



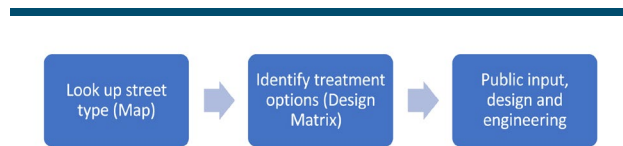
## CHAPTER 4: PEDESTRIAN DESIGN STRATEGY

# INTRODUCTION

Every street in Alameda needs to be safe and comfortable for pedestrians, but over 80% of Alamedans believe more needs to be done to make it safer to walk in Alameda<sup>5</sup>. This Plan includes a set of specific streets to be improved and maintenance programs to be enhanced (described in Chapters 7 and 8), to make Alameda's streets safer and more comfortable for people, whether they're walking to and from school, a bus stop or their parked car.

## DESIGNING FOR PEDESTRIANS

This Plan establishes a three-step process that the City will use when deciding how to improve the design of a street.



### 1. STREET TYPE

The first step is to determine the street type. Not every street in Alameda serves the same purpose and the improvements that are appropriate may differ based on the street type. This Plan classifies every street in Alameda by its pedestrian characteristics and purpose. The Pedestrian Street Types map (Figure 5) classifies each street in Alameda by one of five pedestrian street types. These types are fully described in Table 4, showing that within each street type, the streets have common physical characteristics and design goals.

#### Five Pedestrian Street Types

**Neighborhood Street:** Residential streets with low volumes of motor vehicle traffic

**Neighborhood Connector:** Cross-town routes with higher motor vehicle volumes

**Business Main Street:** Retail and services-oriented streets that accommodate high pedestrian volumes

**Business Commercial Street:** Streets that serve business parks or shopping centers

**Gateway Streets:** Streets that move people on and off the island using all modes

#### Three-Step Process for Designing for Pedestrian Safety and Comfort

### 2. DESIGN MATRIX

For each street type, the Pedestrian Design Matrix (Table 5) presents an array of specific design treatments that are appropriate to implement both along the street and at intersections. These treatments define the possible treatments for the street and reflect national best practices and federal guidelines for improving pedestrian safety<sup>6</sup>. Descriptions and photos of many of these treatments can be found in *Appendix G. Pedestrian and Bicycle Facility Types*. While these treatments are pedestrian-focused, they also benefit people using transit and bicycling.

### 3. PROJECT DESIGN

The final step is to design the street, using some, but not likely all, of the treatments deemed appropriate for the street type in the Design Matrix. The projects listed in Chapter 8, in addition to the City's regular street maintenance projects, will be designed to reflect the street type of the

<sup>5</sup> 2019 City of Alameda statistically significant survey of adult residents (16+), described in Chapter 3.

<sup>6</sup> Treatments reflect guidance presented in the Federal Highway Administration's *Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations* (2018) and the Transportation Research Board's National Cooperative Research Program's *Guidance to Improve Pedestrian and Bicycle Safety at Intersections*.

project location and will include improvements that are appropriate for the applicable street type. The design and treatments selected will consider site specific physical conditions, community input, engineering considerations and available financial resources.

## **CITYWIDE MAINTAINANCE**

Maintaining smooth sidewalk and walkway surfaces, along with safe, visible and functioning street crossings, ensures that the extensive sidewalk network Alameda is comfortable, safe and usable. As described in more detail in Chapter 7, it is imperative to continue to improve upon the City's maintenance programs.



