

STREET SMART

A NEIGHBORHOOD CONNECTIVITY PLAN

FOR THE RESIDENTS OF BERNARD TERRACE, CAPITAL HEIGHTS, VALLEY PARK, AND WEBB PARK



Traffic Calming



Bicycle Facilities



Pedestrian Facilities



Neighborhood Connectivity



Stormwater Management

MID CITY, BATON ROUGE, LOUISIANA

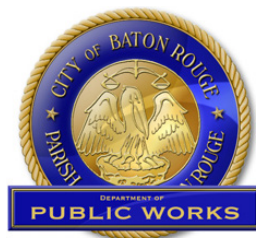
INTRODUCTION

This plan was created with the residents of **BERNARD TERRACE, CAPITAL HEIGHTS, VALLEY PARK, AND WEBB PARK**. These four adjacent neighborhoods are located in the heart of Baton Rouge's Mid City, in close proximity to many of the city's schools, parks, churches, commercial centers, and other destinations. The residents wish to improve access, connectivity, and safety within their neighborhoods as well as to the numerous destinations nearby. This plan is the product of the collaboration of the four civic associations, city officials, a team of experts, and the participation of numerous area residents.

PREPARED BY

CENTER FOR PLANNING EXCELLENCE is a non-profit organization that coordinates urban, rural and regional planning and implementation efforts in Louisiana. We provide best-practices planning models, innovative policy ideas, and technical assistance to individual communities that wish to create and enact master plans dealing with transportation and infrastructure needs, environmental issues, and quality design for the built environment. CPEX brings community members and leaders together and provides guidance as they work towards a shared vision for future growth and development.

PARTNERS



*Department of Transportation and Drainage (T&D) as of January 2015

SUPPORT COMMITTEE MEMBERS

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Bill Arey	Lee Feinswog
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PROJECT TEAM

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OTHER SUPPORTERS

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CNI Wholesale Nursery
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Mid City Redevelopment Alliance
Valley Park Civic Association
Webb Park Civic Association

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PREFACE

This plan, “Street Smart: Connecting our Communities,” is directed to decision makers and officials in City of Baton Rouge-Parish of East Baton Rouge government, including Office of the Mayor-President, Metropolitan Council, Department of Transportation and Drainage (formerly Department of Public Works), and Planning Commission. The plan was created with the input of citizens and homeowners in Bernard Terrace, Capital Heights, Valley Park, and Webb Park neighborhoods, and it is intended to lay out future improvements to the street network within these neighborhoods.

The city-parish has made significant investments and achievements in the area, especially with the creation of the FUTUREBR Comprehensive Plan. However, the neighborhoods in Mid City still have need for infrastructure improvements to make their streets less congested, bicycle- and pedestrian-friendly, and safer for all. This plan recommends improvements to achieve those goals, based on the community’s vision.

Street Smart recognizes that city-parish governmental agencies and elected leaders play an important role in accomplishing the action items outlined in this plan, and requests their support to make the citizens’ vision a reality.



Vision

THE STREET SMART VISION

Baton Rouge’s Mid City neighborhoods have streets that are geared toward walkers and bikers as well as drivers. People of all ages and abilities can get to destinations inside and outside their neighborhood safely and efficiently, using a variety of transportation modes. Street infrastructure helps to promote health, increase sense of community, bolster real estate values, and reduce the amount of flooding from stormwater.

STAKEHOLDERS AND PARTNERS

Center for Planning Excellence (CPEX) was approached by residents in the Mid City area to help address challenges they experienced in safely getting around their neighborhood. While they were close to a variety of daily necessities and amenities, it was not always possible to reach these safely by bike or on foot. The residents also realized that improving street design can make positive changes in their property values, health, safety, and sense of community. CPEX worked with residents, homeowner associations, and public agencies as well as many other local partners who saw the value of this work. Major contributors were Greater Baton Rouge Association of REALTORS® (GBRAR), who supported the demonstration projects, and the local Department of Transportation and Drainage (T&D) whose leadership and resources made the plan possible. A full list of project partners can be found on page 3 of this document.



SUPPORT COMMITTEE

Approximately 18 community leaders representing all areas of the district were appointed to serve on the Street Smart Support Committee. As people who are closely associated with a larger network of area residents, stakeholder groups, and decision makers, they served as a sounding board for CPEX and a link to the groups they represented. The support committee met monthly during fall and winter 2014 to review information, help with publicizing the demonstrations, and provide feedback on plan recommendations.

GOALS

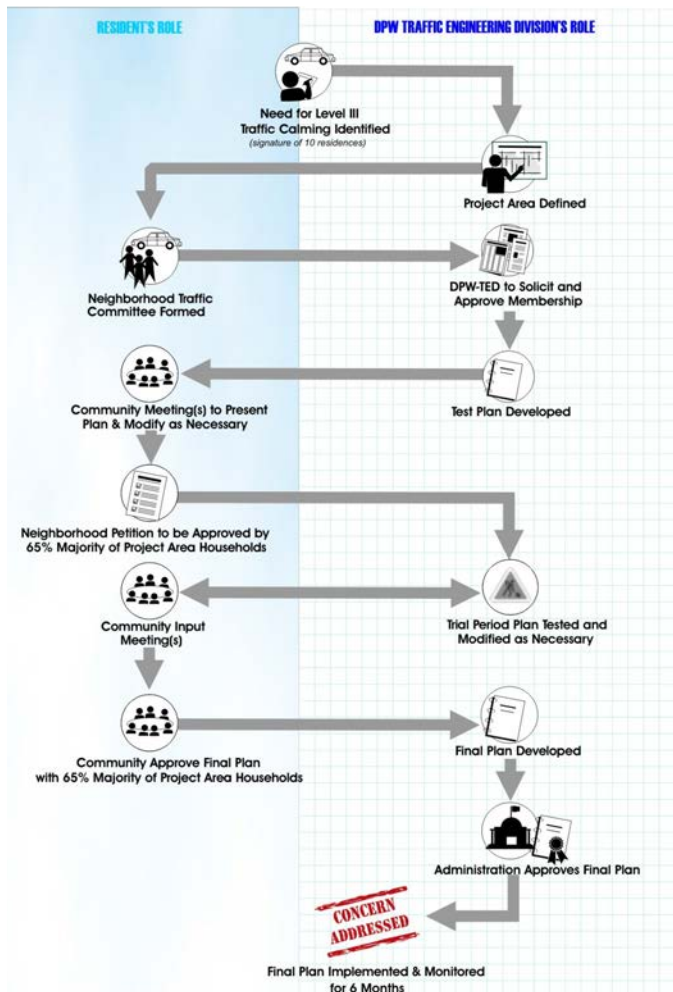
The partners identified the following goals to achieve the vision of the Street Smart project:

- **Promote cost-effective infrastructure improvements**
- **Calm traffic (defined by EBR Department of Public Works as “the management of traffic so that its negative impacts on residents, pedestrians and schools are minimized”)**
- **Create a bike network that connects places inside and outside the neighborhood**
- **Use landscaping to reduce stormwater flooding while beautifying the area**
- **Address issues at a neighborhood level, instead of an individual level**
- **Empower residents to find solutions in partnership with public agencies**

Methodology

T&D IMPLEMENTATION METHOD

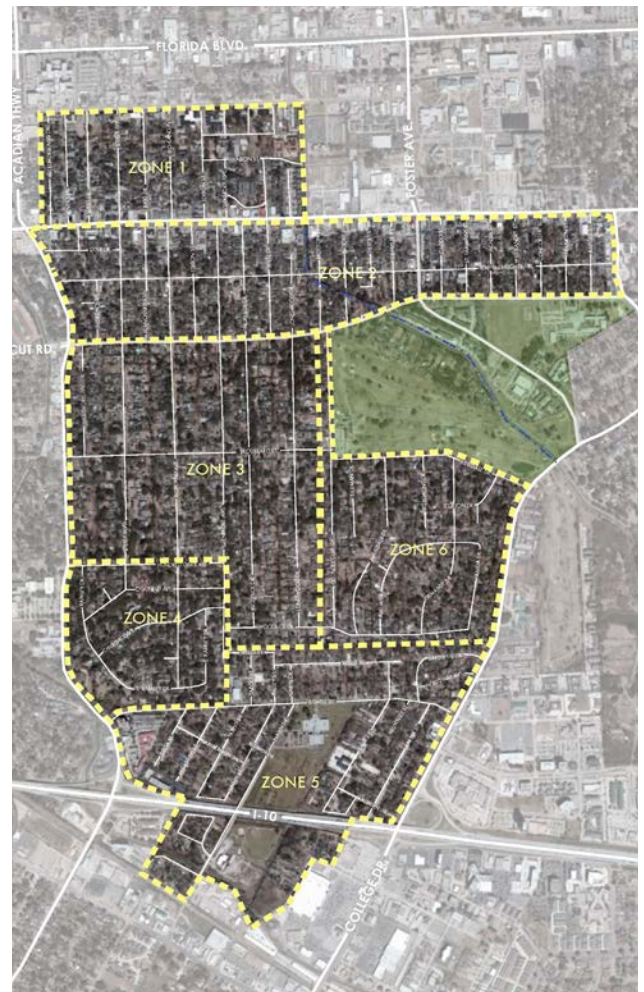
T&D created a publicly available Residential Traffic Calming Manual to provide the community with an understanding of the city-parish's traffic calming initiative. Three levels of traffic calming are described with detailed requirements and example drawings. The entire process of traffic calming, from residents identifying a need, to necessary approvals, is explained in implementation flowcharts in the manual. In order for this plan to become a reality, we utilize this approach in the plan.



The Level III Implementation Process from the Residential Traffic Calming Manual is available online at <https://brgov.com/dept/dpw/traffic/pdf/07ResidentialTraffic.pdf>

STREET SMART ZONES

One of the first decisions of the Street Smart project was to define the project area. The project area covers approximately 1.5 square miles and contains about 29 subdivisions, including the major subdivisions Bernard Terrace, Capital Heights, Steele Place, Glenmore Place, Walnut Hills, Valley Park, Wells Place, Westdale Heights, and Westdale Terrace. Six "zones" were identified to ensure all parts of the project area were fairly represented. The zones were based on residents' concerns, natural boundaries, subdivisions, and similar neighborhood characteristics, and were mainly used at the beginning of the project.



This zone map was used early on in the process to understand the needs of the various, related areas, and make sure all areas were equally represented.

Methodology

WEBSITE/ONLINE PRESENCE

CPEX created and managed a web-based public input platform for public input, feedback and announcements to enhance public participation and communication throughout the planning process. Mindmixer, the web-based tool that was used, was intended to allow for more robust feedback and polling. In collecting data, it allowed us to better understand the public's response to the demonstrations, their priorities, and the overall effectiveness of the various demonstrations.

DEMONSTRATIONS

Over several months, with input and feedback from the public, REALTORS®, the support committee, and stakeholders including the local Department of Public Works, CPEX designed and planned the installation of 11 demonstrations that temporarily changed the neighborhood streets to make them more bicycle- and pedestrian-friendly while still allowing vehicles to travel efficiently.

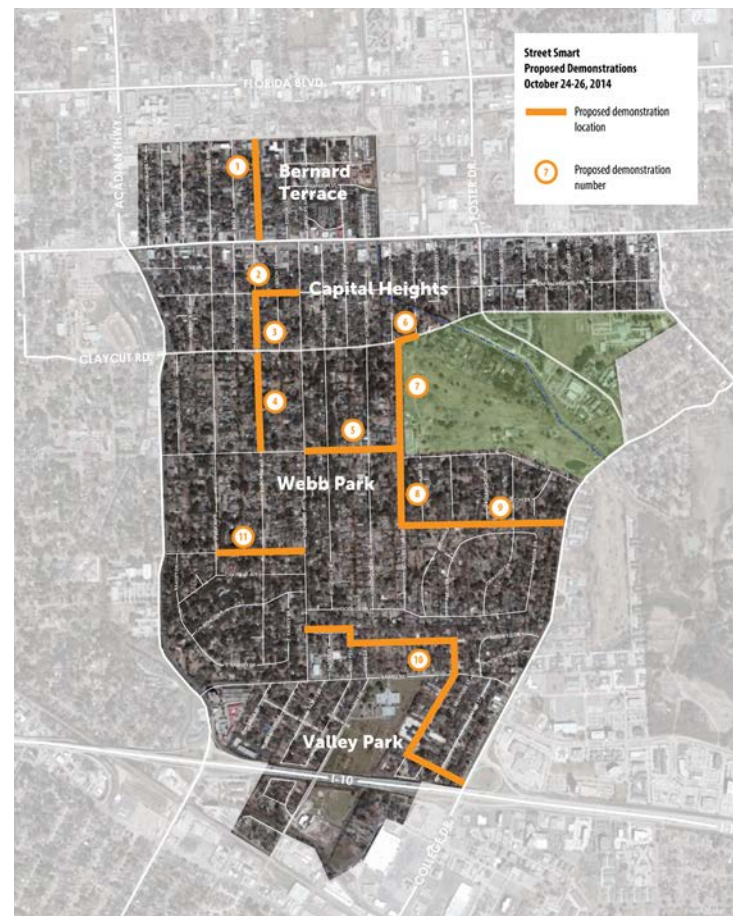
These temporary demonstrations were in place over the weekend of October 24-26, 2014 and showcased a variety of ways to create safer streets, including narrowing travel lanes, adding plantings to improve aesthetics and stormwater drainage, and adding bike lanes, crosswalks, signs, and sidewalks. This was achieved through the creative use of temporary signage, washable paint, potted plants, and the assistance of T&D, REALTORS®, and other volunteers.



Volunteers were on hand throughout the weekend to help installing and staffing the demonstrations.



The Street Smart website (cpex.org/street-smart) has been used throughout this project as a communication and feedback tool.



Maps and other informational signs were placed at each of the demonstration sites.

ACTIVITIES

To draw visitors to the demonstrations, several activities were held throughout the weekend. The activities were designed to engage the many different groups who use area streets, including area residents, walkers, runners, bike riders, and Webb Park playground users. All activities were promoted on the Street Smart website, social media, and with press releases, by CPEX and partner organizations, including REALTORS®.

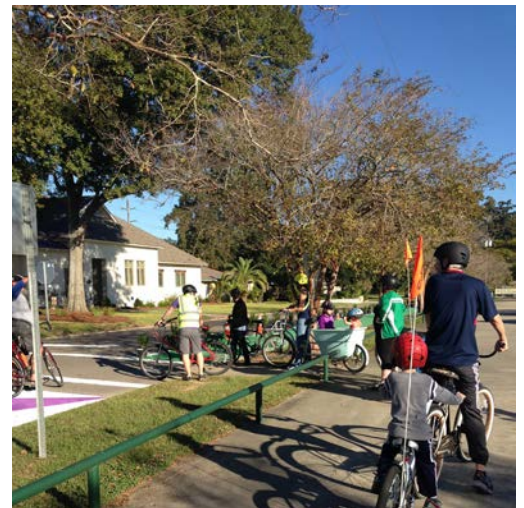
A “wine walk,” planned by the Webb Park Civic Association, was held Friday night, and served as a kickoff for the Street Smart demonstrations. Neighbors and friends of Webb Park Civic Association were invited to bring their wine glasses and visit a series of homes for wine, food, and mingling, and ticket proceeds went towards the association’s signage and landscaping initiative. The wine walk was held on Richland Avenue, and centered on one of the Street Smart demonstrations, the traffic choker between Claycut Road and Broussard Street. A Street Smart information table was also set up at the beginning of the wine walk where CPEX staffers and REALTOR® volunteers talked to attendees about the project, and invited them to visit the rest of the demonstrations and activities.



CPEX and REALTORS at Wine Walk

MINDMIXER FEEDBACK

People were invited to submit information about the Street Smart zones via streetsmart.mindmixer.com, an online engagement platform. Topics included congestion hot spots; what makes you feel safe or unsafe when you are walking; which zone do you live in; share pictures of places you like to walk or run or places that need improvement; and tell us which streets are best for walking and running in the neighborhood and why. These results helped inform the development of the Street Smart plan.



Bike Train



Bike lanes on Capital Heights Avenue were painted to increase visibility and safety.



A partial street closure limited cut-through traffic on Claycut Road.



A “sidewalk” was installed to improve pedestrian connectivity between Capital Heights and Webb Park.



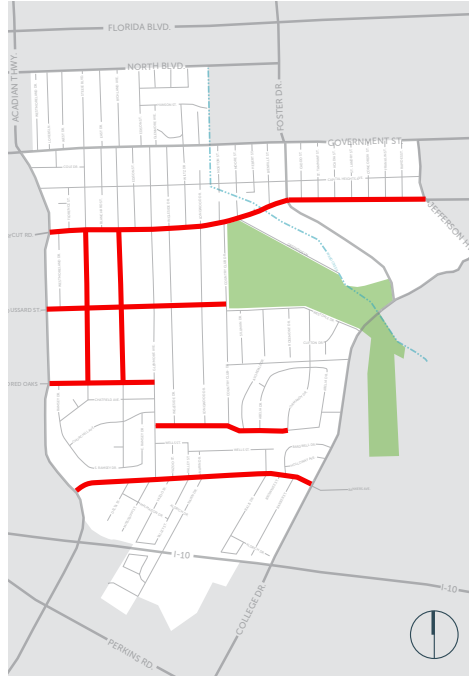
A traffic choker was installed on Richland Avenue to slow down speeding vehicles.

Existing Conditions

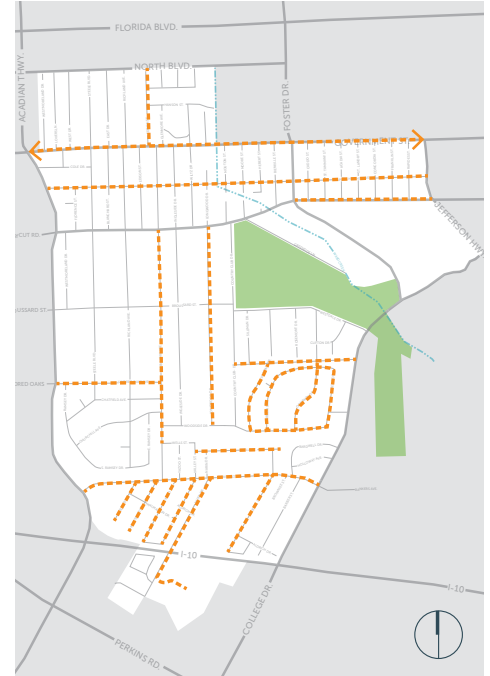
ANALYSIS AND CONTEXT



Observed drainage issues



Streets with speeding issues
(data collected from T&D)



Fragmented existing bike and pedestrian network

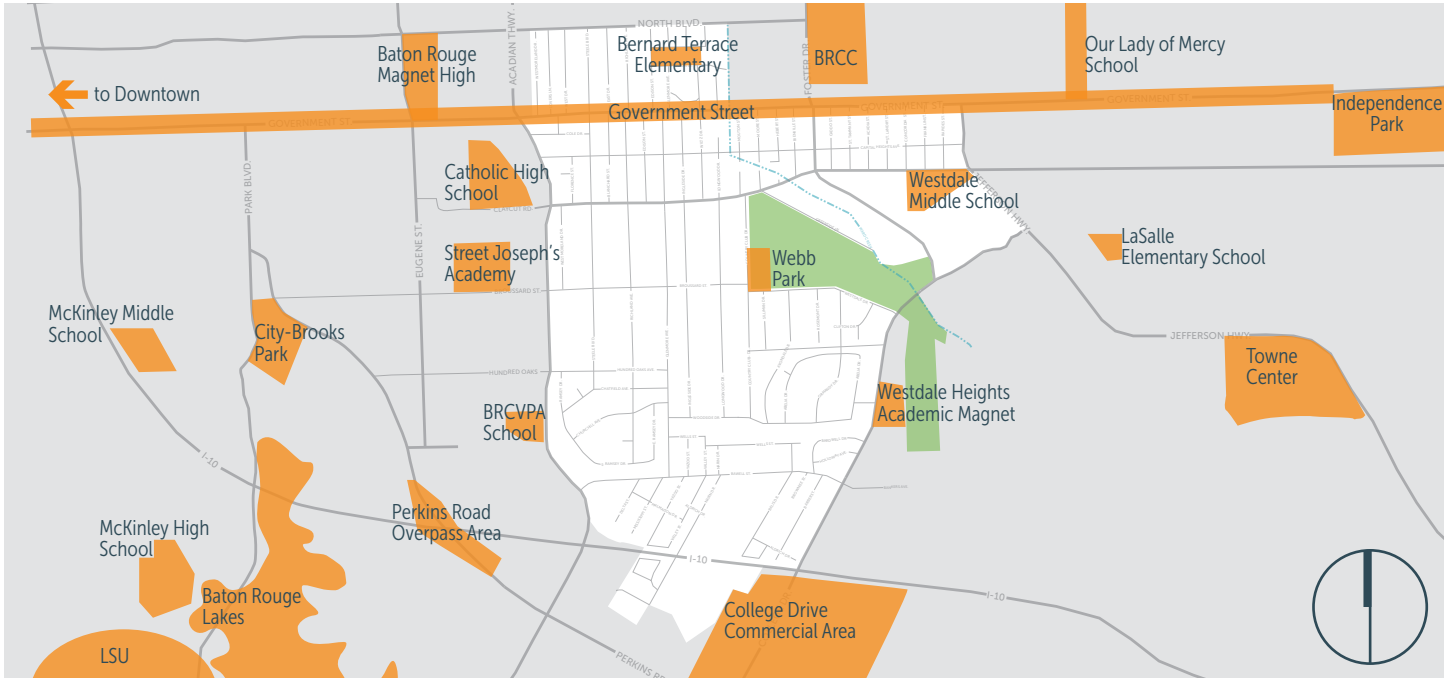
**DRAINAGE
ISSUES**

+ SPEEDING +

**DISCONNECTED
NETWORK**

Initial studies of the Street Smart zone revealed a number of issues relating to the streets and their function. The drainage of stormwater is a concern in this area, just as it is throughout much of Baton Rouge. The stormwater infrastructure often cannot handle the load placed on it by a heavy rain event. In addition to drainage issues, traffic data has revealed that speeding is consistently a problem on several streets, with anecdotal evidence of speeding in other areas as well.

