

# 10 Maintenance and Management



Rules Signage - Battle Branch Trail Chapel Hill, NC

## Introduction

Greenway trails are public infrastructure and, similar to roads and sidewalks, have maintenance and management needs. These needs and the town's capabilities for maintenance should be considered during the planning and design phase. Greenway trails do not require daily ongoing management. As trails are built, funding to address maintenance should be included in town budget considerations.

Trails will require features in order to enhance the user experience, insure the safety of users, provide privacy and security to surrounding and adjacent properties, and/or improve the durability and life of the greenway trail. These features and associated maintenance will be considered during the design and planning process.



Gate rules signage - Cary, NC

## Operational Rules and Regulations

The operational rules for the Zebulon Greenway are based on the rules for the City of Raleigh's Capital Area Greenway Trail System.

- Obey posted rules and regulations
- Trail hours are from dawn to dusk
- Speed limit on trails is 10 mph
- Consumption of alcoholic beverages is prohibited
- Motorized vehicles are prohibited on greenways
- Fires are prohibited on greenways
- It is prohibited to remove, destroy, or damage any plant life or property
- Pets must be on a leash no greater than 6 feet
- Owners must remove pet waste
- It is prohibited to kill, trap, or harm wildlife
- Swimming in Town ponds is prohibited
- Horses are prohibited on trails
- All trail users under the age of 16 are required to wear a safety helmet when using a bike, skates, scooters or any other non-motorized vehicle
- Smoking is prohibited in Town parks and greenways
- Weapons prohibited except those permitted in NCGS 14-415.23
- Camping is prohibited in Town parks and greenways
- Bicyclists, skaters, and skateboarders should approach pedestrians cautiously and pass on the left
- All users, including pets, should remain on the right side of the trail except when passing
- Bicyclists, skaters, and skateboarders must always yield the right of way to pedestrians
- Patrons should be aware of their surroundings on the trail
- The use of headphones is discouraged
- Patrons are encouraged to walk or jog with a companion
- Hide your belongings, lock your car, and take your keys

## Maintenance Procedure and Implications

Neglecting routine maintenance eventually may render facilities unusable and such deteriorating facilities may become a liability to the Town. Users should be encouraged to report facilities that are in need of maintenance.

A central contact person who can authorize maintenance work should be designated to receive such reports. A smooth surface, free of potholes and debris, should be provided on all greenways, sidewalks, and bikeways. Glass, sand, litter and fallen leaves often accumulate on bike lanes, paved shoulders and shared use paths; therefore, regular debris removal is desirable. Pavement edges should be uniform and should not have abrupt drop-offs. Signs and pavement markings should be inspected regularly and kept in good condition and, if determined to be no longer necessary, promptly removed. Highways with bicycle traffic may require a more frequent and higher level of maintenance than other highways.

For shared use paths, attention should be given to maintaining the full paved width and not allowing the edges to degrade. Trees, shrubs and other vegetation should be controlled to provide adequate clearances and sight distances. Trash receptacles should be placed and maintained at convenient locations. Seeded and sodded areas in the vicinity of shared use paths should be mowed regularly. Snow plowing should be used to remove snow from bikeways because de-icing agents and abrasives can damage bicycles. Also, enforcement is often necessary to prevent unauthorized motor vehicles from using a shared use path.



*Fence along greenway - Cary, NC*



*Retaining Wall at the Art Museum - Raleigh, NC*

## Design Considerations

In addition to connecting destinations, design consideration for greenways as well as other bike and pedestrian improvements are dependent on existing conditions and potential use. Significant considerations include user safety, relationships to adjacent properties and impact on the environment. Design also will influence maintenance requirements.

### Defining Edges

Important to the experience of the user and protection of adjacent properties is a clear demarcation of the trail edge or limits of the public greenway space. This can be accomplished through the use of built elements such as fences, walls and railings as well as vegetation, and the manipulation of topography. Defining this edge will help provide visual separation, discourage the creation of unauthorized trail connections, protect the user from drastic changes in grade, and preserve sensitive creek banks and other environmentally sensitive areas. Use of these features should not create obstacles to trail surveillance.

Chicanes may be designed separated from the curb face to create a bicycle bypass and/or to allow water to continue draining along a gutter pan, but this may require maintenance to remove leaf matter and other debris build up.

