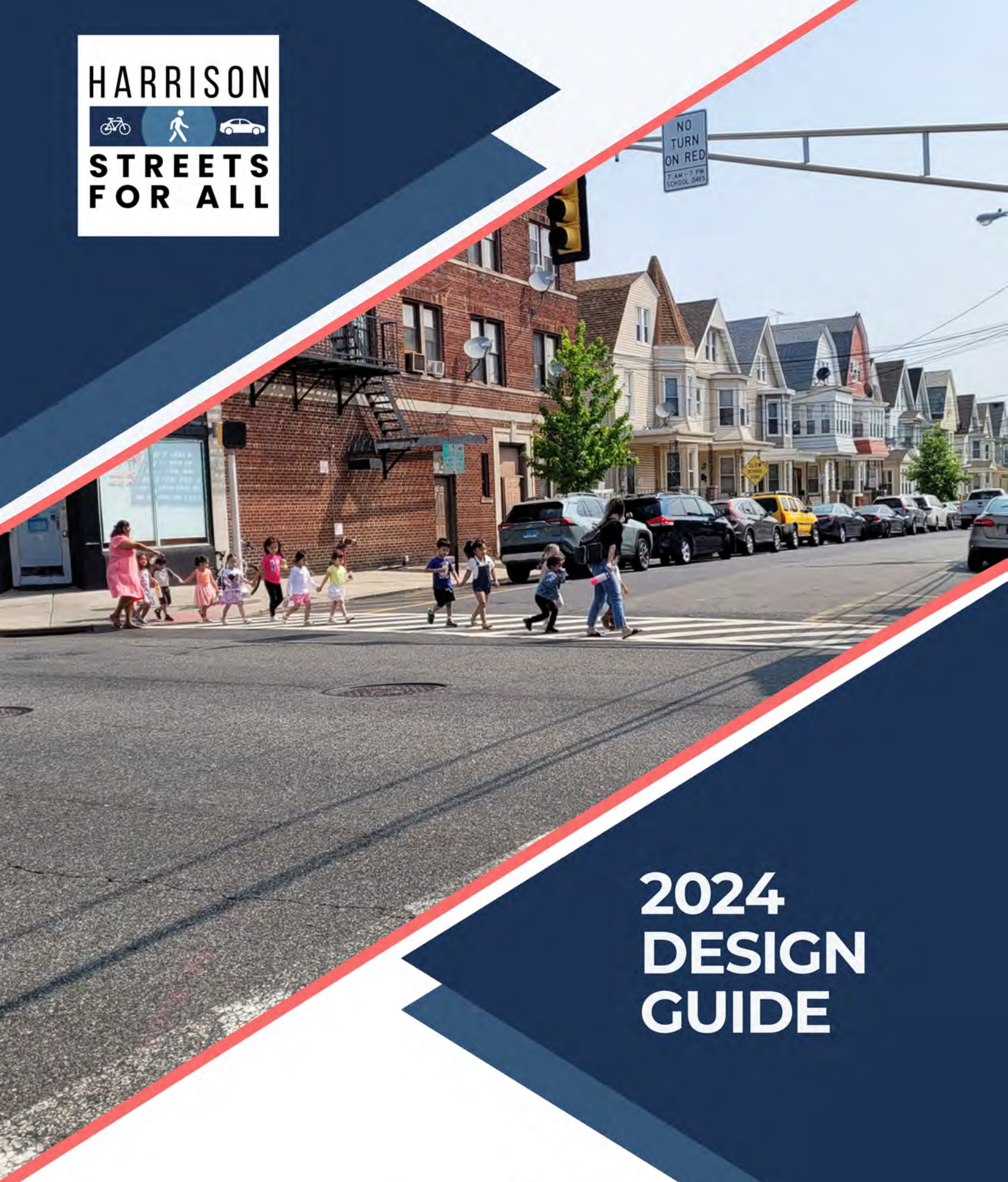
HARRISON

STREETS FOR ALL



2024 DESIGN GUIDE

NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Disclaimer

This document has been prepared as part of the North Jersey Transportation Planning Authority's (NJTPA) Planning for Emerging Centers Program with financing by the Federal Transit Administration and the Federal Highway Administration of the U.S. Department of Transportation. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The NJTPA is solely responsible for its contents.

Acknowledgements

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HARRISON STREETS FOR ALL

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NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

INTRODUCTION

About This Guide

The Harrison Streets for All Design and Implementation Guide provides a practical, customized, and user-friendly reference for Town officials, departments, consultants, engineers, contractors, and private developers to use when working on street projects. These projects may include any street construction or rehabilitation projects that may provide an opportunity to advance safe and Complete Streets in Harrison including resurfacing, subsurface utility upgrade or replacement, safety improvements, or new street construction associated with new development.

Intent

The Design Guide is meant to:

- Convey contextual design direction to both technical and non-technical audiences by recommending specific design, safety, and/or operational treatments as well as associated design guidance from established sources such as the American Association of State Highway Transportation Officials (AASHTO) and the National Association of City Transportation Officials (NACTO)
- Inform and streamline decision-making on street projects by clearly setting expectations on street design and operations
- Improve street safety, mobility, and accessibility for travelers of all ages and abilities
- Support safe and equitable travel options
- Advance Harrison's Complete Streets Policy to support future project implementation

Project Background

Production of this Design Guide was informed by "Harrison Streets for All," a planning effort that evaluated existing transportation conditions in Harrison including its street network; assessed a range of data including crash history, current and future land uses, and Town demographics; and engaged the community in various ways about street use and safety. A municipal Complete Streets Policy was also produced in parallel to complement this Guide and further support the implementation of Complete Streets in Harrison.

Harrison Streets for All was funded through the North Jersey Transportation Planning Authority's (NJTPA's) Planning for Emerging Centers Program, which provides technical assistance to municipalities to create more sustainable, transit-supportive, and walkable communities.

About This Guide

Complete Streets are multifunctional streets that serve multiple purposes: travel by car, walking, biking, gathering, socializing, events, and stormwater management. They are meant for the safe and adequate accommodation of all street users including pedestrians, bicyclists, scooters, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles. In addition to vehicular travel lanes, Complete Streets incorporate a variety of features including some combination of sidewalks, crosswalks, bike or scooter lanes, lighting, street trees, landscaping, green infrastructure, seating areas, transit stops, and other facilities or amenities that make streets safer, more accessible, and more resilient.

Complete Streets are Contextual

Complete Streets should be designed and programmed contextually; there is never a one-size-fits-all approach to Complete Streets planning, design, and implementation. Complete Streets treatments should respond to community vision and needs, local demographic and equity considerations, the character of the roadway, surrounding land uses and destinations, new development, safety concerns, and other local conditions.

Observer Highway, in Hoboken, NJ Image Source: Civic Eye Collaborative.

Complete Street with rain garden in curb extension, and sidewalk seating in Millburn, NJ

Complete Streets Enhance Community Character

Streets generally comprise about one-third of all public space in any given municipality. Thoughtfully considering the function and programming of this space can greatly contribute to the character of a community. Complete Streets do more than just safely and efficiently move people. When designed and programmed contextually, they have multifaceted benefits including:

- Improving freedom, mobility, and accessibility for all members of the community, including seniors and young children
- Encouraging street activity and foot traffic which can support local businesses and enhance public safety
- Supporting travel by multiple modes of transportation which can reduce vehicular trips and parking demand, particularly for shorter trips distances
- Improving water and air quality and reducing urban heat island effects through street trees, landscaping, and green infrastructure

By checking multiple boxes, Complete Streets contribute to improved quality of life and enhanced community character.

Why Complete Streets Are Appropriate in Harrison?

Stated Town Goals

An evaluation of existing plans and studies such as the Town of Harrison Master Plan, the Master Plan Reexamination Report, and the Amended Harrison Waterfront Redevelopment Plan, revealed direct and indirect statements of support for Complete Streets in Harrison. Virtually all existing documents or material related to land use planning and development express a desire for safe, active, walkable streets; pedestrian and bicycle connections and sustainable means of transportation as an alternative to private auto travel; and land development patterns and building typologies that support street life and active mobility (i.e., walking and cycling).

Growth

The Town of Harrison is growing. Designated Redevelopment Areas and new development have introduced new high-density, mixed-use buildings that have been successful in attracting new residents. Location, amenities, and a strong transit.

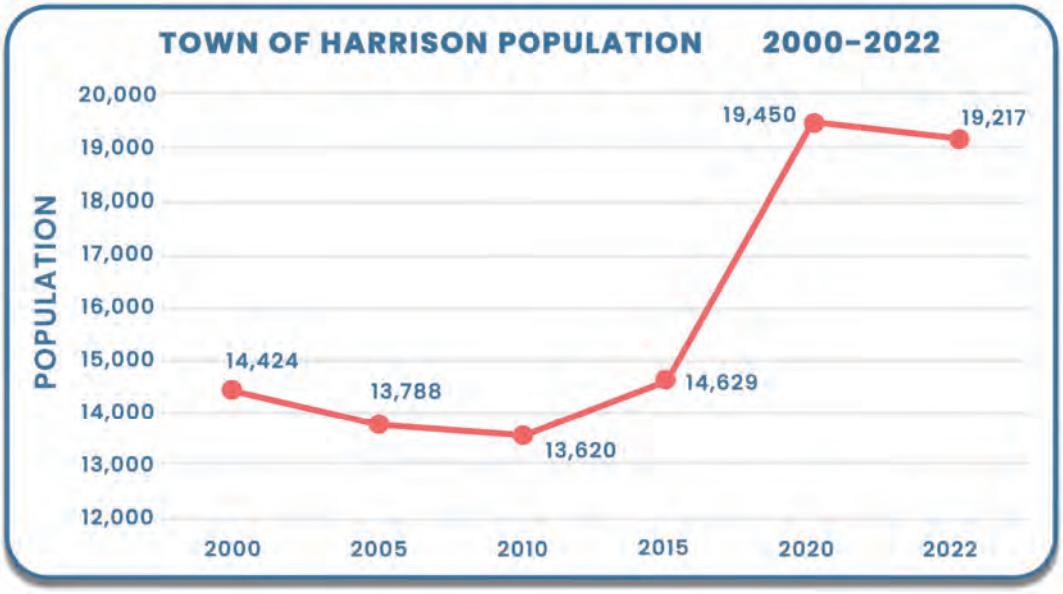


Figure 1: Population Changes in Harrison. Source: US Census.

Roadway capacity improvements alone, such as signal improvements and new street construction, may not be sufficient in mitigating increased congestion associated with Harrison's population growth. Multimodal improvements that accommodate travel by different modes can help to mitigate increased traffic and parking demand by making it safer and easier for more residents to choose driving alternatives, such as walking or biking.

Community Character

DEMOGRAPHICS

Complete Streets improve mobility for seniors, children, minorities, and low-income communities, who are disproportionately impacted by an incomplete transportation network, as they are more likely to rely on alternative modes of transportation which are often not prioritized in the current system.

An analysis of population demographics reveals that Complete Streets would be appropriate in Harrison and beneficial to Harrison residents. Harrison's population has a notable percentage of minorities, low-income residents, foreign-born residents, limited English speakers, and zero car households, especially when compared to ten municipalities in the region selected for comparison: Belleville, Hillside, Kearny, Lyndhurst, North Arlington, Roselle, Roselle Park, Rutherford, Secaucus, and Weehawken.

The population of Harrison is also younger than the comparable municipalities, with more youth and fewer residents over the age of 65. Young people are more likely to walk, bike, or scoot compared to other age groups, due to their age, ability, or cultural factors such as social acceptability.

COMMUTING PATTERNS

The following table summarizes Journey to Work data for Harrison and, for comparison purposes, the State of New Jersey, and Hudson County.

Table 1. Journey to Work Data for Harrison

	DRIVE ALONE	PUBLIC TRANSIT	WALK	BIKE
HARRISON	37%	35%	9%	<1%
NEW JERSEY	62%	8%	3%	<1%
HUDSON COUNTY	32%	32%	7%	<1%

Source: U.S. Census Bureau American Community Survey 5-Year Estimates (2017-2021)

According to the data, Harrison residents take transit for commuting at almost the same rate as driving alone. This is due to the presence of the Harrison PATH station, which provides frequent and convenient connections to major employment destinations in Newark, Jersey City, Hoboken, and Manhattan. NJ TRANSIT and EZ Ride also operate bus services within Harrison that provide connections to Town destinations as well as neighboring municipalities. Harrison residents commute by public transit at a rate of four times the State and walk to work at three times the rate.

Of note, but not shown in the table above, nearly a third (28 percent) of Harrison workers over the age of 16 do not own a vehicle.

Community Input

The Harrison Streets for All project team utilized a multi-pronged community outreach strategy to facilitate participation from public officials, residents, and other stakeholders through both traditional and non-traditional methods. This outreach effort encompassed a comprehensive, sustained effort intended to enhance public awareness about the project and meaningfully and effectively engage with Harrison residents to get their input on street use, safety, and mobility. A key part of the effort was directed toward engaging potentially vulnerable audiences to ensure that traditionally underserved communities and limited English proficiency (LEP) populations could participate in the plan's development.

The outreach effort consisted of:

- Three in-person public engagement events in Harrison. Two events were hosted at the location of the demonstration projects.
- One in-person Walkability Workshop that allowed participants to provide input on street conditions along a defined walking route.
- Three Stakeholder Advisory Committee meetings.
- One online survey.
- One online, interactive map.

The activities allowed for approximately 400 overall engagements with Harrison residents and stakeholders that resulted in the following findings:

- The most frequently cited concern was excessive speeding by motorists. Participants also repeatedly voiced apprehensions about other behavior and traffic concerns, including motorists not yielding to pedestrians, running red lights and disregarding stop signs, and traffic generally making them feel unsafe. When aggregated, these concerns account for one-third of all responses.

- Input and ideas about active transportation (pedestrian/bike/scooter safety and mobility) ranked highly. The desire for bike lanes represented 10 percent of all responses, followed by complete and maintained sidewalks at approximately 8 percent and improved lighting at nearly 7 percent, making them the top three street design and infrastructure choices.
- There was a clear desire for more and improved public spaces and amenities, with participants expressing the need for more open spaces, landscaping/green infrastructure, and outdoor dining.

HOW TO USE THIS GUIDE

1. IDENTIFY YOUR STREET TYPOLOGY

This guide assigns each street in Harrison to one of four typologies based on physical characteristics and function. Use the **map in the Street Typologies section** (page 14) to identify the typology of the street you are working on. Also, identify on the map if an optional Bike Route Overlay applies.

2. DETERMINE APPLICABLE COMPLETE STREETS TREATMENTS BY TYPOLOGY

Next, identify potential Complete Streets treatments using the **Design Treatments matrix** (page 12-13) and/or **Street Typology diagrams** (pages 17-18) for your street type in the **Street Typologies section**. Select the treatments that are right for your street's function and your project goals.

2a. OPTIONAL: DETERMINE COMPLETE STREETS TREATMENTS BY PROJECT TYPE

If you are working on a particular type of project – such as roadway striping, resurfacing, or full scope reconstruction – use the **table in the Project Type section** (page 38-39) to determine a more targeted list of Complete Streets treatments by project type. Use the page numbers in the table to find information about each treatment in the Design Treatments section.

3. REFERENCE DESIGN GUIDANCE FOR THE COMPLETE STREETS TREATMENTS

Use the **Design Treatments section** (Page 43) of this Guide to access information and design guidance on the selected design treatments you determine are right for your street, including reference guides, measurements, siting, and materials. Use the design guidance as a reference to streamline production of your plans, drawings, and related project materials and align with the Town's goals for safer and more Complete Streets.

STREET TYPOLOGIES

Streets in Harrison were assessed and categorized into typologies according to common characteristics such as width, function, number of lanes, and adjacent land uses. These characteristics help define the most important uses of the street, such as through-travel, shopping, commuting, freight, public transit, and local access to homes, parks, and schools. Understanding the street function allows you to select the design and safety treatments that are right for each street. Street typologies enable the comprehensive application of design, operational, and safety treatments to all the different types of streets in Harrison.

This section contains:

ITEM	PURPOSE
Written descriptions of four types of street typologies in Harrison (Pages 12-13)	To describe each street based on generalized functional, design, and operational characteristics
Street typology map (page 14)	To assign street typologies to each street in Harrison
Design Treatments matrix (page 17-18)	To associate specific street design treatments with the different street typologies in Harrison
Street Typology diagrams – conceptual plans and 3D renderings of each street typology (beginning on page 19)	To graphically illustrate the contextual application of various street design treatments for each street typology

HARRISON STREET TYPOLOGIES

Neighborhood Streets: These are "local" streets that provide direct access to predominantly residential areas. Neighborhood Streets can be one-way or two-way with one to two travel lanes and typically feature on-street parking, off-street parking via driveways, low operational travel speeds, and/or some commercial land uses located at street corners.

Typology	Width	Typical Section	Description	Example Streets in Harrison
Neighborhood One-Way Streets	25 to 30 ft.	1 travel lane, parking on one or both sides	• Residential streets (one-way operation) • low speeds • narrow ROW • on-street parking	• Cross Street • Washington Street • 6th Street
Neighborhood Two-Way Streets	30 to 35 ft.	2 travel lanes parking on one or both sides	• Residential streets (two-way operation) • low speeds • narrow ROW • on-street parking	• Hamilton Street • Bergen Street • Warren Street (west of FER) • 7th Street

Slow Streets: These are similar to Neighborhood Streets but with little to no through traffic and even slower travel speeds due to short block lengths or dead ends.

Slow Streets	25 to 35 ft.	1-2 travel lanes parking on one or both sides	• Residential streets • very low speeds • very low volumes • narrow ROW • short blocks with some dead-ends • on-street parking	• William Street (between N. 5th & Davis) • Davis Court • Jersey Street • S. 2nd Street

HARRISON STREET TYPOLOGIES

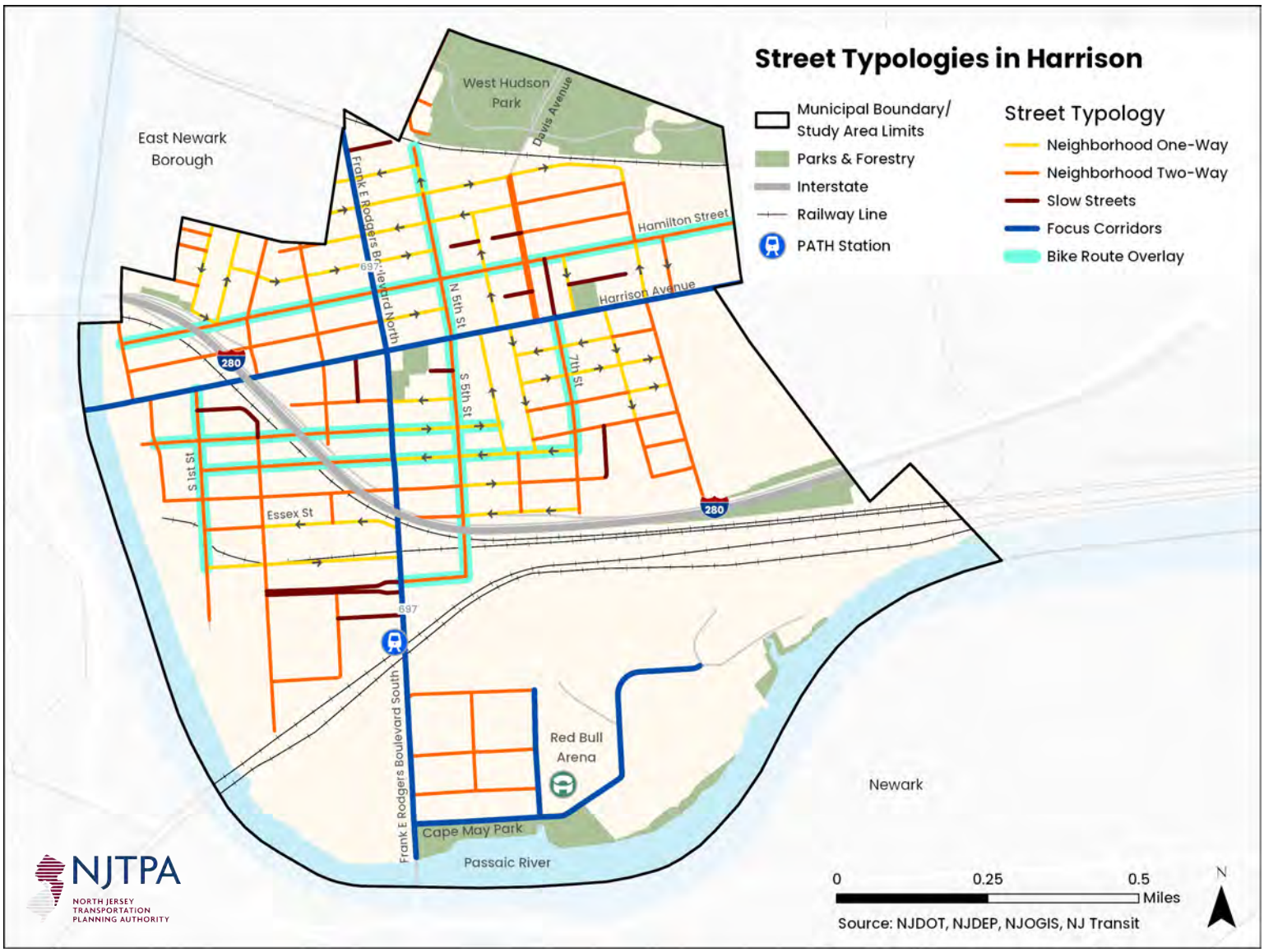
Focus Corridors: Four specific streets in Harrison – Frank E. Rodgers Boulevard, Harrison Avenue, Cape May Street, and Pete Higgins Boulevard – have been classified as Focus Corridors. Design treatments for these streets have been more contextually applied in a location-specific manner due to their local and regional significance in providing access to key destinations in Harrison.

