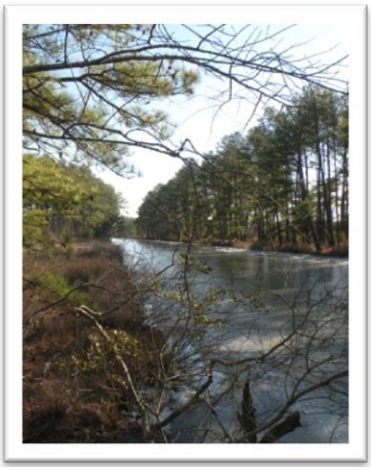
Assawoman Canal Trail
Concept Plan

September 2011



Project Partners

Ocean View
Bethany Beach
South Bethany
Bahamas Beach Cottages
Sea Colony
Salt Pond
Waterside
Delaware State Parks

Assawoman Canal Trail Concept Plan

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I. Acknowledgements

In 2009, a Working Group formed to determine the feasibility of a trail along the Assawoman Canal. The Working Group included municipal leaders from Ocean View, Bethany Beach and South Bethany, community representatives from Salt Pond, Sea Colony, Bahamas Beach, and Waterside and staff from Delaware's Department of Natural Resources and Environmental Control, Division of Parks and Recreation (Division). The Working Group evaluated current conditions, public input, natural and cultural resources and recreation preferences. This successful partnership guided the development of the Assawoman Canal Trail Concept Plan.

Members of the Working Group include: Conway Gregory - Ocean View Town Manager; Clifford Graviet - Bethany Beach Town Manager; Melvin Cusick - South Bethany Town Manager; Carol Olmstead – Bethany Beach Vice Mayor; Tony McClenny – Bethany Beach Mayor; Gordon Wood – Ocean View Mayor; Anthony Aglio - DelDOT, Bicycle/Pedestrian Coordinator; Jim Toedtman - Sea Colony; Dick Malone – Salt Pond; Peter Martucci – Bahamas Beach; Bill Just – Bahamas Beach; Gary Jayne – South Bethany Mayor; Richard Nippes – Ocean View; Jessie Pieplow – Salt Pond; George Walter – Ocean View; Pat Woodring – Waterside; Rosie Marks – Salt Pond; John Gilbert – Sea Colony and Sally Boswell – Center for the Inland Bays.

Staff from the Division of Parks & Recreation provided resource assessment and evaluation. They include the following: Bob Ehemann, Kendall Sommers, David Bartoo, Cherie Clark, Ken Farrall, Thomas Kneavel, Mike Krumrine, Rob Line, Chris Bennett, Doug Long, Don Long, Susan Moerschel, Paul Nicholson, Matthew Chesser and Ron Vickers.

Denise Husband, Environmental Design, LLC, created the conceptual renderings that graphically bring proposed trail facilities to life.

II. Executive Summary

The Assawoman Canal is a linear waterway in eastern Sussex County linking the Indian River Bay and Little Assawoman Bay. This 3.9 mile-long ribbon of green physically links 3 municipalities and 6 communities who all share a boundary with the canal lands. The Canal property, 98.37 acres, was conveyed to the Delaware Division of Parks and Recreation (Division) in 1990 "exclusively for Public Park or public recreation purposes in perpetuity". In 1995, the Division conducted a study that identified the recreation potential for a trail along the canal. However, the study lacked public involvement which is a critical component in developing a plan. In 2009, a Working Group of local leaders and Division staff was formed to explore the extraordinary recreation potential of the Assawoman Canal lands.

This Working Group developed a vision that includes a pedestrian and bicycle trail and multiple waterway access points. This vision was shared with the public for comment and feedback. Based on this public input, local community leaders determine if a pathway is possible, has public support and will enhance recreational opportunities in the region. The purpose of this Concept Plan is to communicate the vision of the Working Group to improve the recreational potential of the Assawoman Canal land for bicycle and pedestrian activities and enhance Canal access for a water trail. If the plan is accepted by the Division and the public, the next step is to begin trail design and engineering.

