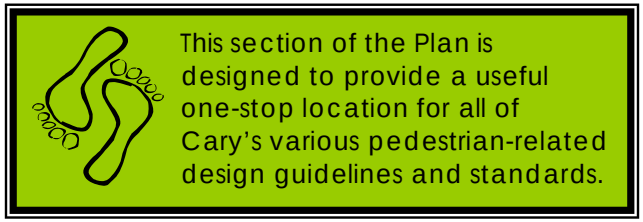



# Section 5. Best Practices

## 5.1. Introduction

This section is intended as a general reference for sidewalk and pedestrian facilities design as well as a guide for various "Best Practices" that apply to special pedestrian situations. Already, the Town has strong policies, guidance, and design standards regarding pedestrian facilities. The first half of this section will review Cary's various design-related standards and policies. The second half of this section addresses special situations for pedestrians, such as parking lots and construction zones. In general, the guidance provided in this section is based upon Cary's Land Development Ordinance (LDO), *Parks, Recreation and Cultural Resources Master Plan*, and *Design Guidelines Manual*. Any modifications to these documents should supersede information contained within this Pedestrian Plan.

Much of Cary's standards are based on design guidance for pedestrian facilities published by NCDOT (draft, 1997), the American Association of State Highway and Transportation Officials (AASHTO, 2004), and the Federal Highway Administration (FHWA, 2002). Ancillary organizations, such as the Institute of Transportation Engineers (ITE), contribute significantly to the state-of-the-practice as well by publishing design standards and manuals on traffic calming, street designs, and traffic signal operations. The recommended guidance herein borrows heavily from these sources and others, and users are encouraged to refer to them for additional information.

## 5.2. Design Guidelines

Overarching documents in Cary for design and construction of sidewalk and pedestrian facilities are:

- Land Development Ordinance (LDO),
- *Parks, Recreation, and Cultural Resources Master Plan*, and
- *Design Guidelines Manual.*

In addition, the Town has developed several policy statements that also affect the design of pedestrian facilities. These are:

- *Policy Statement 128: Pedestrian Crosswalks*, and
- *Policy Statement 135: Sidewalk Requests*.

The following paragraphs provide a brief overview of the general requirements for pedestrian facility design and construction in Cary. These requirements are subject to change with revisions to the aforementioned over-arching documents and policies.

### *5.2.1. Sidewalk Construction*

There are several circumstances when sidewalk is required to be constructed in Cary, including both public and private development projects. The following paragraphs describe the sidewalk construction requirements for each circumstance.

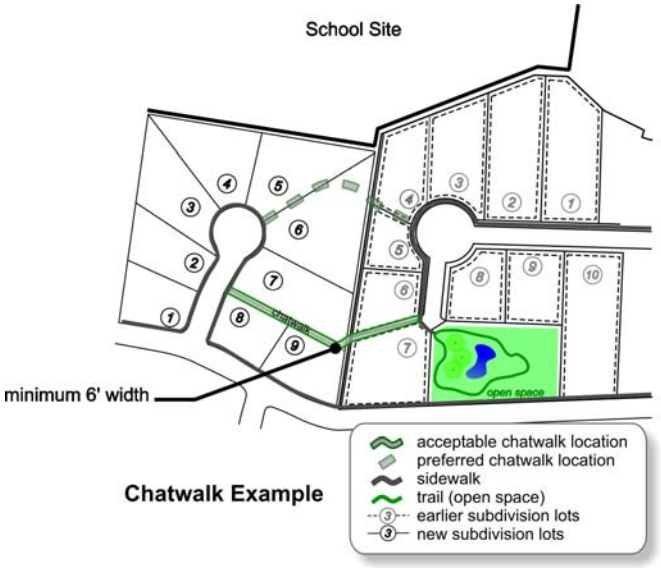
**As part of a development**

According to the *Land Development Ordinance* Section 7.10.4, in both new residential and non-residential development, sidewalk shall be constructed on both sides of the following facilities:

- Arterials;
- Collector streets;
- Non-residential cul-de-sacs; and
- Along the frontage of all new development or redevelopment.

Sidewalk is required on only one side of local streets. Loop streets and/or residential cul-de-sacs are not required to have sidewalks, unless the street is located within 1.5 miles of a school, or 0.5 miles of a greenway, park, or shopping area, in which case a sidewalk shall be required on one side of the street only.

In addition, according to the Town's Connectivity Ordinance, pedestrian facilities should be constructed where residential developments have cul-de-sacs or dead-end streets to connect to the nearest local or collector street or cul-de-sac in adjoining subdivisions (see diagram on this page).



Chatwalk Example

**As part of a road construction project**

According to Cary's Engineering Standard Specifications, Section 0300, sidewalk shall be installed at the time of construction for each new roadway or improvement to existing roadway based on the roadway classification, as follows:

- **thoroughfares, all collector streets, and non-residential cul-de-sacs**: sidewalk on both sides;
- **residential and non-residential local streets**: sidewalk on one side; and
- **loop and residential cul-de-sac streets**: no sidewalk unless either street is within one-half mile linear traverse of a greenway, park, shopping area, or the street is within

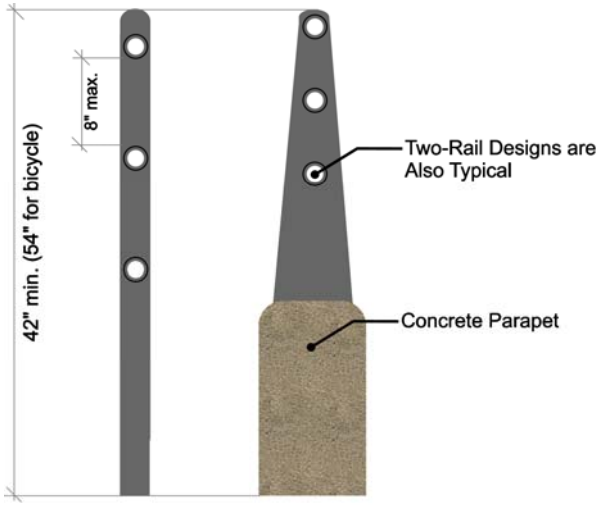
1.5 mile linear traverse of a school, in which case sidewalk on one side will be required.