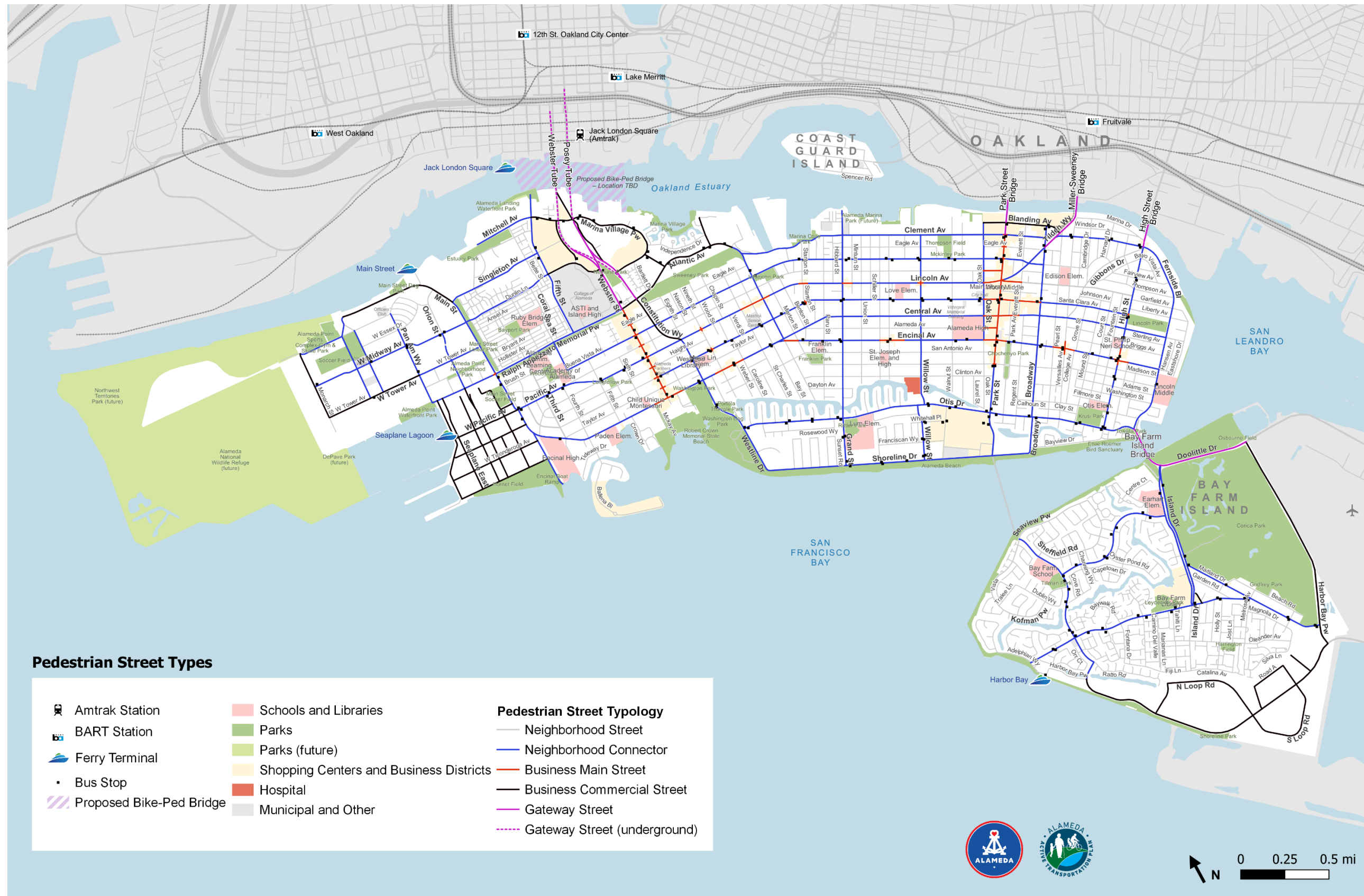







Figure 5. Pedestrian Street Types

Table 4. Pedestrian Street Types

| Street Type                   | Definition   | Current Conditions (Typical)   | Design Goals  | Example Streets   | Photo Example   |
|-------------------------------|--|--|---|---|---|
| <b>Neighborhood Street</b>    | Neighborhood Streets serve residential areas with low volumes of motor vehicle traffic. Walking and socializing are common along these streets. Designs for these streets should focus on encouraging slow speeds, pedestrian safety, a consistent street tree canopy and direct routes to nearby parks, transit and schools.  | <ul style="list-style-type: none"> <li>» Two travel lanes without centerline</li> <li>» Residential land use</li> <li>» Relatively low motor vehicle speeds and volumes</li> <li>» Low to medium pedestrian activity</li> <li>» No transit presence</li> <li>» Crossings have a stop bar for vehicles and curb ramps, but are typically not marked</li> </ul>                          | <ul style="list-style-type: none"> <li>» Continuous sidewalks</li> <li>» Street trees/planter strips</li> <li>» Crossings with ADA-compliant curb ramps</li> <li>» Safety enhancements at major street crossings</li> <li>» Design speeds =&lt; 20 mph</li> </ul>   | <ul style="list-style-type: none"> <li>» Peach Street</li> <li>» Pacific Avenue</li> <li>» Verdemar Drive</li> <li>» Bryant Avenue</li> </ul>   |  <p>Peach Street</p>                         |
| <b>Neighborhood Connector</b> | Neighborhood Connectors serve primarily residential areas, though some neighborhood-serving commercial uses may also be located along them. They are typically cross-town routes with higher motor vehicle volumes, but also have a strong need to safely accommodate and encourage pedestrian activity because of their residential and commercial uses. These streets often have bus stops and are key routes in the transit network. They provide continuous walking routes and connections to other parts of the city. Designs for these streets should emphasize pedestrian safety, safe and frequent crossings clear routes to key destinations and landscaped sidewalk buffers. | <ul style="list-style-type: none"> <li>» At least two travel lanes</li> <li>» May have long block