

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. As trails are built, funding to address maintenance should be included in town budget considerations.

Greenway trails do not require a great deal of attention in terms of ongoing management. 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.



Gate rules signage - Cary, NC

Operational Rules and Regulations

The operational rules for the Zebulon Greenway are consistent with those of 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 lakes 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 (RCC Sec. 9-2021)
- 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
- Removal or damage to vegetation is prohibited

Maintenance Procedure and Implications

Neglecting routine maintenance eventually may render facilities unusable and such deteriorating facilities may become a liability to the state or community. 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 sweeping 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.

Several bicycle facility improvements described in this guide can be implemented during routine maintenance activities.

Design Considerations

Greenways are developed in multiple area types and can play a part to protect certain aspects of the community and the environment. These trails can also be used to connect neighborhoods, community buildings, schools, and waterways. The function of greenway design is predicated on the area where it is located.



Retaining Wall at the Art Museum - Raleigh, NC

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.



Fence along greenway - Cary, NC

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. LID systems typically fit into the trail corridor more 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. Grasses 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.

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.



Mixed surface trail - Cary, NC



Black Creek Greenway - Cary, NC

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 signage may be damaged or stolen. Incorporate funds for new markings and signs in maintenance budget. Signage programs that use consistent designs throughout the bicycle/pedestrian network keep expenses for sign replacement at a minimum.

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



Trailhead landscape - Cary, NC

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.



Maintained lawn along Speight Branch Greenway - Cary, NC

Maintenance Issues and Strategies

Accessible designs are useless if maintenance is neglected and sidewalks 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 surfaces in poor repair, such as uneven or broken concrete and slabs uplifted by tree roots; and
- Lack of regular sidewalk 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.

Assessment techniques

In order to maintain passable sidewalk 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. 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.



Sidewalk - Cary, NC

Sidewalk Maintenance Issues

Sidewalk inspectors should look for conditions likely to inhibit pedestrian access or cause injuries. The following list of common sidewalk 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 a pedestrian or sidewalk inspector believes should merit attention;
- Blocked drainage inlets and inadequate flow planning;
- Temporary construction interruptions; and
- Inadequate patching after utility installation.

Maintenance responsibilities

Although sidewalks are usually elements of the public right-of-way, some Town charters assign the responsibility for sidewalk 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 MUTCD and ADAAG specifications. In general, signs should also be reevaluated 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.



Crosswalk with standard MUTCD signage - Cary, NC

SPOT ME
Maine Department of Transportation Bicycle Coalition of Maine

The Spot ME Program is designed to address low cost road improvements to State roads that will enhance bicycle safety and access (maintenance work, signs and striping, and small construction projects.)

Location: Roadway name _____

Landmarks: (cross street, address, etc.) Be specific! _____

Description of Problem: (What is it, and why is it a problem) _____

Name _____ Day phone _____
Address _____ Zip _____ Date _____

Sent to: _____ Div/Bureau _____ On _____

Resolution: _____

By: _____ On _____ Letter _____

Working for Safe Bicycling
Bicycle Coalition of Maine P.O. Box 5275, Augusta, Maine 04332 Tel: (207) 865-4842

Example of Maine's "Spot Me" postcard

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 to send self-addressed stamped forms 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 attached to existing signs, to instruct pedestrians on how to submit maintenance/improvement requests;
- Periodically placing information flyers in local newspapers; and
- Making maintenance information available at public and school libraries.

The Maine Department of Transportation sends to its residents this "Spot Me" postcard. Residents use the postcard to suggest small repairs and improvements along streets and sidewalks.

Citizens' Request programs can provide local maintenance agencies with an efficient way of repairing facilities. Residents living in an area can often identify issues quicker than a centralized agency.

Pedestrians who take the time to submit problems to the appropriate agency need to receive a timely written response or see quick results to feel their efforts were worthwhile. If timely action or notification of pending action is not taken, participants could become frustrated and be less likely to spend time in the future identifying problems. If problems are to be resolved in an upcoming project, then the citizen can be notified of the plan.

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



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