Consideration also can be given to adjusting lane widths and providing wider outside curb lanes for bicyclists during restriping operations. The addition of edge lines can better delineate a shoulder, especially at night.

## Drainage and Erosion Control

Accommodating and managing natural drainage patterns and preventing erosion is critical to the management of a trail. Typically, drainage and erosion control features can include low impact solutions such as vegetated swales that encourage infiltration as well as engineered solutions and underground systems. Low Impact Development (LID) systems typically fit into the trail corridor seamlessly.

To minimize erosion and drainage concerns it is best for the trail to follow the contours of the land. Pipes conveying storm water under the trail should be adequately sized.

A cross slope of 2% across the trail surface is ideal with a 1:6 shoulder slope.

All facilities will need to be maintained as directed by the NCDENR manual. Grassed swales will need to be kept mowed and the compacted ABC shoulders replenished as necessary.

### Paved Trails

Whether paved or unpaved, all trails will require regular maintenance practices to include removal of leaves and debris, mowing of lawns and pruning of vegetation to keep the trail clear. Any potholes, cracks, and bumps in the pavement will need to be repaired as necessary.



*Mixed surface trail - Cary, NC*



*Black Creek Greenway - Cary, NC*

### Unpaved Trails

Unpaved trails typically require more maintenance. In addition to the typical maintenance required for paved trails, unpaved trails will need to be replenished frequently as the material moves or washes. The edges of the trail will need to be defined regularly. Storm water features are to be designed to divert the flow of water across the trail where possible in order to prevent the surface from washing.

### Pavement

Maintaining smooth pavement surfaces make for a pleasant bike ride or walk. A street can have all the ideal characteristics of a bicycle boulevard, but miss on one important detail: pavement quality. Pavement in poor condition, including potholes, embedded objects such as abandoned railroad tracks, and debris, make for an uncomfortable and potentially dangerous journey. Inattention to pavement quality and debris can reduce the bicycle boulevard attractiveness and effectiveness. Bicycle boulevards must be kept in good condition, with a smooth riding surface. Many cities have maintenance schedules for resurfacing and rehabilitating road surfaces.

When possible and appropriate, prioritize these maintenance activities on the bicycle boulevards and trails. Pavement markings will wear over time and should be accounted for in the maintenance budget.



*Trailhead landscape - Cary, NC*

Several communities with bicycle boulevards have partnered with local residents to help maintain these features. When shoulders are resurfaced, a smooth surface suitable for bicycle riding should be considered.

All facilities, including sidewalks and trails, require regular maintenance to reduce the damage caused over time by the effects of weather and use. However, many maintenance issues can be reduced if properly addressed in the planning and designing phases before construction even begins.



*Maintained lawn along Speight Branch Greenway - Cary, NC*

Proper maintenance is essential to promote user safety, to ensure ease of access, and to encourage the use of a designated route. The implementation regulations under Title II of the Americans with Disabilities Act requires that all features and equipment are required to be accessible and to be maintained in operable working condition for use by individuals with disabilities (U.S. Department of Justice, 1991a).

## Landscape

Native or other low maintenance plants are recommended to reduce maintenance.

Even low maintenance, native plant material may still occasionally require watering and/or sweeping, particularly as plants become established. Cooperative agreements may be formed with nearby residents and business owners to provide for minor maintenance activities such as watering and pruning.

Ensure that signs are not obscured by vegetation through regular monitoring and maintenance.

## Maintenance Issues and Strategies

Accessible designs are useless if maintenance is neglected and sidewalks and trails are allowed to degrade to a state where they cannot be used or must be avoided during travel. Frequently identified roadway safety and sidewalk design problems include:

- Sidewalk and trail surfaces in poor repair, such as uneven or broken concrete and slabs uplifted by tree roots; and
- Lack of regular maintenance, including overhanging trees and excessive snow on sidewalks.

Maintenance strategies should be included in the preliminary planning stages of new construction and alterations. Maintenance plans should also address existing facilities. The extent and frequency of maintenance schedules will vary greatly depending on the location, amount of use, and resources available. It is recommended that a plan be developed that clearly specifies the frequency of maintenance activities and how reported maintenance concerns will be addressed.