lengths</li> <li>» Medium to high motor vehicle volumes</li> <li>» Motor vehicle speeds may be faster than on Neighborhood Streets</li> <li>» Often has transit service</li> <li>» Marked crosswalks are frequently spaced and ADA-compliant</li> </ul>                              | <ul style="list-style-type: none"> <li>» Wider sidewalks</li> <li>» Bus shelters and benches</li> <li>» Sidewalk buffer with street trees</li> <li>» Green infrastructure</li> <li>» Crossings have high visibility striping with curb extensions</li> <li>» Traffic signals or flashing beacons are frequently spaced</li> </ul> | <ul style="list-style-type: none"> <li>» Shore Line Drive (Westline Drive to Willow Street)</li> <li>» Encinal Avenue (Willow Street to Oak Street)</li> <li>» Willie Stargell Avenue (Fifth Street to Monarch Street)</li> <li>» Robert Davey Jr. Drive</li> </ul> |  <p>Shore Line Drive</p>                    |
| <b>Business Main Street</b>   | Business Main Streets serve commercial areas with small and medium-sized businesses. These streets are designed to accommodate significant volumes of pedestrians and foster social interaction. They may include institutional uses. Designs for these streets should create or enhance a safe, inviting and enjoyable pedestrian experience and provide flexible spaces for outdoor dining and support the commercial character of the street.   | <ul style="list-style-type: none"> <li>» Shorter block lengths</li> <li>» At least two travel lanes</li> <li>» Signalized crossings throughout</li> <li>» High pedestrian, bicyclist and motor vehicle activity</li> <li>» Often major transit routes</li> <li>» Buildings close to the street</li> <li>» Crossings have curb ramps, are striped, and have crossing signals</li> </ul> | <ul style="list-style-type: none"> <li>» Wider sidewalks</li> <li>» Enhanced streetscape with amenities</li> <li>» Crossings have high visibility markings, curb extensions</li> <li>» ADA-compliant crossing signals that turn green for pedestrians on every signal cycle during high-usage times</li> </ul>                    | <ul style="list-style-type: none"> <li>» Park Street (San Jose Avenue to Blanding Avenue)</li> <li>» Webster Street (Central Avenue to Ralph Appezato Memorial Parkway)</li> </ul>  |  <p>Webster Street (at Lincoln Avenue)</p> |



