives from the NJTPA, Hudson County, police departments, representatives from the six municipalities along Kennedy Boulevard, NJDOT, NJ TRANSIT, and two universities, TAC members shared specialized knowledge and skills that were critical to the success of the study. The TAC used its expertise to provide insights by identifying issues, providing information

By the numbers	
6	Stakeholder Interviews
3	Pop-up Events
775	Survey Responses
3	TAC Meetings
4	Walk Audits
1	Public Meeting

resources, and disseminating information on the project process, surveys and public meetings to stakeholders. TAC feedback played a key role in determining the four focus areas, the appropriate design interventions, and the implementation priorities.

- **Municipal Stakeholders.** Municipal stakeholders from all six municipalities along Kennedy Boulevard shared their feedback at the six stakeholder interviews held shortly after the study began. These stakeholders also joined the project team on the six walk audits held as a part of the study.

Pop-up events, such as this one held in Washington Park, were one way members of the public could provide feedback on the study. Source: FHI

Participants on the 26th Street to 32nd Street walk audit in Bayonne noted key pedestrian safety challenges and opportunities. Source: FHI

SUMMARY OF FINDINGS & RECOMMENDATIONS

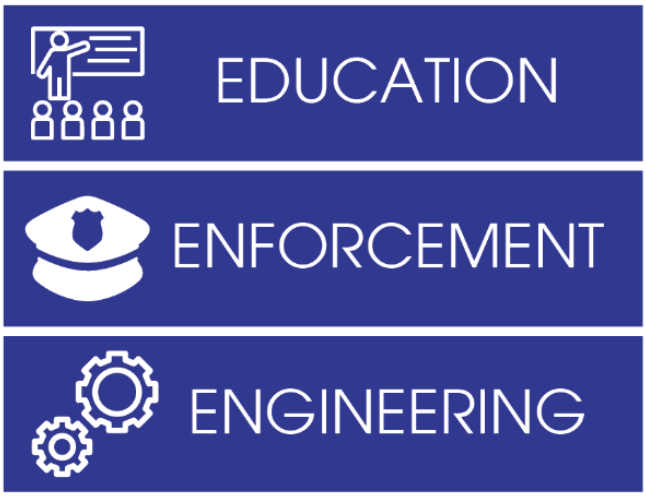
The recommendations can be classified into two broad categories: design interventions and policy. The design interventions primarily include a combination of the following:

High-visibility crosswalks | Leading pedestrian intervals | Curb extensions | Trees & landscaping | Daylighting crosswalks

These design interventions were recommended in all four focus areas and at nearly every intersection. The table below summarizes additional recommendations, many of which are unique to the focus area.

Potential Design Interventions in Focus Areas	
Segment	**Recommendations**
26th to 32nd Street	• A road diet to provide opportunity for bike lanes or transit-only lane • A left-turn pocket at 32nd Street • New pick-up/drop-off lane at the Walter F. Robinson School
Gates to Danforth Avenue	• Buffered bike lanes with connections to the Morris Canal Greenway • High-friction pavement through curves • Raised medians and pedestrian refuge islands • A left-turn pocket at Seaview Avenue
Hague to 10th Street	• A channelized right turn at Paterson Plank Road to reduce crossing distances • Raised medians and pedestrian refuge islands • New crosswalks between Paterson Plank Road and 10th Street • Hardened centerlines with speedbumps at approaches to Secaucus Road
37th to 43rd Street	• Hardened centerlines at 43rd Street • T-ing up the intersection at 43rd Street • Raised medians and pedestrian refuges • Straightened crosswalks to reduce crossing distances

Policy recommendations are organized around the three E's of transportation safety: education, enforcement, and engineering. Education campaigns, events, and enforcement of existing parking and traffic laws aim to foster a culture of responsible use of Kennedy Boulevard. Improved policies related to traffic signalization, access management, turn restriction, and Americans with Disabilities Act (ADA) compliance that will further bolster the goals of this study. Additionally, corridor-wide green stormwater infrastructure to prevent flooding is a key engineering consideration. Last, a major goal of this plan is to consider developing and implementing a Vision Zero Action Plan for Hudson County. Vision Zero is a performance-based initiative to achieve zero traffic fatalities and serious injuries by a designated year. The City of Jersey City and the City of Hoboken have both adopted Vision Zero policies.



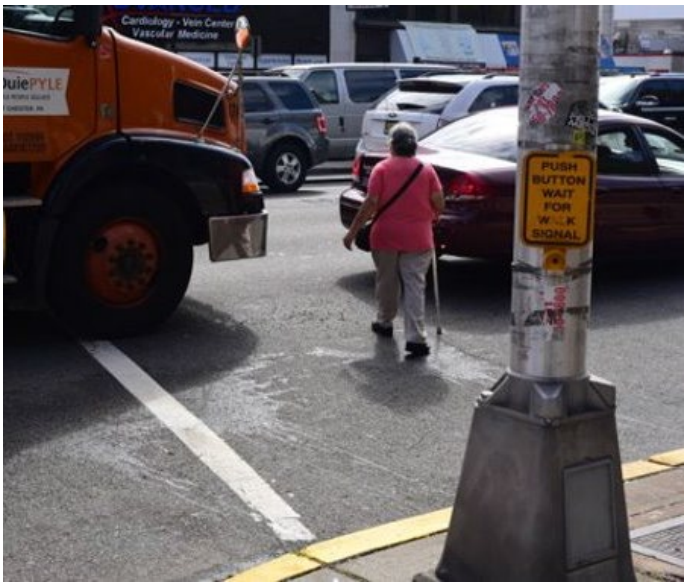
The John F. Kennedy Boulevard Safety Corridor Study builds on numerous existing initiatives and works to incorporate established Complete Streets principles in its design. The quote below, from the NJDOT Complete Streets Design Guide (2017), highlights the need for a new approach to roadway design:

"Auto-centric approach to street design has led to unfriendly (and at times unsafe) conditions for both motorized and non-motorized users in many locations in New Jersey. Fundamentally, this approach often reduces the function of a street exclusively to the movement of automobiles and trucks. However, our streets play a vital role in communities, connecting people of all ages, abilities, and modes, and supporting commerce and social interaction. How a street is designed has an underlying impact on the quality of life and economic vitality of its surroundings and the people that use it."

IMPLEMENTATION STARTS TODAY!

The recommendations in this report build toward the vision of Kennedy Boulevard as a safer corridor for all road users. It is one step in the process of implementing Hudson County's Complete Streets policy. This study recommends ways to reduce speed, improve pedestrian visibility, reduce crash frequency, provide for bicycles, improve stormwater management, and implement more comfortable transit stops. Above all, these recommendations address the pressing need for pedestrian safety in the four focus areas.

The design elements and policies can be applied elsewhere along Kennedy Boulevard. As recommended by TAC members, the road safety work should continue on additional segments following the conclusion of this study. The TAC identified two locations to address next: Montgomery Street to Dekalb Avenue in Jersey City and 90th Street to South Bergen Boulevard/2nd Avenue in North Bergen.



Poor pedestrian visibility was an identified deficiency at many crossings along the corridor. Hudson County has already started adding high-visibility crosswalks throughout the corridor. Source: FHI

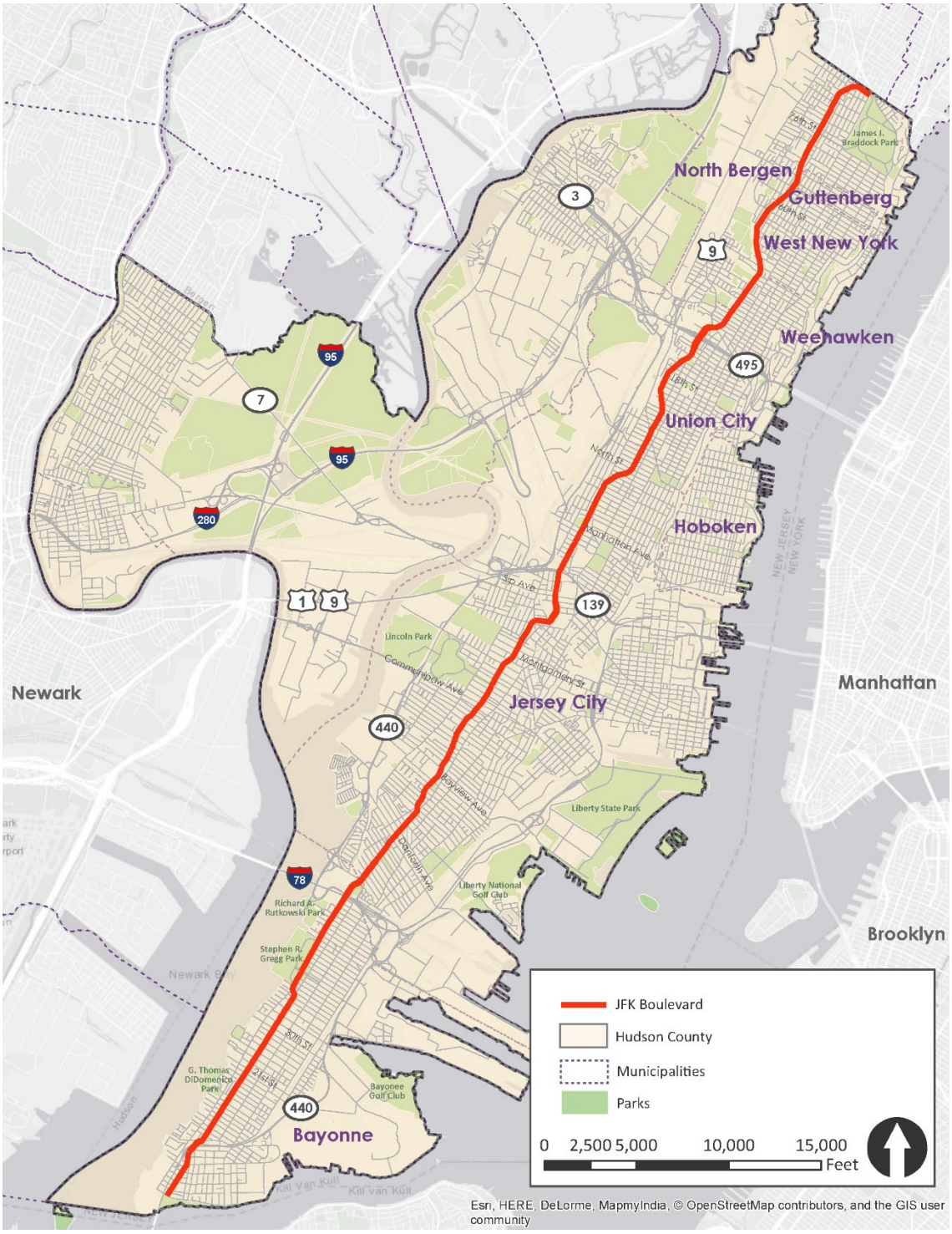
As Hudson County pursues construction of the safety improvements identified through federal, state, or local funding opportunities, it will continue to monitor Kennedy Boulevard's improved bicycle, pedestrian, and transit environment.

CHAPTER ONE
INTRODUCTION

JFK BLVD
SAFETY CORRIDOR STUDY

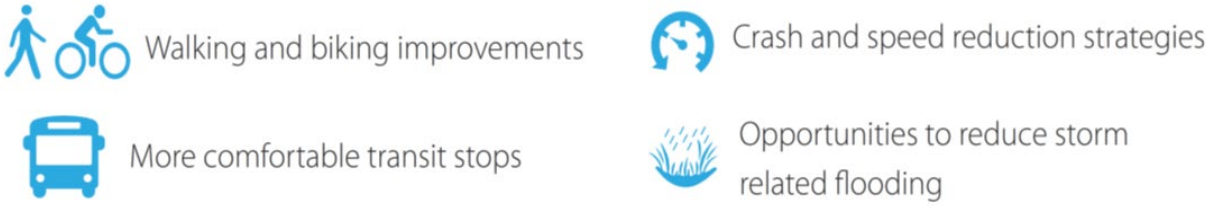
John F. Kennedy Boulevard is a highly-traveled urban corridor in Hudson County that provides interurban connections between the municipalities of Bayonne, Jersey City, Union City, West New York, Guttenberg, and North Bergen. Over 200 signals are located along this approximately 14.2-mile stretch of roadway with a posted speed limit of 25 miles per hour. A map of the study area is shown in **Figure 1**.

Figure 1 Study Area



With its commercial establishments, universities, and 44 schools, Kennedy Boulevard is an important gateway to Hudson County. Its function as a key arterial through much of the county means that this corridor sets the image of its host communities for residents, businesses, and visitors alike. The John F. Kennedy Boulevard Safety Corridor Study is built around the understanding that Kennedy Boulevard is multipurpose. As more residents and businesses start to make a home in Hudson County, Kennedy Boulevard will need to accommodate their travel needs and safety, particularly for vulnerable road users and environmental justice communities.

With this in mind, the study aims to address safety concerns on the corridor. Between 2014 and 2016, the corridor saw more than 4,000 crashes, which led to more than 1,100 injuries and 12 fatalities. This study includes recommendations to identify:



The report that follows considers the study background, existing conditions, and recommendations for Kennedy Boulevard. Input from the public and representatives from all six municipalities was paired with the technical analysis to determine the most suitable design interventions and policies to make Kennedy Boulevard a safer place to walk, bike, take transit, and drive.

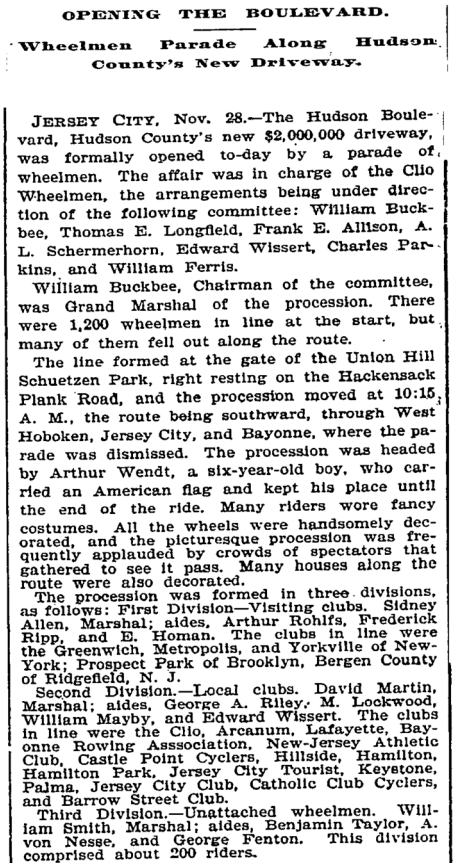
STUDY BACKGROUND

Due to the land use density of the study area and the relatively high vehicular traffic volumes on Kennedy Boulevard, vehicle-vehicle and vehicle-pedestrian/bicycle conflicts are common throughout the corridor. Driver behavior, vehicle speed, traffic volumes, sidewalk condition, crossings, amenities, intermodal considerations, etc. can contribute positively or negatively to the crash rates of the corridor depending on the design. Generally, areas that saw a trend in elevated crash rates on Kennedy Boulevard often had dense, diverse land uses, elevated vehicular volumes, and a lack of buffers between vehicles and other roadway users.

The postcard above depicts Kennedy Boulevard shortly after its opening in 1895.

Kennedy Boulevard has a rich history which matches much of the growth of Hudson County through the later part of the 19th and 20th centuries.[2] The Boulevard opened in 1895 to a ceremonial bicyclist parade and largely served recreational purposes in its early existence. This included a meandering route and many scenic overlooks along its course through the county. Through the 20th century, the function of this road evolved as the population and immediate area around the boulevard continued to develop. It increasingly became the primary corridor for both long-distance travel and access for the properties and neighborhoods immediately surrounding the corridor.

Today, the corridor is surrounded by a diverse set of neighborhoods throughout the county. This ranges from dense mixed-use areas such as Journal Square to quieter residential neighborhoods in Bayonne. As Hudson County's population has grown, there has been increased pressure to build housing, provide more transportation options, and build a more resilient community. The John F. Kennedy Boulevard Safety Corridor Study works within this larger context, aiming to improve safety for all road users.



OPENING THE BOULEVARD.

Wheelmen Parade Along Hudson County's New Driveway.

JERSEY CITY, Nov. 28.—The Hudson Boulevard, Hudson County's new $2,000,000 driveway, was formally opened to-day by a parade of wheelmen. The affair was in charge of the Clio Wheelmen, the arrangements being under direction of the following committee: William Buckbee, Thomas E. Longfield, Frank E. Allison, A. L. Schermerhorn, Edward Wissert, Charles Parkins, and William Ferris.

William Buckbee, Chairman of the committee, was Grand Marshal of the procession. There were 1,200 wheelmen in line at the start, but many of them fell out along the route.

The line formed at the gate of the Union Hill Schuetzen Park, right resting on the Hackensack Plank Road, and the procession moved at 10:15 A. M., the route being southward, through West Hoboken, Jersey City, and Bayonne, where the parade was dismissed. The procession was headed by Arthur Wendt, a six-year-old boy, who carried an American flag and kept his place until the end of the ride. Many riders wore fancy costumes. All the wheels were handsomely decorated, and the picturesque procession was frequently applauded by crowds of spectators that gathered to see it pass. Many houses along the route were also decorated.

The procession was formed in three divisions, as follows: First Division—Visiting clubs. Sidney Allen, Marshal; aides, Arthur Rohlfs, Frederick Ripp, and E. Homan. The clubs in line were the Greenwich, Metropolis, and Yorkville of New-York; Prospect Park of Brooklyn, Bergen County of Ridgefield, N. J.

Second Division.—Local clubs. David Martin, Marshal; aides, George A. Riley, M. Lockwood, William Mayby, and Edward Wissert. The clubs in line were the Clio, Arcanum, Lafayette, Bayonne Rowing Asssociation, New-Jersey Athletic Club, Castle Point Cyclers, Hillside, Hamilton, Hamilton Park, Jersey City Tourist, Keystone, Palma, Jersey City Club, Catholic Club Cyclers, and Barrow Street Club.

Third Division.—Unattached wheelmen. William Smith, Marshal; aides, Benjamin Taylor, A. von Nesse, and George Fenton. This division comprised about 200 riders.

New York Times article from 1895 describing the opening of Kennedy Boulevard.

STUDY PROCESS

The study recommendations were developed through an iterative process, using technical analysis to inform stakeholders who then determined the locations and priorities of potential design interventions and policies. To gain a general understanding of the key challenges and opportunities on the corridor, the project team interviewed representatives from all six municipalities, hosted three pop-up events with for the public, and launched an e-survey that had more than 700 respondents. The results of these can be found in the following chapter as well as Appendix C.

From there, the project team followed a process to develop recommendations. At more than 14 miles in length, the entirety of Kennedy Boulevard could not be studied in detail. Therefore, four focus areas were selected for a more nuanced analysis. Segments where a road safety audit has already been conducted were not considered as potential focus area locations.[3] The process for determining the focus area locations began with an analysis of crash data (including both vehicle-vehicle crashes and vehicle-

[2] *1895 opening of Hudson Boulevard changed county forever* https://www.nj.com/jerseyjournal150/2017/04/1895_opening_of_hudson_boulevard_changed_county_fo.html

[3] Previously conducted road safety audits included the following segments of Kennedy Boulevard: Communipaw Avenue to Montgomery Street, Bergen Avenue to Bond Street, and Pavonia Avenue to St. Paul's Avenue in Jersey City. The road safety audit for the segment between 43rd Street and 64th Street in North Bergen/Union City was conducted at the same time as this study.

pedestrian/bicycle crashes). The highest crash locations were presented to the Technical Advisory Committee (TAC) in September 2018. Through an engagement activity at the meeting and follow-up with TAC members, the shortlist was narrowed down to the final four focus areas:

- 26th Street to 32nd Street in Bayonne
- Gates Avenue to Danforth Avenue in Jersey City
- Hague Street to 10th Street in Jersey City/Union City/North Bergen
- 37th Street to 43rd Street in Union City/North Bergen

Once selected, the project team led a walk audit in each of the focus areas in October 2018. The results were summarized and shared with the TAC. During this phase, the project team conducted technical analysis of each corridor. The project team set up traffic cameras to record 60 hours of footage at one intersection in each of the focus areas. The footage was processed with video analytics technology, which used deep learning artificial intelligence to identify road users, track their trajectories, and monitor conflict areas. The results were summarized in a technical memorandum (Appendix A) and are discussed in the recommendations chapter of this report.

Near Collision between SB Left-turn Vehicle and Crossing Pedestrian at W 26th Street. Source: Miovision

At the second TAC meeting, TAC members reviewed the results of both the technical memorandum and the walk audits. They then considered locations for a variety of design interventions aimed at reducing traffic speeds and improving the safety for all road users. The results of this meeting informed the

recommended designs found in this report. TAC members and the general public were given an opportunity to comment on the draft designs in April 2019. These were updated and finalized following the public meeting.

CHAPTER TWO
EXISTING CONDITIONS

JFK BLVD
SAFETY CORRIDOR STUDY

This chapter explores the existing conditions of Kennedy Boulevard, including the overall transportation context, previous and ongoing planning and engineering efforts, crash history, demographics, access, and results from the public and stakeholder involvement.

TRANSPORTATION CONTEXT

Hudson County has the sixth highest population density of any county in the United States; only counties in New York City and San Francisco have a higher population density, making Hudson County denser than the counties where Boston and Philadelphia are located, as well as Washington, D.C. Less than half of Hudson County's population relies on personal vehicles to commute, and the transit commute rate is over 40 percent. Although the drive alone rate is lower or on par with counties of similar population density, the transit rate is higher.

Table 1 Commute rates by mode

	Hudson Co.	Suffolk Co. (Boston)	Philadelphia Co.	Washington, D.C.
Drove alone	37%	41%	51%	34%
Carpooled	8%	7%	8%	5%
Public transit	42%	33%	25%	35%
Walked	8%	13%	8%	13%
Taxi, motorcycle, bicycle, or other	2%	3%	3%	6%
Worked at home	3%	3%	3%	6%

Source: American Community Survey (ACS) Five-year Estimates (2017)

Zero-vehicle households are common in Hudson County, making up about 32 percent of households. Within a ¼-mile buffer of Kennedy Boulevard, the share of zero-vehicle households is slightly higher (34 percent).[4] This suggests that about a third of work-age residents rely on modes other than a car to commute to work. South of Journal Square, NJ TRANSIT Routes 10 and 119 have more than 9,000 average weekday boardings.[5] Traffic cameras that were deployed as a part of this study as well as in-person observations recorded frequent bicycle and pedestrian use (**Table 2**).

Vehicle use, including driving alone, carpooling, taxis, and jitneys, remains the most common mode on Kennedy Boulevard. The average annual daily traffic (AADT) ranges from 10,000 to 30,000 vehicles depending on the segment of roadway. See Table 3 to review varying traffic volumes at Kennedy Boulevard intersections.

[4] ACS Five-year Estimates (2017)
[5] Journal Square Bus Operations Improvements Existing Conditions Memo (2016)

Table 2 Pedestrian and Bicycle Counts at Kennedy Boulevard Intersections During Peak Period[6]

Location	Pedestrians	Bicycles
26th Street (Bayonne)	709	23
Neptune Avenue (Jersey City)	187	44
Paterson Plank Road/8th Street (Union City/North Bergen)	1,024	50
37th Street (Union City/North Bergen)	1,245	63

Source: MicroTraffic data collected from MioVision cameras as a part of the study.

Table 3 Annual Average Daily Traffic at Kennedy Boulevard Cross Streets

Location	AADT
26th Street (Bayonne)	11,000
Neptune Avenue (Jersey City)	20,000
Paterson Plank Road/8th Street (Union City/North Bergen)	24,000
37th Street (Union City/North Bergen)	30,000

Source: MicroTraffic data collected from MioVision cameras as a part of the study.

The existing transportation environment within Hudson County is multimodal. Although transit and other vehicles account for most of the trips along Kennedy Boulevard, the walking and bicycle counts draw attention to a group of road users that should not be overlooked. Moreover, bicyclists and pedestrians are vulnerable road users who are among the most common injuries and fatalities on Kennedy Boulevard, so special considerations are given to their safety concerns throughout this study.

PREVIOUS AND ONGOING PLANNING & ENGINEERING EFFORTS

The transportation environment described in the previous section summarizes the existing use of the roadway, however, this does not consider the potential of the roadway and changes to the transportation environment. Hudson County has a host of plans that provide a vision for the future and a suggested path to get there. The most relevant plans are discussed below. Collectively, they suggest a growing shift toward transit, walking, and biking along Kennedy Boulevard and throughout Hudson County.

Hudson County Master Plan Re-examination Report (2016)

Hudson County took a careful look at the 2002 and 2008 Master Plans in their 2016 re-examination report. In light of Superstorm Sandy recovery, the report addresses the County's long-term sustainability and resiliency. Additionally, the plan considered changes based on other significant developments, such as the recovery from the Great Recession, the need for affordable housing, and growing need and demand for improved walking, biking, and transit.

The Master Plan identifies the following goals that pertain to transportation circulation on County roads:

[6] References to peak period in this report include AM/MD/PM peak periods, volume collected on a weekday 7-9AM, 11AM-1PM, and 4-6PM.

- **Provide a safe and efficient transportation system.** This goal aims to provide for "safe and efficient pedestrian, bicycle, public transportation, and vehicular travel." This goal also highlights the need for increased education, training, and field audit programs to reduce crashes.
- **Reduce traffic congestion.** This goal emphasizes the need to allow buses to move with greater efficiency and reliability along the corridor.
- **Promote alternate transportation modes including bicycling, telecommuting, transit, and walking.** This goal highlights the need to improve the walking, biking, and pedestrian environment through the implementation of the Hudson County Complete Streets Policy.
- **Redesign existing streets to allow for pedestrians, bikes and green infrastructure.** This goal emphasizes green infrastructure but also considers the implementation of street typologies outlined in the Hudson County Land Development Regulations to better accommodate people walking and cycling.

These goals point toward a need to consider design interventions that improve the comfort and safety of pedestrians, cyclists, and transit users. Although reducing congestion is noted in the goals, the Master Plan paints a larger vision to foster communities where residents have safe and efficient alternatives to driving. The plan proposes that the path to becoming a community of transportation choice is made possible through prioritizing infrastructure that promotes walking, biking, and transit.

Hudson County Land Development Regulations (2016)

The Hudson County Land Development Regulations are the procedures and requirements for the Hudson County Planning Board process. This document was developed to address stormwater concerns raised in the aftermath of Superstorm Sandy as well as the growing interest in developing complete streets throughout Hudson County. The document outlines appropriate design interventions based on a set of street typologies. Included in the list of goals for the regulations are the following:

- Facilitate pedestrian and/or bicycle traffic along county roads.
- Create and/or maintain aesthetically pleasing landscapes along county roads.

Additionally, the regulations include the following as a general policy: "Where permitted based on traffic volumes, appropriate speed control and traffic calming measures shall be incorporated where vehicular traffic is regularly traveling at speeds above the posted speed limit." Regarding traffic volumes, the document notes that metrics beyond vehicular level of service should be considered. The document explains that where "development reduces the motor vehicle level of service, but improves conditions for pedestrians, transit, and/or bicyclists, a motor vehicle level of service in excess of capacity Level E[7] may be acceptable, at the discretion of the Planning Board and the County Engineer."

The document classifies the majority of Kennedy Boulevard as either a Residential Boulevard or Mixed Urban Boulevard. These two classifications have the following listed as strong or moderate considerations:

[7] Level of Service is a measure of the condition of motor vehicle traffic outlined in the Transportation Research Board's *Highway Capacity Manual* and used by traffic engineers. A is the highest measure, representing a free flow of traffic with low volumes, while F is the lowest measure, where high volumes cause a complete breakdown of movement.

- Lane Width
- Wide Sidewalks
- Benches
- Bicycle racks
- Street Trees
- Vehicle Lighting
- Pedestrian Lighting
- Enhanced Bus Stops
- Enhanced Driveway Aprons
- Curb Extensions
- Reduced Curb Radii
- ADA Curb Ramps
- High-Visibility Crosswalks
- Pedestrian Signals
- Road Diets
- Center Medians
- Gateway Treatments
- Neckdowns and Chokers

The goals, general policies, and suggested considerations emphasize the need to reevaluate Kennedy Boulevard with more consideration given to pedestrian, bicycle, and transit infrastructure. When needed, vehicle level of service may be reduced in favor of promoting the safety of walking, biking, and transit use.

Road Safety Audits

As recommended in the Hudson County Master Plan, the County has used road safety audits (RSAs) to help identify the potential causes for crashes on its corridors. In recent years, four RSAs have been conducted along Kennedy Boulevard. All four of these RSAs suggest design interventions could help reduce the number of crashes occurring along Kennedy Boulevard. It is important to note that these four locations were not considered for focus area analysis as a part of this study.

Communipaw Avenue to Montgomery Street (2014)

In response to a fatality at Kennedy Boulevard and Fairmount Avenue, Hudson County conducted RSAs at four intersections stretching from Communipaw Avenue to Montgomery Street. Recommendations from these RSAs included the following:

- Use high-visibility crosswalk striping
- Add ADA-compliant curb ramps
- Add corner curb extensions to reduce pedestrian crossing distance
- Add “Do Not Block the Box” signage
- Change protected-permitted left-turns to protected-only left-turns on north and southbound approaches at Communipaw Avenue
- Increase speed enforcement

Journal Square (2015)

This RSA, referred to as the “southern” Journal Square RSA, focused on the road segments immediately south of Journal Square running from Bergen Avenue to Bond Street. The area was selected because of the high number of crashes relative to the corridor as a whole. Many of the crashes involved pedestrians, which the plan suggests is “a glaring mismatch between Journal Square’s street design and its users.” Recommendations include lighting, ADA-compliant curb ramps, high-visibility crosswalks, leading pedestrian intervals (LPIs), and increased parking enforcement.

Upper Journal Square (2015)

Covering the section of Kennedy Boulevard from Pavonia Avenue to St. Paul’s Avenue, this RSA made recommendations for upgraded pedestrian facilities, repainted pavement markings, and on-street

bicycle facilities. This section was selected because it had an overrepresentation of crashes for the corridor.

43rd Street to 64th Street (2019)
The section of Kennedy Boulevard running from 43rd Street to 64th Street had 428 crashes between January 2014 and December 2016. Hudson County received funding from the New Jersey Department of Transportation (NJDOT) and the Office of the County Engineer partnered with Greenman-Pedersen, Inc. to conduct the RSA to develop improvement recommendations and countermeasures. Recommendations include ADA-compliant curb ramps, pedestrian-scale lighting, curb extensions, and LPIs.

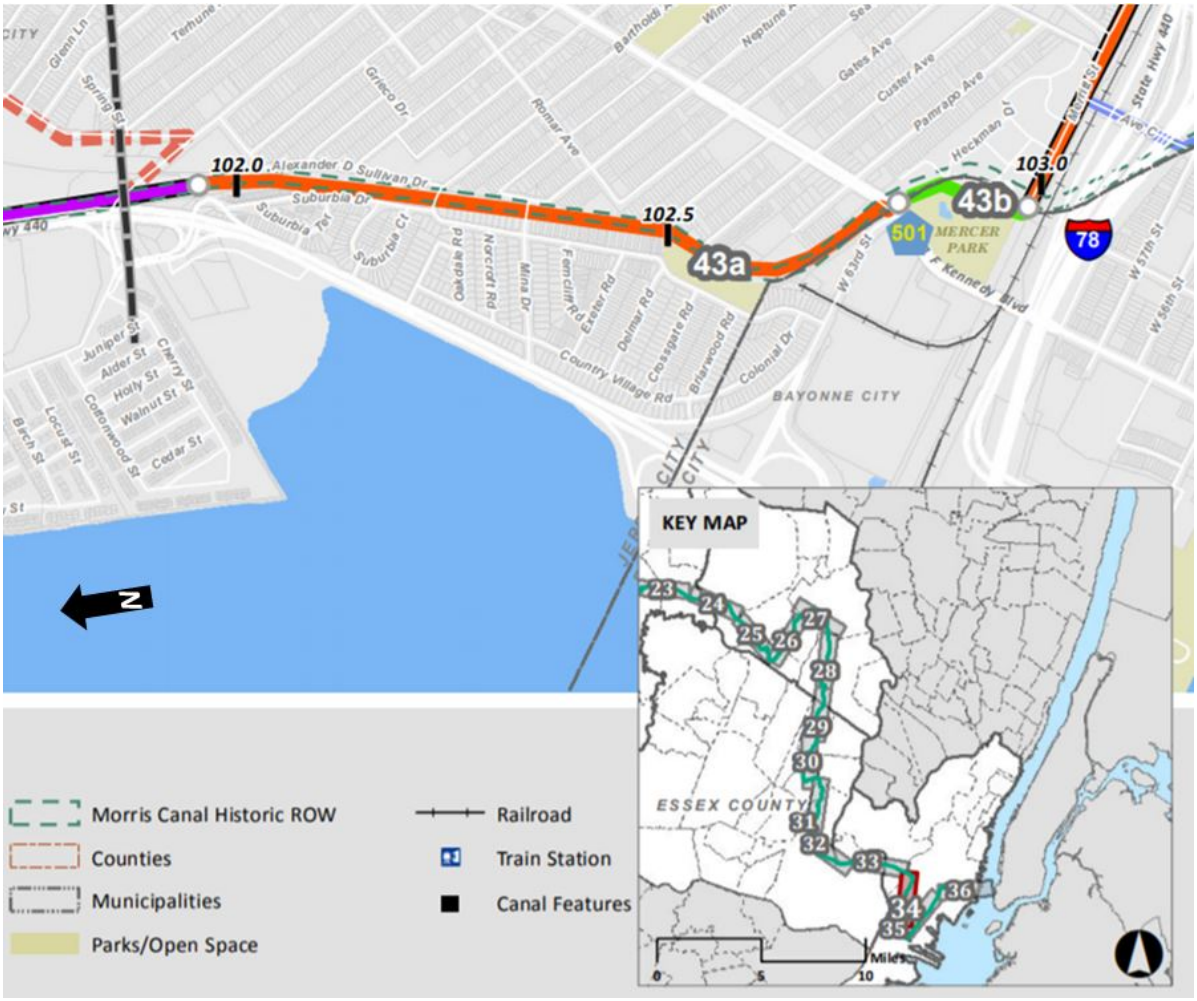
JC Walks Pedestrian Enhancement Plan (2018) & Let's Ride JC Bike Master Plan (ongoing)
Jersey City's pedestrian and bicycle master plans include a series of recommendations to make walking and biking safer within Jersey City. Both plans used temporary installations with low-cost materials to test out new right-of-way configurations and gather feedback from community stakeholders. The JC Walks Plan recommends curb extensions and daylighting crosswalks among a number of other safety improvements. The winter 2019 draft of the Bike Master Plan suggests a protected bike lane running nearly the full length of Kennedy Boulevard within Jersey City. This is recommended because it's the only unbroken north-south corridor in the city. Additional studies would need to be done for Hudson County to consider this proposal.

Morris Canal Greenway Studies
The Morris Canal Greenway is a proposed hiking and biking trail stretching 111 miles from Hudson County to Warren County along the right-of-way of the former Morris Canal. The City of Jersey City Morris Canal Greenway Plan (2013) and the Morris Canal Greenway Corridor Study (2018) propose the alignment of the Morris Canal Greenway. These alignments have since been updated to allow an off-street path running to Custer Avenue,[8] but it is worth noting that previous efforts proposed a bicycle and pedestrian path running along Kennedy Boulevard for longer stretches.

The City of Jersey City Morris Canal Greenway Plan proposes an alignment that stretches north from Mercer Park on Kennedy Boulevard.

[8] More information about the updated alignment can be found in Chapter Four: Recommendations.

The 2013 plan shows the greenway running up Kennedy Boulevard and crossing at Bartholdi Avenue. The 2018 study shows the alignment crossing at Mercer Park. Regardless of the alignment, both documents identify access to recreational opportunities as one of the goals of the plan. Moreover, each study shows the various open spaces that would become accessible by walking and biking if the greenway is constructed.



The Morris Canal Greenway Corridor Study shows the Morris Canal Greenway crossing Kennedy Boulevard at Mercer Park.

NJTPA Plan 2045

The NJTPA's *Plan 2045: Connecting North Jersey* is the long-range transportation plan for northern New Jersey. Adopted in 2017, it meets federal requirements for metropolitan planning organization long range plans, including extensive public outreach, goals, and a financial plan. It builds on the Together North Jersey (TNJ) Regional Plan, completed in 2015, which presents the vision to make northern New Jersey more competitive, efficient, livable, and resilient. Goals pertaining to this study of Kennedy Boulevard include: make travel safer, expand public transit, and support walking and bicycling. Projects funded by NJTPA's Subregional Studies Program, such as the John F. Kennedy Boulevard Safety Corridor Study, align with and advance the goals of Plan 2045.

Bayonne/Greenville/Journal Square Bus Rapid Transit Study (2013)

This study considered the potential for bus rapid transit (BRT) on corridors heading south from Journal Square, including Kennedy Boulevard. The study conducted a preliminary assessment of the need, opportunities, and impacts of BRT on each of the corridors. Among the corridors considered, Kennedy Boulevard was the highest ranked by the public, advisory committee members, and through the technical analysis. Recommendations for this corridor included increasing stop spacing, increasing frequency, and improving bus stop amenities. These recommendations require further detailed analysis to fully understand their impacts, and, if implemented, are intended to reduce the average wait time to board, reduce crowding, and increase level of comfort at the stops.

Vision Zero Initiatives

Jersey City's Vision Zero Action Plan (2019) as well as a number of Hudson County initiatives respond to the pressing need for design interventions, education, and enforcement to reduce traffic fatalities. In Jersey City alone, 100 individuals were killed and more than 200 people suffered life-changing injuries in the past decade. Of these, half the fatalities were pedestrians, and over 40 percent of fatalities and serious injuries in Jersey City occurred on State and County roads.[9] Jersey City's Vision Zero Action Plan does not make recommendations for Kennedy Boulevard directly, but it encourages widespread bicycle and pedestrian infrastructure upgrades that support Vision Zero. In addition to infrastructure, the plan promotes education and enforcement campaigns that build a culture of traffic safety.

WHAT IS VISION ZERO?

The Vision Zero Network defines Vision Zero as the following:

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. First implemented in Sweden in the 1990s, Vision Zero has proved successful across Europe — and now it's gaining momentum in major American cities. (Visionzeronetwork.org)

It should be noted that criticisms of Vision Zero have emerged in recent years. There have been questions about how achievable Vision Zero is as well as concerns pertaining to increased enforcement in communities with a relatively high share of minority residents. These criticisms, among others, are considered in the John F. Kennedy Boulevard Safety Corridor Study and should be considered if a county-wide Vision Zero plan is pursued.

Although Hudson County has not adopted a Vision Zero plan, it is noted the safety improvements are consistent with Vision Zero. Examples of this include left-turn phases, turn restrictions, LPIs, and increased street lighting.

Hudson County Jitney Study (2011)

The Hudson County Jitney Study came about because jitneys have become a more common part of Hudson County's transportation network. They play an important role in Hudson County's overall transportation network. They provide an affordable transportation option and fill gaps in NJ TRANSIT bus service. The study documents key impacts of jitney operations, which include:

[9] Jersey City's Vision Zero Action Plan https://static1.squarespace.com/static/5b3e2f51a2772cc5c3981b6a/t/5c6d81fee79c708463acb3b9/1550680584981/Jersey+City+Vision+Zero+Action+Plan_021519.pdf

- High levels of competition among operators, which has caused safety concerns and congestion
- Poor vehicle maintenance
- Lack of ADA compliance
- Lack of information and accountability
- Oversupply of service in some corridors

Kennedy Boulevard sees an average of one vehicle every 10 minutes in each direction on weekdays. To address existing challenges, the study has a number of recommendations, including a possible medallion system for jitneys. The potential benefits of using medallions would be increased vehicle safety, congestion mitigation, and improved coordination among providers.

