The St. Johns County Greenway, Blueway & Trails Master Plan map illustrates two categories of trails; greenways and blueways. Each type is described in the following section.

Greenway Trail Types

The Master Plan map illustrates two types of greenway trails: paved multi-purpose paths and unpaved multi-purpose paths. Paved multi-purpose paths are generally located in urbanized areas within or along side the road right-of-way. The users of paved multi-purpose paths generally are walkers, runners, local bike riders, roller bladers and parents with strollers. Unpaved multi-purpose paths are generally located in rural areas and are utilized by hikers, runners and non-motorized dirt-bikes. Unpaved multi-purpose paths may be designed to accommodate equestrian users as well. Although only two types of greenway trails have been described, there are other variations of greenways trails including rails-to-trails, separate unpaved equestrian trails, major connected wetland systems, wildlife crossings and scenic edges.

Beyond the greenway trails themselves, there are trail destination points commonly referred to as trail heads. Trailheads are destination points or trail connectors allowing safe access in and out of the trail. Trailheads may include parking facilities, restrooms, information kiosks (containing trail maps and brochures), drinking fountains, interpretive signs and other recreational amenities. The design guidelines for greenway trails and trail types are further described below.

Overall Design Objectives

Design criteria for the different types of greenway trails will vary according to the expected volume, type of trail, location of the trail and abilities of the trail users. In addition to the recommended design standards described in the following section, the county should establish and review various design guidelines on a regular basis. The Florida Greenways and Trails Council (FGTC) is currently working on a set of design standards and will be developed in accordance with the American with Disabilities Act (ADA).

As a general note, trails should be developed with an awareness of codes and/or regulations and environmentally sensitive resources. Construction techniques should cause minimal or no impact and should strive to protect the surrounding environment, wildlife, vegetation and waterways. Where feasible, trails should be routed to minimize contact with motorized vehicles, and should be utilized and promoted as alternative modes of transportation. Efforts should be made to consider historical and archaeological sites and to make interpretation of these sites an integral part of the trail system. Furthermore, trails with intensive use should accommodate users where appropriate and conform to ADA guidelines. Low volume trails should consider accessibility to diverse natural areas and cultural experiences.

Design Guidelines

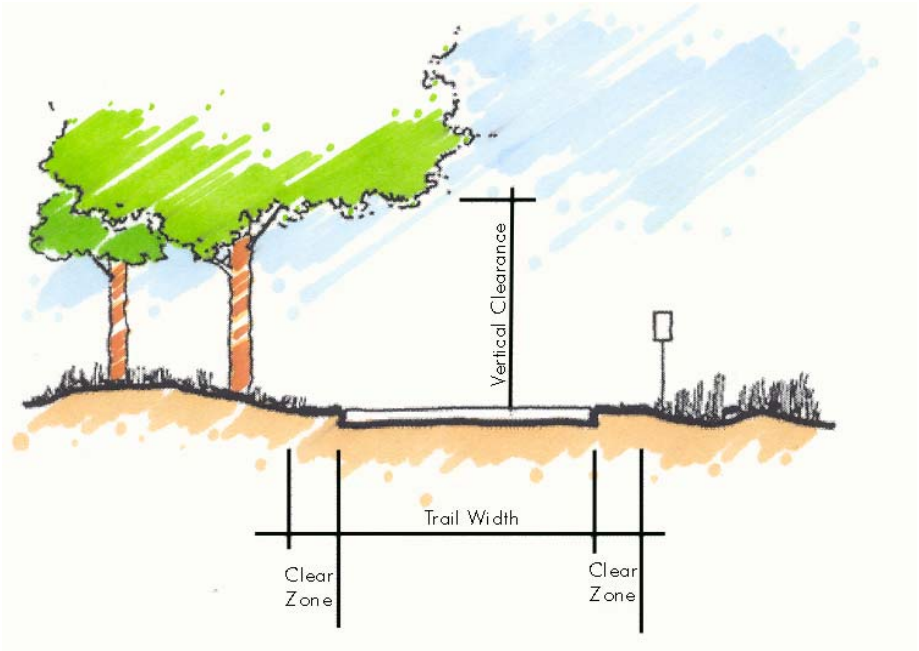
Guidelines for paved and unpaved multi-purpose paths and equestrian trails are set forth relating to the following design considerations.