These requirements apply to roadway projects completed by both the Town of Cary and also the North Carolina Department of Transportation. During roadway improvements, pedestrian facilities shall be provided to maintain pedestrian access, per *American Disabilities Act Accessibility Guidelines for Buildings and Facilities*[1].

**As part of a sidewalk request project**

As described in Section 4, sidewalk can also be constructed as part of the Town of Cary's Sidewalk Request Program. Sidewalk in this program shall adhere to the same standards and guidelines as applies for sidewalk construction on roadway improvement projects. Current policy states that sidewalk shall not be constructed on roads without curb and gutter; however, it is recommended that the Town reconsider restrictions on accepting requests for sidewalk on roads without curb-and-gutter. In some cases, sidewalk may be critically needed on a road, but the road may not be programmed for an upgrade to curb-and-gutter any time in the near future.

**Recommendation:** ***Town should reconsider restrictions on accepting requests for sidewalk on roads without curb-and-gutter.***




**Typical Handrail Specifications On Bridge (Where Sidewalks Exist)**

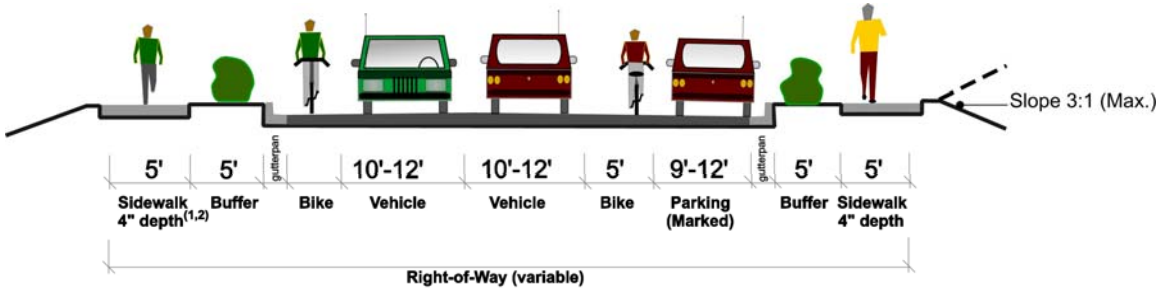
**With Bridge Construction**

Pedestrian facilities shall be provided on all bridges in accordance with NCDOT *Bridge Design Guidance.* Lack of pedestrian facilities on bridges can be a major barrier to pedestrian system connectivity. For bridges with curb and gutter approaches, the North Carolina Department of Transportation maintains a policy of sidewalk construction on both sides of a bridge that is less than 200 ft. in length; sidewalk is required on only one side for structures greater than 200 ft. in length. NCDOT places a number of caveats on this policy: if the sidewalk is deemed unsafe, impractical to program, not in accordance with AASHTO standards, or is difficult to design then the sidewalk may not be constructed. For bridges with shoulder approaches and where a pedestrian need is identified, a 7 ft. 6 in. offset for future sidewalks can be provided in urban areas or a cost-sharing approach for funding sidewalks can be explored by the locality. There is no funding cap on the NCDOT installation of sidewalks on a bridge.2 Pedestrian- and cyclist-safe railing designs are required for structures with sidewalks and bicycle lanes and should be considered in every instance where pedestrians and cyclists are allowed on the street.

### *5.2.2. Sidewalk Design*

Most of Cary's sidewalk and trails design standards can be found online through Cary's Engineering Standard Specifications Section 0300. In general, sidewalk design in Cary follows these requirements:

- Sidewalk is constructed only on roadway with curb-and-gutter.
- Sidewalk shall be a minimum of five feet from back of curb.
- Sidewalk shall be a minimum of five feet wide and a minimum of four inches thick. Sidewalk shall be six inches thick at locations where a driveway crosses a sidewalk, at street intersections (along the length of radius curb returns), and in the handicap ramps.
- Sidewalks shall have a uniform slope toward the roadway of 0.02 inches per foot.




(1) Note: Depth of sidewalk is 4" minimum; 6" at sidewalk crossings and curb ramps.
(2) Note: Slope of sidewalk is .02' / foot towards roadway.

**Sidewalk Material**

In general, standard sidewalks should be concrete, which is more durable than asphalt. A more flexible material, such as rubberized paving, can be considered in situations in which there is the potential for tree roots to crack and lift the concrete. Using these types of materials can reduce the risk of a tripping hazard, and also lower maintenance costs. More permeable materials, such as porous pavers, can also be considered for all pedestrian-ways, and in particular for greenways near streams, in order to reduce run-off from storm events.

**Recommendation:** ***Consider using more permeable materials, such as porous pavers, for all pedestrian-ways, and in particular for greenways near streams, in order to reduce run-off from storm events.***

**Image 5-1.** Examples of various types of sidewalk material used in Cary. The top image is a combination brick and gravel decorative paver used in downtown. The bottom image is the more typical concrete sidewalk used elsewhere in Cary. Other materials besides concrete, such as rubber and asphalt, can be used to reduce the likelihood of cracking.


**Figure 5-1.** A proposed multi-use trail along Regency Parkway from Symphony Lake Greenway to Swift Creek Trail.

**Image 5-2.** The pedestrian crossing at the Kildaire Farm and Maynard Road intersection. Note the marked crosswalk and pedestrian-activated signals. These are standard features which should be installed with each new signal.