NJDOT Complete Streets Design Guide (2017)

The Complete Streets Design Guide provides communities with the tools to develop complete streets with a variety of roadway typologies in mind. In addition to outlining methodologies for developing complete streets and a design guide, the document discusses the importance of providing complete streets in New Jersey communities from the perspective of livability, public health, and economic development. Hudson County has adopted its own complete streets policy, so the NJDOT design guide is one of the many resources available to consider for projects on County roads.

WHAT ARE COMPLETE STREETS?

According to the NJDOT Complete Streets Design guide, "Complete Streets are streets designed for all users, all modes of transportation, and all ability levels. They balance the needs of drivers, pedestrians, bicyclists, transit riders, emergency responders, and goods movement based on local context."

Land Use/Zoning

Throughout the full extent of the more than 14-mile corridor, a variety of different land uses are found. In addition to private development, this also includes community facilities such as municipal buildings, schools, universities, police and fire stations, libraries, and parks.

While the Hudson County Planning Board has jurisdiction to review all developments abutting Kennedy Boulevard for traffic and drainage issues in accordance with the NJ County Planning Act (N.J.S.A. 40:27-1), land use along Kennedy Boulevard is under the authority of the local municipalities through their zoning regulations and redevelopment plans. A summary is provided below and a more detailed analysis of land use/zoning can be found in Appendix D.

Along the length of Kennedy Boulevard throughout the county, permitted uses in the zoning districts are generally of the same size and scale of what is presently in the area, therefore, any redevelopment would be similar to what currently exists. There are a few areas that would allow more intensive development should redevelopment occur. Additionally, in the future, Hudson County's municipalities may seek to use their redevelopment powers to designate redevelopment areas and seek large scale redevelopments of select areas.

In Bayonne at the southern end of Kennedy Boulevard, there have been several projects along which were reviewed by the Hudson County Planning Board that resulted in the demolition of single-family houses to construct more single-family homes on smaller lots. Bayonne's current zoning along Kennedy

Boulevard maintains the existing land use of single-family homes. However, as development pressures increase, the trend of redevelopment to increase density will likely continue.

As established in the Journal Square 2060 Redevelopment Area, the absence of minimum parking requirements has been applied through variances to developments in Jersey City along Kennedy Boulevard outside of the redevelopment area. Beyond Jersey City, projects along Kennedy Boulevard have been approved with parking below the minimum requirements according to the Residential Site Improvement Standards or local zoning requirements. For residents who seek to own automobiles and do not have an off-street parking space, the increase of developments which do not provide a parking space for all residents may lead to additional vehicular circulation and trips on Kennedy Boulevard as residents search for on-street parking spaces. Future considerations for traffic and circulation planning will have to account for these trips.

Increasingly, developments are promoting the use of public transportation and anticipating that residents will utilize one of the several bus routes or jitneys that serve Kennedy Boulevard, or in Union City, the Bergenline Avenue Light Rail Station, rather than drive. As residents must walk to and from transit stops, they are pedestrians for part of their journey. As the reliance on public transportation for developments continues, the increase in pedestrians will necessitate further pedestrian safety improvements throughout the length of the corridor. When analyzing traffic and preparing traffic impact reports, developers will need to include impacts of additional pedestrian trips and the use of multiple transportation modes into their findings and may receive credits for incorporating safety mitigation measures.

Redevelopment may change access management concerns along Kennedy Boulevard. New multifamily residential developments would have less curb cuts than an equivalent number of single-family homes. However, the number of trips at these curb cuts would be much greater, which may in the future warrant additional traffic signals or other mitigation measures.

Hudson County's Capital Investments

Beyond the John F. Kennedy Boulevard Safety Corridor Study, Hudson County has completed numerous road and streetscape improvements throughout the John F. Kennedy Boulevard corridor through a variety of funding sources and programs.

Federal and State Grants

The Office of the Hudson County Engineer applies for federal and state grants on an ongoing basis as funding is available for improvement programs on Hudson County roads, including John F. Kennedy Boulevard. Since 2006, the County has received more than $15 million for projects on John F. Kennedy Boulevard through the federal Local Safety Program or the state County Aid Program.

The NJ Local Safety Program is a federally funded program established by the NJ Department of Transportation (NJDOT) and administered through the state's Metropolitan Planning Organizations (NJTPA for the north Jersey region including Hudson County). The program funds the design and construction of safety improvements on county and local roadways. Since 2006, the County has received a total of $11,701,485 for improvements to John F. Kennedy Boulevard through the program. Local Safety Program funds have been utilized in every municipality along John F. Kennedy Boulevard for improvements including updated pavement markings, crosswalks, turning lanes, new traffic and

pedestrian signals, push buttons, construction of bumpouts, and repairs to medians. Four Local Safety Program improvement projects designed for Jersey City will be going out to bid in 2019 or 2020.

Every year, the New Jersey Legislature appropriates funds to be distributed by the NJDOT as part of the County Aid Program for the improvement of roads and bridges under county jurisdiction. Between 2019 and 2020, Hudson County will use $3,600,000 in County Aid Program funding for milling, paving, striping, and traffic signal improvement on John F. Kennedy Boulevard.

Road Safety Audits Implementation

As discussed earlier in this study, since 2013, four Road Safety Audits have been conducted along different segments of John F. Kennedy Boulevard, which resulted in reports detailing recommended safety improvements, including design treatments and infrastructure. The Office of the County Engineer has subsequently used grant funding for the design and construction of safety improvements recommended in the RSA reports.

Hudson County is making some of these improvements with funding from the NJTPA's Local Capital Project Delivery Program. The competitive, multi-step grant program prepares transportation projects for federal construction funding through a process of identifying and developing alternatives, creating engineering designs, construction documents, and lastly, awarding a construction contract.

The designed improvements integrate recommendations from the 2014 RSA report from Communipaw Avenue to Montgomery Street, and the 2015 Journal Square RSA report covering the southern portion of Journal Square between Bond Street and Sip Avenue. Improvements include new 12-inch LED traffic signal heads, curb extensions, high-visibility crosswalks, updated signage, textured pavements, and the optimization of traffic signals. The project is currently out to bid, with the installation of the curb extensions planned for summer 2019, and the repaving and pavement markings expected to be completed by summer 2020.

Through the NJTPA, Hudson County received federal Highway Safety Improvement Program funds for the design and construction of safety improvements on Kennedy Boulevard from Sip Avenue to Bergen Avenue. The designs are integrating recommendations from the 2015 Journal Square RSA report. Proposed improvements include pedestrian curb extensions at most intersections, high-visibility crosswalks, installation or replacement of signage, and the creation of a new signalized mid-block crosswalk between Tonnelle Avenue and Bergen Avenue, which is a busy commercial corridor with heavy pedestrian activity and a long distance between pedestrian crossings. The draft designs are under review and are scheduled to be finalized and federally authorized by summer 2020, with construction planned for spring 2021.

Finally, Hudson County has submitted an application to the NJTPA for funding through the Local Capital Project Delivery Program's Local Concept Development Phase for Fiscal Year 2020 to create designs incorporating the recommendations of the 2019 Road Safety Audit report from 43rd Street to 64th Street in Union City, North Bergen, and West New York. The Office of the County Engineer also intends to apply for design and construction funding to implement improvements recommended in the Upper Journal Square RSA (Pavonia Avenue to St. Paul's Avenue) in future funding cycles.

In addition to infrastructure improvements, the Hudson County Sheriff's Office, Jersey City Police Department, and Hudson Transportation Management Association as well as other area police departments have partnered to promote pedestrian safety along the corridor through the NJTPA's

Street Smart NJ campaign. Street Smart NJ combines public outreach and increased enforcement to change the behaviors that contribute to crashes. For additional information on Street Smart NJ and other Hudson County safety initiatives, see Appendix E.

CRASHES ON KENNEDY BOULEVARD

The plans above work toward a county-wide vision with more transportation options and reduced roadway fatalities and injuries. The frequency of crashes on Kennedy Boulevard is one of the potential reasons why these plans have a repeated emphasis on roadway safety. In recent years, Kennedy Boulevard has been identified as a corridor of concern with regards to the number of pedestrian fatalities. This includes identification by the Tri-State Transportation Campaign in 2013 as one of the Tri-State area's "Most Dangerous Roads for Walking" six pedestrian fatalities recorded between 2009 and 2011.[10]

Between 2007 and 2017, there were 13,262 crashes on Kennedy Boulevard.[11] Of these crashes, 1,146 involved a pedestrian or cyclist. Isolating just the three-year period concluding in 2016, there were 4,069 crashes that led to 12 fatalities, 12 incapacitating injuries, and 1,107 moderate injuries on the corridor. Every one of these crashes caused some sort of economic harm to individuals and the community. The National Safety Council (NSC), which investigates and reports on preventable unintentional injuries each year in their publication *Injury Facts*,[12] summarizes and estimates the economic impact and costs of crashes due to five components 1) wage and productivity losses, 2) medical expenses, 3) administrative expenses – including police services, 4) motor-vehicle damages, and 5) costs incurred by employers for crashes involving workers. These 4,069 crashes have an estimated $81 million in economic impact and costs.

Table 4 Average Economic Cost by Injury Severity, Kennedy Boulevard 2014-2016

Crash Type	Unit cost	Number	Cost
Death	$1,542,000	12	$18,504,000
Disabling	$90,000	12	$1,080,000
Evident	$26,000	1107	$28,782,000
No injury	$11,400	2938	$33,493,200
	Total	***4069***	**$81,859,200**

Source: National Safety Council (2015)

While this measure evaluates estimated direct economic costs due to these crashes, this number does not include estimated measures of value of these incidents on lost quality of life associated with death and injuries. Therefore, the NSC develops higher, comprehensive costs, to estimate the value of this lost quality of life so municipalities can consider the amount society is willing to pay to prevent these incidents. The three-year total of these comprehensive costs for crashes on Kennedy Boulevard is an

[10] Report Identifies Most Unsafe Roads for Pedestrians. http://tstc.org/reports/danger13/2013-MDR-NJ-Release.pdf

[11] For a more in-depth look at crash data results and methodology, see Appendix A.

[12] Estimating Costs of Unintentional Injuries, 2015 https://www.nsc.org/Portals/0/Documents/NSCDocuments_Corporate/estimating-costs.pdf

estimated $607 million. This extraordinary figure is a consideration when balancing the cost of safety improvements along the corridor.

Nationally, children and senior citizens are overrepresented in vehicle-pedestrian collisions and in their resulting injuries.[13] Additionally, national crash data shows that non-white individuals make up 46 percent of pedestrian deaths but account for only 35 percent of the total population.[14] Although race and ethnicity are not collected on crash victims in Hudson County, the home zip codes are. The majority of pedestrian fatalities on Kennedy Boulevard came from 07305 and 07087, the zip codes of the Greenville neighborhood of Jersey City and Union City, respectively. Both these zip codes have high concentrations of environmental justice communities. For instance, 86 percent of Union City residents are Latino and/or non-white, so it is likely that environmental justice communities were overrepresented in traffic fatalities.

This study included an analysis to help understand the frequency and severity of crashes. The crash analysis (found in Appendix A) highlighted a number of safety issues that indicate a consistency in operational and behavioral patterns that are likely to exist all along Kennedy Boulevard. These include:

- **Vehicles parked at intersections inhibit pedestrian visibility.** Parked vehicles close to intersection corners make pedestrians less visible to drivers. Such sight line restrictions are also detrimental to vehicle-to-vehicle interactions, as drivers have to advance beyond the stop bar to see crossing traffic. This is particularly problematic at unsignalized intersections.
- **Pedestrians cross at mid-block locations or against red lights, due to insufficient or uncomfortable crossings or follow most convenient desire lines.** Consistent errant pedestrian travel could be a symptom of another potential issue. Safe crossing locations work best when provided where people wish to travel.
- **Sideswipes and crashes with parked vehicles are a predominant crash type, indicative of frequent lane changing behavior on a multi-lane street.** Four-lane arterials typically have elevated crash rates as compared with two-lane roads. Vehicles often change lanes abruptly to bypass turning vehicles, which increases the risk of a crash. On-street parking provides friction which serves to calm traffic on two-lane roads but is less effective at doing so on four-lane roads. As such, parking along the edge of Kennedy Boulevard presents increased opportunities for conflict especially with drivers changing lanes to bypass left-turning vehicles.
- **Speeding and distracted driving are likely contributing factors to many crashes.** The posted speed limit on Kennedy Boulevard is 25 mph, but observed speeds are consistently higher. If vehicles were traveling at the speed limit, driver peripheral vision would be increased, reaction time increased, and stopping distance decreased resulting in fewer and less sever crashes. Coupled with increased cell phone use and other in-vehicle distractions, the inevitable result is a road that is unfriendly to virtually every type of user. Managing speed can be one of the single, most effective strategies for improving safety.

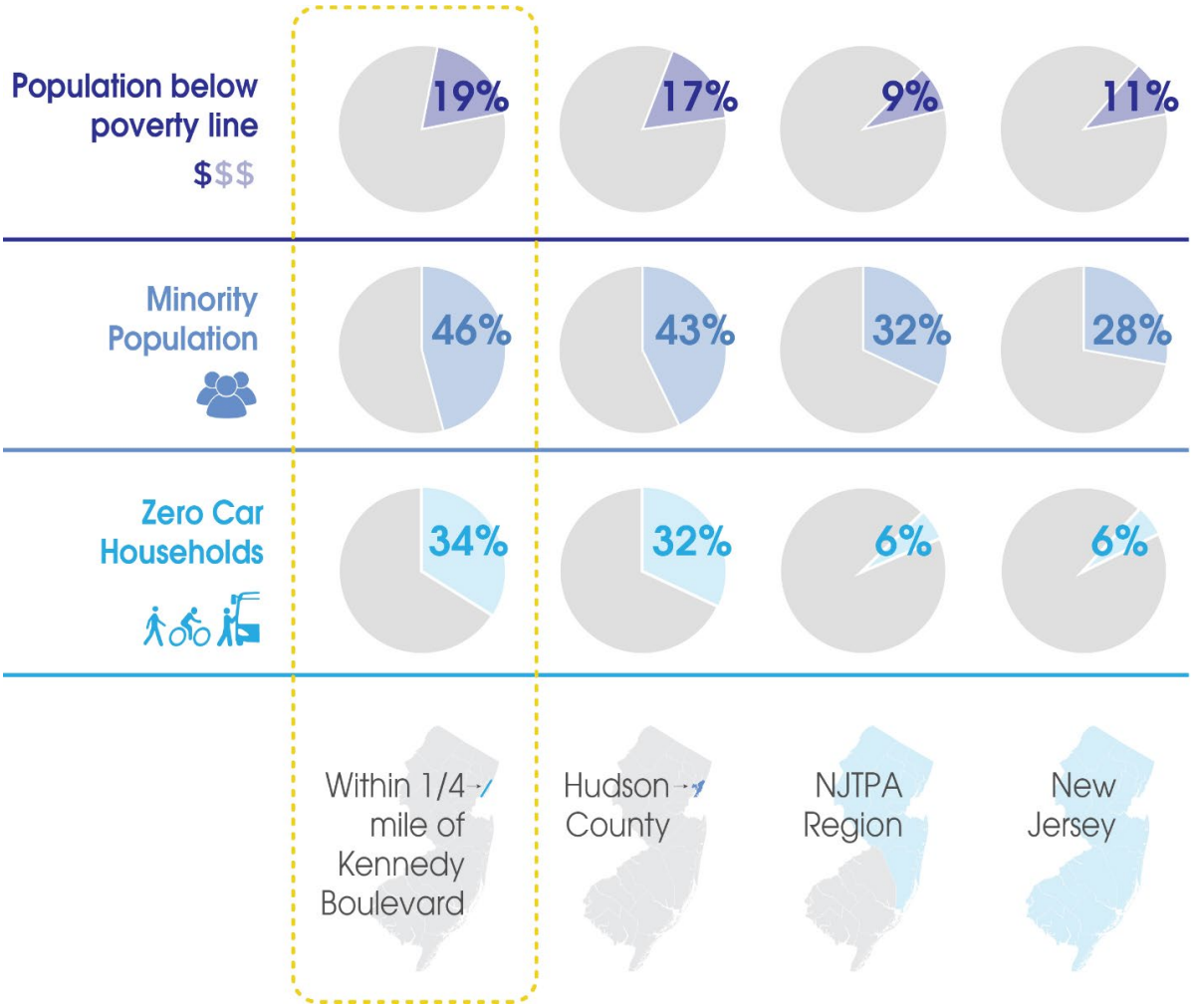
More specific findings and key takeaways on probable contributing circumstances can be found in Appendix A.

[13] Analysis of Pedestrian Crashes https://www.nhtsa.gov/DOT/NHTSA/NRD/Multimedia/PDFs/Crash%20Avoidance/2003/DOTHS809585.pdf
[14] Dangerous by Design https://s3.amazonaws.com/cdn.smartgrowthamerica.org/dangerous-by-design-2016.pdf

DEMOGRAPHICS

When studying a corridor, it's important to consider the characteristics of the households and individuals who live there. There are 208,126 individuals living within a ¼-mile of Kennedy Boulevard. They represent about 31 percent of Hudson County's population. With such a large sample of the population, residents near Kennedy Boulevard closely resemble the make-up of the county as a whole (**Figure 2** and **Table 5**).

Figure 2 Environmental Justice Communities on Kennedy Boulevard and Surrounding Geographies[15]



American Community Survey Five-year Estimates (2017)

[15] "Minority Population" includes anyone who is non-white or is Latino.

Table 5 Demographic Characteristics of Kennedy Boulevard

	Within ¼ mile of Kennedy Boulevard	Hudson County	NJTPA Region	New Jersey
Disabled	8%	8%	10%	11%
Aged 65 or older	12%	11%	15%	15%
Under 18	23%	20%	24%	25%

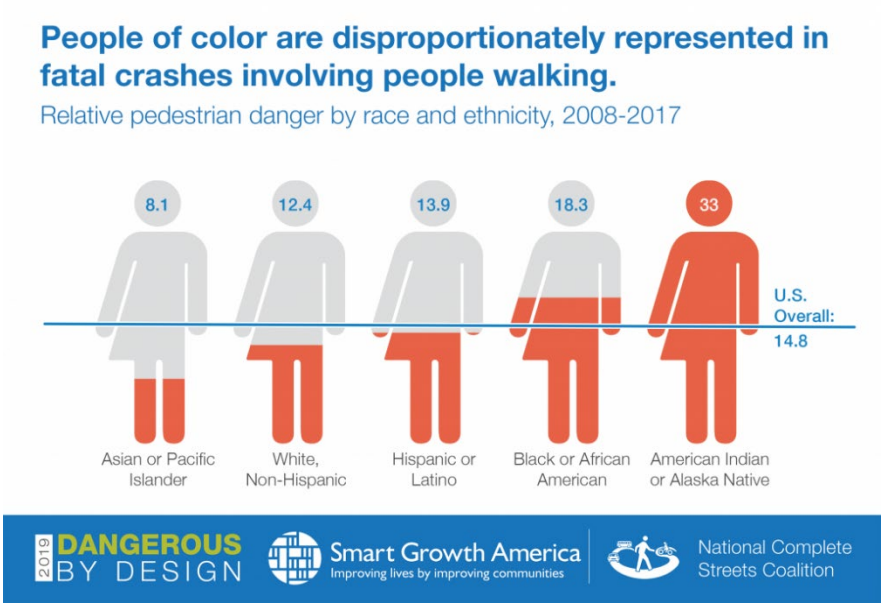
American Community Survey Five-year Estimates (2017)

Although some neighborhoods along Kennedy Boulevard have a higher concentration of environmental justice communities and vulnerable user groups[16] than others, nearly every segment along the corridor touches upon Census Block Groups with a high concentration of one of these groups. When considering modifications to infrastructure and associated policies, it is important to consider how environmental justice and vulnerable user groups will be impacted by the modifications. Considerations include:

- The need for people with disabilities to travel safely through the corridor, which requires universal access principals including but not limited to ADA-accessible ramps, unobstructed sidewalks, and audible pedestrian signals.
- Multimodal access allows people without access to personal vehicles to reach jobs, medical appointments, schools, recreational opportunities, and other regional destinations on foot, by bike, or by transit.
- Environmental justice communities have historically been underrepresented in decision-making related to infrastructure, and as a result, are disproportionately exposed to negative impacts. Developing a process for engaging communities and allowing for meaningful input is critical from the start of a project through implementation.
- According to a study conducted by Smart Growth America called "Dangerous by Design," pedestrian fatalities are more common among people who are non-white (**Figure 3**) or low-income (**Figure 4**) than the public at large. Older adults are also over-represented in pedestrian fatalities (**Figure 5**). This study used a metric called Pedestrian Danger Index that considered pedestrian deaths relative to the population and percentage of walking trips for a specified geography.

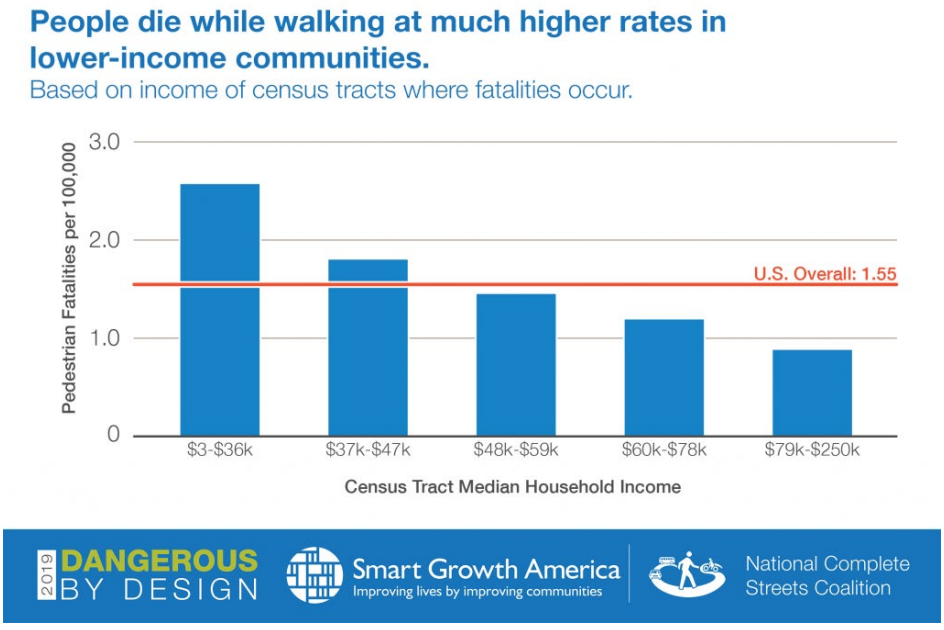
[16] "Vulnerable user groups" include older adults (aged 65+), children (under 18 years old), and people with disabilities.

Figure 3 **Pedestrian Fatalities Relative to Race/Ethnicity**



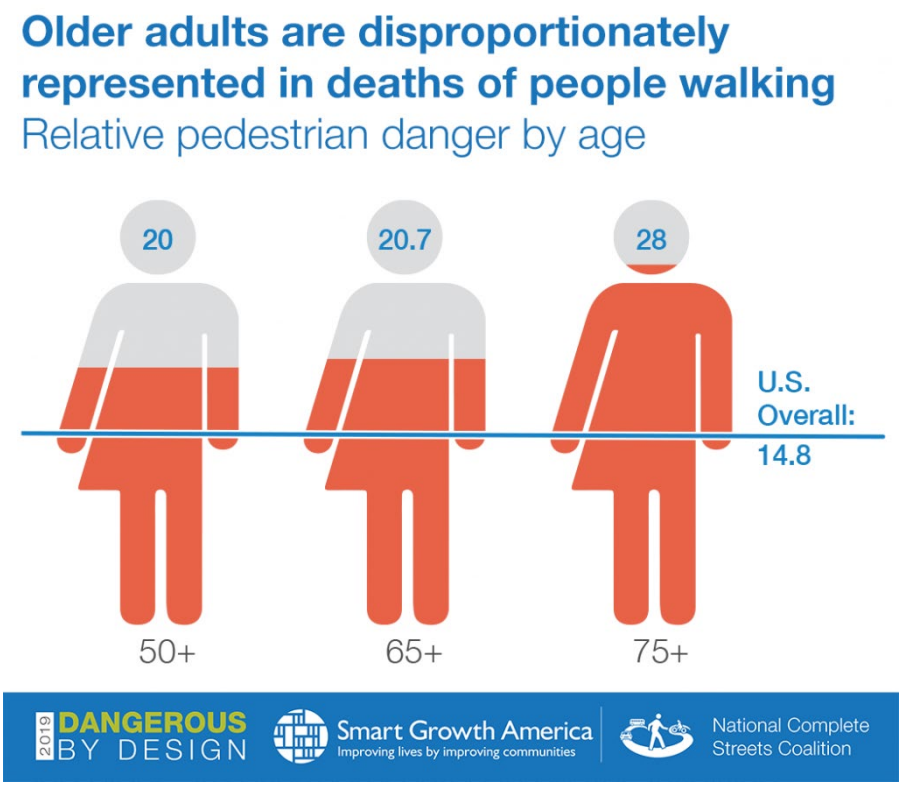
Source: Smart Growth America (2019)

Figure 4 **Pedestrian Fatalities Relative to Income**



Source: Smart Growth America (2019)

Figure 5 **Pedestrian Fatalities Relative to Age**



Source: Smart Growth America (2019)

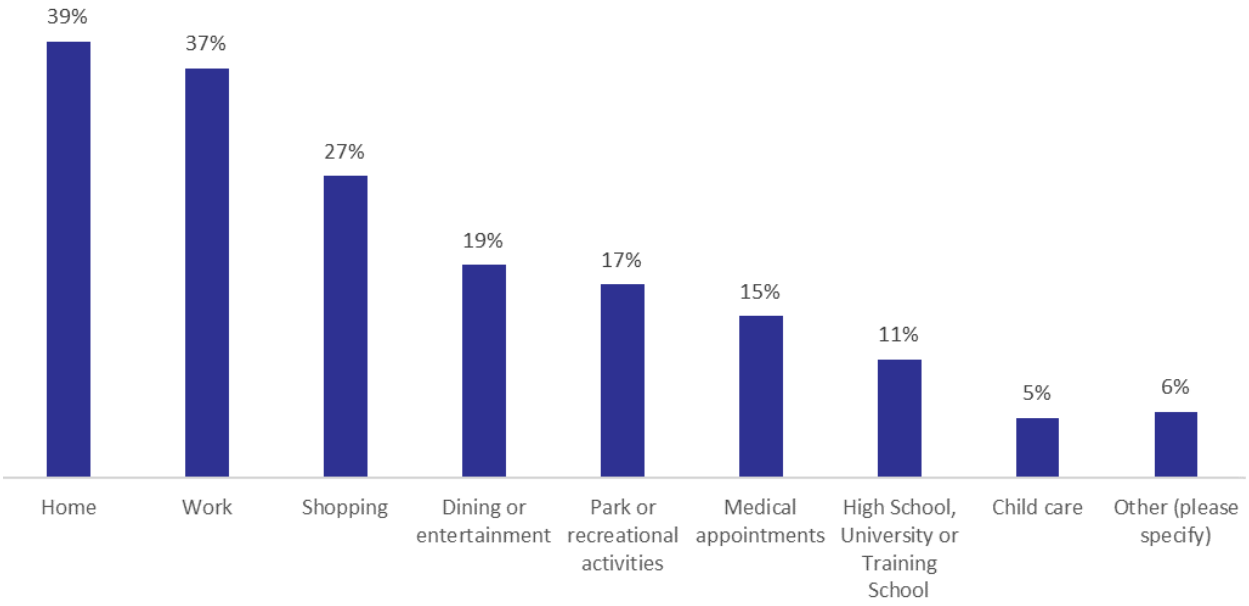
It is also worth noting that there are 44 schools along Kennedy Boulevard, many of which attract students from beyond the corridor. There are nearly 48,000 people under the age of 18 who live along the corridor, the majority of whom are in school. Although the Census does not collect travel patterns of people under the age of 16, representatives from municipalities along the corridor suggested that walking is the most common commute method for many of the schools. This is a noteworthy caveat when considering households with access to vehicles. Although most households have access to a vehicle, this does not mean that everyone within the household uses the vehicle regularly.

ACCESS

In addition to residences and schools, the corridor features a wide array of other destinations. Respondents to the study's e-survey said they traveled on Kennedy Boulevard to get to work, shops, dining, and go to parks (**Figure 6**). There are 48,456 jobs within a ¼-mile of Kennedy Boulevard.[17] It also hosts several universities and colleges, including New Jersey City University, Saint Peter's University, and Hudson County Community College. Additional community destinations include municipal buildings, parks, and transit hubs (e.g., Journal Square).

[17] LEHD On the Map

Figure 6 E-survey Respondent Destinations on Kennedy Boulevard



Kennedy Boulevard is also a critical regional connector. It connects Hudson County to the Bayonne Bridge (NJ-440), NJ-495, and the Pulaski Skyway (US Route 1/9). Moreover, Kennedy Boulevard is the only local north-south corridor that stretches nearly the full-length of Hudson County. Although Bayonne has several north-south alternatives, the road network and major obstacles (e.g., NJ-495) prevent other corridors from providing unbroken north-south connections.

PUBLIC & STAKEHOLDER INVOLVEMENT

The existing conditions shape public and stakeholder perception of the corridor. This study took a multi-pronged approach to outreach. To reach the public, the project team utilized an e-survey, three pop-up events, and a public meeting. To reach municipal stakeholders, the project team conducted six stakeholder interviews (one for each municipality) and three TAC meetings. The TAC meetings also included stakeholders from other agencies and organizations, such as NJTPA, NJDOT, NJ TRANSIT, Hudson TMA, Hudson County Community College, and St. Peter's University.

E-survey and Pop-up Results

The John F. Kennedy Boulevard Safety Study project team hosted pop-up events in August and September 2018. The pop-up locations included Washington Park Wednesdays in Union City/Jersey City, Braddock Park Farmers Market in North Bergen, and New Jersey City University in Jersey City. The pop-up events were held to give the public an opportunity to learn about the study, meet directly with the project team, and help ensure questions about the project are being addressed. At each pop-up event, project team members distributed bilingual bookmarks, asked attendees to participate in the online survey, and collected suggestions for the "How would you improve Kennedy Boulevard?" banner. The following key themes emerged from these events:

- Add high-visibility crosswalks
- Safety improvements to jitney services

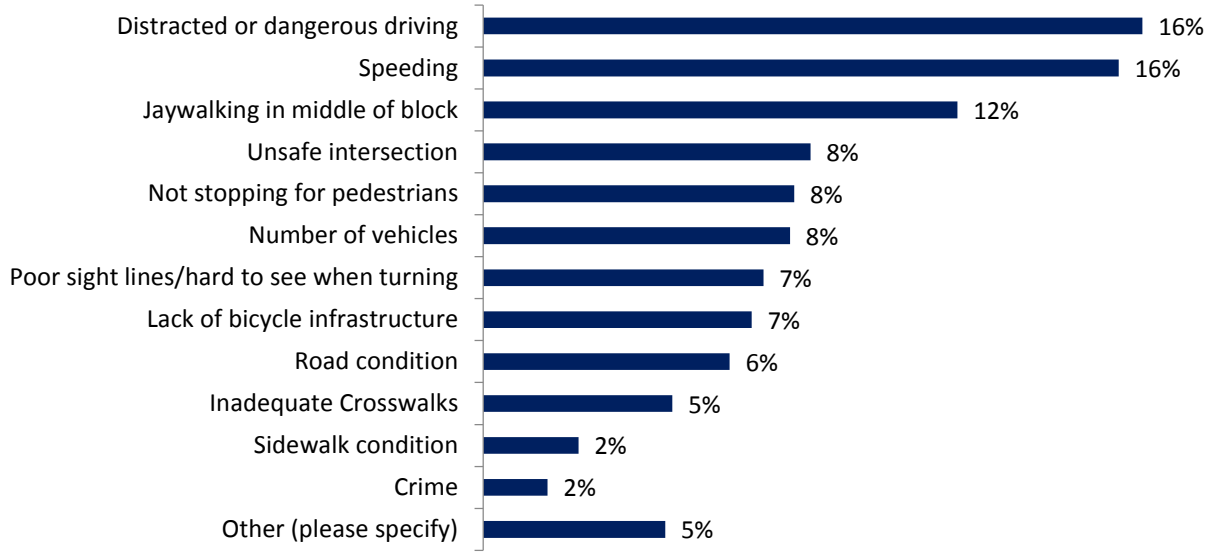
- Improve sidewalk and road conditions
- Provide better access to parks
- Improve trash maintenance

Pop-up events were held at three locations, including the Braddock Park Farmers Market (left) and New Jersey City University (right). Source: FHI

From August through November, 775 people completed the bilingual e-survey. The survey was comprised of 10 questions gauging the participants' use of Kennedy Boulevard, their perception of safety, and demographics. These questions were designed to provide a full picture of how stakeholders interacted with Kennedy Boulevard.

Eighty-eight percent of respondents said they traveled on Kennedy Boulevard a few times a week or even every day. The predominant safety concerns included distracted or dangerous driving, speeding, crossing in the middle of the block, and unsafe intersections.

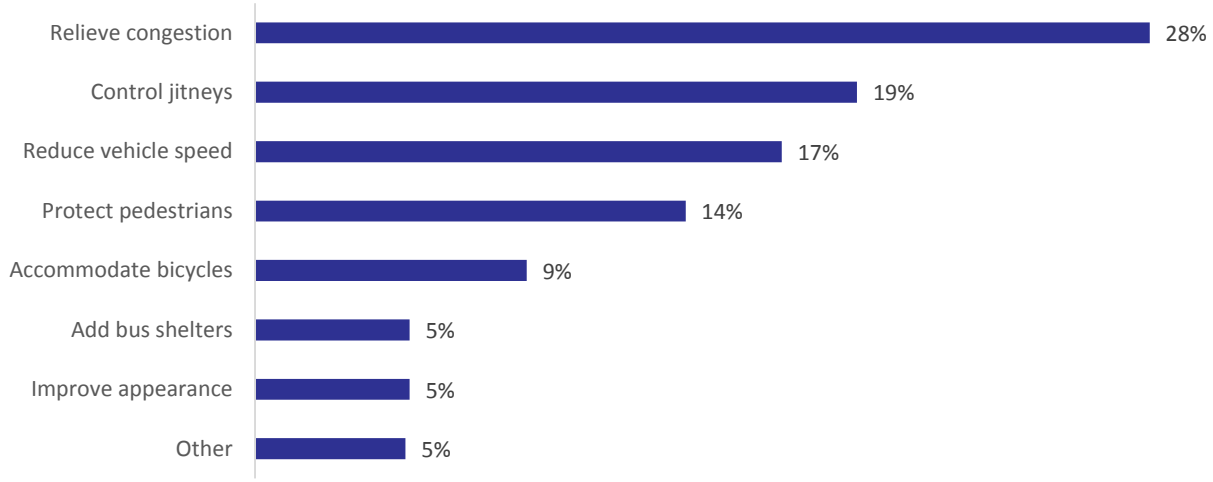
Figure 7 E-survey Respondent Safety Concerns



When asked about the intersections that felt most unsafe, Paterson Plank Road, Communipaw Avenue, and the intersections near Journal Square were mentioned the most frequently. As for how to improve walking along the corridor, respondents most frequently mentioned slower vehicle speeds, increasing pedestrian crossing time, and more lighting. "Other" responses included double parking, construction concerns, and enforcement.

The primary concerns on Kennedy Boulevard pertain mostly to vehicles. About 28 percent of respondents listed relieving congestion as their top priority. Controlling jitneys was second (19 percent), and reducing vehicle speeds was third (17 percent). Although prioritized strategies pertaining to walking, biking, and transit use ranked lower, the sum of these elements matches the top priority.

Figure 8 E-survey Respondents' Prioritized Strategies



Stakeholder Interview Results

The stakeholder interviews with Bayonne, Jersey City, Union City, North Bergen, Guttenberg, and West New York, conducted in July and August 2018, provided insight into the perception of Kennedy Boulevard. Planners, engineers, business administrators, and police officers were present at these interviews. Their primary concerns included:

- **Pedestrian Safety.** The representatives emphasized the importance of designing safer streets for pedestrians. Some also argued for increased education campaigns and enforcement to reduce distracted driving and increase pedestrian awareness.
- **Jitneys.** Jitneys are a major concern. Several municipalities discussed aggressive driving and others noted the added congestion because jitneys stop in the travel lanes to pick up passengers. In Bayonne, there were concerns about jitneys idling. Several municipalities would like to see more regulation.
- **Parking.** Losing parking is a frequent complaint from residents. A representative from Union City pointed out that providing parking helps to reduce traffic speeds.
- **Transit.** Representatives from Bayonne and Jersey City both suggested that bus rapid transit (BRT) should be implemented on Kennedy Boulevard. Other municipalities hoped to see improved transit stops (i.e., bus shelters).

- **Bicycle lanes.** Several representatives said bikes are not common on Kennedy Boulevard but highlighted the potential of increased bike traffic with the new bike share programs. A representative from Bayonne said the School Travel Plan suggests bike lanes for students but that the City of Bayonne is not ready for bike lanes or complete streets.

TAC Priorities

The project team met with the TAC three times throughout the study. The meetings were held at points in the project timeline that would help the project team make key decisions about the process and recommendations.

- **TAC Meeting #1:** Identify prioritization criteria and select study focus areas
- **TAC Meeting #2:** Determine the most appropriate design interventions for each focus area
- **TAC Meeting #3:** Provide input on draft design and policies

The multiple TAC meetings reinforced the vision of Kennedy Boulevard as a safer corridor for all road users. The initial meeting with the TAC emphasized the need to prioritize areas with a high concentration of crashes while emphasizing the importance of equity and vulnerable road users, notably pedestrians and bicyclists. The results from the second and third TAC meeting are discussed in the recommendations section.

CONCLUSION

The overall transportation context, previous and ongoing planning and engineering efforts, crash history, demographics, access, and results from the public and stakeholder involvement collectively suggest that the communities along Kennedy Boulevard support streets designed with active transportation modes and speed reduction in mind. Speed reduction strategies, improved transit facilities, and bicycle and pedestrian infrastructure appeared in nearly every source the project team came across or analyzed. The recommendations developed in the following section considers a short- to long-term vision for Kennedy Boulevard. Recommendations were developed with the recognition that all types of users travel on Kennedy Boulevard and that the safety of the most vulnerable is a key priority.

NACTO's modal hierarchy prioritizes people in street design.

CHAPTER THREE

KENNEDY BOULEVARD DESIGN TOOLBOX

JFK BLVD

SAFETY CORRIDOR STUDY

This section outlines the primary design interventions that are included among the recommendations. In some cases, additional design interventions have been considered. These are discussed in the recommendations sections.

