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PEDESTRIAN DESIGN ELEMENTS

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DESCRIPTION & INTENT

The pedestrian area is the portion of the street right-of-way set aside for use primarily by pedestrians. This area is typically from the curb edge to either the building wall or property line. The pedestrian area has three distinct zones, each running parallel to the right-of-way (figure 4.1.1):

- **Frontage Zone**: This is the portion of the pedestrian area immediately adjacent to the property line or building wall. In Commercial areas, building entrances, outdoor retail displays, overhang or A-frame signage, awnings, cafe seating, or other such uses occupy the Frontage Zone. Pedestrians pause in this zone to window shop, take refuge from sun or rain, or linger on the street.

- **Walking Zone**: This is the portion of the pedestrian area dedicated to through pedestrian travel and where sidewalks are typically located. Sidewalk refers specifically to the paved, continuous, walking area for use by pedestrians. Typically the walking zone and the sidewalk are one and the same.

- **Amenity Zone**: This area is located adjacent to the street curb. It is a location for street fixtures such as street lights, street trees, parking meters, bicycle racks, newspaper boxes, bus stops and shelters, signage, signal poles, and landscaping. Cafe seating is often located in the Amenity Zone. The Amenity Zone is often used for depositing snow cleared from roadways during winter months. It is also the point of transfer between pedestrians and transit vehicles, bicycles parking at racks, or autos parked at the curb.

Pedestrian areas should be inviting places. They are usually set several inches above roadway grade and have a curb designed to deflect vehicles back into the vehicular travel way. Adequate light and shade create a more comfortable pedestrian environment. Ground floor activities, transparent windows, and frequent doors promote observation of and interaction with the sidewalk giving the perception of many “eyes on the street” which, in turn, enhances the sense of safety.

Sidewalks, the paved areas designed for through pedestrian movement, are used by people of all ages and abilities and for a variety of purposes. Well-designed sidewalks support and enable walking as an appealing form of urban transportation. Sidewalks must, at a minimum, provide a clear, unobstructed pathway sufficient to accommodate persons with disabilities. The best sidewalk design is wide enough to enable small groups to walk side by side engaging in conversation and pass oncoming pedestrians without significant conflict. Walking in a downtown is inherently a social activity and adequate sidewalk width supports this objective.
USE & APPLICATION

Location

- In a downtown area, sidewalks must be provided on both sides of every street, regardless of type or transportation priority. Few conditions and justifications warrant the omission of a sidewalk.

- Pedestrian areas have a total assumed width and an actual effective width. Typically the total assumed width is the width of the paved portion between the curb and property line.
  
  » The effective width, however, is the width of the sidewalk (walkway zone) itself. The effective width is typically calculated by drawing two lines. The first line is drawn straight, parallel to the curb, from the center-most fixed objects or occupied areas (e.g. cafe seating or retail displays) down the length of the block. The second line is drawn at the building face or inside edge of the Frontage Zone. Even if clear of obstacles or uses, the effective width does not include the “shy zone” of the Frontage Zone.

- A shy zone occurs when a building wall, fence, or dense vegetation greater than 5 feet is immediately adjacent to the sidewalk. Shy zones are less common when the sidewalk is next to a knee wall, lower fence, lawn, lower planting beds, or airy taller vegetation. The shy zone is, literally, the zone that pedestrians shy away from to provide space between their bodies and obstacles or barriers. Shy zones are roughly 2 feet from the solid, or nearly solid, street wall.

- Pedestrians are the priority users of the sidewalk. While bicycling on the sidewalk is not prohibited in Ann Arbor, it should largely be discouraged for all but the most vulnerable cyclists. When cycling on the sidewalk, cyclists must travel at a very low rate of speed, provide pedestrians a comfortable buffer, always yield to pedestrians, and call out or signal that they are approaching.

- Sidewalks should not be used for parking or travel by any motorized vehicle except assistance devices for persons with disabilities.

Policy References

- The City of Ann Arbor Non-Motorized Transportation Plan (2013 Update) provides policy for pedestrian accommodation and level of comfort evaluation.

- The Downtown Ann Arbor Design Guidelines (2011) provide guidance on ground floor design where buildings engage the sidewalk.

- The Recommended Vision & Policy Framework for Downtown Ann Arbor (2005) provides urban design guidance to improve the pedestrian experience in downtown.

- Sidewalk occupancy permits require maintaining a 6-foot wide clear walking area to accommodate pedestrian traffic.
**DESIGN & OPERATIONS**

**Design Requirements**

- **Continuous**: Sidewalks shall be continuous throughout downtown, connecting to one another via well marked crosswalks with curb ramps.

- **Sidewalk Width**: Sidewalks shall have a minimum clear, unobstructed Walking Zone width of 6 feet regardless of street type or pedestrian volumes; a 5 feet minimum width is allowed on Near Neighborhood streets (See Table 4.1.1A).

- **Height Clearance**: Objects overhanging the sidewalk, such as signs, banners, planter boxes or baskets, or other features shall provide at least 7.5 feet of clear vertical height.
  - City and building codes may require additional overhead clearances.

- **Materials**: The sidewalk shall be paved concrete, 6 inches thick. The sidewalk must be smooth, stable, non slippery, and free from tripping hazards. Materials may vary in the Amenity Zone. Acceptable materials include brick, concrete, neither stamped nor stained, or landscape. Any pavers used in the Amenity Zone must also be non slip. See Table 4.1.1B.

- **Separation**: Pedestrian areas shall be separated from the vehicular travel way via a raised curb. Exceptions may occur where the street is specifically designed to share space freely between all street users including vehicles and pedestrians.

- **Lighting**: Pedestrian areas shall be well lit, preferably with pedestrian-scaled lighting rather than relying on ambient light from roadway lighting systems or building windows. Reliance on privately owned buildings to light the sidewalk via building-mounted lights is not a desirable alternative to pedestrian lighting. See Lighting Section for more details.

- **Cross-slope**: Sidewalks must have adequate cross slope to facilitate stormwater run off, but not so great as to introduce a noticeable and uncomfortable slope to sidewalk users. ADA requirements limits cross slopes to a maximum of 2%.

- **Street Tree Accommodations**: Amenity zones shall provide adequate space for street trees to provide shade and buffer for pedestrian comfort. See Street Tree Design Element for more details.

**Table 4.1.1A**

<table>
<thead>
<tr>
<th></th>
<th>Frontage Zone</th>
<th>Sidewalk / Walking Zone</th>
<th>Amenity Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Preferred</td>
<td>Minimum</td>
</tr>
<tr>
<td>Destination Commercial</td>
<td>0’</td>
<td>2’ - 6’</td>
<td>6’</td>
</tr>
<tr>
<td>Commercial</td>
<td>0’</td>
<td>2’ - 6’</td>
<td>6’</td>
</tr>
<tr>
<td>Mixed</td>
<td>0’</td>
<td>2’</td>
<td>6’</td>
</tr>
<tr>
<td>Civic / University</td>
<td>0’</td>
<td>2’</td>
<td>6’</td>
</tr>
<tr>
<td>Near Neighborhood</td>
<td>0’</td>
<td>2’ or n/a</td>
<td>5’</td>
</tr>
</tbody>
</table>
Additional Design Considerations

- **Preferred Sidewalk Width**: For streets with higher levels of pedestrian activity, such as the dense commercial areas or places with high ridership transit stops, additional pedestrian clear width is recommended. Increasing width may require significant street reconstruction and may not be feasible in current constrained conditions.
  - 8 feet of clear sidewalk is preferred for most downtown streets.
  - On streets with extremely high concentrations of pedestrians, such as those adjacent to the university or dense commercial activity, clear zones of 10 feet or greater may be desirable.
  - The width of the sidewalk should achieve and maintain, through most hours of the day and seasons of the year, a pedestrian level of service of D (Figure 4.1.2) although in Destination Commercial areas and areas of concentrated student traffic, a level of service E may be both expected and desirable. Sidewalks that are too wide makes sidewalks appear vacant and desolate and creates unnecessary impervious or paved surfaces.
  - Adjustment to sidewalk width is most likely to occur as part of a public street reconstruction project. Private projects may be required to adjust sidewalk widths when they are narrower than the rest of the street section and/or where a block or more of right-of-way is impacted.

- **Preferred Frontage Zone Width**: Providing at least a 2 foot wide clear Frontage Zone when immediately adjacent to building faces is recommended. Wider Frontage Zones can allow outdoor activities (e.g. retail or cafe dining) to occur between the sidewalk and building face.

- **Pedestrian Buffer**: Pedestrian areas should be adequately buffered from roadway traffic. This buffer

---

### Table 4.1.1B Sidewalk & Amenity Zone Materials

<table>
<thead>
<tr>
<th>Destination Commercial</th>
<th>Frontage Zone</th>
<th>Sidewalk (Walking Zone)</th>
<th>Amenity Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>Optional</td>
<td>Standard</td>
</tr>
<tr>
<td>Match sidewalk materials when adjacent to buildings; may be lawn in Near Neighborhood</td>
<td>Concrete</td>
<td>Special District Paving *</td>
<td>Concrete or Brick**</td>
</tr>
</tbody>
</table>

**Special District Paving**: Use of pre-established special district paving materials reinforces the identity of the Downtown Character Districts, such as historic brick materials or paver design details that are unique to a specific district.