Typology	Width	Typical Section	Description	Example Streets in Harrison
Focus Corridors	Varies	Varies	• Residential streets (one-way operation) • low speeds • narrow ROW • on-street parking	• Frank E. Rodgers Boulevard • Harrison Avenue • Cape May Street • Pete Higgins Boulevard

Bike Route Overlay: Bike facilities/accommodation such as painted lanes, signage, and/or shared lane markings ("sharrows") can be included in any of the street typologies above or following a defined route which is indicated in the Street Typologies Reference Map. This route has been identified for municipal consideration and is meant to provide access to neighborhoods, shopping, schools, parks, and other community destinations.

Typology	Width	Typical Section	Description	Example Streets in Harrison
Bike Route Overlay	Varies	Varies	• Residential streets (one-way operation • slow speeds • narrow ROW • on-street parking	• Cross Street • Washington Street • 6th Street

References: Hudson County Land Development Regulations, NACTO Urban Street Design Guide, and Hoboken Complete Streets Design Guide


Street Typologies in Harrison
Municipal Boundary/ Study Area Limits
Parks & Forestry
Interstate
Railway Line
PATH Station
Street Typology
Neighborhood One-Way
Neighborhood Two-Way
Slow Streets
Focus Corridors
Bike Route Overlay
West Hudson Park
Davis Avenue
East Newark Borough
Frank E Rodgers Blvd North
697
Hamilton Street
Harrison Avenue
N 5th St
S 5th St
7th St
280
S 1st St
Essex St
Red Bull Arena
Newark
Frank E Rodgers Boulevard South
Cape May Park
Passaic River
NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY
0
0.25
0.5
Miles
N
Source: NJDOT, NJDEP, NJOGIS, NJ Transit

DESIGN TREATMENTS

Design guidance for various street treatments falls into one or more of the following categories:

Speed Management Treatments in this category are meant to slow motor vehicle travel speeds on Town streets to encourage safer travel behavior. Slower travel speeds allow drivers more time to react to potential incidents and reduce the kinetic energy of crashes, thereby minimizing the severity of crashes if or when they occur. Safe travel speeds are one the key principles of the USDOT's Safe System Approach that provides a guiding framework for eliminating crashes that result in death and serious injuries.

Pedestrian Accommodations Treatments in this category include different types of facilities for bike or scooter travel, including lanes or roadway markings in the Street Zone or parking/storage in the Street or Sidewalk Zones. While not feasible on all roads, dedicated facilities for bicyclists or scooters create separate spaces for different travel modes which can reduce conflict between bicyclists/scooterists and motorists or pedestrians, thereby creating safer travel conditions for all. A safer network of facilities for bicyclists and scooterists can help to encourage use and reduce auto trips and parking demand, particularly for shorter trips in Harrison.

Cyclist/Scooter Accommodations Treatments in this category are meant to improve the safety and mobility of pedestrians. Unshielded and unprotected, pedestrians are at greater risk of sustaining serious injury or being killed in crashes with vehicles. Safety and mobility treatments can reduce pedestrian exposure and risk by shortening crossing distances, creating more crossing opportunities, improving pedestrian visibility at crosswalks, and minimizing conflicts between pedestrians and vehicles. Creating a safer and accessible street environment for pedestrians can also encourage walking trips, increase foot traffic, drive activity on streets, and improve public health.

DESIGN TREATMENTS

Design guidance for various street treatments falls into one or more of the following categories:

Transit/Freight Accommodations Treatments in this category are meant to slow motor vehicle travel speeds on Town streets to encourage safer travel behavior. Slower travel speeds allow drivers more time to react to potential incidents and reduce the kinetic energy of crashes, thereby minimizing the severity of crashes if or when they occur. Safe travel speeds are one the key principles of the USDOT's Safe System Approach that provides a guiding framework for eliminating crashes that result in death and serious injuries.

Street Amenities Treatments in this category are related to pedestrian comfort and convenience and are applicable to the Sidewalk Zone of Town streets. These treatments enhance the overall pedestrian experience by fostering welcoming and comfortable street environments for Harrison residents, workers, and visitors. This, in turn, can drive activity on streets which can support local businesses and enhance public safety.

Stormwater Management Treatments in this category can be used to capture, detain, and treat stormwater on Town streets, particularly in areas where spot flooding may occur. This would help to reduce demand on the Town's Combined Sewer Overflows (CSOs). As an added benefit, treatments involving landscaping or greenery will help to beautify Town streets and, in the case of street trees, help to reduce the Heat Island Effect of urbanized areas, in which hardscaping, structures, and other elements of the built environment absorb and reemit the sun's heat, contributing to higher air temperatures relative to outlying areas. Harrison is largely urbanized, so green infrastructure practices can be implemented in rights-of-way, medians, sidewalk areas, or as surface course.

		STREET TYPOLOGIES				
Treatment Category	Complete Streets Treatments	Neighborhood One-Way Streets	Neighborhood Two-Way Streets	Slow Streets	Focus Corridors	Bike Route Overlay
SPEED MANAGEMENT	Speed Feedback Signs	1	1	1	1	
	Speed Hump	1	1		1	
	Speed Cushions	1	1		1	
	Speed Tables/ Raised Crosswalk				1	
	Transverse Rumble Strips	1	1		1	
	High-Friction Surface Treatment (HFST)	1	1		1	
	Lane Narrowing					
	Edge Lines					
	Hardened Centerlines		1	1		
	Medians		2	2		
	Pinchpoints/Chokers/ Neckdowns (without Crosswalk)					
	Chicane					
PEDESTRIAN ACCOMMODATIONS	High-Visibility Crosswalks					
	Pedestrian-Scale Lighting					
	Intersection Daylighting					
	Curb Extensions					
	Midblock Crosswalks					
	Pedestrian Hybrid Beacons (PHBs)					
	Rectangular Rapid Flashing Beacons (RRFBs)					
	Pedestrian Refuge Islands					
	Leading Pedestrian Intervals (LPIs)					
	Countdown Signal Heads					
	No Turn On Red (NTOR)					
Street Amenities	Seating					
	Parklet					
	Wayfinding					

LEGEND:

- APPROPRIATE
- SITUATIONAL
- NOT APPROPRIATE / APPLICABLE

NOTES:

1. Applicable to manage travel speeds
2. Applicable on wide streets (>36 feet)
3. Applicable with potential future bike network implementation

		STREET TYPOLOGIES				
Treatment Category	Complete Streets Treatments	Neighborhood One-Way Streets	Neighborhood Two-Way Streets	Slow Streets	Focus Corridors	Bike Route Overlay
CYCLIST/SCOOTER ACCOMMODATIONS	Bicycle Lane					
	Cycle Track					
	Shared Lane Markings					
	Bike Box					
	Two-Stage Turn Queue Boxes					3
	Protected Intersections					3
	Bicycle Parking					
	Bike Corrals					
TRANSIT/FREIGHT ACCOMMODATIONS	Bus Stop, In-street/Along the Curb					
	Bus Stop, Curbside Kit of Parts					
	Bus Bulbs					
	Mountable Truck Aprons					
	Short-Term Parking/Loading/ Deliveries (Flex Curbside Zones)					
STORMWATER MANAGEMENT	Bioswale and Bioretention Systems					
	Rain Gardens					
	Pervious Pavement					
	Tree Pits and Planter Boxes					

LEGEND:

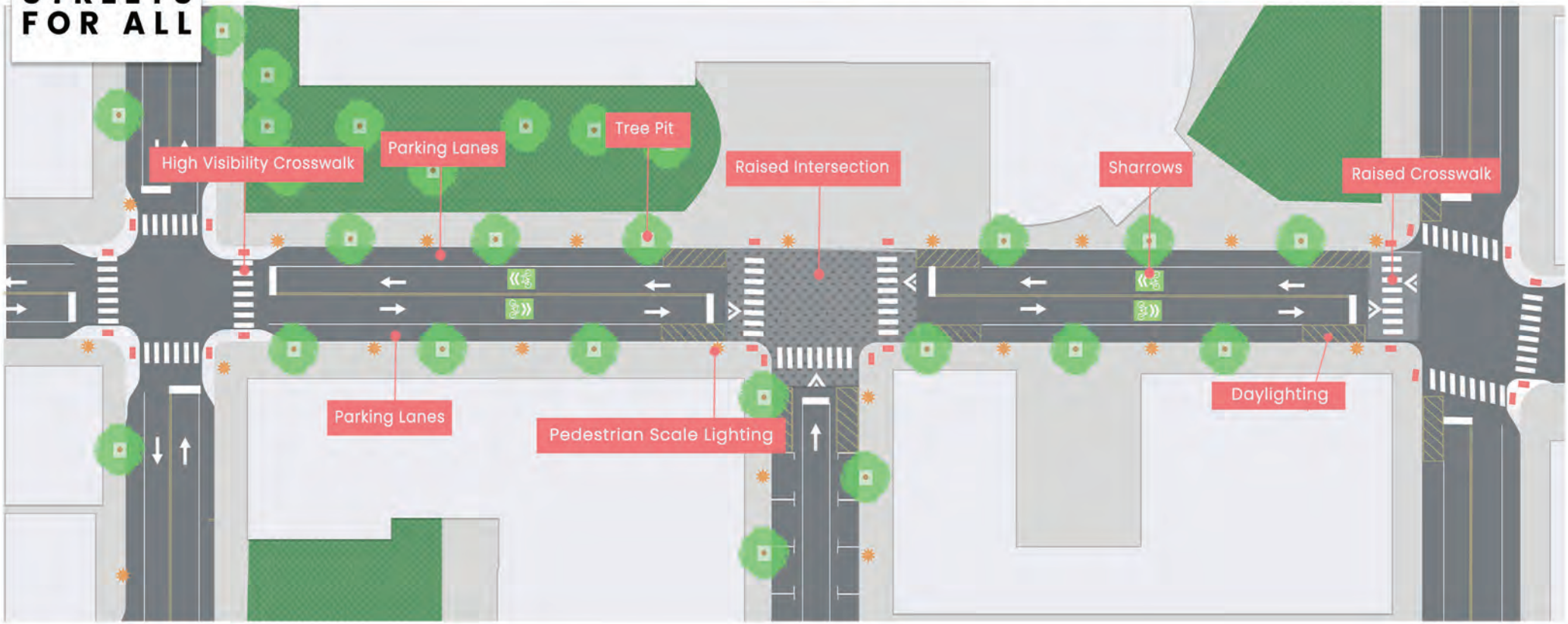
- APPROPRIATE
- SITUATIONAL
- NOT APPROPRIATE / APPLICABLE

NOTES:

1. Applicable to manage travel speeds
2. Applicable on wide streets (>36 feet)
3. Applicable with potential future bike network implementation

HARRISON STREETS FOR ALL

Neighborhood Street – Two Way



= Daylighting
- 25 Feet from Crosswalk

= Narrowed Lanes
- Travel Lanes 10 Feet (11 Feet Maximum)

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Tree Pit

= Sharrows

= Raised Crosswalk

= Raised Intersection

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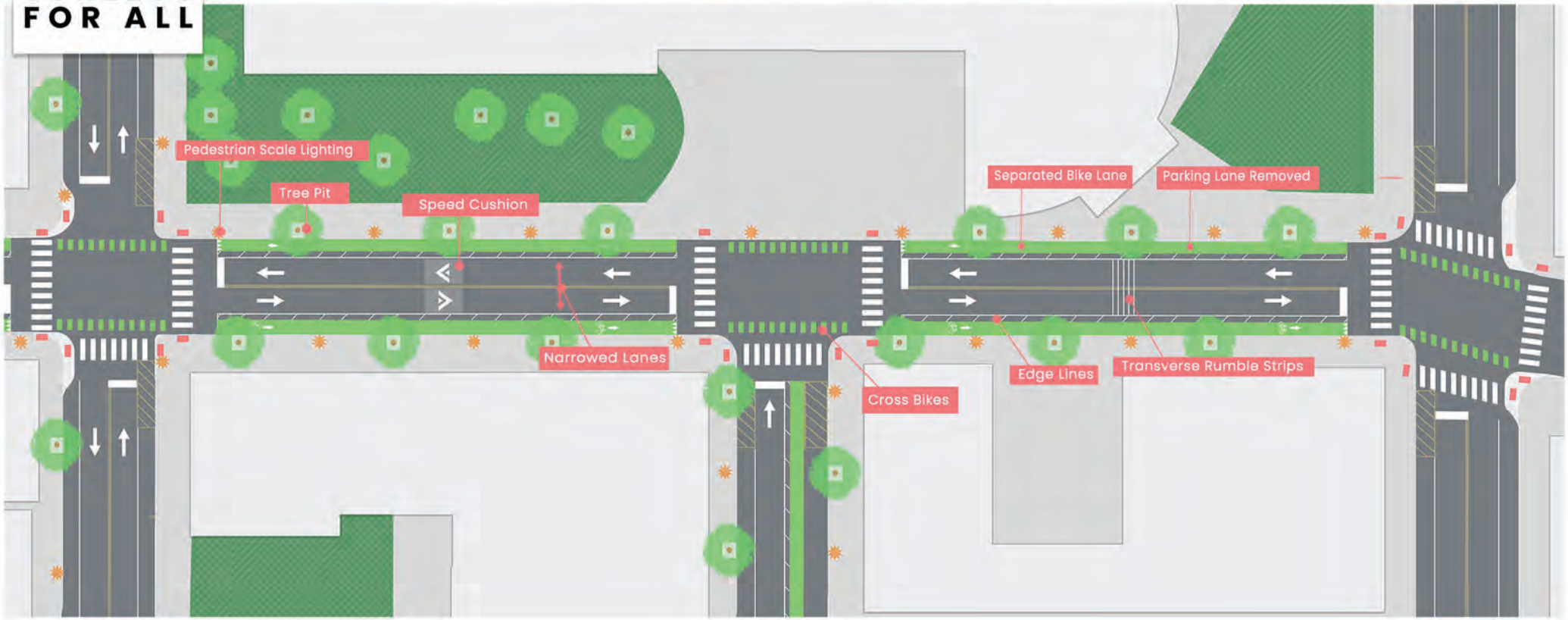
HARRISON STREETS FOR ALL

Neighborhood Street – Two Way

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

HARRISON STREETS FOR ALL

Neighborhood Street – Two Way Bike Overlay



= Separated Bike Lane
- 5 to 6 Feet Desirable
- 4 Feet absolute minimum constrained conditions
- with 3 ft desirable buffer - 1.5 foot minimum

= Narrowed Lanes
- Travel Lanes 10 Feet (11 Feet Maximum)

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian
- crossing at intersection
- Spaced 60 feet along corridor

= Speed cushion

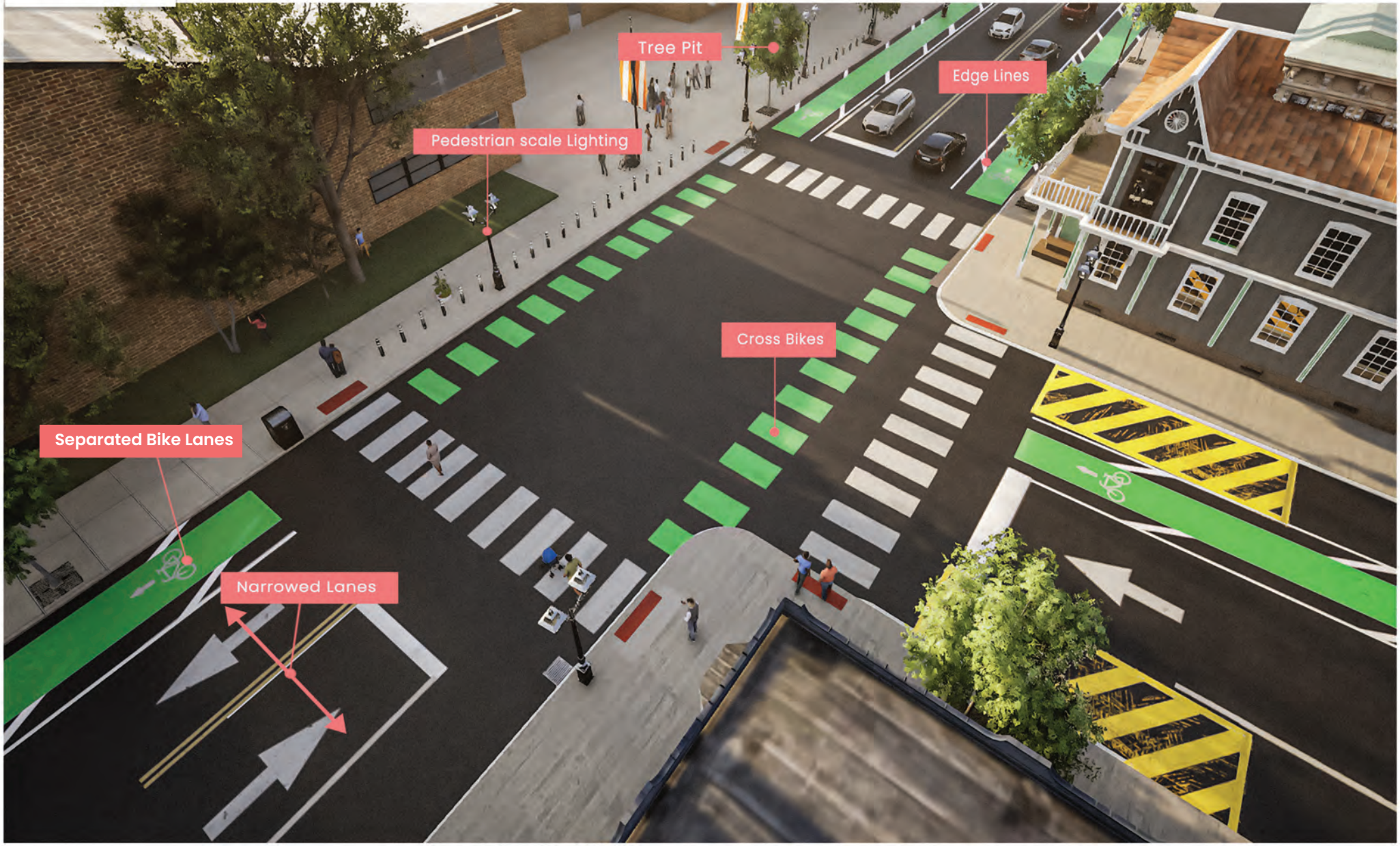
= Transverse Rumble Strips

= Cross Bikes

= Tree Pit

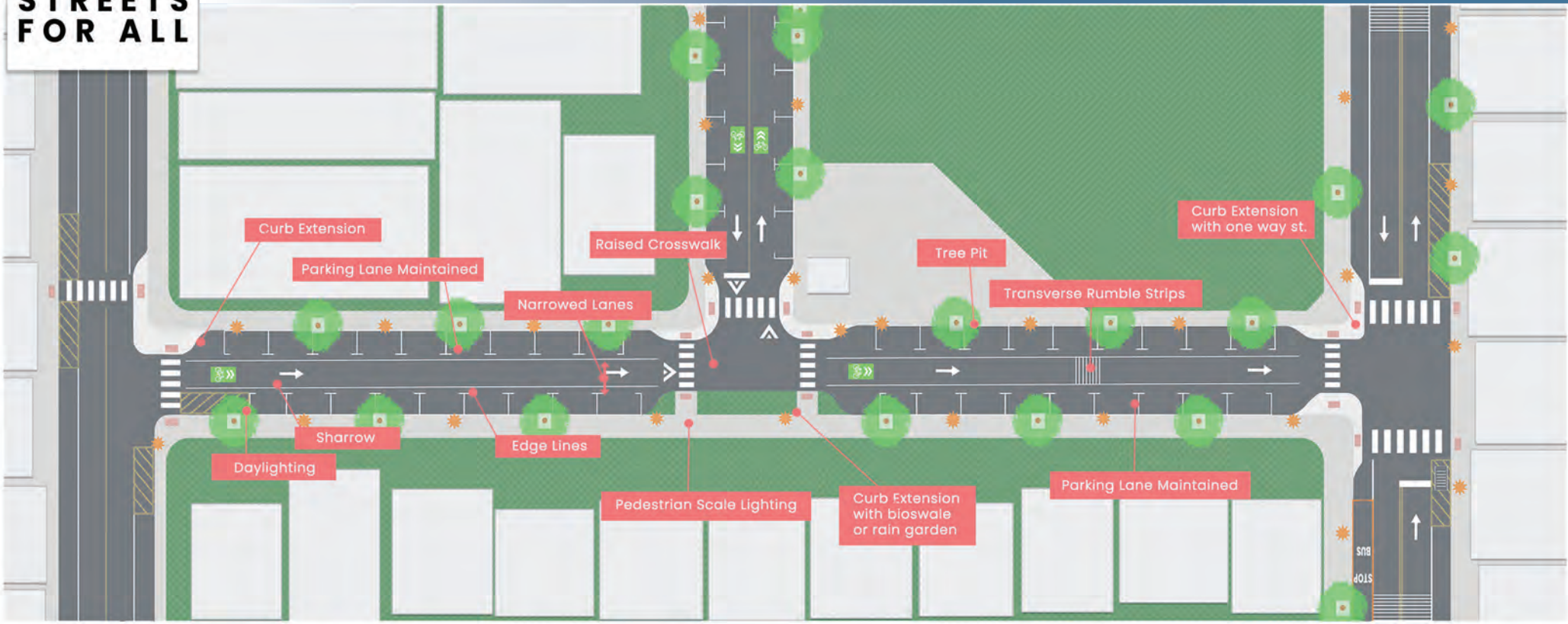
NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Neighborhood Street – Two Way Bike Overlay