| Street Type                       | Definition   | Current Conditions (Typical)   | Design Goals  | Example Streets   | Photo Example   |
|-----------------------------------|--|--|---|---|---|
| <b>Business Commercial Street</b> | Business Commercial Streets serve shopping centers, business parks and/or industrial areas. While there may be fewer pedestrians in these locations, these streets may also serve as through-routes to adjacent uses, such as transit or shopping. Design for these streets should focus on safely accommodating pedestrians and providing greater separation from traffic.  | <ul style="list-style-type: none"> <li>» At least three travel lanes (in most cases)</li> <li>» Low pedestrian volumes</li> <li>» Buildings generally set back from the curb</li> <li>» Longer block lengths</li> <li>» Dominated by motor vehicle traffic</li> <li>» Sidewalk buffer</li> <li>» May have transit</li> <li>» May have truck traffic</li> <li>» Crossings are marked with ADA-compliant curb ramps</li> </ul> | <ul style="list-style-type: none"> <li>» Continuous sidewalks across driveways</li> <li>» Transit service, if present, has comfortable amenities</li> <li>» Crossings are ADA-compliant with high visibility markings and actuated pedestrian signals</li> </ul>                  | <ul style="list-style-type: none"> <li>» Harbor Bay Parkway, Main Street (Navy Way to Singleton Avenue)</li> <li>» Atlantic Avenue (Webster Street to Wind River Way)</li> </ul>    |  <p>Harbor Bay Parkway</p>                     |
| <b>Gateway Street</b>             | Alameda's access points are classified as gateways. The primary purpose of Gateway Streets is to move people on and off the island using all modes. These facilities serve high vehicle volumes and provide access to freeways on the mainland. Gateway streets should be considered for transit priority and fully separated bicycle and pedestrian facilities.   | <ul style="list-style-type: none"> <li>» Two travel lanes in each direction</li> <li>» Hardened median</li> <li>» May have transit</li> <li>» High visibility crossings</li> <li>» Pedestrian crossing signals</li> <li>» May have sidewalk buffer</li> </ul>  | <ul style="list-style-type: none"> <li>» Fully separated pedestrian (and bicycle) facilities</li> <li>» Pedestrian wayfinding</li> <li>» Frequent transit service</li> <li>» Bus benches and shelters</li> <li>» High visibility crosswalks</li> <li>» Curb extensions</li> </ul> | <ul style="list-style-type: none"> <li>» Constitution Way (to Atlantic Street)</li> <li>» Tilden Way (to Blanding Street)</li> <li>» High Street (to Fernside Boulevard)</li> </ul> |  <p>Tilden Way near Miller-Sweeney Bridge</p> |
| <b>Overlays</b>                   |  |  |   |   |   |
| <b>Transit</b>                    | The Transit Overlay includes all streets with existing transit service, except for bus routes that only serve schools. This layer is meant to reflect AC Transit bus service at the time of project planning. The design of streets in the Transit Overlay should provide easy access to transit for all potential users, including people with disabilities.  |  |   |   |   |
| <b>School</b>                     | The School Overlay includes all streets within 600 feet of a public or private school (K-12). Designs for these streets should prioritize pedestrian safety and comfort considering the specific needs and characteristics of child pedestrians while maintaining the multimodal characteristics of the street.  |  |   |   |   |
| <b>Community Destinations</b>     | The Community Destinations Overlay includes the perimeter streets of the city plus those streets within one block of public recreation areas and institutions, including parks, libraries, hospitals, senior centers and colleges. Designs for these streets should prioritize pedestrian safety and comfort considering the specific needs and characteristics of pedestrians who are children or older adults, while maintaining the multimodal characteristics of the street. |  |   |   |   |
| <b>Truck</b>                      | The Tuck Overlay includes truck routes, which are are streets designed to accommodate truck traffic. The routes are defined and mapped in the City's General Plan. These streets may have wider travel lanes and larger turn radii.  |  |   |   |   |

Note: Volume estimates reflect conditions relative to other street types.