**Standard Amenity Zone Materials**: From the Standard treatments listed above, materials shall be determined by the DDA based on review of Character District and adjacent site context.

The Street Design Team is responsible for reviewing and approving Optional paving materials and Standard material, as needed.

---

*Figure 4.1.2 - Pedestrian Level of Service*
may by provided via curbside parking, curbside bicycle facilities, or landscape strips. If landscape strips are the only buffer, the width necessary to provide pedestrian comfort on the sidewalk increases proportional to vehicle travel speeds in the roadway.

- **Construction Impacts**: Continuous pedestrian accommodation and connectivity should be maintained where feasible. Refer to applicable City and Building code documents for further information on sidewalk protections and closures.

- **Street Wall**: Where private property abuts the pedestrian area, landscaping and fencing should be kept below 42 inches to maintain the panorama of the right-of-way and enjoyment of the linear park-like character. Landscaping, fencing, and structures at the corner preserve meet minimum sight distance standards.

**Utility Considerations**

- Utility vaults should be avoided in the sidewalk area. Where vaults cannot be avoided, they should be located in the Frontage or Amenity Zones of the sidewalk. Vaults should be discrete and, where possible, screened by landscaping. The tops of vaults should favor solid materials over grates. Materials should not be slippery when wet or during cold conditions.

**Sustainability Considerations**

- May explore permeable sidewalk materials. Grass strips, low impact design (LID) features, or pavers in the Amenity Zone can increase permeability and lower impervious surface. Specific maintenance plans and commitments must accompany non-standard applications.

- Sidewalk material that increases the reflectivity, and thereby lowers the urban heat island effect, may be considered and utilized.

- Amenity Zones provide opportunities for landscaping and stormwater management features. The Frontage Zone may also provide space for landscaping and stormwater management where buildings are set back from the right-of-way and there is adequate space available for landscaping.

- Street trees can dramatically lower the urban heat island effect and retain stormwater.

**Design References**

- The City of Ann Arbor Public Services Standard Specifications, also known as the Orange Book, provides detailed requirements for materials, design, and construction of sidewalks in downtown.

- The National Association of City Transportation Officials (NACTO) Urban Street Design Guide provides guidance on urban sidewalk design to support downtowns.

MAINTENANCE & MANAGEMENT

General Maintenance

- Day to day sidewalk maintenance is generally the responsibility of the property owner.

- The City of Ann Arbor repairs and replaces sidewalks as a component of the sidewalk millage. The City also maintains stormwater elements in the ROW, including permeable pavers, as a component of the Stormwater Fund.

- The DDA annually repairs brick pavers in the Amenity Zone.

Seasonal Use & Maintenance

- Special Uses: Sidewalks are utilized year round. The Frontage and Amenity Zones of the sidewalk may have seasonal variations in use including outdoor cafes, parklets or platform dining, and/or bicycle corral parking in spring/summer and temporary snow storage in winter months.

- Snow Removal: Efficient removal of snow and ice from the sidewalk is critical. See Ann Arbor Sidewalk Snow/Ice Ordinance for more information.

Special Maintenance

- Sidewalks are prone to many incidences that degrade accessibility and the quality of the walking environment. Sidewalk heaving due to tree roots and shifting sidewalk pavers, including historic bricks, are two very common special maintenance needs. Providing adequate soil volume, quality non-compacted soil, and sufficient growing space can minimize the potential for adverse impacts on sidewalk pavement.

- Sidewalk pavers, even in historic areas, may be reset to smooth sidewalk surfaces. Quality workmanship at installation is essential.

- Innovative materials, such as porous concrete or rubber pavement blends, provide some distinct advantages but require special monitoring and maintenance. Maintenance plans and commitments must be in place prior to the use of these materials.

Reviews & Approvals

- Sidewalk materials and dimensions are reviewed and approved by the Ann Arbor Engineering Unit.

- Sidewalk Occupancy Permits may be obtained to allow for special uses within the Frontage or Amenity Zones. See Cafe Seating and Outdoor Retail Design Element.

- Special paving materials in the Amenity Zone are reviewed and approved by the DDA, with the exception of permeable pavers and other stormwater elements, which remain under City review.
INTERSECTION ZONE

CROSSWALKS

DESCRIPTION & INTENT

Crosswalks are the portion of the roadway zone designated for pedestrian use while crossing the roadway. Marked crosswalks provide pedestrians a safe, clear, place to cross the street on foot, while requiring motorists to stop for pedestrians entering or about to enter the crosswalk. Crosswalks signal to other road users, especially motorists, that pedestrians are, or may be, present. Frequent crossings support a walkable place, and encourage more walking.

State law generally provides that when a pedestrian pathway meets a roadway and continues on the other side, pedestrians may cross legally regardless of the provision of a crosswalk or not. In Ann Arbor, code requires a vehicle to stop for a pedestrian standing “at the curb” at a crosswalk location or “within the crosswalk.” Pedestrians entering an unmarked crosswalk must yield to vehicles1. While they are not the only legal place to cross, marked crosswalks guide pedestrians to the safest crossing locations and increase predictability for motorists and other road users.

Supporting a walkable downtown and making pedestrian connectivity logical, safe, and convenient relies on well-designed crosswalks.

USE & APPLICATION

Location

- Crosswalks are appropriate and necessary in all Frontage Contexts and Functional Emphasis corridors. Crosswalks may be located at either signalized intersections or unsignalized (e.g. stop controlled, uncontrolled or roundabout) crossings. Crosswalks may be utilized at mid-block locations.

- Marked crosswalks should be provided on streets with traffic volumes above 3,000 Average Daily Traffic (ADT), speeds higher than 20 mph, or corridors with multiple travel lanes. Additionally, crosswalks should be provided in the vicinity of schools, parks, senior centers or other facilities that have concentrations of more vulnerable pedestrians.

- Marked crosswalks should be provided across all legs of all intersections, except those with very low volumes. Pedestrians desire direct crossings wherever sidewalks lead to and continue from an intersection.

- Space crosswalks frequently, ideally every 300 to 400 feet, as pedestrians may choose unsafe and unprotected crossing points if marked crosswalks are too far out of the way. Typically, crosswalks closer than 200 feet are unnecessary unless they need to link important pedestrian destinations or corridors.

- Safe pedestrian crossings require more than just marked crosswalks. Comprehensive street design is necessary to manage driver speed, promote visibility, minimize exposure, and maximize safety for all users.

1 Michigan Uniform Traffic Code “Pedestrians must yield the right-of-way to vehicles when crossing outside of a marked crosswalk at an intersection.”
Related Design Elements

- **Bumpouts**: Bumpouts reduce the length of crosswalks, and thus the crossing time for pedestrians. Use bumpouts with crosswalks either at intersections or at mid-block crossings.

- **Signals**: At high volume or high concern crossings where there is no signal or other traffic stop controls, use other appropriate means of highlighting crosswalks, such as hybrid beacons, rapid flash beacons, raised crossings, medians, and other safety measures.

- **Medians**: Where median refuges are used, the crosswalk should “break” through the median with a level, walking surface flush with the crosswalk itself. Detectable warning surfaces should be placed where the crosswalk enters the median refuge to let pedestrians with visual impairments know they are entering a different portion of the crosswalk. A raised “nose” should extend beyond the crosswalk, protecting pedestrians from traffic within the intersection.

- **Bike Boxes**: On streets with a bicycle emphasis, place a bike box between the crosswalk and stop bar. Crosswalks should allow between 10 and 16 feet for bike boxes.

Policy References

- The City of Ann Arbor Public Services Standard Specifications provides multiple recommendations to improve pedestrian crossings.

**DESIGN & OPERATIONS**

**Design Requirements**

![Diagram of crosswalks with labels A, B, C, D, and E]

- **A**Width: Crosswalks shall be as wide, if not wider, than the walkways they connect. Crosswalks shall be at least 6 feet wide and ideally 10 feet wide.

- **B**Length: Crossing distance shall be as short as possible to minimize exposure and risk. Utilize bumpouts, medians, or crossing islands where appropriate.

- **C**Curb Ramps: Curb ramps shall lead to all marked crosswalks to meet accessibility requirements.

- **D**Crosswalk Pattern Markings: Markings shall be clear and legible. The standard crosswalk marking in downtown Ann Arbor is the “continental” design (See Figure 4.1.2) indicated by a series of lines parallel to the curb proceeding from curb ramp to curb ramp. Lines shall be of reflective material at least 12 to 24 inches wide and spaced 12 to 24 inches apart, extending the width of the crosswalk.

- **E**Stop bars, solid white bars 12 to 24 inches wide that extend across all lanes approaching a crosswalk, should be placed at least 4 feet ahead of the crosswalk line.

  » If a bike box is present, the stop line should be at least 8 feet behind the crosswalk.
Additional Design Considerations

- Refuge Islands: Where the crossing involves four or more lanes (roughly 40 feet), crossings should include refuge islands, which make it easier for pedestrians, especially those with limited mobility, to cross safely. Refuge islands allow pedestrians to make a two-stage crossing improving safety and ease.