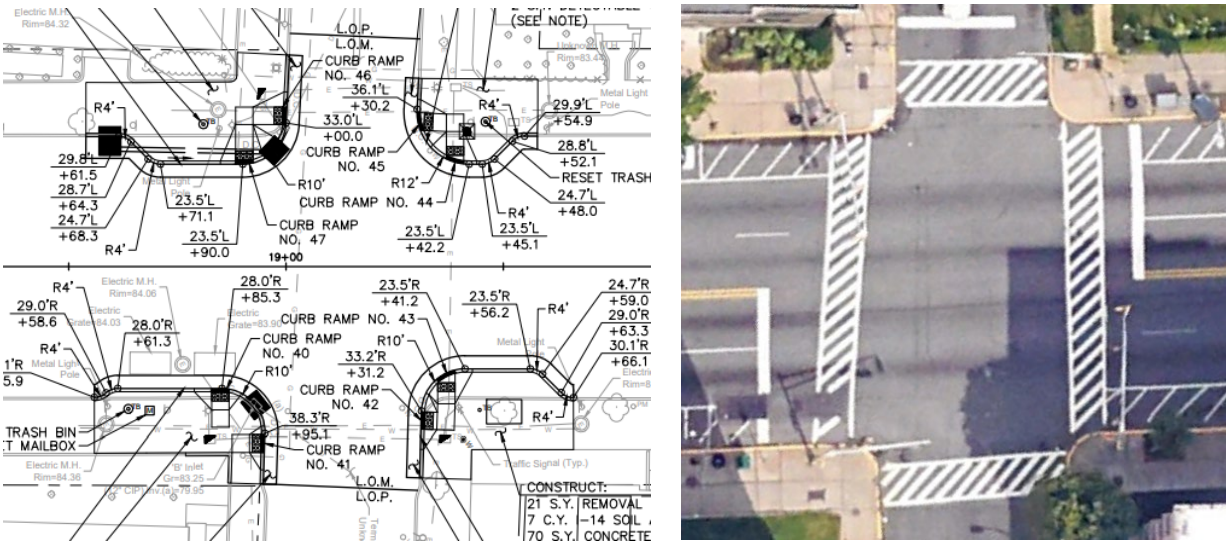
CURB EXTENSIONS

What is it? Curb extensions extend the sidewalk into the existing roadway. Although sometimes implemented midblock, curb extensions are usually constructed at intersections.

What concern is the design intervention trying to address? Curb extensions promote pedestrian visibility, slow vehicle speeds, and prevent illegal parking. Additionally, curb extensions shorten the crossing distance.

Where should it be considered? Curb extensions are easiest to implement on streets with parallel parking. Where feasible, these should be implemented in areas with pedestrian visibility concerns, long crossing distances, or high vehicle speeds. It should be noted that parking spaces are not "removed" at potential locations. Curb extensions are almost always implemented where parking is illegal. Hudson County is in the process of installing curb extensions at certain intersections of Kennedy Boulevard between Communipaw Avenue to Sip Avenue.

How effective is it? Measuring pedestrian visibility is challenging, but studies have shown a significant reduction in vehicles failing to yield.[18]



Hudson County Engineering in partnership with Greenman-Pedersen, Inc. (GPI) has designed curb extensions at multiple intersections on Kennedy Boulevard, including this one at Kensington Avenue. Source: GPI/Hudson County and Google Streetview

[18] Pedestrian Safety Impacts of Curb Extensions: A Case Study
https://nacto.org/docs/usdg/pedestrian_safety_impacts_of_curb_extensions_randal.pdf


Images of Washington Street and 6th Street in Hoboken before and after curb extensions were installed. Source: Google Street View

BUS BULBS

What is it? The purpose of bus bulbs is to facility bus boarding. Bus bulbs extend the sidewalk into the existing roadway. They are most commonly done at intersections, but midblock bus bulbs are possible.

What concern is the design intervention trying to address? Bus bulbs promote pedestrian visibility and prevent illegal parking that can block the bus stop. Bus bulbs also allow for easier boarding and, in some cases, enhanced bus stops, which may include shelters, benches, or green infrastructure.

Where should it be considered? Bus bulbs are easiest to implement on streets with on-street parking. Bus bulbs should be considered where buses have trouble re-entering traffic after picking up passengers.

How effective is it? Studies have shown bus bulbs reduce bus delay without major traffic impacts.[19] Although research is limited on the safety benefits of bus bulbs, they work to improve visibility and limit the time users spend in the travel lane when boarding or waiting for stops.

Example of a bus bulb in San Francisco. Source: NACTO

[19] TCRP Report 65 Evaluation of Bus Bulbs https://nacto.org/docs/usdg/tcrprpt65_fitzpatrick.pdf

DAYLIGHTING CROSSWALKS

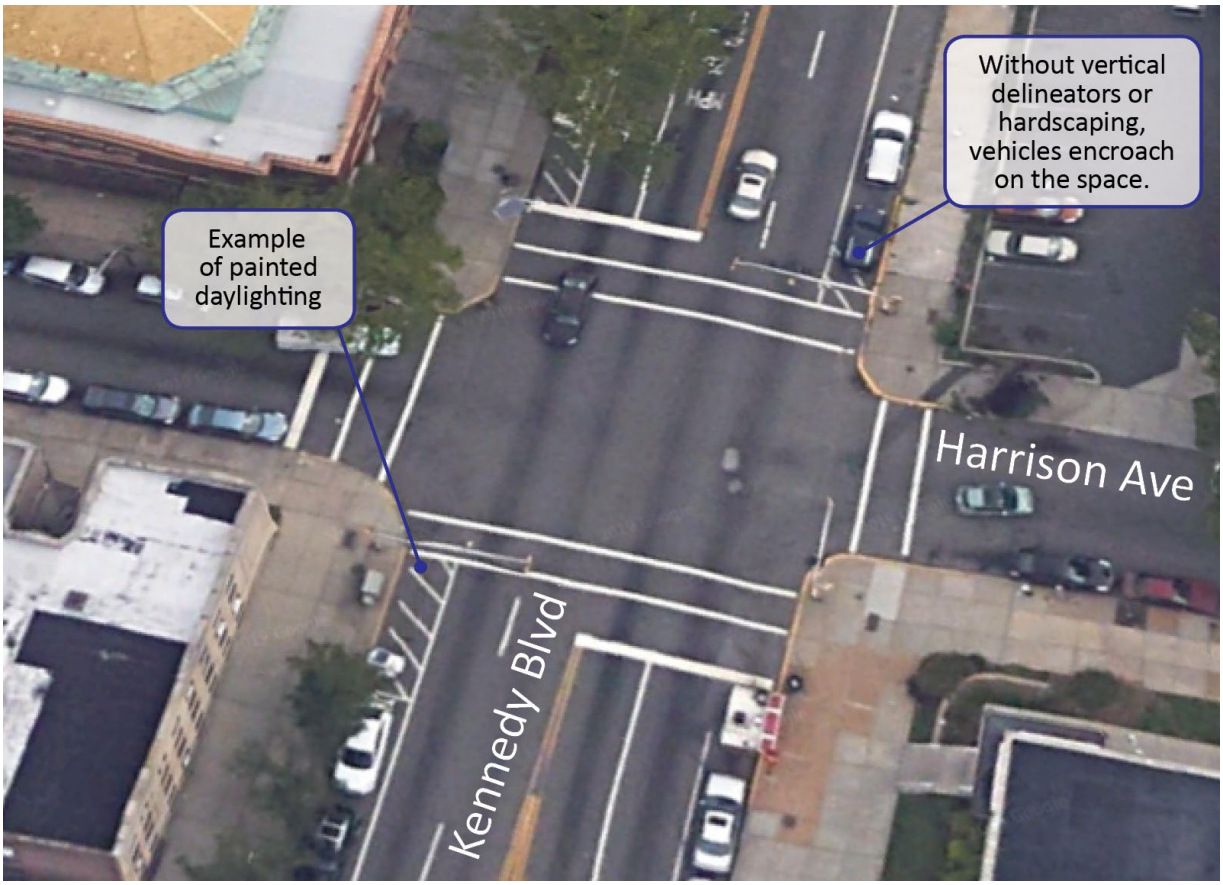
What is it? Daylighting is a set of vertical delineators paired with paint in advance of a crosswalk that prevents cars from parking too close to an intersection.

What concern is the design intervention trying to address? Daylighting is one way to promote pedestrian visibility. Daylighting also enhances visibility for conflicting vehicles pulling out of a minor road.

Where should it be considered? It should be implemented at locations where vehicles frequently park illegally (e.g., too close to intersections).

How effective is it? Studies have shown daylighting can improve overall pedestrian visibility by preventing parked vehicles from blocking sightlines.[20]

Figure 9 Daylighting on Kennedy Boulevard



Source: Google Earth

[20] An Overview and Recommendations of High-visibility Crosswalk Marking Styles https://nacto.org/docs/usdg/overview_and_recommendations_high_visibility_crosswalk_marking_styles_mcgrane.pdf

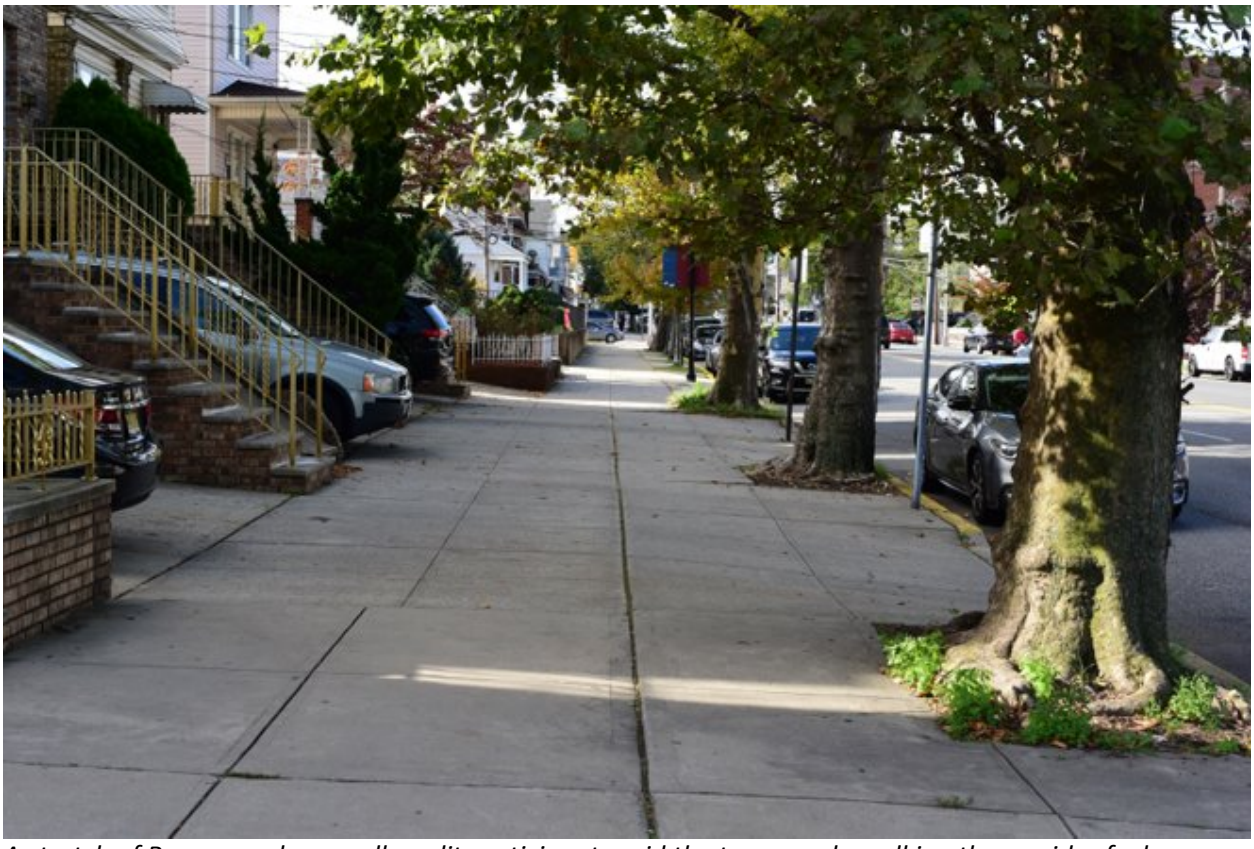
TREES & LANDSCAPING

What is it? Trees, bushes, grasses, and groundcovers integrated into the streetscape through tree pits, or center medians. Hudson County Planning Board's Shade Tree Fund is used to plant trees along Hudson County roads, including Kennedy Boulevard. Paired with bioswales, raingardens, and other green stormwater infrastructure, trees can play an important role in helping manage stormwater.

What concern is the design intervention trying to address? Trees and landscaping can help add to the aesthetics of a community, but they have the added benefit of buffering pedestrians from traffic. Plantings in bioswales and raingardens may also help mitigate the effects of stormwater and reduce flooding.

Where should it be considered? Trees and landscaping should be considered at locations where the sidewalks are wide enough to accommodate plants. The plantings should not limit visibility of crossing pedestrians or turning vehicles. Stormwater management can be helpful in lots of locations but especially where there is poor drainage.

How effective is it? Trees have been shown to improve property values, perhaps a result of improved aesthetics. Some studies provide evidence that street trees could reduce driver speed as well.[21]



A stretch of Bayonne where walk audit participants said the trees made walking the corridor feel more comfortable. Source: FHI

[21] Street Tree Effect and Driver Safety https://www.naturewithin.info/Roadside/Tree&Driver_ITE.pdf

DEDICATED TURN LANES

What is it? On a two-way street such as Kennedy Boulevard, dedicated turn lanes can either be dedicated left-turn lanes running in the middle of the roadway or dedicated right turn pockets.

What concern is the design intervention trying to address? Turning movements are the cause of many of the high-risk movements recorded by MioVision cameras as part of the John F. Kennedy Boulevard Safety Corridor Study. Dedicated turn lanes allow for turning vehicles to slow and wait for gaps out of the way of moving traffic. This can significantly reduce potential conflict as vehicles do not weave to avoid stopped vehicles and can reduce stress of drivers on the corridor and improve intersection operations. In some cases, dedicated turn lanes can provide some congestion relief by keeping the through lanes clear.

Where should it be considered? Turn lanes on Kennedy Boulevard should be considered in locations with a high frequency of turning related crashes, congested segments, and where space allows. On Kennedy Boulevard, installing turn lanes often means removing parking on both sides of the street. This pushes travel lanes closer to the sidewalk; without parking, the added layer of protection for pedestrians is removed. Furthermore, removing parking can lead to increased travel speeds and thus lead to higher road noise and a less desirable pedestrian environment.[22]

How effective is it? Installing left-turn lanes can reduce crashes in urban environments by approximately 47 percent.[23]

Aerial of Secaucus Road and Kennedy Boulevard, where dedicated left-turn lanes were installed Source: Hudson County

[22] The effects of on-street parking and road environment visual complexity on travel speed and reaction time. https://www.sciencedirect.com/science/article/abs/pii/S0001457511002879

[23] Crash Modification Factor Clearinghouse http://www.cmfclearinghouse.org/detail.cfm?facid=269

TURN RESTRICTIONS

What is it? Left-, right-, and U-turn restrictions are implemented through signage notifying drivers of illegal maneuvers. In some cases, more robust infrastructure can be implemented to prevent turns.

What concern is the design intervention trying to address? Turn restrictions are intended to prevent turning-related crashes, particularly crashes with pedestrians in the crosswalks.

Where should it be considered? Turn restrictions should be considered at locations where there is a high frequency of turning-related crashes or locations where there is a high volume of pedestrians or people riding bicycles.

How effective is it? Studies have shown that restricting turning can reduce crashes by as much as 62 percent at urban intersections.[24]

LEADING PEDESTRIAN INTERVALS

What is it? Leading pedestrian intervals (LPIs) give pedestrians a three- to seven-second head start as they enter the crosswalk. In some cities, bicyclists can also pass through the intersection with the pedestrians.

What concern is the design intervention trying to address? LPIs increase pedestrian visibility and, in some cases, increase overall pedestrian crossing time.

Where should it be considered? LPIs should be considered at intersections with limited pedestrian visibility, particularly at locations with high pedestrian volumes, adjacent to schools, or where there is a history of vehicle-pedestrian conflicts.

How effective is it? Studies have shown LPIs can reduce pedestrian-vehicle crashes by 59 percent.[25]

[24] Federal Highway Administration https://safety.fhwa.dot.gov/intersection/other_topics/fhwasa08008/ub11_restrict_turning.pdf

[25] Crash Modification Factor Clearinghouse http://www.cmfclearinghouse.org/study_detail.cfm?stid=111

CASE STUDY: LEADING PEDESTRIAN INTERVALS (LPI)

State Route 26 and College and Beaver Avenues are two urban principal arterial highways in State College, Pennsylvania. Each arterial street has two through lanes, with average daily traffic of approximately 13,500 and 12,000 for College and Beaver Avenues, respectively. All roadways within the study area have a speed limit of 25 mph.

There are high pedestrian volumes during peak periods, associated with class schedules at nearby Penn State University. Ten signalized intersections were selected for a leading pedestrian interval treatment in March 2005. The length of the LPI at each treatment site is three seconds.

A study conducted after implementation found an estimated 59 percent reduction in pedestrian-vehicle crashes due to the LPIs. This is similar to the 60 percent reduction in pedestrian-vehicle crashes at intersections with LPIs that the Federal Highway Administration (FHWA) cites when recommending them as a proven safety countermeasure.

Sources:

Safety Effectiveness of Leading Pedestrian Intervals Evaluated by a Before-After Study with Comparison Groups, Aaron C. Fayish and Frank Gross, 2008

FHWA, Leading Pedestrian Intervals
http://safety.fhwa.dot.gov/provencountermeasures/lead_ped_int/

FHWA, Proven Safety Countermeasures https://safety.fhwa.dot.gov/provencountermeasures/

HIGH-VISIBILITY CROSSWALKS

What is it? High visibility crosswalks are crosswalks with striped, longitudinal lines (also called “continental” markings).

What concern is the design intervention trying to address? High-visibility crosswalks aim to increase visibility of pedestrians crossing Kennedy Boulevard and cross streets. The striping also discourages drivers from encroaching into crosswalks.

Where should it be considered? Hudson County Engineering is in the process of making all crosswalks along the corridor high visibility crosswalks.

How effective is it? Studies show a 40 percent crash reduction in vehicle-pedestrian crashes compared to simple parallel lines.[26]

[26] Crash Modification Factor Clearinghouse http://www.cmfclearinghouse.org/study_detail.cfm?stid=280

A high-visibility crosswalk at Glenwood Avenue and Kennedy Boulevard. Source: Google Street View

PAINTED RUMBLE STRIPS

What is it? Painted rumble strips create noise from vehicles running over the strips, signaling drivers to slow down.

What concern is the design intervention trying to address? Rumble strips are designed to reduce driver speed.

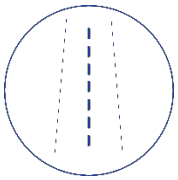
Where should it be considered? Painted rumble strips have been used near schools on Kennedy Boulevard as a traffic calming measure. "SCHOOL" is painted in advance of the rumble strips to further emphasize the approaching school zone. This study considers expanding the use of rumble strips in locations where speeding is common.

How effective is it? Rumble strips are a cost-effective way to reduce crashes. Studies show a small but statistically significant reduction in travel speed with the installation of rumble strips.[27]

[27] Speed Changes Due to Transverse Rumble Strips on Approaches to High-speed Stop-controlled Intersections. https://www.researchgate.net/publication/242555231_Speed_Changes_Due_to_Transverse_Rumble_Strips_on_Approaches_to_High-Speed_Stop-Controlled_Intersections

Painted rumble strips on Kennedy Boulevard are often implemented near schools. Source: Google Street View

CENTER LANE RUMBLE STRIPS



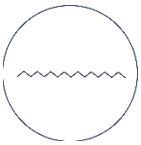
What is it? A center line rumble strip is a textured element that is added to the dividing or center line of a paved roadway. Created from milled or raised elements, the rumble strip vibrates and creates sound as it interacts with vehicle wheels on paved roads.

What concern is the design intervention trying to address? Center lane rumble strips are intended to alert inattentive drivers when they have left their travel lane. The strips are a safety measure intended to reduce the frequency and severity of opposing direction collisions.

Where should it be considered? On opposite direction roadways where a physical barrier, such as a roadway median, is not present. Such roadways with a history of opposing direction collisions should be given higher priority. Typically, center lane rumble strips are installed along the length of a corridor or roadway system, dependent on the crash history of corridors.

How effective is it? Center line rumble strips are among the most cost-effective measures available to reduce collisions and run-off-road crashes. Center line rumble strips reduce injury crashes by 38 to 50 percent on rural two-lane roads, and 37 to 91 percent on urban two-lane roads.[28]

TEXTURED PAVEMENT



What is it? Textured pavement is characterized by textured grooves in the pavement. Depending on the "wavelength" of the grooves, the texture can promote friction during different weather conditions.

What concern is the design intervention trying to address? Textured pavement can reduce the amount of skidding related run-off-road crashes and collisions, especially during wet weather by increasing the skid resistance, or friction factor of the roadway.

Where should it be considered? On roadways or sections of roadways where skidding, in wet or dry conditions, has proven to cause run-off-road crashes and collisions.

How effective is it? Treatment of roadways that have a history of wet weather run-off-road skidding crashes and collisions typically reduces the frequency of wet weather crashes by 50 percent, and total crashes by 20 percent.[29]

"DON'T BLOCK THE BOX" PAVEMENT MARKINGS

What is it? Crisscrossed markings at intersections paired with signage to encourage drivers not to block the box.

What concern is the design intervention trying to address? Drivers who roll through stop bars to cross the intersection before the previous car has cleared often end up blocking the intersection when the signal changes. This can make it difficult for vehicles on cross streets to travel through the intersection and it reduces pedestrian visibility.

Where should it be considered? Many intersections on Kennedy Boulevard have "Don't Block the Box" pavement markings. These should be used at locations where there is frequent congestion.

How effective is it? A Georgia Department of Transportation study did not find a significant reduction in blocking behavior based off the markings alone. Paired with an education campaign, this may be more effective.[30]

BIKE LANES

What is it? Bike lanes are dedicated lanes for bicyclists. These lanes are usually 5 feet wide and they are best paired with a buffer of some kind. Buffers can be delineated with paint, concrete, bollards, and/or parking. Additional pavement markings and signage reinforces the presence of cyclists and can also help with wayfinding.

What concern is the design intervention trying to address? Bike lanes aim to increase cyclist level of comfort and prevent crashes.

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[28] FHWA https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/t504040/
[29] FHWA https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/t504040/
[30] Guin, Angshuman, et al. Operational Evaluation of Do Not Block the Box Campaigns in Georgia (2006)

Where should it be considered? Bicycling is already common on the corridor, even in areas with heavy volumes or high speeds. Bike lanes should be considered on every segment, but especially in locations with destinations and community amenities (e.g., schools, parks, commercial districts).

How effective is it? Studies show bike lanes can reduce vehicle-bicycle crashes by 60 percent.[31]

A painted buffered bike lane in Austin, Texas. Source: NACTO

LANE WIDTH REDUCTION

What is it? Lane width reduction narrows the width of travel lanes, frequently from 12 feet or wider down to 10 or 11 feet wide.

What concern is the design intervention trying to address? Reducing lane width can create more space for other uses (i.e. wider sidewalks or bicycle lanes) in the existing curb-to-curb width while allowing for the same number of travel lanes and similar vehicular capacity. Furthermore, narrower lanes promote slower speeds. While this safety measure may not reduce the number of crashes overall, lowering speeds can reduce the severity of crashes.

Where should it be considered? Lane width reduction should be considered in locations where travel lanes are wider than needed. They should be considered where allowable right-of-way would be better suited for another use, such as a bike lane, bus lane, or expanded sidewalk. Concerns over narrow lane width can be mitigated by using soft edges (e.g., shoulder line or painted median).

[31] Crash Modification Factor Clearinghouse http://www.cmfclearinghouse.org/study_detail.cfm?stid=433

How effective is it? In urban environments, some studies show a reduction of lane width from 12 feet to 10 feet increased some types of less severe crashes by 28 percent,[32] however, other studies have shown lane width reductions have reduced crashes overall by as much as 53 percent.[33]

CASE STUDY: ROAD DIET

This study evaluated the reduction in crash history due to road diets — a reduction in travel lanes— in Iowa. It was conducted by the Iowa State University Department of Statistics in cooperation with Iowa Department of Transportation Office of Traffic and Safety (TAS). The study utilized monthly crash data and estimated volumes obtained from TAS for 30 sites. The sites had volumes ranging from 2,030 to 15,350 during that time span (1982-2004) and were largely located in smaller urbanized areas.

The main research objective was to assess whether road diets appear to result in crash reductions on Iowa roads. To meet the objective, the study analyzed crash data at each site before and after the conversions were completed.

These studies provide evidence that for most corridors with average daily traffic (ADT) below 20,000 vehicles, road diets have minimal effects on vehicle capacity, because left-turning vehicles are moved into a common two-way left-turn lane. A study for one site found that the 85th percentile free flow speed reduced four to five miles per hour and the percentage of vehicles traveling more than five miles per hour over the speed limit dropped by 30 percent after implementation of the four-lane to three-lane conversion.

There was a significant decrease in crash rate and density over time in all sites after treatment. Results indicate a 25 percent reduction in crash frequency per mile and a 19 percent reduction in crash rate. Furthermore, road diets are cited by the FHWA as being a proven safety countermeasure, which can help prioritize funding of such proposed safety improvements.

Sources:

Iowa's Experience with "Road Diet" Measures: Impacts on Crash Frequencies and Crash Rates Assessed Following a Bayesian Approach, Pawlovwich, et. al, August 2005

FHWA, Proven Safety Countermeasures https://safety.fhwa.dot.gov/provencountermeasures/

[32] Crash Modification Factor Clearinghouse http://www.cmfclearinghouse.org/study_detail.cfm?stid=439

[33] Harwood, Douglas W., "Effective Utilization of Street Width on Urban Arterials," National Cooperative Highway Research Program Report 330, Transportation Research Board, August 1990. https://nacto.org/docs/usdg/review_lane_width_and_speed_parsons.pdf

LIGHTING

What is it? Street lighting illuminates the roadway or sidewalks. At times, pedestrian-scale lighting should be different from lighting for the roadway.

What concern is the design intervention trying to address? Lighting addresses poor nighttime visibility. It can also help geographically orient road users.

Where should it be considered? Locations on Kennedy Boulevard with a high frequency of nighttime conflicts, as well as locations where there is a high volume of pedestrian traffic.

How effective is it? Studies show that improving lighting at intersections can reduce crashes by 53 percent.[34]

A NOTE ON DEMONSTRATION PROJECTS

Demonstration projects use paint, plastic bollards, and other low-cost materials to quickly develop safety or placemaking improvements. This method has become increasingly common in Hudson County. For instance, Jersey City painted colorful curb extensions at six intersections as part of the JC Walks Pedestrian Enhancement Plan. These short-term installations allowed community members, municipal employees, and elected officials comment on the potential for longer-term improvements. In Jersey City, the success of the short-term installations paved the way for longer-lasting pilot projects. Once funding is available, these curb extensions could be filled in with concrete.

Temporary installations (left) were installed at the intersection of Bergen Avenue and Sip Avenue as part of the JC Walks Plan. Feedback from the temporary installation help the City of Jersey City implement longer-term pilot projects at the same intersections. Source: FHI

[34] Crash Modification Factor Clearinghouse http://www.cmfclearinghouse.org/study_detail.cfm?stid=462

CHAPTER FOUR
RECOMMENDATIONS

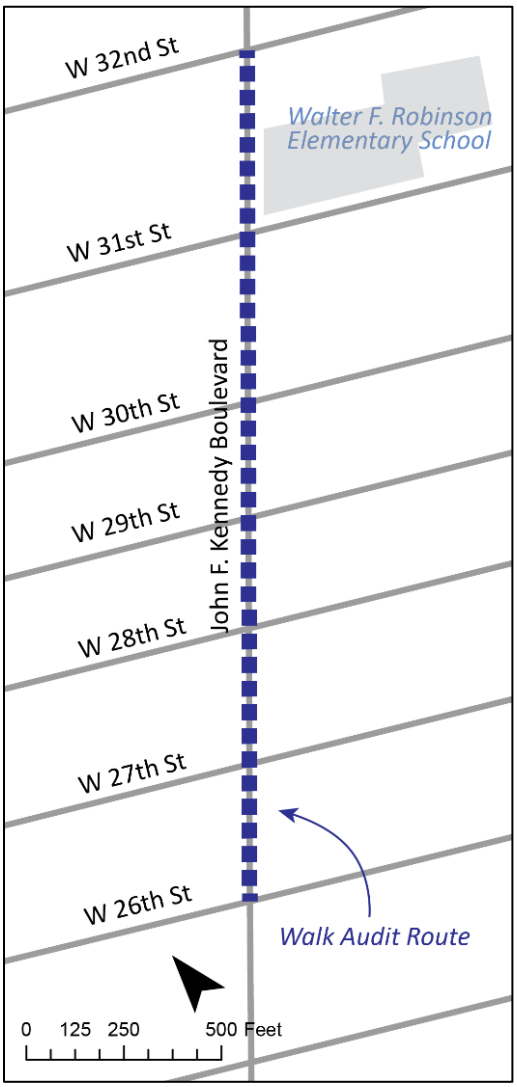
JFK BLVD
SAFETY CORRIDOR STUDY

The following sections detail the identified deficiencies, proposed design interventions, and costs for the four focus areas included in the study. Many of the design interventions could be applied at multiple locations within each focus area or potentially in locations beyond the focus area. Corridor-wide solutions are discussed following the four focus area sections. Unless otherwise noted, these recommendations are considered long-term, planning concepts. The concept drawings stem from feedback from the public, Technical Advisory Committee (TAC), and municipal stakeholders; however, additional collaboration with the adjacent communities, elected officials, municipal stakeholders, and other stakeholders (e.g., NJ TRANSIT, universities) will be required. Before implementation, additional study may be needed. Traffic studies, parking management plans, and bicycle master plans, would help guide the successful implementation of the proposed safety measures.

26TH STREET TO 32ND STREET (BAYONNE)

Existing Conditions

The section of Kennedy Boulevard running from 26th Street to 32nd Street in Bayonne is approximately 2100 feet in length and includes seven intersections, all of which are signalized. This portion of the corridor is classified by the county's Land Development Regulations[35] as a Residential Boulevard due to its "…grand, aesthetically appealing character offering wide sidewalks…tree canopy, on-street parking and ample lanes for vehicles." Curb-to-curb width is approximately 60 feet through this segment of the boulevard with approximately 11 feet allocated for the left travel lane and 19 feet allocated for both the right travel lane and unstriped parking in each direction.



This segment of the boulevard has a more residential neighborhood feel compared to the rest of the corridor. Average daily traffic is about 11,000 vehicles, and the street is fronted by single- and multi-family housing. Mature street trees are also present along this segment, largely towards the northern end of the segment. Land uses adjacent to the focus area are in Zone R-2, which specifies the district for residential housing. On the southern end of the study area at 26th Street, designated as Zone C-2, neighborhood commercial land uses are present.

Walter F. Robinson Elementary School occupies a large portion of the eastern block between W 31st Street and W 32nd Street. Other institutional land uses such as City Hall, Bayonne High School, and the public library are located one block off Kennedy Boulevard, accessible via W 27th Street,

[35] From *Hudson County Land Development Regulations for Smart Growth and Sustainable Development*, released by the county of Hudson and NJTPA in June of 2016.

W 28th Street, and W 31st Street, respectively.

Commercial land uses located on Avenue C, which is one block to the east of Kennedy Boulevard, include restaurants, convenience stores, and ShopRite (at Kennedy Boulevard & 26th Street), which are important neighborhood destinations and generate pedestrian traffic within this focus area. A redevelopment project on the southwestern quadrant of Kennedy Boulevard & W 28th Street for three one-bedroom units and four two-bedroom units is currently under construction.

Additional discussion of the existing conditions can be found in Appendix A.

Identified Deficiencies

This section summarizes the key findings from the October 2018 Walk Audit, technical analysis, feedback from the February 2019 Technical Advisory Committee meeting, and other relevant sources. These sources have identified the following as major challenges:

- Speed of traffic
- Traffic not yielding to pedestrians
- Obstacles in sidewalk (e.g., parked vehicles)
- Trees and other streetscape amenities are missing on the corridor

Walk Audit Results

Observations from walk audit participants:

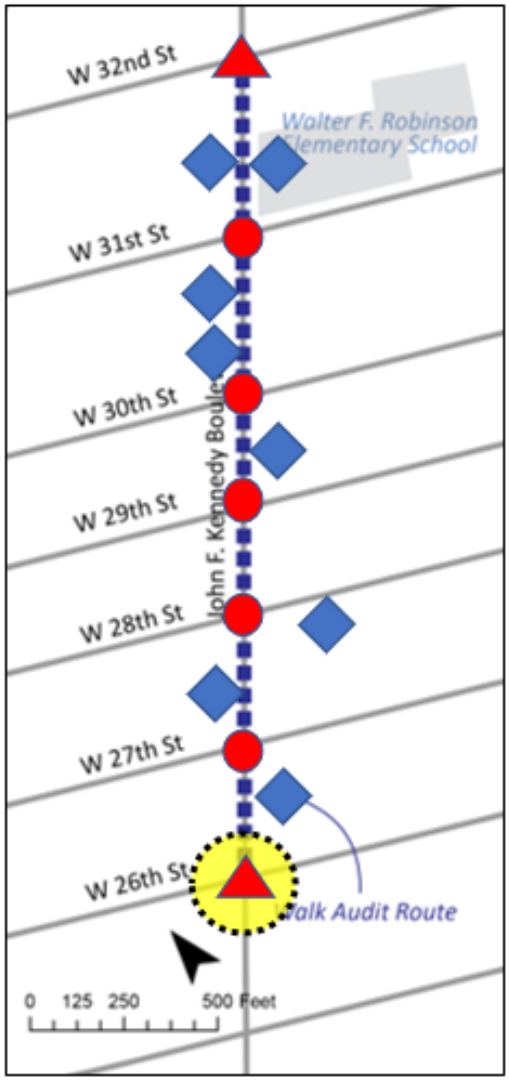
- Drivers make U-turns, particularly near the elementary school.
- There is a high frequency of parking violations, including double parking and parking too close to intersections. This limits pedestrian visibility.
- Heaving of sidewalk is present in a few locations near mature trees.
- Many street trees have been removed but not replaced.

Walk audit participants discussed key challenges on the corridor, which included parking violations, limited pedestrian visibility, and driver behavior. Source: FHI

Findings from Technical Analysis

- Crashes involving pedestrians are more than double the average share for the entire corridor.
- A review of crash type distribution for this focus area also reveals an elevated occurrence of turning-related collisions as compared to the entire Kennedy Boulevard corridor.[36]
- Traffic cameras observed high-risk events for vehicle-vehicle collisions for traffic turning left from Kennedy Boulevard onto W 26th Street; 35 high risk events occurring between northbound left-turn traffic and southbound through traffic and 56 high risk events occurring between southbound left-turn traffic and northbound through traffic during the observed 60-hour period. Additionally, several high risk and critical risk events for vehicles-pedestrians/bicyclists were observed.
- According to turning movement counts performed at the intersection with W 26th Street, 426 pedestrians crossed Kennedy Boulevard and 283 pedestrians crossed W 26th Street during peak period[37] conditions on an average weekday.
- According to turning movement counts performed at the intersection with W 26th Street, a total of 19 bicyclists crossed Kennedy Boulevard and four bicyclists crossed W 26th Street during peak period[37] conditions on an average weekday.

Many of the crosswalks lack high-visibility markings
Source: FHI



Predominant Safety Issues

- Pedestrians hit by turning vehicles
- Pedestrians hit by through vehicles
- Hit parked vehicle
- Highest crash location overall
- Miovision camera deployment

[36] Crash data collected from police investigation reports; most recent 3-year data set
[37] References to peak period in this report include AM/MD/PM peak periods, volume collected on a weekday 7-9AM, 11AM-1PM, and 4-6PM.

Near Collision between SB Left-turn Vehicle and Crossing Pedestrian at W 26th Street. Source: Miovision

Technical Advisory Committee Input

- Bike lanes are a consideration for local streets.
- The removal of parking is a significant issue in Bayonne.
- Potential design interventions that were viewed as highly effective and implementable in the short term were lighting, daylighting crosswalks, and leading pedestrian intervals.
- Potential design interventions that were viewed as less effective with long-term implementation were dedicated turn lanes, bike lanes, and lane width reduction.

A discussion of opportunities in Bayonne at the second TAC meeting. Source: FHI

Additional Sources

Online surveys and stakeholder interviews were also used to gather input on the segment design:

- Speeding and distracted/dangerous driving were the top concerns of e-survey respondents.

- E-survey respondents said slower vehicle speeds and increased pedestrian crossing time would most improve the walking environment.
- According to the stakeholder interview, the School Action Plan has requested bike lanes.

Site-Specific Challenges

Some locations along the corridor received considerable attention throughout the process. This section identifies the primary concerns raised by walk audit participants and TAC members.

31st Street and Kennedy Boulevard

The Walter F. Robinson School at 31st Street received considerable attention due to drivers double parking at pick-up and drop-off times. Students frequently exit vehicles and cross multiple travel lanes instead of crossing at the crosswalk. Drivers were also observed making illegal U-turns to double park on the opposite side of the street. Suggestions from the TAC include:

- The school could consider releasing all their students on 31st Street instead of Kennedy Boulevard.
- Access management needs to be considered for parking/discharge area on Kennedy Boulevard.
- Limited "No parking during school hours" signs around the perimeter of the school may be useful.

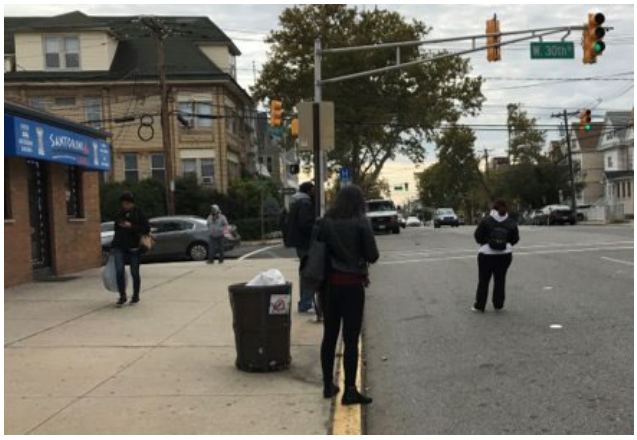
As with other school-adjacent locations on Kennedy Boulevard, there are rumble strips on the roadway both north and south of the school. The intersection features high visibility crosswalks and ADA-curb ramps. Crossing guards are also present during peak periods. However, drivers commonly encroach on the intersection, limiting visibility of pedestrians at the crosswalks.

(Below) Double parked vehicles adjacent to the Walter F. Robinson Community School. Source: FHI

30th Street and Kennedy Boulevard

The intersection of 30th Street and Kennedy Boulevard is a bus stop location used by NJ TRANSIT and jitney services. The bus stops lack amenities such as benches and shelters. It should be noted that this bus stop has been considered for consolidation in the NJ TRANSIT Bus Stop Consolidation Study. Students from the nearby Bayonne High School frequently access jitneys in the general vicnitity of 30th Street. Walk audit participants also noted the need for a high-visibility crosswalk, daylighting, and curb extensions.

Although the Bayonne portion of Kennedy Boulevard has many mature street trees that improve the comfort of walking along the corridor, walk audit participants noted the empty tree pits just south of 30th Street.