Perhaps the most pressing issue is the disconnected network of bike and pedestrian facilities in the area. The existing system is comprised of fragments of sidewalks, bike lanes, and a multi-use trail - few of which are connected to one another, or to bike and pedestrian facilities outside the Street Smart zone. These existing assets make a solid foundation on which to build a connected network.



Area context in relationship to points of interest, which are shown here

$$+ \quad \text{AREA CONTEXT} \quad = \quad \text{INFORMED SOLUTIONS}$$

The Street Smart zone is situated in the heart of Baton Rouge, just a short walk, bike ride, or drive from many of the city's parks, schools, attractions, commercial and civic areas, and other amenities. The masterplan and recommendations that follow were developed with these issues and this context in mind.

Master Plan

BIKE, PEDESTRIAN, AND TRAFFIC CALMING NETWORKS

HOW DID WE GET HERE?

The recommendations in this plan have been made based on a number of factors, including traffic data, existing street conditions, area context, proximity to other facilities, and input from stakeholders, residents, city officials, and other experts. Additional input was gathered during the demonstration weekend where a number of bike, pedestrian, and traffic calming elements were tested. The resulting masterplan is an effort to create a connected and coordinated set of bike, pedestrian, and traffic calming features for these Mid City neighborhoods.



Screen shot of cpex.org/street-smart, where input was gathered

WHAT ARE WE RECOMMENDING?

The Street Smart plan consists of recommendations that address a few key issues: bike and pedestrian access, traffic calming, and overall connectivity to the surrounding community. Wherever possible, stormwater management features have been integrated into the recommendations. In addition to the recommendations, an implementation matrix on page 70 is provided to assist community leaders as they move toward implementing these recommendations.



One of the temporary installations that was tested during the demonstration weekend

HOW ARE THE RECOMMENDATIONS ORGANIZED?


The recommendations are separated into two sections: bike and pedestrian, and traffic calming. Each set of recommendations is preceded by an overall masterplan and an outline of the recommendations. Each recommendation spread is keyed to the masterplan and contains locations, general information, reasoning, and design guidelines for that specific recommendation.



An example of the design recommendations



ALL PROPOSED IMPROVEMENTS

 bike facility improvement

 pedestrian facility improvement

 traffic calming improvement

List of Recommendations

BIKE AND PEDESTRIAN FACILITIES

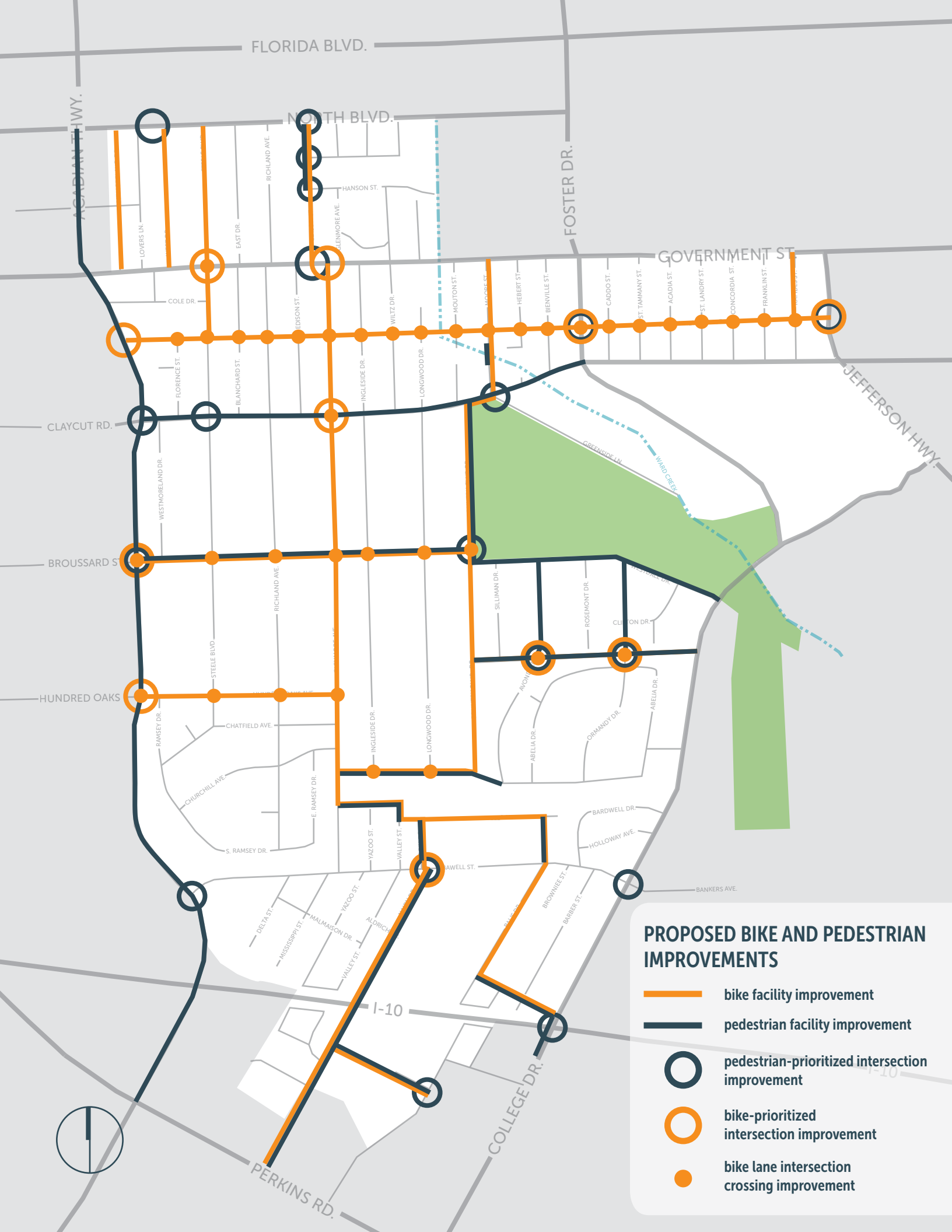
- 1 | **Signage and road marking standards** (BT, CH, VP, WP)
- 2 | **New buffered bike lanes** (BT, WP)
 - Country Club Drive
 - Steele Boulevard
 - West Drive
 - Westmoreland Drive
- 3 | **New dedicated bike lanes** (BT, VP, WP)
 - Broussard Street
 - Edison Street
 - Nairn Drive/Valley Street
 - Woodside Drive
- 4 | **Improvements to existing contraflow bike lanes** (CH)
 - Capital Heights Avenue
- 5 | **Conversion of existing bike lanes to buffered bike lanes** (WP)
 - Glenmore Avenue
 - Hundred Oaks Avenue
- 6 | **Improvements to shared lanes** (CH, VP, WP)
 - Country Club Drive
 - Glenmore Avenue
 - Moore Street
 - Nairn Drive/Valley Street
 - Rapides Street
 - Steele Boulevard
 - Valley Park bike route
- 7 | **Intersection improvements (bike prioritization)** (CH, WP)
 - Glenmore Avenue at Claycut Road
- 8 | **Extended median (bike/ped prioritization)** (BT, CH)
 - Government Street at Steele Boulevard
- 9 | **Traffic signal synchronization** (CH)
 - Capital Heights Avenue at S. Foster Drive
 - Capital Heights Avenue at Jefferson Highway
- 10 | **Bike lane transitions at intersections** (BT, CH, WP)
 - neighborhood intersections (not signalized)
 - major intersections (signalized)



BT= Bernard Terrace
CH= Capital Heights
VP= Valley Park
WP= Webb Park

- 11 | **New sidewalks** (BT, CH, VP, WP)
 - Acadian Thruway
 - Aldrich Drive (missing sections)
 - Avondale Drive
 - Balis Drive
 - Broussard Street
 - Claycut Road
 - Edison Street
 - Ormandy Drive
 - Webb Park perimeter
 - Wells Street (missing sections)
 - Woodside Drive (missing sections)
- 12 | **Improvements to prioritize pedestrians** (CH, VP, WP)
 - Moore Street- Ward Creek crossing
 - Nairn Drive Park path at Ferrett Street
 - Webb Park Neighborhood Trail
- 13 | **Intersection improvements (bike/ped refuge)** (BT, CH)
 - Acadian Thruway at Capital Heights Avenue
 - Government Street at Edison Street
- 14 | **Raised intersection** (WP)
 - Country Club Drive at Broussard Street
- 15 | **HAWK beacon and crosswalk** (CH)
 - Capital Heights Avenue at S. Foster Drive
 - Capital Heights Avenue at Jefferson Highway
- 16 | **Crosswalk and traffic signal additions and improvements** (BT, CH, VP, WP)
 - Acadian Thruway at Bawell Street, Broussard Street, Claycut Road, & Hundred Oaks Avenue
 - Balis Drive at Ferrett Street
 - Bawell Street at College Drive and Nairn Drive
 - Capital Heights Avenue at Jefferson Highway
 - Claycut Road at Moore Street & Steele Boulevard
 - College Drive at I-10 ramp
 - Edison Street at Government Street, Hatcher Drive, Hanson Drive, & North Boulevard
 - Neighborhood Trail at Ormandy Drive & Avondale Drive
 - North Boulevard at Peachtree Boulevard





FLORIDA BLVD.

NORTH BLVD.

GOVERNMENT ST.

FOSTER DR.

JEFFERSON HWY.

CLAYCUT RD.

BROUSSARD ST.

HUNDRED OAKS

I-10

COLLEGE DR.

PERKINS RD.

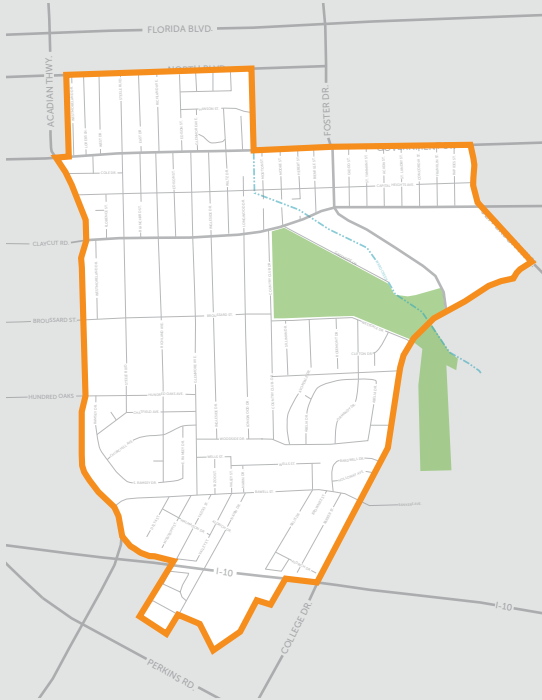
PROPOSED BIKE AND PEDESTRIAN IMPROVEMENTS

-  bike facility improvement
-  pedestrian facility improvement
-  pedestrian-prioritized intersection improvement
-  bike-prioritized intersection improvement
-  bike lane intersection crossing improvement



1 | Signage and road marking standards

IMPROVEMENT LOCATIONS:



OVERVIEW:

Consistency in the usage of directional and advisory signage and road markings is crucial for the safety of all users of our roadways. Clear and uniform road markings eliminate confusion of how a roadway is intended to be used.

Custom signage can be used as a place-making mechanism by defining neighborhoods with unique signs that reflect the history or character of an area.

A number of markings and signs are recommended for multiple areas in the Street Smart district.

APPROPRIATE APPLICATIONS:

- Anywhere signage and roadway markings are currently used, as well as locations where they are needed

INSTALL CONSISTENT SIGNAGE AND ROAD MARKINGS THROUGHOUT THE STREET SMART ZONE.



T&D painted temporary Shared Lane Markings (sharrows) on the streets during the Street Smart demonstration weekend.
source: CPEX



T&D installed "Share the Road" signage as part of the Street Smart demonstrations.
source: CPEX



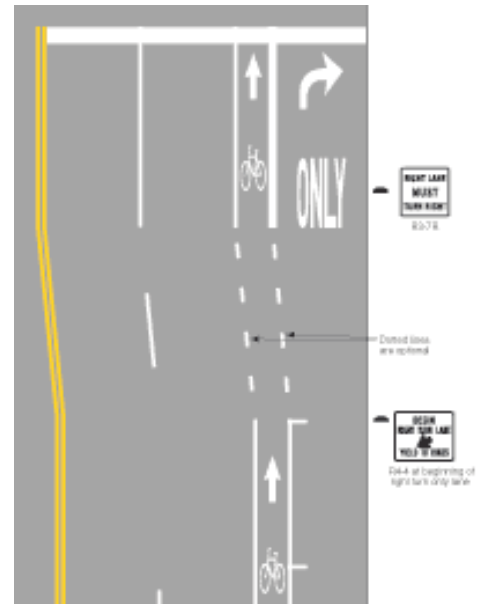
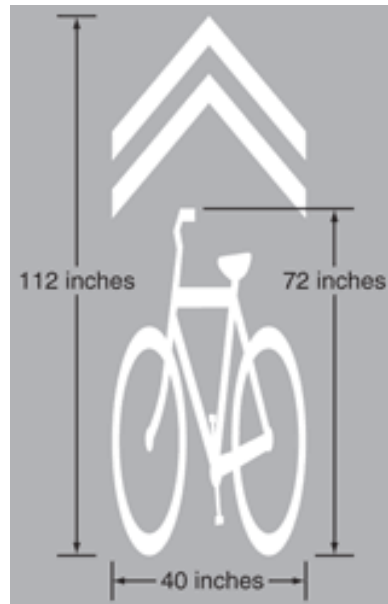
R3-17



R3-17a



R3-17b



R4-4



D1-1b (R)



D1-1b (L)



D1-1c



D4-3



D11-1



M1-8

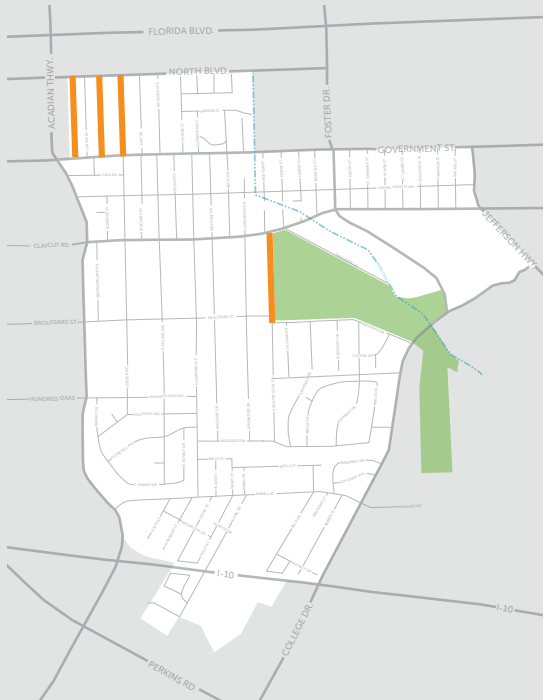
While there is some room for customization of signage, MUTCD sets the standards for most applications.

DESIGN GUIDELINES:

- This document defaults to the standards set forth by the Manual on Uniform Traffic Control Devices (MUTCD).
- The MUTCD is published by the Federal Highway Administration (FWA) of the Department of Transportation to set the standards by which traffic signs, road markings, and signals are used.
- In addition to the MUTCD, this document refers to:
 - American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities.
 - National Association of City Transportation Official's (NACTO) design guidelines for bike and pedestrian facilities.

2 | New buffered bike lanes

IMPROVEMENT LOCATIONS:



OVERVIEW:

Buffered bike lanes are conventional bike lanes that incorporate a buffer space between the bike lane and travel lanes. They can be an effective and economical way to provide increased safety to bicyclists. They not only provide increased visibility of bike lanes to motorists, but also act as a traffic calming feature by narrowing the lane width.