- Signals: Signalized crosswalks should include pedestrian signals with pedestrian countdowns. Where pedestrian signals are not provided, pedestrians should follow vehicular traffic signals. See Pedestrian Signals Design Element

Raised crosswalks may be used. Raised crosswalks elevate the crosswalk slightly above the typical grade of the street and provide a ramp up and down for vehicles. Raised crosswalks are used at high volume pedestrian crossings or at locations that have demonstrated a significant safety risk. Place bumps at the edges of the raised section to alert pedestrians with visual impairments of where the crosswalk ends.

- Special Paving: Stamped or colored asphalt or concrete crosswalks treatments can increase maintenance requirements and decrease night time visibility and legibility. These treatments are prohibited.

Other special or artistic treatments are encouraged. Projects can utilize temporary decorative crosswalk treatments to enhance place making or introduce public art elements (e.g. such as crosswalk tattoos). These modifications, however, must not degrade the visibility nor the legibility of the MMUTCD compliant crosswalk markings. Glow in the dark paint materials may be contemplated, but require coordination with approving agencies.

Utility Considerations

- There should be a clear path from the crosswalk to the curb ramp and onto the sidewalk. Ensure that utility infrastructure, such as signal boxes, signal poles, light fixtures, or fire hydrants are outside of the Walking Zone at the end of the crosswalk to create a clear path.

Design References

- The City of Ann Arbor Public Services Standard Specifications provides guidance on crosswalk design and materials.
- MMUTCD specifies crosswalk dimensions, spacing, markings and signage including stop and yield lines.
- The U.S. Access Board and the FHWA provide guidance for designing crosswalks to meet the needs of persons with disabilities.

![Figure 4.1.2 - Crosswalk Pattern Markings](image-url)
MAINTENANCE & MANAGEMENT

General Maintenance

- **Signalization**: Use countdown signals and shorter cycle lengths to increase compliance, as pedestrians are less likely to comply with crosswalks with delays over 40 seconds at a signalized crosswalk (or 20 at an unsignalized crosswalk). However, signal cycles should be long enough that all pedestrians can cross in a single cycle. Countdown signals are the preferred treatment and shall be installed wherever possible wherever possible to tell pedestrians how much time they have to cross.

  » Refer to the Pedestrian Signals Design Element for additional guidance.

- **Crosswalk Re-striping**: Crosswalks are in the travel way of the roadway. As such, they are subjected to substantial wear and tear and fading. Crosswalk markings should be refreshed at regular intervals.

- **Street Resurfacing**: After repaving, crosswalks should be remarked as soon as possible. Use repaving as an opportunity to install higher-visibility patterns.

Seasonal Use & Maintenance

- **Snow Removal**: Crosswalks must be cleared of snow and ice. Crosswalk curb ramps should not be blocked by obstacles of snow, ice or large pools of water.

Reviews & Approvals

- The Ann Arbor Engineering Unit in collaboration with the Ann Arbor Systems Planning Unit are responsible for determining where crosswalks are installed.
INTERSECTION ZONE

CURB RAMPS

DESCRIPTION & INTENT

Curb ramps are a short ramp cutting through a curb or built up to it.¹ Curb ramps provide the transition from the sidewalk to the street, and benefit all users, especially those in wheelchairs, people pushing strollers or luggage, and children on bicycles.

USE & APPLICATION

Location

Curb ramps are appropriate, encouraged, and required on all streets of all street types. Curb ramps are required to be installed during road resurfacing projects or corner construction impacts. They are also required by law with any sidewalk construction or reconstruction at intersections or other crossing points.²

Curb ramps should be provided at every marked crosswalk.

Curb ramps should be used along a sidewalk length if the sidewalk is cut by vehicle paths located below the grade of the sidewalk, such as alleys. However, in general, driveways and curb cuts should maintain the sidewalk at grade across them.

Curb ramps, including temporary ones, should be provided when a pedestrian detour is needed to maintain access during sidewalk closures.

Related Design Elements

- Curb ramps should be designed as an integral part of an overall intersection. They should work in concert with crosswalks, pedestrian refuge islands, stormwater drainage and all other features of the intersection.

Policy References

- Title II of the Americans with Disabilities Act (ADA) requires state and local governments to provide access for persons with disabilities to utilize pedestrian crossings. The U.S. Access Board provides detailed guidance on the use, design and location of curb ramps.³

---

¹ 28 C.F.R. Part 36, Appendix A, § 3.4.
² Michigan Public Act 8 of 1973
³ http://www.ada.gov/pcatoolkit/chap6toolkit.htm#fn1
DESIGN & OPERATIONS

Design Requirements

**Standard Design:** Curb ramps shall adhere to standards established by the Michigan Department of Transportation (MDOT) in compliance with Public Right-of-way Accessibility Guidelines (PROWAG).

- **Crosswalk Alignment:** The curb ramp shall lie within the area of the crosswalk. Side flares may extend beyond the width of crosswalk if necessary.
  
  » Wherever possible, curb ramps should be constructed in such a manner that provides an individual ramp in each direction that is oriented perpendicular to the street and lines up with the “receiving” ramp on the opposite side of the street, in order to create a sense of directionality for visually impaired users.

- **Crosswalk Accessibility:** Where curb ramps provide access to a crosswalk, they shall be provided at both ends of the crosswalk to prevent entrapment within the intersection.

- **Refuge Islands:** At crossings that pass through pedestrian refuge islands or medians crossings, 2 feet of detectable warning strips shall be placed at each end of the refuge island.

Additional Design Considerations

- Curb ramps should be designed to avoid pooling of water at the base of the ramp along the gutter pan.

- Increase the width of the curb ramp in areas of high pedestrian volume and crossing activities. Curb ramps facilitate the movement of all pedestrians and their benefit is not limited only to pedestrians with mobility impairments.

- Strengthen the curb section and curb ramp to handle heavy vehicles (e.g. trucks and buses) that may frequently mount the curb during turning movements.

- Do not use pedestrian actuated signals at downtown crossings. Frequent pedestrians crossings should be common and expected.

Utility Considerations

- Provision of ADA curb ramps take precedence and utilities should be moved to permit the provision of the ramp.

Design References

- The FHWA has developed detailed guidance on the design and installation of curb ramps.
- The City of Ann Arbor follows MDOT standards regarding the provision and design of curb ramps.

MAINTENANCE & MANAGEMENT

Seasonal Use & Maintenance

- **Snow removal:** Perpendicular curb ramps on tangent or directional ramps on radius of corner aid snow removal because plows are traveling straight along the edge of the ramp. Ramps that are located on the radius of the ramp are more susceptible to plows leaving a wedge of snow in front of ramp from traveling past.
  
  » Snow clearance of sidewalks should also include clearing of curb ramps to ensure that snow does not block access from the sidewalk to and across the street at crosswalk locations.

---

5 MDOT Ramp Details R-28-F dated October 20, 2008.
INTERSECTION ZONE

PEDESTRIAN SIGNALS

DESCRIPTION & INTENT

Pedestrian signals, like vehicle signals, tell people when to cross the street and when to stop and wait. Pedestrian signals, also called “pedheads,” consist of a white “WALK” symbol and a flashing and/or steady “DON’T WALK” symbol.

Intersection operations in a downtown should anticipate the presence of pedestrians, ensure that pedestrian crossings are logical and predictable to all users, and provide adequate time for pedestrians to fully cross the street.

In downtown Ann Arbor, pedestrian count downs and/or accessible pedestrian signals enhance basic pedestrian signals. “Pedestrian count downs” provide information on the number of seconds remaining in a pedestrian cycle. Accessible Pedestrian Signals (APS) are “an integrated device that communicates information about the “WALK” and “DON’T WALK” intervals at signalized intersections in non-visual formats (e.g. audible tones and vibrotactile surfaces).” Signals aid pedestrians with visual impairments and are generally required retrofits when improvements are made to a signalized intersection.

Pedestrian signals provide a walk phase only when pedestrians are present. Most actuated signals require the pedestrians to explicitly request the phase by pushing a button. Downtown Ann Arbor is a pedestrian place. Actuated signals are not desirable in the downtown core and should not be used.

USE & APPLICATION

Location

• Pedestrian signals should be installed at all signalized intersections with crosswalks. In some cases, such as mid-block crossings, signals for pedestrians only may be warranted. In high-volume locations, a new traffic signal may be warranted due to pedestrian volumes.

• Crossings in Near Neighborhood crossings may not need to be signalized (e.g. at four-way stops) where pedestrian and traffic volumes are both much lower.

Related Design Elements

• Please see the crosswalk section for details on crossing dimensions, which will affect necessary pedestrian crossing time.

• Required pedestrian crossing time is dependent on the total distance of pedestrian exposure. This is the distance where a pedestrian is off the curb and in the vehicle zone. Pedestrian crossing distances, and therefore required pedestrian crossing times, may be reduced through the use of curb extensions.

---

1 Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG), Advisory R209
**DESIGN & OPERATIONS**

### Design Requirements

- **Signal Type:** Provide pedestrian signal heads for every leg of a signalized intersection.
  - *Countdown pedestrian signals* provide greater information and predictability to pedestrians, motorists, and cyclists. See the *Countdown Pedestrian Signal Design Element for additional guidance.*
  - *“Actuated” pedestrian signals* require pedestrians to push a button in order to request crossing and are undesirable in downtown and shall not be used.²

- **Timing:** In the DDA District, pedestrian crossings shall be pre-timed. Pre-timed signals ensure that pedestrians are provided sufficient time to cross every leg of an intersection every cycle.
  - Pedestrian crossing time shall, minimally, meet the current MMUTCD standard, but additional pedestrian time may be needed or desired, especially at crossings with high pedestrian volumes or crossings used by a number of children, seniors, or persons with disabilities.