HARRISON STREETS FOR ALL

Neighborhood Street – One Way



= Daylighting
- 25 Feet from Crosswalk

= Tree Pit

= Narrowed Lanes
- Travel Lanes 10 Feet (11 Feet Maximum)

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Sharrows

= Raised Crosswalk

= Curb Extension

= Curb Extension with Bioswale or Rain Garden

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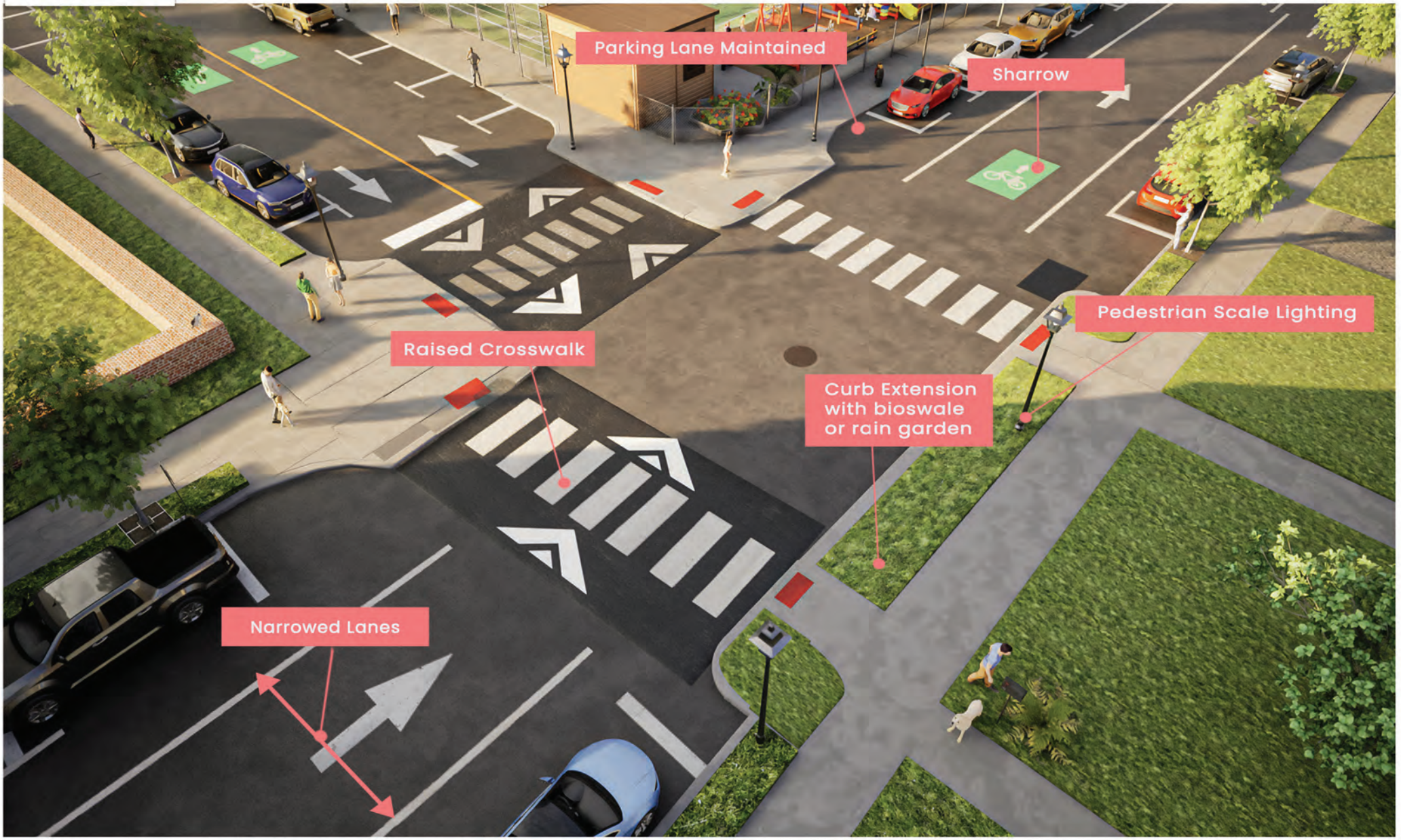
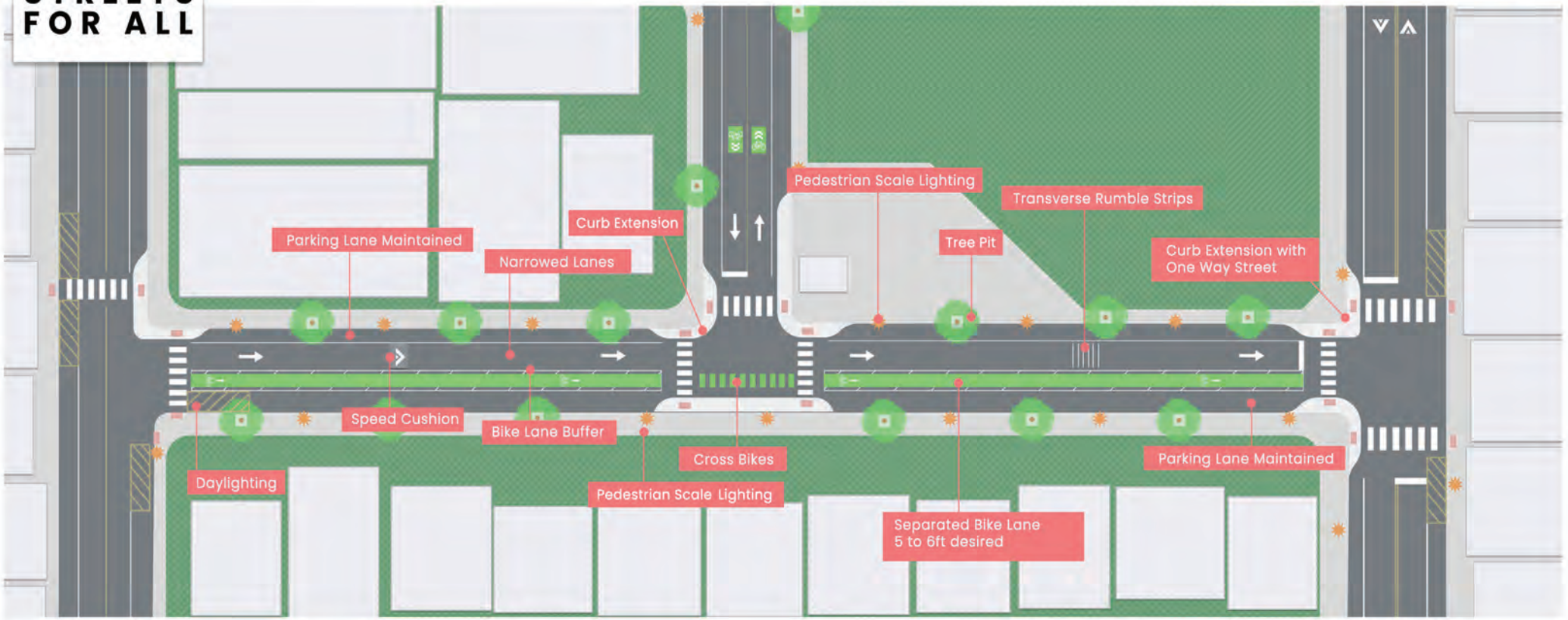
Neighborhood Street – One Way



HARRISON STREETS FOR ALL

Neighborhood Street – One Way Bike Overlay



= Narrowed Lanes
- Approximately 10 - 11 Feet

= Tree Pit

= High Visibility Crosswalk

= Bike Lane Buffer

= Separated Bike Lanes
- 5 - 6 Feet desired
- 4 Feet absolute minimum (constrained conditions)
- 3 Feet desired buffer / 1.5 Feet minimum

= Curb Extension
- Width should be 2 feet less than parking lane width
- One Way- Tigheter Corner Radius where no turns are permitted

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Intersection Daylighting

= Cross Bikes

= Transverse Rumble Strips

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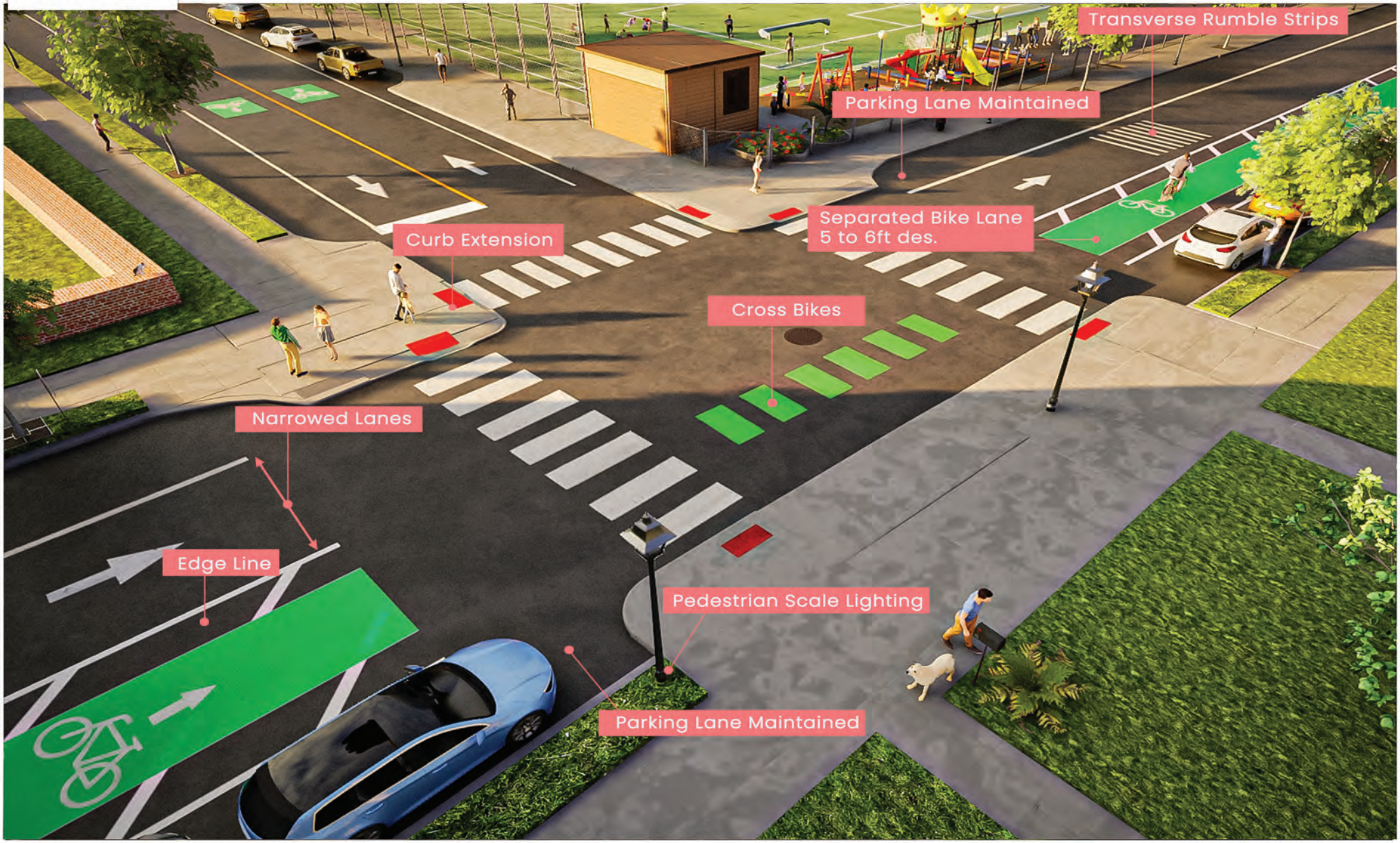
Neighborhood Street – One Way Bike Overlay



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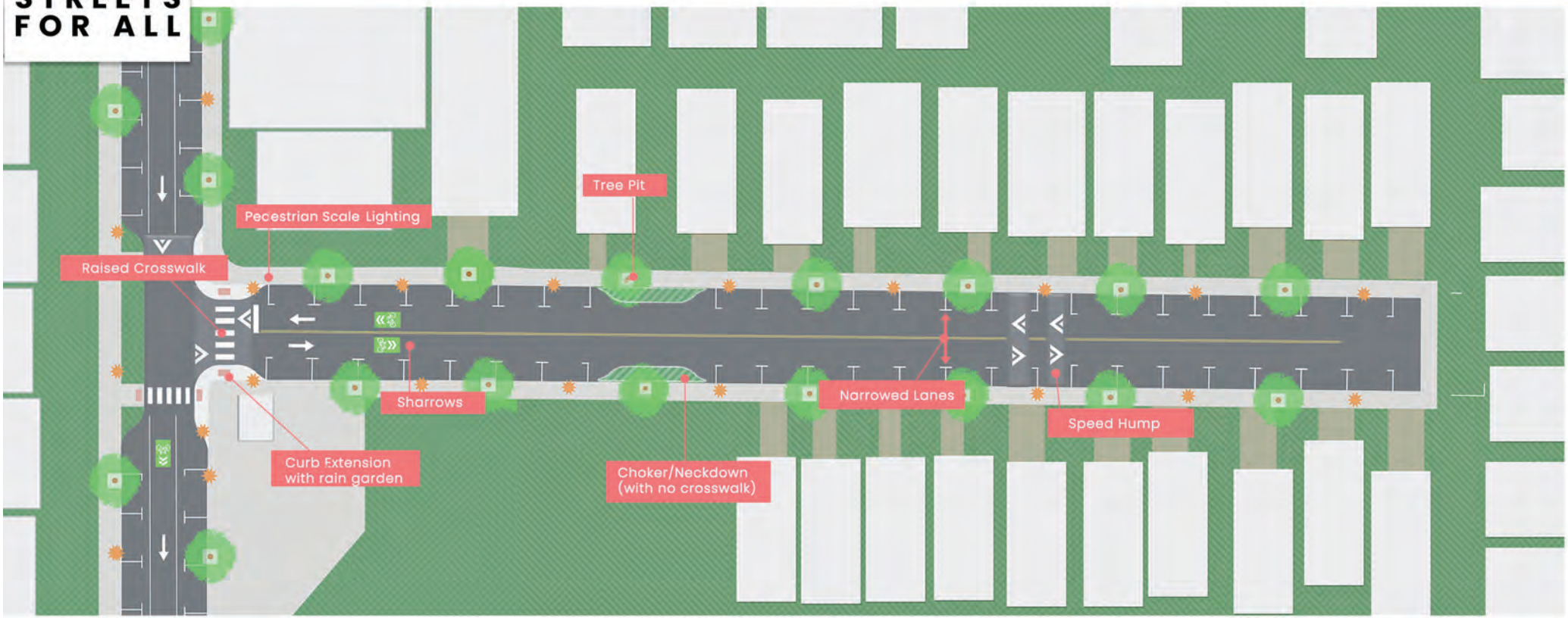
HARRISON STREETS FOR ALL

Slow Street



= Speed Humps

= Tree Pit

= Narrowed Lanes
- Travel Lanes 10 Feet (11 Feet Maximum)
- Shelter and seating to be provided at high traffic stops

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Sharrows

= Raised Crosswalk

= Curb Extension With Rain Garden

= Choker/Neckdown

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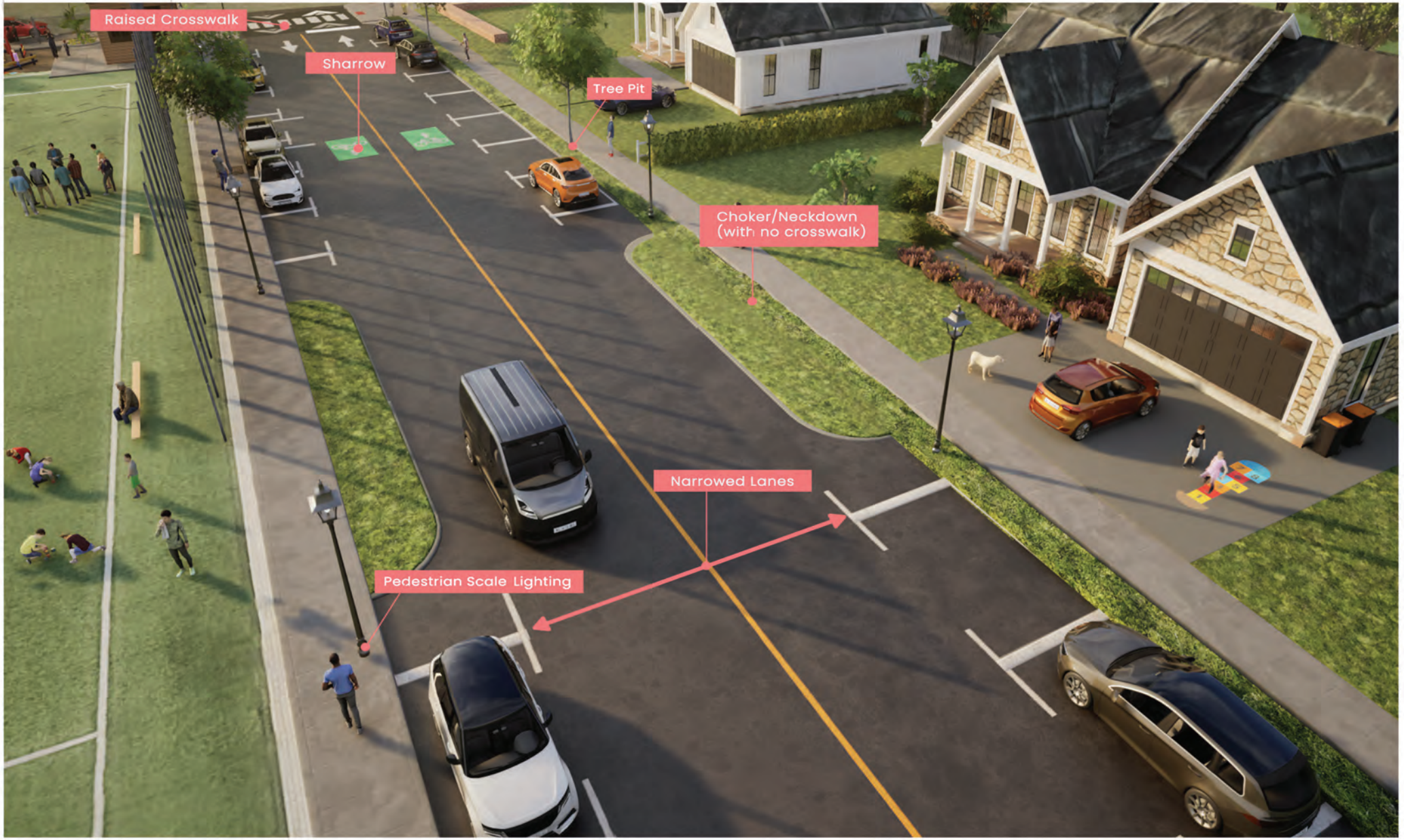
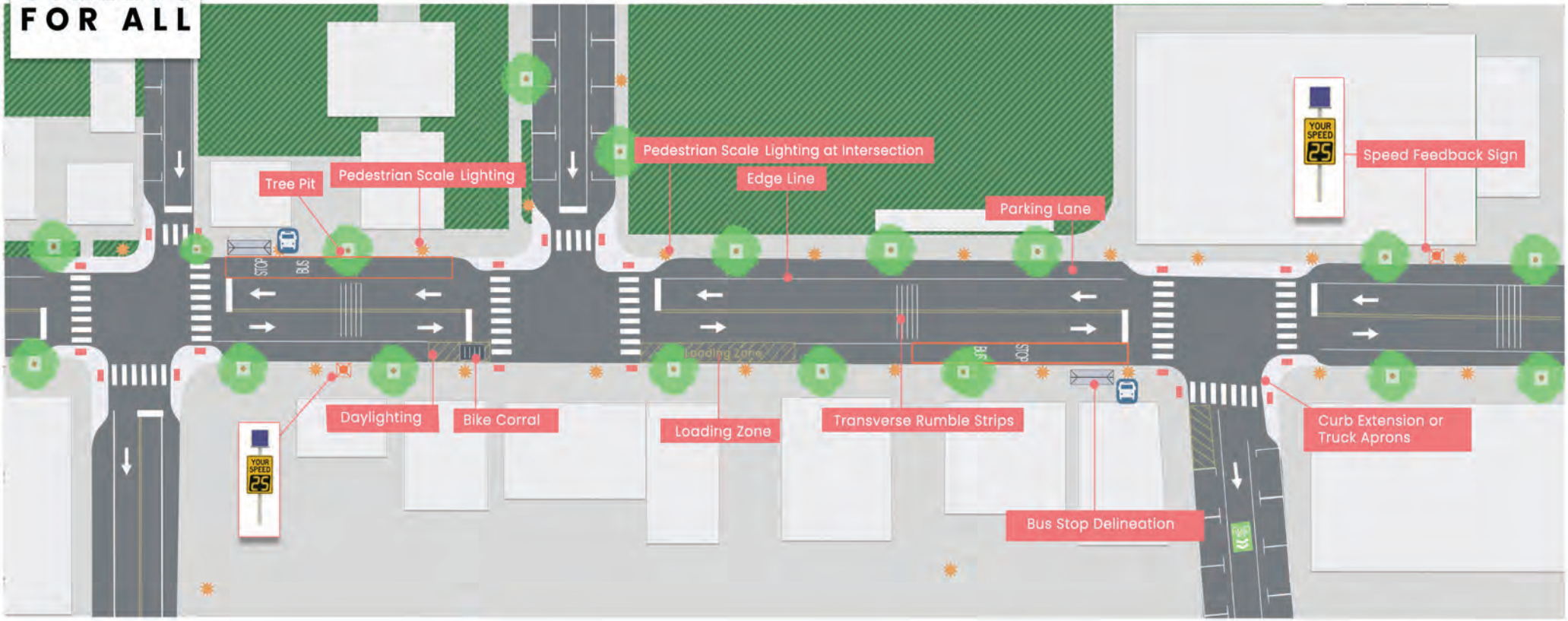
Slow Street