Sidewalk - Cary, NC

## Assessment techniques

In order to maintain passable conditions, current and potential problems must be identified through an objective assessment process. There are many methods available for identifying maintenance needs on existing sidewalks and trails. For example:

- The Sidewalk Assessment Process (SWAP) records and prioritizes maintenance needs on sidewalks
- Pedestrians may identify and report maintenance problems and
- A Town may establish an improvement program that identifies sites requiring improvements, access, or maintenance.

For a maintenance program to be effective, it must identify conditions that can impede pedestrian access and quickly respond with prompt repairs. Any citizen complaints reported should be given first consideration for improvement or repair if the reporting involves a safety or access issue.

## Maintenance Issues

Inspectors should look for conditions likely to inhibit pedestrian access or cause injuries. The following list of common sidewalk and trail maintenance problems was generated from promotional material created for homeowners by the Bureau of Maintenance in the City of Portland, Oregon (1996) and the Division of Engineering for the Lexington-Fayette County Urban Government (1993):

- Step separation - A vertical displacement of 13 mm (0.5 in) or greater at any point on the walkway that could cause pedestrians to trip or prevent the wheels of a wheelchair or stroller from rolling smoothly;
- Badly cracked concrete - Holes and rough spots ranging from hairline cracks to indentations wider than 13 mm (0.5 in);
- Spalled areas - Fragments of concrete or other building material detached from larger structures;
- Settled areas that trap water - Sidewalk segments with depressions, reverse cross slopes, or other indentations that make the sidewalk path lower than the curb. These depressions trap silt and water on the sidewalk and reduce the slip resistant nature of the surface;
- Tree root damage - Roots from trees growing in adjacent landscaping that cause the walkway surface to buckle and crack;
- Vegetation overgrowth - Ground cover, trees, or shrubs on properties or setbacks adjacent to the path that have not been pruned can encroach onto the path and create obstacles;
- Obstacles - Objects located on the sidewalk, in setbacks, or on properties adjacent to the sidewalk that obstruct the passage space. Obstacles commonly include trash receptacles, utility poles, newspaper vending machines, and mailboxes;
- General Safety - Any safety issue that an inspector believes should merit attention;
- Blocked drainage inlets and inadequate flow planning;
- Temporary construction interruptions; and
- Inadequate patching after utility installation.



Crosswalk with standard MUTCD signage - Cary, NC



*Example of a well maintained greenway - Cary, NC*

## Maintenance responsibilities

Although sidewalks and trails are usually elements of the public right-of-way, some Town charters assign the responsibility for upkeep to the owner of the adjacent property. Town charters commonly specify that the Town cannot be held liable for any accidents or injuries incurred due to sidewalk conditions.

When homeowners and businesses are responsible for sidewalk maintenance, they are allowed to decide whether to hire a contractor, perform repairs on their own, or have the Town do the repair. Homeowner associations in some neighborhoods address right-of-way maintenance as a group to minimize the cost to individual members. In some areas, the Town will subsidize property owners for sidewalk repairs. Local laws may also dictate whether or not a homeowner must hire a professional contractor to undertake sidewalk repair. Regardless of the approach for sidewalk maintenance, municipal inspectors should review and approve all repairs to guarantee that the improved sidewalk meets pedestrian access needs.