III. Assawoman Canal Background

The Assawoman Canal lies in eastern Sussex County and is a 3.9 mile long linear waterway linking Indian River Bay and Little Assawoman Bay. The property is defined as 105 feet on each side from the waterway's center running its entire length. The Canal waterway itself is generally 90 feet wide and surrounding uplands are approximately 60 feet wide. At the north end, the Assawoman Canal flows into White Creek joining Indian River Bay. At the south end, the Canal merges with Jefferson Creek joining the Little Assawoman Bay.

The Canal connects the municipalities of Ocean View, Bethany Beach, and South Bethany and the communities of Salt Pond, Turtle Walk, Sea Colony, Ocean Way Estates, Bahamas Beach, Collins Park, Waterside and Cat Hill. Map 1 gives a regional perspective of the Assawoman Canal and the surrounding communities.

Assawoman Canal was a segment of the extensive Intracoastal Waterway originally intended as a continuous channel from New York City to Brownsville, Texas. Though financed by the United States Army Corps of Engineers (Corp) as a defensive coastal waterway, the Assawoman Canal improved transportation options for local farmers who shipped their produce to the developing summer resorts, hotels and inns along the Indian River and Rehoboth Bay.

The Corp managed the Canal, but as the importance for water navigation declined, the property was placed into federal surplus status. The Canal property, 98.37 acres, was conveyed to the Division in 1990 "exclusively for public park or public recreation purposes in perpetuity". The Division owns and manages the property for recreation and is part of Delaware Seashore State Park. The Canal property is currently being used for boating and hiking. Well-worn paths have been created by local residents and visitors who access the Canal's waterway to explore its length and adjoining creeks and coves.

Conservation terms established by the Corp require a 20-foot vegetative buffer landward from the high water mark of the canal. This buffer is required to maintain bank stabilization and resource protection.

Image 1 - In 2009 and 2010, the Canal was dredged to a center depth of three (3) feet below mean low water, with a base width of thirty-five (35) feet. This depth allows motorized craft to pass through the Canal. The Canal is managed as a no wake zone.

It is believed the word “Assawoman” originated from the Algonquian languages. From the Virginia Algonquin, “Namassingakent” means “fish – plenty of” and “Assaomeck” means “middle fishing place”.

Image 2 - A view of the southernmost section of the Assawoman Canal, south of Jefferson Bridge.

IV. Existing Conditions

Area Development

At present, the three municipalities adjoining the Canal – Ocean View, Bethany Beach and South Bethany - are largely built-out. While Bethany and South Bethany have no plans for annexation, Ocean View's Comprehensive Land Use Plan suggests incorporating areas south and west of its current boundary. A significant portion of housing in all three municipalities is single family with some multi-family dwellings. There are no existing features or structures today that hold cultural preservation status within the Canal lands owned by the Division.

Parks & Beaches

The following table lists publicly-owned lands permanently maintained for active and passive recreation opportunities and for conservation in the Canal region.

Community or Managing Agency	Park	Acres	Facilities
Ocean View	John West Park	2.9	Playground, gazebo, walking paths, picnic pavilion, fitness equipment
Bethany Beach	Nature Center and Conservation Area	23.6	Playground, boardwalk trail to observation area, interpretative info, nature center
Bethany Beach	Loop Canal Centennial Park	0.1	Passive park, historical marker
South Bethany	Richard Hall Memorial Park	1.5	Shaded open space
Division of Fish and Wildlife	Assawoman Wildlife Area	3,100	Boat launch, piers, pavilion, picnic, trails
Division of Parks and Recreation	Fresh Pond – Delaware Seashore State Park	757	Trailhead parking, trail, scenic vistas
Division of Parks and Recreation	Holts Landing State Park	202	Trails, boat ramp, pier, playground, picnic pavilion
Division of Parks and Recreation	Fenwick Island State Park	378	Beach, boat access, bathhouse, picnic areas
Division of Parks and Recreation	Delaware Seashore State Park	1,988	Several parking areas, beach access for swimming, fishing, surfing; marina, boat ramp, dry stack storage, kayak access; bathhouses, camping and rental cottages, picnic pavilion, playground; nature trail.