Raised Crosswalk
Sharrow
Tree Pit
Choker/Neckdown
(with no crosswalk)
Narrowed Lanes
Pedestrian Scale Lighting

HARRISON STREETS FOR ALL

Focus Corridor - Harrison Avenue



= Loading Zone

= Tree Pit

= Bus Stop Delineation

- Pavement markings 105 feet per NJT requirements)
- Shelter and seating to be provided at high traffic stops

= Pedestrian Scale Lighting

- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Intersection Daylighting

- 80 Feet Maximum
- 30 Feet Absolute Minimum

= High Visibility Crosswalk

= Speed Feedback Sign

= Transverse Rumble Strips

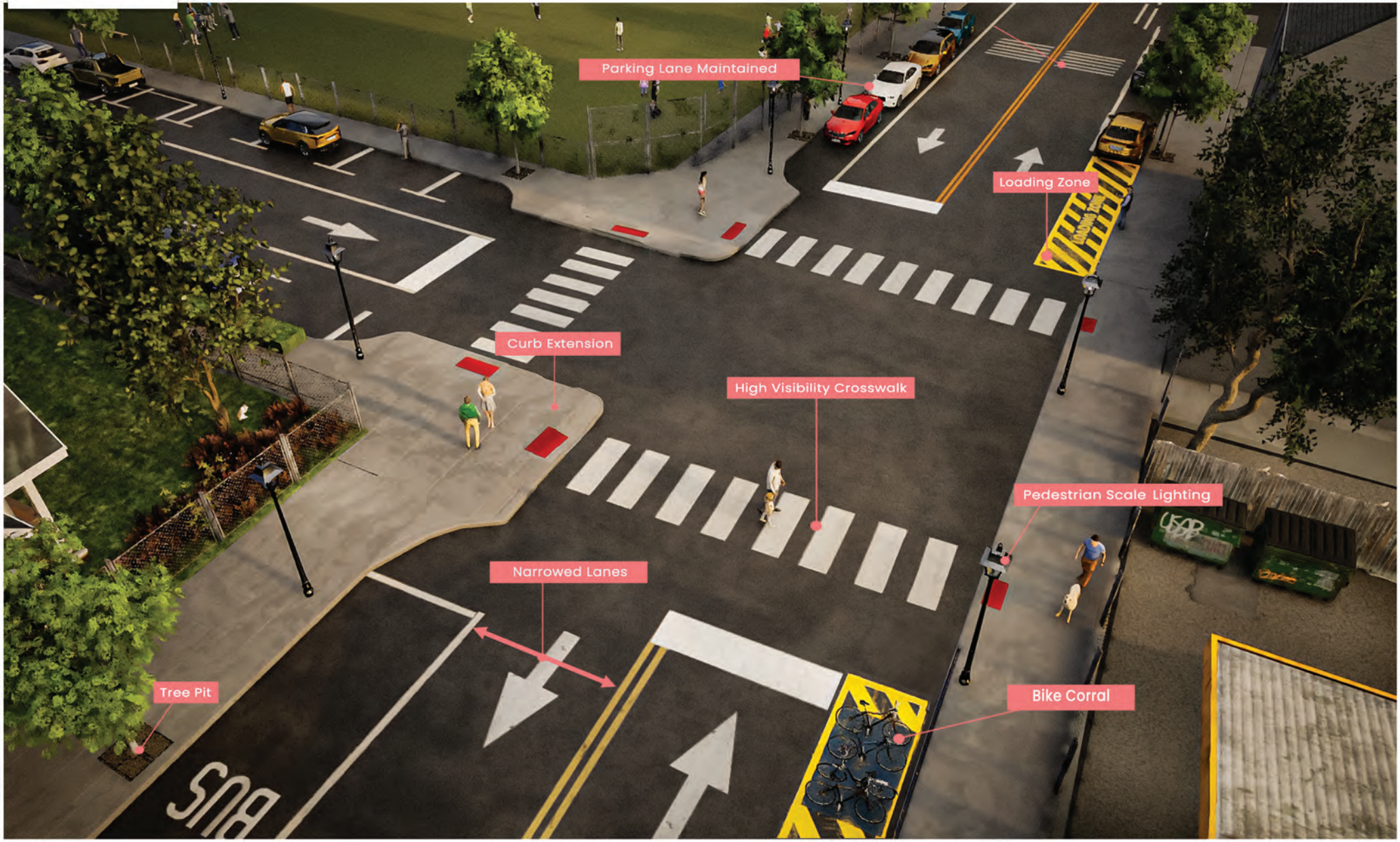
= Curb Extension or Truck Aprons

- One Way- Tigheter Corner Radius where no turns are permitted
- Can be used situationally where needed to accommodate truck movements

= Bike Corral

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

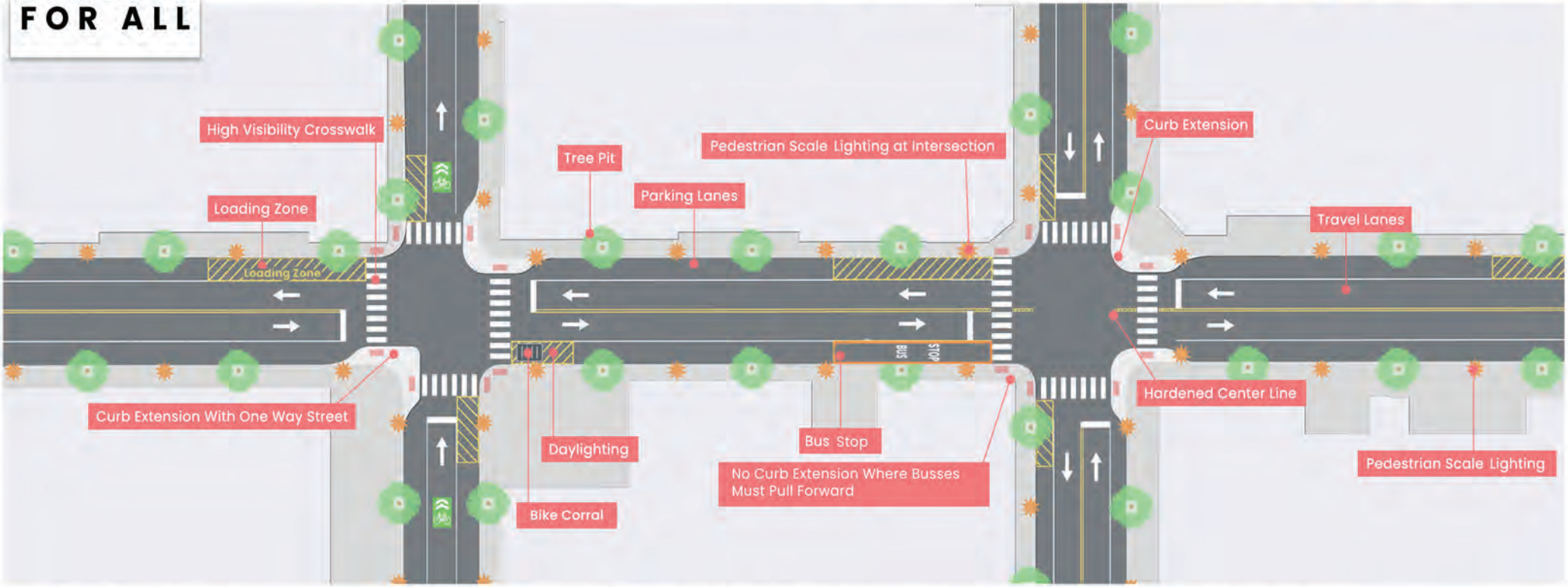
Focus Corridor - Harrison Avenue



NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

HARRISON STREETS FOR ALL

Focus Corridor - Frank E. Rodgers Boulevard



= Travel Lanes
- 11 Feet desirable. 12 Feet maximum

= Parking Lanes
- 8 Feet desirable, 7 Feet minimum width

= Curb Extension
- Width should be 2 feet less than parking lane width

= Bike Corral

= Intersection Daylighting
- Should be 25 feet from crosswalk

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Curb Extension - One Way Street
- Tighter turning radius where no turns are permitted

= Tree Pit

= Loading Zones
- Length along curb is 80 feet maximum; 30 feet minimum

= Bus Stop
- Pavement markings 105 feet (per NJT requirements)
- Shelter and seating to be provided at high traffic stops

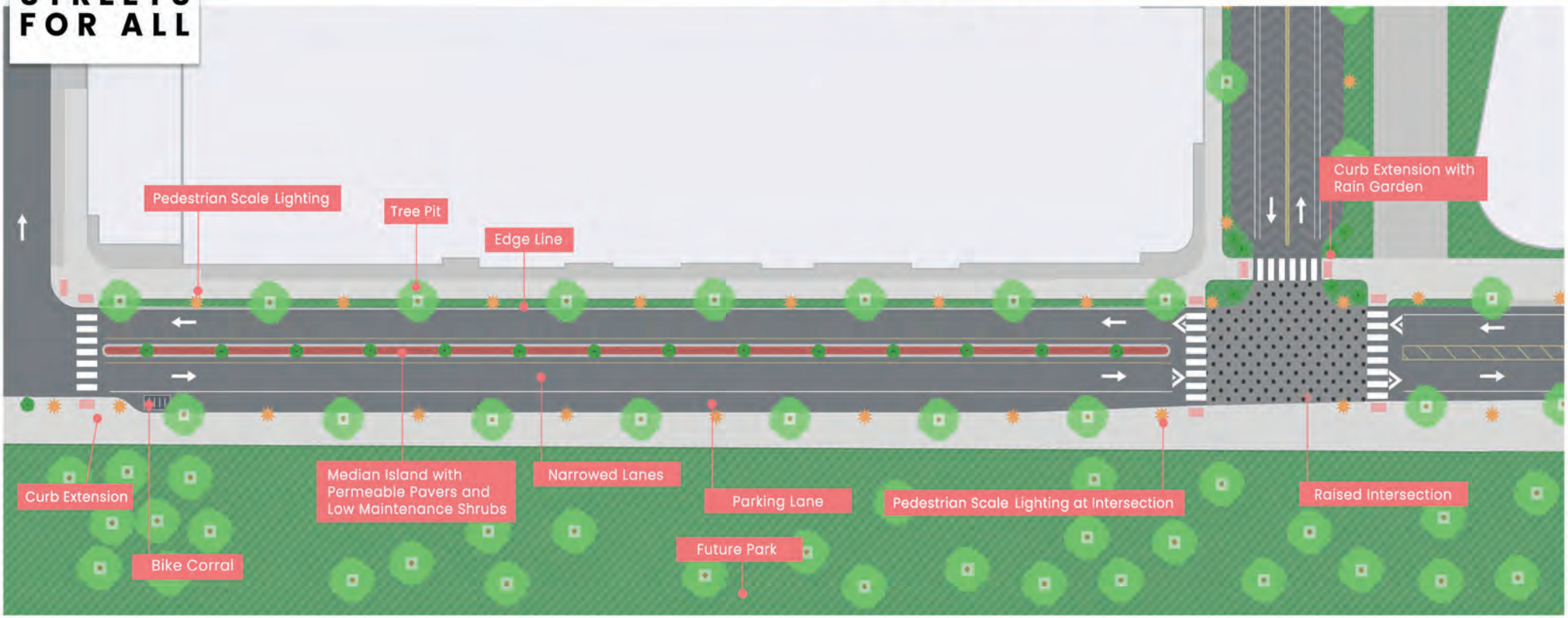
= High Visibility Crosswalk

= Hardened Center Line

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Focus Corridor - Frank E. Rodgers Boulevard

Focus Corridor - Cape May Street



= Narrowed Lanes
- Approximately 11 feet

= Tree Pit

= High Visibility Crosswalk

= Shrubs

= Median Island with Permiable Pavers and Low Maintenance Shrubs

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Curb Extension
- Width should be 2 feet less
- than parking lane width

= Raised Intersection

= Curb Extension with Rain Garden

= Bike Corral

= Edge Line

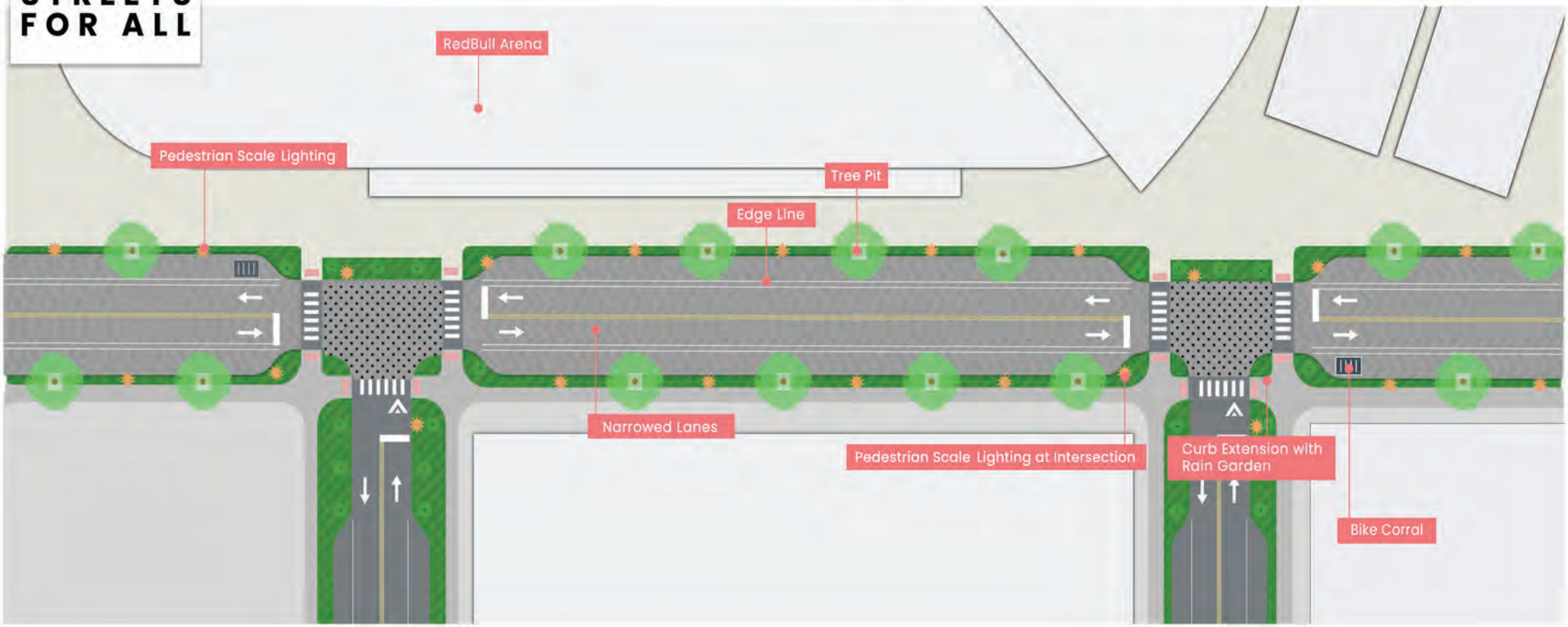
NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Focus Corridor - Cape May Street

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

HARRISON STREETS FOR ALL

Focus Corridor - Pete Higgins Boulevard



= Curb Extension with Rain Garden

= Raised Intersection

= High Visibility Crosswalk

= Flush Roadway Surface
- Street can be closed during RedBull Arena Events

= Curb Extension
- Width should be 2 feet less than parking lane width

= Pedestrian Scale Lighting
- 10 feet in advance of pedestrian crossing at intersection
- Spaced 60 feet along corridor

= Tree Pit

= Bike Corral

= Edge Line

= Narrowed Lanes

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Focus Corridor - Pete Higgins Boulevard

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

PROJECT TYPE

Another way to identify the appropriate treatment for your street is to consider the project type. If you're working on a specific type of project on Harrison streets, e.g., a resurfacing project or an intersection upgrade, this section provides supplemental guidance on Complete Streets treatments that can be considered based on project type. In this way, treatments can be associated with both street typologies and different types of street improvement projects. Seven different types of street projects are defined below. Following these descriptions, a project matrix associates specific Complete Streets treatments with the project types.

Signage/Striping

Projects that focus on adding or upgrading street signage or roadway markings meant for traffic control. These improvements may be associated with resurfacing projects.

Resurfacing

Milling and paving projects meant to keep streets in a state of good repair

Safety

Projects focused on safety improvements, which may utilize federal or state safety funding.

Intersection Upgrades

Projects focused on intersections including traffic signal upgrades and ADA (Americans with Disabilities Act) improvements.

Sidewalk Improvements

Projects focused on sidewalk repair or replacement with little to no impact on the roadway (vehicular travel lanes).

Full Scope Construction

Major capital projects that may include new street construction, underground utility work, drainage upgrades, or full roadway reconstruction.

Quick Build

Projects that can be implemented in a very short period of time using low-cost materials including paint, vertical plastic delineators, large planters, or modular components such as surface-mounted curbing, wheel stops, or speed bumps.

