



DESIGN STANDARDS & GUIDELINES

As adopted on February 15, 2010 by the Granville Greenways Advisory Council

The Design Standards and Guidelines (the “Guidelines”) section of the Granville County Greenway Master Plan provides a set of parameters for implementing a consistent physical character for the greenway system. The Guidelines address the following design issues:

- Corridor Width and Location Guidelines
- Trail Classifications
- Special Trail Needs
- Trail Amenities
- Parking Areas
- Accessibility
- Naming Trails
- Signage
- Construction Standards
- Maintenance Standards
- Safety

The Guidelines can help developers, site designers, elected officials, advisory board members, and staffs make decisions involving the expenditure of public and private funds and the enhancement of public safety. Decisions related to amounts of land or easements to be reserved or purchased, the types of trails to be constructed, and the location of trails can be facilitated by incorporating the Guidelines in the greenways planning and decision-making process.

These Guidelines are adopted by the Granville Greenways Advisory Council (“GGAC”) as a guide for the acquisition and construction of greenways. These Guidelines may be amended from time to time by the GGAC. Further, these Guidelines are not legally binding upon the County or any municipality.

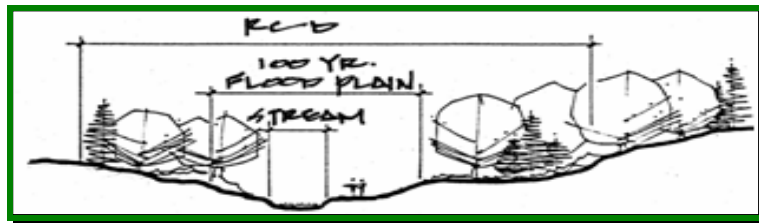
Corridor Width and Location Guidelines

Greenway corridors in the system will vary in width according to the topography of the area, the amount of existing development, the existence of significant biological areas, and patterns of property ownership. The following guidelines are intended to balance the needs to preserve greenway corridors and connectors, provide enough land for trails when appropriate, and to provide privacy for existing residences.

The County and municipalities should make reasonable attempts to protect the following greenway corridors by restricting development, requiring greenway dedications, and purchasing land or easements.

Stream Corridors:

Stream corridors may vary in width depending on the stream and the site specific characteristics of the land itself. Corridor widths should generally be as wide as can be acquired to help assure the privacy of adjacent property owners and the environmental quality of the site. Several factors which often contribute to increased corridor widths of stream-associated greenways include adjacent sanitary sewer easements, floodplain land and areas within environmentally sensitive areas.

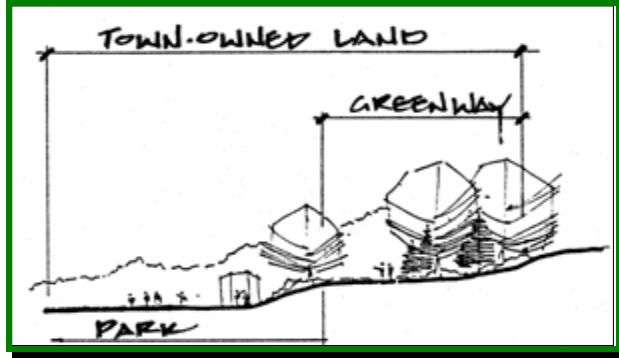


Connector Trails:

Greenway connectors not located along streams should be a minimum of 30 feet in width, if possible. This width should allow for sufficient buffering between neighborhoods, placement of trails, and adequate area for the free movement of wildlife. Smaller corridor widths, however, may be necessary in order to create trail connections between lots in subdivisions.

Greenways as Parks:

Wider greenways may be needed if the land is to be developed as a park. Parks require more land than is typically acquired for a linear greenway. Parks and greenways can share the same land, although the needs of the park may require additional lands outside of the greenway corridor.