Clear Trail Width refers to the width of the traveled part of the trail that is free of protruding objects and obstacles, such as trees and overgrown vegetation

Clear Zones refer to the area on each side of the trail between the traveled surface and any obstructions, such as trees, walls, or fences

Vertical Clearance refers to the height above the trail, which is free from protruding objects and overhead obstructions, such as tree branches or bridges

Trail surface refers to the type of surface on the traveled part of the trail, such as asphalt, concrete, granular, or alternative. Surface quality is affected by tread obstacles, such as roots or rocks, and by any openings such as gaps and grates located within the trail surface.



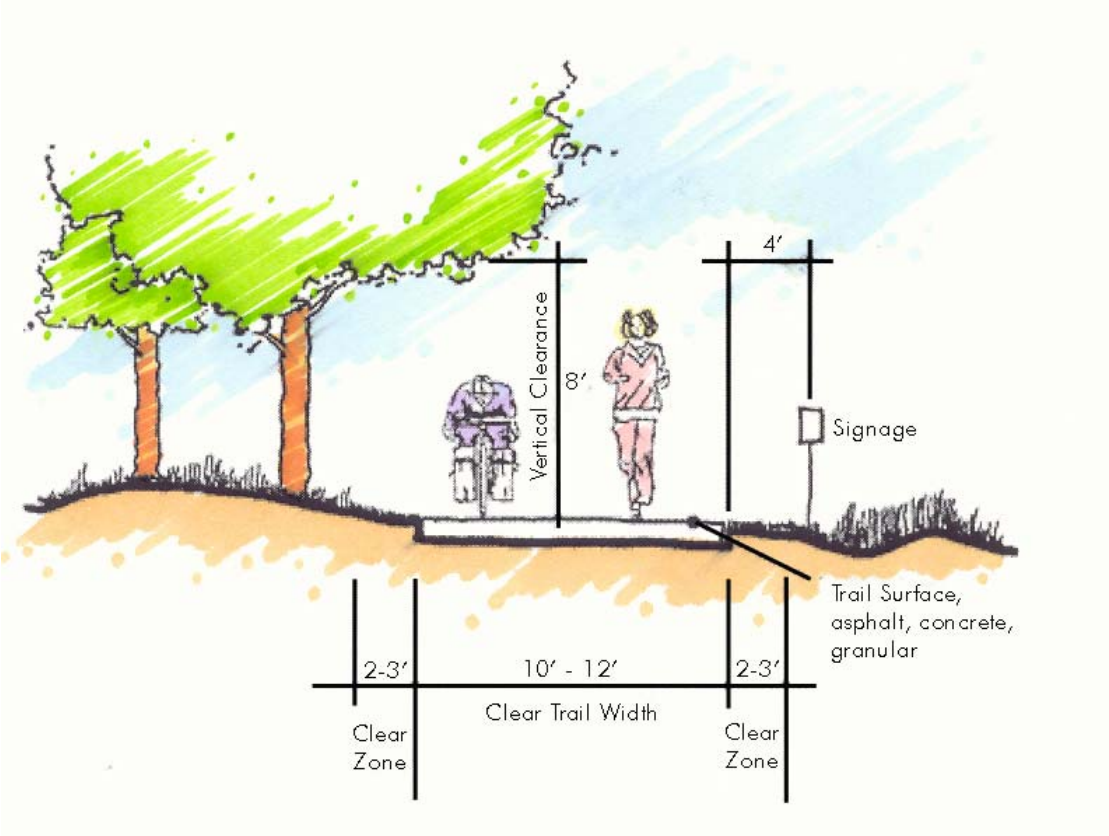
Paved multi-purpose paths include paved trails of asphalt or concrete for walking, running, cycling, and in-line skating. In some cases, a paved multi-purpose path may incorporate a segregated equestrian trail. Also included in this trail type are bikeways, which are striped or marked on roadways as bike routes for commuting. Bike lanes alone are not shown on the Greenways, Blueways & Trails Master Plan map. It is recommended that each separate bikeway be evaluated as to the safety and cost effectiveness before designation and construction. Paved multi-purpose paths should be designed for a more formalized trail experience and should be accessible to a variety of people with a broad range of abilities, skill levels and desired experiences. Paved multi-purpose paths should be considered in more urbanized areas and should follow existing and proposed transportation corridors.

Clear Trail Width – recommended trail width is 10-12' feet but may increase depending on intensity of use and trail location. In urban or suburban locations, trails should be set back at least 10 feet from any roadway curb or edge of pavement.