- Install accessible signals at newly constructed or reconstructed intersections where visual pedestrian signals are installed.

- Clearly mark crossings and provide curb ramps for accessibility.

### Additional Design Considerations

- **Longer Crossing Time:** Pedestrian time should be increased at areas with significant volumes of pedestrians or where pedestrians are the dominant users and/or areas where leisurely pedestrian speeds are welcomed or desired.

- **Pushbutton integrated APS**, where audible queues are emitted from the pushbutton box, are preferred over pedhead integrated APS.

---

² Accessible pedestrian signals (APS) should not be confused with actuated signals, although both may appear physically similar. Both commonly feature a push button, however actuated signals must be accompanied by a sign indicating that the pedestrians must push the button in order to cross. Accessible signals may or may not have accompanying signage and provide a walk phase even when the button is not pushed.
INTERSECTION ZONE

COUNTDOWN PEDESTRIAN SIGNAL

DESCRIPTION & INTENT

Traditional pedestrian signals have symbols for WALK (a white “walking man”) and DON’T WALK (a red hand). Ann Arbor, along with many other communities are adopting enhanced pedestrian signals that also display the number of seconds remaining for pedestrians to cross the intersection.

Pedestrian countdown signals provide greater predictability to the traffic signals in addition to walk phases for pedestrians, cyclists and motorists alike. The additional information provided by pedestrian countdowns enables pedestrians and other travelers to make more informed decisions.

USE & APPLICATION

Location

- Use pedestrian countdown signals anywhere that regular pedestrian signals are used. Pedestrian countdown signals are particularly effective in downtown Ann Arbor.

Related Design Elements

- Pedestrian countdown signals are part of a safe, consistent crossing environment, which also includes crosswalks, curb ramps, pedestrian signal guidance, and sidewalks.

- If pedestrian crossings exceed 90 feet, increase the height of the numerical display to ensure visibility and legibility.
**DESIGN & OPERATIONS**

**Design Requirements**

- Activate pedestrian countdown displays at the beginning of the pedestrian change interval together with the flashing “DON’T WALK” symbol.

- Adhere pedestrian countdowns to the current version of the MMUTCD. This requires that numbers must be immediately adjacent (below or beside) to the “DON’T WALK” symbol. Countdown display should be dark at all times except during the pedestrian clearance phase.

**Additional Design Considerations**

- If signal preemption is utilized, such as by emergency or transit vehicles, the pedestrian countdown display should go dark upon activation of the preemption sequence.

**Sustainability Considerations**

- Use LED or other low energy signal technologies for more energy efficient countdown displays.

**Design References**

- The MMUTCD provides standards for the design and operation of intersection signals.

**MAINTENANCE & MANAGEMENT**

**Special Maintenance**

- Pedestrian countdown signals introduce no more maintenance needs than other signal devices.

**Seasonal Use & Maintenance**

- All crosswalks should be kept clear of snow and other obstacles in the pedestrian’s path.

**Reviews & Approvals**

- The City of Ann Arbor controls all signals on city streets. MDOT oversees signal timing and maintenance on state routes.
DESCRIPTION & INTENT

Waste and recycling receptacles keep downtown environment as clean as possible and free from loose trash and refuse. Waste and recycling receptacles should be provided regularly throughout downtown so that pedestrians encounter them frequently when walking. Receptacles should be durable, visible, and placed conveniently. In addition, receptacles should be easy for maintenance workers to access and empty.

USE & APPLICATION

Location

• Recommended in all areas of downtown. Located within the Amenity Zone, Frontage Zone or the equivalent in the Intersection Zone but set back from all crosswalks.

• Waste and recycling receptacles must be placed such that they do not block major pedestrian movements (sidewalk clear zones), building entries, loading zones or other street functions.

• Place receptacles in locations accessible to curbside pickup and maintenance crews.

The frequency of waste receptacles is as follows depending on the street Frontage Context:

<table>
<thead>
<tr>
<th>Frontage Context</th>
<th>Waste Receptacle - Placement Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destination Commercial</td>
<td>Each corner of an intersection. Mid-block for blocks longer than 400 feet in length</td>
</tr>
<tr>
<td>Commercial</td>
<td>At least two corners of an intersection (diagonally opposite corners)</td>
</tr>
<tr>
<td>Mixed</td>
<td>At least one per intersection</td>
</tr>
<tr>
<td>Civic/University</td>
<td>At least two corners of an intersection (diagonally opposite corners)</td>
</tr>
<tr>
<td>Near Neighborhood</td>
<td>Not required - opportunity only</td>
</tr>
</tbody>
</table>

Separate recycling receptacles should be considered in all locations where waste receptacles are installed to encourage recycling behavior and practices. However, the following minimums are provided:

<table>
<thead>
<tr>
<th>Frontage Context</th>
<th>Recycling Receptacle Placement Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destination Commercial</td>
<td>At least two corners of an intersection (diagonally opposite corners)</td>
</tr>
<tr>
<td>Commercial</td>
<td>At least one per intersection</td>
</tr>
<tr>
<td>Mixed</td>
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</tr>
<tr>
<td>Near Neighborhood</td>
<td>Not required - opportunity only</td>
</tr>
</tbody>
</table>

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**Design Requirements**

**Durability:** Waste and recycling receptacles shall be constructed out of durable materials (metals) and finishes with a minimum standard warranty of 3-years.

**Style:** The style and character of the selected receptacles shall convey a sense of quality consistent with the character of downtown.

- Solid plastic receptacles shall not be used in downtown.
- Purchase of new containers shall consider both the service and functional needs as well as the quality of containers, with input from the Street Design Team.

**Functional Design:** Receptacles shall be closed on the top or otherwise covered such that rain, snow, and other precipitation does not enter the receptacles and mix with refuse.

- Where recycling receptacles are provided, separate receptacles are required with a different design style and/or coloration to clearly signify the receptacle for recyclable refuse.
- Recycling receptacles shall indicate the types of refuse that are recyclable.

**Security:** Ideally, receptacles shall be secured to the ground and be designed with an inner container or other mechanism that can be removed to facilitate collection of refuge.

- Receptacles shall be able to be unlocked and relocated when needed to accommodate special events or maintenance activities.
• **Special Character Districts**: Selection of specific street furnishings shall consider the style of established or preferred site furnishings within downtown Character Districts and/or Historic Districts and choose a style that matches or is deemed compatible.

  » The Street Design Team shall approve selections for consistency with the different Character Districts in downtown.

• **Manufactured Furnishings**: Selected receptacles shall be standard manufactured designs that are readily replaceable. Custom designs and other special order receptacles should not be used due to replacement challenges.

### Additional Design Considerations

• BigBelly or similar solar powered compacting receptacles with wireless full notification should be considered for use downtown. While pickup would not be automated, such receptacles can reduce the need for such frequent pick-ups (e.g. Mixed and Near Neighborhood locations).

### Utility Considerations

• Do not place receptacles directly on top of utility covers, vaults, or infrastructure elements that require access.
Sustainability Considerations

- Use receptacles made from recycled, reclaimed, or salvaged materials when possible.
- Receptacles that increase the efficiency of collection (e.g., smart receptacles like the BigBelly) can minimize energy consumption by collection vehicles.

MAINTENANCE & MANAGEMENT

General Maintenance

- **Public Container Waste Collection**: Responsibility of City of Ann Arbor waste collection crews
- **Receptacle Maintenance**: Ownership and responsibility for receptacle maintenance and replacement is on the City of Ann Arbor.

Seasonal Use & Maintenance

- **Snow Removal**: Snow should not be piled or stored on top of receptacles, both to prevent damage as well as to keep receptacles accessible and usable throughout the year.
  » The ground below and access to receptacles should be kept clear and free of snow and ice to facilitate efficient collection.

Review & Approvals

- **Private Development Projects**: Private development projects can propose public waste and recycling receptacles in association with development projects that are likely to significantly increase foot traffic. Selected receptacles, their location, and orientation must be included on proposed Site Plans and approved by the City. All receptacles that serve the waste needs of the private building shall be located outside of the public right-of-way.
- **Public Streetscape Projects**: The selection, location and orientation of receptacles should be coordinated with both City and DDA staff.
DESCRIPTION & INTENT

Street furnishings include benches, chairs, seat-walls, and other fixed structures that provide places for pedestrians to sit and rest. Street furnishings make using the public streets more accessible for all users and especially those with mobility challenges. By providing places to stop and rest, to wait for services, or just to pause and relax and enjoy the street environment.

Street furnishings include the following types of fixtures:

- Benches (with or without backs)
- Single seats (with or without backs)
- Seat-walls (typically integrated with landscape planters)

USE & APPLICATION

Location

- Site furnishings are appropriate and recommended in most areas of downtown outside of the Near Neighborhood areas. In areas with higher volumes of pedestrian traffic (e.g. Destination Commercial and Commercial), site furnishings can be particularly beneficial although they should be so they do not block major pedestrian movements, building entries, loading zones or other street functions.