Developed Areas:

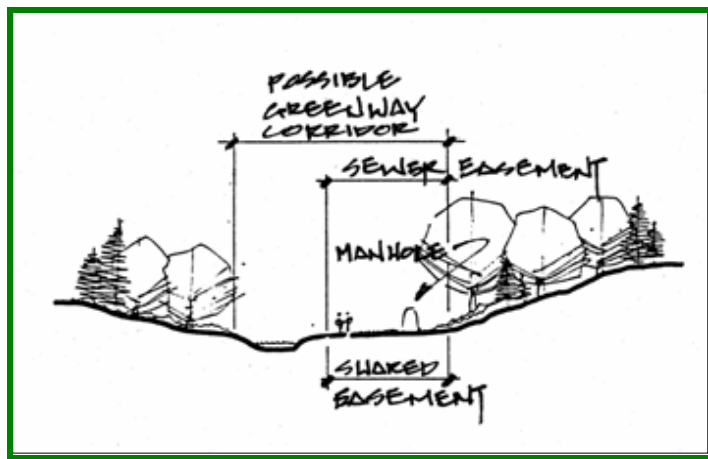
The County and municipalities are encouraged to require proposed residential or nonresidential developments to provide connectivity from internal trails and/or sidewalks linking their development to the master greenway trail system.

Greenway corridors or connectors should not be used for trails within areas that are currently developed if placement of a greenway trail would severely impact the privacy of existing residences.

An exception could include areas where approval of the development foresaw the construction of a trail and where a connector trail corridor was preserved relatively close to homes. In this case, the planning and land acquisition should be complete prior to the construction of the first home.

Utility Easements:

Pedestrian and non-motorized vehicle easements should be coupled with utility easements when possible.



Note: All new development projects will have, wherever possible, direct non-easement connections from streets or other public or common areas. The width of the access to a greenway should be a minimum of 20-feet in width. Slope conditions may require additional width.

The location of trails within greenway corridors is of vital importance to greenway planners, trail users, and the citizens who must live and work in the vicinity of these trails. Greenway planners should consider the following trail location guidelines:

1. Trails should generally be located as far from residential structures as is reasonable in order to preserve privacy of nearby residents and the experience of trail users.
2. Trails of type 4 or higher should be located no closer than 30 feet from any perennial stream bank unless absolutely necessary and no other practical location for the trail exists. Trails should be located further than 30 feet from streams if there is evidence that stream banks are eroding.
3. Stream crossings should be avoided when possible. If stream crossing is required, the crossing should be located and designed in accordance to NCDENR guidelines and requirements.
4. Greenway shall comply with Division of Water Quality Riparian Buffer Standards. <http://portal.ncdenr.org/web/wq>
5. Trails should be located to ensure that minimum disruption of the trail would result from the repair or replacement of utilities.
6. Street crossings should be grade separated if possible. At grade, street crossings should be planned so that trail and road users have the greatest sight distance possible.

Trail Classifications

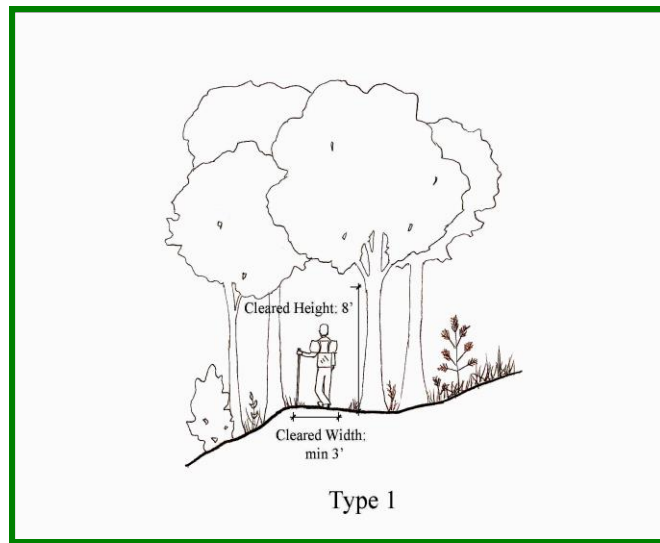
Trails proposed within the Greenway System can range from primitive woodland paths designed for low intensity pedestrian travel to paved bike paths designed for bicycle and wheelchair use.

The following class system identifies different levels of trail development that were assigned to greenway segments. Essentially, it is a 6-level hierarchy of trail development ranging from unimproved greenways, to soft, natural surface trails, to paved trails of varying widths to accommodate different trail uses and intensity of use.