		PROJECT TYPES						
Treatment Category	Complete Streets Treatments	Signage/ Striping	Resurfacing	Safety	Intersection Upgrades	Sidewalk Improvements	Full Scope Reconstruction	Quick Build
SPEED MANAGEMENT	Speed Feedback Signs	✓		✓			✓	✓
	Speed Hump		✓	✓			✓	✓
	Speed Cushions		✓	✓			✓	✓
	Speed Tables/ Raised Crosswalk		✓	✓	✓		✓	
	Transverse Rumble Strips	✓	✓	✓			✓	✓
	High-Friction Surface Treatment (HFST)	✓	✓	✓	✓		✓	✓
	Lane Narrowing	✓	✓	✓	✓		✓	✓
	Edge Lines	✓	✓	✓			✓	✓
	Hardened Centerlines		✓	✓	✓		✓	✓
	Medians	✓		✓	✓		✓	✓
	Pinchpoints/Chokers/ Neckdowns (without Crosswalk)			✓		✓	✓	✓
	Chicane			✓		✓	✓	✓
PEDESTRIAN ACCOMMODATIONS	High-Visibility Crosswalks	✓	✓	✓	✓		✓	✓
	Pedestrian-Scale Lighting			✓	✓	✓	✓	
	Intersection Daylighting	✓	✓	✓	✓		✓	✓
	Curb Extensions		✓	✓	✓	✓	✓	✓
	Midblock Crosswalks	✓	✓	✓			✓	
	Pedestrian Hybrid Beacons (PHBs)	✓		✓	✓		✓	
	Rectangular Rapid Flashing Beacons (RRFBs)	✓		✓	✓		✓	✓
	Pedestrian Refuge Islands			✓	✓		✓	
	Leading Pedestrian Intervals (LPIs)			✓	✓		✓	
	Countdown Signal Heads			✓	✓		✓	
	No Turn On Red (NTOR)	✓		✓	✓		✓	✓
Street Amenities	Seating				✓	✓	✓	✓
	Parklet					✓	✓	✓
	Wayfinding	✓			✓	✓	✓	

		PROJECT TYPES						
Treatment Category	Complete Streets Treatments	Signage/ Striping	Resurfacing	Safety	Intersection Upgrades	Sidewalk Improvements	Full Scope Reconstruction	Quick Build
CYCLIST/SCOOTER ACCOMMODATIONS	Bicycle Lane	✓	✓	✓			✓	✓
	Cycle Track	✓	✓	✓			✓	✓
	Shared Lane Markings	✓	✓	✓			✓	✓
	Bike Box	✓	✓	✓	✓		✓	✓
	Two-Stage Turn Queue Boxes	✓	✓	✓	✓		✓	✓
	Protected Intersections			✓	✓		✓	
	Bicycle Parking	✓			✓	✓	✓	✓
	Bike Corrals	✓	✓		✓		✓	✓
TRANSIT/FREIGHT ACCOMMODATIONS	Bus Stop, In-street/Along the Curb	✓			✓	✓	✓	
	Bus Stop, Curbside Kit of Parts				✓	✓	✓	
	Bus Bulbs		✓		✓	✓	✓	✓
	Mountable Truck Aprons		✓	✓	✓	✓	✓	✓
	Short-Term Parking/Loading/ Deliveries (Flex Curbside Zones)	✓	✓				✓	✓
STORMWATER MANAGEMENT	Bioswale and Bioretention Systems				✓	✓	✓	
	Rain Gardens				✓	✓	✓	
	Pervious Pavement		✓			✓	✓	
	Tree Pits and Planter Boxes					✓	✓	

DESIGN TREATMENTS

Design guidance for various street treatments falls into one or more of the following categories:


Speed Management


Pedestrian Accommodations


Cyclist/Scooter Accommodations


Transit/Freight Accommodations


Street Amenities


Stormwater Management

More information on each category, as well as applicable design treatments, can be found in the following sections.

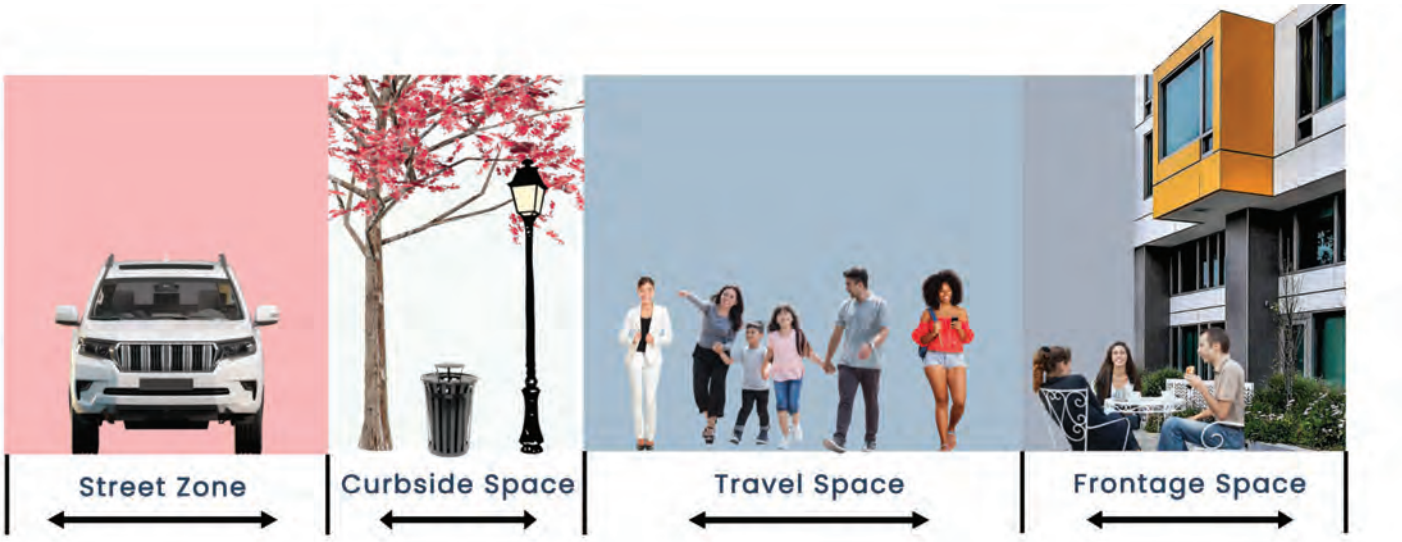
Design treatment guidance should be used for reference only. For each treatment, always check the latest relevant design guidance and best practices.

Design Treatment image source is Michael Baker International unless otherwise attributed.

Street Zones

Each of the following design and/or operational Complete Streets treatments could be installed or implemented in one of two "zones" on each street in Harrison:

- **Sidewalk Zone:** This is the space between a building/property line and the curb and is mainly meant for pedestrian access. The Sidewalk Zone is further defined by:
    - Frontage Space: This is the space closest to buildings that is typically used for property access, café seating, or store signage.
    - Travel Space: This is a through space meant for safe and accessible pedestrian movements. The Travel Space should generally be 5 to 7 feet on Neighborhood and Slow Streets and 8 to 12 feet on Destination and Focus Streets.
    - Curbside Space: This is the space nearest to the street meant for lighting, seating, bus stops, bike/scooter parking, tree pits, landscaping, fire hydrants, parking meters, and other amenities.
- **Street Zone:** This is the street space between curbs that is mainly meant for vehicular



Speed Management

Treatments in this category are meant to slow motor vehicle travel speeds on Town streets to encourage safer travel behavior. Slower travel speeds allow drivers more time to react to potential incidents and reduce the kinetic energy of crashes, thereby minimizing the severity of crashes if or when they occur. Safe travel speeds are one the key principles of the USDOT's Safe System Approach that provides a guiding framework for eliminating crashes that result in death and serious injuries.

The following treatments can be used to help manage driver speeds on Harrison streets. More detailed information on each, including design guidance, can be found on the pages indicated.

Speed Feedback Signs

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 1. Speed feedback sign in Crandford, NJ

Description:

A vehicle speed feedback sign displays the speed of approaching vehicles to alert drivers of their speed in relation to the posted speed limit. In addition to displaying the approaching driver's speed limit, these signs can display a targeted message such as "SLOW DOWN" if measured speed is in excess of posted speed. Speed feedback signs can be used as a method to monitor and mitigate speeding at specific locations in Harrison, particularly along busier streets.

DESIGN GUIDANCE

- Applicable in school zones and transitional zones.
- Can be portable or permanently installed.
- MUTCD sign or plaque (W13-20 or W13-20aP)

Speed Hump

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors

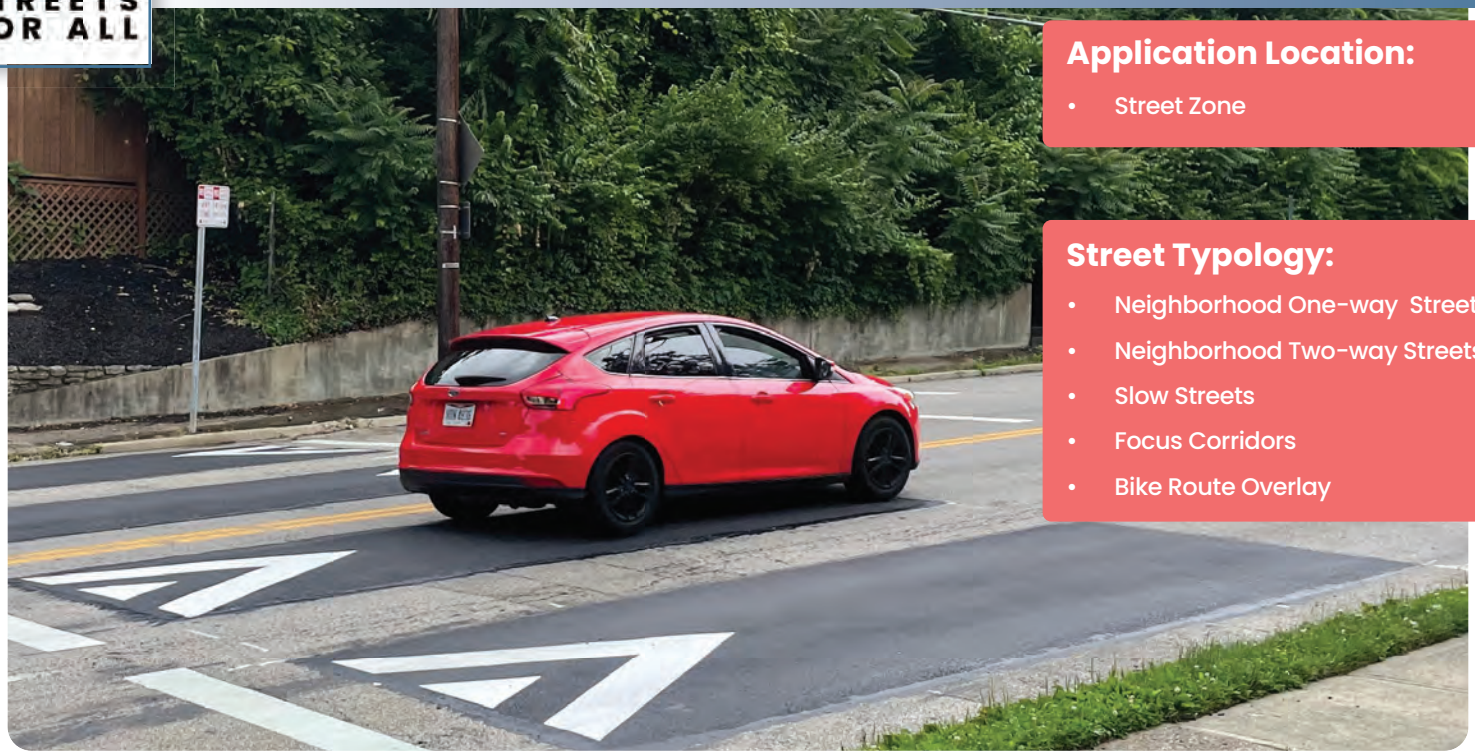
Figure 2. Speed hump in Millburn, NJ

Description:
A long, raised feature on a street designed to slow motor vehicle traffic. This is applicable in neighborhood streets and school zones where speed limits and roadway volumes may be lower. Installed perpendicular to the direction of traffic, speed humps are generally 3-4 inches high and approximately the width of the travel lane, with ramp lengths of 3-6 feet. Speed humps are effective at reducing vehicle speeds below 20 mph.

DESIGN GUIDANCE

- Appropriate on roadways with a posted speed limit of 30 mph or less and fewer than 3,000 AADT.
- Not recommended in areas with frequent driveways.
- Slope should not exceed 1:10 or be less steep than 1:25.
- Side slopes on tapers should be no greater than 1:6.
- Vertical lip should be no more than one-quarter inch high.
- Speed humps should be placed in areas with sufficient lighting and visibility.
- Must be installed in conjunction with appropriate MUTCD sign for drivers (W17-1).
- Spacing for speed humps is determined based on the target speed of the roadway but should be spaced no more than 500 feet apart to achieve an 85th percentile speed of 25-35 mph. Spacing speed humps closer together results in greater speed reduction.

Speed Cushions



Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 3. Speed cushions in Cincinnati, OH. Image Source: City of Cincinnati.

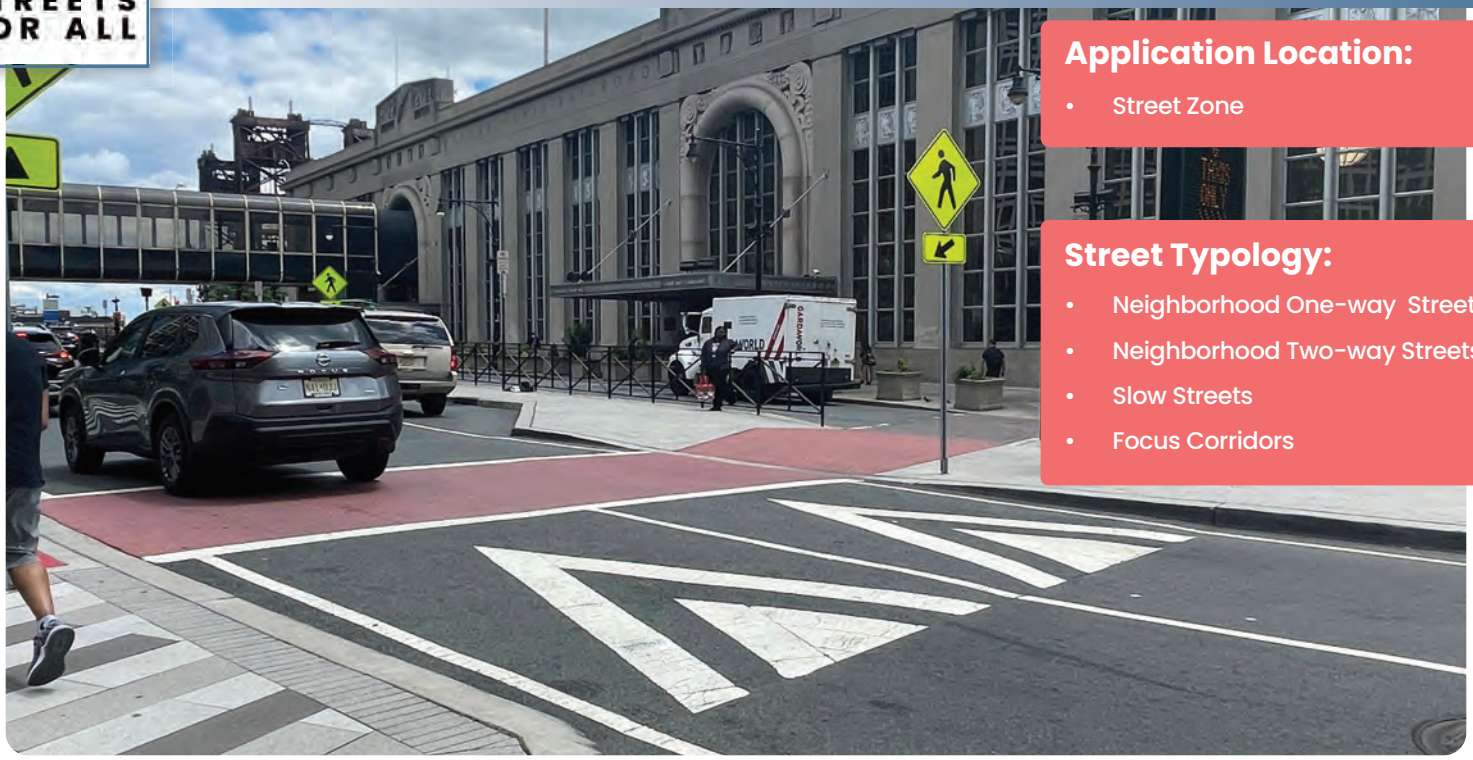
Description:

Speed cushions, like speed humps, are a type of vertical deflection used to reduce passenger vehicle speeds while allowing larger vehicles like fire trucks or freight vehicles to travel unimpeded using wheel cutouts. This treatment therefore represents a speed management tactic that could be used along bus or freight routes.

DESIGN GUIDANCE

- Appropriate on roadways with a posted speed limit of 30 mph or less and fewer than 3,000 AADT.
- Slope should not exceed 1:10 or be less steep than 1:25.
- Side slopes on tapers should be no greater than 1:6.
- Vertical lip should be no more than one-quarter inch high.
- Speed cushions should be placed in areas with sufficient lighting and visibility.
- Must be installed in conjunction with appropriate MUTCD sign (W17-1).
- Additional coordination may be required with emergency service providers for installations on emergency response and transit routes.

Speed Tables / Raised Crosswalk



Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors

Figure 4. Raised crosswalk in Newark, NJ.

Description:

Speed tables are vertical deflection treatments with flat tops that raise the entire wheelbase of the vehicle. They can be used for both intersection and midblock traffic calming. Used in combination with crosswalk striping, speed tables function as raised crosswalks. Speed tables have a height of 3 to 3.5 inches.

DESIGN GUIDANCE

- Can be combined with midblock pedestrian crossings and curb extensions.
- Should be placed in areas with sufficient lighting and visibility.
- Must be installed with appropriate MUTCD sign for drivers (W17-1).
- Distinctive materials such as pavers can help to emphasize tables especially when combined with pedestrian crossings but will require additional maintenance considerations.
- Slope should not exceed 1:10 or be less steep than 1:25.
- Side slopes on tapers should be no greater than 1:6.
- Vertical lip should be no more than one-quarter inch high.

Transverse Rumble Strips

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 5. Transverse rumble strips in Harrison, NJ.

Description:

Transverse rumble strips are slightly raised features on a roadway that present a visual cue to approaching drivers and act as a warning device due to the sound and vibration produced when a vehicle drives over them. Transverse rumble strips are applied within travel lanes, perpendicular to the direction of travel. They are used to slow motorists and draw attention to approaching intersections, crossings, schools, or roadway features like horizontal curves.

DESIGN GUIDANCE

- Must be monitored for wear, which may lessen noise and vibration, reducing effectiveness over time.
- Proximity to residential areas must be considered due to the noise produced from vehicles driving over them.

High-Friction Surface Treatment (HFST)

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Focus Corridors

Figure 6. High-friction surface treatment in North Bergen, NJ.

Description:

High-friction surface treatments (HFST) are applied directly to roadway surfaces using skid-resistant aggregates and are used to aid in vehicle stopping or control. In this way, HFST reduces stopping distances. HFST can be applied to roadways with horizontal curves, on sloping intersection approaches, or in locations where crash data reveals a high number of rear-end crashes.

Pavement friction management is an FHWA Proven Safety Countermeasure, reducing 48 percent of injury crashes at horizontal curves and 20 percent of crashes at intersections.

DESIGN GUIDANCE

- Typically used at intersection approaches, crosswalk approaches, interchange ramps, horizontal curves, and at locations with an overrepresentation of rear-end, failure to yield, wet-weather, or red-light running crash types.
- HFST is applied to existing pavement, but consideration must be given to the underlying pavement structure–if unstable, it may shorten the life of the treatment.
- Automated installation is recommended by the FHWA as opposed to manual application. Human error can contribute to inadequate coverage, thickness, and placement.
- If applying HFST to multiple locations, bundling installations may reduce overall costs.

Lane Narrowing

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 7. Lane narrowing in Millburn, NJ.

Description:

Lane widths between 11 and 13 feet have been the standard in roadway design, creating a more forgiving buffer to drivers, especially on high-speed corridors. In urban contexts, wider lanes encourage speeding and occupy a larger portion of the right-of-way. Lane narrowing can be accomplished by delineating travel lanes with edge or lane lines where absent or restriping existing edge lines to define a narrower travel lane. This strategy promotes slower driving speeds and shortens pedestrian crossings at intersections, increasing safety for all road users.

DESIGN GUIDANCE

- In dense and urban environments, 10-foot lanes are appropriate and may be used without impacting traffic operations. On routes with larger vehicles, 11-foot lanes may be used.
- Lane widths greater than 11 feet should be discouraged as they may increase speeding and minimize the right-of-way available to other road users.
- On multi-lane roadways with transit, freight, and emergency routes, wider lanes should be on the outside, either curbside or adjacent to street parking. Inside lanes should be kept at minimum width.
- Striping helps to channelize traffic and delineates the travel lane from other uses.
- Additional lane width may be necessary for receiving lanes at turning locations with tight curves.

Edge Lines

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 8. Edge lines in Garwood, NJ.

Description:

Edge lines are painted road lines delineating the travel lane and/or the boundary between the travel lane and shoulder or parking lane. Edge lines are visual cues that help drivers to monitor their alignment, travel within the lane, and avoid lane departure crashes, particularly in low-light or inclement weather conditions when visibility may be compromised.

DESIGN GUIDANCE

- The FHWA recommends wider edge lines (those with marking widths of 6 inches as opposed to the minimum normal line width of 4 inches) as a Proven Safety Countermeasure.
- Can be implemented during regular restriping and resurfacing operations to minimize costs.
- Thermoplastic is preferred over painted edge line applications due to lower life cycle costs, as thermoplastic is a more durable treatment.

Hardened Centerlines

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 9. Hardened Centerlines in Washington, D.C. Image Source: Maryland DOT State Highway Administration

Description:

Hardened centerlines typically consist of modular speed humps affixed directly to the roadway surface to physically elongate the roadway centerline at an intersection. They are used to slow left-turning vehicle speeds and/or discourage drivers from "cutting the corner" while making a left turn. To avoid the hardened centerline, drivers must make a wider and slower left turn at an intersection. Vertical plastic delineator posts are sometimes installed on the modular speed humps to draw more visual attention to the hardened centerline feature.