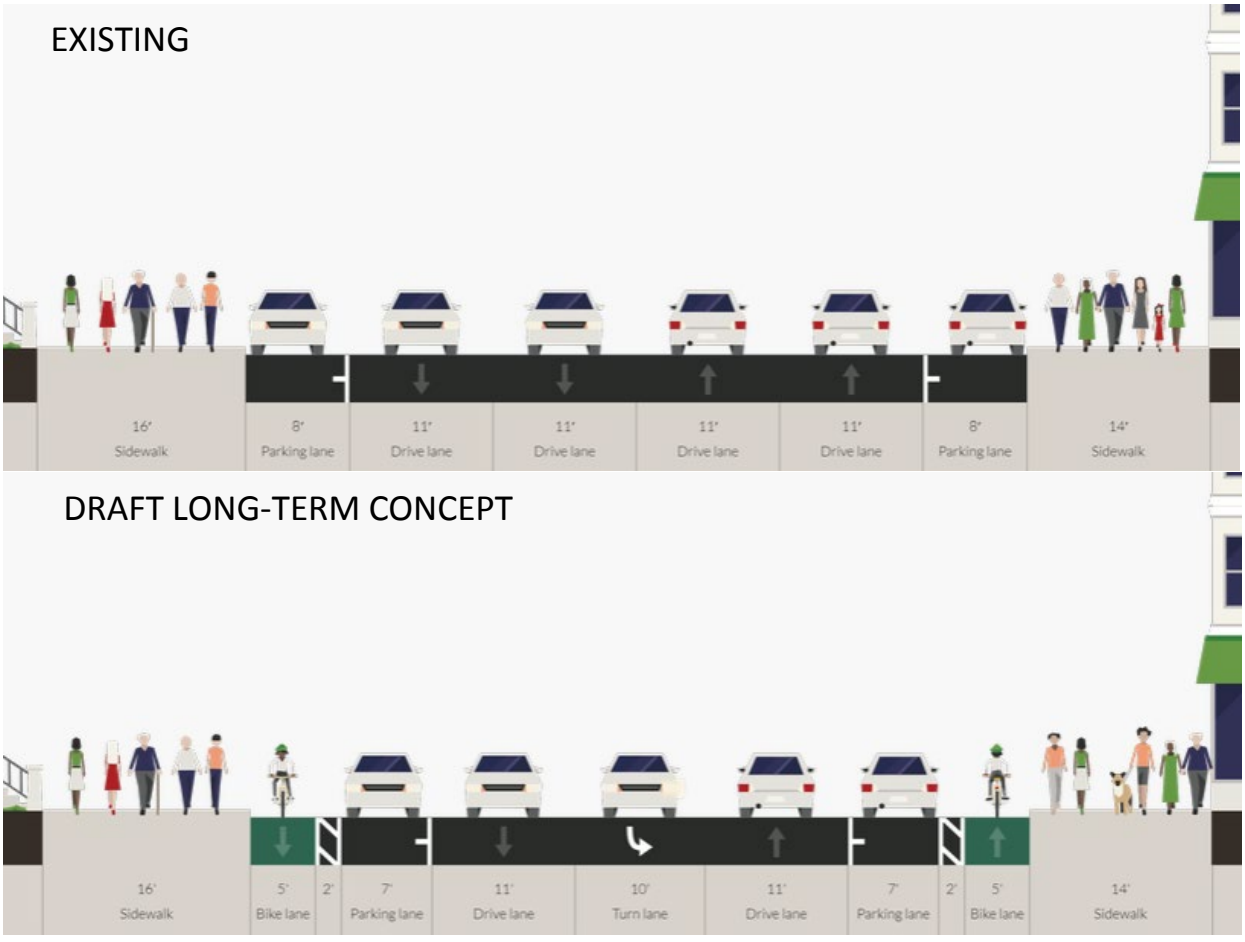
(Top) Transit riders waiting for NJ TRANSIT buses and jitneys at the northbound stop at 30th Street.
(Bottom) Stumps remain at many of the tree pits in Bayonne. Other tree pits are empty altogether.
Source: FHI

Recommendations

This section details the recommended modifications for the focus area. The concept drawings are to be considered a long-term vision unless otherwise indicated. Additional coordination with the City of Bayonne as well as feedback from the surrounding community will be needed if these designs move forward.

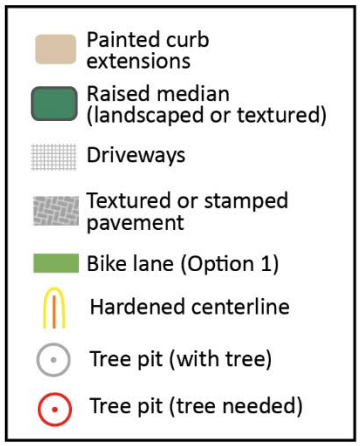
The relatively low traffic volumes on this segement of Kennedy Bouelvard present an opportunity to employ a road diet in Bayonne, which could open up opportunities by creating space for protected bicycle infrastruture or perhaps transit priority lanes. Even during peak hours, the intersections will be able to maintain their level of service, suggesting that the existing configuration has more capacity than is needed. The following pages illustrate a long-term concept, which proposes protected bike lanes. This would have less of an impact on on-street parking than bus priority lanes; that said, both options are worthy of additional study.

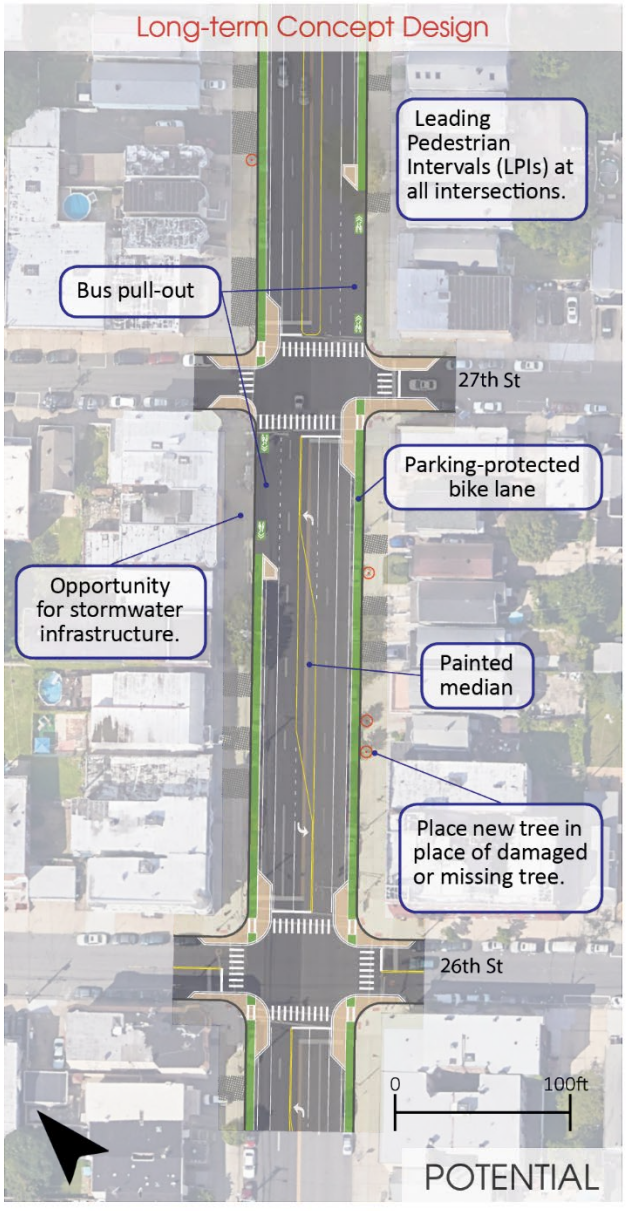
Figure 10 Cross Sections of Existing Conditions and Proposed Long-term Concept (26th Street)



26th to 27th Street & Kennedy Boulevard

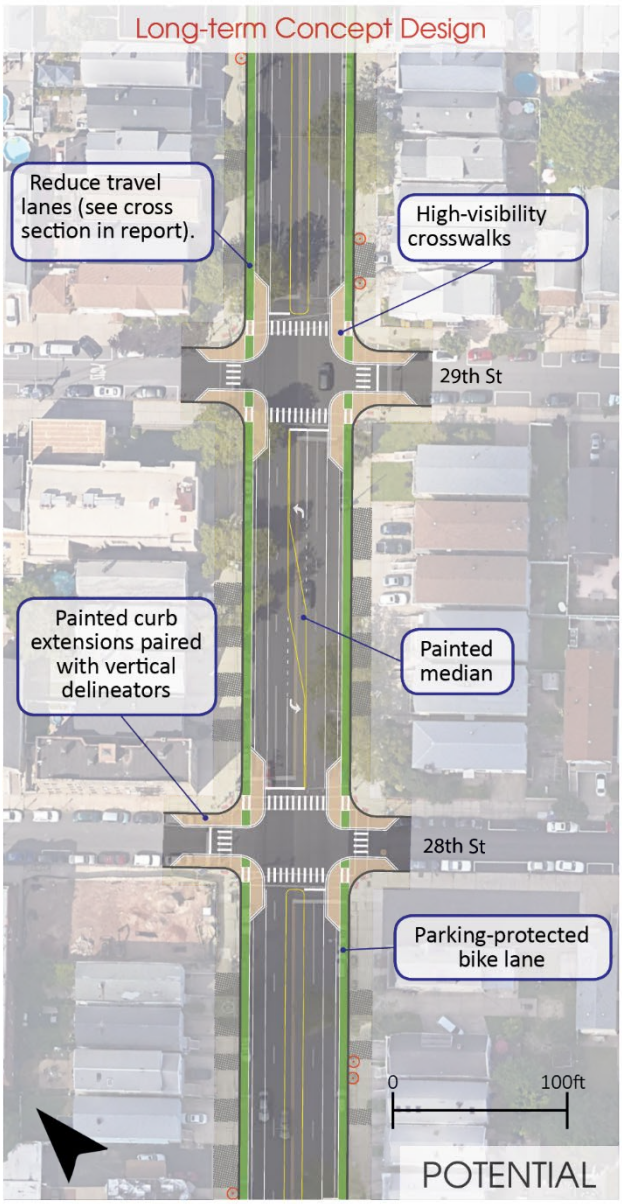
The segment below shows painted curb extensions at every corner, which will increase visibility and shorten the crossing distances. At 27th Street, the northbound and southbound bus stops have bus pull-outs. In these locations, the protected bike lane is replaced with super sharrows (a bicycle marking and chevron placed on a green backdrop), alerting bus drivers to the presence of cyclists. This corridor presents many opportunities for stormwater infrastructure, as well as the replacement of missing trees. LPIs are recommended at all intersections.





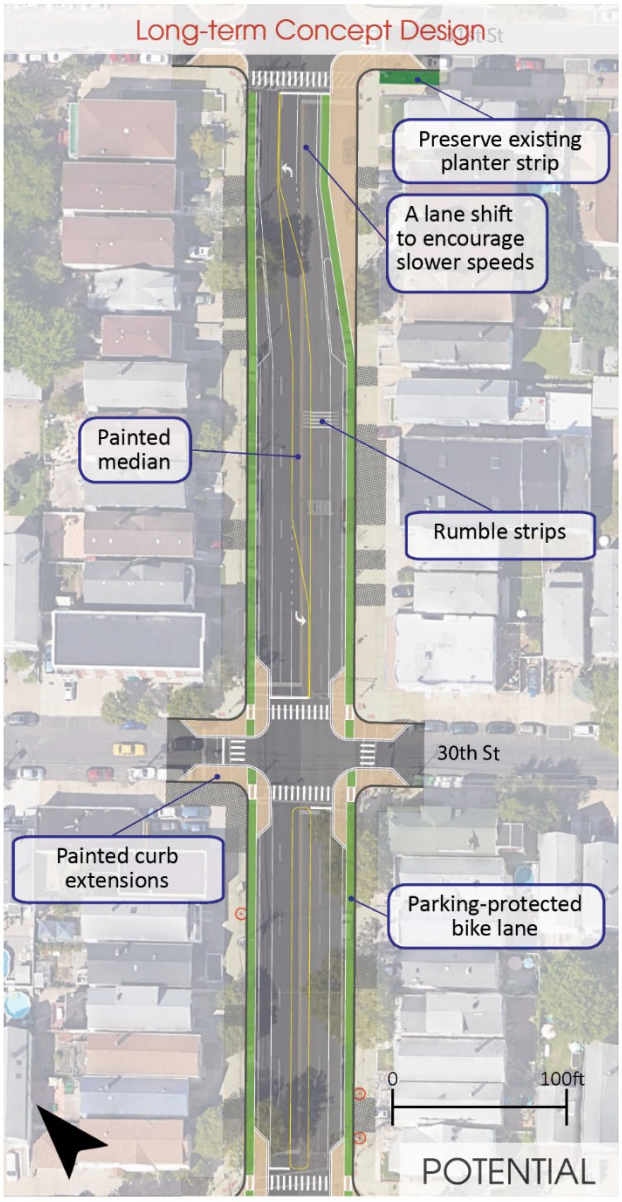
28th to 29th Street & Kennedy Boulevard

This segment continues many of the same elements from the segment to the south. Curb extensions shorten crossing distances and improve visibility. Without any bus stops the protected bike lane remains uninterrupted. Note that the curb extensions also daylight all the crosswalks, further improving visibility relative to the existing conditions.



30th Street & Kennedy Boulevard

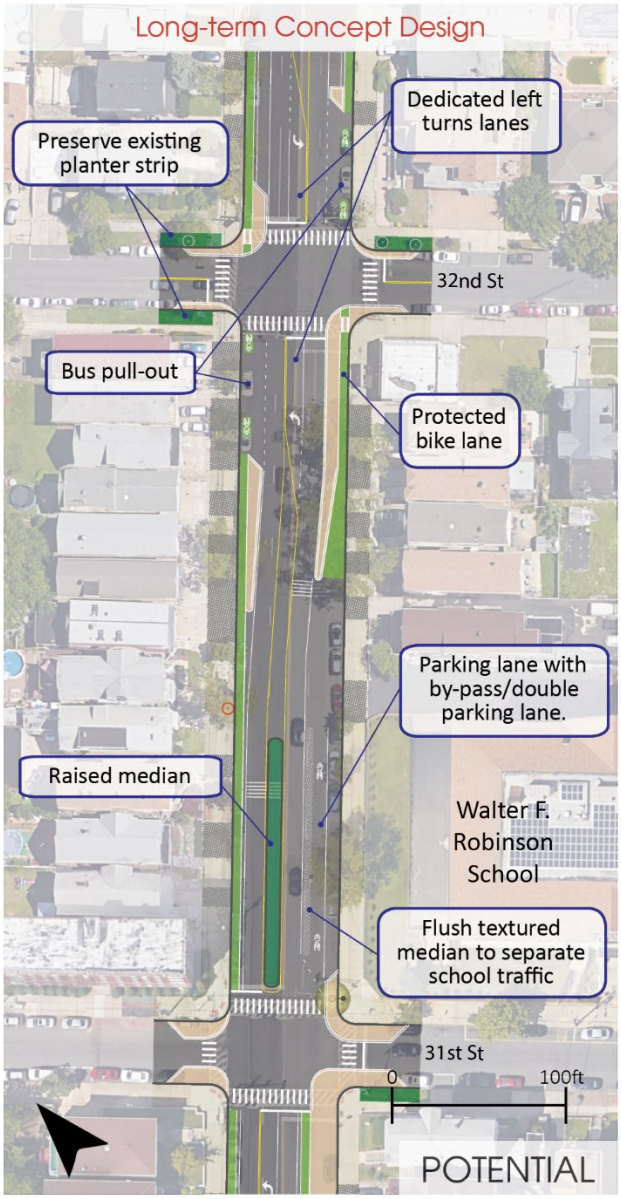
This intersection is similar in its configuration relative to the intersections to the south. Curb extensions and high-visibility crosswalks are recommended at this location. As northbound vehicles approach the Walter F. Robinson School at 31st Street, drivers are alerted by the use of painted rumble strips. The lane shift encourages slower speeds and enables a long curb extension to promote visibility. It should also be noted that the bus stop at 30th Street was recommended for consolidation in the NJ TRANSIT Bus Stop Consolidation Study. If the bus stop remains, the design could be updated to allow for a bus pull-out adjacent to the curb similar to the design at 32nd Street (shown on the following page).



31st to 32nd Street & Kennedy Boulevard

The environment on Kennedy Boulevard at the Walter F. Robinson School is challenging, particularly around pick-up and drop-off times. Wider curb extensions at 31st Street would add visibility and slow vehicles. Angled parking (either front-in or back-in) may work to further slow vehicles. A raised median, which could have fencing or landscaping, could help prevent U-turning or mid-block pedestrian crossings. Because of the angled parking needs, the protected bike lane would be replaced with super sharrows.

Super sharrows are also present at 32nd Street where bus pullouts could be provided. This intersection also offers dedicated left-turn lanes, which would keep turning vehicles out of the travel lane.



Alternative Designs

Road diets and protected bike lanes are often long-term projects that can take years to implement. To address the immediate pedestrian safety concerns, Hudson County and the City of Bayonne could consider a design that features curb extensions and high-visibility crosswalks without the bike lane (Option 2).

Figure 11 28th Street Conceptual Drawing with and without Bicycle Infrastructure

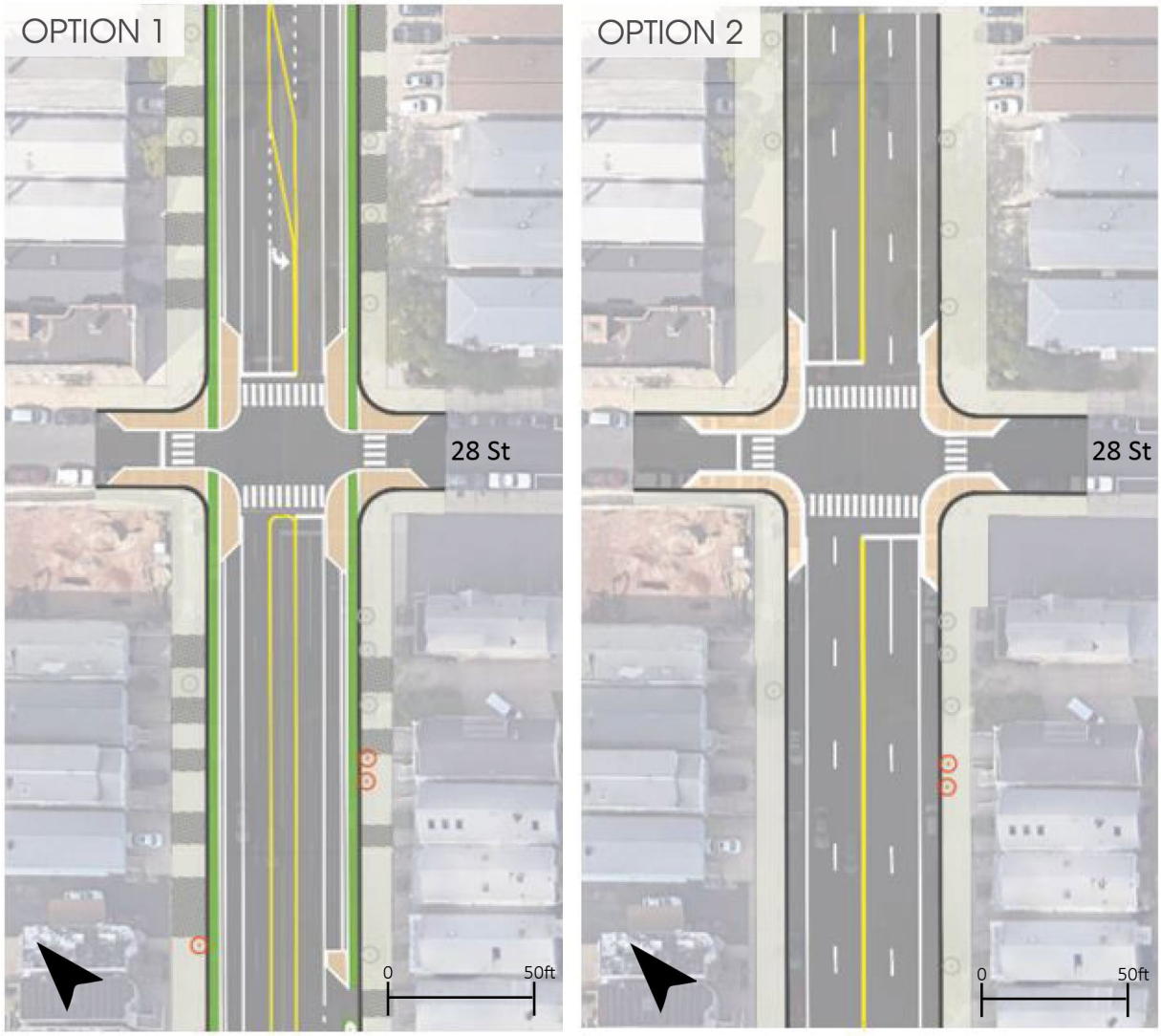
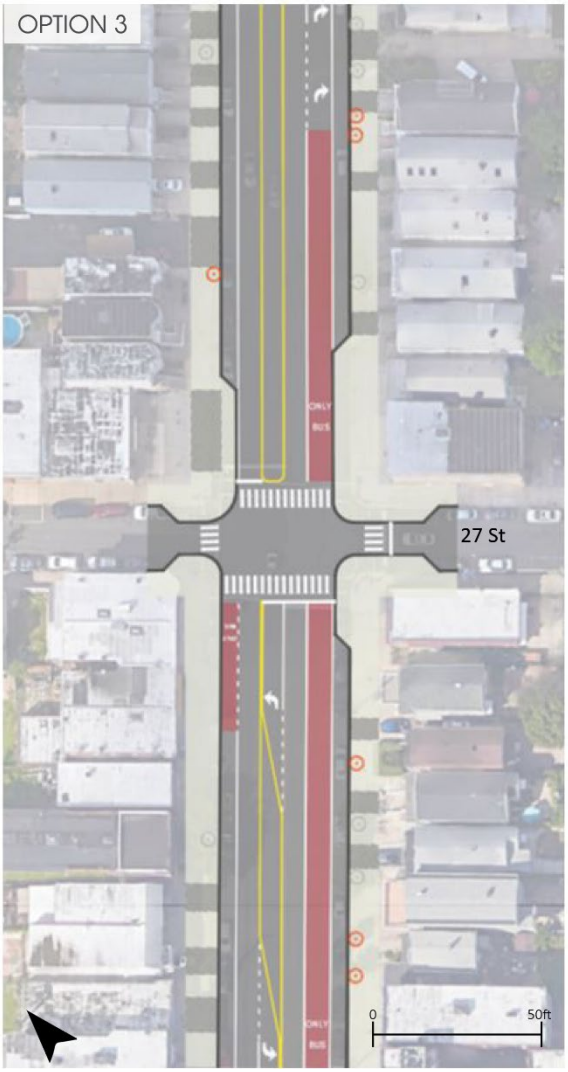


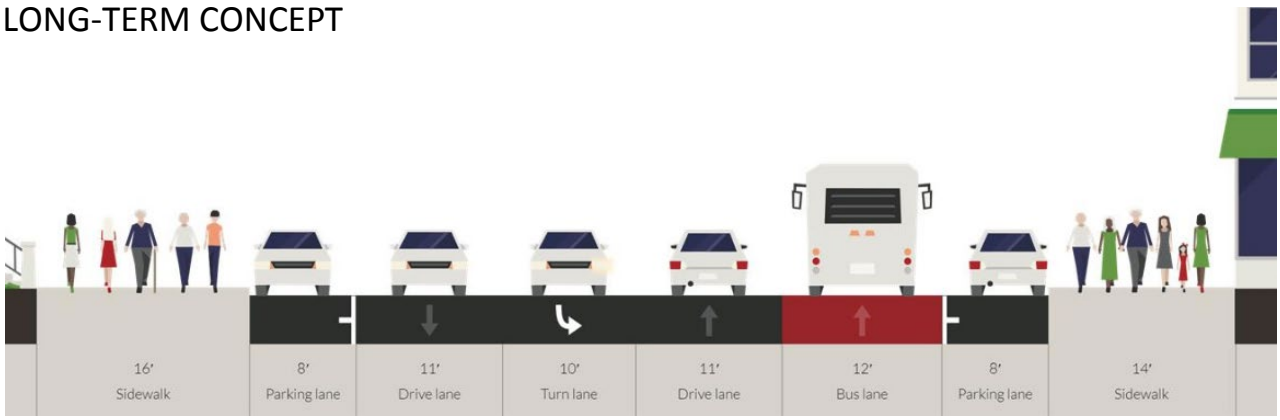
Figure 12 27th Street Conceptual Drawing with Transit-Only Lanes (Option 3)



Another long-term concept could be to add transit-only facilities on Kennedy Boulevard. Stemming from feedback provided by municipal stakeholders and the TAC as well as the analysis found in the Bayonne/Greenville/Journal Square Bus Rapid Transit Study, Kennedy Boulevard could be an option for a transit only lane. Of all the corridors considered as a part of that study, Kennedy Boulevard was ranked the highest among the public, study advisory committee, and through the technical analysis. Transit-only lanes are generally 12 feet wide to accommodate vehicle size, and municipalities in the United States frequently paint these lanes red to emphasize the vehicle restrictions. In some places, transit only lanes have vehicle restrictions 24 hours, but in others, non-transit vehicles or parked vehicles are permitted during off-peak hours. If Hudson County, Bayonne, and other key stakeholders (e.g., NJ TRANSIT) intend to pursue transit-only lanes, there will need to be additional consideration to whether jitneys and bicycles will be allowed to use the lane. **Figure 12** illustrates one potential concept for transit-only lanes on Kennedy Boulevard.

From a transit perspective, it is ideal to have bus lanes going both northbound and southbound. The 12-foot lane width requirements would necessitate the removal of parking on both sides of the road to accommodate a southbound transit-only lane (**Figure 13**). TAC members and municipal stakeholders suggested that parking removal in Bayonne should be avoided, so this option was not considered as a part of this study.

Figure 13 Possible Cross Section of a Transit-only Alternative



On-street Parking Modifications

The implementation of bike infrastructure on this corridor would require either the elimination of parking on both sides of the street or the reduction of two travel lanes. Without the travel lanes, level of service would likely remain the same according to the project team's initial analysis. Additional traffic analysis may lead to other results, so more study is recommended. For the purpose of this study, a concept that eliminates two travel lanes was considered for the conceptual designs.

Even though parking was generally preserved on the corridor, the long-term conceptual design would eliminate seven spaces. Please note that illegal parking spaces, such as locations at bus stops or within 25 feet of the crosswalk were not considered in the parking totals.

Table 6 On-street Parking Spaces Lost with Conceptual Design (26th to 32nd)

	Existing			Proposed		
Segment	**Southbound**	**Northbound**	**Total**	**Southbound**	**Northbound**	**Total**
26th to 27th	4	9	13	5	9	14
27th to 28th	5	5	10	5	6	11
28th to 29th	6	2	8	6	2	8
29th to 30th	3	6	9	6	6	12
30th to 31st	10	7	17	7	4	11
31st to 32nd	8	8	16	0	10	10
TOTAL			***73***			***66***

Green Stormwater Infrastructure (GSI)

The wide sidewalks, inclusion of a parking lane, and pedestrian crossings at most intersections lend themselves well to GSI practices that reduce the potential for flooding while promoting pedestrian safety and traffic calming. Hudson County's current policy, due to limited staff, is that green infrastructure must be maintained by the local municipality. The list below includes some examples of appropriate GSI practices along this focus area.

- Flow Through Planters:
  - Flow through planters provide separation from vehicular traffic for pedestrians and create the aesthetic feeling of a classic, landscaped Main Street. Stormwater is allowed to infiltrate through the soil profile contained within the flow through planter or when the stormwater flows are too high, bypass through a domed riser or similar to stone storage below.
  - The length of Kennedy Boulevard between 26th Street and 27th Street with multiple commercial properties would be a good candidate for this GSI strategy. It is also possible to implement such strategies in front of residential properties; however, consideration must be given to driveways, stairs, utility connections, and other elements that may complicate placement of the stormwater management system.

- Stormwater Curb Extensions:
  - Stormwater curb extensions create a place of pedestrian refuge, decrease pedestrian crossing distances, and provide traffic calming benefits. Stormwater is allowed to infiltrate through the soil profile contained within the stormwater curb extensions or when the stormwater flows are too high, bypass through a domed riser or similar to stone storage below.
  - Due to the multiple pedestrian crossings and the presence of a parking lane on both sides of Kennedy Boulevard throughout this stretch of the study area, the majority of the intersections are prime examples of potential implementation locations for this practice.

Policies

Consider the following policies within this focus area:

- **School release policies.** Hudson County and the City of Bayonne may wish to work with the Walter F. Robinson School to limit the number of students who are released on the Kennedy Boulevard side of the school.
- **Education.** Although education campaigns could be implemented on the full length of the corridor, and Bayonne has previously participated in several Street Smart NJ campaigns, a targeted outreach campaign to the students, parents, faculty, and staff associated with the Water F. Robinson School may be helpful. The campaign could focus on driver and pedestrian behavior.
- **LPIs.** In general, LPIs are an option at every intersection. This corridor is heavily utilized by students from Walter F. Robinson School and Bayonne High School. The traffic cameras used in this study recorded more than 700 pedestrian crossings at 26th Street during peak periods. It is likely that other cross streets have similar counts.

Order of Magnitude Costs

The proposed cost of these improvements is an estimated $1.4 million. This cost is based off bid pricing on similar projects.

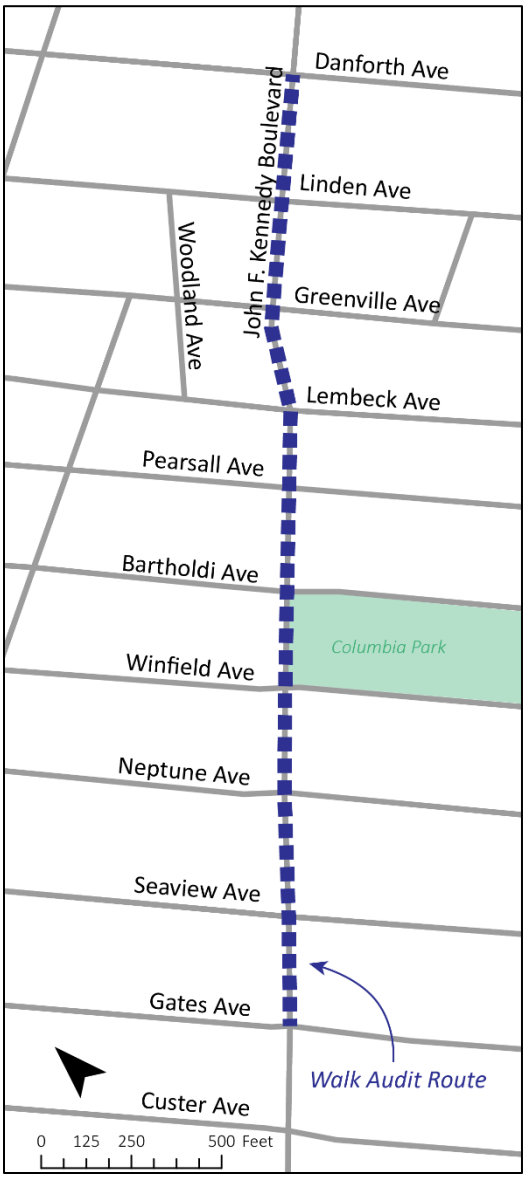
Table 7 Cost Estimates for 26th to 32nd Street

Description	Unit	Quantity	Unit Price	Total
Mill 2"	S.Y.	16,867	$15	$253,004
Pave 2"	TON	211	$90	$18,975
4" Bituminous Bike Path	S.Y.	1900	$30	$56,989
4" Topsoil and Seeding	S.Y.	245	$4	$981
Striping (Roadway)	L.F.	35,317	$1	$44,146
Striping (Bike Lanes)	S.F.	17,097	$13	$222,261
Concrete Curb	L.F.	5,300	$33	$174,900
Concrete Islands	S.Y.	222	$70	$15,531
Update Existing Signalized Intersections	EACH	7	$50,000	$350,000

Subtotal:	$1,136,788
Contingency:	$284,197
Total:	**$1,420,985**

GATES AVENUE TO DANFORTH AVENUE (JERSEY CITY)

Existing Conditions



The section of Kennedy Boulevard running from Gates Avenue to Danforth Avenue is approximately 2300 feet in length and includes 10 intersections, seven of which are signalized and three of which are unsignalized (Hudson County is in the process of adding a signal at Linden Avenue). This portion of the corridor is classified by the county's Land Development Regulations[38] as a Downtown Avenue, which "…is a vibrant mixed-use corridor, lined with retail and restaurants that attract people from the region." Curb-to-curb width varies throughout this segment of Kennedy Boulevard, narrowing from south to north. Gates Avenue to Neptune Avenue (the two southernmost blocks) is approximately 75 feet wide from curb-to-curb, consisting of a 15-foot median with approximately 10 feet allocated for left travel lane and 20 feet allocated for both the right travel lane and unstriped parking in each direction. Neptune Avenue to Danforth Avenue is approximately 59 feet from curb-to-curb consisting of two (2) 11-foot travel lanes and one striped 7.5-foot parking lane in each direction. While some street trees help to reinforce the vibrant nature of the neighborhood along Kennedy Boulevard, it was observed that many street trees had outgrown their tree pits and had been removed, exposing a relatively bare streetscape environment.

This segment of the boulevard has a more mixed urban feel in comparison with the rest of the corridor, with higher traffic volumes, low-density housing, commercial land uses, and lack of mature street trees on the northern and southern ends of this focus area. Land uses adjacent to the focus area are in Zone NC, which specifies the district for neighborhood commercial land uses. On the northern end of the study area at Danforth Avenue, designated as Zone R-1, neighborhood commercial and one- and two-family housing land uses are present. Columbia Park occupies the eastern block between Winfield Avenue and Bartholdi Avenue. Redevelopment on the southeastern quadrant of Kennedy Boulevard and Danforth Avenue for a mixed-use development with office space and 40 one- and two-bedroom units has been approved by Jersey City and Hudson County.

Additional discussion of the existing conditions can be found in Appendix A.

[38] From *Hudson County Land Development Regulations for Smart Growth and Sustainable Development*, released by County/NJTPA in June '16.

Identified Deficiencies

This document summarizes the key findings from the October 2018 Walk Audit, technical analysis, feedback from the February 2019 Technical Advisory Committee meeting, and other relevant sources. These sources have identified the following as major challenges:

- High traffic speeds
- Poor visibly at some intersections possibly due to vehicles parking too close to the intersections and low-visibility crosswalks
- Drivers failing to yield to pedestrians in crosswalks
- Lack of infrastructure to protect cyclists traveling on and crossing Kennedy Boulevard
- A lack of streetscape amenities, such as trees, benches, and pedestrian-scale lighting
- Unsafe crossing into Columbia Park at Winfield Avenue

Walk Audit Results

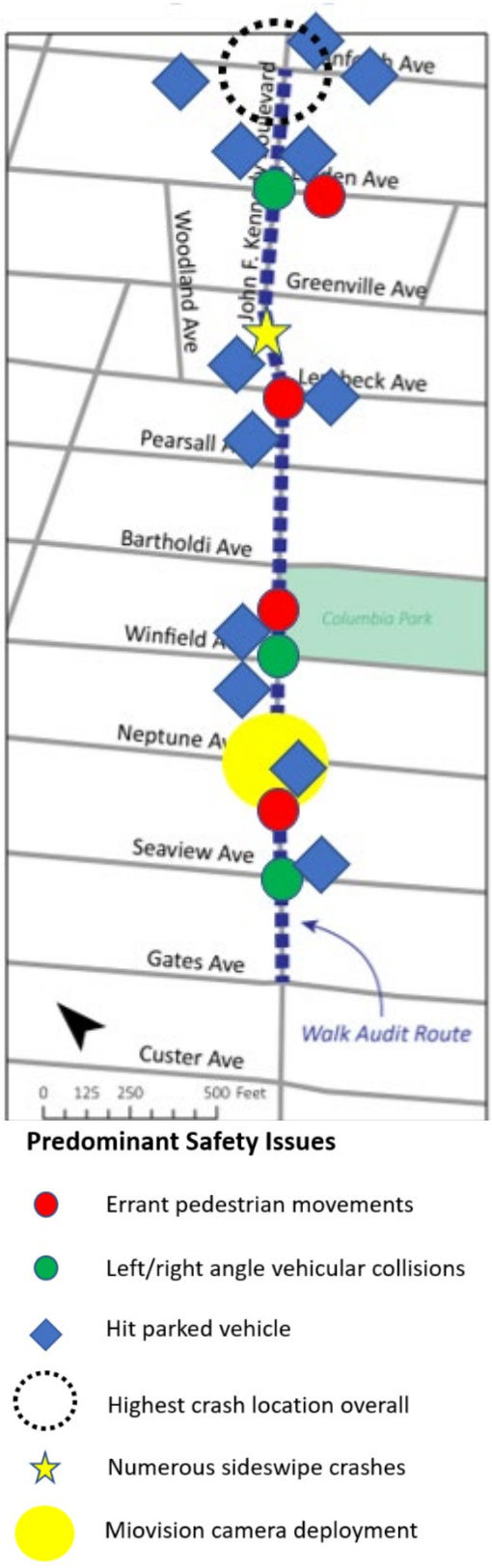
Observations from walk audit participants:

- Drivers fail to yield to pedestrians in the crosswalks.
- Parked cars block the sidewalk, particularly at driveways and in front of businesses.
- Leading pedestrian intervals (LPIs) are requested at all signalized intersections.
- Pedestrians frequently cross Kennedy Boulevard at Winfield Avenue to access Columbia Park. This intersection does not have a crosswalk or signal, so addressing this crossing is a priority for safety improvements.
- Street trees are lacking.

Walk audit participants considering design interventions. Source: FHI

Findings from the Technical Analysis

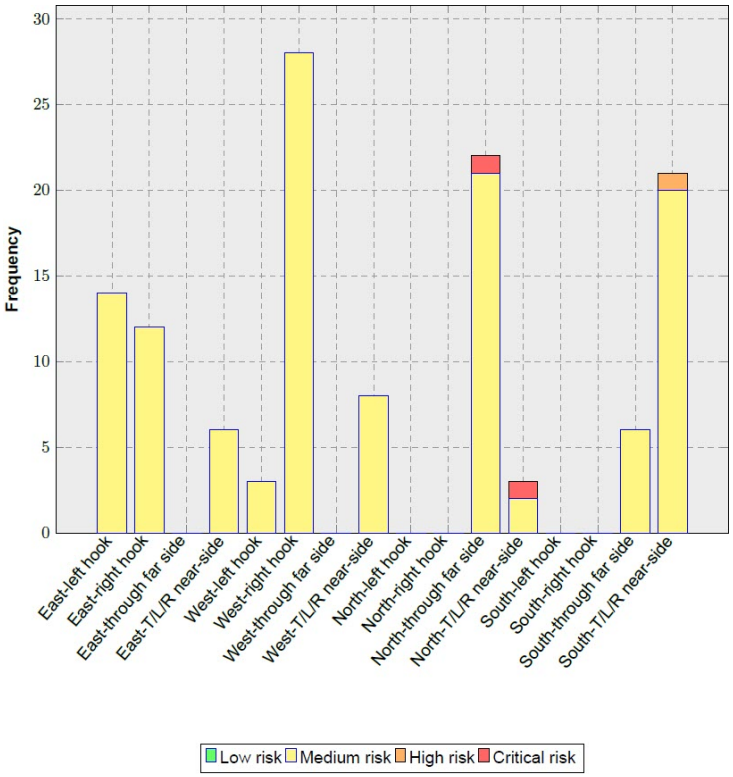
- A review of crash type distribution for this focus area reveals an elevated occurrence of right-angle and left-turn collisions (left-turn 31 percent in total) as compared to the entire Kennedy Boulevard corridor (17 percent in total).[39]
- This focus area has an elevated occurrence of nighttime crashes as compared to the corridor as a whole.
- High risk events for vehicle-vehicle collisions were rare at intersection with Neptune Avenue due to the restriction of left-turn traffic from Kennedy Boulevard at this intersection.
- According to turning movement counts at Neptune Avenue, 42 pedestrians crossed Kennedy Boulevard while 145 pedestrians crossed Neptune Avenue during peak period[40] conditions on an average weekday.
- A total of two critical risk and one high-risk vehicle-pedestrian/bicycle conflicts were observed during the 60-hour video camera recording period. Two vehicles nearly missed pedestrians on northbound/southbound approach to the intersection, while one northbound vehicle nearly struck a pedestrian at the crosswalk on the far side of the intersection.
- According to video turning movement counts at Neptune Avenue, a total of 31 bicycles were crossing Kennedy Boulevard and 13 bicycles were counted crossing Neptune Avenue during peak periods.