Type 1: No Facility Development

This classification refers to corridors containing environmentally sensitive areas, steep slopes, wetlands or other constraints that make greenway facility development undesirable or impossible. A Type 1 corridor will remain primarily in a natural state as human access would be extremely limited. Other functions for these corridors will include floodplain management, water quality protection and conservation of important habitat for wildlife and plants. This corridor is not handicapped accessible.

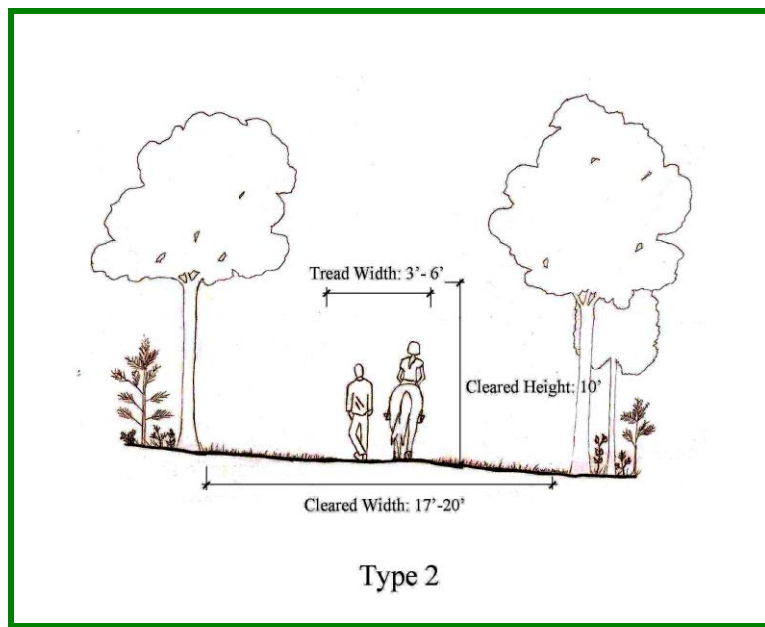
1. **Typical Location:** Environmentally sensitive areas
2. **Typical Surface:** Natural
3. **Typical Trail Width:** N/A
4. **Level of Use:** Low impact
5. **Users Types:** Pedestrians
6. **Typical Amenities:** Trash receptacles, signage



Type 2: Limited Natural Surface

This designation applies to corridors containing environmentally sensitive areas that limit the extent of greenway facility development, and are best suited for low impact uses. The corridor would remain primarily in a natural state, with gravel, mulch or dirt trails (3 to 6 feet wide) for use by one or two low impact user groups, such as hikers and/or equestrians. Signage, picnic tables, and restroom facilities would be limited. These trails would not accommodate wheel chair bound users.

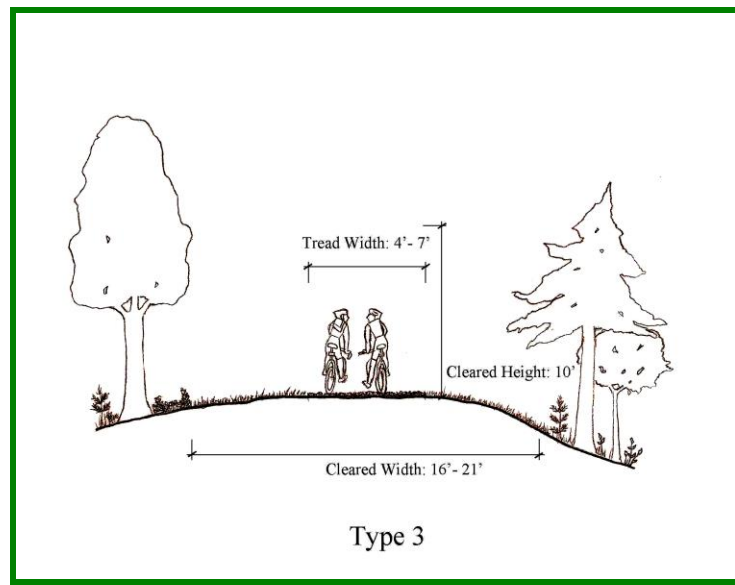
- 1. Typical Location:** Environmentally sensitive areas
- 2. Typical Surface:** Gravel, mulch, or dirt
- 3. Typical Trail Width:** 3' – 6'
- 4. Level of Use:** Low impact
- 5. Users Types:** Equestrians, pedestrians, mountain bikers* (*see page 7. “Special Trail Needs”)
- 6. Typical Amenities:** Limited trash receptacles, signage, and picnic tables