Clear Zones - should maintain a minimum 1-foot buffer zone between the edge of the graded clear zone and any fixed objects such as signs or trees

Vertical Clearance – should maintain a 8-foot minimum vertical clearance

Trail Surface – asphalt or concrete are the preferred surfaces but it is very important that the paved areas are well drained because standing water on the trail will adversely affect the trail surface and decrease the life and quality of the trail. The paved trail should not exceed a uniform cross slope of 2 percent and disturbed areas should be sodded or mulched to prevent erosion.



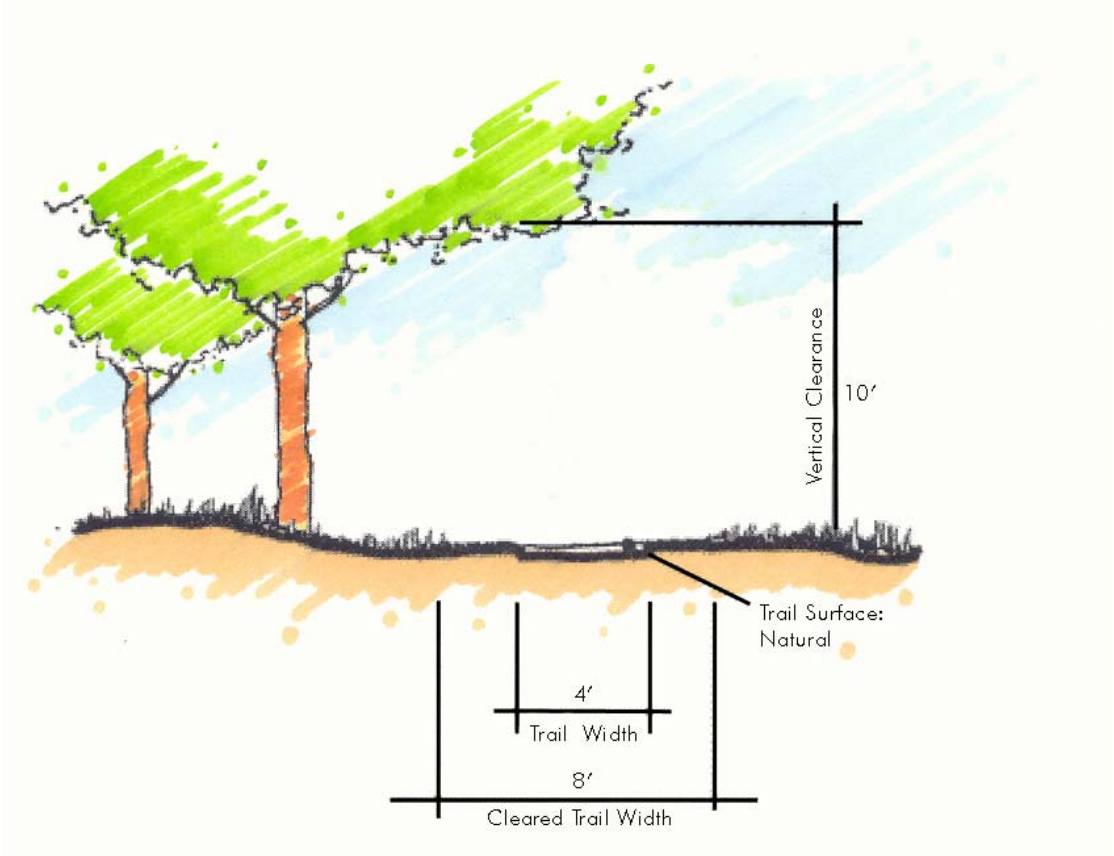
Unpaved multi-purpose paths include hiking, walking, biking and may include equestrian uses as well. New and reconstructed trails should be made as accessible as possible while maintaining the character of the resource and natural environment. Because of the rustic nature, the guidelines for unpaved multi-purpose paths are general and trail design will be primarily determined by site conditions and intended use. Unpaved multi-purpose paths should be considered in rural, undeveloped areas of the county.

Clear Trail Width – recommended clear trail width is 4' width and 8' clear trail width but may fluctuate based on site conditions and desired trail experience

Clear Zones – this type of trail does not typically require clear zones, since users are moving at relatively slow speeds. In natural areas, underbrush should be trimmed so that it does not hang over the trail edge or obstruct the traveled way.

Vertical Clearance – trails should maintain a 10-foot minimum vertical clearance in order to accommodate equestrian users

Trail Surface - trails may be surfaced with wood chips, crushed stone or shell, or may be made of compacted earth. In any case, the surface should be firm and stable.