APPROPRIATE APPLICATIONS:

- Anywhere a bike lane is considered
- On streets with lanes wide enough to accommodate the buffer zone
- On streets where a two-way cycle track is proposed
- As an economical alternative to bike lanes that are separated from travel lanes by a curb or any other type of physical barrier

INSTALL NEW BUFFERED BIKE LANES ON:

COUNTRY CLUB DRIVE

Between Claycut Road and Broussard Street

STEELE BOULEVARD*

Between Government Street and North Boulevard

* Steele Boulevard becomes one-way, southbound

WEST DRIVE

Between Government Street and North Boulevard

WESTMORELAND DRIVE

Between Government Street and North Boulevard



Buffered bike lane in Austin, TX, showing chevron buffer markings and dashed right turn transition

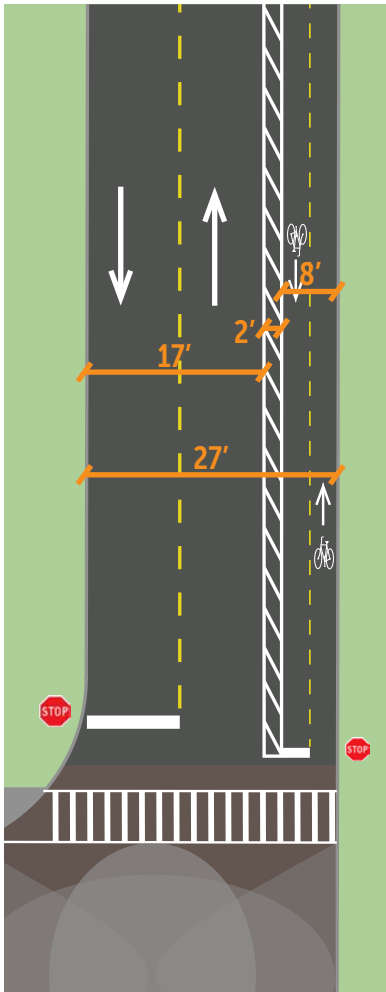
Source: NACTO



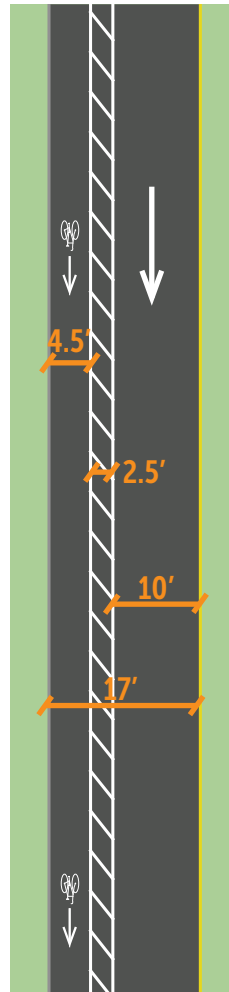
Buffered bike lane in conjunction with a high visibility crosswalk in Billings, MT

Source: NACTO

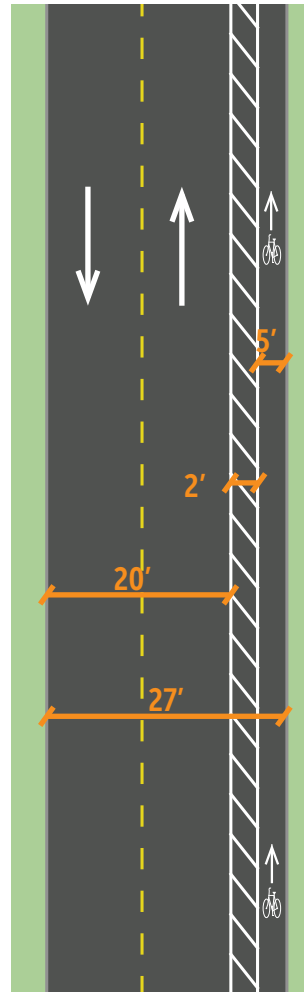
COUNTRY CLUB DRIVE



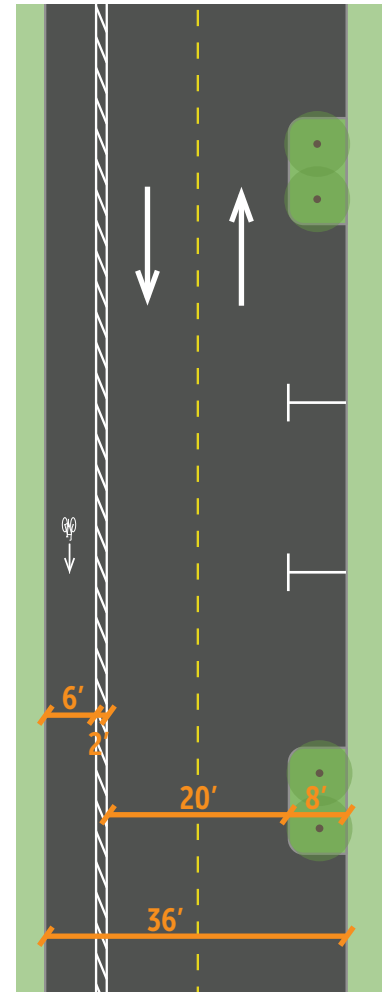
STEELE BLVD.



WEST DRIVE



WESTMORELAND DRIVE



DESIGN GUIDELINES:

- Install buffered lane markings (two solid white lines with interior hatching) as per MUTCD guidelines.
- The buffer should be at least 18 inches wide, but 3 to 4 feet is preferred.
- Install bike lane pavement markings (bike symbol or helmeted bicyclist symbol and arrow) at the beginning of each block or every 300', whichever is less, in both directions.
- Install stop bars and stop signs at intersections when appropriate.
- Maintain, at minimum, a bike lane width of 4' for a one-way lane and 8' for a two-way lane.
- When approaching right turns, replace solid white lines with dashed lines to indicate a transition area to both vehicles and bicyclists.
- Install proper bike lane signage as per MUTCD guidelines to signify the beginning and end of the lane, as well as intermittently along its length.

3 | New dedicated bike lanes

IMPROVEMENT LOCATIONS:



OVERVIEW:

Dedicated bike lanes provide bicyclists with a space in which to ride that is separated from vehicular travel lanes. Bike lanes are proposed on these streets to serve as key routes that connect to other existing or proposed bike facilities or to existing destinations.

APPROPRIATE APPLICATIONS:

- Anywhere bicyclists are present or desired
- On streets with the required street width to accommodate dedicated bike and travel lanes
- On streets with higher speeds or higher traffic volumes

INSTALL NEW DEDICATED BIKE LANES ON:

BROUSSARD STREET *

Between Country Club Drive and Acadian Thruway

EDISON STREET *

Between Government Street and North Boulevard

NAIRN DRIVE/VALLEY STREET**

Bawell Street to Perkins Road

WOODSIDE DRIVE

Between Country Club Drive and Glenmore Avenue

* Installation of bike lanes requires the addition of pavement in the right of way.

** This is a phased, long term solution. For short term solution, see pg. 28.

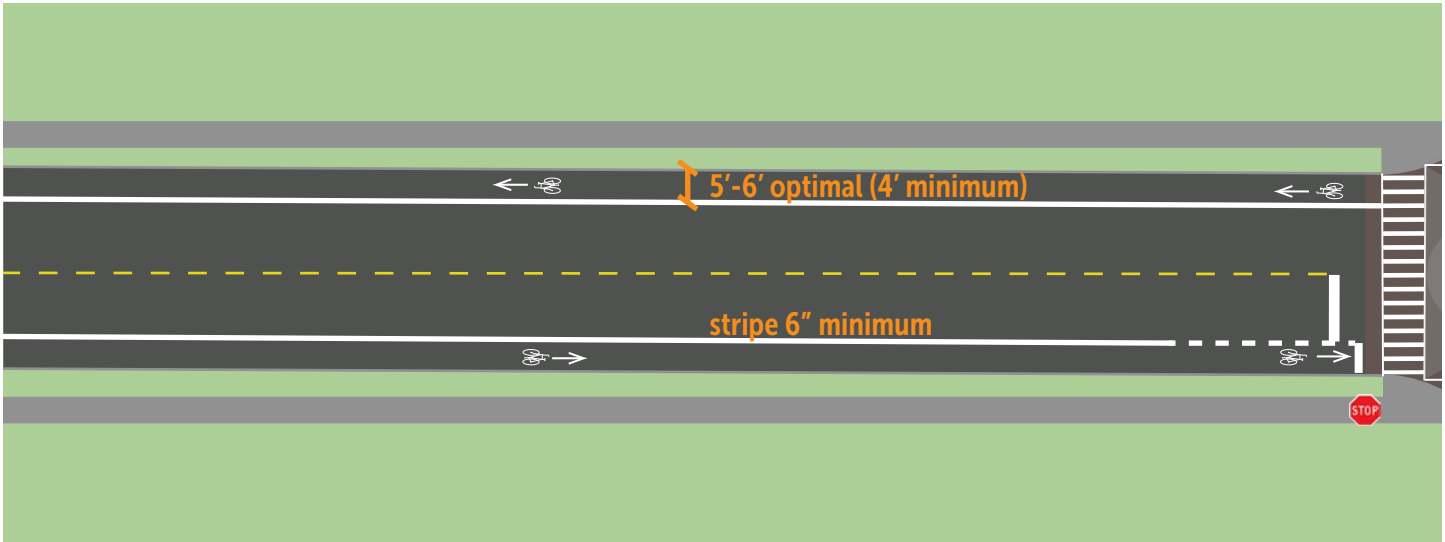


Conventional dedicated bike lane in Baldwin Park, CA, with appropriate roadway markings
source: NACTO



There are numerous options for marking a bike lane, including symbols, words, and directional arrows
source: NACTO

TYPICAL DESIGN:



BROUSSARD STREET

Phase 1: Install two 4' one-way lanes between Country Club Drive and Glenmore Avenue

Phase 2: Install additional pavement to accommodate two 5' lanes between Country Club Drive and Acadian Thruway

EDISON STREET

The addition of pavement along Edison Street will provide space for dedicated bike lanes, between Government Street and North Boulevard. This is part of the Bernard Terrace Elementary Safe Routes to School grant.

NAIRN DRIVE/VALLEY STREET

Install additional pavement to accommodate either dedicated bike lanes or a shared use path on one side of the street.

WOODSIDE DRIVE

Two 5' one-way lanes connecting Country Club Drive to Glenmore Avenue

DESIGN GUIDELINES:

- Install 5'-6' wide bike lanes.
- Install solid white lane markings (minimum 6" wide) to mark the boundary of the lane.
- Revised markings should include a dotted transition approximately 50' before each cross street where right turns are allowed.
- Install bike lane pavement markings (bike symbol or helmeted bicyclist symbol and arrow) at the beginning of each block or every 300', whichever is less, in both directions.
- Replace existing bike lane signage with MUTCD R3-17 "Bike Lane" signs (see pg. 19).
- Maintain bike lanes so that they are free of potholes, broken glass, and other debris.

4 | Improvements to existing contraflow bike lanes

IMPROVEMENT LOCATION:



IMPROVE BIKE LANES ON:

CAPITAL HEIGHTS AVENUE *
Acadian Thruway to Jefferson Highway



Contraflow lanes in Eugene, OR, allow bicyclists to travel in two directions on a one-way vehicular street. Note the extra wide line separating the lanes.
source: NACTO

OVERVIEW:

Contraflow bike lanes are designed to allow bicyclists to travel in the opposite direction of motor vehicle traffic.

On one-way streets like Capital Heights Avenue, more space is opened up for the addition of bike lanes that flow with traffic, and in this case a contraflow lane as well. Streets with contraflow bike lanes should be appropriately and consistently marked and signed to ensure that cars and bikes travel safely and without confusion.

APPROPRIATE APPLICATIONS:

- Streets with two-way bike traffic and one-way vehicular traffic
- Locations where two-way bike traffic is necessary as part of a larger network of bike facilities

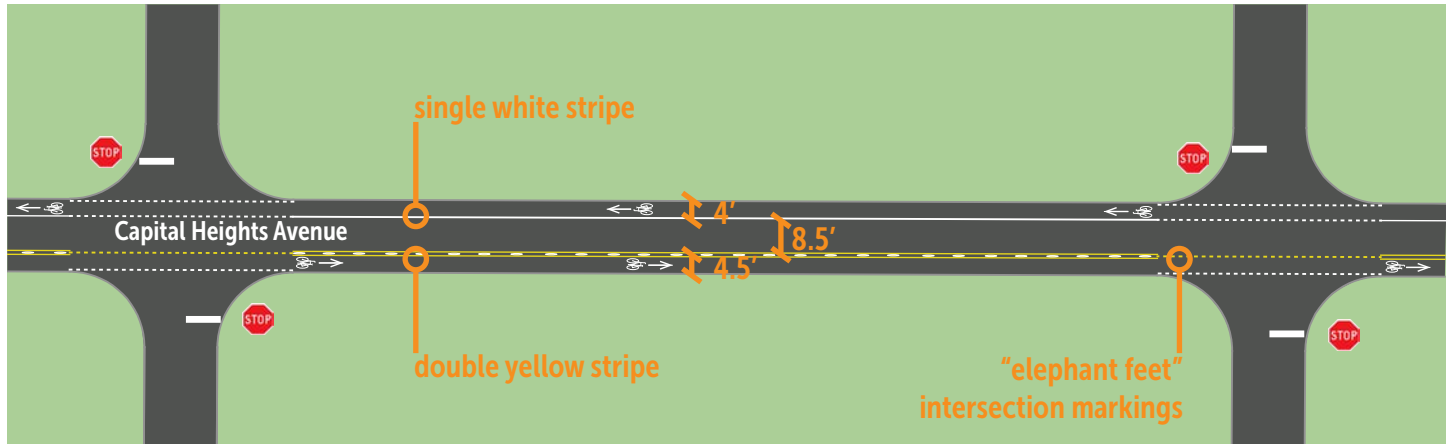


A "Do Not Enter" sign paired with "Except Bicycles" clarifies the intended use of the road to bicyclists and motorists.
source: NACTO



Contraflow lane in a residential area of Eugene, OR.
source: NACTO

TYPICAL CONDITION ON CAPITAL HEIGHTS AVENUE



Example of proper bike lane signage (MUTCD R3-17)



Low profile plastic lane separators add an additional layer of protection for cyclists without creating a dangerous obstacle for vehicles.



Example of MUTCD W6-3

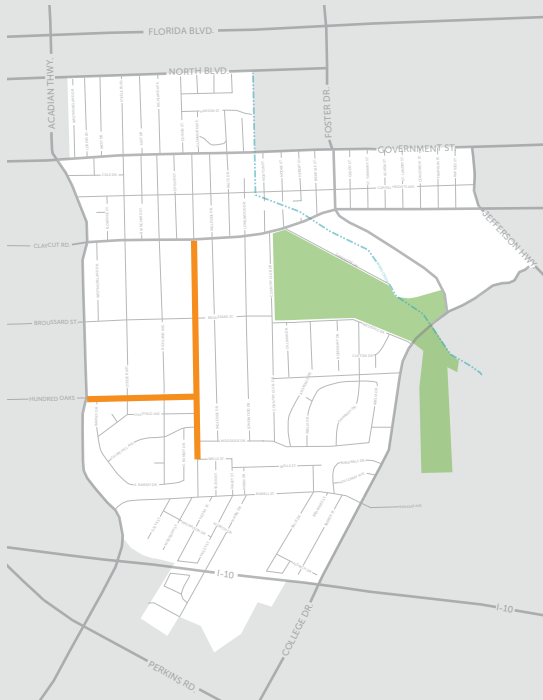
DESIGN GUIDELINES:

***If Capital Heights Avenue is used as the designated bike route for this section of the Government Street redesign, then it is recommended that the existing pavement be widened to 20' to accommodate two 5' bike lanes and a 10' travel lane.**

- Install bike lane pavement markings (bike symbol or helmeted bicyclist symbol and arrow) at the beginning of each block or every 300 feet, whichever is less, in both directions.
- Replace existing bike lane signage with MUTCD R3-17 "Bike Lane" signs.
- Install solid double yellow lane marking to mark the contraflow lane.
- At cross streets, install "EXCEPT BIKES" supplemental plaque beneath existing R6-2 "ONE WAY" signs.
- Optional: Install modified "TWO WAY" signs (MUTCD W6-3) at each end of the street to indicate two-way bike travel.
- OPTION: Install plastic bike lane separator strips between travel lane and bike lanes.
- Remove tapered markings where Capital Heights approaches Jefferson Highway, N. Foster, and Acadian Thruway, and replace with transitions per MUTCD, Part 9. Revised markings should include a dotted transition approximately 50 feet before each cross street where right turns are allowed from Capital Heights.
- Install additional intersection traffic controls on Capital Heights such as stop signs and stop bars so they are oriented to bicyclists in the contraflow lane.
- Install supplemental "EXCEPT BIKES" signs beneath all "DO NOT ENTER" (R5-1) signs.

5 | Conversion of existing bike lanes to buffered bike lanes

IMPROVEMENT LOCATIONS:



OVERVIEW:

Buffered bike lanes are an effective and economical way to provide increased safety to bicyclists. They not only provide increased visibility of bike lanes to motorists, but they also acting as a traffic calming feature by narrowing travel lanes.

In this context, Glenmore Avenue serves this area as the primary North-South bike boulevard.

APPROPRIATE APPLICATIONS:

- Anywhere a bike lane is considered
- On streets with lanes wide enough to accommodate the buffer zone
- On streets where traffic volume and/or speed is a concern
- As an economical alternative to bike lanes that are separated from travel lanes by a curb or any other type of physical barrier

IMPROVE EXISTING BIKE LANES ON:

GLENMORE AVENUE

Wells Street to Claycut Road

HUNDRED OAKS AVENUE

Acadian Thruway to Glenmore Avenue



Buffered bike lane in Austin, TX, showing chevron buffer markings and dashed right turn transition
source: NACTO

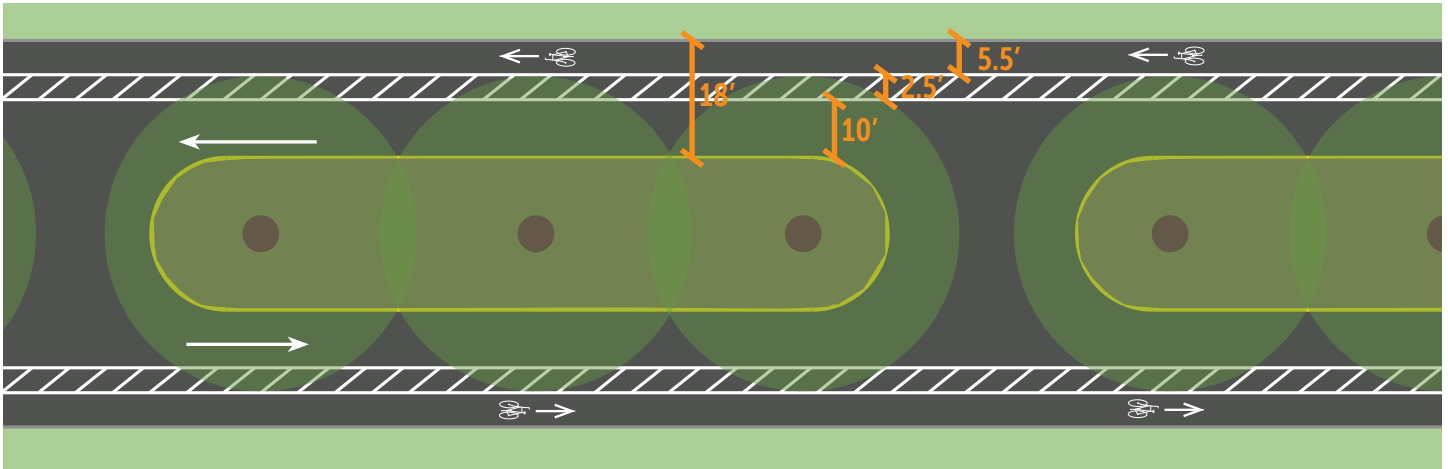


Buffered bike lane in a residential area of Cape Coral, FL, where simple solid white lines are used when the buffer zone is less than three feet wide.
source: NACTO



Buffered bike lane in conjunction with a high visibility crosswalk in Billings, MT
source: NACTO

TYPICAL CONDITION ON GLENMORE AVENUE

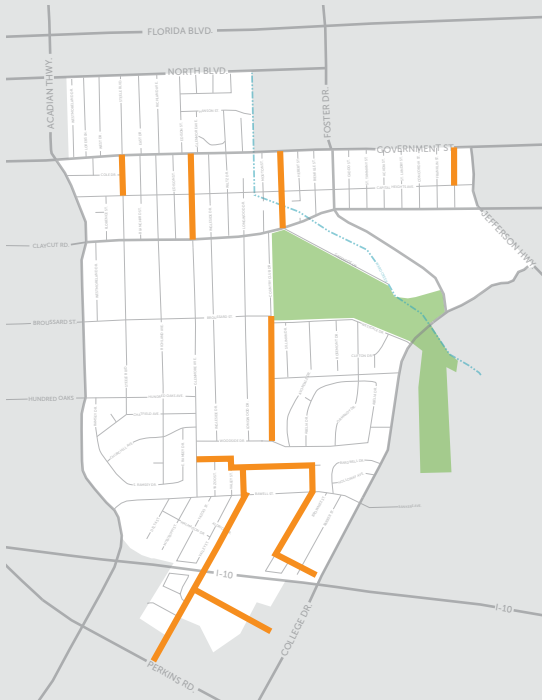


DESIGN GUIDELINES:

- Remove existing bike lane markings and replace with buffered bike lanes.
- Install buffered lane markings (two solid white lines with interior hatching) as per MUTCD guidelines.
- When approaching right turns, replace solid white lines with dashed lines to indicate a transition area to both vehicles and bicyclists.
- Install stop bars and stop signs at intersections when appropriate.
- Install bike lane pavement markings (bike symbol or helmeted bicyclist symbol and arrow) at the beginning of each block or every 300 feet, whichever is less, in both directions.