DESIGN GUIDANCE

- Suitable in locations with high pedestrian volumes and where left-turning vehicle speeds are an issue.
- Implementing hardened centerlines can be simple and low-cost, using rubber curbs, flex posts, and rubber speed bumps, which should only extend a maximum of six feet into the intersection but will depend on the intersection geometry and vehicle turning radius.

Medians

Application Location:

- Street Zone

Street Typology:

- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors

Figure 10. Median in Harrison, NJ.

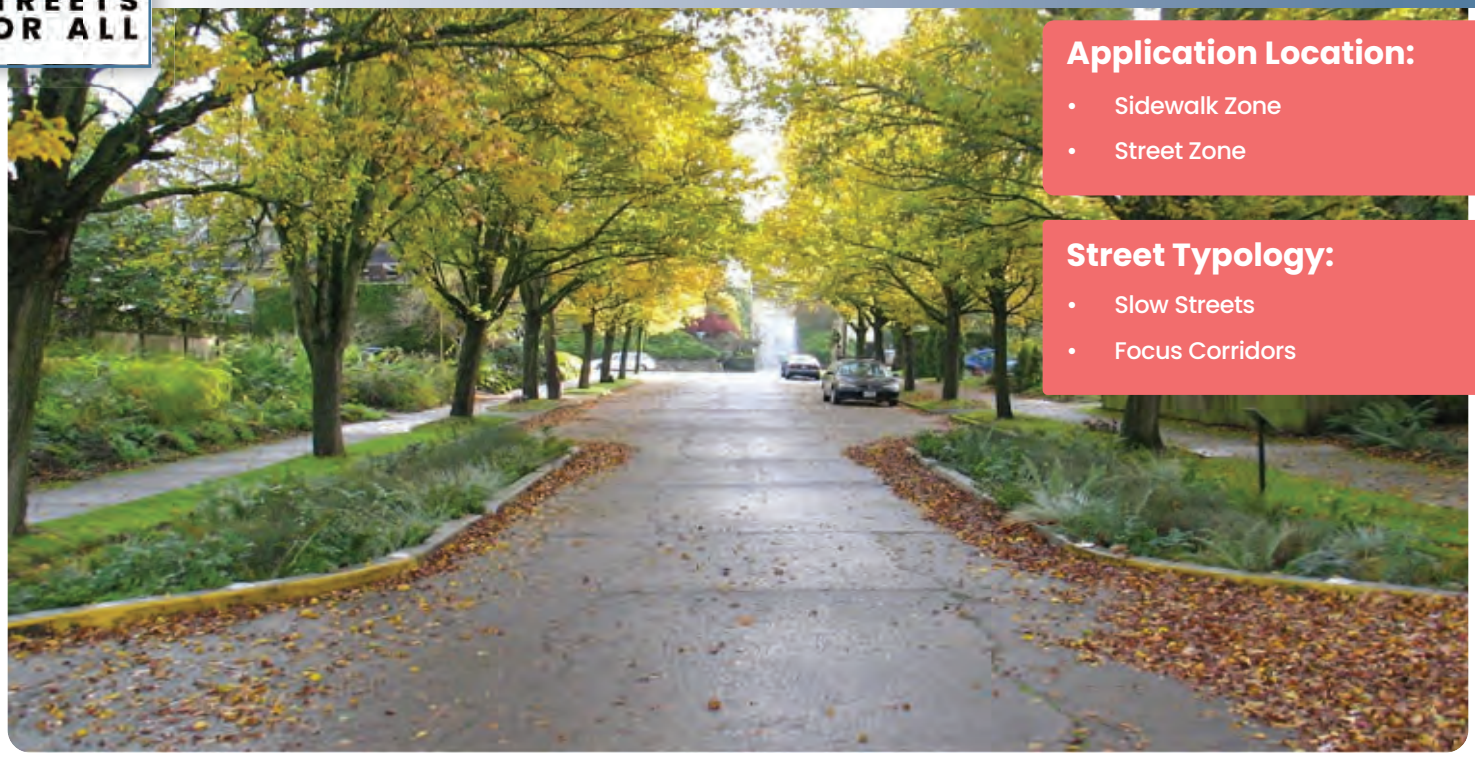
Description:

A median is the center area of the roadway separating opposing lanes of traffic. Depending on the context, medians are typically defined by paint applied directly to the roadway surface or vertical curbed features with or without landscaping. Medians wider than 6 feet can serve as Pedestrian Refuge Islands which help to shorten crossing distances on wider roadways by providing a space for pedestrians to potentially wait within the island. Medians are an FHWA Proven Safety Countermeasure and have been found to significantly reduce pedestrian crashes.

DESIGN GUIDANCE

- Recommended locations: Mid-block crossings, approaches to multilane intersections, areas with high pedestrian activity like transit stops and stations.
- Recommended on curbed sections of urban and suburban multilane roadways with significant pedestrian and motor vehicle traffic.
- Recommended on roads with around 9,000 AADT and travel speeds of 35 mph or greater.
- At an intersection with a median, crossing islands should be at least 6 feet wide, with a preferred width of 8 to 10 feet for pedestrian comfort.
- Crossing islands should have the same cut-through width as the crosswalk, with detectable warning surfaces at the edge of both ends. There should also be a buffer between the cut-through space and the road, to protect pedestrians from turning traffic.
- Medians may also serve as space for green infrastructure like rain gardens and bioswales.

Pinchpoints/Chokers/Neckdowns (without a crosswalk)



Application Location:

- Sidewalk Zone
- Street Zone

Street Typology:

- Slow Streets
- Focus Corridors

Figure 11. Pinchpoints in Portland, OR. Image Source: NACTO Urban Street Design Guide.

Description:

Pinchpoints, chokers, or neckdowns typically use physical or painted mid-block curb extensions to visually and/or physically narrow the roadway, thereby heightening driver awareness and reducing travel speeds. These features are typically used on low-volume streets and can accommodate mid-block pedestrian crossings in areas with high pedestrian activity.

DESIGN GUIDANCE

- Suitable for lower speed and lower volume roads.
- Crosswalk striping is not required for roads with volumes below 3,000 AADT but is encouraged depending on proximity to mid-block destinations like schools and parks.
- Benches, bicycle racks, green infrastructure, trash receptacles, and other amenities can be added to pinchpoints if they do not obstruct pedestrian routes, emergency operations, or sight lines.
- They should not impede driveways or transit.

Chicane

Application Location:

- Street Zone

Street Typology:

- Slow Streets

Figure 9. Hardened Centerlines in Washington, D.C. Image Source: Maryland DOT State Highway Administration

Description:

Similar to pinchpoints, chokers, or neckdowns, chicanes use lateral deflection in the form of physical or painted curb extensions installed in an alternating manner to create S-shapes in the roadway and horizontally shift travel lanes. Navigating chicanes requires heightened driver awareness and lower travel speeds by forcing drivers from a straight travel path.

DESIGN GUIDANCE

- Appropriate on roadways with a posted speed limit of 35 mph or less and fewer than 3,500 AADT.
- May require signage and striping to alert drivers of the change in horizontal alignment.
- May be designed using a return angle of 45 degrees. A more gradual taper can also be implemented resulting in an s-shaped roadway.
- Curb extensions can be combined with bicycle parking, green infrastructure, or other amenities like benches.
- Where the placement of a curb extension may impact drainage, they may be designed as edge islands, with a 1 to 2-foot gap from the curb.
- For a low-cost and flexible alternative, chicanes may be implemented using temporary materials like temporary curbs, flex posts, planters, or striping.
- Alternate street parking placement can also be used to create a chicane.
- Chicanes should not impede driveway usage.

Pedestrian Accommodations

Treatments in this category are meant to improve the safety and mobility of pedestrians. Unshielded and unprotected, pedestrians are at greater risk of sustaining serious injury or being killed in crashes with vehicles. Safety and mobility treatments can reduce pedestrian exposure and risk by shortening crossing distances, creating more crossing opportunities, improving pedestrian visibility at crosswalks, and minimizing conflicts between pedestrians and vehicles. Creating a safer and accessible street environment for pedestrians can also encourage walking trips, increase foot traffic, drive activity on streets, and improve public health.

The following treatments can be used to improve the safety and mobility of pedestrians on Harrison streets. More detailed information on each, including design guidance, can be found on the pages indicated.

Treatment Category	Complete Streets Treatments	Page #
Pedestrian Accommodations	High-Visibility Crosswalks	56
	Pedestrian-Scale Lighting	57
	Intersection Daylighting	58
	Curb Extensions	59
	Mid-Block Crosswalks	60
	Pedestrian Hybrid Beacons (PHBs)	61
	Rectangular Rapid Flashing Beacons (RRFBS)	62
	Pedestrian Refuge Islands	63
	Leading Pedestrian Intervals (LPIs)	64
	Countdown Signal Heads	65
	No Turn On Red (NTOR)	66

High-Visibility Crosswalks

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 13. High-visibility crosswalk in Cranford, NJ

Description:

High-visibility crosswalks are marked in "ladder" or "piano key" patterns using a reflective thermoplastic application. This type of design draws attention to the crosswalk, particularly at night or during inclement weather conditions. If installed consistently, high-visibility crosswalks can add predictability to the street environment. Crosswalk visibility enhancements are an FHWA Proven Safety Countermeasure. According to the FHWA, high-visibility crosswalks have been found to reduce pedestrian injury crashes by up to 40 percent.

DESIGN GUIDANCE

- Ladder, zebra, and continental crosswalk markings are preferable, as they are more visible to approaching vehicles than standard crosswalk striping.
- The FHWA recommends inlay or thermoplastic tape for crosswalk markings instead of paint or brick for improved visibility.
- On higher volume roadways, crosswalks should be accompanied by additional pedestrian safety treatments such as leading pedestrian intervals, pedestrian signal heads, and curb extensions.
- Curb ramps are required at all crosswalks by the Americans with Disabilities Act (ADA).
- Crosswalks should be striped at a minimum as wide as the walkways they are connecting to.

Pedestrian-Scale Lighting

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 14. Pedestrian-scale lighting in Portsmouth, NH.

Description:

Pedestrian-scale lighting is installed at lower heights than typical street or roadway lighting to illuminate sidewalks and crosswalks, thereby improving pedestrian visibility, safety, and security. There are many different styles of pedestrian-scale lighting, and, if planned and installed contextually, can also provide aesthetic benefits. Improved lighting is an FHWA Proven Safety Countermeasure, and has been found to significantly reduce nighttime injury crashes for pedestrians at intersections.

DESIGN GUIDANCE

- Prioritize pedestrian-scale lighting in high pedestrian activity areas like crosswalks, schools, parks, transit areas, and nearby businesses.
- Consider light placement so that it does not cause any sidewalk obstructions or affect sidewalk access. Crosswalk lighting should not obstruct pedestrian travel.
- Lights should be focused downward to reduce light pollution.
- Pedestrian-scale lighting should be evenly spaced at approximately 60 feet apart and should be between approximately 12 and 16 feet in height.
- Pedestrian scale lighting fixtures should be faced downward to direct the light onto the pedestrian and not the roadway. The light should have a brightness of 20 lux measured at a height of five feet from the road surface.

Intersection Daylighting

HARRISON STREETS FOR ALL

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 15. Intersection daylighting with flexible delineators in Denver, CO.

Description:

Intersection "daylighting" improves visibility at intersections by eliminating visual obstructions such as parked cars adjacent to crosswalks that, if present, can obstruct a driver's view of approaching pedestrians. Daylighting is typically achieved by painting a no-parking zone near intersection corners. This zone is sometimes further defined with vertical plastic delineators. Bike parking or "corrals" are sometimes installed in daylighting zones.

DESIGN GUIDANCE

- Remove parking within 20 to 25 feet of the intersection.
- Street trees should be sited at a 5-foot minimum from the intersection, aligning the street tree on the near side of the intersection with the adjacent building corner. Trees should be sited 3 feet from the curb return and 5 feet from the stop sign.
- Removing parking and other visual obstructions may allow for additional space for green infrastructure.

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Curb Extensions

Application Location:

- Sidewalk Zone
- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors

Figure 16. Curb extension in Harrison, NJ.

Description:

Curb extensions or "bump outs" are physical extensions of the curbline and sidewalk space at street corners. They serve to shorten crossing distances, enhance pedestrian visibility, and slow motor vehicle turning movements at intersections by physically narrowing the roadway. Curb extensions are typically installed on streets with on-street parking and physically prevent parking near crosswalks in compliance with New Jersey state law.

DESIGN GUIDANCE

- Permanent curb extensions must include ADA-compliant curb ramps.
- Curb extensions should never extend into or impede bicycle facilities.
- Should be constructed with a width between 6 and 8 feet and offset from the through traffic lane by 1.5 feet.
- Can be incorporated along emergency, transit, and access routes if appropriate turning radii can be provided.
- Requires additional coordination with maintenance operations if curb extensions are coupled with green infrastructure, or during snow removal operations.
- For a lower cost and quicker build approach, curb extensions can be painted using the same dimensions that would apply to a permanent build. Low-cost materials such as temporary curbs, flex posts, planters, or striping can be used. The curb extension area should be established using double solid lines connecting to the outside physical curb as per the MUTCD Section 3J.07, "Sidewalk Extensions Designated by Pavement Markings."

Midblock Crosswalks

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Focus Corridors

Figure 17. Midblock crosswalk in St. Albans, VT.

Description:

Midblock crosswalks are installed between intersections, often on long blocks or on streets with multiple destinations that generate pedestrian trips. Midblock crossings enhance street safety and pedestrian mobility by providing frequent and accessible crossing opportunities where they are most needed. Midblock crossings can be controlled by signage such as pedestrian crossings signs or stop signs or by more advanced control devices such as pedestrian hybrid beacons (PHBs) or rectangular rapid flash beacons (RRFBs). See the next two treatments for more information on both.

DESIGN GUIDANCE

- Install midblock crossing facilities where there is a significant pedestrian desire line.
- Context should dictate the mid-block crossing facilities. On low-volume and low-speed streets, crosswalk striping may be sufficient if pedestrian volumes are also low, but additional treatments like pinchpoints and speed tables can be implemented in conjunction with the crosswalk to improve pedestrian visibility.
- Actuated pedestrian signals like Pedestrian Hybrid Beacons and Rapid Flashing Beacons should be considered for mid-block crossings where infrequent crossings make a traffic signal or stop sign unnecessary.
- Daylighting, whether through parking restrictions and/or the use of curb extensions, should be implemented to make pedestrians more visible to drivers.

Pedestrian Hybrid Beacons (PHBs)

Application Location:

- Sidewalk Zone
- Street Zone

Street Typology:

- Focus Corridors

Figure 18. Pedestrian Hybrid Beacon in Westfield, NJ

Description:

A pedestrian hybrid beacon (PHB), also known as a high intensity actuated crosswalk (HAWK), is a traffic control device typically used at mid-block crossings, where traditional traffic signals are absent. The beacon is made up of three lights in a triangular pattern that are activated by a pedestrian push button. PHBs are an FHWA Proven Safety Countermeasure, reducing 55 percent of pedestrian crashes, and 29 percent of total crashes, with a 15 percent reduction in serious injury and fatal crashes.

DESIGN GUIDANCE

- Effective at locations with traffic volumes above 9,000 AADT, roadways with wide cross-sections, or high traffic speeds.
- Should be installed in conjunction with high-visibility crosswalks and pedestrian countdown signals.
- Suitable for major pedestrian destinations and crossing points like schools and transit stops.

Rectangular Rapid Flashing Beacons (RRFBs)

Application Location:

- Sidewalk Zone

Street Typology:

- Focus Corridors

Figure 19. Rectangular Rapid Flashing Beacon near Somerville, NJ by Civic Eye Collaborative.

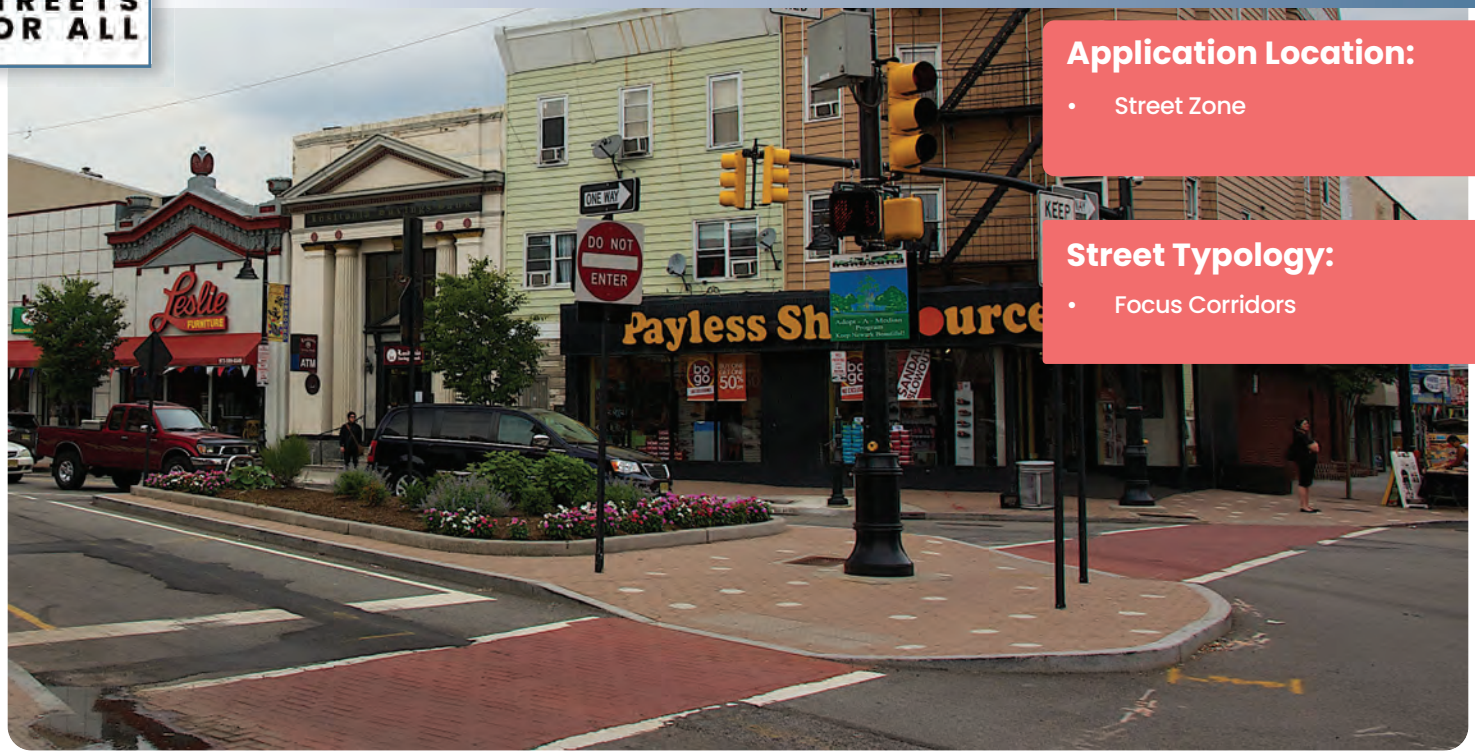
Description:

Rectangular Rapid Flashing Beacons (RRFBs) are a form of traffic control device used to enhance pedestrian safety and mobility at unsignalized intersections or mid-block crossings. RRFBs are comprised of pedestrian warning signage and rectangular flashing amber LED lights meant to draw attention to crossing pedestrians. The lights are activated by a pedestrian push button. RRFBs are an FHWA Proven Safety Countermeasure and can reduce up to 47 percent of pedestrian crashes and can contribute to motorist yielding rates as high as 98 percent at marked crosswalks.

DESIGN GUIDANCE

- Suitable for roads with speed limits of less than 40 mph.
- RRFBs should be installed in conjunction with high-visibility crosswalks and should be placed on both sides of the crosswalk.
- Context matters when it comes to the effectiveness of RRFBs. Too much visual and sign clutter can decrease their visual impact.
- Using solar-powered panels eliminates the need for a power source.
- Overuse of RRFBs may diminish their effectiveness. They should be installed in select priority locations with significant pedestrian and vehicle conflicts.
- Should not be used at approaches controlled by YIELD signs, STOP signs, traffic control signals, or pedestrian hybrid beacons.
- Can be used in conjunction with pedestrian, school, or trail crossing warning signs.
- RRFBs should be installed in the median rather than the far-side of the roadway for roadways with pedestrian refuge islands or medians.
- Can be activated through pushbuttons or passive pedestrian detection.

Pedestrian Refuge Islands



Application Location:

- Street Zone

Street Typology:

- Focus Corridors

Figure 20. Pedestrian refuge island in Newark, NJ.