Additional Greenway Elements

In addition to the various greenway trail types depicted on the master plan, there are a number of other elements that have been identified as relatively important in establishing an effective greenway system. Each of these elements is briefly described below:

Rails-to-Trails corridor identified on the master plan is a previously abandoned 21-mile Florida East Coast rail-line purchased by the Florida DOT. The rail-line extends in a southwesterly direction along the S.R. corridor from I-95/S.R. 207 to the St. Johns/Putnam County boundary. The trail will be a source of connectivity between St. Johns County, Putnam County and Gainesville's Lake Butler Trail.

Major connected wetland systems include greenway open spaces that encompass large environmentally sensitive lands such as continuous wetland systems and lands managed by the Water Management District, Division of Forestry or the Florida Wildlife Commission. Within the major connected system, recreational multi-use and unpaved trails may be located as long as there is adequate protection of the resources. Additionally, these lands may encompass specific lands that are available and targeted for acquisition through Florida Forever projects or other acquisition programs.

- **Florida Forever Lands,** a land acquisition program designed to preserve and conserve Florida's natural resources, were an important part of determining the proposed county greenway system. As shown on the master plan, Florida Forever Lands offer vital links and destinations for the proposed trail systems and offer large natural resources for users.

- The **Conservation Lands** depicted on the master plan include Guana River State Park, Faver-Dykes State Park, Deep Creek Conservation Area, Moses Creek Conservation Area, Anastasia State Recreation Area, Watson Island, Julington-Durbin Creek Preserve, Cedar Swamp and Pellicer Creek Aquatic Preserve. As with the Florida Forever Lands, the conservation areas are important elements of the greenway system and will continue to be an important resource to the county as the greenway plan moves into its implementation stages. Although some of the conservation areas are managed by other agencies, the county should work closely with those organizations by trying to link any existing interior trails with the proposed trail system.

Wildlife Crossings are displayed on the mater plan map and have been established as part of the Northwest Sector Plan. Wildlife crossings have been identified in areas wherever a road, lane, path or bridge impacts the movement of wildlife, especially on or over streams, ravines, wetlands, preservation areas and buffers. The goal of the wildlife crossings are to allow room for wildlife to pass without being interfered with, injured or threatened by vehicular and pedestrian traffic. Currently, wildlife crossings have only been identified in the northwest part of the county but it is recommended that the county identify additional sites in conjunction with greenway and trail construction.

Scenic Edges are also depicted as part of the greenway system. The primary purpose of scenic edges is to screen development and create natural edges between the development and the roadway through the use of native canopy trees, understory trees, bushes, shrubs, and ground cover. Scenic edges are also an integral part of the development edges and recreational trail system because they provide areas where trails and sidewalks can be located. Scenic edges have been identified only on the Northwest Sector Plan

and are provided along all arterials, collectors and proposed roads within the Northwest Overlay. The average width of the scenic edges is 75 outside the road right-of-way but the specific width and extent will vary with the proposed development.

Trailheads and access points refer to parcels specifically designed as primary means of accessing a trail. They may include restrooms, maps, parking, picnic facilities, and other recreational amenities. Access points refer to minor connections between the trail and nearby parks, communities, or roadways. Access points are important because many trails will run for long stretches surrounded by private property, and access should be provided wherever possible, but controlled so that ad hoc trails do not occur on private land. Some access points are automatic, such as when a trail crosses a roadway, and others may be carefully planned and implemented, such as a connection to a trail that would require a railroad crossing. The following guidelines relate to the development and placement of trailheads and access points.

- Trailheads should be placed at each terminus of a trail corridor, and any place where a large concentration of trail users is expected, such as at towns or major parks along the trail.
- An accessible pathway should be developed that connects parking and other accessible elements to the trailhead.
- Trailheads should at least include parking and a trail map, but may also include restrooms, drinking water, picnic facilities, horse tie-ups, and other recreational amenities.
- Trailheads associated with equestrian and off road biking trails should provide parking and turn-around space for trailers.
- Trail access points should be placed wherever trail access is expected, such as at adjacent communities, schools, commercial areas, and parks.

Trail access points should include signage identifying the trail and may include a map and drinking water.

Blueway Trail Types

The Master Plan map also illustrates two types of blueway trails: canoe/kayak trails and boating trails. Canoe/Kayak trails are generally identified in the county's streams and tributaries and are usually associated with slower traveling speeds. Boating trails are identified on well-traveled water routes including the St. Johns River and Intracoastal Waterway and are generally associated with faster traveling speeds and motorized vessels.