Type 3: Enhanced Trail Surface

This designation applies to greenway corridors where the adjacent natural areas, rural landscapes or historic sites dictate a more natural facility development objective. These corridors are low impact and primarily recreational. The unpaved trails could be surfaced with gravel or crushed stone (4 to 7 feet wide) for use by several user groups, such as bicyclists, joggers, and equestrians. Wheelchair users and persons with strollers can use unpaved trails if they are designed to ADA standards and surfaced with compacted crushed stone. Trail Head facilities and other amenities (such as benches, signage, restroom facilities, and picnic tables) would be developed as needed or where appropriate.

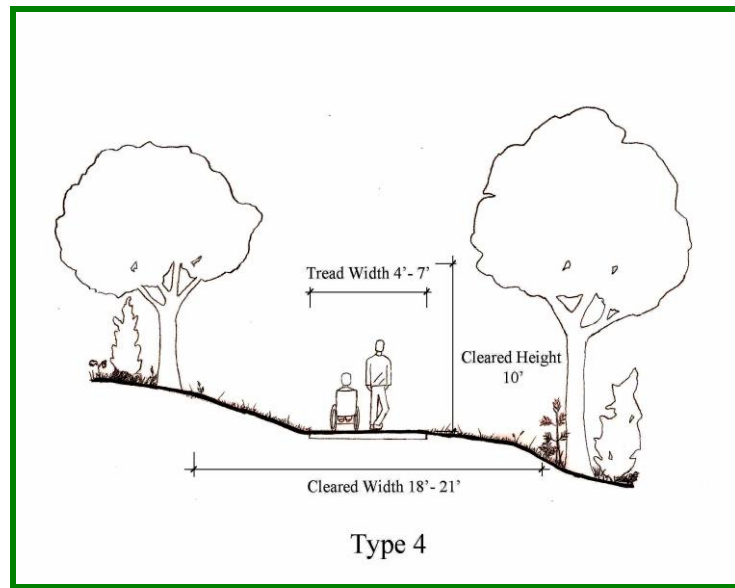
- 1. Typical Location:** Adjacent natural areas, rural landscapes or historic sites
- 2. Typical Surface:** Gravel or crushed stone
- 3. Typical Trail Width:** 4' – 7'
- 4. Level of Use:** Low impact
- 5. Users Types:** Bicyclists, pedestrians, and equestrians
- 6. Typical Amenities:** Trash receptacles, benches, signage, and picnic tables



Type 4: Hardened Structural Surface

This designation applies to corridors where high use is anticipated; greenways that do not contain environmentally sensitive areas, or corridors that will most likely be used as transportation routes. Several user groups, such as bicyclists, joggers, wheelchair users, and roller-bladers, need a surface paved with asphalt or concrete (8 to 10 feet wide). Permeable asphalt or permeable concrete is best for areas that experience frequent flooding. Trail Head facilities and other amenities (such as benches, signage, restroom facilities, and picnic tables) would be developed as needed or where appropriate.

1. **Typical Location:** Developed area
2. **Typical Surface:** Asphalt or concrete
3. **Typical Trail Width:** 8 to 10 feet wide
4. **Level of Use:** High use
5. **Users Types:** Bicyclists, pedestrians, wheelchair users, and roller-bladers
6. **Typical Amenities:** Trash receptacles, lights, benches, and signage