Description:

Pedestrian refuge islands are part of roadway medians that enhance the safety of pedestrian crossings (at intersections or mid-block) by creating a refuge or waiting area between lanes of traffic. Pedestrian refuge islands are typically used on wide or multilane streets and allow pedestrians to cross a street in two stages. Pedestrian refuge islands are an FHWA Proven Safety Countermeasure, reducing 56 percent of pedestrian crashes.

DESIGN GUIDANCE

- Typically used when pedestrians must cross more than three lanes of traffic or on roadways with high speed or traffic volume.
- Recommended on curbed sections of urban and suburban multilane roadways with significant pedestrian and motor vehicle traffic.
- Recommended on roads with around 9,000 AADT and travel speeds of 35 mph or greater.
- Refuge islands should be at least 6 feet wide, with a preferred width of 8 to 10 feet for pedestrian comfort.
- Refuge islands should have the same cut-through width as the crosswalk, with detectable warning surfaces at the edge of both ends. There should also be a buffer between the cut-through space and the road, to protect pedestrians from turning traffic.
- Pedestrian refuge islands may also serve as space for green infrastructure like rain gardens and bioswales.

Leading Pedestrian Interval (LPI)

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Focus Corridors
- Bike Route Overlay

Figure 21. Intersection in Harrison, NJ

Description:

A leading pedestrian interval (LPI) allows pedestrians to enter the crosswalk at an intersection a few seconds before vehicles are given a green light. In this way, pedestrians are given a head start when crossing a street which can aid in pedestrian visibility in a crosswalk. LPIs are an FHWA Proven Safety Countermeasure, reducing 13 percent of pedestrian-vehicle crashes at intersections.

DESIGN GUIDANCE

- Applicable at intersections with high pedestrian volumes and near schools, transit, and commercial areas.
- LPIs should be at least 3 seconds in duration to allow pedestrians to cross at least one lane of traffic, or in instances involving a large corner radius, the pedestrian should travel far enough to position themselves ahead of the turning traffic before the turning traffic is released.
- LPIs are relatively low-cost to implement, requiring adjustments to existing signal timing.
- Coupling LPIs with curb extensions improves visibility of pedestrians at the intersection.

Countdown Signal Heads

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 22. Countdown pedestrian signal head in Union, NJ.

Description:

Countdown pedestrian signals enhance intersection safety and navigability by clearly indicating to pedestrians when they can safely cross and how long they have to do so using a visible countdown timer in seconds. The standard practice for new or upgraded signals is to include a countdown display at locations with existing pedestrian signals.

DESIGN GUIDANCE

- Must be installed above 7 feet and less than 10 feet above sidewalk level, positioned to provide maximum visibility at the beginning of the controlled sidewalk.
- Per MUTCD guidelines, a walk speed of 3.5 feet per second (fps) is recommended to determine pedestrian clearance time. However, slower walk speeds should be considered to accommodate those with disabilities or slower walking speeds.
- Countdowns can be on a fixed-time or activated through a push button. When using a push button activation, ensure that it is accessible to people in wheelchairs or with visual disabilities.

No Turn On Red (NTOR)

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 23. No Turn on Red sign in Garwood, NJ.

Description:

No Turn on Red restrictions prevent drivers from making right turns at a red light. These regulations help to prevent conflicts between right-turning motorists, who often direct attention to their left when making a right turn, and pedestrians using the crosswalk.

DESIGN GUIDANCE

- Suitable for intersections with moderate to high pedestrian volumes, school crossings, crosswalk locations causing drivers turning right to block the crosswalk while waiting for a gap, and at crossings used by bicycles approaching from the right side.
- Can be coupled with leading pedestrian interval (LPI) with minimal impacts on traffic.
- Sign must be clearly visible to right turning vehicles.
- Can be implemented part-time (e.g., 7 a.m. to 7 p.m.), allowing right turns on red at off-peak hours.
- Use NO TURN ON RED (MUTCD R10-11, R10-11b) word message sign for prohibiting right turns on circular red signal indications or left turns on a circular red signal indication from a one-way street to a one-way street.
- Use a NO TURN ON RED with circular red symbol (MUTCD R10-11a) sign when the approach is controlled by both circular red and red arrow indications.

Cyclist/Scooter Rider Accommodations

Treatments in this category include different types of facilities for bike or scooter travel, including lanes or roadway markings in the Street Zone or parking/storage in the Street or Sidewalk Zones. While not feasible on all roads, dedicated facilities for bicyclists or scooters create separate spaces for different travel modes which can reduce conflict between bicyclists/scooterists and motorists or pedestrians, thereby creating safer travel conditions for all. A safer network of facilities for bicyclists and scooterists can help to encourage use and reduce auto trips and parking demand, particularly for shorter trips in Harrison.

The following treatments can be used to create safer and more accommodating facilities for cyclists and scooter riders. More detailed information on each, including design guidance, can be found on the pages indicated below.

Treatment Category	Complete Streets Treatments	Page #
CYCLIST/SCOOTER ACCOMMODATIONS	Bicycle Lanes	68,69
	Cycle Track	70
	Shared Lane Markings	71
	Bike Box	72
	Two-Stage Turn Queue Boxes	73
	Protected Intersections	74
	Bicycle Parking	75
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Bicycle Lanes

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Focus Corridors
- Bike Route Overlay

Figure 24. Bicycle lane in Newark, NJ

Description:

Bicycle lanes are designated portions of the roadway specifically delineated through striping, signage, and pavement markings for the use of bicycles. Bike lanes are typically oriented in the same direction of traffic, except under special circumstances, and provide space for bicycles to travel with limited conflicts or interference from other roadway users. On one-way streets, bike lanes may be located on the left or right sides. Bike lanes may be separated from motor vehicle travel lanes by a painted buffer or physical barrier intended to distance bicyclists from moving vehicles or vehicle doors opening into the bicycle lane from the parking lane.

DESIGN GUIDANCE

Conventional Bike Lanes:

- Typically applied on streets with greater than or about 3,000 AADT, posted speed limits equal to or greater than 25 mph, and high transit vehicle activity.
- Minimum bicycle lane widths should be 5 feet when there is no on-street parking and when adjacent to a curb. When adjacent to parking, the preferred bicycle lane width is 7 feet, with a minimum width of 5 feet. Consider that bicycles may ride side by side when planning on bike lane widths.
- When the bicycle lane is sited next to a parking lane, the desirable distance from the curb face to the edge of the bicycle lane is 14.5 feet.
- Use the bicycle lane word and/or symbol and arrow markings (MUTCD Figure 9E-1) to define the bike lane and place it outside of vehicle tread paths to minimize the wear on the marking (intersections, driveways, and other areas that vehicles may have to drive over).
- Use a 6 to 8-inch solid white line to separate vehicle travel lane from the bike lane.
- Should not be installed to the right of a "right turn only" lane (unless split-phase signal timing is used) or to the left of a "left turn only" lane.
- Drain inlets and utility covers should be flush with the ground and the pavement surface in the bike lane should be as smooth as possible. Adjust bike lane widths accordingly where these are present on the roadway.

Bicycle Lanes

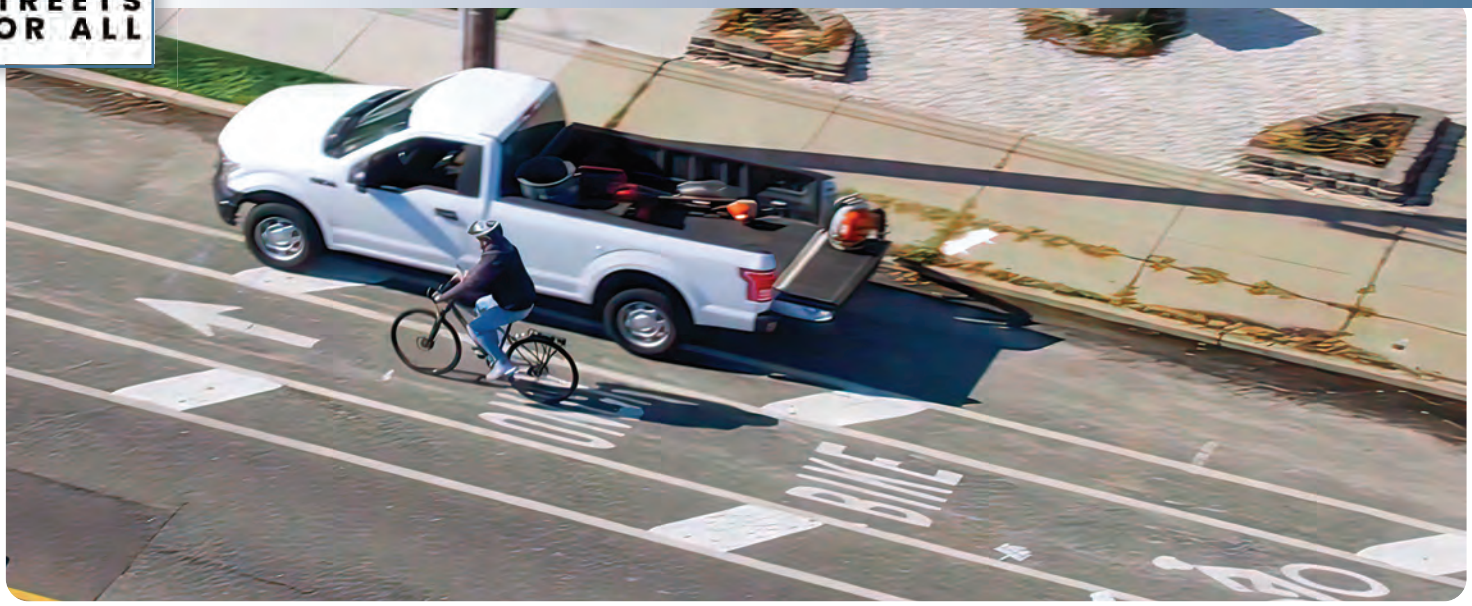


Figure 24b. Bicycle laane in Cape May, NJ.

Buffered Bike Lanes

- Applicable on streets with high travel speeds, high travel volumes, and truck traffic.
- Considerations should be given at transit stops to manage bicycle and pedestrian interactions.
- For buffered bike lanes, use the bicycle lane word and/or symbol and arrow markings (MUTCD Figure 9E-1).
- The buffer is delineated with two solid white lines on both edges of the buffer space. Lines may be dashed when the buffer space crosses past driveways. Use a 6-to-8-inch solid line next to a travel lane and a 4-inch solid line next to the parking lane.
- If the buffer is three feet or wider, it should have interior diagonal cross hatching or chevron markings according to the MUTCD.
- The preferred width of a buffer is 3 feet, with a minimum width of 1.5 feet.

Contra-Flow Bike Lanes

- The contra-flow bike lane should be separated from opposing traffic with a solid double-yellow lane line and defined using bicycle lane word, symbol, and arrow markings (MUTCD Figure 9E-1).
- Use "ONE WAY" sign (MUTCD R6-1, R6-2) with "Except Bicycles" (MUTCD R3-7bP) plaque along the facility and at intersecting streets alerting motorists of the two-way traffic flow (opposing vehicle and bike lane directions).

Left-Side Bike Lanes

- Applicable on streets with high volumes of right turn movements by vehicles or high parking turnover.
- Left-side bike lanes should be installed with accompanying signage (modified MUTCD R3 series).
- Consider intersection bike treatments to help left-side bike lanes transition to right-side bike lanes.

Cycle Track

Application Location:

- Street Zone

Street Typology:

- Focus Corridors
- Bike Route Overlay

Figure 25. Cycle track in Seattle, WA. Image Source: Seattle DOT.

Description:

A cycle track is a two-way bicycle lane that is physically separated from vehicle traffic, parking lanes, and sidewalks by curbing, a constructed barrier, landscaping, or some other physical buffer. These features allow bicyclists to operate without conflicts or interference from other roadway users, making them some of the safest and most accessible types of bike facilities. Cycle tracks can be constructed at either roadway or sidewalk level.

DESIGN GUIDANCE

- Applicable on streets with fewer driveways and cross streets and on streets with high bicycle volumes.
- Use the bicycle lane word and/or symbol and arrow markings (MUTCD Figure 9E-1) at the start of the cycle track and at regular intervals.
- Use solid white line markings to define the space which may be coupled with diagonal crosshatch markings in the buffer space and raised medians or barriers for physical separation.
- The minimum desired width for a one-way cycle track should be 5 feet, while the preferred width for a two-way cycle track is 12 feet with a minimum width of 8 feet. The minimum desired width for a buffer is 3 feet.
- Special considerations must be made when accessible parking spaces are provided adjacent to cycle tracks.
- Colored pavement can be used to delineate the cycle track space.
- For two-way cycle tracks, a "DO NOT ENTER" sign (MUTCD R5-1) with "Except Bicycles" (MUTCD R3-7bP) must be posted along the facility. Intersection traffic controls like stop signs and traffic signals should also be installed and oriented towards bicyclists traveling in the contra-flow direction.
- Raised cycle tracks should be protected from adjacent travel lane with mountable curbs, street furnishings, streetscaping, or a parking lane. Vertical separation between the roadway and cycle track should be between 1 and 6 inches while the vertical separation between the cycle track and sidewalk should be between 0 and 5 inches.

Shared Lane Markings

Figure 26. Shared lane marking in Princeton, NJ.

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Description:

Shared lane markings or "sharrows" indicate a shared space for bicycles and vehicles, legitimizing bicyclist presence on the road and alerting drivers to be cautious. Shared lane markings can be used when roadway space does not permit dedicated bike facilities like lanes and where street volumes and operating speeds (25 mph or less) are low.

DESIGN GUIDANCE

- Adjacent to parking, shared lane markings should be placed a minimum of 11 feet from the curb (4 feet without parking).
- Preferred shared lane marking placement is at the center of the travel lane.
- Marking is illustrated in the MUTCD Figure 9E-9.
- Should not be used on shoulders, dedicated bike facilities, or to designate bicycle detections at signalized intersections.
- Combine the use of shared lane markings with traffic calming measures to ensure vehicle speeds remain appropriate for the context.

Bike Box

Application Location:

- Street Zone

Street Typology:

- Focus Corridors
- Bike Route Overlay

Figure 27. Bike box in Newark, NJ.

Description:

Bike boxes are designated waiting areas for bicyclists located at the head of a traffic lane at a signalized intersection. They are typically connected to bike lanes which allow access for bicyclists. The placement of bike boxes enables cyclists to move ahead of vehicles, allowing for a head start at traffic signals and increasing bicyclist visibility near the intersection. Bike boxes can also facilitate turning movements and reduce turning conflicts. They are suitable along dedicated bike routes and/or at intersections with high volumes of bicycle and motor vehicle traffic.

DESIGN GUIDANCE

- Bike Boxes should be 10 to 16 feet deep and between two transverse solid white lines.
- The intersection vehicle stop bar is placed at the bottom of the bike box, furthest from the intersection. It can be placed up to 7 feet in advance of the bike box. A post-mounted "Stop Here on Red" sign (MUTCD R10-6A) can be used to further communicate to drivers that they should not encroach on the bike box area.
- "No Right Turn on Red" signs (MUTCD R10-11) should be posted on intersections with bike boxes to prevent vehicles from encroaching during a red light.
- Pavement marking should include a bicycle stencil centered between the crosswalk line and stop bar to demarcate the bike box space (MUTCD Figure 9E-12).
- Using colored pavement increases visibility, emphasizing the bike queueing area.

Two-Stage Turn Queue Boxes

Application Location:

- Street Zone

Street Typology:

- Focus Corridors
- Bike Route Overlay

Figure 28. Two-stage turn queue box in Denver, CO. Image Source: Laura Sandt.

Description:

A two-stage turn queue box is a special design treatment that safely facilitates left turns for bicyclists. As the name implies, left turns from one street to another are completed in two stages. Rather than making a direct left turn through an intersection, bicyclists first access a queue box located on the far side of the intersection, adjacent to the bike lane. This positions bicyclists near the corner of the intersection, on the right side of the side street. From there, bicyclists can then proceed straight through the intersection, completing the second stage of the left turn. This reduces turning conflicts for bicyclists, particularly on busier streets with higher traffic volumes and travel speeds where safely navigating gaps in traffic may be challenging.

DESIGN GUIDANCE

- Use "No Turn on Red" sign (MUTCD R10-11) to prohibit vehicles from entering the queue box.
- Pavement marking should include a bicycle stencil and a turn arrow to indicate bicycle direction and positioning (MUTCD Figure 9E-10).
- Placement of the queue box should be in a protected area either within an on-street parking lane or between bike lane and pedestrian crossing.
- Use colored paving to delineate queueing area (typically green).
- Queue box should be positioned laterally in the cross street to improve visibility of bicyclists.

Protected Intersections

Application Location:

- Street Zone

Street Typology:

- Focus Corridors
- Bike Route Overlay

Figure 29. Protected intersection in Chicago, IL. Image Source: Nathan Roseberry

Description:

Protected intersections are used where streets with bike lanes (buffered or otherwise) intersect. Protected intersections feature two-stage left turns for bicyclists, similar to two-stage turn queue boxes (previous treatment). Bicyclists looking to make a left turn from any intersection approach first pass through the intersection to the far side to access a queue space on the right side of the side street. From there, bicyclists can proceed straight through the intersection, completing the turn. A small island constructed at the intersection corners provides a physical buffer – protection – between bicyclists and motor vehicles.

DESIGN GUIDANCE

- Bike setbacks typically determine the dimensions of other elements in a protected intersection. A setback of 14 -20 feet is preferred.
- Corner island radii should be small enough to slow drivers to 10 mph or less. On truck, transit, and emergency response routes consider a mountable curb.
- Bike queue area should be at least 6.5 feet deep.
- Use yield teeth on the bikeway before the crosswalk to encourage bicyclists to yield to pedestrians. Yield teeth should be accompanied by a "Yield Here to Pedestrian" sign (MUTCD R1-5).
- Pedestrian island should be a minimum of 6 feet. If wider, use detectable warning surfaces.
- Intersection "No Stopping/No Standing" zone should be long enough to allow drivers and bicyclists to see each other ahead of the intersection.

Bicycle Parking

Application Location:

- Sidewalk Zone
- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Focus Corridors
- Bike Route Overlay

Figure 30. Bicycle parking in Cape May, NJ.

Description:

Bicycle racks provide dedicated space for bikers to park and lock their bikes. In this way, bike parking is a vital component of the bicycle network. Lack of safe and secure bike parking discourages bicycling, and leads to bicycles locked to railings, street trees, or locations that obstruct the sidewalk. Bicycle parking should be installed at key destinations such as the PATH station, schools, parks, or Red Bull Arena.

DESIGN GUIDANCE

- Bike parking facilities should be spaced out properly to allow independent access to each bicycle.
- Short-Term Parking:
  - Short-term bike parking should be sited 50 feet or less from the entrance of a destination, increasing visibility.
  - Consider a location with good lighting for added safety and security.
  - Weather-protected parking can encourage year-round use.
- Long-Term Parking:
  - Space permitting, long-term bicycle parking should be weather-protected and in a secure location. The PATH station is one location that would benefit from long-term parking.
  - Special consideration must be given to parking facility types in long-term parking. While high-density configurations should be used to allow ample spaces for parking, bicycle parking facilities need to remain easy to use and accessible to riders.
- Recommended bicycle rack designs:
  - Inverted U: Also known as staples or loops, offers two points of ground contact and can be installed in series on rails for free-standing bike parking areas,
  - Post and Ring: One point of ground contact and less prone to perpendicular parking. Unused parking meter posts can be converted into post and ring bicycle parking.
  - Wheelwell-Secure: This design cradles one wheel of the bicycle, and is intuitive to use, but accommodates fewer bicycle types than inverted U and post and ring. More suitable for long-term parking and large-scale installations.
- For bicycle racks installed parallel to curb: Racks should be 2 feet from the curb (3 feet if adjacent to parking), 4 feet from other fixtures like lighting (3 feet minimum), and spaced 6 feet apart (4 feet minimum).
- For bicycle racks installed perpendicular to curb: Racks should be 3 feet from the curb (2 feet minimum), 4 feet from other sidewalk fixtures like lighting (3 feet minimum), and spaced 4 feet apart (3 feet minimum).

Bike Corrals

Application Location:

- Street Zone

Street Typology:

- Focus Corridors
- Bike Route Overlay

Figure 31. Bike corral in Newark, NJ.

Description:

Bike corrals are bicycle parking areas installed within a street, adjacent to the curb, in either a parking space or at a street corner. If installed at street corners, bike corrals help to "daylight" intersections by preventing cars, trucks, or other vehicles from obstructing visibility by parking too close to the intersection. In addition, by using street space, bike corrals free up sidewalk space for pedestrians.

DESIGN GUIDANCE

- Bike corrals typically occupy an 8-foot by 20-foot on-street parking space.
- Bike corral bike fixtures should be installed 30 inches from the curb and spaced 4 feet apart (3 feet minimum), with end fixtures placed 3 feet (32 inch minimum) from the edge line of the parking space.