**Multi-Use Trails**

Multi-use trails are described in detail in the Cary *Parks, Recreation, and Cultural Resources Master Plan* as a Type 7 Trail Facility. Multi-use trails are similar to sidewalks in that they are on-street and paved, however, they are designed to accommodate both cyclists and pedestrians and must therefore be a minimum of 10 feet wide. There is a minimum 12-foot set-back for multi-use trails from the edge of the roadway pavement[3]. They often serve to connect one greenway to another. For example, a multi-use trail is recommended to connect the Symphony Lake Trail to Swift Creek Trail along Regency Parkway (see Figure 5-1). Because multi-use paths are shared by both pedestrians and cyclists, a dashed, wide, yellow center line should be used to separate opposite directions of travel for cyclists. Sometimes, multi-use trails will also have a solid white stripe to designate separate travel lanes for pedestrians and cyclists. In this case, regulatory signs should also be used to clarify the appropriate users for each designated travel lane.[4]

**Recommendations:** ***(1) Provide multi-use trail to connect the Symphony Lake Trail to Swift Creek Trail along Regency Parkway. (2) For multi-use trails with separated travel lanes for pedestrians and cyclists, signs should also be used to clarify the appropriate users for each designated travel lane.***

**Greenways**

Standard greenway design is discussed in Cary's *Parks, Recreation, and Cultural Resources Master Plan*. This document should be referenced for all greenway design standards. The following is a listing of the types of trails outlined in the *Parks, Recreation, and Cultural Resources Master Plan*.

- Type 1: Greenway Corridor
- Type 2: Unpaved Footpath
- Type 3: Equestrian or Mountain Bike Trail
- Type 4: Secondary Greenway, 8' Paved Trail
- Type 5: Primary Greenway, 10' Paved Trail
- Type 6: Soft Surface Greenway
- Type 7: Multi-Use On-Road Trail, 10' Paved Trail
- Type 8: Sidewalk Connectors

### *5.2.3. Pedestrian Crossings*

The North Carolina State Statute, as of January 2007, holds that "pedestrians have the right-of-way at marked and unmarked crosswalks in residential and business areas except where there is a traffic or pedestrian signal [§20-155(c) and §20-173(a)]"[5]. In addition, "where traffic control signals are not in place or in operation the driver of a vehicle shall yield the right-of-way, slowing down or stopping if need be to so yield, to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at or near an intersection [ss20-173(a)]"[6].

According to Cary's Engineering Standard Specifications, Section 0300, all locations which are designated for pedestrian traffic crossings shall be designated as a crosswalk with pavement markings and signage. The type and placement of signage and markings shall be consistent with the requirements as identified in *Manual of Uniform Traffic Control Devices*. *Cary's Policy 128: Pedestrian Crosswalks*, states that where new sidewalks are proposed, Staff shall consider marked crosswalks as a part of the design criteria.

**At Signalized Intersections**

At signalized intersections, Policy 128 states that the addition of pedestrian activated push-buttons and walk/don't walk signals shall be considered. Informally, the Town has a policy to install pedestrian signal heads and crosswalks with the installation of any new signalized intersection. Based on the North Carolina General State Statutes, it is recommended that this become a formal policy, along with the installation of marked crosswalks, in order to reinforce a pedestrian's legal right to passage. In addition, pedestrian signals should be provided even in locations without sidewalk on one or both sides of an intersection. In the past, common practice has sometimes been to ignore pedestrian movement across some legs or across some intersections entirely. By providing pedestrian signals, the Town will accommodate pedestrians while providing a safer crossing. It is also recommended that the Town create a database of intersections with signals and pedestrian treatments for reference when discussing a safety issue and for understanding and tracking the availability of pedestrian connections.

**Recommendations:** ***(1) Formalize Town policy to install pedestrian signal heads and crosswalks with the installation of any new signalized intersection. (2) Provide pedestrian signals even in locations without sidewalk on one or both sides of an intersection. (3) Create a database of intersections with signals and pedestrian treatments for reference.***


**Image 5-3. Top image:** An example pedestrian-activated signalized mid-block crossing. **Bottom image:** A guide for pedestrians to understand the meaning of the push-button signals.

**Protected Right-on-Red and Free-Flowing Turn Lanes**

There are two signalized intersection design scenarios that are often difficult for pedestrians: protected right-on-red and free-flowing turn lanes. Protected right-on-red conditions are often provided at signalized intersections to improve intersection capacity. This type of design allows a vehicle to make a protected right-on-red with a green arrow while vehicles in the cross-street are making left turns. This situation can create confusing and dangerous conditions for pedestrians by eliminating a protected crossing phase. As a result, it is important that additional signal phases exist which specifically provide protected crossings for pedestrians at an intersection with protected right-on-red for motorists.

Similarly, free-flowing turn lanes are often provided for right turns at intersections to improve capacity. These turn lanes separate right-turning traffic from through-traffic and create a condition comparable to a freeway on-ramp in which the right-turn does not require signalization. Sometimes, these free-flowing turn lanes do not require vehicles to slow down or stop to make a turn. Once again, this can create a dangerous condition for pedestrians attempting to cross the free-flowing turn lane. In order to improve pedestrian safety, free-flowing turn lanes should only be used in very rare instances in which pedestrians are not expected. If they must be used, engineers should give extra consideration to appropriate treatments which will warn both motorists and pedestrians of potential conflicts.

**Recommendations:** ***(1) At an intersection with protected right-on-red for automobiles, there should be signal phases which specifically provide protected crossings for pedestrians. (2) Free-flowing turn lanes should only be used in very rare instances in which pedestrians are not expected. If they must be used, engineers should give extra consideration to appropriate treatments which will warn both motorists and pedestrians of potential conflicts.***

**At Mid-Block and Greenway Crossings**

*Policy 128: Pedestrian Crosswalks* places strict requirements on mid-block crossings and intersections without control of Right-of-Way. Marked pedestrian crosswalks shall not be placed across streets at mid-block locations or intersections without control of right-of way with the following characteristics:

- Where the street is a multi-lane (four or more lanes) street without raised medians and the Average Daily Traffic (ADT) volumes exceed 9,000 or the posted speed limit is 30 MPH or greater.