Sidewalks & Bicycle Lanes

Within this plan's focus area, there is no complete system of sidewalks. Sidewalk networks encourage residents to recreate, reduce vehicular trips, and afford safer opportunities to move around communities. Recognizing the need for sidewalks, Ocean View is partnering with DelDOT to create a community sidewalk network including improvements along Central Avenue scheduled to begin in 2013. These improvements will make pedestrian access to John West Park, the Canal and Atlantic Avenue destinations safer and convenient. Map 4 depicts the region's pedestrian and bike facilities with a description of each below.

- Garfield Parkway (Route 26, east of the Canal bridge) – nearly continuous on both sides of the road from the Boardwalk to the Assawoman Canal bridge. A 500 foot gap exists on the north side between Kent Ave. and Route 1.
- Atlantic Avenue (Route 26, west of the Canal bridge) – sidewalk improvements will continue west along Route 26 into Millville.
- Cedar Neck Road – as new development has occurred on this road, 6 to 8 foot pathways were constructed. However, the system is not continuous.
- Central Ave – a sidewalk with a curb exists on the north side of the bridge. Sidewalk improvements along Central Ave. are part of an upcoming street project
- Kent Ave – no sidewalks exist, but the shoulder is marked for "share the road".
- Muddy Neck Road – no sidewalks and the wide shoulders are unmarked.

The access from Cedar Neck Road is a short distance from Fred Hudson Road and Fresh Pond (a Delaware Seashore State Park unit). Existing pedestrian/bike pathways along Cedar Neck and a planned pathway along Fred Hudson promote regional recreation opportunities.

Within this plan's focus area, bicycle lanes exist in the following locations:

- Garfield Parkway (SR 26) - bicycle lanes on both shoulders starting at the Bethany Beach Bandstand running continuously westbound over the Assawoman Canal Bridge shown in Image 12.
- Pennsylvania Avenue and Atlantic Avenue (both run north and south in Bethany Beach east of Route 1) have bicycle lanes on both shoulders from the Town's northern and southern limits.
- Atlantic Avenue (Ocean View) - narrow bicycle lanes on both shoulders.
- Kent Avenue - bicycle lanes on both shoulders between Garfield Parkway (SR. 26) and the Jefferson Bridge.
- Route 1 – bicycle lanes are in both directions with wide shoulders for bike use.

Population

The communities adjacent to the Assawoman Canal have a year-round population of nearly 5,000. The population swells during the summer months to more than 20,000 and to nearly half that in the spring and fall shoulder seasons. From 2000-2010, the Town of Ocean View's year round population grew from 1,006 to 1,882, an 87.1% increase; the 7th fastest growing municipality in the state. Bethany Beach's year round population grew 17.4% to 1,060 residents. South Bethany's year round population decreased by 8.7% to 449 residents. These population numbers reflect year round residents of the three municipalities. According to its

current Comprehensive Land Use Plan, Bethany Beach expects its future population growth to come from existing and new residents opting to live here year-round and not from new-home construction. Map 3 depicts the 2010 Census Block populations in the region. Areas in pink are population densities greater than 500 people per square mile.

Water Resources

Delaware's Inland Bays – comprised of Rehoboth, Indian River and Little Assawoman Bays – were recognized for their national significance in 1988 when the three-bay system was designated into the National Estuary Program. The Assawoman Canal is the main water artery connecting the Indian River and Little Assawoman Bays. Inland Bay surface water covers 32 square miles while the entire watershed encompasses 320 square miles. The focus area of this concept plan falls within the Inland Bay watershed.

Natural Habitat

The Assawoman Canal is a narrow fringe of early succession habitat anchored by bays at both ends. Aside from nearby publicly-owned lands at the Canal's south end, the surrounding area has been extensively developed and consists of a modified habitat of hedgerows and manicured lawns.

Adjoining the southwest end of the Canal is the Assawoman Wildlife Area. Encompassing 3,100 acres, this site is managed by the State Division of Fish & Wildlife for migrating and wintering waterfowl, white-tailed deer and bobwhite quail. Wildlife area lands adjacent to the Little Assawoman Bay are predominately wetland landscapes.