## Information maintenance

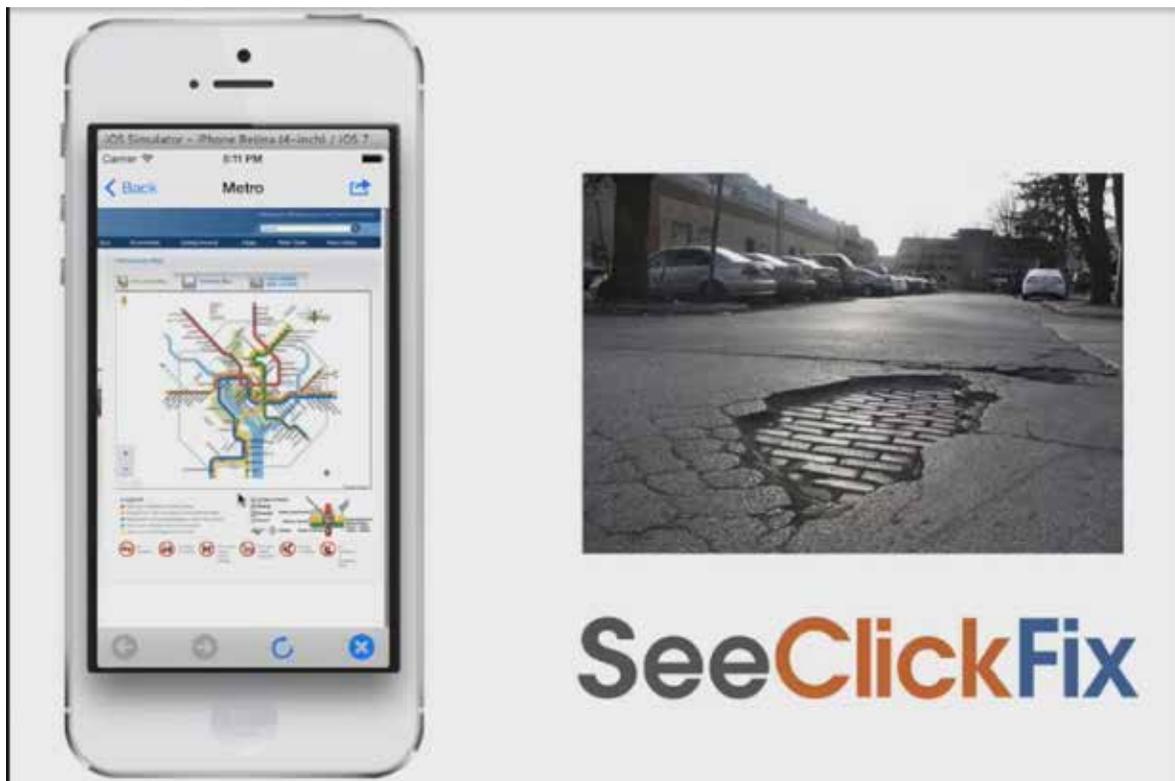
In addition to maintaining the physical characteristics of sidewalks, agencies should also maintain signs, signals, and other information regarding crossing construction and general pedestrian facility conditions. Periodic reassessment of sidewalks should be conducted to verify that conditions have not changed. Assessment data should also be verified after a catastrophic event, such as a flood or a hurricane.

Signs should comply with Manual on Uniform Traffic Control Devices (MUTCD) and ADAAG specifications. In general, signs also should be re-evaluated periodically and replaced when age and weathering reduces legibility. The design of the sign and signal should consider the information that is being displayed, as well as actions taken to reduce theft or vandalism. Signs should be removed or replaced when messages are no longer needed, the content of the information has changed, or information is not being provided for people with visual impairments. Signage programs that use consistent designs throughout the bicycle/pedestrian network keep expenses for sign replacement at a minimum.

## Citizen reporting

Those responsible for sidewalk maintenance should provide users with a convenient means to report sites in need of maintenance. The following techniques have been used successfully by a variety of municipalities to obtain maintenance input from users:

- Publishing a comprehensive maintenance guide with easy to follow guidelines that highlight the local maintenance goals and procedures;
- Using mass mailings for requesting a repair. For example, the Maine Department of Transportation's "Spot Me" program sends residents a postcard asking for small repair/improvement suggestions along bikeways. This type of a program could also be used to improve sidewalk access;
- Using additional signs or adhesive stickers with QR codes attached to existing signs, to instruct pedestrians on how to submit maintenance/improvement requests;
- Periodically placing information flyers in local newspapers; and



*Example of SeeClickFix Application*

There are also options for applications for smart phones where users can report a maintenance issue directly from their smart phones. Both the City of Raleigh and the Town of Wake Forest utilize the See Click Fix App for this purpose. This App is beneficial as it makes it even easier for the community to report issues.

## Volunteer Programs

Greenway Volunteers are an excellent way to not only patrol the trail system, but also get citizens involved in the maintenance and management of each trail. The Zebulon Police Department can partner with the Parks and Recreation Department to coordinate a Volunteer Program for the safety, security, and protection of greenway users, park resources, and the surrounding natural areas.

Any citizen interested in helping keep a watchful eye on our growing greenway trails by reporting back to Parks officials any breach in safety, security or maintenance concerns is invited to apply to become a Greenway Volunteer. The Volunteers will also help guide users around the trail system and offer services to enhance the user experience.

To become a Greenway Volunteer, you must be:

- At least 18 years of age
- Have no felony or Class A misdemeanor convictions
- Submit to a criminal background check
- Have basic knowledge of the Greenway system