- Where the street is a multi-lane (4 or more lane) street with raised medians and the ADT volumes exceed 12,000 and the posted speed limit is 40 MPH or greater.
- Where the street provides three travel lanes and the ADT volumes exceed 9,000 or the posted speed limit is 40 MPH or greater.
- Where the street is residential in nature, providing two travel lanes, and the ADT volumes are less than 400 or greater than 12,000.

Especially noteworthy is that raised medians must be four feet or greater in width and six feet or greater in length to provide an adequate pedestrian refuge.

Greenway crossings frequently occur at mid-block locations. Greenway crossing design is discussed in Cary's *Parks, Recreation, and Cultural Resources Facilities Master Plan*, and also in the Town's Policy Statement 128. Policy Statement 128 states:

> *"Where new greenway trails are being planned, Parks and Recreation staff shall implement grade-separated crossings in the designs. If grade separations are determined to be unfeasible, then engineering staff shall work with Parks and Recreation staff to ensure that the trail will cross the street at a signalized intersection or location that maximizes sight distance for pedestrians and motorists. Traffic/Pedestrian signals, raised medians, advance warning signs, and other enhanced pedestrian safety devices should be considered to supplement marked crosswalks where needed.*
>
> *Where greenway trails are existing engineering staff shall work with Parks and Recreation staff to consider marked crosswalks and/or other enhanced safety devices on a case by case basis and subject to the thresholds stated in part 'B' above [guidelines for mid-block pedestrian crossings]"*

The following is a listing of the trail crossings identified in the *Parks, Recreation, and Cultural Resources Master Plan*:

- Trail Crossing Type 1: 2-lane road, 25 mph speed
- Trail Crossing Type 2: 2-lane road, 35 mph speed
- Trail Crossing Type 3: 3-lane road, 35 mph or less
- Trail Crossing Type 4: 4-lane road, 45 mph or less
- Trail Crossing Type 5: 5-lane road, 45 mph or less
- Trail Crossing Type 6: 2-lane road, Over 35 mph
- Trail Crossing Type 7: 3-lane road, over 35 mph
- Underpass
- Overpass

**Image 5-4.** The greenway underpass at Kildaire Farm and High Meadow. An underpass is one form of pedestrian crossing.

It is recommended that the Town amend Policy 128 to reference the Parks, Recreation, and Cultural Resources Facility Master Plan for greenway crossings. The Town should also continue to explore ways to refine grade-separated crossing criteria as discussed in the Plan. At the same time, the Town should coordinate with NCDOT to agree upon a mutually acceptable mid-block crossing policy for greenways. At the writing of this Plan, there was no formal greenway crossing policy identified in the following documents:

- *Manual on Uniform Traffic Control Devices for Streets and Highways,* 2003 edition
- *NC Department of Transportation Bicycle Planning and Design Workshop Manual*
- *North Carolina Bicycle Facilities Planning and Design Guidelines*
- NCDOT Division of Bicycle and Pedestrian Transportation website: http://www.ncdot.org/transit/bicycle/default.html

**Recommendations:** ***(1) Amend Policy 128 to reference the Parks, Recreation, and Cultural Resources Facility Master Plan for greenway crossings. (2) Continue to explore ways to refine grade-separated crossing criteria as discussed in the Plan. (3) Coordinate with NCDOT to agree upon a mutually acceptable mid-block crossing policy for greenways.***

**Crossing Treatments**

There are a variety of crossing treatments that Cary can consider using for pedestrian facilities. The following is a listing of some of the treatments that can be used (Figure 5-2).

- Striped crosswalk
- Zebra crosswalk
- Raised platform
- Bulb-outs
- Embedded lights
- Embedded signs
- Ped-signals and crosswalks
- Ped-signals with audible signal
- Ped-signals with count-down
- Median with z-crossing
- HAWK Signal

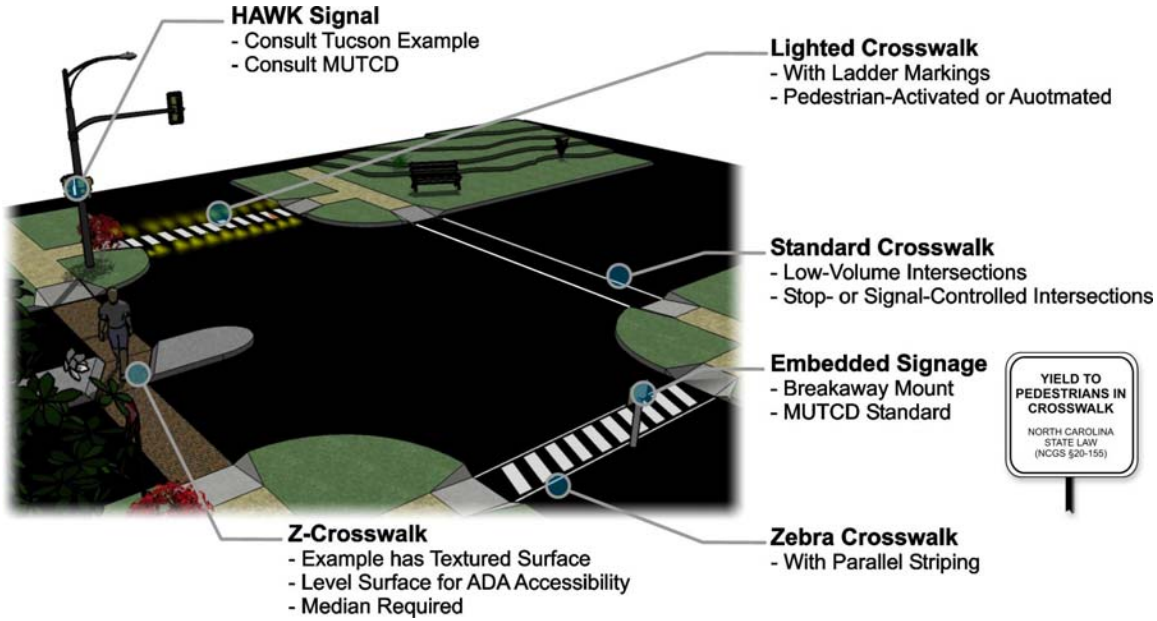



**Figure 5-2.** A diagram of various crossing treatments Cary can consider to improve pedestrian accessibility and safety crossing the street.