Species of Concern

Though no species of concern are located along the Assawoman Canal, a number of rare and/or endangered species are associated with White Creek, The Salt Pond Woods, and the Assawoman Wildlife Area. The Division of Fish and Wildlife identifies and tracks the species of concern through the Delaware Natural Heritage Program.

Birds: To determine the current distribution of all bird species breeding within the state, a second Breeding Bird Atlas began in 2008. A four year project, the Delaware Breeding Bird Atlas is a grid-based survey using US Geological Survey topographic quadrangles. After two years of surveys, 76 and 63 bird species have been reported for quadrangle subsets known as Blocks 199 and 210. These blocks fall within the study area. Consult Appendix A for a list of bird species identified in these blocks. The reported species are for each block as a whole, however with the overall lack of available bird habitat away from the canal, it is likely that many, if not all, of the species occur along the Canal. The complete list can be found at http://www.pwrc.usgs.gov/bba/index.cfm?fa=explore.ResultsByBlock&BBA_ID=DE2008

Floodplains & Topography

The Assawoman Canal is located in the Coastal Plain Region and is characterized by variations of elevation between one and twelve feet, with an average elevation of ten feet

along the coastline and five feet inland. Slopes are generally less than one percent with the exception of the remnants of the dune line and the canal banks. Most of the Assawoman Canal falls outside of the Federal Emergency Management Agency (FEMA) 100-year floodplain.

Recent projected Sea Level Rise maps demonstrate three scenarios of water inundation for Delaware by 2100. Map 2 depicts Potential Sea Level Rise Scenarios in various metric increments. Following the first scenario, 0.5-meter sea level rise, there would be little if any impact to the Assawoman Canal. The greatest effects of water inundation are projected to occur south of the Jefferson Bridge and Muddy Neck Road in the Assawoman Wildlife Area.

Greater impacts to the Assawoman Canal are in the second two predicted scenarios, 1.0 meter and 1.5 meter sea level rise by 2100. In the 1.0m scenario, water intrusion would be seen north of Muddy Neck Road/Jefferson Bridge affecting the Bahamas Beach Cottages, Waterside, and the southern portion of Sea Colony. Water intrusion would also be seen along Atlantic Avenue north to The Salt Pond. Land where White Creek connects with the Assawoman Canal would also be impacted with a 1.0m rise in sea level.

In the worst case scenario, a 1.5 meter sea level rise by 2100 would have significant impacts on the Assawoman Canal. Lands from Sea Colony south would be submerged. Sea water intrusion would be seen along Garfield Parkway encompassing most of The Salt Pond and extending into Ocean View on the west side of the Canal. There would also be significant water intrusion north of Central Avenue.

V. Community Vision for the Canal Property

In 2009, a Working Group of municipal and community leaders met to discuss options for using the Canal Property. Appendix B details the activities of these Working Group sessions during the concept phase.

The Working Group's hope for the Canal trail is to enhance active lifestyles and community livability as reflected in the towns' vision statements:

South Bethany: "To develop the Town into a well-maintained, law-abiding, and single-family community serving residents and visitors with an infrastructure committed to the enhancement of a safe, healthy and attractive lifestyle, while preserving and improving the Town's natural and man-made assets."

Ocean View: "Implement a comprehensive land use plan that will enhance Ocean View's quality of life and retain its small town charm while coping effectively with the pressure of growth."

Bethany Beach: "People are Bethany's greatest asset; the Town's goal is providing a high quality of life experiences and opportunities to residents, property and business owners and visitors."

The municipal Comprehensive Land Use Plans promote systems that support walking and biking for recreation and transportation. This canal trail will promote active lifestyles and create community connections while reducing vehicle trips.

Image 3 - members of the Working Group visit the Junction & Breakwater Trail, a model trail that links communities, neighborhoods, shopping centers, and other community services. The J&B Trail lies between Lewes and Rehoboth Beach. Community access, information boards with orientation maps, wayside exhibits, and a parking lot at Wolfe Neck Road are found along the trail. In this image, Working Group members cross a reconstructed railroad bridge over Holland Glade.

The Working Group's Vision

The Working Group came to the conclusion that the linear nature of the Canal property and its proximity to residential development lends itself to trail development. The Group envisioned a bike and pedestrian trail along both sides of the Assawoman Canal and a water trail with canoe and kayak access.