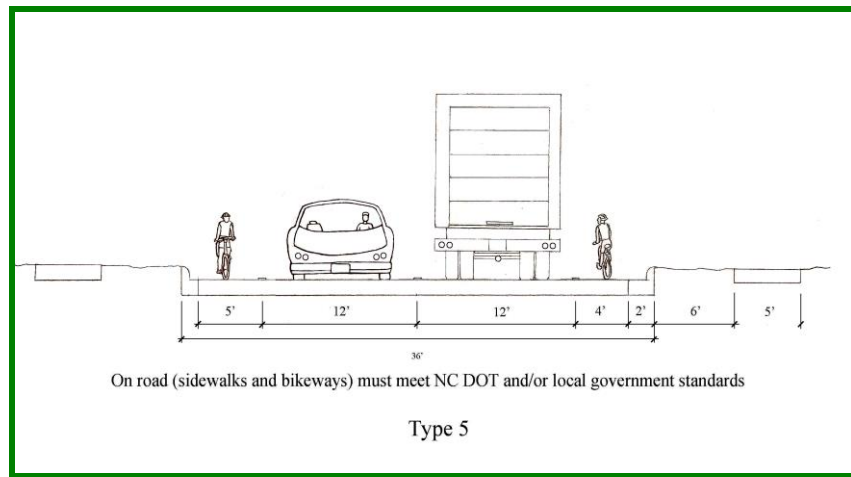


Note: The above graphic should show the newly updated standard of an 8' – 10' trail width.

Type 5: On-road (sidewalks and bikeways)

This classification applies to corridors in urbanized areas where an off-road option is not possible, or corridors which function as connections between off-road trails and major origins and destinations. On-road greenways will consist of sidewalks for pedestrian use and bikeways for cyclists. Bikeways can vary from 6-foot wide bicycle lanes (complete with pavement striping and signage) to 4-foot wide paved roadway shoulders. Refer to the adopted standards from the Bicycle Transportation Plan for bicycle facility design guidelines. Pedestrian scale lighting, street trees, benches and other amenities should be developed to encourage sidewalk use.

- 1. Typical Location:** Urbanized areas
- 2. Typical Surface:** Asphalt, concrete
- 3. Typical Trail Width:** 4' – 6'
- 4. Level of Use:** High impact
- 5. Users Types:** Pedestrians, bicyclists
- 6. Typical Amenities:** Trash receptacles, pedestrian scale lighting, street trees, benches.



Special Trail Needs

There are some special trail needs that may be considered by the County and municipalities for various reasons. Some uses such as hiking and mountain bicycling may not be compatible on the same trail. Specialty trail needs should be addressed if funds, land, and public support are assured. Examples of special trail needs are listed as follows:

Mountain Bicycle Use

Type 2 and 3 trails should be designed for the use of mountain bicycles whenever possible. The extent of possible environmental damage by bicycle users should be considered on every project. Mountain bicycle use may have to be curtailed on occasion to allow natural regeneration of heavily eroded trails. Signs should be placed at all type 2 and 3 trailheads requesting

mountain bicycle users to yield to pedestrians and to refrain from using the trails in wet conditions.

Sidewalks and Public Streets

In some cases, trail connections will be on sidewalks and along public streets. In the event that off-street bicycle paths merge onto streets, provide appropriate signage and pavement markings to help safe merging. The provision of designated bicycle lanes is desirable. Where a public street provides a link in a pedestrian path, sidewalks should be provided where possible.

Interpretive Trails

Trails can meet many different needs including education. Many trails can be converted to dual recreational/educational use by placing interpretive signs and stations along the pathway. Interpretive signage may identify or provide explanations of special natural features, geographic, historic or other points of interest. Interpretive trails should not be built in conjunction with trails that are anticipated to have moderate to heavy bicycle traffic.

Measured Trails

Many individuals enjoy recreational walking and running. It is highly recommended to measure sections of trails and to mark them for persons wishing to monitor their mileage. This type of activity is suitable on most trails, although, for fitness walking, the path surface should be relatively stable and free of obstacles.

Dual Surface Trails

Like Type 4, this classification applies to corridors where high use is anticipated: greenways that do not contain environmentally sensitive areas, or corridors that will most likely be used as transportation routes. User groups such as bicyclists and joggers will use an 8 to 10 foot wide strip of paved surface. A natural area of grass separates this path from a second, wider path (about 4 to 7 feet wide) constructed of mulch, dirt or gravel for equestrian users. Signs should be erected along the paths to notify users which path is for horses and which is for other users to keep the uses separate.

Trail Amenities

Certain amenities may be planned to provide for the comfort and safety of trail users and area residents. Trail amenities shall be reviewed and must be approved by the local jurisdiction. The local government or private association may provide the following amenities within greenway corridors:

Bollards

These devices prevent automobiles from driving on greenway trails. Bollards are commonly used on trails of type 3 or higher. Bollards should be locked so that emergency vehicles, police

cars, and maintenance vehicles have access to the trail. The bollards would require approval by the local authority having jurisdiction.