*ADA Requirements*

In 1990, Congress passed the Americans with Disabilities Act (ADA), a civil rights law which prohibits discrimination against people with disabilities in all aspects of life. The purpose of this legislation is to ensure equal participation and opportunity for all in mainstream society. ADA contains five titles, which cover requirements for employment, state and local government services, public accommodations and commercial facilities, telecommunications, and miscellaneous requirements. As done throughout the US, the Town of Cary's transportation facilities, including sidewalks and pedestrian facilities, must comply with the guidelines set forth in the ADA Accessibility Guidelines (ADAAG) in order to meet the standards of the American Disabilities Act. For a complete guide to ADA requirements, see the National Access Board's website: www.access-board.gov. It is recommended that the Town should consider revising its engineering standards and specifications to explicitly state that all facilities must comply with the requirements outlined in the American Disabilities Act Accessibility Guidelines for Buildings and Facilities.

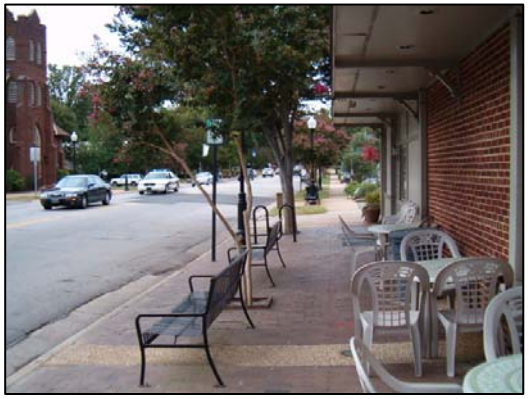


**Image 5-5.** Sidewalk in Downtown Cary, wide enough to support the occasional outdoor cafe.

The most frequent ADA consideration in pedestrian systems is the sidewalk curb ramp that connects perpendicular streets and driveways to the sidewalk. The Town of Cary has adopted very specific standards for the design and placement of sidewalk curb ramps under a variety of geometric conditions. The designer is encouraged to carefully consider these standards, especially detail drawings 03000.14 (three sheets) located at: www.townofcary.org/depts/dsdept/engineering/stddrawings.htm.

**Recommendation:** ***Consider revising Town's Engineering Standard Specifications to explicitly state that all facilities must comply with the requirements outlined in the American Disabilities Act Accessibility Guidelines for Buildings and Facilities.***

## 5.3. Special Considerations

### *5.3.1. Downtown Cary*

The guiding document for pedestrian facility design in Downtown Cary is the *Town of Cary Town Center Area Plan*. This Plan states that "sidewalks should be wide enough to support a high volume of pedestrian traffic, and perhaps the occasional sidewalk café in certain blocks." To this end, it is recommended that sidewalk in the Downtown Area be set at a minimum of 10 feet wide to accommodate higher pedestrian volumes. Sidewalks should also maintain the same look and feel throughout the downtown area – this is often achieved by creating a uniform sidewalk pattern, using colored pavers and materials that produce varied textures, such as brick. Image 5-5 shows an example of the current sidewalk pattern used in Downtown. Similarly, the *Town Center Plan* also advises that street crossings should have unique characteristics, stating that "pedestrian crossings should use distinctive designs and materials to help establish the pedestrian-oriented nature of the heart of the downtown". Pedestrian facilities in Downtown should also have plenty of street amenities, such as street trees, signage, trash cans, benches, and signature street lamps in order to make the pedestrian experience as pleasant as possible. In addition, as described in the *Town Center Plan* buildings should be oriented towards the street to provide an interesting and inviting walking environment. These features will encourage pedestrians and walking in downtown, creating a popular destination for people to shop, walk, and meet.


**Image 5-6.** A school zone sign on Harrison Ave. in Cary. School zones should be established around all schools in Cary to create a safe walking environment for students.

**Recommendations:** ***(1) In downtown, provide plenty of pedestrian facilities and street amenities, such as street trees, signage, trash cans, benches, and signature street lamps in order to make the pedestrian experience as pleasant as possible. (2) As described in the Town Center Plan, orient buildings towards the street to provide an interesting and inviting walking environment.***

### *5.3.2. Schools and School Zones*

Schools are a highly sensitive area for pedestrians – they can generate pedestrians of all ages, with varying levels of pedestrian safety skills and understanding. It is important that a school be a "safe zone" equipped with the best safety features available - both for walking around the school and for walking to and from the school. In addition to ensuring safety, it is also important that a school encourage physical activity and teach children safe pedestrian behaviors.

In order to create a safe zone, speed limits on roads with access to schools should be reduced by 10 mph within a quarter mile of the school. This reduction in speed should be announced by large school zone signs that also indicate the presence of a school nearby. Additional school zone signage should be placed on all access routes to schools within the quarter-mile zone. The Town should consider developing an ordinance that requires sidewalk along all roads within a quarter -mile of a school and that all signalized intersections within a quarter-mile of the school should have functioning pedestrian signals with crosswalks and push-buttons. If the school is accessed from a mid-block location, then a signalized mid-block crossing should be provided for safe pedestrian access. The Town planning and engineering staff will need to work with the Wake County School System and the Town of Cary Police Department in order to implement and enforce these improvements.