6 | Improvements to shared lanes

IMPROVEMENT LOCATIONS:



OVERVIEW:

There are a number of areas that either do not have space for, or do not warrant, dedicated bike lanes. Some of these areas serve as key connections between proposed or existing bike facilities, so it is important that they are signed and marked with the appropriate wayfinding and advisory signs and road markings.

APPROPRIATE APPLICATIONS:

- Anywhere bikes are present or desired
- On streets that do not have enough space to accommodate dedicated bike lanes
- On streets that do not warrant dedicated lanes due to low traffic volume
- Along designated bike routes- as wayfinding and directional elements

IMPLEMENT OR IMPROVE SHARED LANES ON:

COUNTRY CLUB DRIVE

Broussard Street to Woodside Drive

GLENMORE AVENUE

Claycut Road to Government Street

MOORE STREET

Claycut Road to Government Street

NAIRN DRIVE/VALLEY STREET*

Bawell Street to Perkins Road

RAPIDES STREET

Capital Heights Avenue to Government Street

STEELE BOULEVARD

Capital Heights Avenue to Government Street

VALLEY PARK NEIGHBORHOOD

Bike route to College Drive (see map)

*This is a short term solution. See pg. 22 for a phased, long term solution.



Temporary Shared Lane Markings (sharrows) were painted on the streets during the Street Smart demonstration weekend.
source: CPEX



"Share the Road" signs were also installed as part of the Street Smart demonstrations.
source: CPEX



DESIGN GUIDELINES:

- Install Shared Lane Marking "Sharrow" on streets, near center of travel lanes, in both directions.
- Sharrows shall be placed approximately 7' from the outside curb, and no less than 4' from the curb, especially on streets with on-street parking.
- The chevron portion of the sharrow should be oriented in the direction of the desired bike route.
- Custom bike route signage is highly recommended for areas that can only accommodate shared lanes and not dedicated bike lanes. Route signage directs bicyclists to certain destinations, while also making motorists aware of the presence of bicyclists.

7 | Intersection improvements (bike prioritization)

IMPROVEMENT LOCATION:



OVERVIEW:

The intersection of Glenmore Avenue and Claycut Road presents visibility and maneuvering challenges to both bicyclists and motorists.

Extension of the Glenmore Avenue median, tightening of corner radii, and legible street markings and signage decrease the overall size of the intersection and improve safety and visibility for all users.

APPROPRIATE APPLICATIONS:

- At odd-angled or wide intersections
- At intersections where a bike lane or cycle track crosses a heavily traveled road

IMPROVE BICYCLE PRIORITIZATION AT:

GLENMORE AVENUE AT CLAYCUT ROAD



Boulevard with extended median and designated U-turn area
source: NACTO

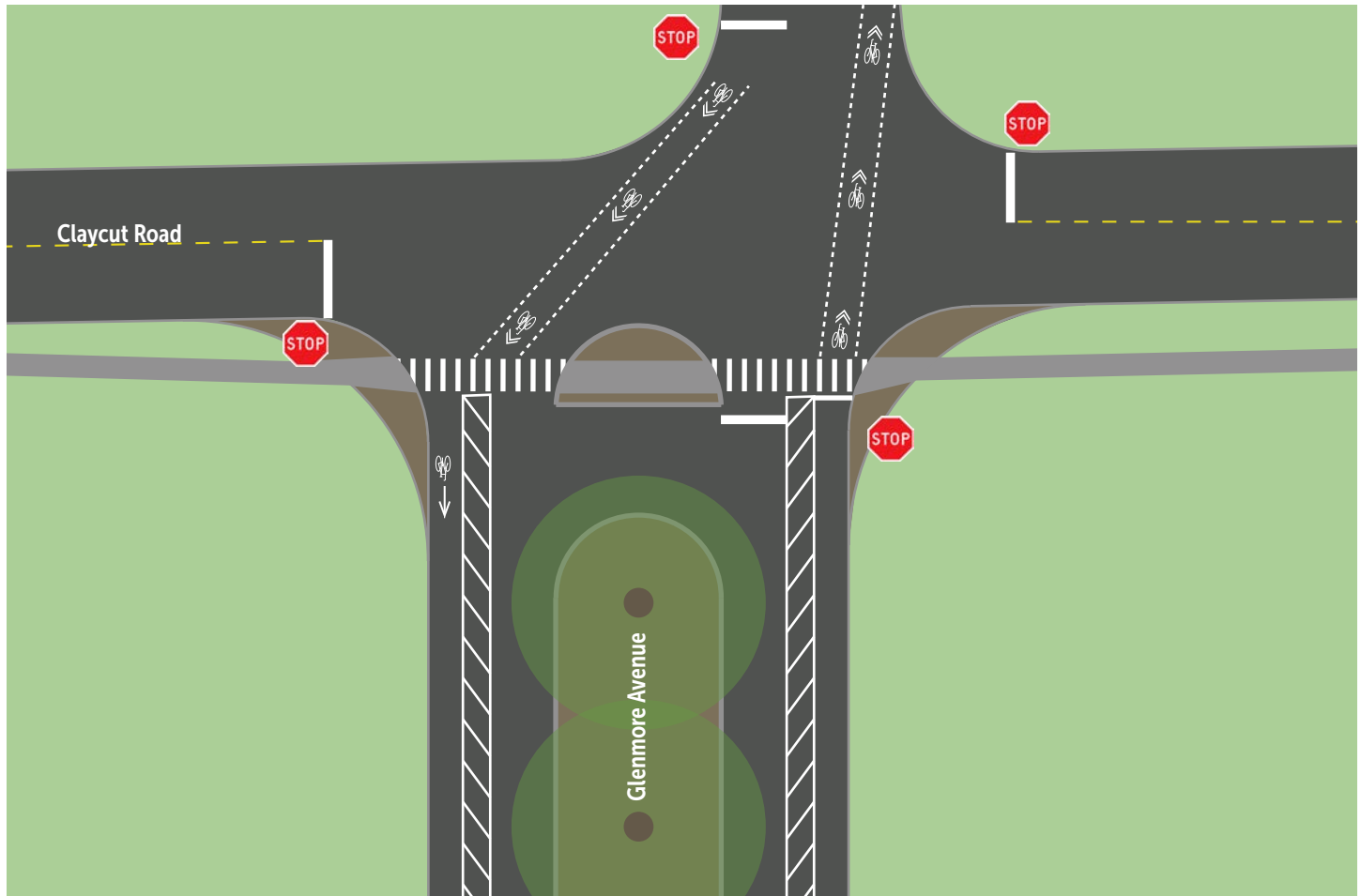


Bicycle refuges in medians provide bicyclists with a much safer option for crossing busy multi lane streets.
source: NACTO



The existing intersection presents a potentially confusing and dangerous crossing for all users.
source: CPEX

GLENMORE AT CLAYCUT DESIGN SCHEME:



DESIGN GUIDELINES:

- Install vertical curbs and tighten curb radii to slow down turning vehicles.
- Move stop sign forward, and install stop bars in vehicular and bike travel lanes.
- Install high visibility crosswalks across Glenmore.
- Add pedestrian refuge in extended median. Designate U-turn space in extended median.
- Demarcate desired path across intersection for bicyclists with dashed white lines and bike symbol.
- Utilize tightened corners and extended median as stormwater collection areas with slotted curbs, sunken planting areas, and stormwater-appropriate plants.

8 | Extended median (bike/ped prioritization)

IMPROVEMENT LOCATIONS:



OVERVIEW:

An extended median is an effective means to help bicyclists cross streets with multiple lanes. They can also be used to limit vehicles to right turns only.

Extended medians on Government Street help bridge bike facilities across this busy street.

APPROPRIATE APPLICATIONS:

- At intersections suitable for vehicles to make right turns only
- At intersections where a bike lane or cycle track crosses a heavily traveled road
- On streets wide enough to accommodate a median and bike refuge

INSTALL EXTENDED MEDIANS AT:

GOVERNMENT STREET AT STEELE BOULEVARD*

*Installation of an extended median at this location assumes that Government Street will be redesigned as a 3-lane road with center medians/turn lane.



Boulevard with extended median and designated U-turn area

source: NACTO



Bicycle refuges in medians provide bicyclists with a much safer option for crossing busy multi lane streets.

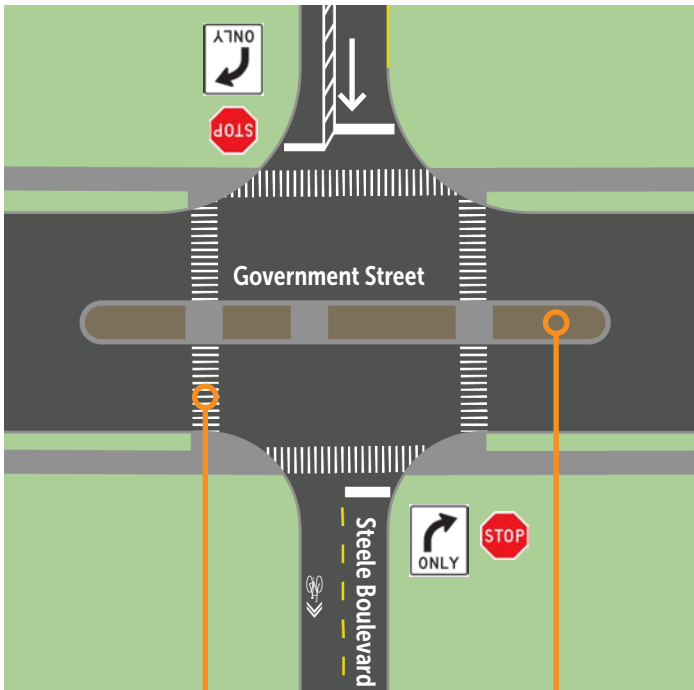
source: NACTO



The existing intersection of Capital Heights and Acadian has the potential for retrofit extended median

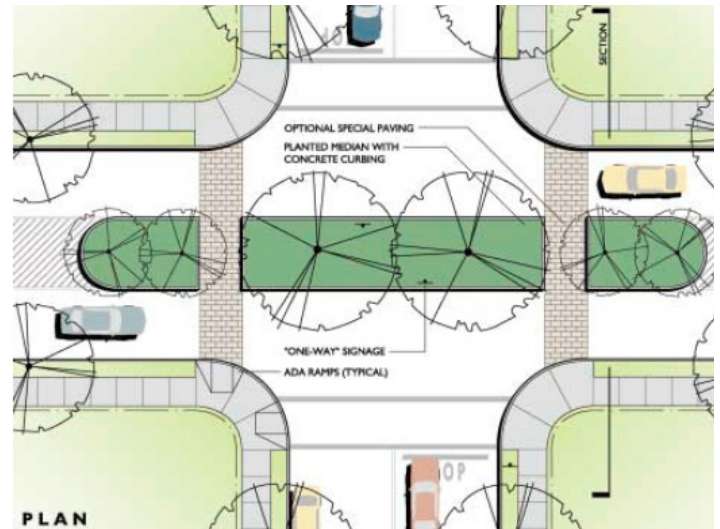
source: Google Maps

INTERSECTION OF STEELE BOULEVARD AND GOVERNMENT STREET:



high visibility crosswalks

extended median with pedestrian refuge



source: DPW's Residential Traffic Calming Manual

DESIGN GUIDELINES:

- Median shall extended beyond cross street to eliminate left turns and cross traffic for vehicles.
- While eliminating some movements for vehicles, extended medians should accommodate the safe and easy crossing of bicyclists and pedestrians.
- Median refuges for pedestrians should be at least 4' wide, and bicycle refuges should be at least 6' wide.
- Wherever possible, medians shall be designed to capture stormwater runoff using slotted curbs and sunken planting area.
- Planting areas should be planted with material that filters and treats stormwater runoff.
- Plantings should not be placed so that they interrupt the sight-line of crossing bicyclists and pedestrians, or that of oncoming vehicles.

9 | Traffic signal synchronization

IMPROVEMENT LOCATIONS:



OVERVIEW:

Synchronizing traffic signals in key areas creates a traffic-free space for bicyclists and pedestrians to cross a busy street that is not signalized.

In the same way that properly synchronized signals benefit traffic flow for motorists, a coordinated system can also help bicycle traffic flow smoothly and safely.

*The areas in question on Foster Drive and Jefferson Highway will likely require a traffic study to determine the feasibility of this recommendation.

APPROPRIATE APPLICATIONS:

- In areas where a major bike route crosses a major roadway between two signals
- At intersections where a bike lane or cycle track crosses a heavily traveled road

SYNCHRONIZE TRAFFIC SIGNALS TO PRIORITIZE BICYCLISTS AT:

CAPITAL HEIGHTS AVENUE AT S. FOSTER DRIVE*

CAPITAL HEIGHTS AVENUE AT JEFFERSON HIGHWAY*

*The areas in question on S. Foster Drive and Jefferson Highway will likely require a traffic study to determine the feasibility of this recommendation.



Capital Heights Avenue at Jefferson Highway
source: Google Maps



Capital Heights Avenue at S. Foster Drive
source: Google Maps



*A new signal at Claycut Road and S. Foster Drive eliminates right turns on red to allow bikes, pedestrians, and vehicles to cross S. Foster Drive at Capital Heights Avenue safely.

DESIGN GUIDELINES:

- Coordinate the timing of traffic signals at Government Street and Foster Drive, and Claycut Road and Foster Drive to allow for the clear crossing of bicyclists at Capital Heights Avenue and S. Foster Drive.
- This recommendation can be used in conjunction with recommendation 15 (pg. 46-47), which calls for HAWK signals at these intersections.
- Coordinate the timing of traffic signals at Government Street and Jefferson Highway, and Claycut Road and Jefferson Highway to allow for the clear crossing of bicyclists at Capital Heights Avenue and Jefferson Highway
- Install high visibility crosswalks at the intersection of Capital Heights Avenue and Jefferson Highway

10 | Bike lane transitions at intersections

IMPROVEMENT LOCATIONS:



OVERVIEW:

Intersection crossing markings are used to indicate the desired path for bicyclists. Markings of various types are used to indicate a bike lane crossing to motorists.

Typical markings range from dashed lines, solid painted green blocks, or modified bike and arrow symbols. These markings go by a number of names, including "elephant feet."

APPROPRIATE APPLICATIONS:

- On streets where a bike lane crosses an intersection
- In areas where visibility of bicyclists to motorists is a concern
- In intersections that can be potentially confusing for bicyclists to navigate

INSTALL IMPROVED BIKE LANE TRANSITIONS AT:

NEIGHBORHOOD INTERSECTIONS

not signalized

MAJOR INTERSECTIONS

signalized



Bike lane intersection crossing with modified "sharrow" symbol in Chicago, IL

source: NACTO



Dashed markings guide bicyclists across intersections, while also signifying the presence of bicyclists to motorists.

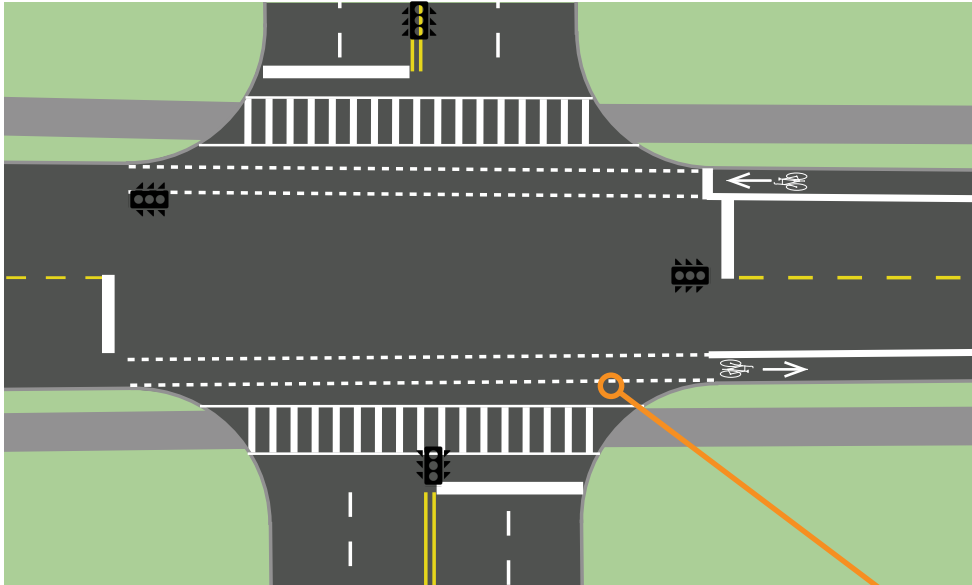
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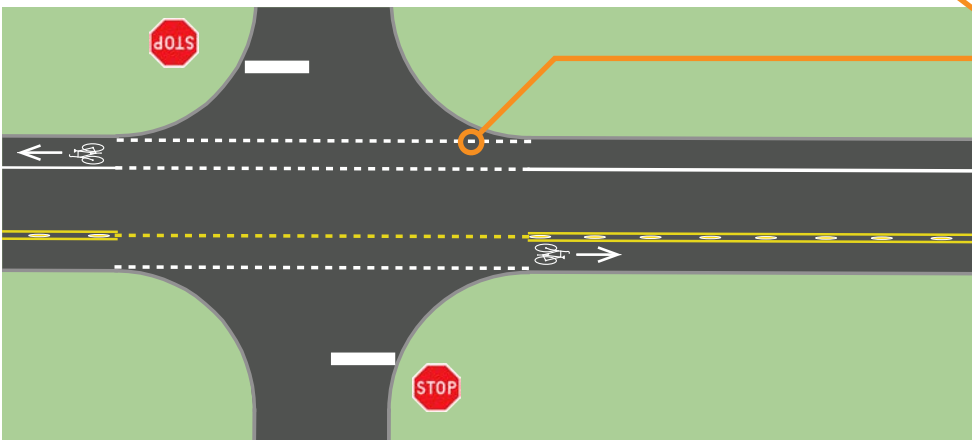
Large or complex intersections can be daunting or confusing for bicyclists, so clear markings are essential.

source: NACTO

TYPICAL DESIGN:



Bike lane transition across a signalized intersection, in conjunction with crosswalks



"Elephant Feet" bike lane transition markings

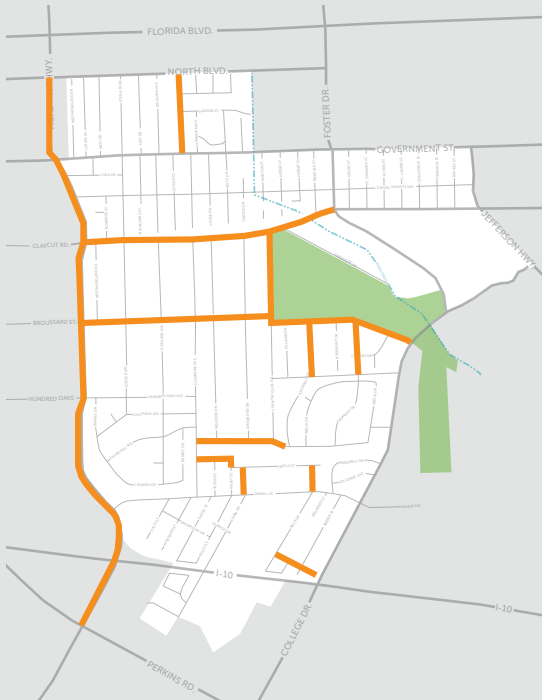
Bike lane transition across a two-way stop neighborhood intersection

DESIGN GUIDELINES:

- Install dashed line or "elephant feet" markings to indicate the desired path of bicyclists across intersections.
- The dashed or dotted line shall conform to MUTCD guidelines.
- Where bikes are expected to stop at an intersection, install white stop bars at intersection, ahead of stop bar in vehicular travel lane.
- Optional: install bike symbol markings between dashed lane lines for increased visibility of bike crossing.