Canoe/paddling routes represent areas identified along the St. Johns County's waterways and coastline appropriate for use by non-motorized vessels such as canoes and kayaks. Canoe/paddling routes should be designed to offer the safe and reliable passage of a canoe or kayak and should offer trips of varying length. The primary considerations in the designation of canoe/paddling routes include adequate signage and support facilities, and the reasonable expectation that the waterway can accommodate small

watercraft most of the time. The following guidelines describe the minimum level of development of a canoe/paddling route to accommodate the needs of canoe and kayak use:

- Access points (landings) should be situated at maximum intervals of 5 miles.
- Camping and sanitary facilities should be situated at maximum intervals of 20 miles.
- Portages should be kept to a minimum, but, where required, should consist of established landings and a well-drained, natural surface trail that is free from branches, brush, or other obstacles.
- Accurate information on the route should be available, including river maps, mileage between services, level of difficulty, and current water levels. This information should be updated frequently.
- Signage should be included to direct users to the river, and to inform users on the river. Uniform directional signage should be placed on nearby roadways to advertise landing locations. Uniform signage should be installed along the river to advertise landings, camping facilities, portages, and hazards.

Boating trail opportunities identified on the Greenways, Blueways & Trails Master Plan are limited to navigable waterways suitable for motorized vessels. The primary areas identified for boat use are along the Intracoastal Waterway and the St. Johns River. Boating trails may refer to private recreational activities such as skiing, tubing and fishing but may also incorporate organized public activities such as the establishment of riverboat rides/tours or the use of water taxis. For private boating use, the county should continue to identify and construct boat ramps and related facilities to ensure access to the county's waterways. For public use, the county should identify areas for use of riverboats and water taxis and promote them as part of the county's tourism industry.

Public Boat Ramps are also an important element of the Greenways, Blueways & Trails Master Plan because they act as access points to the county's waterways and as destination points for existing and proposed trails. The county currently operates 13 boat ramps at 11 locations throughout the county. The county should continue to identify areas for potential construction of boat ramps in order to continue providing adequate access to the county's waterways.

Signage

The inclusion of signage on trails is an important element that can help increase safety and comfort on trails. Signs may assist in the navigation of a trail or trail system, warn of approaching roadway crossings, regulate trail use, or interpret natural features. There are five basic types of signs that the county should consider incorporating into the greenway system.

- *Directional signs* give trail names, direction arrows, mileage to points of interest, and other navigational information.
- *Cautionary signs* warn of upcoming roadway crossings, steep grades, blind curves, and other potential trail hazards.
- *Regulatory signs* tell the "rules of the trail" by prohibiting certain uses or controlling direction of travel.
- *Interpretive signs* offer educational information on the trail environment such as identification of ecosystems and its community types, flora, fauna and history of the area.
- *Objective signs* provide information about the actual trail conditions, including grade, cross slope, surface, clear trail width and obstacle height.

The inclusion of signage in a trail project should be planned from the outset, but each project is vastly different, and signage should be considered on a case-by-case basis. By establishing a design standard, signage can also bring uniformity to trail system. The following guidelines relate to the general placement and design of trail signage.

- Signs should be placed where they will be clearly visible. Placement is dependent on the sight lines (relative to user speed) of each trail.
- Signs should be placed at a constant distance from the trail edge, 3 feet is preferred.
- Lettering less than two inches in height is not recommended for directional signs.
- Text should be avoided on regulatory or cautionary signs wherever possible.

Multiple signs may be mounted on the same post, but the primary message should be in the top position on the post.