**Recommendations:** ***(1) Create a policy that requires "safe zones" around schools in which speeds are reduced by 10 mph within a quarter mile of the school and signs are posted warning of school and student presence. (2) Consider developing an ordinance that requires sidewalk along all roads within a quarter-mile of a school and that all signalized intersections within a quarter-mile of the school should have functioning pedestrian signals with crosswalks and push-buttons. If the school is accessed from a mid-block location, then a signalized mid-block crossing should be provided for safe pedestrian access.***

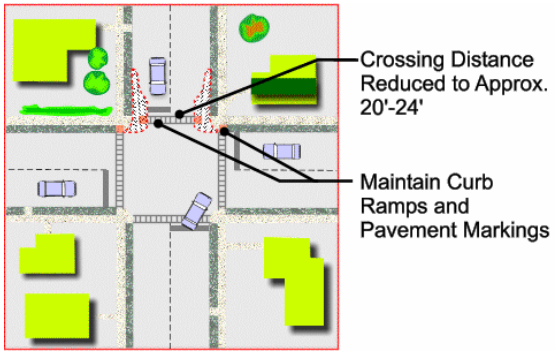



**Image 5-7.** Example bulb-out placement to reduce curb radii and shorten travel distance for pedestrians crossing an intersection.

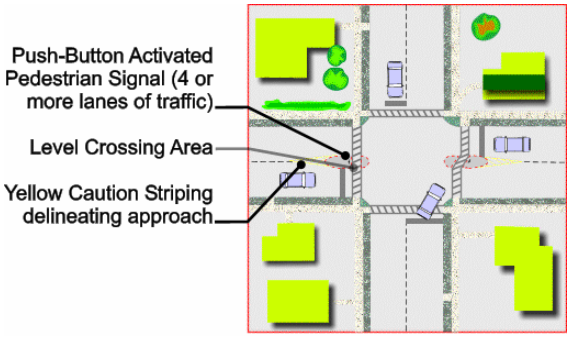



**Image 5-8.** An example of good median and refuge island design.

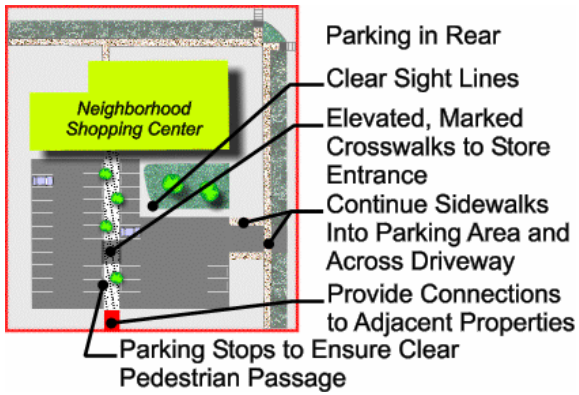



**Image 5-9.** An example of pedestrian-friendly parking facility design.

### *5.3.3. Curb Extensions (Bulb-Outs) and Curb Radii*

The primary purpose of bulb-outs is to shorten the distance that pedestrians must travel to cross a street. In addition, they may encourage motorists to drive slower by narrowing the travel lane and reducing vehicular speeds during turning movements at intersections. Motorists will travel more slowly around corners with smaller curb radii even without the use of curb extensions. Landscaping and other aesthetic treatments such as special paving textures should be carefully designed to avoid hazards to drivers and visually-impaired citizens while minimizing maintenance costs. Image 5-7 shows an example image bulb-out placement to reduce curb radii and make an intersection more pedestrian-friendly.

### *5.3.4. Medians and Refuge Islands*

Image 5-8 indicates the design and markings associated with refuge islands. Note that pavement markings delineate the approach to the islands; that the islands are "split" to allow for a level platform for wheelchair use; and that in cases where there are wide roads and high traffic volumes, a push-button pedestrian signal may be mounted in the refuge area to allow a pedestrian to split their trip into two halves as they cross the street. Note that the crosswalk on the right side of the diagram is configured at a skewed angle as it crosses the median. This allows pedestrians to have a better angle of sight as they approach and cross each side of the street. In all cases, a minimum 10-foot travel lane is maintained. Sensitivity to large vehicles (buses, trucks and fire equipment) dictates some elements of the median design, curb style, and placement. Median-controlled roadways reduce the number of turning conflicts and are generally preferred for both pedestrians and cyclists over a two-way, left-turn lane (TWLTL) roadway.

### *5.3.5. Parking Lot Design*

Everyone becomes a pedestrian once they park their car, but there are many examples of poor parking lot design. Poor parking lot design at the least will deter customers that may be walking or riding transit to a store, and at the most can create a dangerous safety hazard by increasing pedestrian-vehicle interaction. The most common design issue is that the primary carriageway for vehicles in the parking lot happens to coincide with where the greatest number of pedestrians cross: directly in front of the main entrance. Other issues include poor sight lines to spot pedestrians; bad transition areas from the public domain (e.g., streets) to the private parking area; and inconvenient pedestrian access between parking areas, shops, and adjacent communities. Image 5-9 indicates a preferred set of suggestions to overcome these common problems. The larger the parking lot, the more vehicles and pedestrians, and therefore the more

important it is to carefully design treatments to minimize vehicle-pedestrian interaction. Some suggested treatments:

1. **Parking in the rear.** One way to attract pedestrians to a store and to reduce pedestrian-vehicle interaction is to minimize the amount of parking lot that a pedestrian must walk through to get to the store entrance. This can be done by placing parking in the rear which will reduce travel time for pedestrians approaching the store from the street-front and sidewalk. It will also minimize pedestrian-vehicle interaction by keeping pedestrian customers separate from vehicles by allowing the pedestrian customers to access the store directly from the sidewalk rather than through a parking lot. Parking lots in the rear also create a more attractive streetscape – something that also encourages pedestrian use.
2. **Create safe "landing areas".** Provide continuous transitions from the street into a safe "landing" area in the parking lot; don't just "dump" pedestrians into the throat of a driveway.
3. **Maintain good sight lines** at major turning points inside the parking area.
4. **Provide well-marked pedestrian access perpendicular to store fronts.** Whenever possible, provide perpendicular pedestrian access into the front of a high volume land use such as major retail uses. The final crossing to the store entrance(s) should be well-marked, preferably with a raised crosswalk and/or colored demarcations to provide good visual cues to the driver. Moving the main parking aisle away from the principal entrance is another option.
5. **Supply adequate, pedestrian-scale lighting.** Adequate lighting is often perceived as a personal security issue in many large parking areas, and should be provided while avoiding disabling glare (looking into a direct light source and being partially blinded) or causing light pollution to adjoining properties. The following table (Table 5-1) is the recommended horizontal illumination requirements for high-, medium-, and low-level land uses, and should be considered a basic guide based on a majority of lighting policies reviewed. In order to make customers and pedestrians feel more comfortable, lighting should also be provided at a pedestrian scale. This means lowering the height of some light poles and providing lighting at key locations, such as the entrances and exits to stores, and not just in the parking lots.
6. **Provide awnings.** Especially for some "big box" stores, it is important that the transition for customers from inside the store to the outside be gradual and protected as much as possible from conflicts with vehicles. By providing awnings, a store protects its customers from the rain while allowing for a more comfortable pedestrian environment for customers to window shop and wait for rides or a bus to arrive. This can make a store seem much more comfortable while encouraging customers to