11 | New sidewalks

IMPROVEMENT LOCATIONS:



OVERVIEW:

Sidewalks are a key component of a safe and connected neighborhood. Sidewalks give pedestrians a dedicated space to move along the streets without worrying about conflicts with vehicles.

While sidewalks on most streets would be ideal, there are many obstacles to installing sidewalks including mature trees, storm drains, utility lines, and right of way restrictions.

New sidewalks are proposed for key locations that make the most sense in terms of connectivity.

APPROPRIATE APPLICATIONS:

- Anywhere pedestrians are present or desired
- On streets that link between other streets with sidewalks

INSTALL NEW SIDEWALKS ON:

ACADIAN THRUWAY (PRIORITY)

Bawell Street to BRCVPA, (west side of street)

ACADIAN THRUWAY (LONG TERM)

North Boulevard to Perkins Road (missing sections, both sides of roadway)

AVONDALE DRIVE AND ORMANDY DRIVE

Westdale Drive to neighborhood trail

BROUSSARD STREET

Acadian Thruway to Country Club Drive

CLAYCUT ROAD

Acadian Thruway to Foster Drive (south side of Claycut Road)

EDISON STREET*

Government Street to North Boulevard

WEBB PARK PERIMETER

Along Claycut Road, Country Club Drive**, and Westdale Drive**

WOODSIDE DRIVE, WELLS STREET, BALIS DRIVE, AND ALDRICH DRIVE

Fill in missing areas (see map)

*Edison Street sidewalk is included in the Bernard Terrace Elementary School Safe Routes to School (SRTS) grant.

**Because of safety and liability concerns, BREC is not in support of installing sidewalks on Country Club Drive and Westdale Drive.



A temporary "sidewalk" was added to Claycut Road to link Capital Heights to Webb Park during the Street Smart demonstration.

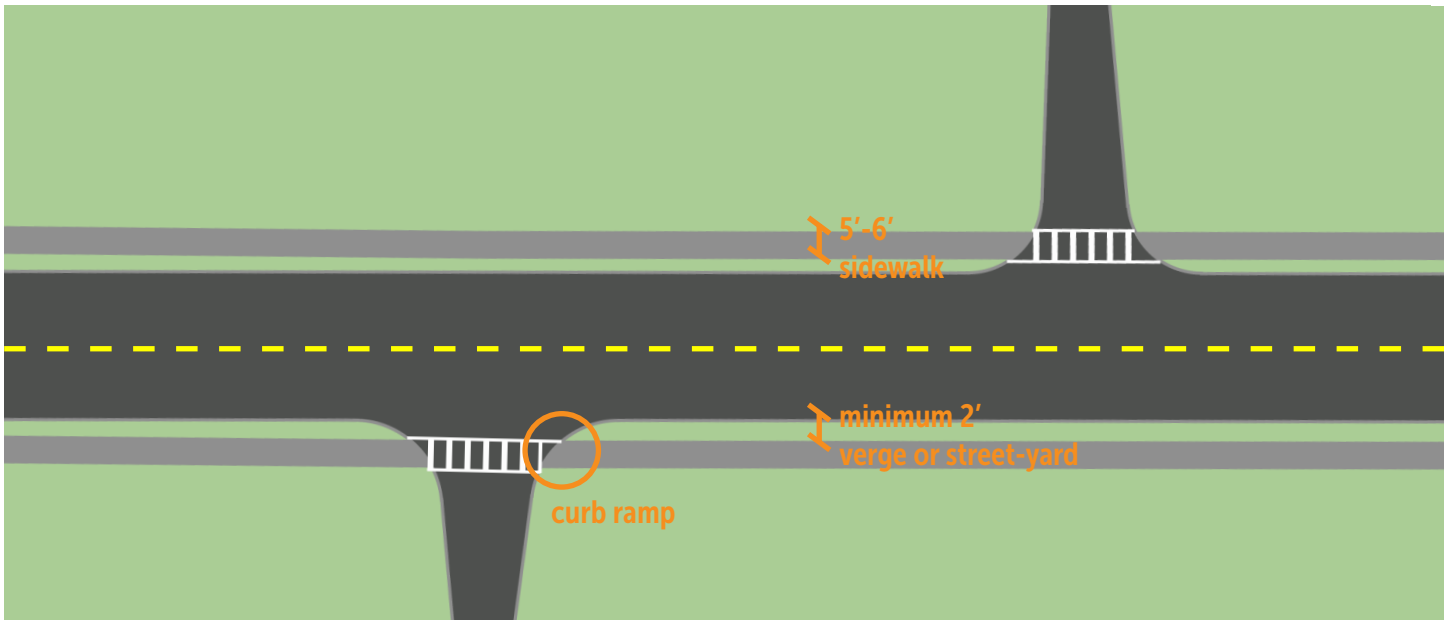
source: CPEX



This section of Myrtle Avenue has a sidewalk on only one side of the street.

source: Google Maps

TYPICAL DESIGN:



DESIGN GUIDELINES:

- Install concrete sidewalks, 5'-6' wide.
 - A 5'-wide sidewalk allows 2 people to walk side by side and addresses ADA requirements for passing areas.
- Sidewalks should be located as far back from the curb as the right of way and any obstructions allow.
- Install high visibility crosswalks where pedestrians are expected to cross streets.
- Where possible, install integrated concrete transit pads along bus routes.
- When possible, sidewalks shall be installed on both sides of the street with the following exceptions:
 - Claycut Road- only on the south side of the street due to presence of mature trees and steep grade change
 - Acadian Thruway- only on the west side of street between Bawell Street and BRCVPA
- Lighting should be provided along pedestrian routes, especially sidewalks not adjacent to public streets.

12 | Improvements to prioritize pedestrians

IMPROVEMENT LOCATIONS:



OVERVIEW:

The Webb Park neighborhood trail and the Ward Creek crossing on Moore Street are important linkages for bike and pedestrian users.

A few key improvements including re-striping, crosswalks, and signage can make the trail safer and more useful as a connection to other facilities.

The Moore Street bridge can be made more accessible to bicyclists by removing the bollards and trimming the overgrown vegetation.

Lighting along the pathways in Nairn Park can improve safety for pedestrians in the area at night.

IMPROVE THE FOLLOWING LOCATIONS TO PRIORITIZE PEDESTRIANS:

MOORE STREET

Ward Creek crossing

NAIRN DRIVE PARK PATH

at Ferrett Street

WEBB PARK NEIGHBORHOOD TRAIL

Country Club Drive to College Drive



Ward Creek crossing at Moore Street

source: Google Maps



Webb Park neighborhood trail at College Drive

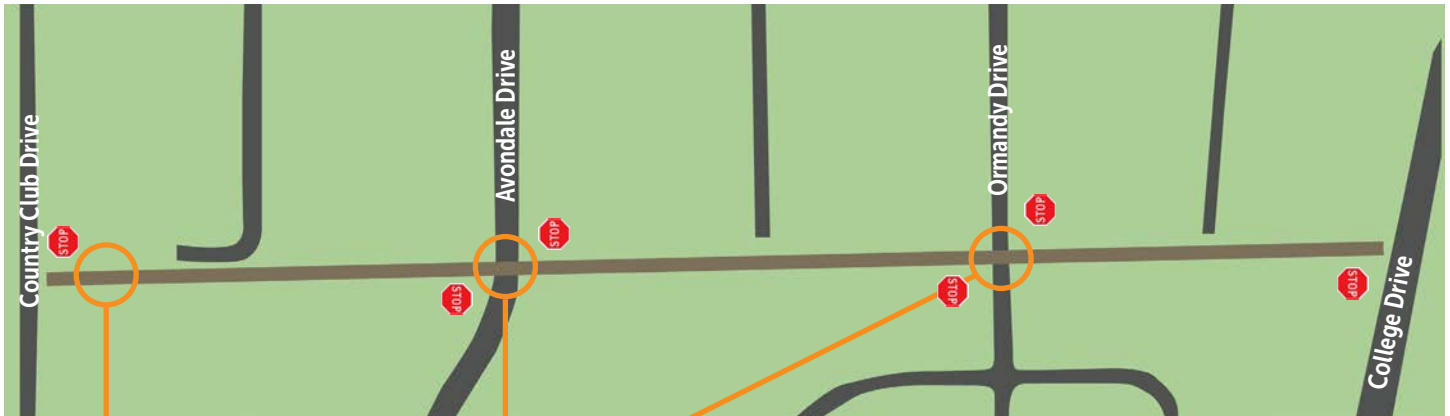
source: Google Maps



Nairn Drive Park path at Ferrett Street

source: Google Maps

WEBB PARK NEIGHBORHOOD TRAIL DESIGN:



Widen trail to 12 to 14 feet to safely accommodate bikes and pedestrians.

Install high visibility raised crosswalks where streets cross trail.



A temporary trail head was placed at the Country Club Drive end of the trail for the Street Smart demonstration weekend.
source: CPEX



This neighborhood asset has the potential to be a gathering space for local residents.
source: CPEX

DESIGN GUIDELINES:

- Widen asphalt path to 10' wide or greater for two-way shared use path
- Install high visibility raised crosswalks where the trail crosses Ormandy and Avondale.
- Install signage to mark the beginning and end of the trail, as well as approaching street crossings.
- Trim overgrown plant material that obstruct the trail at Ferrett Street.
- Add new bollards to the trail to prevent vehicles from using the trail.
- Trim overgrown plant material that may be obstructing passage across the bridge at Moore Street.
- Install lighting along the Nairn Park path to Ferrett Street.
- Install pet litter disposal stations along the trail.

13 | Intersection improvements (bike/ped refuges)

IMPROVEMENT LOCATIONS:



INSTALL IMPROVED INTERSECTIONS AT:

ACADIAN THRUWAY AT CAPITAL HEIGHTS AVENUE
GOVERNMENT STREET AT EDISON STREET

OVERVIEW:

The intersection of Government Street and Edison Street is a key location for pedestrians to cross. Assuming Government Street will be redesigned as a 3-lane road, an extended median and pedestrian refuge will improve the safety of crossing pedestrians.

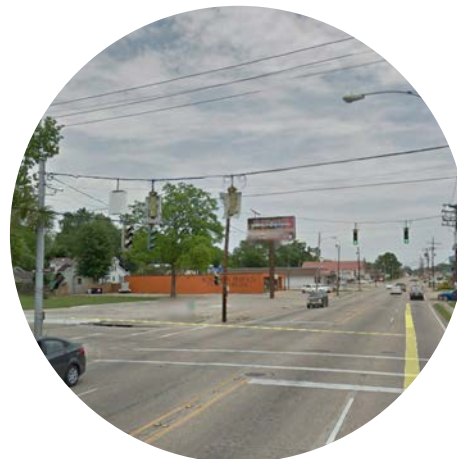
Reconfiguring the intersection of Capital Heights Avenue and Acadian Thruway can improve safety and eliminate confusion for all users.

APPROPRIATE APPLICATIONS:

- At intersections where bicyclists frequently cross a busy street
- At intersections where pedestrians frequently cross a busy street

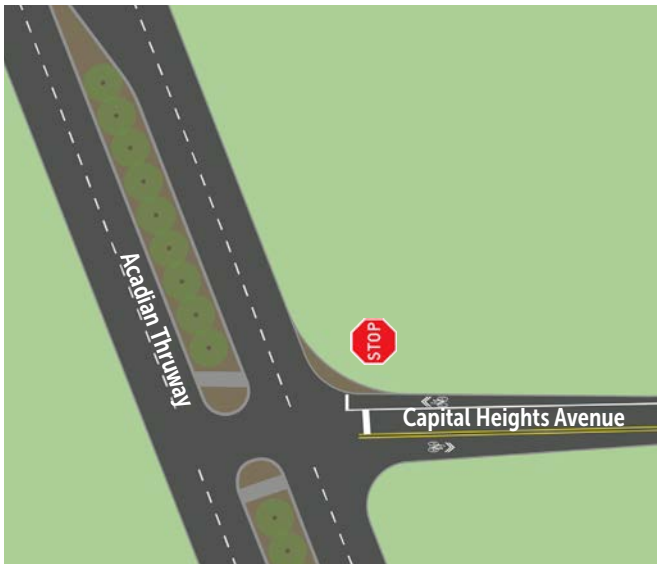


Medians can provide a protected area for bikes and pedestrian, while incorporating attractive landscaping.
source: NACTO

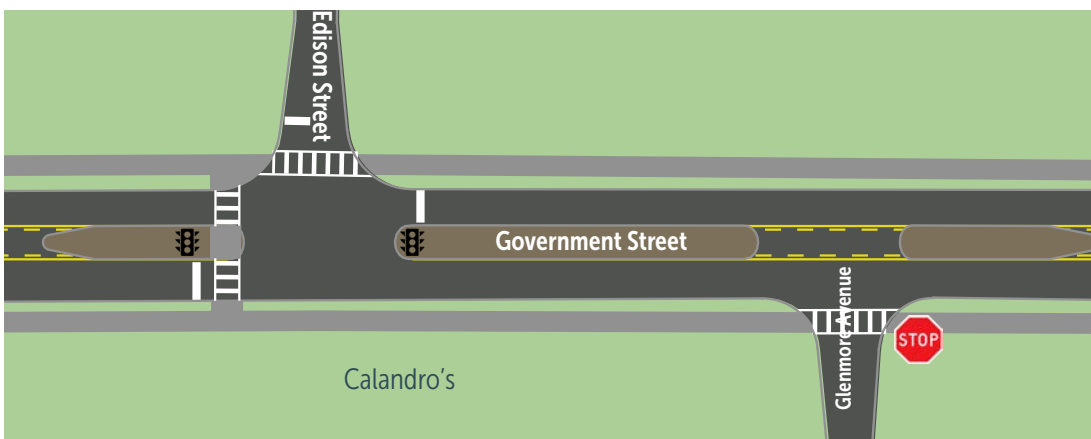


Pedestrians often cross Government Street near Calandro's despite the lack of proper facilities and a dangerous crossing.
source: Google Maps

ACADIAN THRUWAY AT CAPITAL HEIGHTS AVENUE:



GOVERNMENT STREET AT EDISON STREET



DESIGN GUIDELINES:

- Median shall extend far enough to provide a pedestrian refuge at least 4'-wide.
- Median shall extend far enough to provide a bicycle refuge at least 6'-wide.
- Median and street shall be marked and signed appropriately to notify motorists of the presence of pedestrians and bicyclists.
- Where possible, design medians to capture stormwater runoff using slotted curbs and sunken planting area.
- Landscaped areas should contain plants that filter and treat stormwater.
- Plantings should not interrupt the sight-line of crossing bicyclists and pedestrians, or that of oncoming vehicles.

14 | Raised intersection

IMPROVEMENT LOCATION:



INSTALL A RAISED INTERSECTION AT:

COUNTRY CLUB DRIVE AT BROUSSARD STREET

OVERVIEW:

Raising an entire intersection to the level of the sidewalks has a number of benefits ranging from slower traffic and improved safety, to opportunities for creative intersection paving design.

The high number of pedestrians, speeding issues, and its proximity to Webb Park make this intersection a good candidate for this treatment.

APPROPRIATE APPLICATIONS:

- At intersections with frequent pedestrian crossings
- At intersections where speed may be an issue
- Raised intersections can be used to designate special zones such as near a park or school.



This raised intersection utilizes alternate paving for the crosswalk areas of the intersection.

source: Google Images



This example uses pavers in the intersection to provide a distinct contrast from the surrounding asphalt.

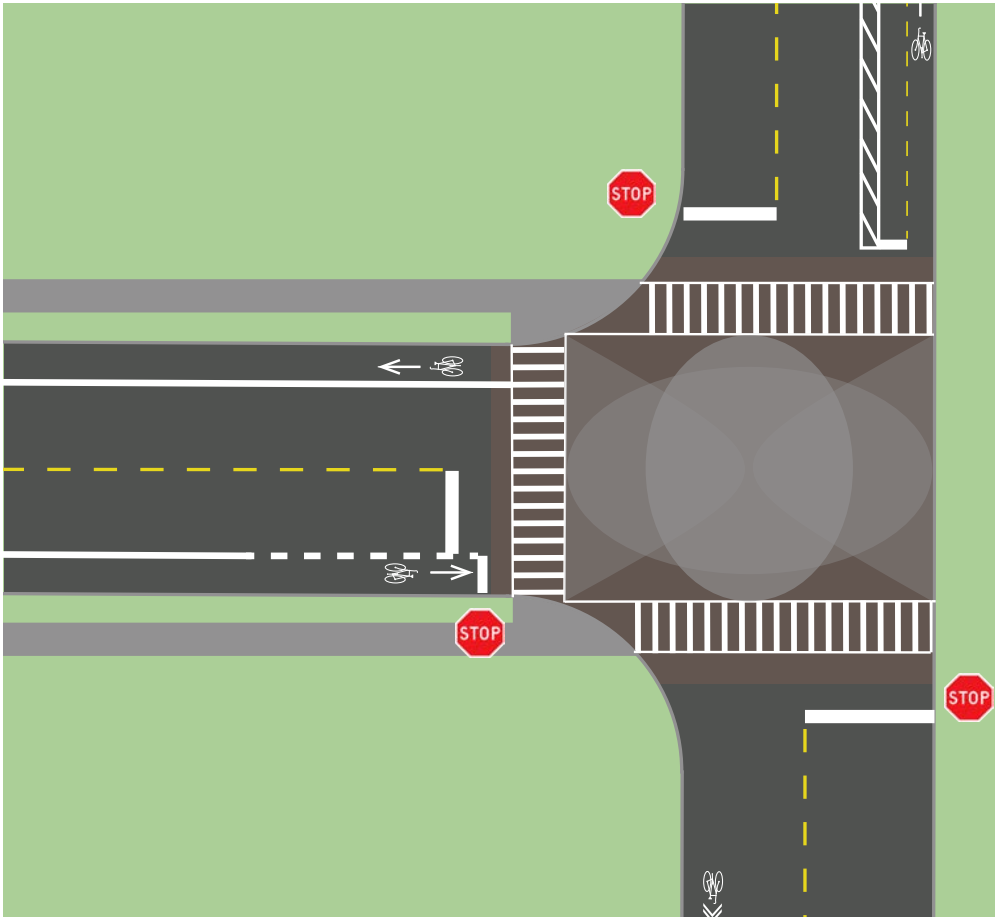
source: Google Images



The intersection of Broussard Street and Country Club Drive was temporarily painted for the Street Smart demonstration weekend to improve safety near Webb Park.

source: CPEX

CONCEPTUAL DESIGN FOR THE INTERSECTION OF BROUSSARD STREET AND COUNTRY CLUB DRIVE



DESIGN GUIDELINES:

- Install raised intersection that elevates the pedestrian crossing plane to the level of the sidewalk.
- Install appropriate warning signage to indicate to users that they are approaching a raised intersection.
- The slope of the crosswalk edge should not exceed 1:10 or be less than 1:25.
- Ideally, the crossing surface should be made of unit pavers in a contrasting color to the surrounding pavement.
- The slopes and edges should be made of concrete for maximum durability.
- Raised intersections should be designed not to interfere with street drainage.

15 | HAWK beacon & crosswalk

IMPROVEMENT LOCATIONS:



INSTALL HAWK BEACON AND CROSSWALK AT:

CAPITAL HEIGHTS AVENUE AT S. FOSTER DRIVE

CAPITAL HEIGHTS AVENUE AT JEFFERSON HIGHWAY

OVERVIEW:

A high intensity activated crosswalk, or HAWK, beacon is a pedestrian activated traffic signal used to give pedestrians a clear and safe road crossing.

The number of neighborhood pedestrians who wish to cross Jefferson Highway at Capital Heights Avenue to access commercial services and amenities makes this a suitable location for this treatment.