Transit/Freight Accommodations

Treatments in this category support the movement of larger vehicles on Harrison streets. Whether trucks, buses, or fire trucks, these vehicles and their operators support the Town of Harrison by moving people, supplying stores, maintaining public safety, transporting and delivering goods, and creating jobs. Facilitating the movement of these vehicles is therefore critical to supporting day-to-day life in Harrison.

The following treatments support the implementation of Complete Streets while not impeding the movement of larger vehicles. More detailed information on each treatment, including design guidance, can be found on the pages indicated.

Treatment Category	Complete Streets Treatments	Page #
TRANSIT/FREIGHT ACCOMMODATIONS	Bus Stop, In-Street/Along the Curb	78
	Bus Stop, Curbside Kit of Parts	79
	Bus Bulbs	80
	Mountable Truck Aprons	81
	Short-Term Parking/Loading/Deliveries (Flex Curbside Zones)	82

Bus Stop In-Street / Along the Curb

Application Location:

- Sidewalk Zone
- Street Zone

Street Typology:

- Focus Corridors

Figure 32. NJ Transit bus stop in Hoboken, NJ. Image Source. Alec Perkins.

Description:

In Harrison, bus routes travel along Harrison Avenue, Frank E. Rodgers Boulevard, and Davis Avenue. Bus stops along these routes can be improved based on the street and sidewalk context to enhance safety for all road users. Bus stops can have three different placements in relation to an intersection: far side, near side, and midblock.

Far Side Bus Stops: Far side bus stops are located immediately after passing through an intersection. They are most common, allowing pedestrians to cross behind a bus at the intersection and increasing their visibility to drivers stopped at the intersection.

Near Side Bus Stops: Near side bus stops are located just before an intersection. They are recommended on longer blocks where the near side stop is closer to pedestrian destinations, on one-way streets with one lane of traffic, and where constraints (typically driveways or traffic calming measures) preclude far side placement.

Midblock Bus Stops: Midblock bus stops are suitable for long blocks, as they require more space for a bus to maneuver to and from the curb. Midblock stops may be aligned with destinations that generate transit trips.

DESIGN GUIDANCE

- Depending on the bus stop location, always provide safe and visible nearby pedestrian crossings, ideally behind the departing bus.
- Bus stops must meet ADA standards with landing pads and curb heights that accommodate wheelchair boardings. Bus boarding and alighting areas should be at least 5 feet wide when measured parallel to the roadway, and 8 feet long when measured perpendicular to the curb or vehicle roadway edge. The boarding area should be accessible by wheelchair.
- In locations with high bus demand, consider bus bulbs to increase the space of the queueing area for riders without encroaching on sidewalk space.
- Bus stops should be well lit for passenger safety and security.
- NJ TRANSIT maintains bus stop signs and poles.

Bus Stop, Curbside Kit of Parts

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood Two-way Streets
- Focus Corridors

Figure 33. Bus shelter, seating, and trash receptacle in Princeton, NJ.

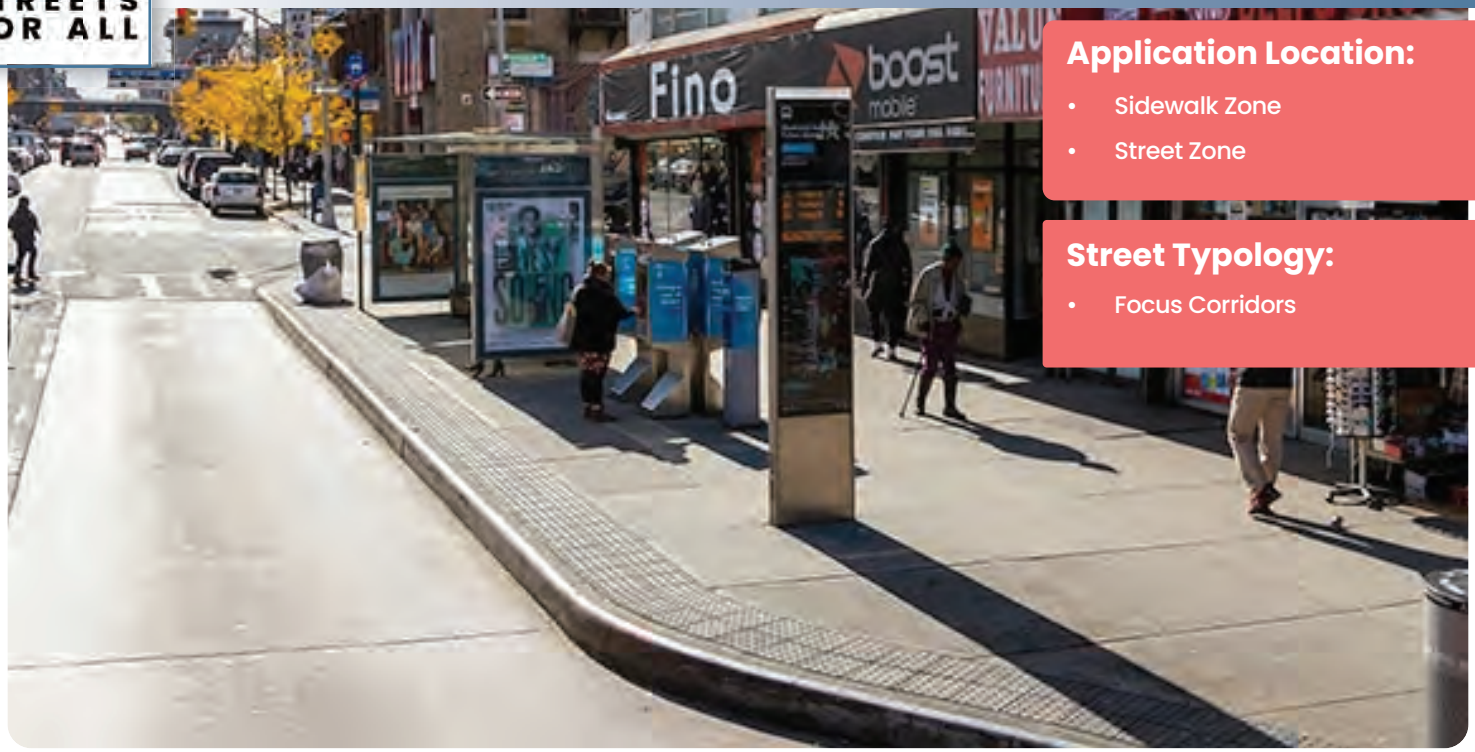
Description:

Bus stops, completed with shelter, seating, lighting, trash receptacles, and service information, can provide a safe and comfortable environment for transit users, particularly those waiting. Bus stops can be improved in Harrison in a scalable manner using a "kit of parts" approach, whereby bus stop components – shelter, seating, lighting, trash receptacles, bike parking, signage, and other elements – can be installed over time or in relation to available sidewalk space. Improved bus stops are applicable on Harrison Avenue, Frank E. Rodgers Boulevard, and Davis Avenue, where buses currently operate.

DESIGN GUIDANCE

- **Bus Shelter**
  - Prioritize bus shelter installations for stops with higher boarding rates.
  - Maintain bus shelters regularly to keep them free of debris.
  - Bus shelters should be lit and include seating and route information.
- **Bench**
  - In the absence of a full shelter, bench installations near bus stops can enhance the transit user experience, especially for older adults and those with disabilities.
  - Bench installations should not obstruct sidewalk use. See the Street Amenities section for additional seating guidelines.
- **Bicycle Parking**
  - Bicycle parking near bus stops can encourage multi-modal connections, giving transit riders additional options for traveling to the stop.
  - Bicycle parking should not obstruct sidewalk use. See the Cyclist Facility section for additional guidance.
- **Lighting**
  - Incorporating pedestrian-scale lighting near bus stops and shelters may improve the user's sense of safety and security.
- **Wayfinding**
  - Bus stops should be easily found and recognizable along routes, but wayfinding signage is encour aged throughout the town to direct riders to the nearest stop. Wayfinding can be a useful tool to en courage and facilitate the use of transit by newer residents, especially in the south side of Town, and visitors to the Red Bull Arena.
- NJ TRANSIT will install bus shelters and concrete pads, but the sponsor agency (typically the municipality) is responsible for maintaining shelters and any other amenities.

Bus Bulbs



Application Location:

- Sidewalk Zone
- Street Zone

Street Typology:

- Focus Corridors

Figure 34. Bus bulb in New York, NY. Image Source: NYC DOT.

Description:

Bus bulbs are physical extensions of the curb that allow buses to stop without leaving the travel lane. This helps to smooth bus operations while reducing conflicts associated with departing a travel lane to access a curbside stop and merging back into the travel lane. Bus bulbs also create space for passenger movements (boarding and alighting) or bus stop amenities like a shelter or seating.

DESIGN GUIDANCE

- Bus bulbs should be at least 40 feet long to accommodate a standard bus. Desired length of the bus bulb depends on context and frequency of service, with longer lengths preferred in places with more frequent service.
- Widths should consider the need for maneuvering and accommodation of bus shelters, with a minimum of 6 feet (8 to 10 feet preferred) or the width of a parking lane with a return angle of 45 degrees.
- Bus bulbs should be combined with bus shelters where possible.

Mountable Truck Aprons

Application Location:

- Street Zone

Street Typology:

- Neighborhood One-Way Streets
- Neighborhood Two-Way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 35. Mountable truck apron in Portland, OR. Image Source: Steve Vance.

Description:

Mountable truck aprons are special intersection treatments consisting of a low concrete curb extension installed at street corners that creates a tighter effective turning radius for smaller vehicles while being fully traversable by large vehicles: buses, trucks, or emergency vehicles. These aprons are designed to limit the turning speeds of passenger vehicles while still allowing large vehicles to complete a right turn. These can be installed as traffic calming treatments along transit or truck routes or where emergency vehicles frequently operate.

DESIGN GUIDANCE

- Mountable truck aprons typically use a height between the existing road grade and adjacent sidewalk area.
- The edge profile can be traversable or mountable. Traversable curbs support the stability of larger vehicles but may not deter passenger vehicles from driving over it. Mountable curbs have steeper bevels and will more likely discourage passenger vehicles from driving over the apron.
- Mountable truck aprons should be visually differentiated from sidewalk and adjacent travel lane, while still conveying to larger vehicle drivers that it is a traversable surface. Color and material variations to define a truck apron area can include pavers and concrete, stamped and colored concrete, and edge striping.
- Truck aprons should be designed to discourage pedestrian and bicyclist queueing. Intersection features such as detectable warning surfaces and traffic signals must be located behind the mountable surface.
- Mountable rubber speed humps and other textured surfaces can also be installed at corners to create the desired turning path and deter passenger vehicles from using the apron.

Short-Term Parking/Loading/Deliveries

Application Location:

- Street Zone

Street Typology:

- Focus Corridors

Figure 36. Loading Zone in Summit, NJ.

Description:

Curbside zones along active streets with multiple destinations or businesses can be used flexibly for short-term parking, loading/unloading, or pick-up/drop-off. These "flex zones" allow for efficient use of the curb space based on time-of-day, demand, or local needs. For instance, curbside space in front of a doctor's office could be used for short-term pick-up/drop-off, while space near restaurants can be used for delivery services. These spaces can be specially marked using paint and/or signage.

DESIGN GUIDANCE

- Appropriate on streets with commercial land uses or destinations that generate passenger drop-offs such as near transit and the Red Bull Arena.
- Zones should be indicated with proper signage and striping.
- Typically, flex curbside zones should be 8 feet wide and depending on uses can be 20 to 40 feet in length (one to two parking spaces). Commercial loading requires at least 40 feet.
- Commercial loading can be restricted to certain times of day to allow for other uses during the day such as passenger pick-ups and drop-offs.

Street Amenities

Treatments in this category are related to pedestrian comfort and convenience and are applicable to the Sidewalk Zone of Town streets. These treatments enhance the overall pedestrian experience by fostering welcoming and comfortable street environments for Harrison residents, workers, and visitors. This, in turn, can drive activity on streets which can support local businesses and enhance public safety.

The following treatments can be used to enhance the pedestrian experience. More detailed information on each, including design guidance, can be found on the pages indicated.

Seating

Application Location:

- Sidewalk Zone

Street Typology:

- Focus Corridors
- Bike Route Overlay

Figure 37. Public Seating in Metuchen, NJ.

Description:
Public seating, typically in the form of street benches, can encourage pedestrian activity and enhance comfort by providing places for rest or socialization. Public seating can incorporate art or be customized in various ways and using different materials based on community needs or preferences.

DESIGN GUIDANCE

- Public Seating should not obstruct sidewalks.
- ADA requirements for seating:
  - 3-foot minimum on each side of the bench.
  - Minimum of 5 feet from bench and fire hydrants.
  - 1-foot minimum from any other amenity, utility, or fixture.
  - 5-foot minimum clear path in front of a bench located at the back of a sidewalk space, facing the curb.
  - 5-foot minimum clear path behind a bench when located at the front of the sidewalk space, facing the curb.
- Combining streetscape and seating is a suitable option on streets with narrow sidewalks, but maintenance should occur on a regular basis to ensure that seating area remains clear and free of debris.
- Public seating installation near key locations and transit stops can encourage usage.

Parklet

Application Location:

- Street Zone

Street Typology:

- Focus Corridors

Figure 38. Parklet in Maplewood, NJ.

Description:

Parklets are small, public open spaces installed in existing on-street parking spaces that are often used for seating, gathering, or dining. Parklets can be designed in countless ways but typically incorporate a constructed platform, seating, greenery, lighting, bike parking, or public art. In this way, they can be fully customized to meet community preferences. Parklets can be installed seasonally or for longer term, year-round use.

DESIGN GUIDANCE

- Parklets should not be installed on corners where they might affect sightlines. They should be placed at least one parking space away from the intersection.
- Parklets have a minimum width of 6 feet or the width of a parking lane.
- Parklets are suitable for commercial corridors, especially when sidewalks are too narrow to accommodate outdoor dining areas.
- Parklets should be separated from the roadway through planters or other vertical barriers.
- Suitable for all climates as long as heating elements are also provided. Can be installed seasonally as well.
- Consider ADA accessibility. Elevated parklets will require ADA-compliant ramps.

Wayfinding

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Focus Corridors
- Bike Route Overlay

Figure 39. Wayfinidng signage in Santa Monica, Ca.

Description:

Wayfinding signage helps to orient pedestrians to key destinations and places of interest in a community. Signage can be informational or directional. Wayfinding signage, especially when consistent, clear, and conspicuous can enhance navigation while contributing to placemaking and community character.

DESIGN GUIDANCE

- Consider sign placement to ensure high visibility. Avoid locations with visual clutter where the sign may be missed by the passersby.
- Consistent signage design and branding can help with placemaking and increases recognizability for all road users.
- Signs should be posted on both sides of the street.

Stormwater Management

Treatments in this category can be used to capture, detain, and treat stormwater on Town streets, particularly in areas where spot flooding may occur. This would help to reduce demand on the Town's Combined Sewer Overflows (CSOs). As an added benefit, treatments involving landscaping or greenery will help to beautify Town streets and, in the case of street trees, help to reduce the Heat Island Effect of urbanized areas, in which hardscaping, structures, and other elements of the built environment absorb and reemit the sun's heat, contributing to higher air temperatures relative to outlying areas. Harrison is largely urbanized, so green infrastructure practices can be implemented in rights-of-way, medians, sidewalk areas, or as surface course.

The following treatments can be used on Town streets to help manage stormwater and runoff. More detailed information on each, including design guidance, can be found on the pages indicated.

Bioswales and Bioretention Systems

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 40. Bioswale in New York, NY. Image Source: Chris Hamby.

Description:

Bioretention Systems are landscaped features designed to capture and treat stormwater runoff as it moves downstream. As vegetated and shallow depressions, they slow runoff water velocity while cleaning the water and recharging the underlying groundwater table. Per the NJDEP Best Management Practices (BMP) Manual, bioswales can fall under both the Large-Scale and the Small-Scale Bioretention System designations.

DESIGN GUIDANCE

- The soil bed material must consist of the following mix, by volume: 85 to 95 percent sand, with no more than 25 percent of the sand as fine or very fine sands; no more than 15 percent silt and clay with 2 percent to 5 percent clay content. The entire mix must then be amended with 3 to 7 percent organics, by weight.
- The soil bed must have a depth of 1.5-2 feet. Minimum permeability rate is 0.5 inches per hour with a maximum drawdown rate set at 72 hours.
- The minimum density of vegetation in the bioswale must be 85 percent.
- Contaminated soil areas must be remediated prior to installation. Infiltration facilities should only be located in Class A or B soils.
- Curb cuts should be at least 18 inches wide and spaced 3 to 15 feet apart depending on tributary areas and the profile of the roadway gutter.
- Can be combined with traffic calming and pedestrian safety treatments like curb extensions and pedestrian refuge islands/medians and between the curb and sidewalk space.
- Refer to New Jersey Stormwater Best Management Practices Manual (BMP manual) for latest guidance.

Rain Gardens

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 41. Demonstration rain garden at Highland Park High School. Image Source: Rutgers Cooperative Extension (RCE) Water Resources Program.

Description:
Rain gardens are landscaped depressions used for collecting and absorbing rainwater runoff from impervious surfaces, filtering pollutants from the water, and contributing to overall community beautification.

DESIGN GUIDANCE

- The soil mix for a rain garden should be 85 to 95 percent sand with no more than 25 percent of the sand being fine or very fine; no more than 15 percent silt; and 2 to 5 percent clay content.
- Can be combined with traffic calming and pedestrian safety treatments like curb extensions and pedestrian refuge islands/medians and between the curb and sidewalk space.
- Minimum permeability rate is 0.5 inches per hour with a maximum drawdown rate set at 72 hours.
- The minimum density of vegetation in the bioswale has to be 85 percent.
- Slopes are designed with a maximum side slope ratio for earthen embankments of 3:1 as well as a maximum 10 percent longitudinal slope.
- Refer to New Jersey Stormwater Best Management Practices Manual (BMP manual) for latest guidance.

Pervious Pavement

Application Location:

- Sidewalk Zone
- Street Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 42. Pervious pavement in Chicago, IL. Image Source: Center for Neighborhood Technology.

Description:

Alternative hardscaping materials, including pervious asphalt and concrete and interlocking pavers, allow stormwater runoff to infiltrate into the ground while trapping pollutants. Pervious pavement is versatile in application and implementable on sidewalks and roadways, either from curb-to-curb or on parking lanes or gutter strips only. Pervious asphalt is made without fine aggregates added to a typical asphalt mixture, allowing greater porosity for water infiltration. Subsurface reservoirs are used to hold the water, allowing it to evaporate or permeate into surrounding soils. Like pervious asphalt, pervious concrete is designed to allow water and air to pass through, while interlocking concrete pavers have permeable spaces in between paver units.

DESIGN GUIDANCE

- Contaminated soil areas must be remediated prior to installation.
- Minimum permeability rate is 0.5 inches per hour, and the maximum drawdown time for the practice is 72 hours.
- A full geotechnical evaluation is recommended to determine permeability, height of the water table, and depth to bedrock. The surface course must be designed to support, without lateral movement of the components, the anticipated traffic and other design loads.
- The maximum surface course slope is 5 percent.
- Pervious Pavement can be designed either as an underdrain system or as a system that infiltrates directly into the subsoil. Refer to the NJ Stormwater Best Management Practices Manual (BMP manual) for more information.
- De-icing agents used on pervious surfaces should be biodegradable and non-corrosive.

Tree Pits and Planter Boxes

Application Location:

- Sidewalk Zone

Street Typology:

- Neighborhood One-way Streets
- Neighborhood Two-way Streets
- Slow Streets
- Focus Corridors
- Bike Route Overlay

Figure 43. Street tree in Marplewood, NJ.

Description:

Street trees are not just for beautification and shading; they also play an important role in stormwater management. They can absorb rainfall, transpire water, and control runoff, which helps with stormwater management. Street trees also remove pollutants from the air.

DESIGN GUIDANCE

- Tree pits and trenches must have adequate root space underneath the sidewalk for the tree species. A tree with a canopy 30 feet wide needs roughly 1,000 cubic feet of root space. This is critical not only for tree health but also to prevent buckling sidewalks which may pose accessibility challenges in the pedestrian zone. Root barriers can help direct roots to appropriate growth areas. A gravel-filled stormwater storage bed may be necessary if drawdown time is slower.
- Choose climate appropriate trees that are also salt-tolerant so they can withstand routine snow-removal operations.
- Provide an appropriate inlet for sidewalk trees performing bioretention to capture and distribute runoff through connected tree boxes. Options include curb cuts, depressions, or catch basins.
- Ensure that trees do not block bike facilities and that branches are properly maintained to avoid causing any obstructions. Street tree branches should not hang lower than 8 to 14 feet.
- Minimum permeability rate is 0.5 inches per hour with a maximum drawdown rate set at 72 hours.
- As with the other small-scale bioretention systems, the maximum contributing drainage area should be less than 2.5 acres.
- Refer to the New Jersey Stormwater Best Management Practices Manual (BMP manual) for the latest guidance.

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