remain within the protected awning area and out of conflict with vehicles in the travelway.

**Table 5-1.** Recommended horizontal illumination requirements for land uses.

| Intensity of Pedestrian-Oriented Land Use | Average Luminosity (foot-candles) | Minimum Luminosity (foot-candes) |
|---|---|---|
| **High**<br>*Civic Centers, Regional Shopping, Fast Food* | 3.6 | 0.9 |
| **Medium**<br>*Community Shopping, Office Parks, Hospitals, Apartment Complexes* | 2.4 | 0.6 |
| **Low**<br>*Neighborhood Shopping, Churches, Industrial Employee Parking* | 0.8 | 0.2 |

**Recommendation:** ***Implement parking lot design requirements in the LDO or Design Guidelines Manual as recommended in this section.***

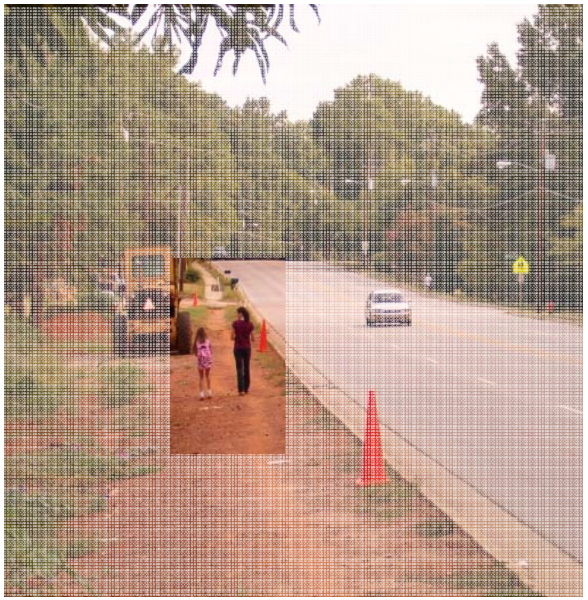


**Image 5-10.** Poor pedestrian access at a construction zone in Cary.

### *5.3.6. Construction Zones: Providing Adequate Temporary Pedestrian Access*

The construction or expansion of roadways, utilities, or private development sometimes requires that sidewalks or trails be temporarily closed to allow for the movement of construction vehicles on and around the site. When pedestrian facilities are closed temporarily, the entity responsible for the construction is also responsible for providing adequate access through or around the site as well as signage that provides advance warning to pedestrians and motorists of the closure. Both the MUTCD (Manual on Uniform Traffic Control Devices)[7], NCDOT Planning and Designing Local Pedestrian Facilities[8], and the ADA (Americans with Disabilities Act)[9] stipulate that safe passage should be maintained throughout a temporary closure unless it occurs during an extreme situation such as a natural or man-made emergency. During private construction within Town limits, it is the responsibility of the Town of Cary to ensure compliance with these rules by regular (recommended: daily in high pedestrian areas) monitoring and by the posting of a call-in telephone number to be placed on-site to report potential problems or non-compliance.

The following must be considered by the Town, State, or private/public construction agents whenever a sidewalk or trail will be closed temporarily:

- *Accessibility for Mobility Impaired Citizens.* At least one accessible route should be provided to transportation or transit facilities; accessible parking areas/spaces; public streets/sidewalks; and public parking areas to an accessible entrance of the building. This route(s) will comply with all other accessibility provisions contained in the ADA regardless of whether they are temporary or permanent. A barrier shall be placed across the full width of the sidewalk or trail to be detectable by a visually impaired person using a cane. An audible information device may be needed in cases where there are especially high traffic volumes challenging a visually impaired person making a street crossing.
- *Temporary Obstructions.* Parked construction equipment, erosion control fencing, storage of materials/construction debris, and other potential obstructions should be kept away from roadside pedestrian access and pedestrian or multi-use trails so as to keep a permanent passageway open for pedestrians crossing the site. Signs and other devices should not protrude more than 4" into the pedestrian passageway and 7' or less above a sidewalk (8' min. preferred).
- *Advance Warning and Signage.* Advance warning may consist of a single sign to a flashing strobe, depending on the nature of the construction or context (such as vehicular volumes) of the work area. Advance signage should be placed so that pedestrians have an opportunity to read the sign and make a safe crossing at a street intersection to the opposite side of the roadway. Smaller, mid-block closures will require fewer treatments, but will still retain the "Sidewalk Closed Ahead Cross Street" advance warning at an appropriate and safe crossing point in advance of the closure, at a minimum.
- *Route Design.* Temporary traffic barriers like jersey barriers (although not intermittent short sections of jersey barriers) and breakaway bollards should be considered as tools to help delineate a buffer from moving vehicles in areas with high pedestrian traffic volumes and/or to help ensure worker safety. Routes should be smooth and level and maintain the 60" standard width where possible; if not possible, then passing zones measuring a minimum of 60" x 60" will be provided every 200 linear feet. Rumble strips and other warning devices may be considered with professional engineering judgment, but care must be taken to consider noise and traffic diversion onto other streets before applying such devices.