The Working Group believes that a trail on Canal land will increase recreational opportunities in a populated area where these activities are limited. The trail will also begin to expand a network of bicycle and pedestrian pathways that will connect communities, ease movement to the beach and provide alternative transportation options.

The key elements of the Working Group's vision are:

- Develop an upland-based sustainable, safe and meandering pedestrian and bike trail;
- Develop a water trail for kayaks and canoes in the Assawoman Canal waterway;
- Develop community access points to both the land trail and water trail;
- Design a trail system with a uniform pathway surface across all jurisdictions and communities;
- Be sensitive to the privacy concerns of adjoining property owners by using vegetative buffers or fences;
- Keep the area natural: retain trees and native vegetation and minimize wildlife disturbance;
- Landscape with native vegetation; and
- Incorporate trail amenities such as benches, way finding signage and wayside interpretation of the area's history and environment.

VI. Public Engagement

With the vision articulated by the Working Group, the next step was to share the vision with the public. The following section highlights the results of the public input.

Public Input

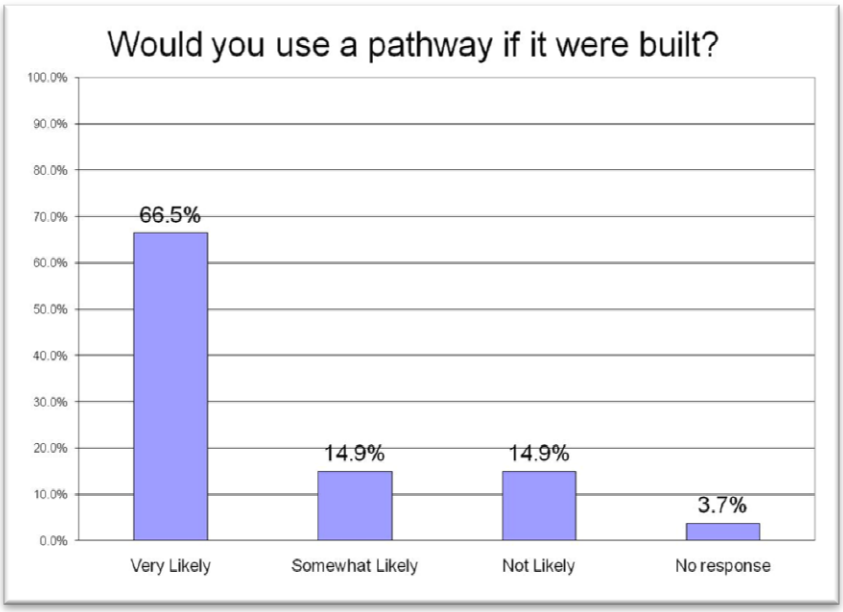
To gage public interest and to help shape the vision of a canal trail, the Working Group held a series of public workshops in Ocean View, Bethany Beach, South Bethany and Sea Colony. These workshops were held on the evenings of September 16, 24, 30 and October 9, 2009. Maps of the Canal lands showing the extent and location of a potential trail were exhibited. Trail crossings, and trail enhancements such as surface materials, information boards, and foot bridges were exhibited to familiarize the attending public with possible trail features.

Approximately 200 full-time and part-time residents participated in the public workshops. A Comment Form (see Appendix C) was distributed to attendees to obtain opinions on potential usage, access, design and safety considerations. The comment form was intended to gage public support and to encourage respondents to share comments and concerns regarding trail development. A section of the form allowed attendees to comment openly. Attendees were given the option to complete the Comment forms at the workshop or at home and turn it in at a later date.