Observation Decks

Observation decks can be built overlooking scenic areas. These structures should not be built within floodplains, in places where they may compromise the privacy of nearby residents, or in areas not readily accessible to maintenance vehicles. They should be designed by a North Carolina licensed design professional and built in accordance with state/local regulatory requirements.

Gazebos

These small structures can be provided to allow trail users to enjoy passive recreation activities such as resting, picnicking, or reading. These structures should not be built within floodplains, in places where they may endanger the privacy of nearby residents, or in areas not readily accessible to maintenance vehicles. They should be designed by a North Carolina licensed design professional and built in accordance with state/local regulatory requirements.

Restroom Facilities

Restroom facilities should be built where appropriate and should be designed by a North Carolina licensed design professional and built in accordance with state/local regulatory requirements. Portable units may be used where appropriate.

Picnic Tables

Picnic tables may be located along greenway trails, however past experience has shown that these amenities should not be placed randomly. Picnic tables are more likely to be used when placed with other attractions such as play areas, observation decks, or other points of interest. These structures should not be built in places where they may compromise the privacy of nearby residents, or in areas not readily accessible to maintenance vehicles. Picnic tables should always be accompanied by trash receptacles.

Benches

Many potential users of greenway trails are elderly or physically challenged. Benches should be placed where needed throughout the greenway trail corridor. Special care should be taken to place benches at the top of steep sections of trail.

Trash Receptacles/Pet Waste Stations

Trash receptacles/ pet waste stations should be placed at the trail heads. This is to prevent potential litter problems along the trail. Trail users will be encouraged to discard any unwanted items in the trash receptacles before using the trail. The pet waste stations will only be used for the placement of animal waste product. Another advantage of placing receptacles near trail heads is to make the receptacles easily serviceable for park, sanitation, or volunteer crews.

Parking Areas

Although one of the primary purposes of greenways trails is to provide non-motorized transportation, many individuals will use the trails for purely recreational purposes. In order to accommodate recreational users, provision of small parking areas should be a goal and should be pursued when possible. In many cases, parking lots within existing parks may be used.

Accessibility

The design of greenway facilities and trail amenities should provide accessibility in accordance with the American with Disabilities Act (ADA) standards to the greatest degree practicable. Many trails, however, will not be wheelchair accessible due to the constraints of existing terrain or due to the nature of soft, natural surfacing. The design process for each trail should address the priority of accessibility and provide the appropriate accommodations.

Naming Trails

Please refer to page [4211](#) of the Granville County Greenway Master Plan.

Signage

A coordinated and consistent signage program is important to the safety and aesthetics of the greenway system. Signs serve to identify trails, orient the greenway user, and assist in way finding, but also have a great collective impact on the overall visual quality of the greenway system.

Signage should be used in a consistent, selective and strategic manner so as not to clutter nor dominate the visual character of the greenway. Signs are generally to be small and unobtrusive. The signs shall be constructed with a durable material, preferably recycled material. [Appendix A of this document includes sign templates that may be used as guides by member jurisdictions in developing trail signage.](#)

Entrance Signage

Main entrance signs marking points of entry to each greenway should identify the name of the trail and display the greenway program logo. The main entrance sign at the trail head can also recognize sponsors of the trail. The main entrance sign should be consistent in color throughout the greenway system and should be constructed of a wood relief panel [or other durable materials](#), wall-mounted, or attached to wood or recycled material posts.

[Additional Entrance](#) signs ~~located at the entrances~~ should [also](#) inform users of several key facts: where the trail ends, the distance to the end of the trail, and what activities are not permitted while using the trail. [An Entrance Sign Template is provided in Appendix A.](#)

Informational and Directional Signage

Signs located along the course of the trail should inform users of the locations of side trails, note interesting features, ~~proper direction should confusing options occur~~, mark the correct path, and in the case of paved trails, directions for safe trail use. Mile marker signs should also be placed at least every 1/2 mile to help emergency response agencies more quickly locate users on the trail in case of emergencies. Mile marker signs should include the trail name and be visible from both directions.

Informational and directional signs at pedestrian-only trails may be of wood panel construction mounted on wood or recycled posts. Signs should be located at significant decision points and positioned to provide a clear line-of-sight from the point of desired reading, free from obstructions.