APPROPRIATE APPLICATIONS:

- At locations where a traffic engineering study finds the location in question to be suitable
- Variables include traffic volume and speed, as well as the gaps in traffic that may not allow for a safe pedestrian crossing



HAWK signal on a busy street
source: Google Images

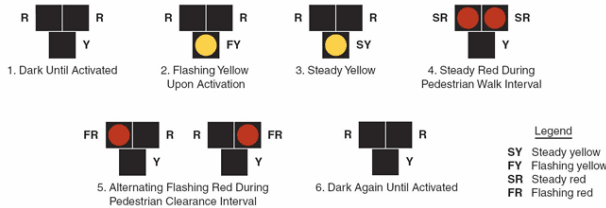


HAWK signal and high visibility crosswalk on a busy street
source: bikepedinfo.org

PROPOSED LOCATION FOR HAWK BEACON:



Figure 4F-3. Sequence for a Pedestrian Hybrid Signal



Signal sequencing per MUTCD

DESIGN GUIDELINES:

- The HAWK beacon should be installed at least 100' from side streets or driveways that are controlled by STOP or YIELD signs.
- Parking and other sight obstructions should be prohibited for at least 100' in advance of and at least 20' beyond the marked crosswalk, or site accommodations should be made through curb extensions or other techniques to provide adequate sight distance.
- The installation should include suitable standard signs and pavement markings.
- If installed within a signal system, the HAWK beacon should be coordinated with the signal system.
- Install high visibility crosswalks across Jefferson Highway in coordination with HAWK beacon.

16 | Crosswalk and traffic signal additions and improvements

IMPROVEMENT LOCATIONS:



OVERVIEW:

High visibility crosswalks incorporate bold striping, alternate paving materials, and even flashing pavement lights to improve visibility of the crossing to both drivers and pedestrians.

Pedestrian countdown signals help pedestrians better gauge how much time they have to make it across an intersection.

APPROPRIATE APPLICATIONS:

- Anywhere pedestrians cross a street
- At crossings where driver visibility is a concern
- At crossings where speed is a concern
- High visibility crosswalks are especially useful at mid block crossings.

INSTALL CROSSWALKS AND IMPROVED TRAFFIC SIGNALS AT:

ACADIAN THRUWAY AT:

Bawell Street, Broussard Street, Claycut Road, & Hundred Oaks Avenue

BALIS DRIVE AT FERRETT STREET

BAWELL STREET AT:

Nairn Drive & College Drive

CAPITAL HEIGHTS AVENUE AT JEFFERSON HIGHWAY

CLAYCUT ROAD AT MOORE STREET

COLLEGE DRIVE AT I-10 RAMP

EDISON STREET AT:

Government Street, Hatcher Street*, Hanson Street*, North Boulevard

NEIGHBORHOOD TRAIL AT:

Avondale Drive and Ormandy Drive

NORTH BOULEVARD AT PEACHTREE BOULEVARD

*These crosswalks are included in the Bernard Terrace Elementary School Safe Routes to School (SRTS) grant.



High visibility crosswalks across a neighborhood street

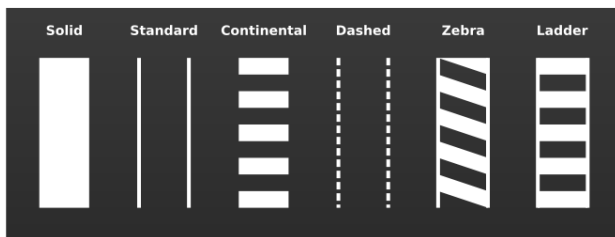
source: NACTO



High visibility crosswalks across a multi-lane commercial street

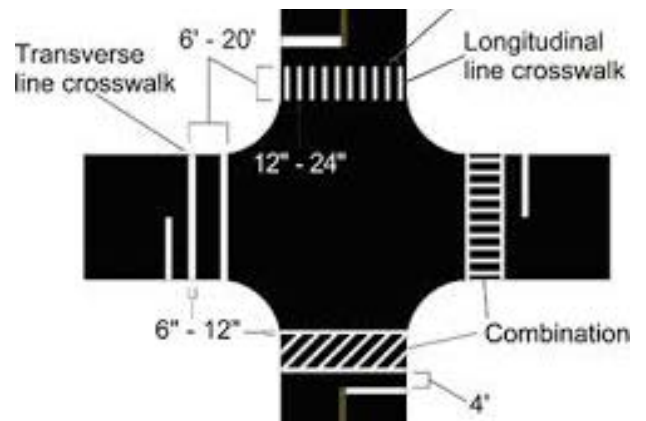
source: NACTO

TYPICAL PEDESTRIAN COUNTDOWN SIGNAL:



STANDARD STYLES AND LAYOUT FOR HIGH VISIBILITY CROSSWALKS

Figure 4E-1. Typical Pedestrian Signal Indications



DESIGN GUIDELINES:

- Install high visibility crosswalks so that they are aligned as closely as possible with the sidewalk or pedestrian zone.
- Utilize ladder, zebra, or continental style crosswalk markings to increase visibility.
- Stop bars should be located 4' behind the crosswalk.
- Install ADA-compliant ramps to access crosswalk wherever necessary.
- Install traffic signals with pedestrian countdown at the following intersections:
 - Acadian Thruway at Claycut Road
 - Acadian Thruway at Broussard Street
 - Acadian Thruway at Bawell Street

List of Recommendations

TRAFFIC CALMING NETWORK

Level I elements

1 | High visibility crosswalks (BT, CH, VP, WP)

- Acadian Thruway at Bawell Street, Broussard Street, Claycut Road, and Hundred Oaks Avenue
- Balis Drive at Ferrett Street
- Bawell Street at College Drive and Nairn Drive
- Capital Heights Avenue at Jefferson Highway
- College Drive at I-10 ramp
- Claycut Road at Moore Street
- Edison Street at Government Street, Hanson Street, Hatcher Street, and North Boulevard
- Neighborhood trail at Avondale Drive and Ormandy Drive
- North Boulevard at Peachtree Boulevard

2 | New signage and speed limit reduction (BT, CH, VP, WP)

- Stop signs on Bawell Street, Capital Heights Avenue, Claycut Road, and Hundred Oaks Avenue
- Street sign replacement
- Speed limit reduction on non-stripped streets
- Permanent speed radar on Bawell Street

3 | Lane narrowing (re-striping) (BT, CH, VP, WP)

- | | | |
|--------------------------|-----------------------------|----------------------|
| • Broussard Street | • Glenmore Avenue | • Steele Boulevard |
| • Capital Heights Avenue | • Hundred Oaks Avenue | • West Drive |
| • Country Club Drive | • Lovers Lane | • Westmoreland Drive |
| • Edison Street | • Nairn Drive/Valley Street | • Woodside Drive |

4 | Mid-block bulbouts (BT)

- Lovers Lane
- Westmoreland Drive

Level II elements

5 | Raised crosswalks (CH, WP)

- Claycut Road at Moore Street and Steele Boulevard
- Neighborhood trail at Avondale Drive and Ormandy Drive

6 | Raised intersection (WP)

- Country Club Drive at Broussard Street

7 | Traffic chokers (BT, WP)

- East Drive
- Ingleside Drive
- Longwood Drive
- Richland Avenue

8 | Chicanes (WP)

- Avondale Drive
- Ormandy Drive
- Woodside Drive

Level III elements

9 | Extended median (BT, CH)

- Government Street at Steele Boulevard

BT= Bernard Terrace
CH= Capital Heights
VP= Valley Park
WP= Webb Park



* The Level I-III organization in this section is taken from DPW's *Residential Traffic Calming Manual*, which also organizes traffic calming elements in levels I-III. Level I elements are the least time and resource intensive to implement, while Level III elements are the most intensive.



PROPOSED TRAFFIC CALMING IMPROVEMENTS

- Level I improvement
- Level II improvement
- Level III improvement



1 | High visibility crosswalks

IMPROVEMENT LOCATIONS:



OVERVIEW:

High visibility crosswalks incorporate bold striping, alternate paving materials, and even flashing pavement lights to improve visibility of the crossing to both drivers and pedestrians.

These improved crosswalks are recommended for a number of busy intersections throughout the Street Smart district.

APPROPRIATE APPLICATIONS:

- Anywhere pedestrians cross a street
- At crossings where driver visibility is a concern
- At crossings where speed is a concern
- High visibility crosswalks are especially useful at mid block crossings

INSTALL HIGH VISIBILITY CROSSWALKS AT:

ACADIAN THRUWAY AT:

Bawell Street, Broussard Street, Claycut Road, Hundred Oaks Avenue

BALIS DRIVE AT FERRETT STREET

BAWELL STREET AT:

College Drive and Nairn Drive

CAPITAL HEIGHTS AVENUE AT JEFFERSON HIGHWAY

CLAYCUT ROAD AT MOORE STREET

COLLEGE DRIVE AT I-10 RAMP

EDISON STREET AT:

Government Street, Hanson Street*, Hatcher Street*, North Boulevard

NEIGHBORHOOD TRAIL AT:

Avondale Drive and Ormandy Drive

NORTH BOULEVARD AT PEACHTREE BOULEVARD

*These crosswalks are included in the Bernard Terrace Elementary School Safe Routes to School (SRTS) grant.



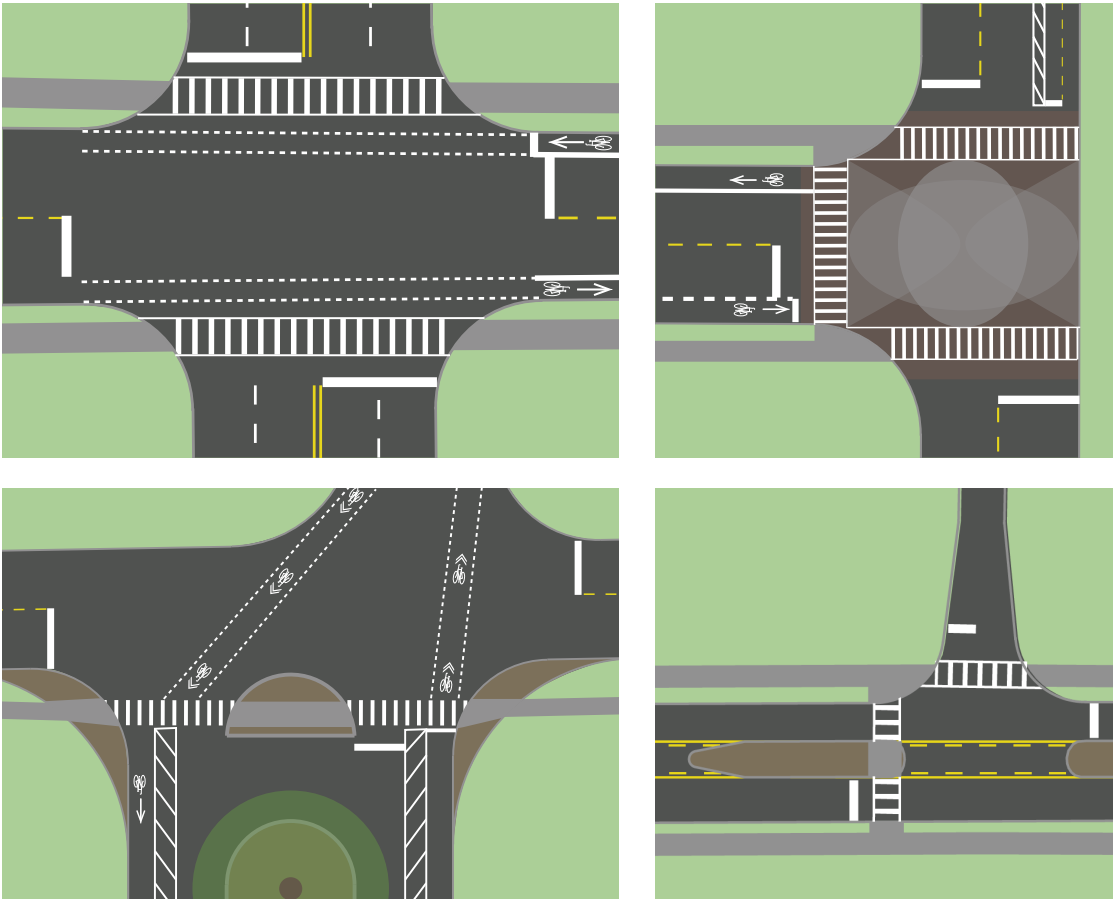
High visibility crosswalks across a neighborhood street

source: NACTO

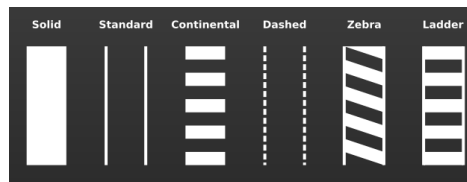


High visibility crosswalks across a multi-lane commercial street

source: NACTO



These are a few of the numerous applications of high visibility crosswalks that are recommended for the Street Smart district.

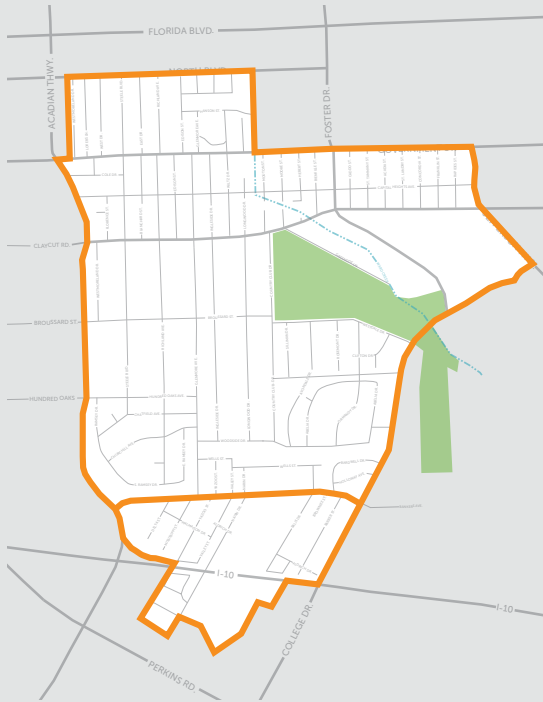


DESIGN GUIDELINES:

- Install high visibility crosswalks so that they are aligned as closely as possible with the sidewalk or pedestrian zone.
- Utilize ladder, zebra, or continental style crosswalk markings to increase visibility.
- Stop bars should be located 4' behind the crosswalk.
- Install ADA-compliant ramps to access crosswalk wherever necessary.
- Install alternate paving crosswalks on newly constructed or re-constructed streets.
- Alternate paving materials may include: unit pavers, concrete (on asphalt streets), or other materials that provide visual and textural contrast to the surrounding street.

2 | New signage and speed limit reduction

IMPROVEMENT LOCATIONS:



OVERVIEW:

Lower speed limits and new high visibility signage can be effective at slowing down traffic through neighborhood streets.

The Department of Public Works is already in the process of replacing signs and lowering speed limits.

INSTALL NEW SIGNAGE AND IMPLEMENT SPEED LIMIT REDUCTION:

STOP SIGNS ON:

Bawell Street, Capital Height Avenue, Claycut Road, Hundred Oaks Avenue

STREET SIGN REPLACEMENT

SPEED LIMIT REDUCTION ON NON-STRIPED STREETS

PERMANENT SPEED RADAR ON BAWELL STREET



A permanent radar sign on S. Ardenwood Drive in Baton Rouge

source: CPEX

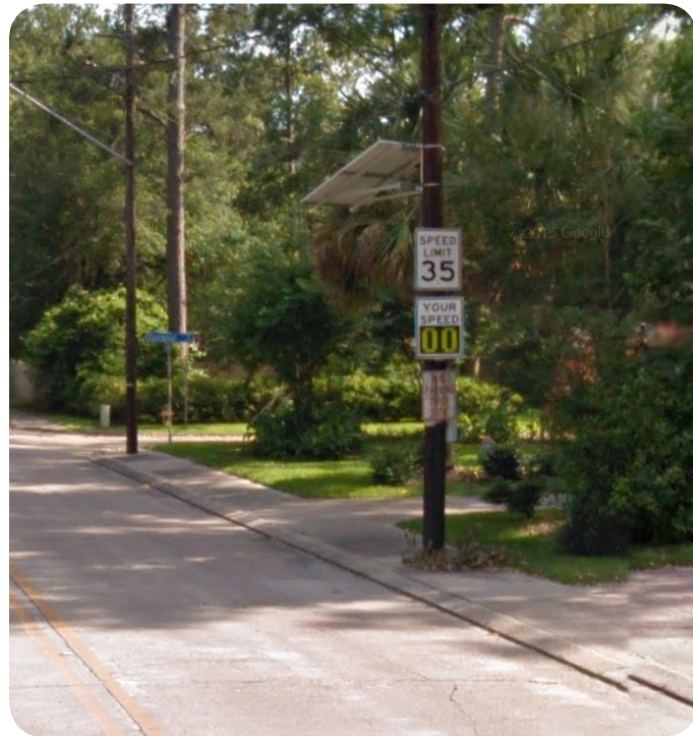


Custom high visibility street signs are used in many neighborhoods, like this one in Spanishtown.

source: brgov.com



MUTCD R2-1 signage for new, lower speed limit on non-stripped neighborhood streets



A solar-powered radar informs drivers of their speed. This example is located on S. Ardenwood Drive

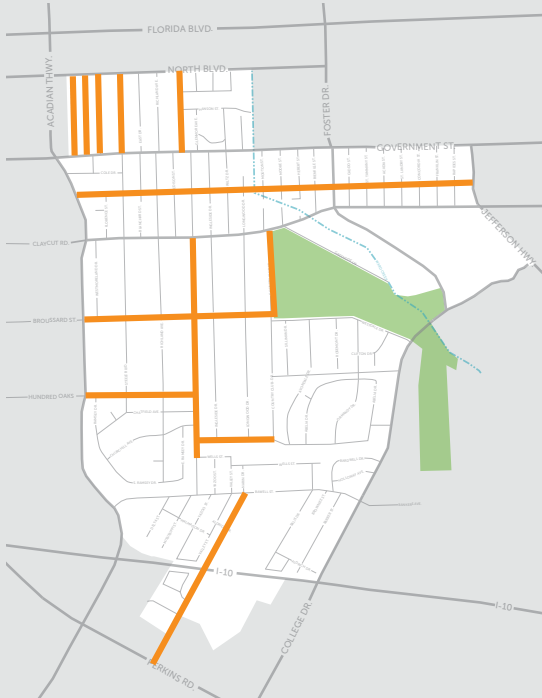
DESIGN GUIDELINES:

- Speed limit reduction from 30 to 25 MPH on non-stripped neighborhood streets is already underway.
- New high visibility street, stop, and speed limit signs are to be installed throughout the zone.
- Install a permanent speed radar sign on Bawell Street in conjunction with the posted speed to notify drivers of their speed.
- Install appropriately-spaced *STOP signs on:
 - Capital Heights Avenue
 - Hundred Oaks Avenue
 - Bawell Street
 - Claycut Road

*Stop signs should be spaced so that they have maximum effectiveness in slowing down drivers.

3 | Lane narrowing (re-striping)

IMPROVEMENT LOCATIONS:



OVERVIEW:

Lane narrowing by re-striping is a simple and cost-effective way to slow traffic.

In many cases throughout the recommendations, lane narrowing is a byproduct of the addition of bike lanes or other elements.