[39] Crash data collected from police investigation reports; most recent 3-year data set

[40] References to peak period in this report include AM/MD/PM peak periods, volume collected on a weekday 7-9AM, 11AM-1PM, and 4-6PM.

Figure 14 – Frequency of Low to Critical Risk Events for Vehicle-Ped/Bike Crashes at Neptune Avenue



Example of a sidewalk obstruction at Danforth Avenue. Source: FHI

Technical Advisory Committee Input

- Participants said bike lanes are a top priority, particularly with the need to build connections to the Morris Canal Greenway.
- Potential design interventions that were viewed as highly effective and implementable in the short term included curb extensions, daylighting crosswalks, dedicated turn lanes, turn restrictions, LPIs, painted rumble strips, and lane width reduction.
- TAC members suggested adding LPIs to every intersection on the focus area segment.
- A curb extension and refuge island were added to the Gates Avenue intersection.
- High-visibility crosswalks, daylighting, and lighting were added to the Winfield Avenue intersection.
- TAC members supported bike lanes to provide connections to the Morris Canal Greenway.

Additional Sources

Additional sources were also considered in the segment design:

- Let's Ride JC, Jersey City's Bicycle Master Plan, calls for protected bike lanes on the full length of Kennedy Boulevard within Jersey City.
- Speeding and distracted/dangerous driving were the top concerns of e-survey respondents.
- E-survey respondents said slower vehicle speeds and increased pedestrian crossing time would most improve the walking environment.

Site-Specific Challenges

Some locations along the corridor received considerable attention throughout the process. This section outlines some of the primary concerns raised by the walk audit participants and TAC members and are supported by the findings of the technical analysis.

Seaview/Neptune Avenues and Kennedy Boulevard

Walk audit participants thought of a number of ways to improve safety between Seaview Avenue and Neptune Avenue. At the intersection with Seaview Avenue, participants suggested that the medians could be extended into the crosswalk, providing a refuge. This idea was encouraged by members of the TAC as well.

At the intersection with Neptune Avenue, walk audit participants saw a need for high-visiblity crosswalks. Curb extensions and daylighting were also suggested to promote pedestrian visibility.

As recorded by the MioVision cameras, high risk turning movements were rare. However, there was a relatively high frequency of northbound and southbound left-turn traffic from Kennedy Boulevard onto the approaches of Neptune Avenue. These streets are one-way streets that are not meant to receive traffic, indicating the need to provide better notification to drivers of the turning restriction and the one-way nature of traffic flow on Neptune Avenue. A total of four illegal northbound left-turn movements were recorded by MioVision during peak period conditions.

Image of left turning vehicle turning onto a street not meant to receive traffic from Kennedy Boulevard. Source: Miovision

Winfield/Bartholdi Avenues and Kennedy Boulevard

The streets adjacent to Columbia Park received considerable attention from walk audit participants. Batholdi Avenue lacks high-visibility crosswalks. Participants observed high speeds and suggested adding rumble strips. They noted the location of a preschool on the corner.

Columbia Park is an important community amentity, yet access from Winfield Avenue is a challenge. Walk audit particpiants observed pedestrians crossing Kennedy Boulevard. The location does not offer a crosswalk or curb extensions, so audit participants and TAC members suggested adding these design interventions to promote pedestrian visiblity.

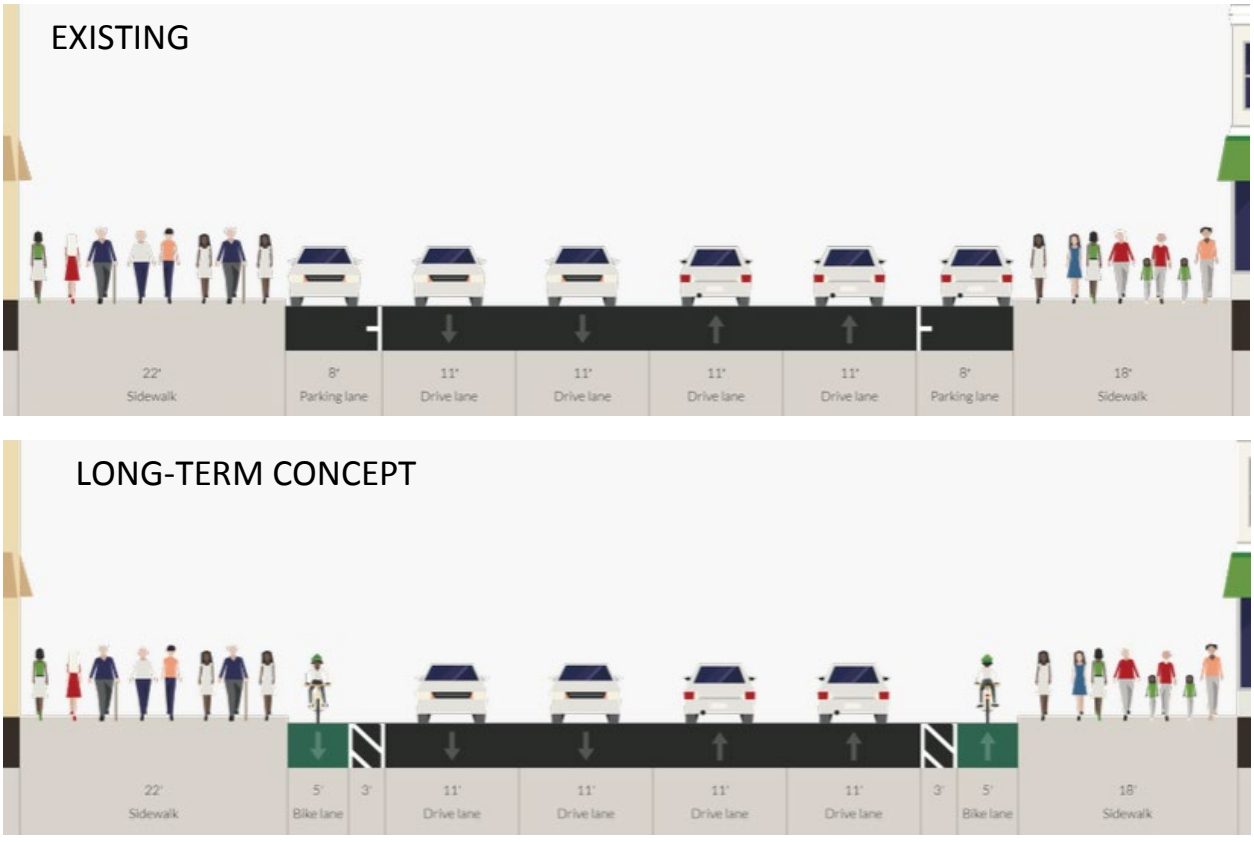
Existing conditions of Kennedy Boulevard at Winfield Avenue. Source: FHI

Recommendations

This section details the recommended modifications for the focus area. The concept drawings are to be considered a long-term vision unless otherwise indicated. Hudson County Engineering currently has funding for design and implementation for a segment of Kennedy Boulevard that includes this focus area. This funding is for shorter-term implementation relative to this study. Their work incorporates many of the elements discussed below, including curb extensions and left-turn pockets. For many of the recommendations discussed below, additional coordination with the City of Jersey City as well as feedback from the surrounding community will be needed if these designs move forward.

In keeping with the Let's Ride JC Bicycle Master Plan as well as TAC members' desire to provide connections to the planned Morris Canal Greenway, a buffered bike lane has been added on Kennedy Boulevard running the full length of the focus area (Gates Avenue to Danforth Avenue). With an average annual daily traffic (AADT) of greater than 20,000 vehicles, reduction of travel lanes would possibly result in reduced level of service in the area. Without removing travel lanes, the only other option is to remove parking, which poses challenges to residents and businesses. For the purposes of this study, the project team assumed parking removal to be more viable than removing a travel lane, but additional study and collaboration with the community is recommended (see "Tactical Urbanism Approach" in Chapter Six: Implementation).

Figure 15 Cross Sections of Existing Conditions and Proposed Long-term Concept



As noted above, the Morris Canal Greenway is a planned greenway that will surely become a popular community amenity. Multiple planning documents have suggested that Kennedy Boulevard will be a critical link to the greenway. These plans have suggested different alignments, which include crossings at Mercer Park and Bartholdi Avenue. Through the stakeholder engagement effort conducted for this study, additional crossings have been mentioned. The City of Jersey City's recent purchase of the right-of-way near Sycamore Road makes it possible for trail users to be on an off-street path until Custer Avenue, at which point it will go on street and continue on Kennedy Boulevard south to Mercer Park. The project team studied multiple options for connections to the proposed path.

The first option provides a two-way cycle track between Mercer Park and Custer Avenue. Two-way cycle tracks are generally not recommended in locations where there are an abundance of driveways. With limited driveways on the eastern side of Kennedy Boulevard, a two-way cycle track could potentially work. The western side has more curb cuts, including two at a gas station. The intersection at W 63rd Street is also mostly avoided by placing the cycletrack on the east side of the street.

The path could then cross Custer Avenue and connect with the recently purchased right-of-way, which starts at the western end of the street. Roadways in mostly residential areas with sharrows, wayfinding, speed humps, and traffic calming are frequently called "neighborhood greenways." Custer Avenue could become a neighborhood greenway and serve as a trail link. The existing condition of Custer Avenue is a residential street with on-street parking on both sides. With the addition of speed humps and other traffic calming devices, the street would be a safer and more comfortable environment for people of all ages and abilities without the loss of heavily utilized on-street parking. Sharrows could help with wayfinding and serve as a reminder to drivers that this facility is a link to the Morris Canal Greenway.

The second option builds on the first option, maintaining the two-way cycle track on Kennedy Boulevard as well as the neighborhood greenway on Custer Avenue. The second option, however, incorporates the feedback from TAC members from Jersey City as well as the latest draft of the Let's Ride JC Bicycle Master Plan, which extends bicycle infrastructure up Kennedy Boulevard to at least Columbia Park. Unlike the segment from Mercer Park to Custer Avenue, the segment north of Custer Avenue has one-way bike lanes on either side of the street. The number of driveways would create a cycle-track with numerous conflict points, which could be hazardous.

The second option also notes the existing bike lane on Neptune Avenue as well as the proposed bike lane on Bartholdi Avenue.[41] These two streets would create a couplet that could potential connect to the Morris Canal Greenway. By providing additional bicycle infrastructure on Kennedy Boulevard, community members could more comfortably bike to the Morris Canal Greenway. Moreover, users of the trail could better access community businesses, providing an exciting economic development opportunity for the neighborhood.

[41] Bartholdi Avenue currently has a bike lane east of Kennedy Boulevard. The segment to the west of Kennedy Boulevard is proposed in the Let's Ride JC Bicycle Master Plan.

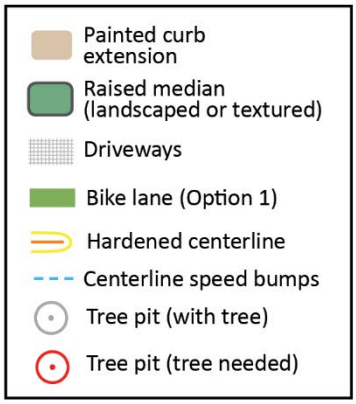
Figure 16 **Option 1 for the Morris Canal Greenway Connection**

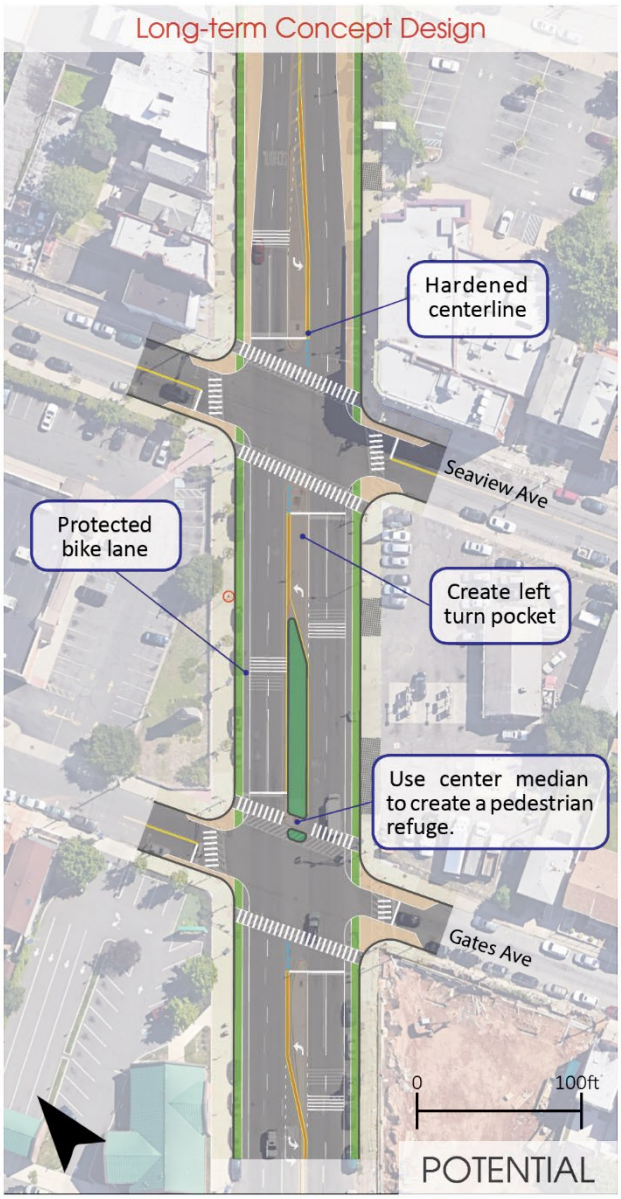
Figure 17 Option 2 for the Morris Canal Greenway Connection

With the Morris Canal Greenway in mind, the following concepts may be considered as a long-term vision for the focus area.

Gates to Neptune Avenue & Kennedy Boulevard

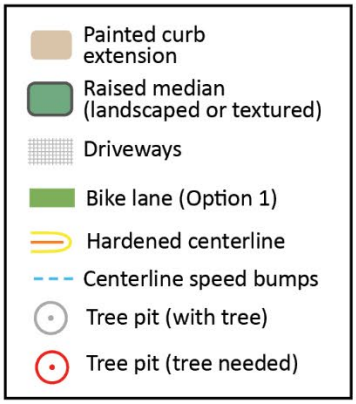
Buffered bike infrastructure is recommended. As shown, the buffer is painted rather than concrete, a technique that will make for faster implementation than hardscaping. Additionally, this segment features a pedestrian refuge island at Gates Avenue and left-turn pockets at both intersections. A hardened centerline may also be added to slow turning speeds and preventing U-turns. Curb extensions are recommended at multiple intersections.

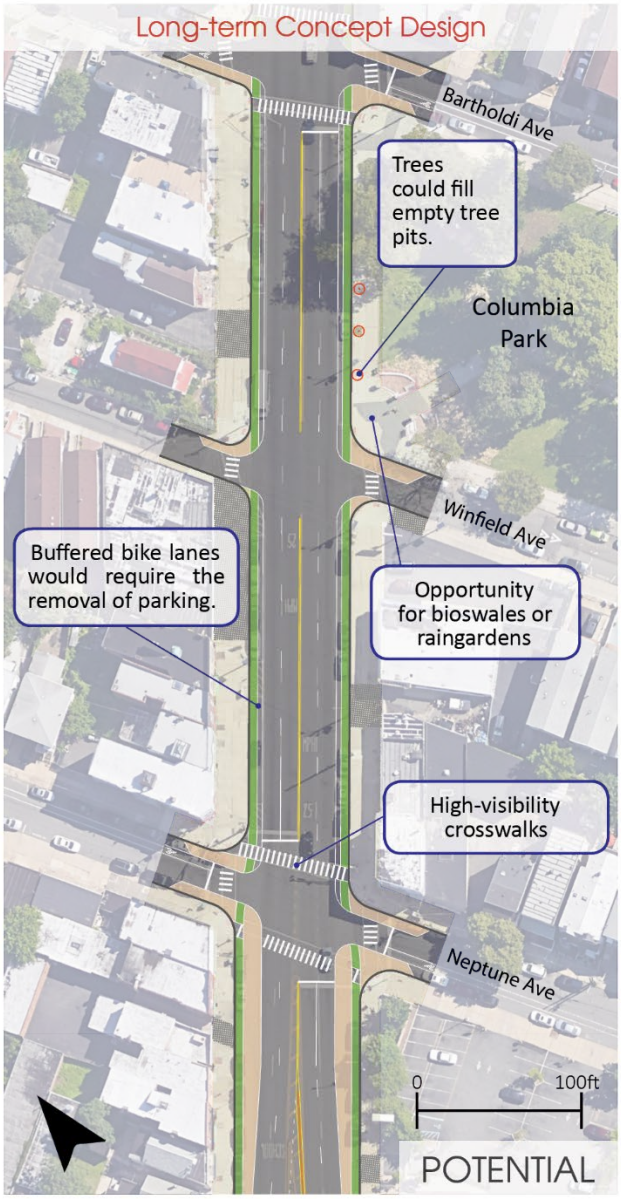




Neptune to Winfield Avenue & Kennedy Boulevard

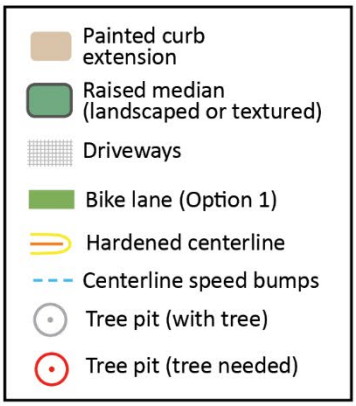
This segment also features curb extensions and high-visibility crosswalks. The buffered bike lane, which continues from the previous segment, would require the removal of on-street parking, a topic discussed in the following section. Outside Columbia Park, filling the empty tree pits and implementing bioswales or raingardens may help beautify the street. Note that the crossing at Winfield does not feature a crosswalk. This location could be considered for a crosswalk if a signal is implemented.

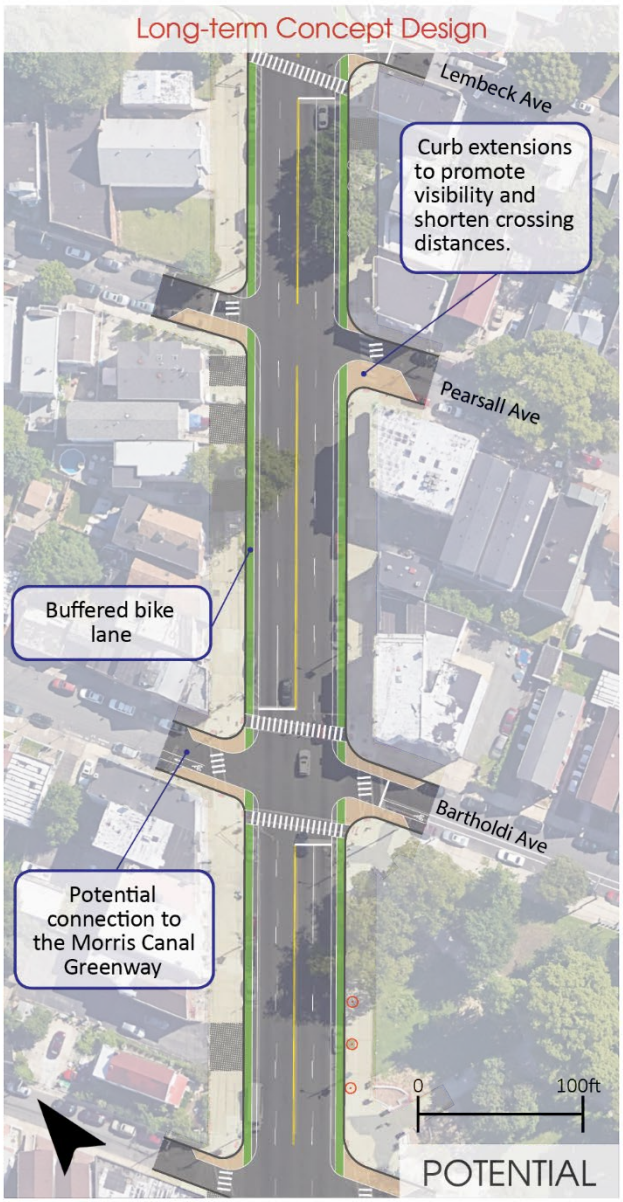




Bartholdi to Pearsall Avenue & Kennedy Boulevard

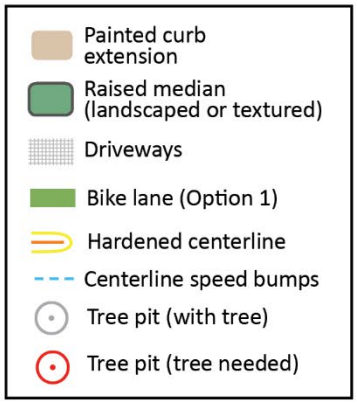
As noted in the previous discussion on the Morris Canal Greenway, the bike lane on Bartholdi Avenue could continue west across Kennedy Boulevard to make a new connection to the planned trail alignment. A bike box, which is a green box with bike markings that designate space for turning cyclists, could encourage a two-stage left-turn. This segment also features curb extensions and high-visibility crosswalks.

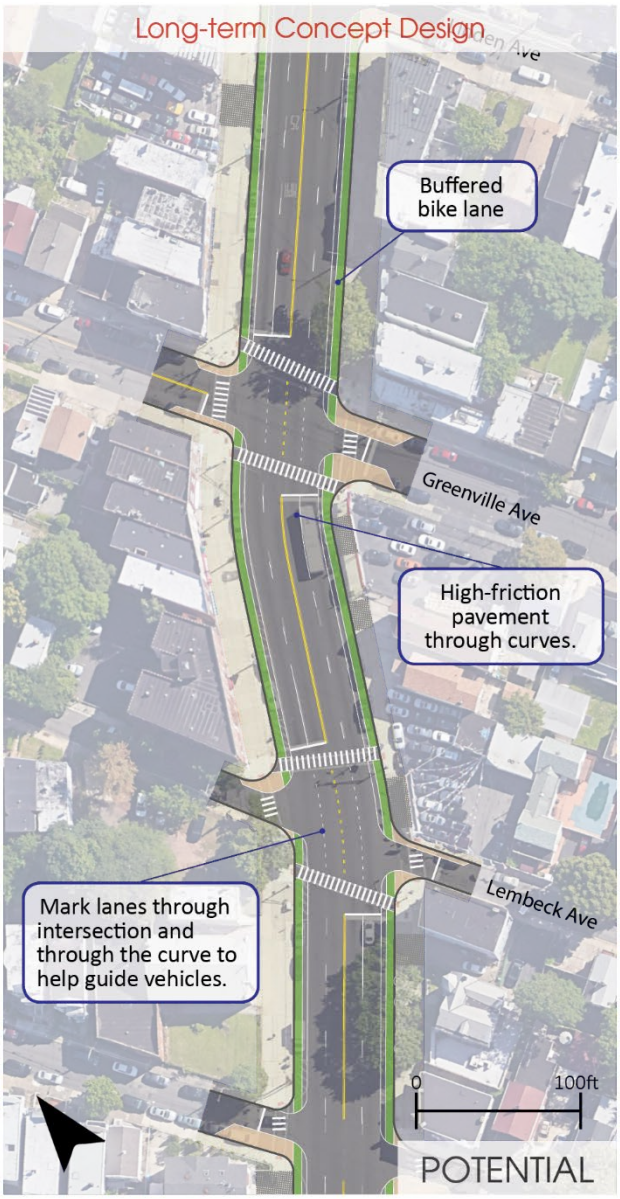




Lembeck to Greenville Avenue & Kennedy Boulevard

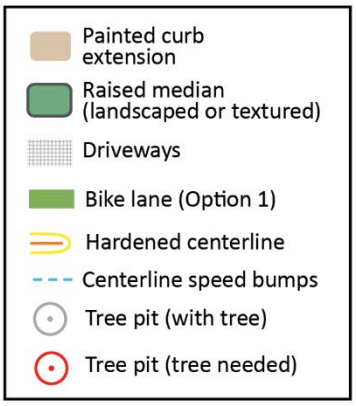
This segment has a slight curve, which may feature high-friction pavement to prevent vehicles sliding. The lanes could be marked with dashed lines through the intersections to help guide vehicles in these locations. The protected bike lane continues north, and these intersections also feature high-visibility crosswalks and curb extensions.

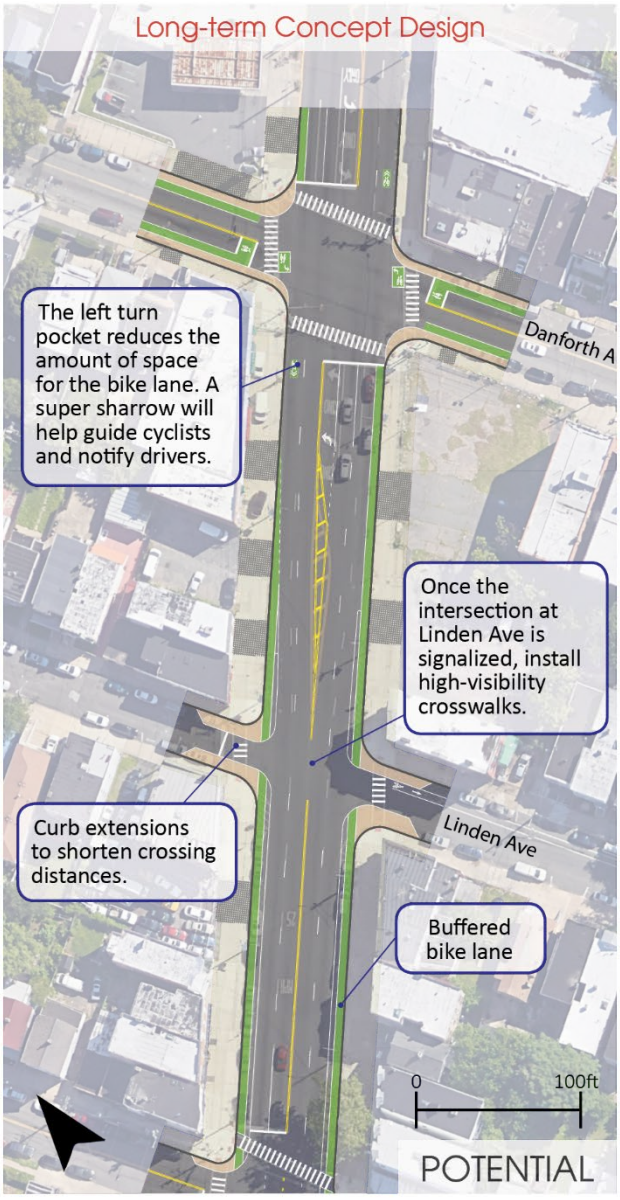




Linden to Danforth Avenue & Kennedy Boulevard

The northernmost segment of the corridor has features and a cross section similar to the previous segments. The buffered bike lane exists on both sides of the street. At Danforth Avenue, however, a left-turn pocket will force the elimination of the bike lane so super sharrows have been added. Once the planned traffic signal at Linden Avenue is implemented, a high visibility crosswalk is recommended. The design below includes room for bus stops at Danforth Avenue, though it should be noted that the NJ TRANSIT Bus Stop Consolidation study considers the consolidation of the Pearsall Avenue and Danforth Avenue stops.





On-street Parking Modifications

The implementation of a bike lane on this corridor would require either the elimination of parking on both sides of the street or the reduction of two travel lanes. Without the travel lanes, level of service would likely decrease according to the project team's initial analysis. Additional traffic analysis may lead to other opportunities, so more study is recommended. For the purpose of this study, a concept that eliminates parking (not travel lanes) was considered.

On the walk audit and site visits, on-street parking was not heavily utilized. Yet, many of the cross streets show low parking availability. A parking study, such as Jersey City's forthcoming parking management plan, may help the community consider alternative options and weigh the tradeoffs of implementing bicycle infrastructure.

This design as shown eliminates 41 on-street spaces. Please note that illegal parking spaces, such as locations at bus stops or within 25 feet of the crosswalk were not considered in the parking totals.

Table 8 On-street Parking Spaces Lost with Conceptual Design (Gates to Danforth)

	Existing			Proposed		
Segment	**Southbound**	**Northbound**	**Total**	**Southbound**	**Northbound**	**Total**
Gates to Seaview	6	0	6	0	0	0
Seaview to Neptune	7	7	14	0	0	0
Neptune to Winfield	3	5	8	0	0	0
Winfield to Bartholdi	4	4	8	0	0	0
Bartholdi to Pearsall	4	5	9	0	0	0
Pearsall to Lembeck	3	3	6	0	0	0
Lembeck to Greenville	4	4	8	0	0	0
Greenville to Linden	5	5	10	0	0	0
Linden to Danforth	0	0	0	0	0	0
TOTAL			***41***			***0***

Recognizing that the elimination of 41 parking spaces in the community may be a challenge, the project team considered alternative designs that implement pedestrian safety measures without the bike lane (Option 2). This alternative design features many of the same elements found in the conceptual designs, such as curb extensions and high-visibility crosswalks. Considering that the implementation of a protected bike lane is frequently a long-term design, the option with painted curb extension could be

implemented in the shorter term as the community, the City of Jersey City, and Hudson County consider bicycle infrastructure.

Table 9 Bartholdi Avenue Conceptual Drawing with and without Bicycle Infrastructure

Green Stormwater Infrastructure (GSI)
The large footways, inclusion of a parking lane, and pedestrian crossings at most intersections lend themselves well to GSI practices that promote pedestrian safety, traffic calming, and surface practices. The larger number of commercial properties also increase the opportunities to introduce aesthetic designs. Hudson County's current policy is that green infrastructure must be maintained by the local municipality. The list below includes some examples of appropriate GSI practices along this focus area.

- Flow Through Planters
    - Flow through planters provide separation from vehicular traffic for pedestrians and create the aesthetic feeling of a classic, landscaped Main Street. Stormwater is allowed to infiltrate through the soil profile contained within the flow through planter or when the stormwater flows are too high, bypass through a domed riser or similar to stone storage below.

- Due to the higher number of commercial properties along this section of Kennedy Boulevard, a more formalized pattern of flow through planters would increase the feel of a landscaped main street and add a partial screening element between pedestrian traffic on the sidewalk and vehicular traffic in the roadway.

- Stormwater Curb Extensions

  - Stormwater curb extensions create a place of pedestrian refuge, decrease pedestrian crossing distances, and provide traffic calming benefits. Stormwater is allowed to infiltrate through the soil profile contained within the stormwater curb extensions or when the stormwater flows are too high, bypass through a domed riser or similar to stone storage below.

  - Due to the multiple pedestrian crossings and the presence of a parking lane on both sides of Kennedy Boulevard throughout this stretch of the study area, the majority of the intersections are prime examples of potential implementation locations for this practice. As some intersections are not signalized or do not have four-way crossings, care could be taken when implementing curb extensions in order to ensure that turning radii are maintained.

In addition, the adjacency of Columbia Park to Kennedy Boulevard between Winfield Avenue and Bartholdi Avenue provides additional opportunities for implementation of a more diverse set of stormwater management practices. Due to the open space and the lack of adjacent structures, stormwater management practices such as raingardens, swales, and subsurface infiltration trenches could be implemented to manage runoff from Kennedy Boulevard.

Policies
The following policies could be considered on this corridor:

- **Leading Pedestrian Intervals.** In general, LPIs could be added at each of these intersections in the corridor that do not already have them.
- **Green Stormwater Infrastructure.** Due to the high pedestrian traffic and store fronts, GSI can be provided in the form of:
  - Flow Through Planters: Flow through planters provide separation from vehicular traffic for pedestrians and create the aesthetic feeling of a classic, landscaped main street. Stormwater is allowed to infiltrate through the soil profile contained within the Flow Through Planter or when the stormwater flows are too high, bypass through a domed riser (or similar) to stone storage below.
  - Bumpouts (e.g., at within curb extensions or bus bulbs): Stormwater can infiltrate through the soil profile contained within the bump out or when the stormwater flows are too high, bypass through a domed riser or similar to stone storage below.

Order of Magnitude Costs

The proposed cost of the safety enhancements for the conceptual design is an estimated $1.7 million. This cost is based off bid pricing on similar projects.

Table 10 Cost Estimates for Gates to Danforth Avenue Recommendations

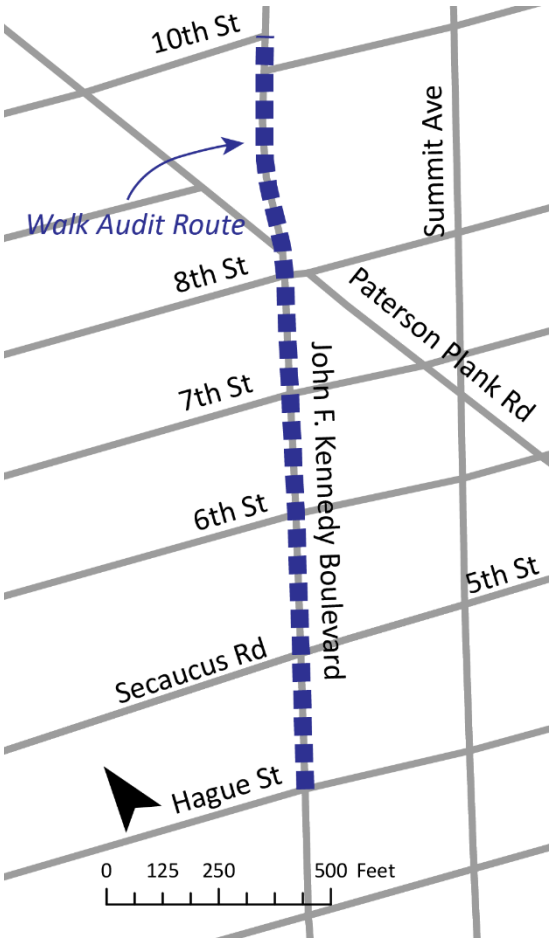
Description	Unit	Quantity	Unit Price	Total
Mill 2"	S.Y.	22,724	$15	$340,862
Pave 2"	TON	284	$90	$25,565
4" Bituminous Bike Path	S.Y.	2,549	$30	$76,460
4" Topsoil and Seeding	S.Y.	140	$4	$562
Striping (Roadway)	L.F.	33,419	$1	$41,774
Striping (Bike Lanes)	S.F.	22,938	$13	$298,194
Concrete Curb	L.F.	5,718	$33	$188,694
Concrete Islands	S.Y.	140	$70	$9,831
Update Existing Signalized Intersections	EACH	7	$50,000	$350,000

Subtotal:	$1,331,941
Contingency:	$332,985
Total:	**$1,664,926**

HAGUE STREET TO 10TH STREET (JERSEY CITY / UNION CITY / NORTH BERGEN)

Existing Conditions

This section of Kennedy Boulevard is approximately 1530 feet in length and includes six intersections, all of which are signalized. This particular portion of the corridor is classified by the county's Land Development Regulations[42] as a Mixed Urban Boulevard, which is "similar in character to the Residential Boulevard except that the land use and character is more varied." Curb-to-curb width is approximately 60 feet through this segment of the boulevard (briefly widening to approximately 66 feet curb-to-curb at Paterson Plank Road) with approximately 11 feet allocated for the left-turn lane and left travel lanes and 13 feet for the right travel lane in each direction. Where left-turn lanes are not provided, curb side parking is provided in both directions. Like Kennedy Boulevard, Paterson Plank Road is owned by Hudson County.



This segment of the boulevard has a mixed urban feel with higher traffic volumes, low-density housing, and commercial land uses. Although most of the focus area lacks streetscaping and mature street trees, newly planted trees were observed on the northbound side of Kennedy Boulevard in the vicinity of the intersection with Paterson Plank Road. Land uses adjacent to the focus area are in residential zones for the various adjoining municipalities, which specify one- and two-family housing and other low-density residential developments. The segment also contains commercial land uses in North Bergen Zone C1-A, general business limited mixed-use, on the west side of Kennedy Boulevard. There are currently no development applications within the focus area that have been approved or are pending approval at this time.

Additional discussion of the existing conditions can be found in Appendix A.

Identified Deficiencies

This section summarizes the key findings from the October 2018 Walk Audit, technical analysis, feedback from the February 2019 Technical Advisory Committee meeting, and other relevant sources. These sources have identified the following as major challenges:

- Speed of traffic
- Traffic congestion

[42] From *Hudson County Land Development Regulations for Smart Growth and Sustainable Development*, released by County/NJTPA in June '16.

- Limited marked crosswalks and unsafe pedestrian crossings at Paterson Plank Road

Walk audit participants explore the Hague Street to 10th Street focus area. Source: FHI

Walk Audit Results
Observations from walk audit participants:

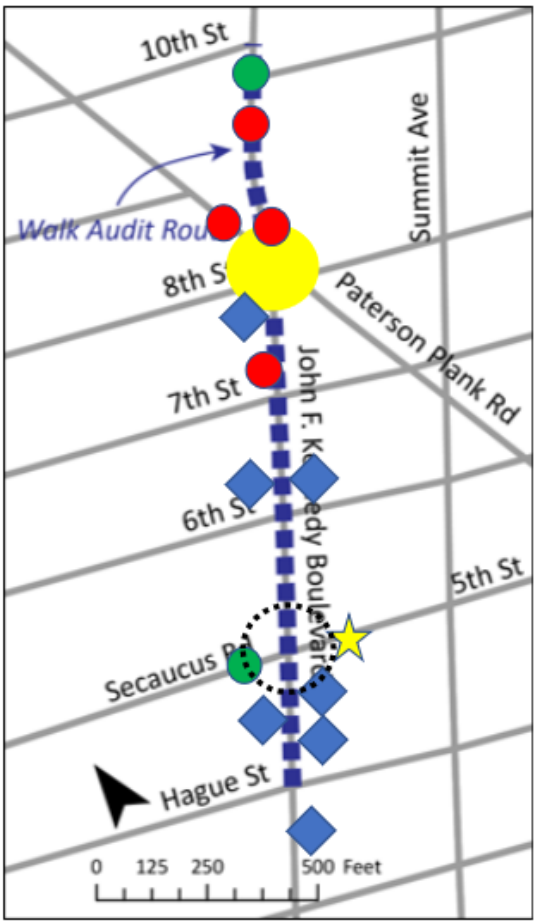
- Visibility is a major challenge along the corridor as a result of vehicles parking up to the crosswalk.
- Due to the skewed intersection (photo below), the pedestrian crossings near Paterson Plank Road are long and have limited visibility.
- Participants noticed that there are no marked crosswalks between 10th Street and Paterson Plank Road.
- Some stretches of the corridor lack trees and landscaping, but there are trees near the bus stop at Paterson Plank Road.