- In Mixed and Near Neighborhood areas, seating locations should be carefully evaluated to ensure that they will be visible, and regularly used.

- Street furnishings are to be located within the Amenity Zone. Furnishings may be located in the Frontage Zone where adequate width exists for placing the furnishing and accounting for a clear zone for seating that does not encroach into the Walking Zone (typically 5’ is required necessary). Furnishings and their clear zones should never impact the Walking Zone.

- Ideally, seating should be placed below street trees or other shading elements.
**DESIGN & OPERATIONS**

**Design Requirements**

- **Durability**: Construct street furnishings from long-lasting and durable materials and finishes that are backed by a minimum 3-year standard warranty.
  
  » Allowable materials include metal (with galvanized and powder-coated steel or stainless steel finished) or composite lumber. Seating walls must be constructed from concrete.

- **Number of seats**: When seating is provided, at least two seats shall be provided adjacent to each other. Single seats placed in isolation are not permitted.

- **Clear Zones & Placement**:
  
  - **A** A 3 foot minimum clear zone shall be provided to the sides and front of the seat to provide ADA accessibility and clearance for wheelchairs.
  
  - **B** Benches shall have a 5 foot minimum distance from fire hydrants and 1 foot minimum distance from other street fixtures.
  
  » Seating must not be placed in such a way where people’s legs would hang into planting beds or landscape areas.

- **Seat Depth**: Benches and seats shall have a seating depth of at least 18 inches.

- **Bench & Seatwall Breaks**: Design benches & seatwalls with breaks, arm rests, or other elements that provide an interrupted seating edge to discourage furnishings from being used as a feature for purposes other than sitting (e.g. skateboarding, sleeping). Seatwalls shall still allow use as seating.

- **Installation**: Street furnishings shall be cast-in-place or otherwise fixed into the street to prevent unauthorized removal.

- **Special Character Districts**: Selection of specific street furnishings shall consider the style of established or preferred site furnishings within downtown Character Districts and/or historic districts and choose a style that matches or is deemed compatible.
  
  » The Street Design Team shall approve selections for consistency with the different Character Districts in downtown.

» Free-standing seating (not integrated into a landscape bed) should be purchased from a catalog and easily replaceable. Custom furnishings would require a maintenance agreement with the City.
• **Manufactured Furnishings**: Selected furnishings shall be standard manufactured designs that are readily replaceable. Custom designs and other special order receptacles should not be used due to replacement challenges.

• **Seat-walls**: Refer to the Landscape Planter Design Element for dimensional guidance on seat-wall design.

**Additional Design Considerations**

• Provide a mixture of seating types, where multiple street furnishings are used in close proximity, to accommodate different users’ needs. Include both backed and backless bench seating and seating both with and without armrests.

• Cluster groups of seating to face each other to allow for small groups to converse.

• Seating can be integrated into building facades or other street elements provided clear zones remain open.

**Utility Considerations**

• Placed seating on top of utility covers, vaults, or infrastructure elements that require access.

**Sustainability Considerations**

• Use site furnishings made from recycled, reclaimed, or salvaged materials whenever possible.
MAINTENANCE & MANAGEMENT

General Maintenance

- **Ownership**: City Field Operations maintains public seating and benches in coordination with the DDA. Benches and seating should be regularly inspected for damage to ensure that provided seating is safe and comfortable for all users.

Seasonal Use & Maintenance

- **Snow Removal**: Do not pile or store snow on top of street furnishings, both to prevent damage to the furnishings as well as to keep them accessible and usable throughout the year.
  - Sidewalk snow removal is the responsibility of adjacent property owners; care should be taken to keep the ground below and leading up to seating free of snow and ice. The ground below and leading up to seating should be kept clear and free of snow and ice.

Review & Approvals

- **Private Development Projects**: Private development projects can propose street furnishings in association with development projects. Selected street furnishings, their location, and orientation must be included on proposed Site Plans and approved by the Ann Arbor Engineering Unit (for conflicts with utilities, ADA, etc.).
- **Public Streetscape Projects**: The selection, location and orientation of site furnishings should be a coordinated effort; recommended by City or DDA staff with final approvals of DDA and the Ann Arbor Engineering Unit (for conflict with utilities or ADA).
DESCRIPTION & INTENT

The most basic form of wayfinding is the street sign. Although often forgotten, street signs are essential for locals and visitors alike to get around the city efficiently. Missing, blocked or unreadable signs are a source of frustration for travelers.

However, Ann Arbor has gone far beyond the standard street sign in aiding wayfinding in the city. In 2009 and 2010, the DDA installed over 200 wayfinding signs to provide guidance to the four commercial districts of downtown - Kerrytown, South University, State Street and Main Street. The wayfinding signs are designed for both motorists and pedestrians. Directional signage provides a convenient path to reach destinations. Informational signage provides local area maps and other local information.

Ann Arbor conducted an intensive design process to develop the unique signage system in place today. Signs feature clean lines and simple styling. Name plates are interchangeable to permit updating and modification as needed.

USE & APPLICATION

Location

Vehicle-Oriented Wayfinding:

- Vehicle-oriented wayfinding is used on key corridors of entry into the Downtown District to guide motorists from surrounding highways or other access points and combined with signage in downtown to lead the driver to their destination.Parking wayfinding accompanies destination wayfinding in Ann Arbor to seamlessly guide motorists to the closest public parking facility from which they can walk to their final destination.

Pedestrian-Oriented Wayfinding:

- Pedestrian-oriented wayfinding is generally concentrated within the commercial areas of downtown. Pedestrian wayfinding leads to the various commercial districts and key landmarks, cultural assets and other destinations within them.
- On-street maps give pedestrians an opportunity to orient themselves and discover other destinations in downtown.
- Wayfinding systems enable travelers to navigate downtown independent of mobile devices or physical maps. Visitors, in particular, benefit from wayfinding systems. The information they provide increases visitor level of comfort and confidence in visiting and traveling around downtown.
Related Design Elements

- Consistently locate street signs throughout downtown to be easily and reliably identified. Signs should be visible from both sidewalk and travel ways from all legs of an intersection approach.

- Locate community wayfinding signs proximate to intersections and crosswalks. Pedestrian wayfinding directional signage must lead to safe pedestrian crossings.

Policy References

- The Ann Arbor Downtown Wayfinding Project is the basic reference guide for community wayfinding in downtown.

- The MMUTCD provides standards on street signs and community wayfinding sign design and installation.

DESIGN & OPERATIONS

Design Requirements

- Clarity: Wayfinding signs shall be clear and concise with limited text in order to be quickly read, comprehended and react.

- Pedestrian vs. Vehicle Wayfinding: Signs shall be designed for use by the intended audience. Vehicle-oriented signs shall have larger letters while pedestrian-oriented signs may have smaller font size. Pedestrian-oriented signs shall be mounted at pedestrian eye level while vehicle-oriented signs will be mounted higher. Vehicle signs should be retro-reflective to increase legibility at night while pedestrian-oriented signs may be otherwise illuminated.

- Required Signage: Wayfinding signs shall not obstruct nor take the place of wayfinding signs required in the MMUTCD. Likewise, community wayfinding signs should not themselves be obstructed.

- Accuracy: Wayfinding signs shall be accurate and kept up to date. Inaccurate or outdated signs serve as a detriment to downtown navigation.
Additional Design Considerations

- Follow the guidelines and design for wayfinding signs developed by the DDA in the DDA Wayfinding Standards Manual.
- Install wayfinding signs in the Amenity Zone of the sidewalk and may not impede the Clear Walk Zone.
- Signs intended only for pedestrians, should be inconspicuous to motorists in order to avoid confusion. Pedestrian signs may indicate a route available to pedestrians that is precluded for motorists due to one-way street operations or other factors.
- Do not use logos of individual businesses on wayfinding signs. Signs should focus on providing direction to public institutions, transportation facilities, hospitality services, and cultural and entertainment venues. Only recognized iconic private businesses should be included on vehicle wayfinding signs with Street Design Team and DDA approval.

Utility Considerations

- Signage shall not be placed above utility vault, close to fire hydrants, or other infrastructure access points.

Sustainability Considerations

- Green opportunities for wayfinding are generally limited.

Design Reference


MAINTENANCE & MANAGEMENT

General Maintenance

- **Ownership:** The DDA maintains signs installed as part of the Ann Arbor Downtown Wayfinding Project.
  
  » Maintaining the currency of wayfinding signs can be a challenge. Signs must reflect current destinations and current traffic operations. Adjusted signs during temporary construction lasting longer than a few days.
  
  » Wayfinding signs are a unique structure in the right-of-way, and special protocols or procedures may need to be established to guide sign restoration in the event of a knock-down or need for replacement.
  
  » Wayfinding signs are frequently altered by street users. Directions may be changed, additional informal signage added, stickers or paint applied. These should be promptly removed to avoid confusion and maintain the quality image of downtown.

Seasonal Use & Maintenance

- Snow should be cleared around pedestrian wayfinding maps to ensure that pedestrians can access the maps.