APPROPRIATE APPLICATIONS:

- On streets where traffic calming is desired
- On streets with lanes that are wider than necessary
- On streets with where bike lanes are added within the existing roadway width

RE-STRIPE TO NARROW THE TRAVEL LANES ON:

- BROUSSARD STREET** (Country Club to Acadian)
- CAPITAL HEIGHTS AVENUE** (entire length)
- COUNTRY CLUB DRIVE** (Claycut to Broussard)
- EDISON STREET** (Government to North)
- GLENMORE AVENUE** (Wells to Claycut)
- HUNDRED OAKS AVENUE** (Acadian to Glenmore)
- LOVERS LANE** (Government to North)
- NAIRN DRIVE/VALLEY STREET** (Bawell to Perkins)
- STEELE BOULEVARD** (Government to North)
- WEST DRIVE** (Government to North)
- WESTMORELAND DRIVE** (Government to North)
- WOODSIDE DRIVE** (Country Club to Glenmore)



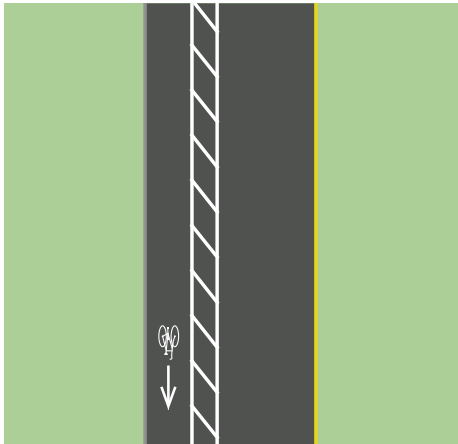
Extra wide streets can be narrowed through the addition of a striped buffer at the outside edge of the street.
source: CPEX



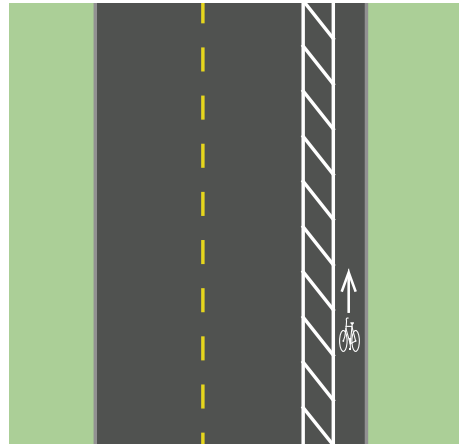
Country Club Drive was temporarily narrowed by the addition of bike lanes and a planting strip during the Street Smart demonstrations.
source: CPEX

EXAMPLES OF RE-STRIPING ON VARIOUS STREETS THROUGHOUT THE STREET SMART DISTRICT:

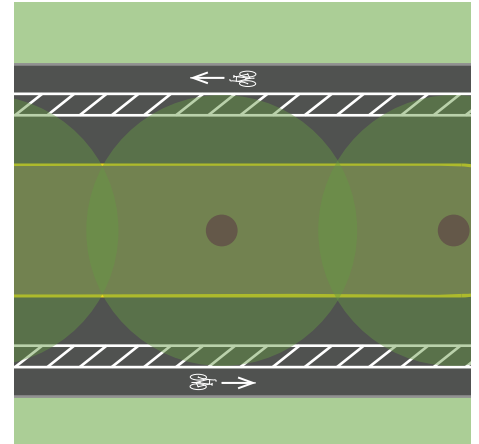
Steele Boulevard



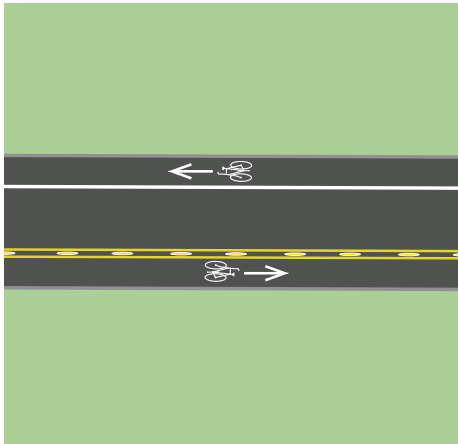
West Drive



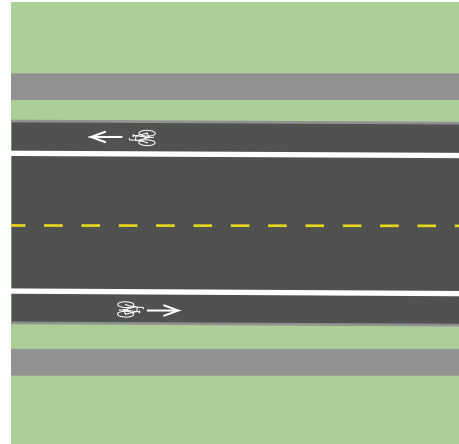
Glenmore Avenue



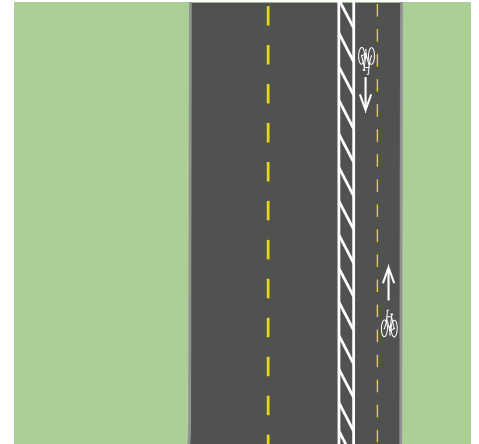
Capital Heights Avenue



Brossard Street



Country Club Drive



GUIDELINES:

- Re-stripe to create narrower travel lanes on streets where a bike lane is being added within the existing street.
- Layout of street markings shall conform to local and MUTCD guidelines for road markings
- On wide streets that do not have a bike lane, wider striping or a striped buffer on the outside of the lane can create the same effect of narrower lanes.

4 | Mid-block bulbouts

IMPROVEMENT LOCATIONS:



OVERVIEW:

Bulbouts may be painted or curbed islands that periodically narrow a roadway to slow traffic. The bulbout areas can be paved or planted and used in conjunction with the stormwater system to help mitigate street flooding by accepting stormwater.

APPROPRIATE APPLICATIONS:

- On streets where traffic calming is desired.
- On streets where additional stormwater management is necessary.
- On wide streets where on-street parking is needed.

INSTALL MID-BLOCK BULBOUTS ON:

LOVERS LANE

Between Government Street and North Boulevard

WESTMORELAND DRIVE

Between Government Street and North Boulevard

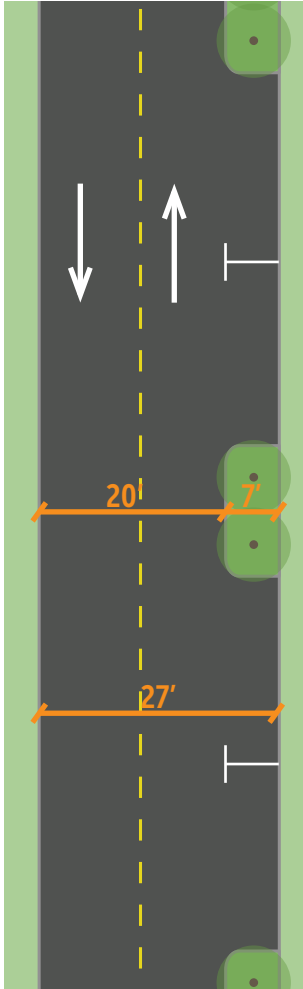


Bulbouts can be used in conjunction with on-street parallel parking to break up large expanses of pavement. source: deq.state.or.us

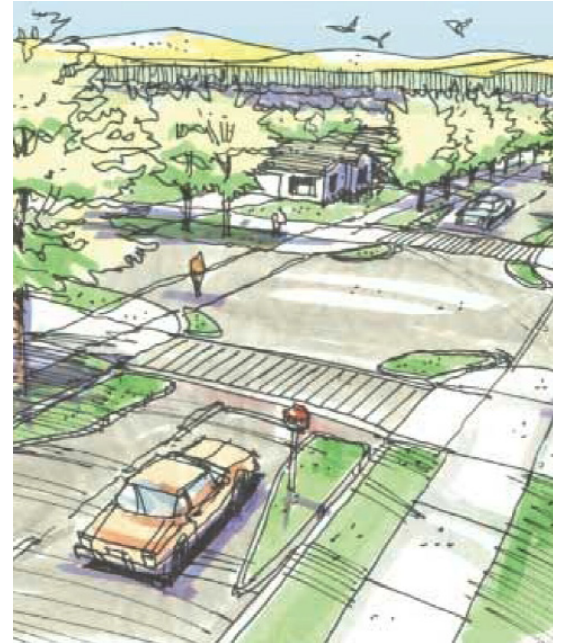
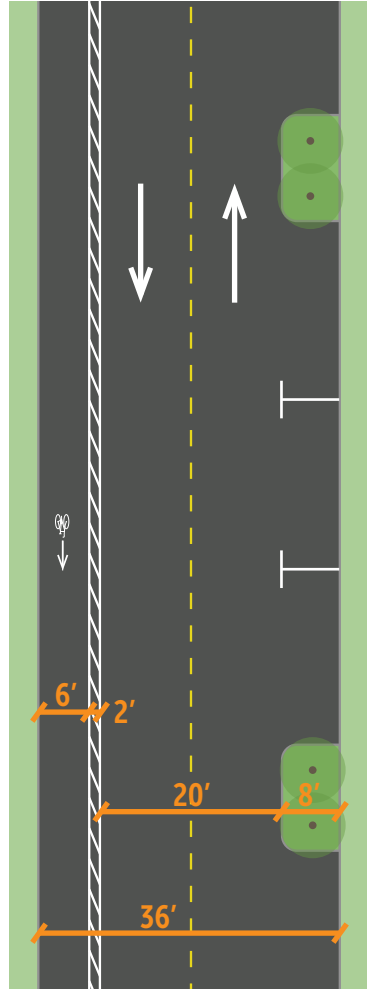


This mid-block bulbout is located on a residential street and is tied into the stormwater system. source: ASLA

LOVERS LANE :



WESTMORELAND DRIVE:



DPW's Residential Traffic Calming Manual classifies minor bulbouts as a Level I traffic calming measure.

DESIGN GUIDELINES:

- Re-stripe Lovers Lane to accommodate two 10' travel lanes and a 7' parking lane on the east side of the street.
- Install 7'-wide curbed bulbouts on the east side of the street. Spacing to be determined by specific site restraints, storm drain location, and residential parking needs.
- Layout of street markings shall conform to local and MUTCD guidelines for road markings.
- Bulbout curbs should be slotted to accommodate stormwater. Bulbouts should be planted with plant materials that will tolerate inundation.
- Restripe Westmoreland Drive to accommodate a 6' bike lane on the west side of the street, two 10' travel lanes, and an 8'-wide parking lane on the east side of the street.
- Install 8'-wide curbed bulbouts on the east side of the street. Spacing to be determined by specific site restraints, storm drain location, and residential parking needs.

5 | Raised crosswalks

IMPROVEMENT LOCATIONS:



OVERVIEW:

Raised crosswalks are an improved version of standard high visibility crosswalks. Raised crossings allow pedestrians to cross a street at the same level as the sidewalk. This also creates a raised area in the street that slows traffic.

Raised crosswalks often incorporate paving material that is different from the street. This adds another level of awareness to motorists as they approach and cross a raised crosswalk.

APPROPRIATE APPLICATIONS:

- Anywhere pedestrians regularly cross a street
- On streets where speed is a concern
- Especially beneficial near schools or parks

INSTALL RAISED CROSSWALKS AT:

CLAYCUT ROAD

at Moore Street & Steele Boulevard

NEIGHBORHOOD TRAIL

at Ormandy Drive & Avondale Drive



This mid-block raised crosswalk is a simple design made of asphalt, which is consistent with the surrounding street.

source: pedbikesafe.org



This design utilizes improved features such as unit pavers and a solar-powered flashing signal.

source: pedbikesafe.org

TYPICAL DESIGN:



source: DPW's Residential Traffic Calming Manual



These raised crosswalks utilize contrasting pavers to distinguish the crosswalk from the street.

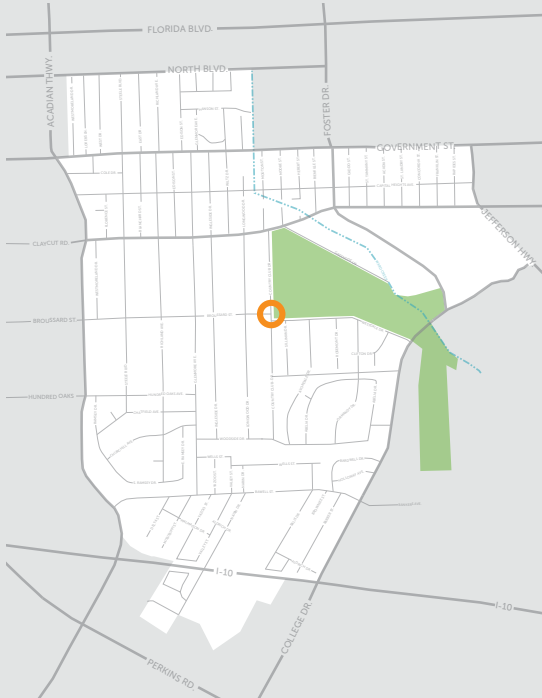
source: pedbikesafe.org

DESIGN GUIDELINES:

- Install raised crosswalks that elevate the crossing plane to the level of the sidewalk.
- Install MUTCD W11-2 signage to warn drivers that they are approaching the crossing.
- The slope of the crosswalk edge should not exceed 1:10 or be less than 1:25.
- Ideally, the crossing surface should be made of unit pavers in a contrasting color to the surrounding pavement.
- The slopes and edges should be made of concrete for maximum durability.
- Raised crosswalks should be designed not to interfere with street drainage.

6 | Raised intersections

IMPROVEMENT LOCATION:



OVERVIEW:

Raising an entire intersection to the level of the pedestrian plane has a number of benefits, ranging from slower traffic and improved safety, to opportunities for creative intersection paving design.

The intersection of Broussard Street and Country Club Drive is a good fit for this treatment because of the high number of pedestrians, speeding issues, and its proximity to Webb Park.

APPROPRIATE APPLICATIONS:

- At intersections with frequent pedestrian crossings
- At intersections where speed may be an issue
- Raised intersections can be used to designate special pedestrian zones such as near a park or school.

INSTALL RAISED INTERSECTION AT:

COUNTRY CLUB DRIVE AT BROUSSARD STREET

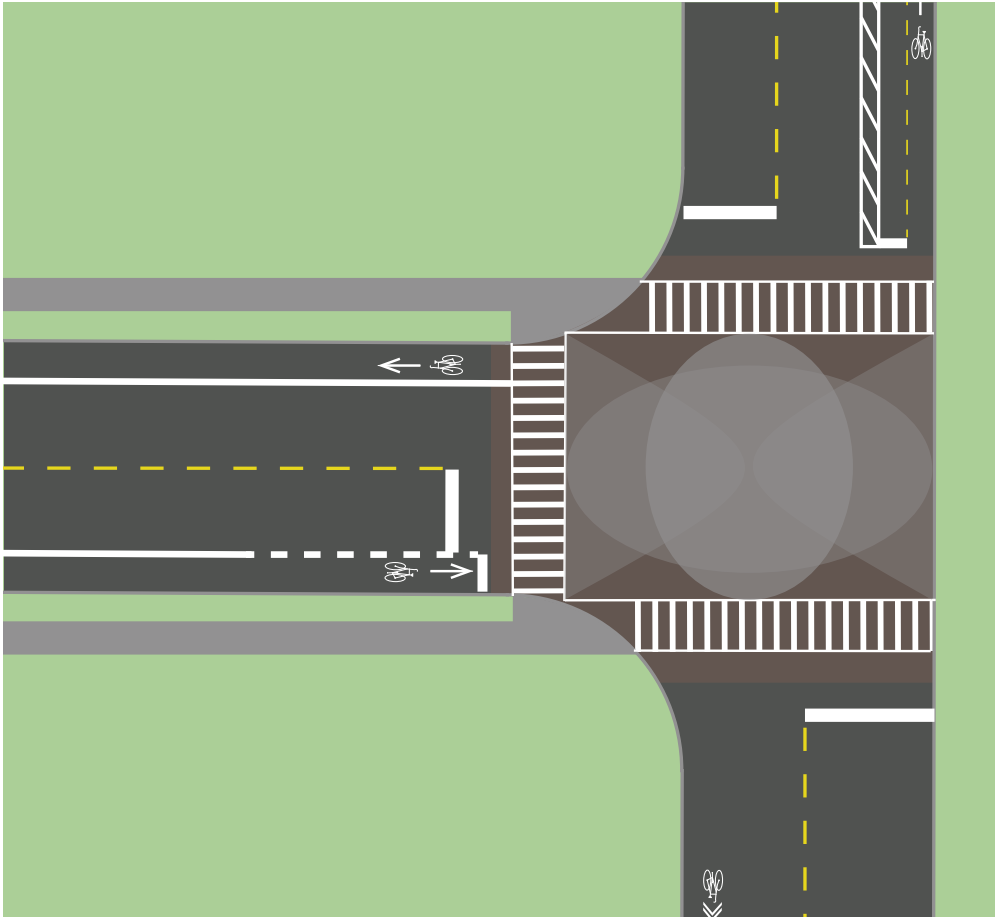


In this example the field of the intersection is raised and paved with unit pavers, providing a distinct contrast from the surrounding asphalt.
source: fruitville210.org



This raised intersection utilizes alternate paving for the crosswalk areas of the intersection.
source: njbikeped.org

CONCEPTUAL DESIGN FOR THE INTERSECTION OF BROUSSARD STREET AND COUNTRY CLUB DRIVE:

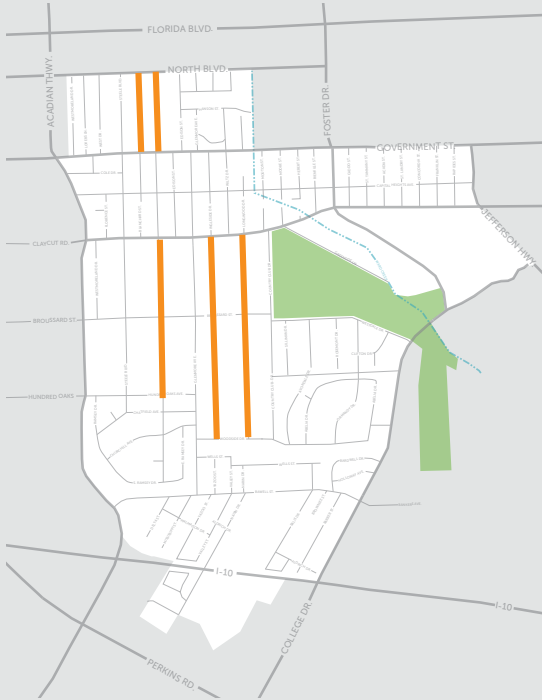


DESIGN GUIDELINES:

- Install raised intersection that elevates the pedestrian crossing plane to the level of the sidewalk.
- Install MUTCD signage to warn drivers that they are approaching the raised intersection
- The slope of the crosswalk edge should not exceed 1:10 or be less than 1:25.
- Ideally, the crossing surface should be made of unit pavers in a contrasting color to the surrounding pavement.
- The slopes and edges should be made of concrete for maximum durability.
- Raised intersections should be designed not to interfere with street drainage.

7 | Traffic chokers

IMPROVEMENT LOCATIONS:



OVERVIEW:

Mid-block chokers narrow the roadway for a short distance with an extended curb. This results in a yield situation in both directions, thus slowing traffic speeds.

Chokers are a good way to incorporate stormwater management and landscape elements into neighborhood streets.

APPROPRIATE APPLICATIONS:

- On streets where speed control is desired
- On streets where some on-street parking can be eliminated
- Chokers can also be useful on streets with stormwater drainage issues.

INSTALL TRAFFIC CHOKERS ON:

EAST DRIVE

Between Government Street and North Boulevard

INGLESIDE DRIVE

Between Woodside Drive and Claycut Road

LONGWOOD DRIVE

Between Woodside Drive and Claycut Road

RICHLAND AVENUE

Between Hundred Oaks Avenue and Claycut Road; between Government Street and North Boulevard



This temporary traffic choker was installed as part of the Street Smart demonstration weekend.