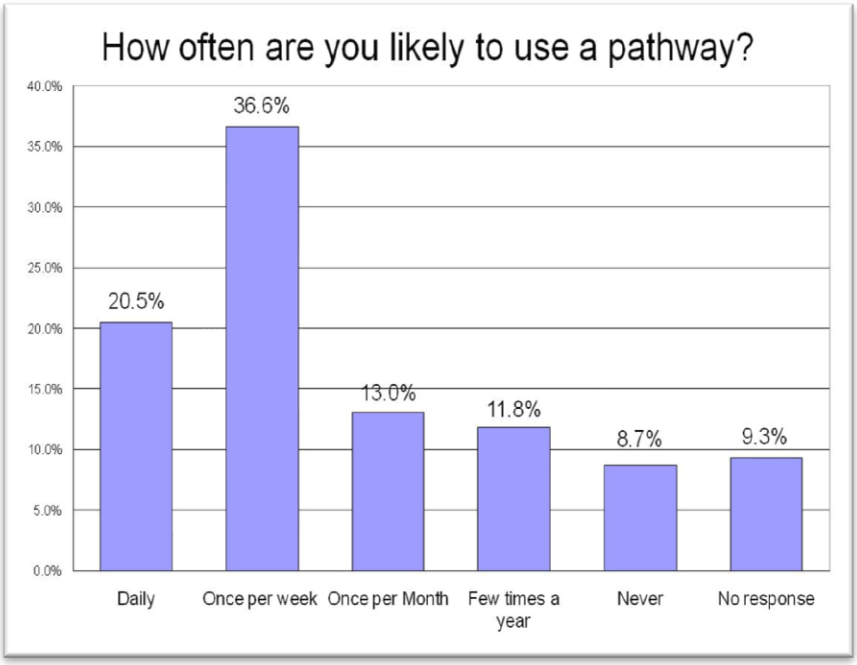
A total of 161 area residents participated in the four Assawoman Canal Workshops. Based on the input received directly and the responses provided on the Comment Forms, public support for an Assawoman Canal trail is favorable and widespread. The majority of the feedback was positive and supportive. The open responses are listed in no particular order in Appendix D. An electronic version of the Comment Form was also available to Sea Colony owners. More than 100 replied electronically, with results similar to the workshop responses.

Several pages that follow summarize public responses submitted on the Assawoman Canal Comment Forms.

Would you use a pathway (trail) if it were built?
When asked if they would use the trail, 81.4% of respondents said they would use the trail if it were constructed while 14.9% said they would not use the trail.