- The DDA maintains signs installed as part of the Downtown Wayfinding Project

Reviews & Approvals

- The Ann Arbor Downtown Wayfinding Project is an initiative of the DDA. Additional wayfinding signage in downtown should be coordinated through the DDA which will, in turn, coordinate with the appropriate City units for design, permitting and installation.
DESCRIPTION & INTENT

Corner bumpouts, also known as curb extensions or bulb-outs, visually and physically narrow the street by extending the sidewalk, reducing pedestrian crossing distance, and increasing pedestrian visibility and line of sight.

At signalized locations, reduced crossing distance enables shorter walk phases and greater flexibility in signal timing. At intersections, the narrower street profile, coupled with the tighter turn radii, can encourage slower driving, calm traffic, and increase safety for everyone.

USE & APPLICATION

Location

Bumpouts are appropriate on all streets and required on all types of streets other than transit emphasis streets. Bumpouts on transit streets will need to carefully consider the turning radii of transit vehicles. Regardless of street type, curb extensions may only be used where a curb lane is present and used for parking or loading, not travel.

Bumpouts are particularly beneficial in destination commercial and commercial Frontage Contexts where pedestrian volumes are high and activity concentrated, where traffic calming is desired, on very wide streets, and/or where sidewalks are narrow.

Bumpouts increase safety and pedestrian comfort by increasing visibility and shortening pedestrian crossing distance. They help increase the visibility of pedestrians at unsignalized crossings, or near large institutions that generate a lot of foot traffic, such as schools.

Multiple types of bumpouts exist and have different applications.

- **Corner bumpouts**, located at intersections and typically wrap around the corner extending the curb into both intersecting streets, are the most common type of curb extension.

- **Mid-block bumpouts** are installed in the Curbside Zone along a block. Mid-block bumpouts can be used to narrow a street for traffic calming, additional sidewalk space, or in conjunction with a mid-block pedestrian crossing. Mid-block bumpouts also provide space for street trees. See Mid-block Bumpouts Design Element.

- **Transit bumpouts**, also known as bus bulbs, extend the sidewalk to enable buses to board and alight passengers from the first travel lane. Bus bulbs provide critical space for a quality transit stop with amenities and modestly decrease transit travel time. Transit bumpouts typically occur at the far corner of intersections and appear to be an elongated corner bumpout; however, they may also be used for near-side or mid-block locations. See Transit Bumpout Design Element.
Related Design Elements

- **Curb Ramps**: Bumpouts intended as pedestrian crossings must include curb ramps and marked crosswalks.

- **Bicycle lanes or buffered bicycle lanes** should bend toward the bumpout so that they are against the extended curb at the intersection. This makes cyclists more visible to both pedestrians and motorists. Ideally, bike boxes should be placed at intersections with bumpouts to give cyclists a place to wait.

- **Parklets and Platform Dining**: Bumpouts may be used in conjunction with sidewalk platforms, which can temporarily expand the sidewalk in the parking lane. Sidewalk platforms should be the same width as bumpouts, and should create a flush ground plane with the bumpout for safety and accessibility.

Incompatible Elements:

- **Travel Lanes**: Bumpouts should not be used on streets where the curb lane is used as a travel lane during any part of the day. While this condition does not presently exist in downtown Ann Arbor, the concept of non-rush hour parking has been raised with regard to Huron Street.

- **Street Trees**: Street trees are generally not appropriate for corner bumpouts as they can reduce visibility.

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**DESIGN & OPERATIONS**

Bumpouts are a tool for increasing pedestrian safety, enhancing the pedestrian experience, and creating additional sidewalk space and calming traffic. Bumpouts may only be used on streets where the curbside lane is not used for travel (e.g. reserved for on-street parking or loading at all hours of the day).

**Design Requirements**

- **A Width**: Bumpouts shall not narrow any bike or general traffic lanes to an unsafe width. The width of bumpouts shall preserve 1 to 2 feet of shy distance between the curb face and the first travel lane or bicycle lane. When applied to streets with on street parking, bumpouts are typically 6 feet wide.

- **B Length**: Corner bumpouts or mid-block bumpouts with crosswalks shall be at least as wide as the crosswalk, and ideally extend to the stop bar. The curve of bumpouts must fit outside of any crosswalks.

  - Bumpouts are an effective way to restrict parking near intersections and maintain or increase visibility at corners. Consider making bumpouts at least 20 feet long, from the intersection side of the crosswalk back, to prevent motorists from parking within 20 feet of an intersection.
**Corner Radius:** Bumpouts are intended to narrow pedestrian crossing distance and slow traffic speeds. To accomplish this, maintain tight turning radii not more than 20 feet. The effective turning radius however must still be 30 feet.

**Returns:** Bumpouts shall have a 45-degree return to the street.

- **Sight Lines:** Any street furniture or landscaping in a bumpout shall maintain clear pedestrian paths and access to ramps. Any objects located in the bumpout such as furnishings or landscaping, shall not interfere with corner sight triangles.

- **Durability:** Where vehicles may frequently mount the curb during turning, the corner shall be kept free of furnishings and durable concrete materials shall be used (see City of Ann Arbor Standard Specifications, DDA Sidewalk Detail).

**Additional Design Considerations**

- **Turn Restrictions:**
  - At corners with turn restrictions, use the turning radii of the bumpout to make that turn more difficult, ensuring that transit vehicles or through traffic is not delayed by motorists turning.
  - Carefully design bumpouts at intersections where turning movements by transit vehicles or long wheel base trucks are common. Curb radii may need to be adjusted wider to accommodate the tracking patterns of these vehicles and/or other design or management solutions explored.

- **Stormwater:** Bumpouts must be cognizant of stormwater drainage and avoid pooling of water at the curb. Trench drains are not generally permissible stormwater drainage solutions in Ann Arbor. Where bumpouts conflict with storm drains, storm drains must be relocated and/or additional inlets provided to enable proper drainage.

- **Temporary Installation:** Bumpouts can be a temporary installation, using low-cost materials such as paint, bollards and planters. This may be useful for a location where a more expensive installation may not be warranted, or as a trial for a permanent solution.

- **Bicycle Parking:** Bumpouts may be ideal locations for bicycle parking. Ensure parked bicycles do not obstruct pedestrian paths nor block the sight triangle at corners.

- **Outdoor Space Use:** Bumpouts may be used for public seating or outdoor dining, again with careful attention paid to paths of movement and required sight lines.

- **Curbside Uses:** Bumpouts may have an impact on business loading, delivery access, garbage removal, and street sweeping. If well-managed and designed, bumpouts serve as a location to consolidate business waste for removal where alleys do not exist.

- **Flexibility:** Bumpouts may limit the ability to change the street design in the future, such as the location of bus zones, lane layout, and crosswalks. Bumpouts also make the street less flexible for construction routing. While considerations, none of these concerns negate the value of bumpouts to downtown districts.

**Design References**

- The City of Ann Arbor Non-Motorized Transportation Plan Update provides recommendations on the use of bumpouts. Additional locations in downtown are possible.

- The NACTO Urban Street Design Guide provides additional guidance on how to design a bumpout.

- The Institute of Transportation Engineers “Designing Walkable Urban Thoroughfares: A Context Sensitive Approach” describes in detail how to design a bumpout as part of a complete street.

**Sustainability Considerations**

- Combine bumpouts with stormwater management features, such as rain gardens or bioswales, to absorb and collect rainwater and reduce impervious surface area.

- Create opportunities for additional plantings through bumpouts, particularly mid-block bumpouts. Plantings at corner bumpouts must not block driver or pedestrian vision. Plantings at bus bumpouts must not conflict with bus doors or transit operations.

- All green applications in bumpouts should have well developed and committed maintenance plans prior to installation.

**Utility Considerations**

- Bumpouts may require relocating utilities or storm drains. They may also require moving a fire hydrant closer to the extended curb to ensure emergency vehicle access, which may increase cost. If a bumpout impacts a storm drain, the storm drain must be moved.
MAINTENANCE & MANAGEMENT

Seasonal Use & Maintenance

- **Temporary Use**: Temporary bumpouts defined by rubber curbing, flexible posts or similar, should be removed in winter months to facilitate snow removal.

- **Snow Removal**:
  - Bumpouts may make snow removal more complicated, though special equipment should not be necessary if bumpouts are designed with return radii adequate to accommodate snow removal vehicles.
  - Bumpouts may be appropriate locations for temporary snow storage if pedestrian pathways and crossings remain clear. Bus bulbs are not generally appropriate locations for snow storage.

Reviews & Approvals

- The Ann Arbor Engineering Unit is responsible for permitting the construction of bumpouts. The Systems Planning Unit, Engineering Unit, and the DDA (for impact to on-street parking, loading, etc) will coordinate review in the case of a private development project.
DESCRIPTION & INTENT

A mid-block bumpout, like other curb extensions, narrows the roadway of a street and extends the sidewalk space. When two bumpouts are designed directly opposite of each other they form what is known as a pinch-point or choker. By visually narrowing the street profile, chokers encourage motorists to slow down, thereby calming traffic.

Mid-block bumpouts are well-suited for mid-block crossings where traffic volumes are low, but may also be used for landscaping rather than pedestrian usage. These may be referred to as tree bumpouts or stormwater bumpouts. Mid-block bumpouts permit small street trees on corridors where sidewalks may otherwise be too narrow for plantings. Tree bumpouts also calm traffic. With careful design, management and approval, these bumpouts serve as green infrastructure for stormwater management.