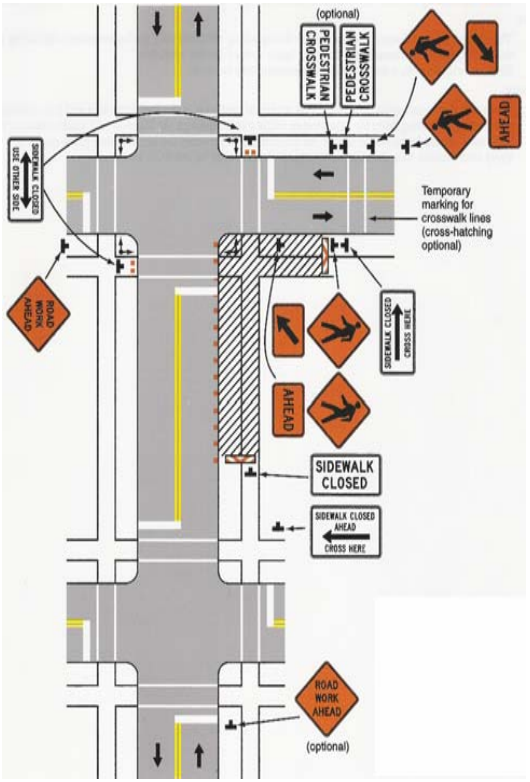



**Image 5-11.** Adapted from Sample Signage Plan for Temporary Pedestrian Closure (MUTCD, Figure 6H - 29).

## 5.4. Recommendations

Table 5-2 shows the priority recommendations for changes to Cary's policies, standards, and design guidelines to help implement best practices for pedestrians. The table also shows the reason for the recommendation's priority and any challenges to its implementation.

**Table 5-2. Priority recommendations for changes to Cary's policies, standards, and design guidelines to help implement best practices for pedestrians.**

| Best Practices Recommendations |
|---|
| ♦ Reconsider restrictions on accepting requests for sidewalk on roads without curb-and-gutter. |
| ♦ Consider using more permeable materials for all pedestrian in order to reduce run-off from storm events. |
| ♦ Provide multi-use trail to connect the Symphony Lake Trail to Swift Creek Trail along Regency Parkway |
| ♦ On multi-use trails with separated travel lanes for pedestrians and cyclists, provide signs to clarify the appropriate users for each designated travel lane |
| ♦ Formalize existing Town practice of installing pedestrian signal heads and crosswalks with the installation of any new signalized intersection. |
| ♦ Provide pedestrian signals even in locations without sidewalk on one or both sides of an intersection. |
| ♦ Create a database of intersections with signals and pedestrian treatments for reference. |
| ♦ At intersections with protected right-on-red for automobiles, provide signal phases which specifically create protected crossings for pedestrians. |
| ♦ Restrict use of free-flowing turn lanes. When used, provide appropriate treatments to warn both motorists and pedestrians of potential conflicts. |
| ♦ Amend Policy 128 to reference the Parks, Recreation, and Cultural Resources Facility Master Plan for greenway crossings. |
| ♦ Continue to explore ways to refine grade-separated crossing criteria as discussed in this Plan. |
| ♦ Develop with NCDOT a mutually acceptable mid-block crossing policy for greenways. |
| ♦ Revise Town's Engineering Standard Specifications to explicitly state that all facilities must comply with the requirements outlined in the American Disabilities Act Accessibility Guidelines for Buildings and Facilities. |
| ♦ In downtown, provide plenty of pedestrian facilities and street amenities, such as street trees, signage, trash cans, benches, and signature street lamps. |

**Table 5-2 cont'd.**

| Best Practices Recommendations |
|---|
| ♦ As described in the Town Center Plan, orient buildings towards the street to provide an interesting and inviting walking environment. |
| ♦ Create a policy that requires "safe zones" around schools in which speeds are reduced by 10 mph within a quarter mile of the school and signs are posted warning of school and student presence. |
| ♦ Consider developing an ordinance that requires sidewalk along all roads within a quarter-mile of a school and that all signalized intersections within a quarter-mile of the school should have functioning pedestrian signals with crosswalks and push-buttons. If the school is accessed from a mid-block location, then a signalized mid-block crossing should be provided for safe pedestrian access |
| ♦ Implement parking lot design requirements in the LDO or Design Guidelines Manual as recommended in this section. |

## Resources

[1] *ADA Accessibility Guidelines for Buildings and Facilities.* Available at http://www.access-board.gov/adaag/html/adaag.htm. Accessed October 30, 2006.

[2] North Carolina Department of Transportation, "Pedestrian Policy Guidelines." October 1, 2000. (www.ncdot.org/transit/bicycle/laws/ped_guide.pdf)

[3] Cary Parks, Recreation and Cultural Resources Facilities Master Plan. Town of Cary. Page 119. December 2003.

[4] *North Carolina Bicycle Facilities Planning and Design Guidelines*. North Carolina Department of Transportation. January 1994: Chapter 7, page 51.

[5] "A Guide to North Carolina Bicycle and Pedestrian Laws: Guidebook on general statutes, ordinances, and resources." North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation. September 2004. pgs: 16 – 17.

[6] A Guide to North Carolina Bicycle and Pedestrian Laws: Guidebook on general statutes, ordinances, and resources." North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation. September 2004. pg: 20.

[7] *Manual on Uniform Traffic Control Devices for Streets and Highways*, 2003 Edition. Federal Highway Administration, 2003. Especially Sections 6B-1, 6D, 7, and Figures 6H-28, 6H-29, 7A-1, and 7B-4.

[8] *Planning and Designing Local Pedestrian Facilities*, North Carolina Department of Transportation Office of Bicycle and Pedestrian Transportation. February, 1997, Chapter 10.

[9] Americans with Disabilities Act, US Code 28 CFR Part 36: ADA Standards for Accessible Design. Page 496 (www.usdoj.gov/crt/ada/adastd94.pdf).