Table 5. Pedestrian Design Matrix

| Design Treatments <sup>n</sup>  | Street Types        |                        |                      |                            |         | Overlays |         |                        |       | Implementation Feasibility <sup>+</sup>   | FHWA Proven Safety Countermeasure <sup>s</sup> |
|---|---------------------|------------------------|----------------------|----------------------------|---------|----------|---------|------------------------|-------|---|--|
|   | Neighborhood Street | Neighborhood Connector | Business Main Street | Business Commercial Street | Gateway | School   | Transit | Community Destinations | Truck | III = High; II = Medium; I = Low; ° = Low-cost, rapid implementation option available |  |
| <b>Key: ☑ = Permitted; ☐ = May be appropriate to use, based upon further review, if permitted in overlay or street type, or if other treatments are not effective; - = Not recommended or not appropriate for street type</b> |                     |                        |                      |                            |         |          |         |                        |       |   |  |
| <b><i>Crossing Treatments</i></b>   |                     |                        |                      |                            |         |          |         |                        |       |   |  |
| Curb extension  | ☐                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☐       | ☑                      | ☐     | III°  | ✓  |
| Median refuge island <sup>1</sup>   | -                   | ☑                      | ☐                    | ☑                          | ☑       | ☑        | ☐       | ☑                      | ☐     | III°  | ✓  |
| In-street pedestrian crossing sign (paddle sign) <sup>2</sup>   | ☑                   | ☑                      | ☑                    | ☑                          | -       | ☑        | ☑       | ☑                      | -     | I   | ✓  |
| Mid-block crossing  | -                   | ☑                      | ☑                    | -                          | -       | ☑        | ☑       | ☑                      | ☐     | III°  | ✓  |
| Pedestrian Hybrid Beacon (PHB) <sup>3</sup>   | -                   | ☐                      | ☐                    | ☐                          | ☐       | ☑        | ☐       | ☐                      | ☐     | III   | ✓  |
| Rectangular Rapid Flashing Beacon (RRFB) <sup>3</sup>   | -                   | ☐                      | ☐                    | ☐                          | -       | ☑        | ☐       | ☐                      | ☐     | II  | ✓  |
| High-visibility crosswalk marking (i.e., ladder- or continental-style markings)   | -                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | I   | ✓  |
| Raised crossing <sup>4</sup>  | ☑                   | ☐                      | ☐                    | -                          | -       | ☑        | ☐       | ☑                      | -     | II  | ✓  |
| Crosswalk visibility enhancements (advance yield lines, pedestrian yield sign)  | -                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | I   | ✓  |
| Truck apron   | -                   | ☐                      | ☐                    | ☐                          | ☐       | ☐        | ☑       | -                      | ☑     | II°   |  |
| Parking prohibition (red curb) near intersection (“Daylighting”)  | ☑                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | I°  | ✓  |
| Daylighting with vertical elements to discourage parking  | ☐                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☐       | ☑                      | ☐     | I°  | ✓  |
| Pedestrian signal and leading pedestrian interval <sup>5</sup>  | -                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | II/III°   | ✓  |
| Pedestrian scramble   | -                   | ☐                      | ☑                    | ☐                          | -       | ☑        | ☐       | ☑                      | ☐     | III°  | ✓  |
| Modern Roundabout   | -                   | ☑                      | ☐                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | III   | ✓  |
| <b><i>Corridor Treatments</i></b>   |                     |                        |                      |                            |         |          |         |                        |       |   |  |
| Street lighting   | ☑                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | III   | ✓  |
| Sidewalks   | ☑                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | III   |  |
| Vertical traffic calming (e.g., speed humps and cushions)   | ☑                   | ☐                      | -                    | -                          | -       | ☑        | -       | ☑                      | -     | II  |  |
| Horizontal traffic calming <sup>2</sup>   | ☑                   | ☑                      | ☐                    | -                          | -       | ☑        | -       | ☑                      | -     | II°   |  |
| Neighborhood traffic circle <sup>2</sup>  | ☑                   | -                      | -                    | -                          | -       | ☑        | -       | ☑                      | -     | II°   | ✓  |