Bicycle Route Signage

Paved type 4 or higher trails designed for multiple users will generally require more signage than pedestrian-only trails. These signs are used in the same manner as vehicular signage, but should be ‘down-sized’ to remain in scale with the greenway. These signs are typically constructed of metal panel and placed on wood or recycled posts.

Adequate signs and markings are essential to alert pedestrians and bicyclists to potential hazards and convey regulatory messages to vehicles at greenway crossings. Signs and pavement markings for on-road bicycle lanes should follow the guidelines published by the Federal Highway Administration in the “Manual of Uniform Traffic Control Devices” (“MUTCD”).

Construction Standards

General Trail Standards for Granville County						
Trail Type	Recommended Tread Width	Cleared Width	Cleared Height	Recommended Maximum Grade	Surfaces	Bridges & Boardwalks
Type 1	N/A	min 3' 0"	8'	Follow existing	Natural	Natural crossings
Type 2	3' - 6'	17' - 20'	10'	Follow existing	Crushed stone, mulch, screening, wood chips, natural surface	Wood, recycled synthetic material, concrete, stone
Type 3	4' - 7'	16' - 21'	10'	1% - 4%	Crushed stone, natural surface	Wood, recycled synthetic material, concrete, stone
Type 4	8' - 10'	18' - 21'	10'	1% - 5%	Asphalt or concrete	Wood, recycled synthetic material, concrete, stone
Type 5	On-road (sidewalks and bikeways) – must meet NCDOT and/or local government standards.					

Bridges and Boardwalks: Bridges and Boardwalks should be constructed where it is necessary to cross over various topography and existing construction. Stream crossings, wetland observation areas, and vehicular bridges are examples of such locations that may require bridges and boardwalks.

For all construction of bridges and boardwalks, a registered professional engineer must be consulted for such design. Minimum standards should meet state/local regulatory requirements and specifications for the design.

If bridges are to include vehicular and pedestrian traffic, standards must meet the guidelines developed by AASHTO (American Association of State Highway and Transportation Officials) and the NCDOT (North Carolina Department of Transportation).

Type 1: No Facility Development – Natural

Type 2: Limited Natural Surface: 2' graded shoulder each side of trail; 5' horizontal clearance on both sides and 10' vertical clearance; 3' – 6' unpaved trail with natural surface, screening, or wood chips.

Type 3: Enhanced Trail Surface 1 – 2' graded shoulder on both sides, 5' horizontal clearance on both sides of trail and 10' vertical clearance; 4' – 7' unpaved trail with natural surface, gravel or crushed stone.

Type 4: Hardened Structural Surface – 2' graded shoulders on each side, 5' horizontal clearance on both sides of trail and 10' vertical clearance; 8' – 10' paved trail with 2" I-2 Asphalt, 6" aggregate base course, geotextile if required due to site conditions, compacted subgrade.

Type 5: On-road (sidewalks and bikeways) – must meet NCDOT and/or local government standards.

Maintenance Standards

A primary concern of greenway development is what maintenance will the greenway trails demand and what the maintenance costs will be. Obviously, proper maintenance is the best way to protect the investment in the trails. Good trail maintenance will prolong the life of the trail surface, help to avoid the development of unsafe conditions, and keep the trail attractive for the public.

The County and municipalities are encouraged to create and adopt appropriate maintenance standards relative to the surface type and location of the trail. A maintenance schedule should be developed during the planning process for any new trail. A typical maintenance schedule may include trash, debris, pavement, and vegetation management.

Safety

The County and municipalities are encouraged to cooperatively develop and implement a Safety and Security Program for the greenway system. This program will need to be coordinated with local law enforcement officials, local neighborhood watch associations, and Adopt-a-Greenway organizations. Important components of the safety and security program may include the following:

- 1) Work with public safety agencies to develop a management plan for the greenway system.
- 2) Prepare and post user rules and regulations at all public access points to greenway trails.
- 3) Work with the management agencies to develop trail emergency procedures.
- 4) Prepare a safety checklist for the greenway system, and use it during field inspection of greenway facilities.
- 5) Develop a method to gather user input regarding safety through written or electronic feedback.
- 6) Coordinate other public information programs that provide information about greenway events and activities in which municipal and county residents can participate.