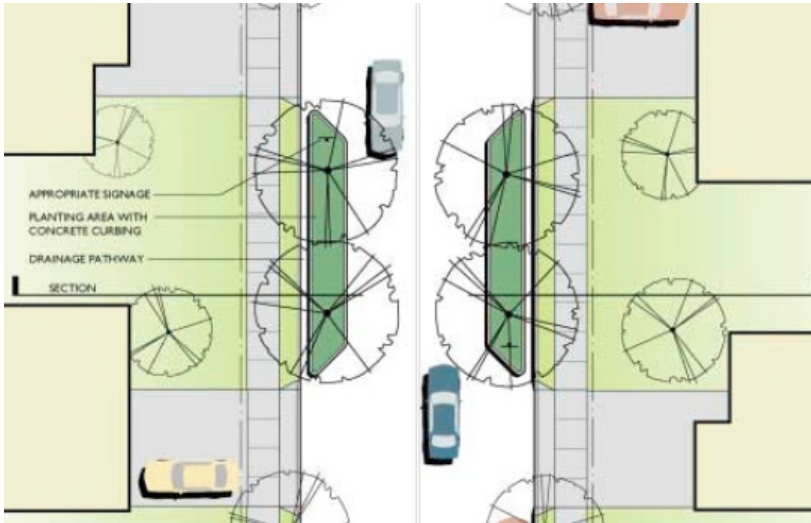
source: CPEX



A newly installed choker in Alexandria, VA. In this case, the choker is separated from the curb, allowing for drainage.

source: njbikeped.org

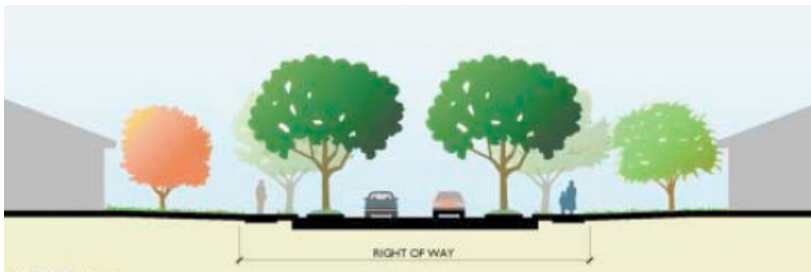
TYPICAL DESIGN:



source: DPW's Residential Traffic Calming Manual



source: DPW's Residential Traffic Calming Manual



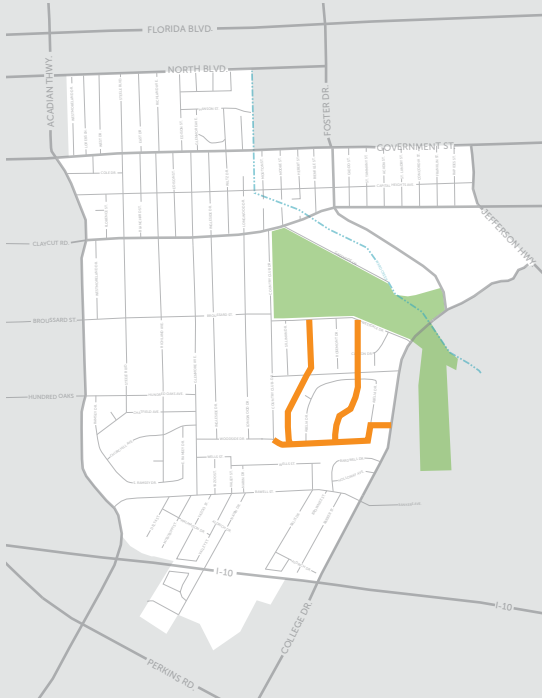
source: DPW's Residential Traffic Calming Manual

DESIGN GUIDELINES:

- Chokers shall be placed approximately in the middle of the block to slow drivers.
- Due to varying street widths, each choker will vary slightly in design. However, all chokers will narrow the roadway to a width that allows for one car to pass (approximately 10').
- Proper signage approaching and at the choker is necessary to notify drivers of the yielding procedure.
- Whenever applicable, chokers should be designed to accommodate stormwater runoff through slotted curbs and a sunken planting area.
- Chokers should be planted with plants that treat stormwater, as well as trees. However, plantings shall not interfere with driver sight-lines.

8 | Chicanes

IMPROVEMENT LOCATIONS:



OVERVIEW:

Chicanes are, in this case, retrofits that convert a straight street into a curved one. This curved alignment shortens driver sight-lines and requires additional maneuvering, resulting in lower speeds.

Chicanes are also a good way to add attractive landscaping and stormwater management elements to a street.

APPROPRIATE APPLICATIONS:

- On streets where speed control is desired
- On streets wide enough to accommodate the chicane
- In some cases, chicanes can be useful on streets with stormwater drainage issues.

INSTALL CHICANES ON:

AVONDALE DRIVE

Woodside Drive to Westdale Drive

ORMANDY DRIVE

Woodside Drive to Westdale Drive

WOODSIDE DRIVE

College Drive to Country Club Dr



The landscaping in this chicane in Austin, TX, is well-incorporated into the surrounding neighborhood landscape. source: LADOTbikeblog

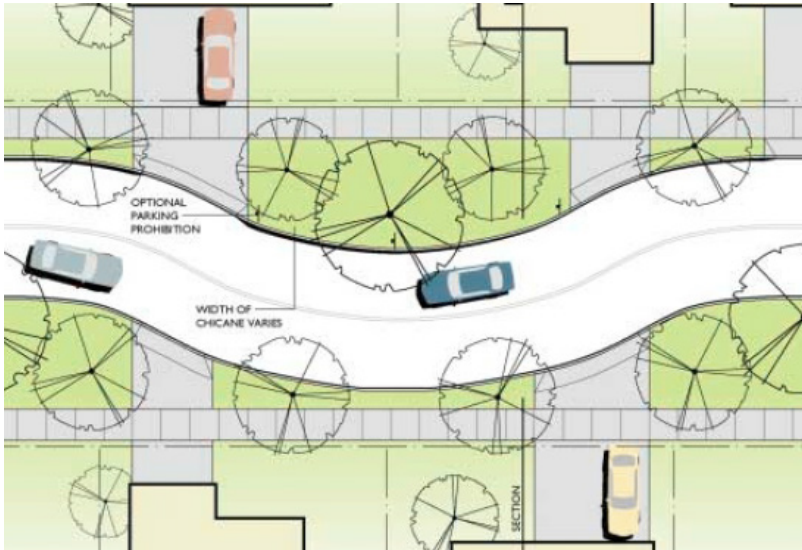


This chicane was designed to be part of a new development, though it is also feasible to retrofit a chicane. source: lgam.info

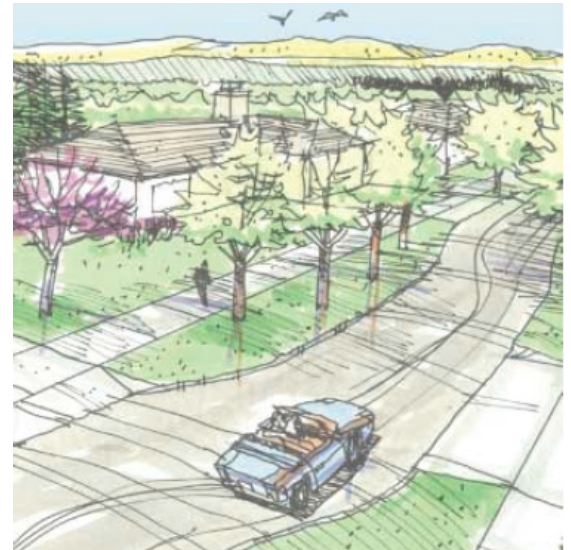


Temporary chicanes were installed on Richland Avenue as part of the Street Smart demonstration weekend. source: CPEX

TYPICAL DESIGN:



source: DPW's Residential Traffic Calming Manual



source: DPW's Residential Traffic Calming Manual

DESIGN GUIDELINES:

- Chicanes shall be designed to have the appropriate horizontal curve alignment. This may vary, so an engineering study is necessary.
- Whenever applicable, chicanes should be designed to accommodate stormwater runoff through slotted curbs and a sunken planting area.
- Chicanes should be planted with trees and shrubs that treat stormwater, as well as trees. However, plantings shall not interfere with driver sight-lines.

9 | Extended medians

IMPROVEMENT LOCATION:



OVERVIEW:

In addition to providing refuge for bikes and pedestrians, extended medians help calm traffic by eliminating left turns and through traffic.

APPROPRIATE APPLICATIONS:

- At intersections suitable for vehicles to make right turns only
- At intersections where a bike lane or cycle track crosses a heavily traveled road
- On streets wide enough to accommodate a median with bike and pedestrian refuge

INSTALL EXTENDED MEDIANS AT:

GOVERNMENT STREET AT STEELE BOULEVARD



This example located in Baltimore, MD, shows an extended median that incorporates a U-turn area. source: NACTO

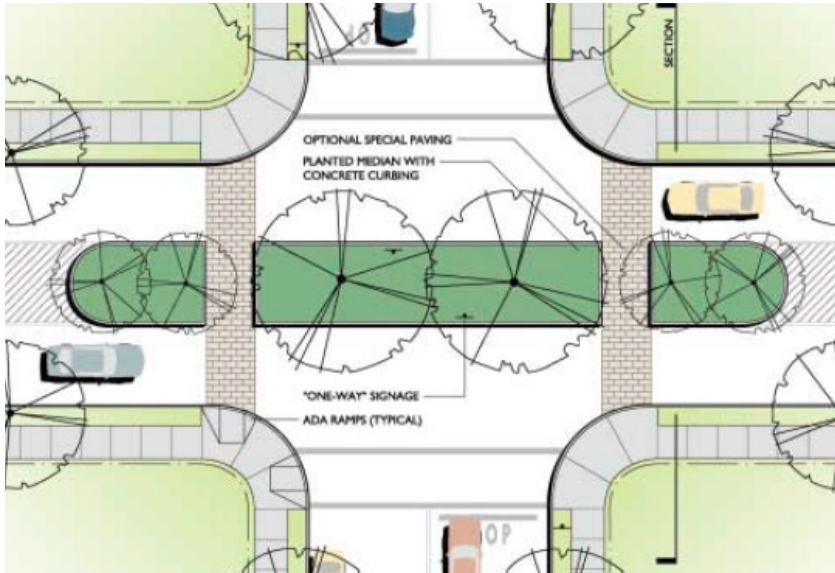


Bike refuges in medians provide bicyclists with a safe mid block crossing point. This example is located in Bellevue, WA. source: NACTO

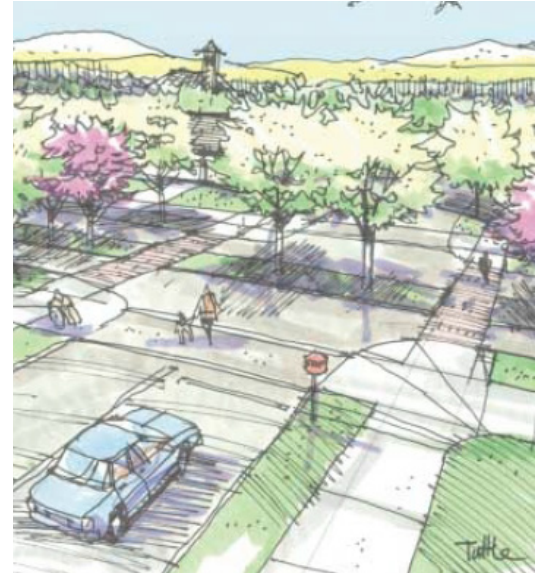


Similar to providing bike refuge, extended medians can provide the same service to pedestrians, while incorporating attractive landscaping. source: NACTO

TYPICAL DESIGN:



source: DPW's Residential Traffic Calming Manual



source: DPW's Residential Traffic Calming Manual

DESIGN GUIDELINES:

- Median shall extended beyond cross street to eliminate right turns and cross traffic for vehicles.
- While eliminating some movements for vehicles, extended medians should accommodate the safe and easy crossing of bicyclists and pedestrians.
- Wherever possible, medians shall be designed to capture stormwater runoff by use of slotted curbs and sunken planting area.
- Planting areas should be planted with material that filters and treats stormwater runoff.
- Plantings should not be placed so that they interrupt the sight-line of crossing bicyclists and pedestrians, or that of oncoming vehicles.

Implementation Matrix

Location	Bike/Pedestrian Project	Traffic Calming Project	Partners	Funding Sources	Signatures Req.	Civic Association				In Process		
						BT	CH	VP	WP			
Low Cost/Effort												
Acadian at Bawell, Hundred Oaks, Broussard, Claycut	crosswalk	high visibility crosswalk (L1)	T&D	STP, LRSP, LOC								
Aldrich	shared lanes, sidewalk	-	T&D	RTP, LOC	*							
Bails	shared lanes	-	T&D	LOC								
Bails at Ferrett	crosswalk	high visibility crosswalk (L1)	T&D	LRSP, LOC								
Bawell	-	appropriately spaced stop signs and speed radar (L1)	T&D	LOC								
Bawell at College	crosswalk	high visibility crosswalk (L1)	T&D	STP, LRSP, LOC								
Broussard (Acadian to Country Club)	dedicated bike lane	lane narrowing (L1)	T&D	RTP, TAP, STP, LOC	*							
Capital Heights	-	appropriately spaced stop signs (L1)	T&D	LOC								
Capital Heights (Acadian to Jefferson)	contraflow lane improvements	lane narrowing (L1)	T&D	RTP, SRTS, LOC								
Capital Heights at Foster and Jefferson	traffic signal synchronization	-	T&D	LRSP, LOC								
Capital Heights at Jefferson	crosswalk	high visibility crosswalk (L1)	T&D	LRSP, LOC								
Claycut	-	appropriately spaced stop signs (L1)	T&D	STP, LOC								
Claycut at Moore and Steele (option 1)	crosswalk	high visibility crosswalk (L1)	T&D	LRSP, LOC								
College at I-10	crosswalk	high visibility crosswalk (L1)	T&D	LRSP, LOC								
Country Club (Broussard to Woodside)	shared lanes	-	T&D	LOC								
Country Club (Claycut to Broussard)	buffered bike lane	lane narrowing (L1)	T&D	TAP, LOC	*							
Edison (Government to North)	dedicated bike lane	lane narrowing (L1)	T&D	RTP, TAP, LOC	*							
Glenmore (Wells to Claycut)	buffered bike lane	lane narrowing (L1)	T&D	RTP, SRTS, LOC								
Glenmore (Claycut to Government)	shared lanes	-	T&D	RTP, SRTS, LOC								
Government at Edison	crosswalk	high visibility crosswalk (L1)	T&D	LRSP, LOC								
Hundred Oaks	-	appropriately spaced stop signs (L1)	T&D	LOC								
Hundred Oaks	buffered bike lane	lane narrowing (L1)	T&D	RTP, SRTS, LOC								
Lovers	-	lane narrowing (L1)	T&D	LOC								
Moore (Claycut to Government)	shared lanes	-	T&D	LOC								
Moore pedestrian bridge	remove bollards/trim vegetation	-	T&D	LOC								
Nairn/Valley (Wells to Perkins)	shared lanes or bike lane	lane narrowing (L1)	T&D	RTP, LOC	*							
Nairn at Bawell	crosswalk	high visibility crosswalk (L1)	T&D	LRSP, LOC								
Overall - non-signalized intersections	bike lane transitions	-	T&D	LOC								
Overall - subdivision non-stripped streets	-	reduced speed limit to 25 (L1)	T&D	LOC								
Overall - throughout district	-	high visibility street signs (L1)	T&D	LOC								
Overall - throughout district	signage/road marking standards	-	T&D	LOC								
Overall - signalized intersections	bike transitions and crosswalks	high visibility crosswalk (L1)	T&D	LRSP, LOC								
Rapides (Capital Heights to Government)	shared lanes	-	T&D	LOC								
Steele (Capital Heights to Government)	shared lanes	-	T&D	LOC								
Steele (Government to North; one-way southbound)	buffered bike lane	lane narrowing, one-way southbound (L1)	T&D	TAP, LOC	*							
Wells	shared lanes	-	T&D	LOC								
West	-	chicanes with one-way (L2)	T&D	LOC	*							
Woodside (Country Club to Glenmore)	dedicated bike lane	lane narrowing (L1)	T&D	RTP, TAP, LOC	*							
Shared use of golf paths in off hours	sidewalk	-	BREC	n/a								

RTP=Recreational Trails Program
 TAP=Transportation Alternatives Program
 STP=Surface Transportation Program
 LRSP=Local Road Safety Program
 SRTS=Safe Routes to School
 LOC=Local Operational and Capital

Medium Cost/Effort										
Avondale	-	chicane (L2)	T&D	LOC	●	*	●		●	
Broussard at Country Club	raised intersection	raised intersection (L2)	T&D	TAP, LRSP, STP, LOC	●	*	●		●	
Claycut at Moore & Steele (option 2)	crosswalk	raised crosswalk (L2)	T&D	LRSP, LOC	●	*	●		●	
East	-	choker (L2)	T&D	LOC	●	*	●		●	
Glenmore at Claycut	intersection improvements	-	T&D	LRSP, LOC			●			
Ingleside (Woodside to Claycut)	-	choker (L2)	T&D	LOC	●	*	●		●	
Longwood (Woodside to Claycut)	-	choker (L2)	T&D	LOC	●	*	●		●	
Lovers	-	bulbout (L1)	T&D	LOC	●	*	●		●	
Ormandy	-	chicanes (L2)	T&D	LOC	●	*	●		●	
Richland (Hundred Oaks to Claycut, Government to North)	-	choker (L2)	T&D	LOC	●	*	●		●	
Trail at Ormandy and Avondale (option 2)	crosswalk	raised crosswalk (L2)	T&D	LRSP, LOC	●	*	●		●	
Wells (Glenmore to Valley)	sidewalk	-	T&D	LRSP, LOC	●	*	●		●	
Westmoreland (Government to North)	-	bulbout (L1)	T&D	LOC	●	*	●		●	
Woodside (Country Club to College)	-	chicanes (L2)	T&D	LOC	●	*	●		●	
High Cost/Effort										
Acadian (Bawell to BRCVPA, North to Perkins)	sidewalk	-	T&D	LRSP, LOC, SRTS	●	*	●	●	●	●
Acadian at Capital Heights	bike/ped refuge	-	T&D	TAP, LRSP, LOC			●			
Avondale (trail to Westdale)	sidewalk	-	T&D	LRSP, LOC	●	*	●		●	
Broussard (Acadian to Country Club)	sidewalk	-	T&D	STP, LRSP, LOC	●	*	●		●	
Capital Heights at Foster and Jefferson	HAWK beacon and crosswalk	-	T&D	LRSP, LOC	●	*	●		●	
Claycut (Acadian to Foster)	sidewalk	-	T&D	LRSP, LOC	●	*	●		●	
College at I-10 overpass lighting	pedestrian improvements	-	T&D					●		
Edison (Government. to North)	sidewalk	-	T&D	SRTS	●	*	●			
Government at Edison	bike/ped refuge	-	T&D	TAP, LRSP, LOC			●		●	
Government at Steele	-	extended median (L3)	T&D	TAP, LRSP, LOC	●	*	●		●	
Nairn Park lighting and bridge maintenance	ped improvement	-	BREC	RTP, TAP, LOC				●		
Ormandy (trail to Westdale)	sidewalk	-	T&D	LRSP, LOC	●	*	●		●	
Trail	multi-use trail improvements	-	BREC,T&D	RTP, TAP, LOC					●	
Webb Park (Claycut, Country Club, Westdale)	sidewalk	-	T&D	LRSP, LOC					●	
Woodside (Avondale to Glenmore)	sidewalk	-	T&D	LRSP, LOC	●	*	●		●	

* Pending Approval of Department of Transportation and Drainage- Traffic Engineering

BT=Bernard Terrace
WP=Webb Park

CH=Capital Heights
VP=Valley Park

References

THE DESIGN GUIDELINES IN THIS DOCUMENT WERE DEVELOPED USING THE FOLLOWING RESOURCES:

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STREET SMART

PREPARED BY:



CENTER *for* PLANNING EXCELLENCE

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