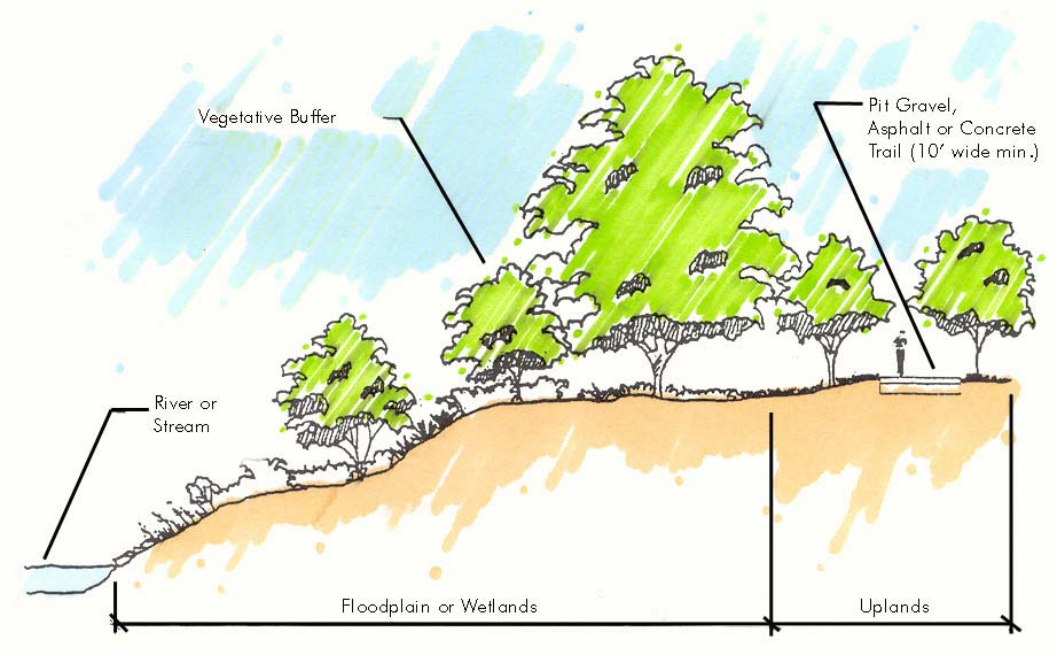
Minimizing Use Conflicts

To fully appreciate the design considerations related to greenways, it is important to keep in mind what greenways are – linear open space with or without trails, and having natural resources and/or recreational functions. Given this definition, there are a number of situations where use conflicts can arise and where design can play an important role in minimizing those conflicts.

Natural resource functions include such functions as flood control, movement corridors for wildlife, habitat for rare and endangered plants and animals, and aquifer recharge areas. In areas where natural resource functions are important, consideration must be given to restricting access to incompatible recreational activities or, in case of critical habitat such as nesting areas, allowing no access for recreational use.

Natural resource areas can be public or private land. Examples of privately owned natural areas that could be part of a greenway are tracts designated as Conservation Areas within development projects. Designing a greenway system to include these or other private natural lands and allowing public access to them should be dependent upon not only the sensitivity of the area but also the landowner's desire to allow such use.

Greenways with primarily recreational functions can be located in urban or rural areas and are typically narrow, man-made corridors. Activities such as jogging, bicycling, skating, as well as alternative transportation require paved trails. These kinds of uses can all occur on the same trail if appropriately designed as a multi-use trail. Recreational greenways, in both urban and rural settings, also can provide some natural functions and benefits, such as nature study where the greenway corridor passes through or adjacent to a natural area.



More rural settings are appropriate for such recreational activities as hiking, horseback riding, and off-road bicycling. Each of these activities requires it's own unpaved trail, or conflicts between users will occur.

Another type of conflict can occur between recreational uses and natural resource functions when the two are not compatible, such as "mountain" biking in natural areas. The natural resources of the area suffer when off-road bicyclists break new trails destroying vegetation and causing erosion and adverse impacts to wildlife.

Local trial user ordinances have been adopted which authorize citations and fines for violators. Educational programs also have been developed which target and inform user groups about the environmental damage caused by mountain bikes in sensitive areas.

The National Recreational Trails Advisory Committee has produced a helpful report, titled ***Conflicts on Multi-Use Trails***, which is a synthesis of the literature and summary of the state of the practice in reducing conflicts. This document would be useful to greenway designers and managers in developing ways to address the issue in St. Johns County.

Each of the three features, which comprise a recreational greenway, provide possible areas of conflict. The three features are the trail, trail head and the crossings (intersections with roads, etc.). Along the multi-purpose path (paved), bollards or other structures are needed to prevent vehicular access. On multi-purpose (unpaved), where private property owners adjacent to the trail desire more privacy, fencing or a landscaped buffer can be used to address that concern. At trailheads, design considerations would be the same as in a park. Adequate parking spaces, trash receptacles, educational and directional signage, and possibly restrooms, depending on anticipated usage, would be appropriate facilities.

Where a trail intersects a road, a pedestrian crossing will be needed. The design will depend on the type of road. To cross a high volume or major road, a pedestrian crossing light or overpass would be needed; to cross less used roads, striping and signage are adequate. Sidewalks and bike lanes along roadways or low volume roads with bike signs can serve as neighborhood connectors to a greenway facility. Where trails follow along stream channels and must cross, a bridge structure, or bridge under-crossing is preferred. Opportunities are lost when bridges are built without considering heights needed to accommodate an under-crossing for pedestrians, equestrians and cyclists.