Findings from the Technical Analysis

- The share of left-turn collisions occurring within this focus area (11 percent) was more than twice the average for the study corridor (4 percent). This prevalence of crashes is most apparent at the offset 10th Street intersection and from the Secaucus Road approaches to Kennedy Boulevard where no dedicated left-turn phase is provided.[43]

[43] Crash data collected from police investigation reports; most recent 3-year data set

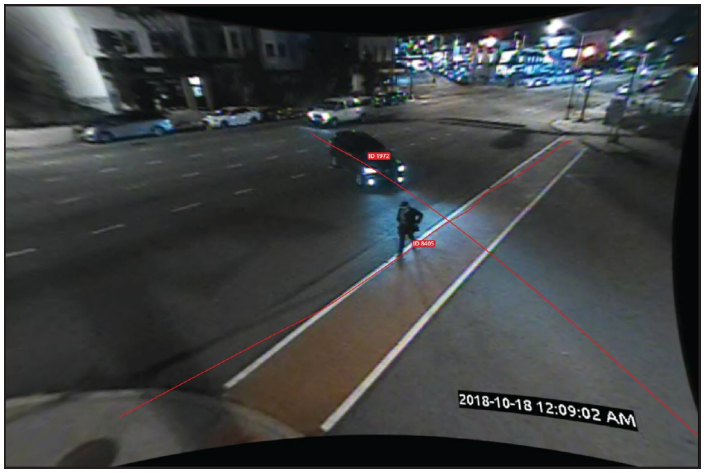
- Traffic cameras observed five high-risk events for vehicle-vehicle collisions between eastbound Paterson Plank Road left-turn traffic and westbound Paterson Plank Road through traffic during the 60-hour period. Additionally, several high risk and critical risk events for vehicles-pedestrians/bicyclists on John F. Kennedy Boulevard were observed.
- According to turning movement counts performed at the intersection with Paterson Plank Road and 8th Street with traffic data collection cameras on Tuesday, October 16, 2018, 609 pedestrians were crossing Kennedy Boulevard while 415 pedestrians were crossing Paterson Plank Road/8th Street during peak period[44] conditions on an average weekday.
- According to turning movement counts performed at the intersection with Paterson Plank Road and 8th Street on Tuesday October 16, 2018, a total of 40 bicycles were crossing Kennedy Boulevard and ten bicycles were counted crossing 8th Street during peak period[45] conditions on an average weekday.



Predominant Safety Issues

- Errant pedestrian movements
- Left turn vehicular collisions
- Hit parked vehicle
- Highest crash location overall
- Numerous sideswipe crashes
- Miovision camera deployment

Near Collision between northbound left turn vehicle and crossing pedestrian at Paterson Plank Road. (Source: Miovision)



[44] References to peak period in this report include AM/MD/PM peak periods, volume collected on a weekday 7-9AM, 11AM-1PM, and 4-6PM.
[45] References to peak period in this report include AM/MD/PM peak periods, volume collected on a weekday 7-9AM, 11AM-1PM, and 4-6PM.

Technical Advisory Committee Input

- In-road reflectors in the lanes could be used increase the visibility of travel lanes on Kennedy Boulevard, particularly at night.
- A pedestrian refuge island on Paterson Plank Road on the west side of Kennedy Boulevard was discussed.
- Participants were in favor of LPIs but preferred a pedestrian-only phase at the Paterson Plank Road intersection.
- Participants mentioned an interest in speed tables or raised intersections.

TAC members discussing options for Paterson Plank Road. Source: FHI

- Bike lanes were not seen as appropriate in this area. Attendees felt that adjacent streets would be better suited.
- Potential design interventions that were viewed as highly effective and implementable in the short term were lighting, curb extensions, and high-visibility crosswalks.

Additional Sources

Additional sources have been considered in the segment design:

- Speeding and distracted/dangerous driving were the top concerns of e-survey respondents.
- E-survey respondents said slower vehicle speeds and increased pedestrian crossing time would most improve the walking environment.

Site-Specific Challenges

Some locations along the corridor received considerable attention throughout the process. This section outlines some of the primary concerns raised by the walk audit participants and TAC members and are supported by the findings of the technical analysis.

Secaucus Road/6th Street and Kennedy Boulevard

The steep grade of Secaucus Road approaching Kennedy Boulevard presents visibility challenges. Secaucus Road is a truck route, so participants noted the limited potential to extend crosswalks. One of the curbs had evidence of deterioration from repeated mounting by vehicles. Participants suggested an LPI may be one option for improving pedestrian safety.

The intersection at 6th Street has less vehicular traffic than Secaucus Road. Walk audit participants suggested high-visibility crosswalks and curb extensions to enhance pedestrian visibility. Participants also noted that vehicles frequently block the sidewalk on the eastern side of Kennedy Boulevard between Secaucus Road and 6th Street.

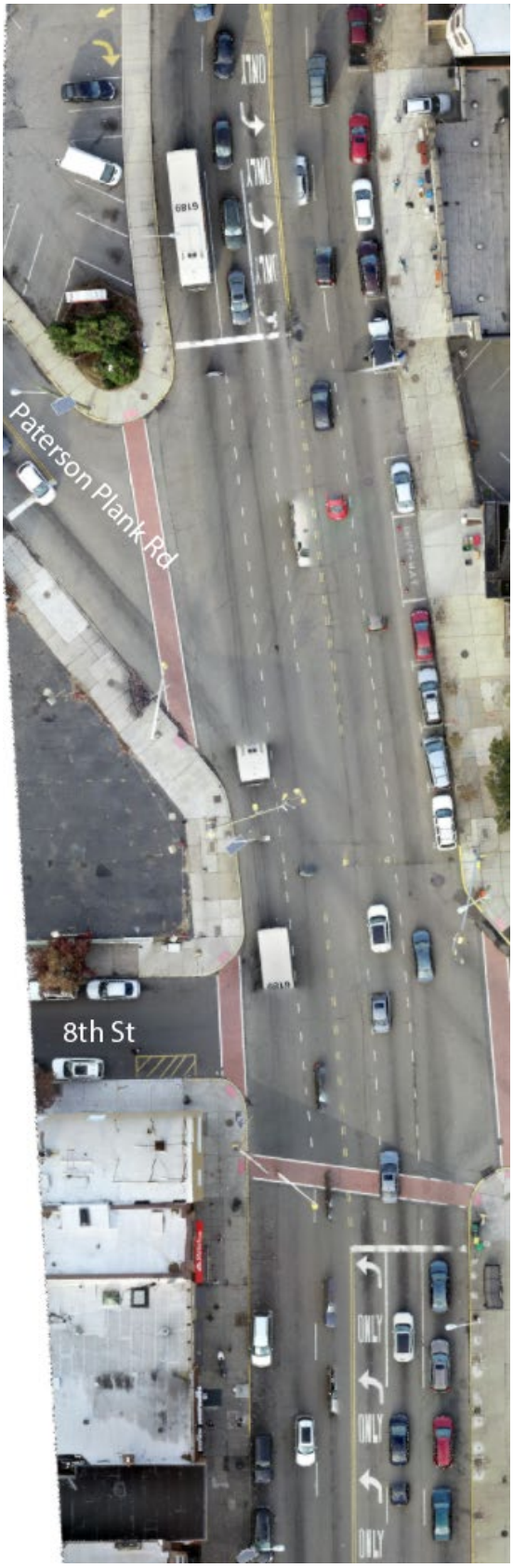
Walk audit participants and TAC members suggested adding high-visibility crosswalks. Source: FHI

Paterson Plank Road and Kennedy Boulevard

The skewed intersection of Paterson Plank Road and Kennedy Boulevard was the most commonly cited intersection of concern in the e-survey. Walk audit participants wondered if making the intersection less skewed was an option. The crossing on the western side of Kennedy Boulevard is about 90 feet in length, and participants said this generated some safety concerns. Moreover, participants observed people crossing on the northern side of the intersection where there is no marked crosswalk. Pedestrians attempting to cross this intersection would need to walk down to the southern side of 8th Street or cross at the northern side of 10th Street to cross using a marked crosswalk. Using a marked crosswalk would require walking 402 feet if crossing at 8th Street or 915 feet if crossing at 10th Street.

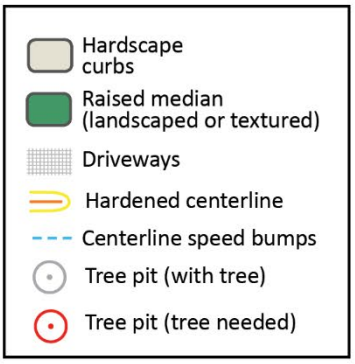
TAC members considered LPIs as one option but preferred a pedestrian-only phase at the intersection. This has the potential to allow a crosswalk on the northern side of the intersection.

The crosswalk on the western side of Kennedy Boulevard at Paterson Plank Road is 90 feet long. TAC members and walk audit participants asked if there was a way to shorten this crosswalk.
Source: FHI



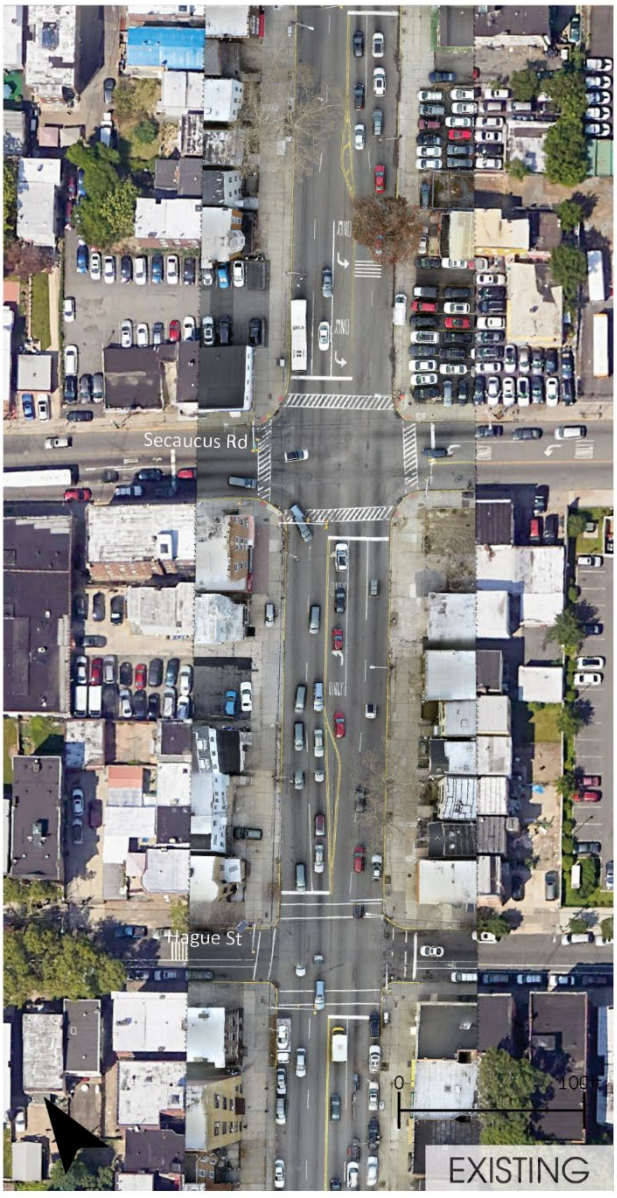
Recommendations

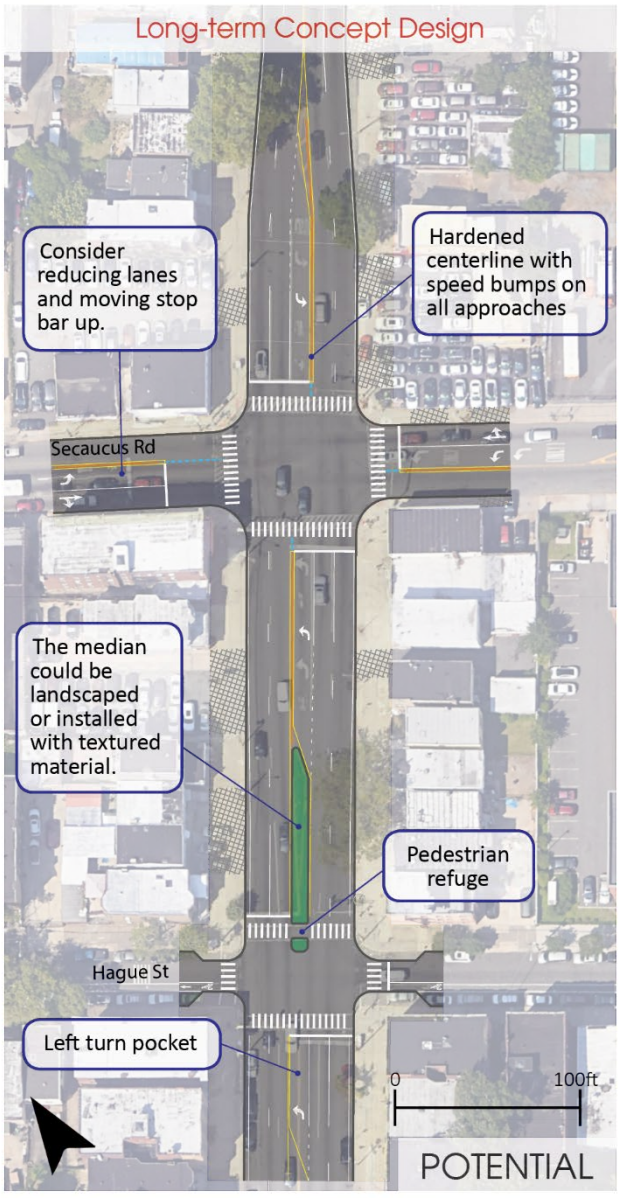
This section details the recommended modifications for the focus area. The concept drawings are to be considered a long-term vision unless otherwise indicated. Additional coordination with the municipalities as well as feedback from the surrounding community will be needed if these designs move forward. Unlike the focus areas in Bayonne and Jersey City, the proposed concept drawings do not feature major changes to the street cross sections.



Hague Street to Secaucus Road & Kennedy Boulevard

High-visibility crosswalks could be added at all intersections in this segment, and curb extensions and daylighting could be added at Hague Street. Hague Street has the opportunity for a pedestrian refuge island, which could be equipped with a pedestrian activation button.



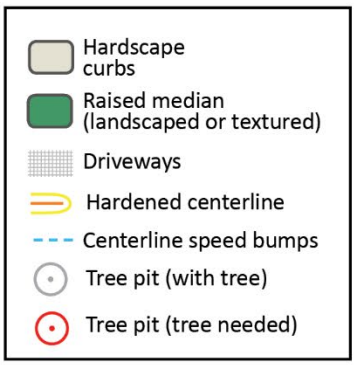


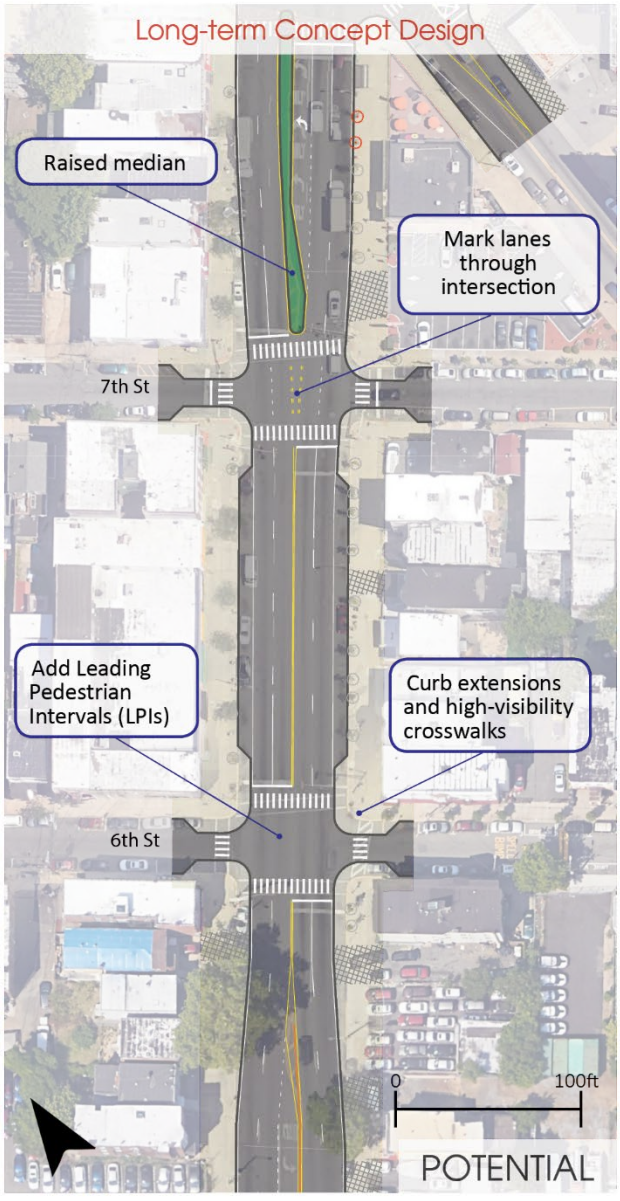
The curb extension opportunities at Secaucus Road are limited by the road's role as a freight route and lack of on-street parking. LPIs or crossing guards could be a helpful way to increase pedestrian visibility.

Considering traffic volumes, bicycle lanes are not recommended on this segment. Union City has multiple parallel routes with lower traffic volumes that could serve as viable options for people on bikes.

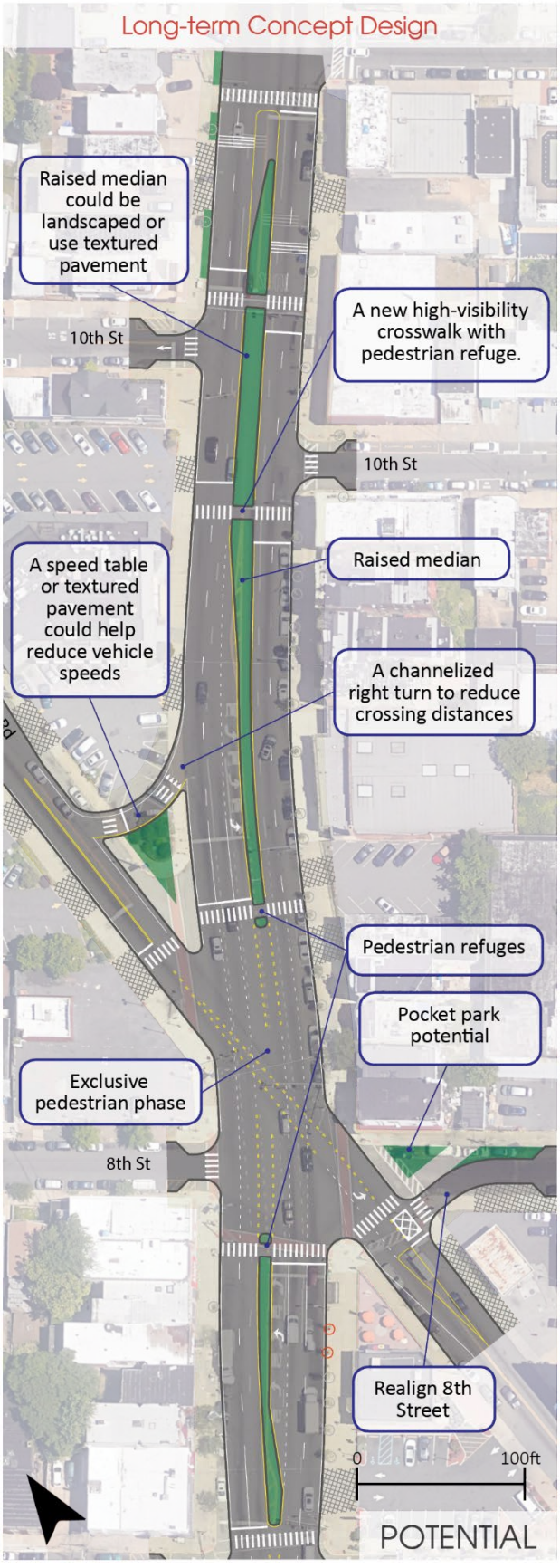
6th to 7th Street & Kennedy Boulevard

The segment of Kennedy Boulevard including 6th and 7th Streets offers opportunities for curb extensions on all corners. This will shorten the crossing distance and remind drivers of the residential nature of the streets as they enter from Kennedy Boulevard. High-visibility crosswalks could be added at all intersections. At 7th Street, the lanes could be marked with dashed lines through the intersection to guide vehicles. An LPI at 6th Street is also recommended.



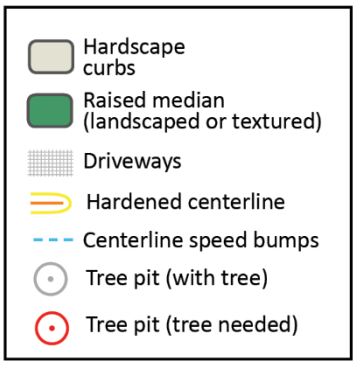



10th St
10th St
Paterson Plank Rd
8th St
0
100ft
EXISTING


Long-term Concept Design
Raised median could be landscaped or use textured pavement
A new high-visibility crosswalk with pedestrian refuge.
10th St
10th St
Raised median
A speed table or textured pavement could help reduce vehicle speeds
A channelized right turn to reduce crossing distances
Pedestrian refuges
Pocket park potential
Exclusive pedestrian phase
8th St
Realign 8th Street
0
100ft
POTENTIAL

8th to 10th Street & Kennedy Boulevard

Shortening crossing distances and addressing pedestrians crossing outside of crosswalks was a priority of stakeholders. The existing crosswalks are long, leaving pedestrians feeling exposed. At 8th Street, curb extensions would shorten the crossing distance, and the crosswalk crossing Kennedy Boulevard could be straightened. A pedestrian refuge island could be added to improve the pedestrian level of comfort.



At Paterson Plank Road, a large refuge island would help shorten crossing distances. It would also allow for a crosswalk on the northern side of the Paterson Plank Road. Previously, people would have to either cross on the south side of 8th Street or the north side of 10th Street. To make this refuge possible, a channelized right-turn lane is recommended as one option. This lane could be designed to slow turning vehicles. Without speed reduction measures, slip lanes can be unsafe locations for pedestrians, so a speed bump or raised crosswalk is recommended. Additional long-term options for Paterson Plank Road are discussed below.

The intersection at 10th Street features two center lane pedestrian refuges, curb extensions, and a new crosswalk on the south side of the intersection.

Alternatives for Paterson Plank Road

Paterson Plank Road is a complicated, skewed intersection that stakeholders repeatedly mentioned as a top priority for safety improvements. Hudson County Engineering is interested in conducting a Paterson Plank Road study, but one of the recommended redesign options is shown on the rendering on the previous page. This option, shown below as Option 1, "Minor Modification," does not help straighten the intersection but does address most of the long crossing distances and limited crosswalks on Kennedy Boulevard.

Option 2, the "Un-skew" option is a longer-term solution that creates two separate intersections with Paterson Plank Road. Intersections that come at right angles are generally safer for all road users relative to skewed intersections. Although the continuity of Paterson Plank Road is impacted, an analysis of traffic impacts showed no reduced level of service. As with the first option, this alternative would

require the purchase of private property. That said, the segments of existing Paterson Plank Road immediately adjacent to Kennedy Boulevard could be opened up for park space or new developments if 8th Street were closed off. These opportunities could potentially offset the impacts of the takings.

The last option, the "T-up" option, maintains the continuity of Paterson Plank Road while making it less skewed. The proposed curvature of the road is designed with a 25 mph speed in mind (lowering it to a 15 mph speed limit could allow for further straightening of the intersection). In this scenario, 8th Street's access to Kennedy Boulevard would need to be closed off, which would simplify the intersection and signalization. The closed off areas could present opportunities for new development, however, the property takings would be more substantial relative to the other options. If pursued, it is anticipated that this option is considered a long-term option.

On-street Parking Modifications

The long-term conceptual drawing would result in some parking loss. From Hague Street to 6th Street, there is no on-street parking, so all the lost parking spaces are north of 6th Street. The majority of the lost spaces are between Paterson Plank Road and 10th Street. This location features parking spaces in the intersection. Additionally, the proposed median would take away parking spaces on the north side of the intersection.

The long-term conceptual design as shown eliminates 24 on-street spaces. Please note that illegal parking spaces, such as locations at bus stops or within 25 feet of the crosswalk were not considered in the parking totals.

Table 11 On-street Parking Spaces Lost with Conceptual Design (Hague to 10th)

	Existing			Proposed		
Segment	**Southbound**	**Northbound**	**Total**	**Southbound**	**Northbound**	**Total**
Hague to Secaucus	0	0	0	0	0	0
Secaucus to 6th	0	0	0	0	0	0
6th to 7th	8	7	15	7	6	13
7th to Paterson Plank	3	0	3	0	0	0
Paterson Plank to 10th	1	18	19	0	0	0
TOTAL			***37***			***13***

Green Stormwater Infrastructure (GSI)

Kennedy Boulevard between Hague Street and 10th Street, as it relates to the implementation of Green Stormwater Infrastructure (GSI), is best defined by its lack of consistent curb-side parking and use of left-turn lanes in addition to two lanes of traffic in each direction. This lack of non-travel lanes limits GSI practices to those that are behind the curb line. In addition, the curb line is broken by multiple curb cuts for private parking or car sale lots that will limit the regular implementation of flow through planters.

Given these constraints, while both curb extensions and planters could be utilized inconsistently, subsurface infiltration trenches may be a better fit for this focus area:

- Subsurface Infiltration Trenches
    - Subsurface infiltration trenches provide a stone bed or other stormwater storage medium for the collection of stormwater runoff. Sitting below grade, these systems provide little to no changes to the sidewalk surface and can therefore be used in areas where a standard footway is required.
    - In places where infiltration is not feasible, a non-infiltrating, slow release system can be used. This does not have all the benefits of an infiltrating system, providing only a minimal water quality benefits, but still reduces the rate at which stormwater enters the public storm sewer.

Subsurface infiltration trenches allow for filtration when there is not enough room for a surface treatments. Source: Stantec

Policies

The following policies could be considered on this corridor:

- **Crossing Guards.** Expanding the use of crossing guards at Secaucus Road will help with pedestrian visbility and level of comfort.
- **Leading Pedestrian Intervals.** In general, LPIs could be added at each of these intersections in the corridor that do not already have them. This corridor is heavily utilized by pedestrians. The traffic cameras used as part of this study recorded more than 1,000 pedestrian crossings at Paterson Plank Road during peak periods. It is likely that other cross streets have similar counts.

Order of Magnitude Costs

The proposed cost of these improvements is an estimated $1.4 million. This cost is based off bid pricing on similar projects. These cost estimates do not factor in the costs of land acquisition as discussed in some of the options for Paterson Plank Road.

Table 12 Cost Estimates for Hague to 10th Street Recommendations

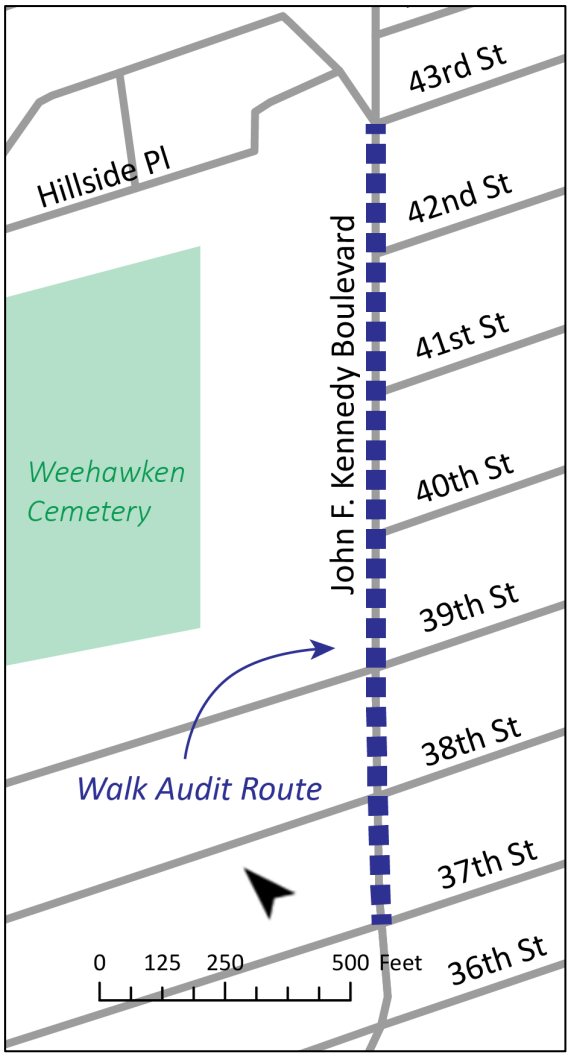
Description	Unit	Quantity	Unit Price	Total
Mill 2"	S.Y.	15,481	$15	$232,220
Pave 2"	TON	194	$90	$17,416
4" Topsoil and Seeding	S.Y.	901	$4	$3,604
Striping (Roadway)	L.F.	21,058	$1	$26,323
Concrete Curb	L.F.	7,157	$33	$236,181
Concrete Sidewalk (Bump Outs)	S.Y.	1,806	$80	$144,480
Concrete Islands	S.Y.	901	$70	$63,070
Update Existing Signalized Intersections	EACH	8	$50,000	$400,000

Subtotal:	$1,123,294
Contingency:	$280,823
Total:	**$1,404,117**

37TH STREET TO 43RD STREET (UNION CITY / NORTH BERGEN)

Existing Conditions

The section of Kennedy Boulevard running from 37th Street to 43rd Street on the Union City-North Bergen border is approximately 1480 feet in length and includes seven intersections, all of which are signalized. This particular portion of the corridor is classified by the county's Land Development Regulations[46] as a Mixed Urban Boulevard, which is "similar in character to the Residential Boulevard except that the land use and character is more varied." Curb-to-curb width is approximately 59 feet through this segment of the boulevard with approximately 11 feet allocated for left travel lanes and 18.5 feet allocated for both the right travel lane and unstriped parking in each direction. At the intersections at both ends of the study area where parking is prohibited (37th Street and 43rd Street), curb-to-curb width remains the same with 11 feet allocated for the center median/left-turn lane, one 11-foot left travel lane in each direction, and one 13-foot right travel lane in each direction. Route 495, a major regional freeway providing connections to the Lincoln Tunnel and the New Jersey Turnpike/Route 3, is located immediately to the south of the focus area and influences the speed and volume of traffic on Kennedy Boulevard towards the southern end of the focus area.



This segment of the boulevard has a mixed urban feel with higher traffic volumes, multi-family housing, mixed-use buildings, and a cozier streetscape as defined by relatively narrow sidewalks. Land uses adjacent to the focus area are in Union City Zone R and North Bergen Zone R-2, which specifies the district for low and intermediate density housing. On the southern end of the study area from 37th Street to 40th Street there are neighborhood commercial land uses, designated as Union City Zone C-N. A cemetery and associated buildings occupy a large portion of the west edge of the focus area from 40th Street to 42nd Street. Redevelopment on the southeastern quadrant of Kennedy Boulevard and 37th Street for a one-story retail building has been approved by Union City and the County.

Additional discussion of the existing conditions can be found in Appendix A.

[46] From *Hudson County Land Development Regulations for Smart Growth and Sustainable Development*, released by County/NJTPA in June '16.

Identified Deficiencies

This section summarizes the key findings from the October 2018 Walk Audit, technical analysis, feedback from the February 2019 Technical Advisory Committee meeting, and other relevant sources. These sources have identified the following as major challenges:

- High traffic speeds
- Large traffic volumes
- Blocked intersections and crosswalks during congested periods
- Limited buffer zone, particularly in areas without parking, trees, or bollards
- Left-turn conflicts, especially at 37th Street
- Narrow sidewalks

Walk Audit Results

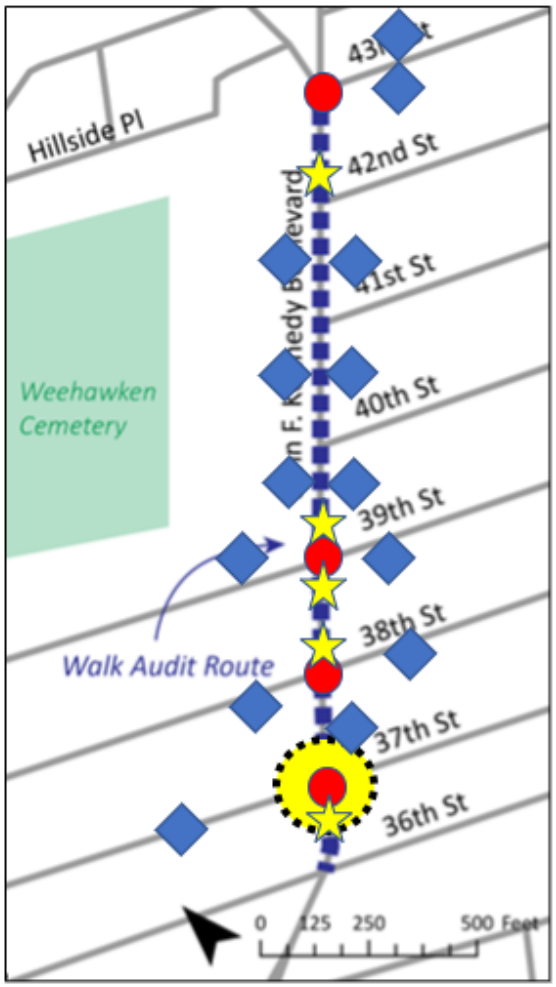
Observations from walk audit participants:

- The sidewalk is narrow along the corridor.
- Bollards and tree pits help create a buffer.
- The crossings at 39th and 43rd Streets need the most attention due to vehicle behavior and visibility challenges.
- Both 39th and 43rd Streets could be considered for leading pedestrian intervals (LPIs).
- There are some areas where there is signage clutter.

(Above) Participants on the 37th Street to 43rd Street walk audit. (Below) Vehicles frequently block sidewalks in the corridor. Source: FHI

Findings from Technical Analysis

- A review of the crash data for this focus area as compared to the entire Kennedy Boulevard corridor indicates that there is a prevalence of rear-end and sideswipe crashes, which is typical of a congested area. There is also a relatively large share of parked vehicle collisions, which is reflective of the tight lane geometry on a section of Kennedy Boulevard with parking.[47]
- According to turning movement counts performed at the intersection with 37th Street using the traffic camera, 935 pedestrians crossed Kennedy Boulevard while 310 pedestrians crossed 37th Street during peak period[48] conditions of an average weekday.
- According to turning movement counts performed at the intersection with 37th Street, 37 bicycles crossed Kennedy Boulevard and 26 bicycles crossed 37th Street during peak period conditions of an average weekday.



"Don't Block the Box" striping at 37th Street
Source: FHI

[47] Crash data collected from police investigation reports; most recent 3-year data set
[48] References to peak period in this report include AM/MD/PM peak periods, volume collected on a weekday 7-9AM, 11AM-1PM, and 4-6PM.

Technical Advisory Committee Input

- Participants requested pedestrian refuge islands.
- A four-phase traffic light interval with the fourth phase dedicated to pedestrians could be considered at 43rd Street.
- Prohibited left-hand turns were not considered effective, and law enforcement believed that any new sign would have low compliance.
- Daylighting, curb extensions, and high-visibility crosswalks were viewed favorably.
- Potential design interventions that were viewed as highly effective and implementable in the short term were lighting, leading pedestrian intervals (LPIs), and high-visibility crosswalks.
- Participants suggested high-visibility crosswalks at intersections located on 37th Street, 38th Street, and 40th Street.
- Curb extensions were suggested on 38th Street and 40th Street.
- Participants suggested removing parking.
- Participants liked the idea of adding elements like curb extensions or center lane medians so the roadway would not stay so consistent. This may encourage drivers to pay better attention.

TAC members, including representatives from both North Bergen and Union City, discussed opportunities from 37th Street to 43rd Street. Source: FHI

Additional Sources

Additional sources have been considered in the segment design:

- Speeding and distracted/dangerous driving were the top concerns of e-survey respondents.
- E-survey respondents said slower vehicle speeds and increased pedestrian crossing time would most improve the walking environment.

Site-Specific Challenges

Some locations along the corridor received considerable attention throughout the process. This section outlines some of the primary concerns raised by the walk audit participants and TAC members and are supported by the findings of the technical analysis.

37th Street and Kennedy Boulevard

The intersection at 37th Street at the southern edge of the focus area is currently marked with "Don't Block the Box" markings. Walk Audit participants noted high vehicle speeds as cars transition from a more commercial area into a mixed-use zone. TAC members suggested adding a pedestrian refuge, an LPI, and a "LOOK!" pedestrian crossing sign.

The MioVision camera was deployed at this intersection. A remarkable frequency of high-risk events for vehicle-vehicle collisions (257 events) were recorded by MioVision cameras at 37th Street between northbound left-turn traffic and southbound through traffic on Kennedy Boulevard during the 60-hour period. This site had the highest amount of conflicts observed among all four MioVision locations, which is reflective of the one per year right-angle crash frequency seen at this intersection.

Source: Hudson County

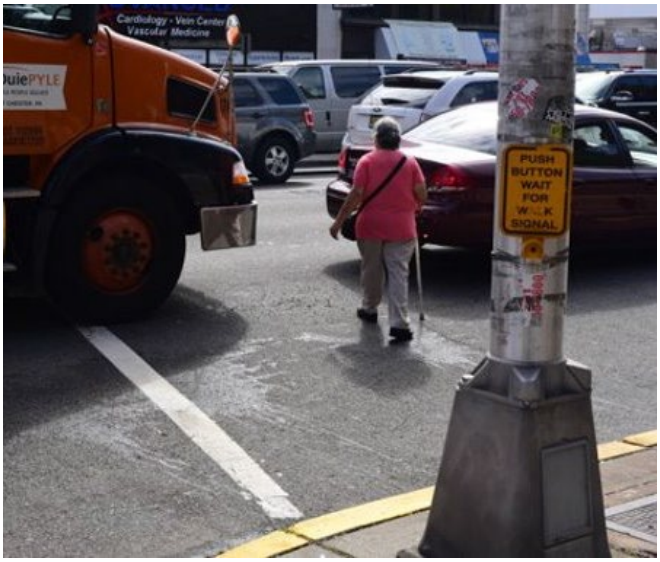
Near collision between northbound Left Turn Vehicle and southbound Through Vehicle at 37th Street on Kennedy Boulevard. Source: Miovision

39th/40th Streets and Kennedy Boulevard

Walk Audit participants discussed a number of challenges on the segment between 39th and 40th Streets. Participants expressed concern about the wide curb cuts at the gas station. One participant noted that drivers on 39th Street cut through the gas station to avoide the light. Evidence of broken curbs further added to some participants' concerns. This intersection has a crossing guard during peak hours. The crossing guard told participants that she felt drivers did not respect her.

At 40th Street, participants noted narrower sidewalks and the need for high-visibility crosswalks on all four legs of the intersection. As with many intersections in the focus area, vehicles sometimes block the crosswalk when the area is congested. This makes crossing Kennedy Boulevard challenging and raises pedestrian visibility concerns.