USE & APPLICATION

Location

- Mid-block bumpouts, like other bumpouts, may only be used on streets where the curb lane is not used for through travel.
- Mid-block bumpouts are suitable for all street types, but are especially well-suited for commercial corridors with a pedestrian emphasis or Near Neighborhood streets where traffic calming is desired.
- When used in conjunction with a crosswalk, mid-block bumpouts should only be placed where existing crossings are more than 660 feet (1/8 mile) apart.
- Mid-block bumpouts may be applied where sidewalks are narrow to provide space for small street trees or other plantings; however, careful design is needed to provide adequate soil volume and quality for suitable growing conditions.
- Mid-block bumpouts may be used as a traffic calming device where needed.
- Mid-block bumpouts may also be used to define entrances to alleys or other curb cuts and to preclude curbside parking from encroaching on and blocking these access points.
Related Design Elements

• Mid-block bumpouts enhance the pedestrian experience and create additional public space. They calm traffic and present substantial placemaking opportunities.
• Mid-block bumpouts may narrow the travel way but must not unacceptably narrow or impinge upon any travel lane. Mid-block bumpouts may be used with traditional bicycle lanes.
• Protected or buffered bicycle lanes can conflict with mid-block bumpouts, especially if there is an unsignalized crossing. When approaching the bumpout, a buffered bicycle lane should traverse between the sidewalk and the bumpout.

Policy References

• The City of Ann Arbor Non-Motorized Transportation Plan Update provides an initial list of potential mid-block crossing locations in downtown. Additional locations may be identified.

DESIGN & OPERATIONS

Design Requirements

A Width: Bumpouts shall not narrow any bike or general traffic lanes to an unsafe width. The width of bumpouts shall preserve 1 to 2 feet of shy distance between the curb face and the first travel lane or bicycle lane. When applied to streets with on street parking, bumpouts are typically 6 feet wide.

B Pedestrian Crossings: If bumpouts provide for a mid-block crossing:
   » Mid-block crosswalks must be appropriately signed as required by MMUTCD.
   » Bumpouts must include curb ramps and clear, accessible pathway between sidewalk and crossing.
   » Stop bars or yield lines shall be set back 20 to 50 feet back from the crossing to increase the visibility of pedestrians. The Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE 2013) advises that a setback of 30 feet is appropriate for most unsignalized mid-block crossings. At signalized mid-block locations, the 2009 MMUTCD recommends the stop line be placed a least 40 feet from the nearest signal indication.
Returns: Mid-block bumpouts shall have a curb return of approximately 45-degrees to facilitate street cleaning and snow removal.

Additional Design Considerations

- **Special paving materials** may be used for mid-block bumpouts. Approved materials include scored concrete, brick, or pavers. Stamped or colored concrete is not permissible.

- **Street Trees:** Street trees in the bumpout visually define the street edge, which can calm traffic. Where trees are intended in mid-block bumpouts, bumpouts must provide adequate soil volume and root space cannot impede visibility.

- **Groundcover** on mid-block bumpouts should rise to a height of no more than 18 inches to maintain visibility. Maintenance should be carefully considered when opting for plants in mid-block bumpouts.

- **Furnishings** such as seating or bicycle parking may be placed in mid-block bumpouts as long as it does not impede visibility. If a crossing is associated with the mid-block bumpout, fixtures or furniture must not impede curb ramps or access to crosswalk.

- **Temporary Installation:** Mid-block bumpouts may be piloted with temporary materials, such as rubber curbs, planters, flexposts or other treatments.

**Sustainability Considerations**

- Combine mid-block bumpouts with stormwater management features, like a bioswale, that absorbs and collects rainwater and can reduce impervious surface area.

- Use porous materials in bumpouts such as porous concrete, pavers, grass or plantings.

- Clear maintenance plans and commitments must be in place prior to the installation of non-standard green treatments.

**Utility Considerations**

- Do not place fire hydrants in mid-block bumpouts with crosswalks due to the risk of blocking by other vehicles in the event of an emergency.

- Avoid conflicts with storm drains. If bumpouts are used, storm drain inlets must be relocated as needed. Trench drains are not generally permissible in Ann Arbor.

**Design References**

- The NACTO Urban Street Design Guide provides additional guidance on mid-block bumpout design.

- The Institute of Transportation Engineers “Designing Walkable Urban Thoroughfares: A Context Sensitive Approach” describes in detail how to design mid-block crossings and mid-block bumpout as part of a complete street.

- The MMUTCD provides standards on mid-block crossing signage.
MAINTENANCE & MANAGEMENT

Seasonal Use & Maintenance

- **Snow Removal:** Bumpouts may make snow removal more complicated, though special equipment may not be necessary.

- Vertical posts or signs should be located at the outer edge of mid-block bumpouts to signal their presence to snow removal crews.

- Mid-block bumpouts may be acceptable locations for temporary snow storage, particularly if they are not associated with a mid-block crossing.

Reviews & Approvals

- The Ann Arbor Engineering Unit is responsible for permitting the construction of bumpouts. Installations should be coordinated with the Street Design Team.
ROADWAY ZONE

MID-BLOCK CROSSING

DESCRIPTION & INTENT

Mid-block crossings allow pedestrians to safely cross the street away from the intersection. These crossings are used where there is a destination or gap in the street network that generates demand for a crossing. Marking mid-block crossings indicates to both pedestrians and motorists where to cross and tend to concentrate pedestrian activity in that location thus decreasing jaywalking. Mid-block crossings increase predictability and safety for both pedestrians and motorists.

USE & APPLICATION

Location

• Mid-block crossings should be located wherever there is significant pedestrian demand, such as at mid-block bus stops, parks, building entrances to major destinations, or mid-block passageways.

• Mid-block crossings are ideal for corridors with a pedestrian and access or bicycle transport emphasis, but are an opportunity on all street types.

• AASHTO recommends mid-block crossings where there are already a substantial number of uncontrolled mid-block crossing movements, where a new development is expected to produce many mid-block crossings, or where the nearest intersections are at least 660 feet (1/8 mile) apart.

• The City of Ann Arbor Non-Motorized Transportation Plan Update identifies a number of such conditions in Ann Arbor. The plan distinguishes between a minor mid-block crossing (limited infrastructure modification needed) and a major mid-block crossing (which requires more Related Design Elements).
Related Design Elements

- **Raised Crosswalks**: Raised crosswalks (See Crossings Design Element) can increase the visibility of the mid-block crossing. At crossings without signals, raised crosswalks can encourage greater compliance on roads where average traffic speeds may exceed posted speeds.
- **Lighting**: Use high-visibility lighting and markings to highlight unsignalized mid-block crossings.
- **Curb Cuts**: Crossings should be carefully placed when close to driveways or loading zones due to potential for conflicts with motor vehicles.

Policy References

- The City of Ann Arbor Non-Motorized Transportation Plan Update recommends crossing islands at all unsignalized marked crosswalks that cross three or more lanes. The plan also recommends active crosswalk warning systems, with a flashing beacon, for mid-block crossings.

Design & Operations

**Design Requirements**

- **Crosswalk Marking**: Mid-block crossings shall conform to the requirements of the Crosswalk Design Element for markings. Mid-block crossings shall feel like a deliberate part of the pedestrian network and should show where pedestrians have priority and where motorists should yield. Crossings shall be visible and easily distinguished from other street features. They are an opportunity to calm traffic and reduce speeds.
- **Visibility**: Mid-block crossings can be used to increase visibility, restrict parking or extend the curbs around a crossing (See Mid-block Bumpout Design Element) at least 20 feet to either side of the crosswalk.
- **Width**: Mid-block crossings shall be at least 8 feet wide but ideally 10 feet in width.
- **Stop bars** shall be provided at mid-block crossings. Stop bars shall be between 12 and 24 inches wide.
- **Stop bars or yield lines** should be set back 20 to 50 feet back from the crossing to increase the visibility of pedestrians. PEDSAFE 2013 advises that a setback of 30 feet is appropriate for most unsignalized mid-block crossings. At signalized mid-block locations, the 2009 MMUTCD recommends the stop line be placed a least 40 feet from the nearest signal indication.

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Additional Design Considerations

- Mid-block crossings may be signalized or unsignalized. There are many options for pedestrian signalization:
  - The standard pedestrian signal gives oncoming motorists the red light long enough for pedestrians to clear the crossing.
  - The HAWK signal, or High-intensity Activated crossWalK, is a lighted beacon that displays a flashing yellow signal to motorists when a pedestrian attempting to cross the street pushes a button. The beacon runs through a series of cycles ultimately giving approaching motorists a red light. This allows pedestrians to safely cross on their own cycle. A separate pedestrian signal provides information to pedestrians. This type of signal is dark to the roadway users when not in use, which may be confusing for motorists. It typically shows a “DON’T WALK” signal to pedestrians when not activated.
  - Rapid flashing beacons (RRFBs), which are being used extensively in Ann Arbor, is a pedestrian activated light that flashes brightly and rapidly to alert drives that a pedestrian is waiting to cross at a mid-block location and should yield to crossing pedestrians. RRFBs are typically mounted onto the standard pedestrian crossing signage.