Trails within greenway corridors shall be for public use from sunrise to sunset, 365 days a year, except as specifically designated. Individuals who are found to be using unlighted facilities after dusk and before dawn should be deemed in violation of these hours of operation and treated as trespassers. Where trails are lighted for nighttime use, the rules established within the Greenway Master Plan should govern permitted uses and activities. Law enforcement shall enforce trespassing laws as defined under North Carolina General Statutes for publicly owned lands and facilities.

The greenway program should:

- Always discourage the general public from using any segment of a greenway trail that is under construction.
- Not allow public use of any trail until such time as an official trail opening has been completed.
- Consider individuals who violate this access and use policy as trespassers and treated accordingly.

Appendix A: Sign Templates

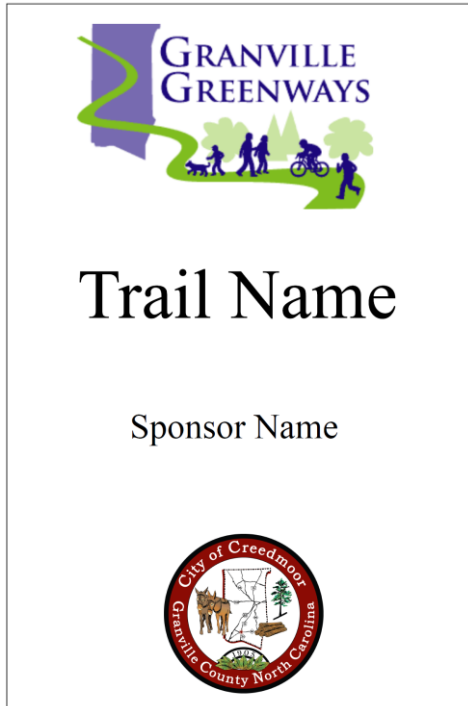
The following templates are intended to provide jurisdictions with a basic layout of what should or may be included on a greenway sign. The sign templates are designed to allow each jurisdiction some flexibility while still having overall consistency throughout the system of trails. Templates are provided for Entrance Signs, Street Level Signs, Directional Signs, and Uses and Rules Icon Signs.

1. Entrance Sign (Trailhead Sign)



Notes:
Sign Dimensions:
Width: 4 feet
Height: 3 feet
Maximum Sign Height: 6 feet

2. Street Level Sign (with attached Uses and Rules Icons Sign)



Street Level Sign Notes:

Sign Dimension:
Width: 18 inches
Height: 24 inches

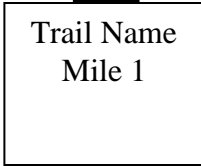
Maximum Sign Height: 6 feet



Uses and Rules Icons Sign Notes:

Sign Dimensions:
Single Icon: 8” by 8”
Two Icons: 8” by 16”
Three Icons: 8” by 24”

This sign is intended to be attached to the Street Level Sign post with number and type of icons decided by each jurisdiction. A variety of icons examples are provided later in this Appendix.



Mile Marker Sign Notes:

Sign Dimensions:
Width: 8 inches
Height: 8 inches

Can be attached to any sign.

3. Directional Sign



Directional Sign Notes:

Sign Dimensions:

Width: 12 inches

Height: 12 inches

Maximum Sign Height: 4 feet

4. Uses and Rules Icons Signs

The following are examples of uses and rules icons that can be used in the Uses and Rules Icons Sign. These icons may also be used on the Entrance Signs under the trail rules section. Ideally there will be no more than three icons per sign. This list of icons is not complete and additional icons may be added in the future or modified as needed based on jurisdictional needs.



No motor vehicles allowed on trail.



No weapons are allowed on the trail.



Please clean up after pets.



Alcohol consumption prohibited on trails.



No littering. Please use provided trash receptacles.



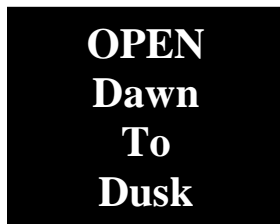
No cyclist allowed (intended for use on sidewalks where cyclist may be prohibited by ordinance).



Slow down and communicate when approaching or passing.



Equestrian uses allowed.



Trail only open for public use between dawn and dusk.



QR Codes are intended for smartphone users to find out more information such as trail rules, upcoming events, upcoming trail maintenance closings, or to report debris or other maintenance issues.