During congested periods, vehicles block the crosswalk at 40th Street. Source: FHI

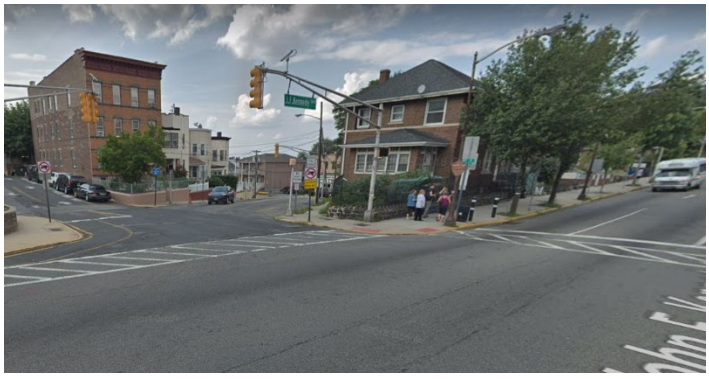


43rd Street and Kennedy Boulevard

The intersection at 43rd Street is offset, with the western leg coming in at a skewed angle. Walk audit participants noted the following:

- LPI would be helpful
- Pedestrian countdown not working for the crossing on the northern end of the intersection
- Cracked sidewalks suggest that vehicles are mounting the curb
- Westbound vehicles on 43rd cannot see pedestrians crossing on the north side of the intersection.

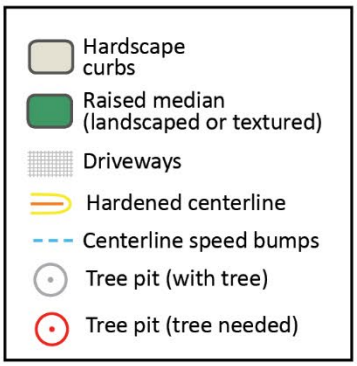
The skewed angle paired with the entrance to the North Bergen Town Hall at Hillside Place creates a challenging atmosphere for drivers and pedestrians alike.



(Top) 43rd Street crosses Kennedy Boulevard at a skewed angel. (Source: Google Street View) (Bottom) Northbound vehicles approaching the intersection at 43rd Street. Source: FHI

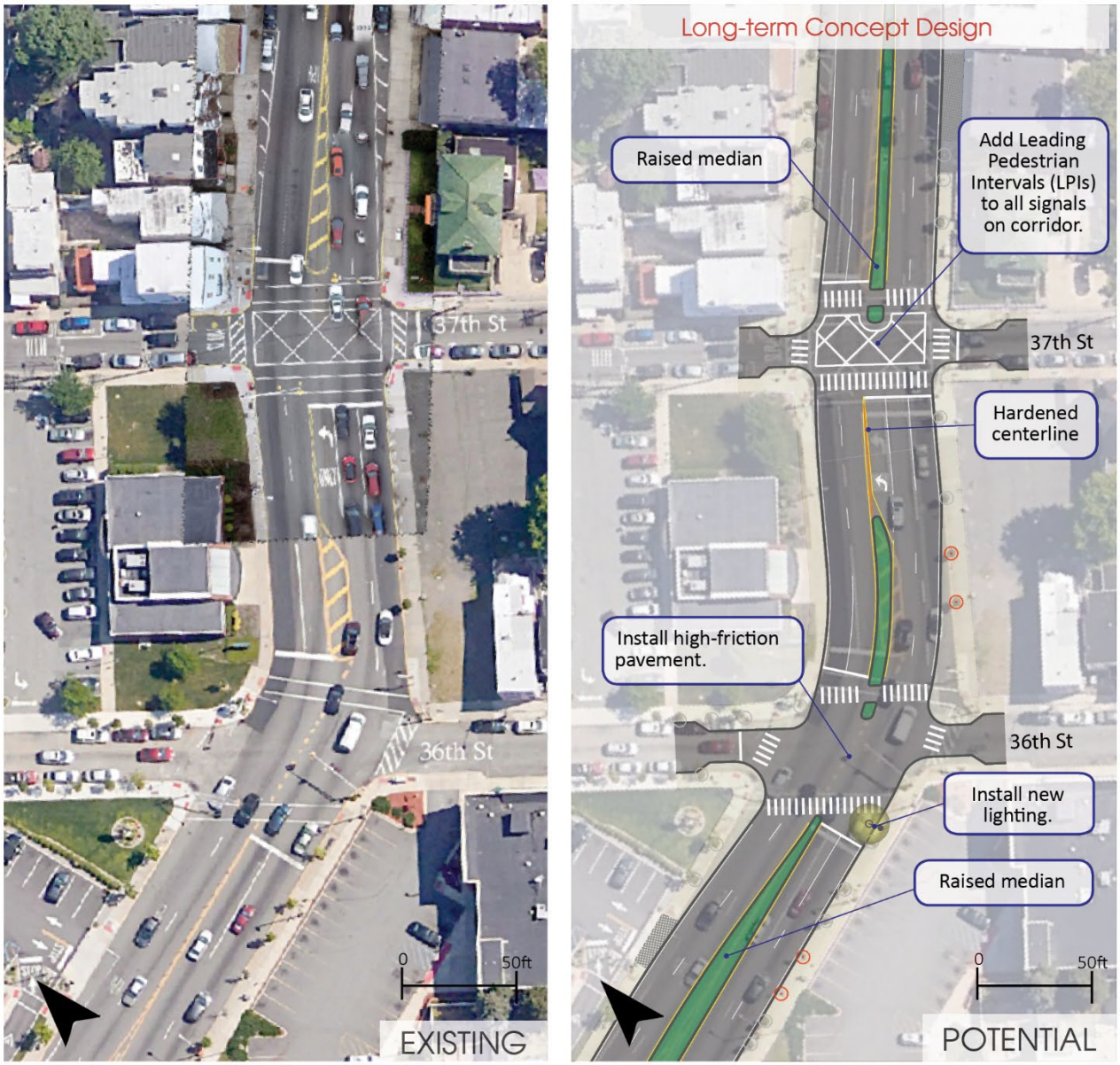
Recommendations

This section details the recommended modifications for the focus area. The concept drawings are to be considered a long-term vision unless otherwise indicated. Additional coordination with the City of Union City and the Township of North Bergen as well as feedback from the surrounding community will be needed if these designs move forward.



36th to 37th Street & Kennedy Boulevard

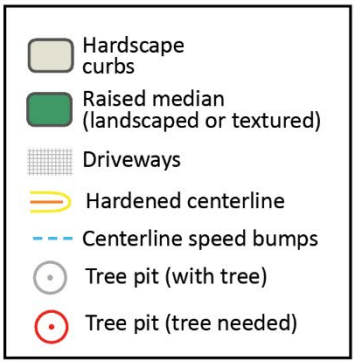
Although the focus area starts at 37th Street, it is relevant to include the block to the south. Many drivers heading north on this section have just exited 495, and the design of Kennedy Boulevard between 31st and 37th Street has elements that mimic a road with higher speeds (e.g., jersey barriers, merging lanes). At 37th Street, Kennedy Boulevard transitions to a design with a more neighborhood feel.

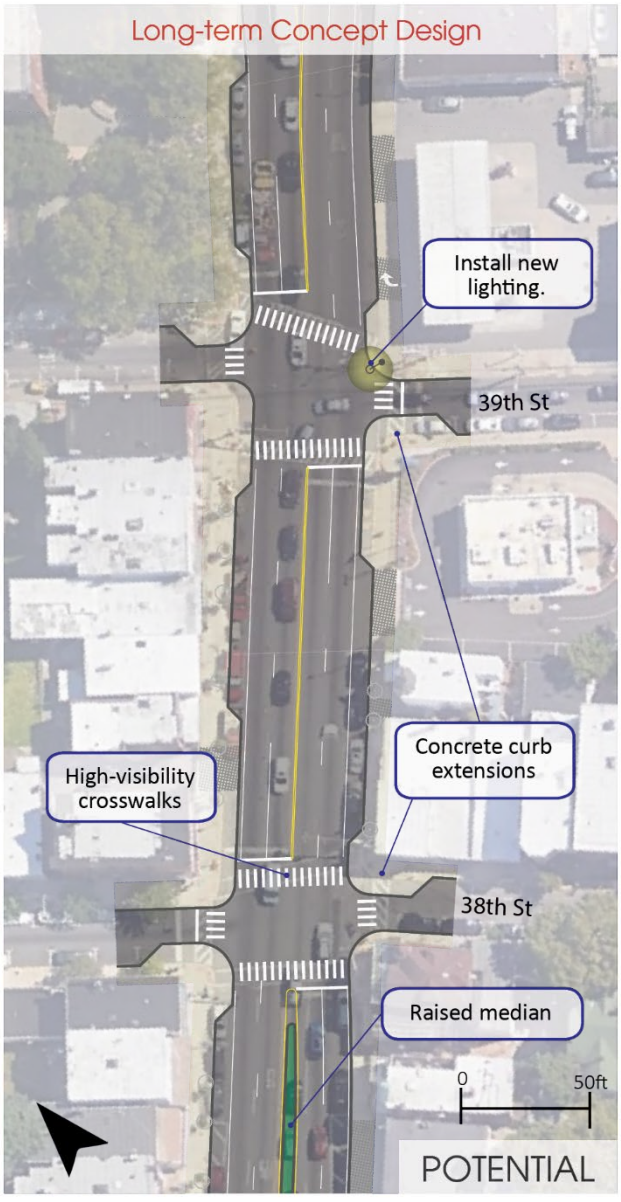


Recommendations include high visibility-crosswalks, curb extensions, daylighting, and pedestrian refuge islands.

38th to 39th & Kennedy Boulevard

High-visibility crosswalks could be added at each corner. Where possible, the crosswalks could be straightened to shorten the crossing distance. Wherever there is a pedestrian refuge, a push button could be constructed to prevent pedestrians from being stuck in the refuge when pedestrian activation is required.

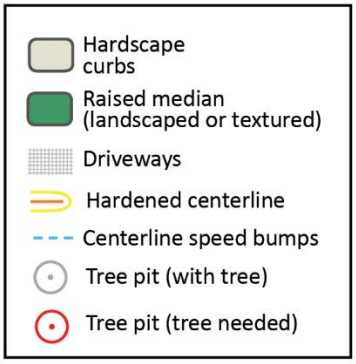


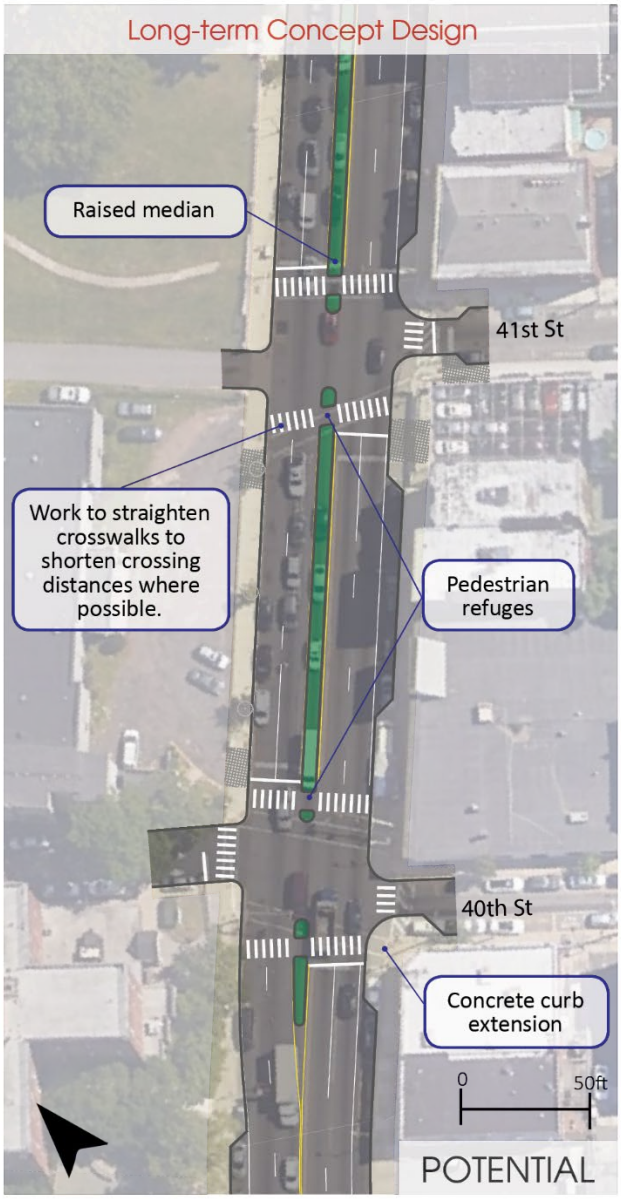


40th to 41st Street & Kennedy Boulevard

At 40th Street, the center lane median has been reintroduced. This recommendation is consistent with the TAC member's request to have less consistency in the roadway design, encouraging drivers to stay focused.

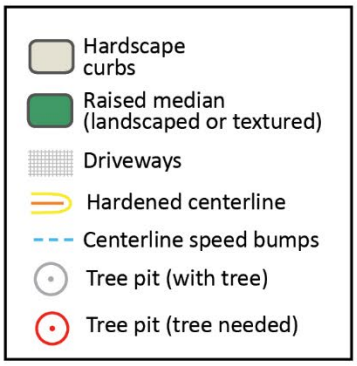
To accommodate the center lane pedestrian refuge island, southbound parking will be removed, which may require input from the community. This area and the corridor as a whole has a high number of crashes with parked vehicles. Without parking, buffers such as trees could be added to enhance the pedestrian level of comfort.

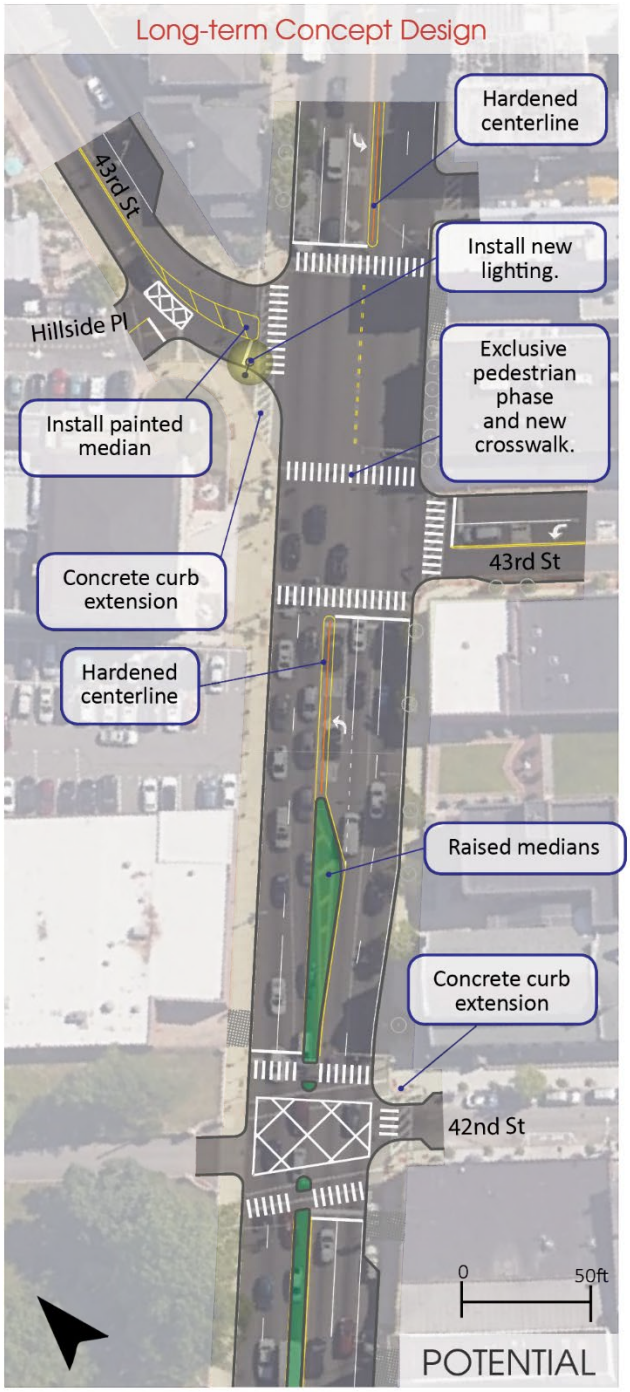




42nd to 43rd Street & Kennedy Boulevard

At 42nd Street, high-visilbity crosswalks could be added and the crosswalks could be straightened. The center median could continue from 40th Street and accommodate pedestrian refuges. To address the visibilty concerns at 43rd Street, an exclusive pedestrian phase could be added; including the exclusive pedestrian phase, the signal timing could be five-phase. The sidewalk in front of North Bergen Town Hall could also be expanded, which would allow more space for people walking and help straighten the intersection and shorten the crosswalk.





On-street Parking Modifications

The long-term conceptual drawing would result in the loss of eight parking spaces, all of which are located between 40th and 42nd Street. In place of parking spaces, a center lane median could be installed, which would prevent U-turning and pedestrian crossings outside the crosswalk. Please note that illegal parking spaces, such as locations at bus stops or within 25 feet of the crosswalk were not considered in the parking totals.

	Existing			Proposed		
Segment	**Southbound**	**Northbound**	**Total**	**Southbound**	**Northbound**	**Total**
37th to 38th	3	3	6	6	3	9
38th to 39th	5	3	8	5	3	8
39th to 40th	5	4	9	4	5	9
40th to 41st	5	7	12	0	5	5
41st to 42nd	6	4	10	0	6	6
42nd to 43rd	0	0	0	0	0	0
TOTAL			***45***			***37***

Green Stormwater Infrastructure (GSI)

Kennedy Boulevard between 37th Street to 43rd Street, as it relates to the implementation of Green Stormwater Infrastructure, is best defined by its lack of consistent curb-side parking and use of left-turn lanes in addition to two lanes of traffic. This lack of non-travel lanes limits GSI practices to those that are behind the curb line. In addition, the curb line is broken by multiple curb cuts for private parking or car sale lots that will limit the regular implementation of flow through planters. Given these constraints, while both curb extensions and planters could be utilized inconsistently, Subsurface Infiltration Trenches may be a better fit for this focus area:

- Subsurface Infiltration Trenches
    - Subsurface infiltration trenches provide a stone bed or other stormwater storage medium for the collection of stormwater runoff. Sitting below grade, these systems provide little to no expression on the sidewalk surface and can therefore be used in areas where a standard footway is required.
    - In places where infiltration is not feasible, a non-infiltrating, slow release system utilizing an orifice can be used. This does not have all the benefits of an infiltrating system, providing only a minimal water quality benefits, but still reduces the rate at which stormwater enters the public storm sewer.

In addition, the adjacency of Weehawken Cemetery's open lawn presents an opportunity for a partnership to provide management points for runoff from Kennedy Boulevard. The open lawns here could be used for raingardens, swales, and subsurface infiltration trenches.

Policies
The following policies could be considered on this corridor:

- **Leading Pedestrian Intervals.** In general, LPIs could be added at each of these intersections in the corridor that do not already have them. This corridor is heavily utilized by pedestrians. The traffic cameras used as this study recorded more than 1,000 pedestrian crossings at 37th Street during peak periods. It is likely that other cross streets have similar counts.
- **Green Stormwater Infrastructure.** Due to the high pedestrian traffic and store fronts, green stormwater infrastructure can be provided in the form of:
    - Flow Through Planters: Flow through planters provide separation from vehicular traffic for pedestrians and create the aesthetic feeling of a classic, landscaped Main Street. Stormwater is allowed to infiltrate through the soil profile contained within the flow through planter or when the stormwater flows are too high, bypass through a domed riser or similar to stone storage below.
    - Bumpouts (e.g., at within curb extensions or bus bulbs): Stormwater can infiltrate through the soil profile contained within the bump out or when the stormwater flows are too high, bypass through a domed riser or similar to stone storage below.

Order of Magnitude Costs

The proposed cost of these improvements is an estimated $1.4 million. This cost is based off bid pricing on similar projects.

Table 13 Cost Estimates for 37th to 43rd Street Recommendations

Description	Unit	Quantity	Unit Price	Total
Mill 2"	S.Y.	15,193	$15	$227,893
Pave 2"	TON	190	$90	$17,092
4" Topsoil And Seeding	S.Y.	766	$4	$3,064
Striping (Roadway)	L.F.	21,468	$1	$26,835
Concrete Curb	L.F.	7,708	$33	$254,364
Concrete Sidewalk (Bump Outs)	S.Y.	1,058	$80	$84,640
Concrete Islands	S.Y.	766	$70	$53,620
Update Existing Signalized Intersections	EACH	9	$50,000	$450,000

Subtotal:	$1,117,508
Contingency:	$279,377
Total:	**$1,396,886**

CHAPTER FIVE
CORRIDOR-WIDE SOLUTIONS

JFK BLVD
SAFETY CORRIDOR STUDY

The previous chapter considers recommendations for the four focus areas. Each segment of the corridor is different, but some of the lessons learned from the focus areas can be applied corridor-wide. This chapter considers some of the corridor-wide opportunities. They are organized around the three E's of transportation safety: education, enforcement, and engineering. The recommendations are based off what the project team heard from the TAC and public as well as best practices from other cities. This chapter concludes with a discussion of Vision Zero.

EDUCATION & ENCOURAGEMENT

Street Smart NJ Pedestrian Safety Campaign

Hudson County, including the Division of Planning, Office of the County Engineer, Hudson Transportation Management Association (TMA), and Hudson County Improvement Authority, have provided several Street Smart NJ campaigns along John F. Kennedy Boulevard. Street Smart NJ is a public education program developed by the NJTPA that works with law enforcement and other partners to change the behaviors that contribute to pedestrian-vehicle crashes. For each campaign, participating agencies observe vehicular and pedestrian behavior, then conduct outreach including street signs, internet and social media content, and finally perform a second set of observations to look for any changes in pedestrian and driver behavior.

Jersey City was a Street Smart NJ pilot location in 2013 and that campaign included Kennedy Boulevard and Danforth Avenue, among several other intersections throughout the city. Jersey City also participated in Street Smart NJ in 2016 and focused on the intersection of Kennedy Boulevard and Sip Avenue.

In 2017, Street Smart NJ campaigns were held along Kennedy Boulevard centered at the following intersections:

- Bayonne: 25th Street
- Jersey City: Lexington Avenue
- North Bergen: 91st Street
- Union City: 36th Street
- West New York: 51st Street

In 2018, an additional Street Smart NJ campaign was held in Bayonne at 25th Street.

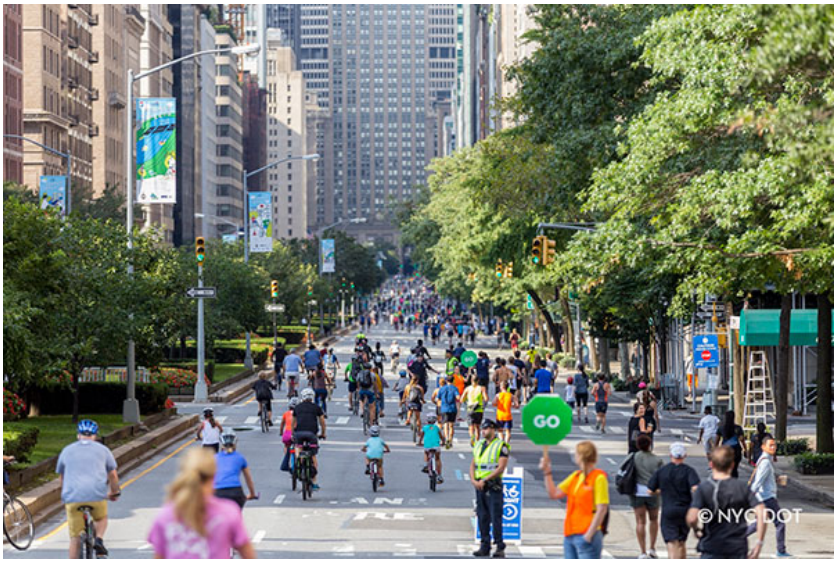
Hudson County will continue to hold Street Smart campaigns on John F. Kennedy Boulevard on different segments to further engage roadway users in promoting safe behavior.

Street Smart NJ developed a messaging campaign to encourage greater awareness among drivers and pedestrians. Source: NJTPA

Events and Temporary Street Closures

Previous planning efforts in Hudson County (e.g., JC Walks Pedestrian Enhancement Plan) have recommended encouragement programs to promote biking, walking, and transit use within Hudson County. Events, such as temporary street closures for cars, are one way to promote active transportation while cultivating neighborhood pride, attracting visitors, and boosting the local economy.

An open street program like 'Summer Streets' on Park Avenue in Manhattan could open Kennedy Boulevard for a set duration to people walking, running, biking, or skateboarding. There could be the potential to accommodate food vendors, farmers markets, or parklets.



Each August, the New York City Department of Transportation opens the streets for people walking, biking, and taking other active modes (left). A similar event takes place in New Brunswick, NJ. Source: NYCDOT & Together North Jersey/City of New Brunswick

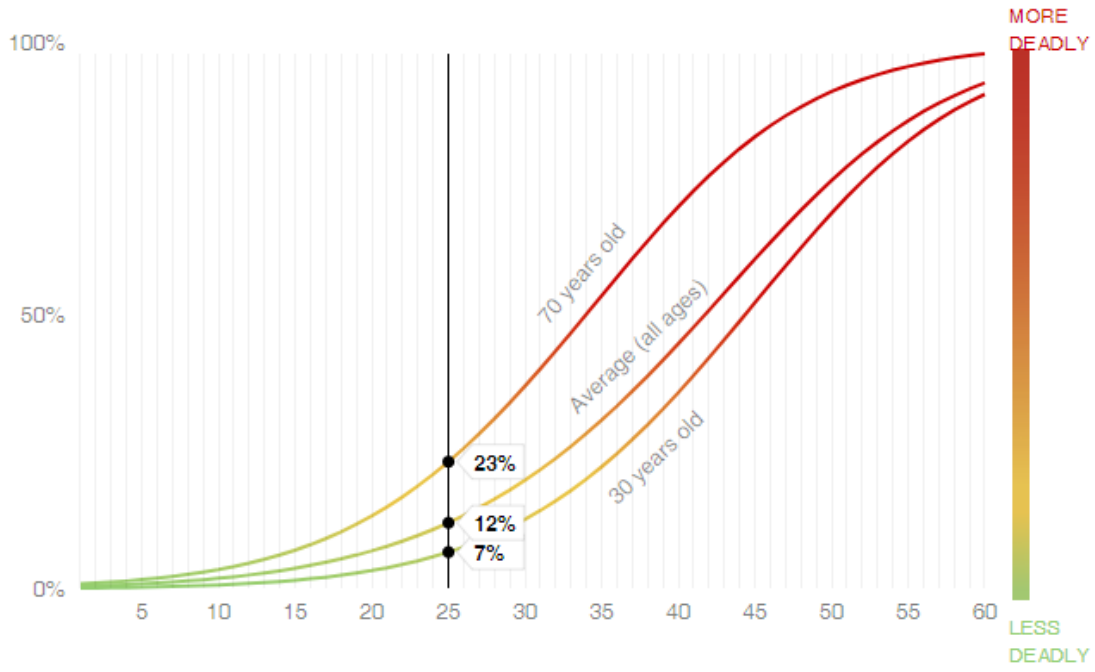
ENFORCEMENT

Speeding Enforcement

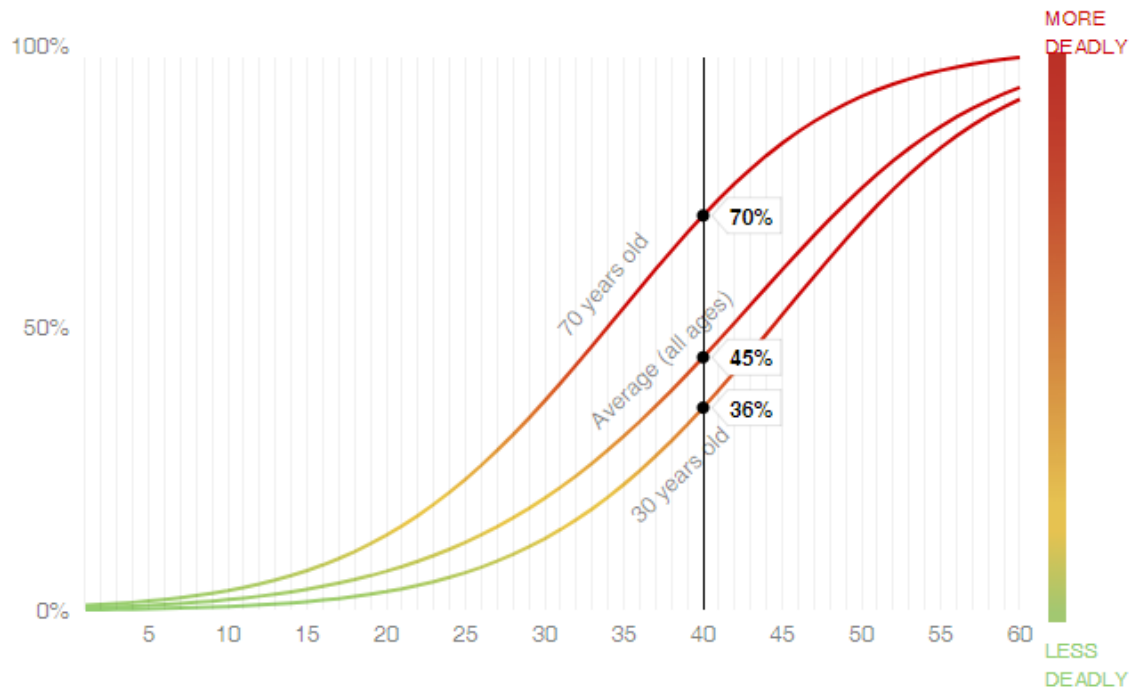
According to both the technical analysis and the stakeholder involvement, speeding is the leading contributing factor to crashes along the corridor. Higher speeds also dramatically increase the risk of serious injury and death. As shown in **Figure 18**, the risk of death for a pedestrian hit by a vehicle traveling at 25 mph is 12 percent. For a vehicle traveling at 40 mph, the risk of death increases to 45 percent. The charts also note how age affects the risk of death, with older adults facing a higher risk of death. Multiple stakeholders suggested that frequent enforcement in Bayonne led to slower traffic speeds and a generally safer environment for pedestrians and people on bicycles.

Increased enforcement is always a challenge for communities. Environmental justice communities nationally have historically experienced higher rates of enforcement, so measures need to be taken to ensure speed enforcement does not disproportionately affect members of environmental justice communities.[49] Before increasing enforcement, Hudson County could notify the public so drivers are aware of the speed enforcement measures. Other communities that have implemented Street Smart NJ have done this. Additionally, heightened enforcement is often a temporary solution to controlling speed. As police resources become constrained, speed enforcement is often diminished to free up officers to attend to other matters. For this reason, targeted enforcement campaigns could be used to supplement physical design solutions that slow traffic.

Figure 18 Probability of Pedestrian Fatality at 25mph v 45mph



[49] Smart Growth America. Dangerous by Design, 2019. https://smartgrowthamerica.org/dangerous-by-design/



This graphic illustrates the results of the AAA Foundation for Traffic Safety's study, "Impact Speed and a Pedestrian's Risk of Severe Injury or Death" (2011)[50] Source: ProPublica

Communities across the country have started to pilot neighborhood and community policing centers. These centers are staffed by a small group of officers or civilian positions. They are intended to be inviting settings where neighborhood issues can be discussed openly and honestly. The Hudson County Sherriff's Office could work with local municipalities to support neighborhood-level speeding enforcement campaigns. In addition to helping with local efforts, these centers could help improve the communication between the Sherriff's Office and local police departments, which was mentioned as a concern by at least one municipality.

Community policing centers will require additional funding. Until funding is secured, the Sherriff's Office is encouraged to continue partnering with local police departments on community outreach. Outreach events, such as events held at senior centers, schools, and established community events, are some of the ways the Sherriff's Office has promoted traffic safety. Public meeting attendees found these events helpful and were enthusiastic of continued engagement. It should be noted that enforcement in Hudson County faces staff limitations that pose challenges for both enforcement and educational campaigns, so additional grants or funding for officers may need to be secured to achieve this goal.

An additional safety issue observed to be pervasive on John F. Kennedy Boulevard is red light running by vehicles. Enforcement campaigns, combined with education and outreach, can help to reduce this behavior as well.

[50] See https://www.propublica.org/article/unsafe-at-many-speeds?utm_campaign=sprout&utm_medium=social&utm_source=twitter&utm_content=1464207000

Jitneys

The County should consider different options to encourage the safe operation of jitneys on John F. Kennedy Boulevard. A jitney communication strategy may help to promote better safety practices for jitney drivers. The Hudson County Jitney Study included several recommendations. A potential option mentioned in the Jitney Study is that Hudson County could establish a "revenue neutral" jitney medallion program. The intended purpose of the program would be to ensure jitneys are operating in compliance with federal and state requirements. Moreover, this program could improve communication with vehicle operators and increase access to safety training. This could help facilitate communication among drivers to follow established traffic laws, addressing a concern brought up among many members of the public as well as TAC members.

Parking

Street parking is common on Kennedy Boulevard. With high demand for parking comes a greater frequency of illegal parking. Walk audit participants observed parking violations on all four walk audits. Double parking and encroachment on crosswalks reduce pedestrian visibility. This is a safety concern, particularly for children or people using wheelchairs who may not be seen above the parked vehicles by vehicles approaching the travel lane. It is recommended that Hudson County clarify local responsibility to enforce parking on Kennedy Boulevard. Municipal stakeholders expressed confusion on whether local police departments should be enforcing parking on County roads. Considering it may take years before daylighting is implemented along the full corridor, Hudson County could work to address this communication gap in the short-term. These conversations could further discussion on the role of on-street parking and its relationship to safety on the corridor.

Additionally, better management of the curb zone can help reduce vehicle speeds while offering opportunities for public-private partnerships. For example, clearly designating and enforcing loading zones can reduce instances of double parking by delivery vehicles that need to access local businesses. Also, parking spaces can be converted to provide a range of mobility and non-mobility functions such as parklets, and strategic placement of bike shares or car shares.

Finally, where road width allows, converting parallel parking to angle parking can create more spaces and serve as a traffic calming measure. Back-in angle parking is gaining wider acceptance in communities because it provides better visibility for drivers, positions passengers (including children) to exit the vehicle near the sidewalk and facilitates safer access to the vehicle's trunk.

ENGINEERING

Signalization

Respondents to the e-survey as well as walk audit participants suggested that they have insufficient time to cross Kennedy Boulevard during the walk phase. Hudson County could carry out a pedestrian signal timing study and retime pedestrian signal phases as appropriate. Hudson County could also implement audible pedestrian signals and countdown timers at every intersection. This will help people who are visually impaired safely cross Kennedy Boulevard.

Advisory signage that tells drivers what speed the signals are set for can encourage drivers to maintain that speed. Source: ITE/Nelson Nygaard

In addition, Hudson County could reevaluate the pros and cons of traffic signal synchronization as a tool to control traffic speed. By programming each signal with a predetermined timing offset, a 'green wave' can be achieved that allows motorists to progress along the corridor at a desired speed. This technique can also be used to prioritize bicycles and pedestrians by changing the offset to align with typical cycling and walking speeds. Synchronizing signals can be most effective when combined with advisory signage that tells drivers what speed the signals are set for. While there are several challenges to implementing signal synchronization along Kennedy Boulevard, it is recommended that a comprehensive study of the corridor be undertaken to determine if, where, and how it could work. Moreover, signals would also need to be upgraded and timing studied if bike lanes are installed.

Access Management

Access management is the practice of controlling vehicular access points (driveways) to properties adjacent to the road. Along Kennedy Boulevard, wide and poorly defined driveways emerged as a key challenge within multiple focus areas. When considering the long-term potential for dedicated bicycle and transit infrastructure, Hudson County could continue to work to limit the number of driveways located along Kennedy Boulevard, and ensure they are designed to minimize high-speed access and reduce bicycle and pedestrian conflicts. Where possible, new developments could consolidate their driveways or eliminate on-site parking altogether. This will help prevent future conflicts with other road users and prevent some of the visibility challenges and sidewalk obstructions that exist on the corridor today.

Hudson County is already doing this in a number of ways. All development applications to the Hudson County Planning Board are reviewed by the County Planner and County Engineer prior to going before the Planning Board for a hearing. As a condition of Planning Board approval, Hudson County requires that, for any applications on Kennedy Boulevard, the applicants must prohibit left hand turns into or out of any driveways fronting Kennedy Boulevard. The installation of no left-turn signs is typically required. Hudson County often requests design elements be added to the driveways, such as concrete "pork chops" in the driveways, which channel traffic to make right turns and restrict left-turns. For large developments that are expected to generate a lot of traffic, Hudson County may add as a condition of approval that six months after the certificate of occupancy is issued, the building owner must do a study to see if left-turns are occurring. If left-turns are found to be an issue, Hudson County will require the installation of flexible bollards in the center of the road. Finally, Hudson County works with applicants to limit the number of driveways on all County roads to only those that are necessary. If a development has frontage on a County road and a municipal road, Hudson County works with the applicant and the municipality to share the traffic generated by the development between the County road and local street.

Turn Restrictions

Preventing turning conflicts was a focus of the proposed design of the four focus areas. Right turn on red (RTOR) is a nationwide policy with the exception being New Yok City. Numerous studies have concluded the RTOR policies increase the number of bicycle and pedestrian crashes at intersections. Kennedy Boulevard could also consider banning RTOR, especially at areas with high pedestrian activity.

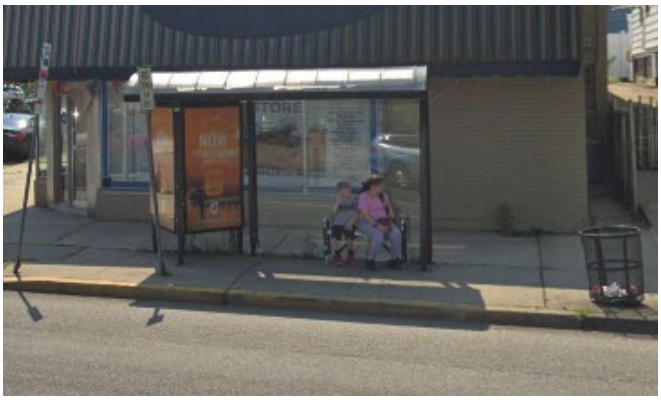
Left-turn prohibitions, while typically more judiciously applied, can be effective at locations where severe crash conditions exist. Locations with low left-turn volumes and high vehicle-vehicle, vehicle-pedestrian, or vehicle-bicycle conflicts could be evaluated for the feasibility of a left-turn prohibition.

Under peak hour traffic conditions, this treatment can improve intersection capacity as well, but impacts may result at upstream and downstream intersections.