- Refuge Islands: Where the crossing involves three or more lanes, mid-block crossings should include Pedestrian Refuge Islands, which make it easier for pedestrians, especially those with limited mobility, to cross safely. Refuge islands in the middle of a crossing allow pedestrians to make a two-stage crossing, which is both safer and easier. Refer to Pedestrian Refuge Island design element for more information.

- Special paving materials or markings can visually highlight the crossing and alert motorists that pedestrians are present. They can also be used to extend streetscape elements from the sidewalk.

Utility Considerations

- Maintain a clear path from the crosswalk to the curb ramp and onto the sidewalk. Ensure that utility infrastructure, such as signal boxes, signal poles, light fixtures, trash receptacles, and fire hydrants are outside of the Walking Zone at the end of the crosswalk.

Sustainability Considerations

- Mid-block bumpouts and refuge islands that are part of a mid-block crossing provide an opportunity to incorporate stormwater management facilities into the street design.

Design References

- The City of Ann Arbor Public Services Standard Specifications lists specifications for allowable soil mixtures, mulches, and staking methods for landscaping in median refuge islands.
- The MMUTCD recommends providing a signal at mid-block crossings where pedestrian demand is high.
MAINTENANCE & MANAGEMENT

General Maintenance

• The Ann Arbor City Field Services Unit is responsible for maintaining mid-block crossings on public streets. Monitor crosswalks for any damage to paint or markings that could reduce their visibility and repair them quickly. Crosswalks should be visible to all road users at all times.

Special Maintenance

• Re-stripe crosswalks as soon as possible after repaving.
• Use repaving as an opportunity to install higher-visibility markings.

Seasonal Use & Maintenance

• Keep crosswalks and curb ramps clear of snow to facilitate pedestrian movement after a snowfall.

Reviews & Approvals

• Ann Arbor City Engineering Unit, in collaboration with the Systems Planning Unit, is responsible for determining where crosswalks are installed.
PEDESTRIAN REFUGE ISLAND

DESCRIPTION & INTENT

Pedestrian refuge islands are raised sections within the roadway that provide a safe landing zone for pedestrians to use while crossing a street with multiple travel lanes. Also known as pedestrian crossing islands, these protected spaces reduce pedestrian risk by reducing the crossing distance and breaking up longer crossings into two or more stages. Because the pedestrian is crossing fewer lanes of traffic, pedestrians more easily find gaps to cross at unsignalized crossings. Median pedestrian refuges are a sub-category of pedestrian islands.

Pedestrian refuge islands also function as a traffic calming device. The Pedestrian and Bicycle Information Center, a FHWA project, reports that “crossing islands have been demonstrated to decrease pedestrian-vehicle incidents by 46% at marked crossings, and by 39% at unmarked crossings.”

USE & APPLICATION

Location

- Pedestrian refuge islands are appropriate on streets with any Frontage Context or transportation emphasis.
- Pedestrian refuge islands are most often used on multi-lane roadways where a pedestrian must cross 40 feet or more of continuous roadway, and their use is further recommended on vehicle emphasis streets. Pedestrian refuge islands are already in place in some of the larger street corridors of downtown (e.g. North University and Huron Street).
- Pedestrian refuge islands may also be used as a channelization device, often in concert with mini roundabouts or acute angle right turns. While most intersections in the downtown area join at right angles, the tool is included here for information.

Related Design Elements

- **Mid-Block Crossing**: Pedestrian refuge islands may occur in the middle of the street, as on Huron Street near the University, as part of a mid-block crossing.
- **Bumpouts**: Pedestrian refuge islands may be used in conjunction with bumpouts, raised crossings or other applications as a traffic calming device.

**DESIGN & OPERATIONS**

**Design Requirements**

- **Crosswalks**: Pedestrian refuge islands shall have marked crosswalks leading to and from them. To accommodate snow removal equipment, the crosswalk shall be 10 feet wide. The pedestrian walk should continue at-grade through a pedestrian island and include detectable warnings such as raised bumps, where crosswalks intersect islands.

- **Elevation**: Pedestrian refuge islands shall be raised above the level of the roadway and protected with a vertical curb.

- **Width**: Pedestrian refuge islands shall be at least 6 feet wide and preferably 10 feet wide in order to comfortably accommodate single pedestrians, pedestrians with strollers or assisted mobility devices, or pedestrians with bicycles.

- **Signage**: Shall include placement of MMUTCD “Stop Here for Pedestrians” signs and stop bars as needed per crosswalk requirements.

- **Landscaping**: Landscaping on pedestrian refuges shall be less than 18 inches, so as not to impede sight-lines and visibility.

**Utility Considerations**

- Pedestrian refuge islands should be carefully coordinated to minimize conflicts. Do not place utility vaults in pedestrian islands with subsurface utilities.

**Sustainability Considerations**

- Pedestrian refuge islands provide opportunities to introduce stormwater management systems such as infiltration pits, rain gardens, or pervious areas in the roadway.

- Pedestrian refuge islands also provide an opportunity for public art, provided it does not introduce any hazard or safety risk to roadway operations.

**Design References**

- The NACTO Urban Street Design Guide provides additional guidance on the design of pedestrian islands.

- The MMUTCD provides standards for the design of pedestrian islands and refuges.

MAINTENANCE & MANAGEMENT

Special Maintenance

- **Repaving**: Pedestrian refuge islands will introduce some additional costs to routine maintenance such as street repaving.

- **Landscape**: Landscaped pedestrian refuge islands will need regular landscape maintenance and may need irrigation.

Seasonal Use & Maintenance

- **Snow Removal**: Pedestrian refuge islands can introduce some complications for snow removal if not properly designed.
  - Islands should accommodate the turn radii of snow clearance equipment. Pedestrian refuge islands that are lane diverters or channelization features must provide adequate width from curb-to-curb to enable snow plows to proceed through the gap.
  - Pedestrian refuge islands should not generally be used for snow storage; however, portions of the island not used for walking surface may accommodate some temporary snow storage as long as it does not impede sight lines.
  - Clearly assign responsibility for removing snow from walking surfaces on pedestrian islands.
  - Walking surfaces should be designed for adequate drainage to avoid the pooling of water and propensity to ice over. Walking surfaces should be wide enough to accommodate snow removal equipment.
  - Use vertical reflective delineators to alert snow removal crews to the presence of the island, median or refuge.

Reviews & Approvals

- As with other features in the road travel lanes, pedestrian refuge islands will be reviewed and approved by the Ann Arbor Engineering Unit and the Systems Planning Unit. If facilities are proposed on a state route, MDOT will govern approvals.
4.1 PEDESTRIAN DESIGN ELEMENTS
[PEDESTRIAN REFUGE ISLAND]
DESCRIPTION & INTENT

Public art in downtown can create more vibrancy and interest for pedestrians and other users of the public right-of-way. Public art can assume many different forms, from murals on the sides of buildings, to fixed sculptures, artistic crosswalks, to temporary exhibits and installations. Incorporating public art into other street elements, such as light post banners, the sides of waste receptacles, and signal boxes, can transform common street elements into unique features. Public art helps activate less intensely used areas and fosters care and investment in downtown.

USE & APPLICATION

Location

- Public art can be incorporated in any place downtown and is appropriate to all street types and contexts.
- Public art can be freestanding works in the Amenity Zone or Frontage Zone, visible to pedestrians and road travelers alike. Artwork can also be horizontal surface treatments on walking surfaces, parking surfaces, or travel lanes provided it does not cause hazards or confusion for street users. Public art can also be incorporated into building facades.

DESIGN & OPERATIONS

Design Requirements

- Works of public art shall not infringe or impede on the free flow of pedestrian traffic in the Walking Zone.
- A minimum clear zone in the sidewalk of 6 feet shall be maintained. This minimum clear zone may be wider in certain locations where wider sidewalks are stipulated. See the Sidewalk and Amenity Zone Design Element.
- Public art shall not interfere or obstruct the safe use and operations of the public streets for vehicles, pedestrians, cyclists, and other users of the street.
- Artwork on horizontal surfaces, such as sidewalks, crosswalks, or roadways, should be temporary installations, recognizing that street projects and general wear will degrade the art work overtime.

Utility Considerations

- Works of public art cannot impede access to utility access panels, vaults, or other infrastructure services areas.
MAINTENANCE & MANAGEMENT

General Maintenance

- Works of public art are required to be maintained for the duration of their installation by the entity responsible for sponsoring art. Public art must be maintained so that it does not pose on-going safety concerns or other nuances on uses within downtown.

Seasonal Use & Maintenance

- Temporary works of public art are allowed.
- Sponsors of public art are responsible for maintaining the condition of installed works during the winter months.

Review & Approvals

- Permanent works of art occupying any part of the street right-of-way must be approved by the Ann Arbor Engineering Unit and a maintenance agreement may be required.
- If permanent works of art are gifted to the City or DDA (and accepted), the accepting unit or agency will be responsible for maintenance.
- Sidewalk occupancy permits are required for temporary art installations that are within the Frontage, Sidewalk, or Amenity Zones of the street.
- Temporary works of art intending to occupy parking spaces must be approved by the DDA, and the parking meter must be rented consistent with other alternative uses in parking spaces (e.g. construction closures, platform dining, bike corrals).