| Design Treatments <sup>n</sup>  | Street Types        |                        |                      |                            |         | Overlays |         |                        |       | Implementation Feasibility <sup>+</sup>   | FHWA Proven Safety Countermeasures <sup>§</sup> |
|---|---------------------|------------------------|----------------------|----------------------------|---------|----------|---------|------------------------|-------|---|---|
|   | Neighborhood Street | Neighborhood Connector | Business Main Street | Business Commercial Street | Gateway | School   | Transit | Community Destinations | Truck | III = High; II = Medium; I = Low; ° = Low-cost, rapid implementation option available |   |
| <b>Key: ☑ = Permitted; ☐ = May be appropriate to use, based upon further review, if permitted in overlay or street type, or if other treatments are not effective; - = Not recommended or not appropriate for street type</b> |                     |                        |                      |                            |         |          |         |                        |       |   |   |
| Lower speed limits (20 mph or 15 mph)   | ☑                   | ☐                      | -                    | -                          | -       | ☑        | -       | -                      | -     | II  |   |
| Road diet (4 lanes to 3 or 2)   | -                   | ☑                      | ☑                    | ☑                          | ☐       | ☑        | ☐       | ☑                      | ☐     | III°  | ✓   |
| Partial traffic diverters (limiting through and left turns) <sup>6</sup>  | ☑                   | ☑                      | -                    | -                          | -       | ☐        | -       | ☐                      | -     | II°   |   |
| <b>Streetscape Improvements</b>   |                     |                        |                      |                            |         |          |         |                        |       |   |   |
| Trees/planter strip   | ☑                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | III   |   |
| Green infrastructure (e.g., bio-retention areas)  | ☑                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | III   |   |
| Bus stop amenities (e.g., benches and shelters) <sup>7</sup>  | -                   | ☑                      | ☑                    | ☑                          | ☑       | ☑        | ☑       | ☑                      | ☑     | II  |   |
| Bus bulb-outs   | -                   | ☑                      | ☑                    | ☐                          | ☑       | ☑        | ☑       | ☑                      | ☐     | III°  |   |
| Street furniture (e.g., benches, art, water fountains and recycling bins)   | -                   | ☐                      | ☑                    | -                          | ☑       | ☑        | ☐       | ☑                      | ☐     | I/II  |   |
| Pedestrian-scale lighting   | ☑                   | ☑                      | ☑                    | -                          | ☐       | ☑        | ☑       | ☑                      | -     | III   | ✓   |
| Above-ground planters and potted plants   | -                   | -                      | ☑                    | -                          | ☑       | -        | ☐       | ☐                      | -     | I   |   |
| Sidewalk seating and dining   | -                   | -                      | ☑                    | -                          | ☑       | -        | ☐       | ☐                      | -     | I   |   |
| Parklets  | -                   | -                      | ☑                    | -                          | ☑       | -        | ☐       | ☐                      | -     | II  |   |
| Decorative/painted intersections and crosswalks   | ☐                   | ☐                      | ☑                    | -                          | ☐       | ☐        | ☑       | ☑                      | ☐     | I   |   |
| Pedestrian-oriented wayfinding  | -                   | ☐                      | ☑                    | ☐                          | ☑       | -        | ☑       | ☑                      | -     | I   |   |
| Pedestrian plazas and closed streets  | -                   | -                      | ☑                    | -                          | -       | ☐        | -       | -                      | -     | II°   |   |

**Notes**

<sup>n</sup> See *Appendix G. Pedestrian and Bicycle Facility Types* for more information on some of the treatments listed in this table.

<sup>+</sup> Tiers of implementation feasibility are defined by timeframe, financial cost and impact to right-of-way.

<sup>§</sup> Federal Highway Administration (FHWA) Proven Safety Countermeasures are treatments that have been scientifically studied and evaluated to offer safety benefits for road users.

<sup>1</sup> Preferable on streets with operating speeds of at least 30 mph unless in a school or community destination overlay.

<sup>2</sup> Mostly applicable on streets with posted speeds 25 mph or less. “Horizontal traffic calming” includes treatments such as neckdowns that create a yield condition or chicanes that force automobiles to slow speeds for a winding path of travel.

<sup>3</sup> In general, PHBs are reserved for crossings with three or more travel lanes and roadways with 30+ mph posted speeds or higher motor vehicle volumes (9,000+ ADT) and RRFBs are used on one- or two-lane crossings typically with lower motor vehicle volumes and/or 35 mph posted speeds or less. RRFBs should be supplemented with a median crossing island on streets with four or more total travel lanes. Near schools, high-visibility crosswalks can be accompanied by RRFBs and multi-lane (3 or more travel lanes) crossings can be treated with PHBs instead of RRFBs.

<sup>4</sup> Applicable on streets with posted speeds 30mph or less, ADT 9,000 or less, and less than four lanes.

<sup>5</sup> Leading pedestrian intervals are recommended at signalized intersections with high pedestrian volumes and high conflicting turning vehicle volumes; pedestrian signals should be applied per CA-MUTCD standards.

<sup>6</sup> Any possible traffic diversion would be evaluated prior to construction.

<sup>7</sup> Transit stop improvements are only applicable along transit routes. Prioritize bus shelters at bus stops with the highest ridership.

Sources: Federal Highway Association. *Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations*. 2018. Transportation Research Board. *NCHRP 15-63: Guidance to Improve Pedestrian and Bicycle Safety at Intersections*. 2020.