Transit Stop Enhancements

Attractive and comfortable transit stops serve a variety of functions. These include making transit use more appealing to patrons and potential riders, improving accessibility and overall performance, and branding and marketing of the transit agency. High-quality transit stop design and amenities benefit the riders and promote transit streets as fundamental components of the street network. Transit stops on the corridor may be updated to include the following:

- **Shelters.** Shelters are especially vital at stops with moderate to high boardings, at weather-exposed locations, or in areas without nearby shelter locations. Additionally, shelters should be provided in locations with elderly or child riders. Basic shelters with seating and network information are appropriate at low volume stops with basic coverage, such as neighborhood transit streets. Providing comfortable shelters and seating can significantly improve the perception of wait times and rider satisfaction.[51]
- **Seating.** Seating is a basic feature of a transit stop. Comfortable seating near stops dramatically improves the comfort of the passenger experience. Transit stops with moderate to high boardings, long wait times, or high use by senior or child riders should provide seating for passengers. The United States Access Board recommends 4 feet of clearance distance on all sides of seating, and seating should not conflict with pathways or sidewalk clearance.[52]
- **Trash cans.** Providing trash cans can prevent the accumulation of litter at transit stops.
- **Wayfinding and passenger information.** Transit stops should include information about routes serving the stop in a clear, legible manner. Wayfinding should be placed in highly visible, obvious locations such as overhead or at eye-level, in regular intervals. Signage and materials should be consistent with the regional or agency branding. Consistent logos, colors, and fonts reinforces the visibility of route signage. Schedule and real-time arrival information reduces uncertainty and can improve rider satisfaction, therefore, real-time arrival displays should be utilized whenever possible.[53]



Transit stops with seating, shelter, route information, and trash cans can improve comfort at the stops and even improve perception of wait times and rider satisfaction. Source: Google Street View

[51] Fan, Yingling, Andrew Guthrie, and David Levinson. *Perception of Waiting Time at Transit Stops and Stations.* Working paper, University of Minnesota, Minneapolis, MN: 2015.
[52] United States Access Board. "Ch. 8 Special Rooms, Spaces, and Elements, Std. 810: Transportation Facilities." ADA Standards. US Department of Justice, Washington, D.C.: 2015.
[53] Brakewood, Candace. *Evaluating the Impacts of Real-Time Transit Information in Tampa and Atlanta*. Webcast, Center for Urban Transportation Research, University of South Florida, Tampa FL: 2014.

Other amenities such as bicycle parking, ticket vending, and landscaping/GSI elements can also be explored as opportunities. Hudson County is encouraged to work with NJ TRANSIT and local municipalities to consider ways in which transit stops may be improved on the corridor.

GSI example that is integrated into a curb extension in Elmhurst Queens. Source: Chris Hamby

Green Stormwater Infrastructure

Kennedy Boulevard contributes a large amount of impervious cover within Hudson County, which often leads to flooding. Implementing Green Stormwater Infrastructure could reduce the rate and amount of stormwater generated by this corridor. In addition, some GSI practices provide secondary benefits of aesthetic improvements or increased pedestrian safety. By implementing GSI practices, Kennedy Boulevard can realize significant improvements to its stormwater management properties while also improving the walkability of the corridor.

GSI practices from the Hudson County Land Development Regulations that could be implemented on Kennedy Boulevard include:

- Flow-Through Planters
- Subsurface Infiltration Trenches
- Stormwater Curb Extensions

These strategies are specifically designed and adopted from typical roadway management practices and are intended to capture runoff along a curb line or through a standard catch basin. Given the makeup of Kennedy Boulevard, these strategies could be part of a cohesive solution to address stormwater management and improve vehicular and pedestrian traffic. Where open space is readily available adjacent to the corridor (e.g. parks, parking lots, etc.), strategies such as rain gardens and swales can be considered to increase capture opportunities and provide diversity in the stormwater management approach.

ADA Compliance

Under federal law, all cities must meet certain standards of the Americans with Disabilities Act (ADA). The Public Right of Way Accessibility Guidelines (PROWAG) is a reference when designing and constructing sidewalks, pedestrian facilities, and other elements in the public right-of-way. All sidewalks at crosswalks could include detectable warning surfaces, curb ramps, and accessible pedestrian signals. Hudson County has included ADA-compliant designs whenever a segment of Kennedy Boulevard is rebuilt. Moreover, the Planning Board integrates ADA requirements in the development review process.

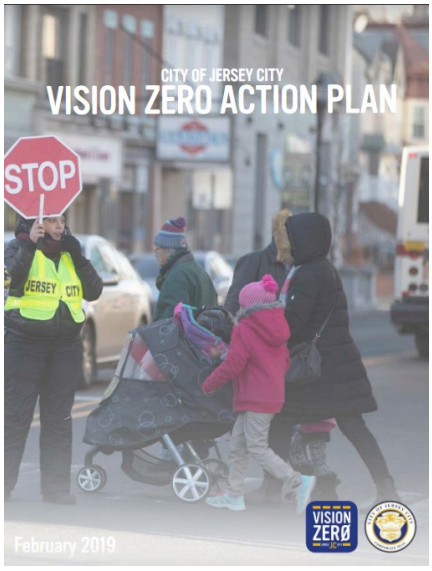
Lighting

Lighting should be sufficient for all users of the road. This means that vehicle-scale lighting often does a poor job of illuminating sidewalks and could be replaced (or supplemented) with pedestrian-scale lighting where appropriate. Intersections, crosswalks and transit stops could receive special attention with regard to lighting design.

CONSIDER VISION ZERO

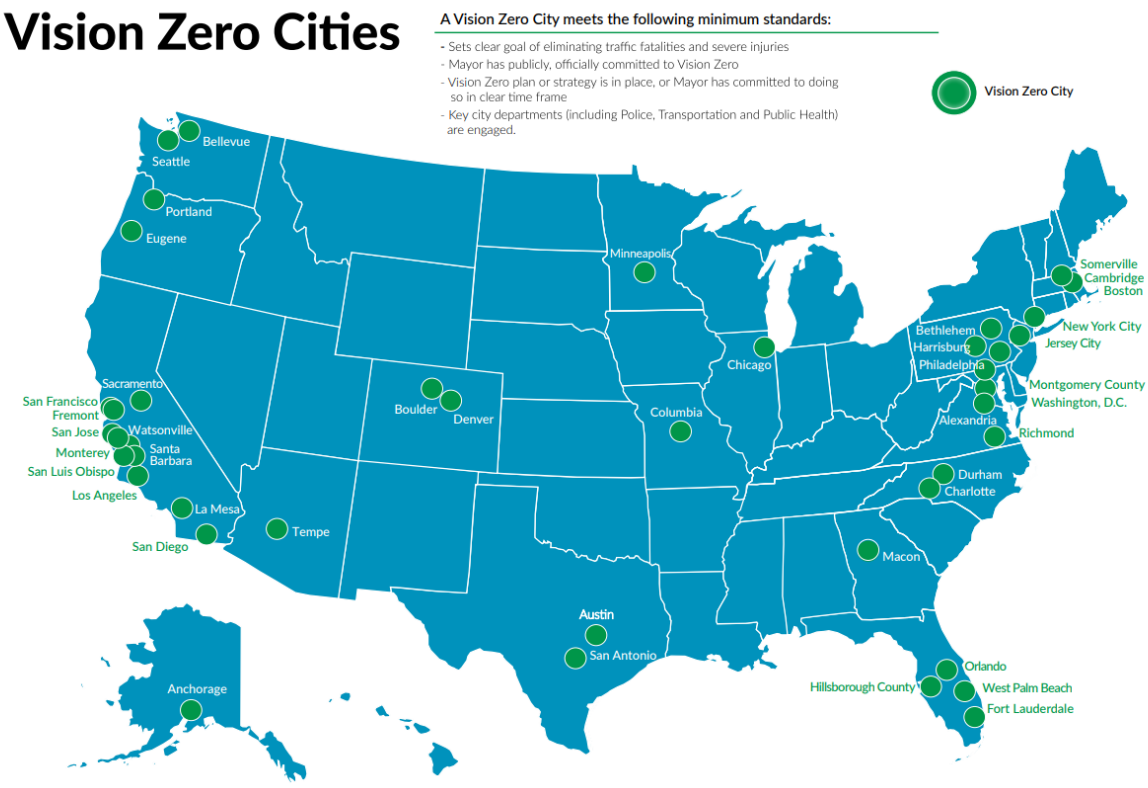
Vision Zero is a safety policy originating in Sweden and has been adopted in many major U.S cities, including New York City, Philadelphia, and Hoboken. It is founded on the premise that it is fundamentally unethical to design and operate a system where death or serious injury is an acceptable outcome. New Jersey is a Towards Zero Death state, which is similar to Vision Zero.

Hudson County supports Vision Zero initiatives, but it has not yet decided on the adoption of a policy. It is recommended that Hudson County consider developing a Vision Zero Action Plan for all county roads. By adopting Vision Zero, Hudson County will communicate its commitment to creating safer streets for all road users. The action plan could determine which departments to involve, what changes to engineering standards and design guidelines need to be made, and cost estimates for materials and maintenance.



The City of Jersey City's Vision Zero Action Plan (2019) is a resource for Hudson County if they choose to prepare their own Vision Zero Action Plan.

Figure 19 Vision Zero Cities Map



Source: Vision Zero Network

In addition to implementing the design interventions discussed in this report, Hudson County may wish to consider the following as a component of the Action Plan:

- Develop a Task Force to lead the planning effort
- Invest in smaller maintenance and emergency vehicles with tighter turning radii.
- Maintain a database with completed and planned projects. Ensure these projects incorporate pedestrian and bicycle safety.
- Facilitate discussions with the local municipalities on developing bike routes parallel to Kennedy Boulevard.
- Foster a culture of safe driving, walking, and biking through education, encouragement, and enforcement.
- Consider and respect the intersectionality of economic security, housing, and public health when working in communities that have a high concentration of low-income, minority, non-English speaking, and/or disadvantaged households.

CHAPTER SIX
IMPLEMENTATION

JFK BLVD
SAFETY CORRIDOR STUDY

Implementation starts today. This chapter identifies strategies, funding sources, timeframes, and implementing agencies to take action now, through low-cost, interim improvements, and by laying the groundwork for more significant capital projects.

STRATEGIES AND ACTION

Although the pathway to implementation may not be direct, communities across New Jersey have effectively implemented safety improvements by piecing together federal, state, and local funding sources. However, securing major grants (see following section) is not the only path toward implementation. Short-term strategies can help implement many of the recommendations of this plan within the next two years. For components requiring additional study such as road diets or protected bike lanes, Hudson County and municipal partners will need five years or longer to coordinate with neighboring communities.

Top: Hudson County is implementing high-visibility crosswalks as it repaves intersections. Source: NACTO

Bottom: Temporary bus bulbs like this one in Brooklyn are a low-cost way to implement street improvements while until funding can be secured. Source: TransitCenter

Hudson County regularly repaves its roadways. With each repaving comes an opportunity to add high-visibility crosswalks, daylight intersections, or – in some cases – bike lanes. Hudson County is already in the process of replacing its crosswalks with high-visibility crosswalks with each repaving. This is an excellent practice that should continue. Expanding this program to include daylighting with bollards will prevent illegal parking and promote pedestrian visibility in the short term. Hoboken and Jersey City have both implemented these practices on local streets.

Hudson County can also use low-cost materials to test and refine design interventions while funding for more robust infrastructure is secured. This approach was strongly supported by TAC members eager to see street improvements. Striping with bollards can make for a protected bike lane, rubber bus bulbs can make for a "quick deliver" transit stop, and a painted mural at an intersection can help remind drivers of the community they are passing through.

No matter the strategy, consider the community context. How transportation interfaces with housing, economic opportunity, the environment, and public health are important considerations with any infrastructure project. Elected officials, local municipalities, stakeholder groups, and the public at large should have the opportunity to comment on any major changes to their community.

Although safety is the most important goal of any roadway redesign projects, it is not the only goal. Environmental justice communities have historically not been awarded the same level of investment found in majority-white communities. Hudson County should consider equity in its distribution of resources on Kennedy Boulevard. TAC members also recommended that schools be considered as priority locations for safety improvements.

DEMONSTRATION PROJECT APPROACH

Could a demonstration project approach work on Kennedy Boulevard? As discussed in Chapter Three, demonstration projects use paint, plastic bollards, and other low-cost materials to quickly develop safety or placemaking improvements. This method has helped Jersey City implement curb extensions throughout their community without having to wait for funding for longer-term, hardscape investments. Although demonstration projects are not right for every situation, there could be opportunities to use the approach. This approach has the added benefit of letting the community consider new infrastructure elements in the community without making the investment in hardscaped infrastructure.

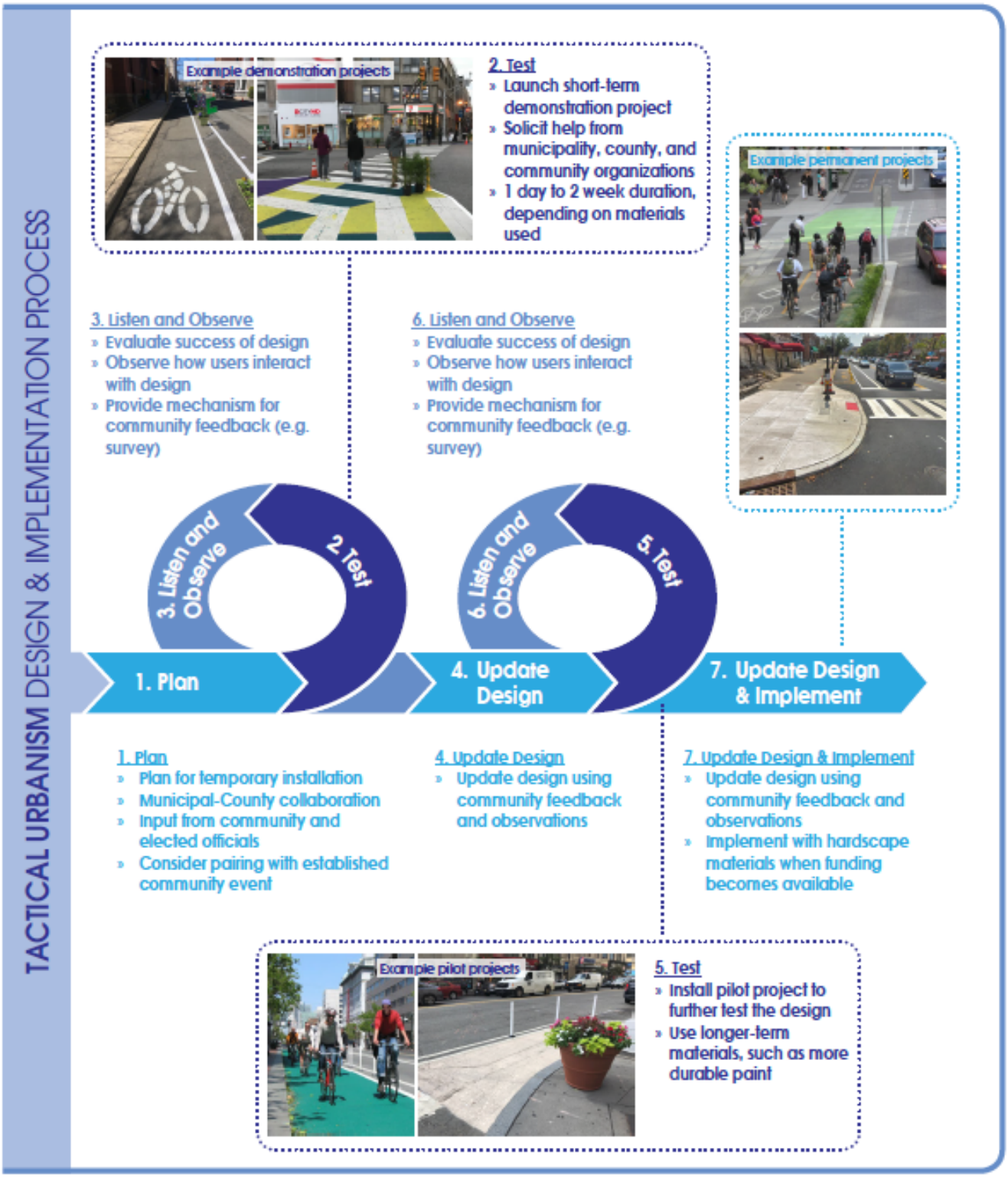
Figure 20 identifies an approach that may work in Hudson County. Note that collaboration among communities, municipalities, and the County (among others) is an important aspect of implementing this process. Moreover, the process allows for multiple iterations of design, which will allow stakeholders to see how the design functions and provide input in design updates.

Potential ideas and locations for demonstration projects within the focus areas include:

- **Testing out a multi-block buffered bike lane as a connection to the Morris Canal Greenway in Jersey City.** Jersey City tested out a buffered bike lane on Bergen Avenue for the Let's Ride JC Bicycle Master Planning effort. The City of Jersey City launched the demonstration project on a holiday weekend and paired the launch with an event. Hudson County could take this approach and may even consider closing off a section of Kennedy Boulevard on a weekend.
- **Temporary parking solutions near the Walter F. Robinson School in Bayonne.** Working with the Walter F. Robinson School, Hudson County and the City of Bayonne could collaborate on a demonstration project to consider the feasibility of a new parking configuration. Communicating the new configuration to the parents would help prevent confusion. Temporary parklets in place of parking could also be explored.
- **Curb extensions in Union City and North Bergen.** The focus areas in Union City and North Bergen showed promising opportunities for curb extensions. Implementing curb extensions with colorful designs may be one way to add placemaking to the area. The municipalities and Hudson County may wish to seek help from local students or artists to help with the designs.

Project sponsors could work with students or local artists to help create colorful designs for temporary demonstration projects. This demonstration project at Lincoln Park – a block away from Kennedy Boulevard – was later turned into a pilot project using more durable materials. Source: FHI

Figure 20 Potential Approach to Implementation



FUNDING SOURCES

Funding sources, however, are the most helpful aid in redeveloping streets. Fortunately, there are opportunities for funding at the federal, state, and local level, as well as through foundation grants for infrastructure and education programs. The primary source of federal funding for pedestrian improvements, the Transportation Alternatives Set-Aside Program, replaced the former Transportation Alternatives Program (TAP) under the current federal surface transportation bill. This funding source is intended to be used for on- and off-road pedestrian and bicycle facilities, as well as improving access to public transportation. Because federal grants are often more generous than state or local grants, Hudson County could pursue federal funding for the most expensive efforts. Examples of these efforts include the proposed protected bike lanes or redesign of the Paterson Plank Road and/or 43rd Street intersections.

Safe Routes to School Funding has become much more competitive than it was in previous federal transportation bills. Yet, New Jersey received $5.6 million in funding in FY2018.[54] Municipalities, counties, and school districts are all eligible to apply, but the funding must be used for infrastructure projects and construction only (not education programs). The purpose of the funding is to promote safer walking and biking to elementary and middles schools. The proposed design interventions at the Walter F. Robinson School, for instance, could be a candidate for this funding.

State funding sources in New Jersey are more numerous but generally provide smaller grants than federal sources. Potential sources include:

- **County Aid.** A non-competitive grant allocated based on county population and road mileage. This source is directed toward county-owned roads.
- **Bikeway Program.** A competitive application process directed at adding dedicated bike paths.
- **Safe Streets to Transit Program.** This competitive grant process aims to improve pedestrian access to transit. This grant must be used for locations within a half-mile of a transit stop. It provides funding for crosswalks, ADA-access ramps, lighting, pedestrian signals, and traffic calming. The grant is for construction-ready projects.
- **Sustainable Jersey.** This small grant program aims to help governments achieve sustainability goals. Transportation issues are among the objectives considered.

Less common sources of funding include foundation grants (e.g., the Robert Wood Johnson Foundation) and public health agencies like the Center for Disease Control. These sources may be particularly useful where education or promoting recreational activity are involved.

[54] Sustainable New Jersey http://njbikeped.org/wp-content/uploads/NJDOT-Funding.pdf

IMPLEMENTING AGENCIES & TIMEFRAME

As a county road, Hudson County will be responsible for most of the recommended design interventions included in this study. However, support from local municipalities, the NJTPA, NJDOT, NJ TRANSIT, Hudson TMA, universities, school districts, and local advocacy groups will be beneficial to speeding up the implementation timeline. By sharing their support and assisting with grant applications, these community partners can collectively work toward a safer Kennedy Boulevard.

The recommendations for the four focus areas found in this plan range from short (two years) to long term (five years or more). As noted by TAC members, painted curb extensions can be implemented in less than a year. The City of Jersey City, for instance, implemented painted curb extensions within a year of testing them through demonstration projects. As for repaving, Hudson County could immediately start considering adding daylighting whenever repaving occurs.

Kennedy Boulevard near Saint Peter's University
Source: Hudson County Division of Planning

Implementation of longer-term projects, however, begins now. Engaging elected officials and stakeholders, applying for grants, and planning for low-cost implementation options could begin at the conclusion of this study.

IMPLEMENTATION MATRICES

The following pages include the implementation matrices for each of the four focus areas as well as the corridor-wide recommendations. Each matrix includes a list of the recommendations, a description, strategies and actions, time frame, and implementing agencies. Hudson County is generally the primary implementing agency, but most of the recommendations will require collaboration with other key stakeholders, including the municipalities, NJTPA, NJDOT, and Hudson TMA, among others.

Table 14 Implementation Matrix -- 26th Street to 32nd Street

Recommendation	Recommendation Description	Strategies & Actions	Time Frame	Implementing Agencies
Leading pedestrian intervals (LPIs)	Add LPIs at all intersections.	Study potential impacts to traffic.	1-4 years	Hudson County
Trees and green stormwater infrastructure (GSI)	Fill empty tree pits along the corridor; explore potential for GSI or other plantings.	Work with the City of Bayonne to clarify maintenance. Generally, Hudson County will maintain the street trees, but there is nothing in place for maintenance of any additional plantings or GSI beyond trees.	1-4 years	Hudson County City of Bayonne
Parking lane with by-pass/double parking lane	Install a by-pass/double parking lane outside the Walter F. Robinson School; implement a flush textured median to distinguish the double parking lane from the travel lane.	Include the Walter F. Robinson School and the City of Bayonne when developing potential designs; explore options for school release policies that utilize local streets more.	5-10 years	Hudson County City of Bayonne Walter F. Robinson School
Left-turn pocket	Install left-turn pocket at 32nd Street.	Install when street is due for repaving.	5-10 years	Hudson County City of Bayonne
Curb extensions and high-visibility crosswalks	Implement curb extensions and high-visibility crosswalks. Short-term installation will be with paint and flexible delineators.	Curb extensions could be implemented in the short-term. When implementing a road diet at a later date, the curb extensions could be reinstalled with concrete.	5-10 years	Hudson County City of Bayonne
Raised medians/pedestrian refuge islands	Install raised medians and add landscaping if municipality agrees to maintain; low fencing could be installed to prevent pedestrian crossings outside crosswalk.	Determine the municipality's interest in maintaining landscaped medians, then install when road is due for repaving.	5-10 years	Hudson County City of Bayonne
Road diet	Install protected bike lanes or transit-only facilities along Kennedy Boulevard.	Hudson County could partner with the City of Bayonne to help develop a road diet using a combination of demonstration projects, public meetings, and other outreach efforts. A road diet could start as a pilot project and move forward as a more permanent project if a permanent buildout is not possible initially.	5-10+ years	Hudson County City of Bayonne

Table 15 Implementation Matrix – Gates Avenue to Danforth Avenue

Recommendation	Recommendation Description	Strategies & Actions	Time Frame	Implementing Agencies
Leading pedestrian intervals (LPIs)	Add LPIs at all intersections with concurrent phases.	Study potential impacts to traffic.	1-4 years	Hudson County
Trees and green stormwater infrastructure (GSI)	Fill empty tree pits along the corridor; explore potential for GSI or other plantings.	Work with the City of Jersey City to clarify maintenance. Generally, Hudson County will maintain the street trees, but there is nothing in place for maintenance of any additional plantings or GSI beyond trees.	1-4 years	Hudson County City of Jersey City
Morris Canal Greenway bike connections*	Implement protected bike and pedestrian infrastructure along with wayfinding where the trail alignment crosses and/or runs along Kennedy Boulevard. The current plans for trail alignment run along Kennedy Boulevard from Mercer Park to Custer Avenue.	Develop alongside the City of Jersey City as they construct the adjacent trail segments.	3-5 years	Hudson County City of Jersey City
High-friction pavement and lane markings through intersection	Install high-friction pavement at Greenville Avenue and lane markings through intersections at Lembeck Avenue and Greenville Avenue.	Install when street is due for repaving	5-10 years	Hudson County
Left-turn pocket	Install left-turn pocket at Seaview Avenue.	Install when street is due for repaving.	5-10 years	Hudson County City of Jersey City
New crosswalks	Install new high-visibility crosswalks with curb extensions at Linden Avenue.	Install the new crosswalks and curb extensions when the intersection at Linden Avenue is signalized.	5-10 years	Hudson County
Curb extensions, high-visibility crosswalks, hardened centerlines, and GSI	Implement curb extensions, high-visibility crosswalks, and hardened centerlines; where possible (e.g., Columbia Park), integrate GSI into curb extensions.	Installing curb extensions could be a phased approach where painted curb extensions are implemented in the short term. After receiving feedback from the community, hardscape curb extensions could be installed. If GSI is pursued, work with the City of Jersey City to clarify maintenance.	5-10 years	Hudson County City of Jersey City

Recommendation	Recommendation Description	Strategies & Actions	Time Frame	Implementing Agencies
Raised medians/pedestrian refuge islands at Gates Avenue	Install a raised median and add landscaping if municipality agrees to maintain; low fencing could be installed to prevent pedestrian crossings outside crosswalk.	Determine the municipality's interest in maintaining landscaped medians, then install when road is due for repaving. If raised medians cannot be funded, painted medians are a short-term alternative.	5-10 years	Hudson County City of Jersey City
Protected bike lanes	Install protected bike lanes along Kennedy Boulevard north of the trail alignment to Bartholdi Avenue or potentially north past Danforth Avenue.	Installing protected bike lanes along Kennedy Boulevard could be implemented as a phased approach. A demonstration project paired with a community event could kick-off the project. If successful, Hudson County could partner with the City of Jersey City to pursue a painted buffered bike lane; potentially a hardscaped buffer could be implemented in the long term.	5-10+ years	Hudson County City of Jersey City

**The current plans for the proposed trail alignment are just south of the Gates Avenue to Danforth Avenue focus area.*

Table 16 Implementation Matrix – Hague Street to 10th Street

Recommendation	Recommendation Description	Strategies & Actions	Time Frame	Implementing Agencies
Leading pedestrian intervals (LPIs)	Add LPIs at all intersections with concurrent phases	Study potential impacts to traffic	1-4 years	Hudson County
Trees and green stormwater infrastructure (GSI)	Fill empty tree pits along the corridor; explore potential for GSI.	Work with the Township of North Bergen, the City of Union City, and the City of Jersey City to clarify maintenance. Generally, Hudson County will maintain the street trees, but there is nothing in place for maintenance of any additional plantings or GSI beyond trees.	1-4 years	Hudson County Township of North Bergen City of Union City City of Jersey City
Curb extensions, high-visibility crosswalks, hardened centerlines, lane markings through intersections, and GSI	Implement hardscape curb extensions, high-visibility crosswalks, and hardened centerlines; where possible, integrate GSI into curb extensions.	Install when road is due for repaving; if GSI is pursued, work with the municipalities to clarify maintenance.	5-10 years	Hudson County Township of North Bergen City of Union City City of Jersey City
Raised medians/pedestrian refuge islands	Install raised medians and add landscaping if municipality agrees to maintain; low fencing could be installed to prevent pedestrian crossings outside crosswalk.	Determine the municipalities' interest in maintaining landscaped medians, then install when road is due for repaving.	5-10 years	Hudson County Township of North Bergen City of Union City City of Jersey City
Left-turn pocket	Install a turn pocket for northbound vehicles turning on to Hague Street.	Study potential impacts to traffic, then install when road is due for repaving.	5-10 years	Hudson County City of Jersey City

Recommendation	Recommendation Description	Strategies & Actions	Time Frame	Implementing Agencies
Reconfigure 8th Street/Paterson Plank Road to 10th Street	Reconfigure this segment to help T-up the intersection, reduce crossing distances, and improve pedestrian visibility.	Reconfiguring this segment will require a detailed assessment of traffic and pedestrian patterns; determining the best option for the area may also require consideration for new pocket parks or development opportunities. Property acquisition may also be a factor to consider. One strategy could be to start with the "Minor Modification" option where a channelized right turn is added on the western side of Kennedy Boulevard. More robust changes to the roadway could be pursued at a later date.	5-10+ years	Hudson County Township of North Bergen City of Union City NJDOT NJTPA

Table 17 Implementation Matrix -- 37th Street to 43rd Street

Recommendation	Recommendation Description	Strategies & Actions	Time Frame	Implementing Agencies
Leading pedestrian intervals (LPIs)	Add LPIs at all intersections with concurrent phases.	Study potential impacts to traffic.	1-4 years	Hudson County
Trees and green stormwater infrastructure (GSI)	Fill empty tree pits along the corridor; explore potential for GSI or other plantings.	Work with the Township of North Bergen and the City of Union City to clarify maintenance. Generally, Hudson County will maintain the street trees, but there is nothing in place for maintenance of any additional plantings or GSI beyond trees.	1-4 years	Hudson County Township of North Bergen City of Union City
Exclusive pedestrian phase and new crosswalk at 43rd Street	Add an exclusive pedestrian phase at 43rd Street, which will allow for a new crosswalk in front of the Town Hall.	Study potential impacts to traffic; communicate changes to adjacent land uses, including North Bergen Town Hall and North Hudson Fire and Rescue.	5-10 years	Hudson County Township of North Bergen City of Union City
High-friction pavement	Install high-friction pavement at 36th Street	Install when street is due for repaving	5-10 years	Hudson County
Curb extensions, high-visibility crosswalks, hardened centerlines, GSI, and straightened crosswalks	Implement hardscape curb extensions, high-visibility crosswalks, and hardened centerlines; where possible, integrate GSI into curb extensions.	Install when road is due for repaving; determine the municipalities' interest in maintaining GSI.	5-10 years	Hudson County Township of North Bergen City of Union City
Raised medians/pedestrian refuge islands	Install raised medians and add landscaping if municipality agrees to maintain; low fencing could be installed to prevent pedestrian crossings outside crosswalk.	Determine the municipalities' interest in maintaining landscaped medians, then install when road is due for repaving.	5-10 years	Hudson County Township of North Bergen City of Union City

Recommendation	Recommendation Description	Strategies & Actions	Time Frame	Implementing Agencies
Reconfigure 43rd Street and Hillside Place	Work to T-up intersection of Hillside Place and 43rd Street as well as 43rd Street and Kennedy Boulevard through a combination of curb extensions and painted medians. Remove the signal phase at Hillside Place and add "Don't Block the Box" paint to this intersection.	Work with the Township of North Bergen to realign Hillside Place; remaining elements could be developed after further study of the intersection and changes could be implemented when the road is repaved.	5-10 years	Hudson County Township of North Bergen

Table 18 Implementation Matrix -- Corridor-wide Recommendations

Category	Recommendation	Recommendation Description	Strategies and Actions	Time Frame	Implementing Agencies
Education & Encouragement	Expand Street Smart NJ Safety Campaign	Coordinate public, private, and non-profit organizations to urge motorists and pedestrians to increase awareness on Kennedy Boulevard.	Utilize the current Street Smart NJ practices and work to include schools, senior centers, and in communities with high concentrations of vulnerable road users and environmental justice communities.	Ongoing; 1-4 years	Hudson County NJTPA Hudson TMA Municipalities
	Events and temporary street closures	Promote active transportation through temporary street closures.	Work with municipalities to expand existing street closure programs to include Kennedy Boulevard or consider starting a new event that rotates to different areas along Kennedy Boulevard.	1-4 years	Hudson County Municipalities Hudson TMA
Enforcement	Speed and parking enforcement	Increase focus on speed reduction and parking through a combination of ticketing and education campaigns.	Build upon Hudson County's (as well as local police departments') community policing efforts. Seek funding for additional staffing resources and a community policing center.	1-4 years	Hudson County Sheriff's Office Municipal Police Departments
	Jitney outreach and communication	Explore opportunities to improve communication and driver/vehicle safety, such as an outreach strategy or establishing a revenue-neutral medallion program.	Seek opportunities to collaborate with elected officials, law enforcement, and other agencies to establish a framework for improving jitney driver behavior.	5-10 years	Hudson County Elected officials Municipalities NJDOT NJ Division of Consumer Affairs

Category	Recommendation	Recommendation Description	Strategies and Actions	Time Frame	Implementing Agencies
Engineering	Signalization	Conduct a signal timing study to reevaluate pros and cons of staggering signals to prevent acceleration beyond posted speed limit.	Work with Hudson County leadership to develop materials (e.g., fact sheets, letters) to explain the decision and disseminate to municipal stakeholders.	1-4 years	Hudson County
	Access management	Limit driveways/curb cuts on Kennedy Boulevard.	Continue to work with municipalities and developers to limit the number of curb cuts on Kennedy Boulevard. When necessary, evaluate success of existing process and consider modifications.	ongoing; 1-10+ years	Hudson County Hudson County Planning Board Municipalities
	Turn restrictions	Explore left-turn limitations and consider implementing no right turns on red signals in high pedestrian areas.	Evaluate the traffic impacts of potential turn limitations, and implement where feasible.	5-10 years	Hudson County Municipalities
	Green stormwater infrastructure (GSI)	Implement GSI to capture runoff along a curb line or through standard catch basins.	Work with municipalities to determine maintenance and interest in installing GSI; install when adding curb extensions, bus bulbs, or other sidewalk/roadway modifications.	5-10 years	Hudson County Municipalities Municipal Utility Authorities
	ADA compliance	Work to develop ADA compliant sidewalks, including curb ramps and sidewalks free of obstructions. Install ADA-compliant push buttons.	Implement curb ramps in any missing locations as sidewalks are reconstructed; give warnings to (or write citations for) businesses or residents who obstruct the pedestrian right-of-way through parked vehicles or other obstacles.	5-10 years	Hudson County
	Lighting	Add streetlights or pedestrian-scale lighting where needed.	Carry out a lighting study on the corridor to determine needs and identify design guidelines.	5-10 years	Hudson County Municipalities
-	Consider Vision Zero	Consider adopting a Vision Zero policy that aims to reduce traffic fatalities and serious injuries to zero.	Arrange meetings with Hudson County leadership and municipalities to weigh opportunities and challenges posed by such a policy and communicate decision to municipalities and other stakeholders.	1-4 years	Hudson County

CHAPTER SEVEN
CONCLUSION

JFK BLVD
SAFETY CORRIDOR STUDY

The recommendations in this report build toward the vision of Kennedy Boulevard as a safer corridor for all road users. The study has made recommendations to reduce speed, improve pedestrian visibility, reduce crash frequency, provide for bicycles, improve stormwater management, and implement more comfortable transit stops. Above all, these short- and medium-term recommendations address the pressing need for pedestrian safety in four focus areas.

The design elements and policies can be applied elsewhere. As recommended by TAC members, the road safety work could continue on additional segments following the conclusion of this study. The TAC identified two locations to address next because they also scored highly. These are described below.

MONTGOMERY STREET TO DEKALB AVENUE IN JERSEY CITY

This road segment is located in front of Saint Peter's University, a hub of pedestrian, bicycle, and transit activity. According to the crash analysis conducted as a part of this study (Appendix A), this segment was the third highest vehicle-pedestrian/bicycle crash cluster location and the ninth highest vehicle-vehicle crash cluster location on Kennedy Boulevard outside of Journal Square. As a major employment and educational institution, this segment is a regional destination in need of high-visibility crosswalks, traffic calming, enhanced transit stops, and curb extensions/daylighting. This segment is scheduled to receive improvements, including high-visibility crosswalks and curb extensions, beginning in summer 2019 through a County project.

The segment of Kennedy Bouelvard adjacent to St. Peter's University is the third highest vehicle-pedestrian/bicycle crash cluster outside of Journal Square.

90TH STREET TO SOUTH BERGEN BOULEVARD/2ND AVENUE IN NORTH BERGEN

Located at the northernmost point of Kennedy Boulevard, this segment has the second highest vehicle-vehicle crash cluster location of anywhere on Kennedy Boulevard excluding Journal Square. With the merging of Bergen Boulevard, this location is a complicated intersection where pedestrians must walk 500 feet or more to cross Kennedy Boulevard. It is a skewed intersection located at a bend in the roadway, posing further challenges to visibility. Exclusive pedestrian phases, curb extensions and daylighting could be considered wherever possible. Future study could consider the potential to close slip lanes. Straightening out the intersection through the realignment of Bergen Boulevard could also be explored along with Bergen County.

The segment of Kennedy Boulevard running between 90th Street and 3rd Avenue has the second highest vehicle-vehicle crash cluster of any location on Kennedy Boulevard outside of Journal Square.

INFRASTRUCTURE INVESTMENT & ENVIRONMENTAL JUSTICE

Equity received considerable focus throughout the study, from the selection of the focus areas to the public outreach conducted and the design interventions considered. The recommendations in this report aim to improve the safety of environmental justice communities, which have higher rates of walking, biking, and transit use than other areas of Hudson County. Recognizing that infrastructure can have significant impacts on the lives of individuals, this plan recognizes the need to continue to engage the residents and businesses within the environmental justice communities on the corridor. Working with the communities will hopefully lead to safer streets for all road users and promote accessibility to destinations, regardless of ability, race, ethnicity, or age.

KENNEDY BOULEVARD TOMORROW

Kennedy Boulevard has always been a multimodal corridor. It opened with a bike parade in the late 19th century and continued to evolve with national transportation trends and increased population density. Today, the corridor sustains thousands of vehicle, pedestrian, transit, jitney, and bike trips. This plan stems from safety concerns of road users and plays an important part in the continued evolution of Kennedy Boulevard. As recommended by a multitude of previous planning documents as well as

feedback from municipal stakeholders and the public, Kennedy Boulevard must change to better accommodate road users' need for safety, comfort, and efficiency. This document provides guidance on how to best address these concerns in four focus areas and encourages the continued study of additional segments. Through continued safety improvements, Kennedy Boulevard will continue to evolve alongside Hudson County communities and help the region work toward its goals to become more competitive, efficient, livable, and resilient.

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June 24, 2019

Michael Morehouse, P.E., Project Manager
Fitzgerald and Halliday, Inc. (FHI)
416 Asylum Street
Hartford, Connecticut 06103

RE: Hudson County Response to Study Recommendations
"John F. Kennedy Boulevard Safety Corridor Study"

Mr. Morehouse:

The County of Hudson thanks the Consultant team for their participation in this important effort to evaluate traffic safety on JF Kennedy Boulevard and better accommodate all road users along the corridor.

Hudson County is committed to improving safety and implementing appropriate elements of our Complete Streets policy along all county roadways to better serve the traveling public.

The County has reviewed the recommendations outlined in "John F. Kennedy Boulevard Safety Corridor Study", dated May 24, 2019, and while the County cannot commit to specific improvements without further assessment, municipal support and funding, we generally agree with many of the findings and recommendations.

In general, the identified improvements primarily include corridor-wide and site-specific recommendations, both short and long term, as follows:

- High-visibility crosswalks
- Implementation of curb extensions (bump-outs) at some locations
- Addition of dedicated turn lanes and pockets, where feasible
- Turning restrictions in high-conflict areas
- Leading pedestrian intervals or dedicated pedestrian signal phases
- Rumble strips
- Pedestrian-scale lighting
- Extension of center medians and pedestrian refuges
- Access management planning
- A corridor-wide signal timing study
- Potential installation of green stormwater infrastructure (GSI)
- Continuation of education and enforcement campaigns, such as the Street Smart NJ Campaign

Based on the recommendations of the Consultant team, as a next step, the County will apply for future grant opportunities in order to conduct further study and to obtain funding for the implementation of these recommendations. Long term recommendations will be further considered and reviewed in future studies as potential options, in coordination with municipal support.

Should you have any questions, please do not hesitate to contact the Division of Planning office at (201)-217-5137.

Sincerely,

Francesca Giarratana

Francesca Giarratana, PP, AICP
Division Chief, Hudson County Planning

Thomas Malavasi, PE, PP, CME, CPMW
County Engineer

cc: Thomas DeLeo, Director, Parks and Community Services
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