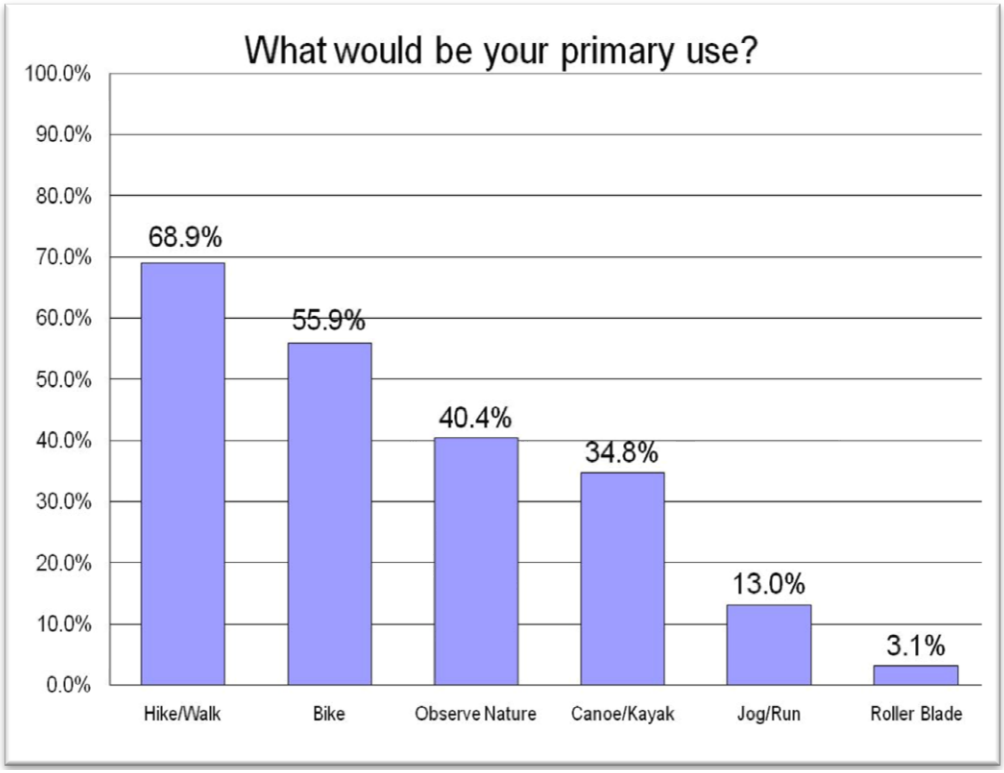


How often are you likely to use a pathway?
When asked how often they would use the pathway, 20.5% responded they would use the pathway daily, 36.6% weekly, 13% monthly and 11.8% a few times per year. Less than 9% responded that they would never use it and 9% did not respond. Both the high number of potential trail users and the frequency of visits reinforce the need and desire for bike and pedestrian facilities in the region.



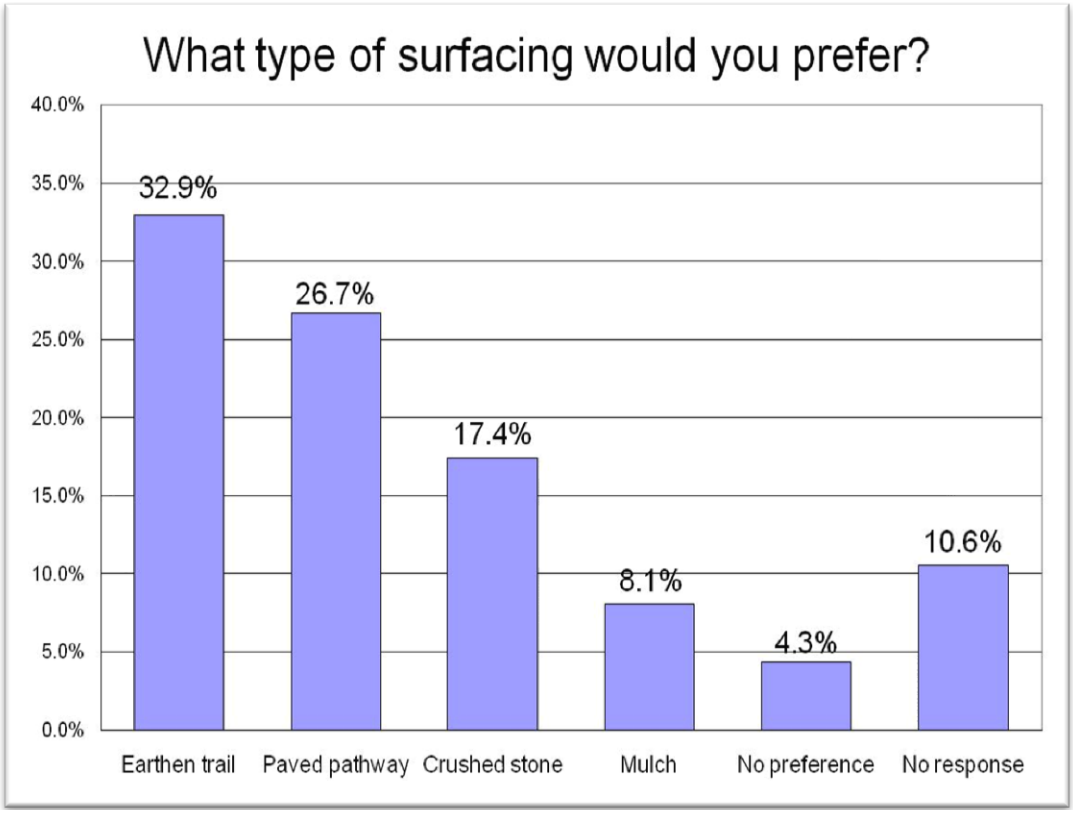
What would be your primary use of a pathway (trail)?

In response to the primary activities on the trail, 68.9% responded they would walk, 55.9% bike, 40.4% observe wildlife, 34.8% canoe/kayak, 13% jog/run and 3.1% roller blade. Many of the respondents listed multiple activities. In fact, 69 of the 161 responded that their primary use of the trail is both walking and biking. More than a third of respondents indicated their interest in paddling the Canal, a popular beach activity.



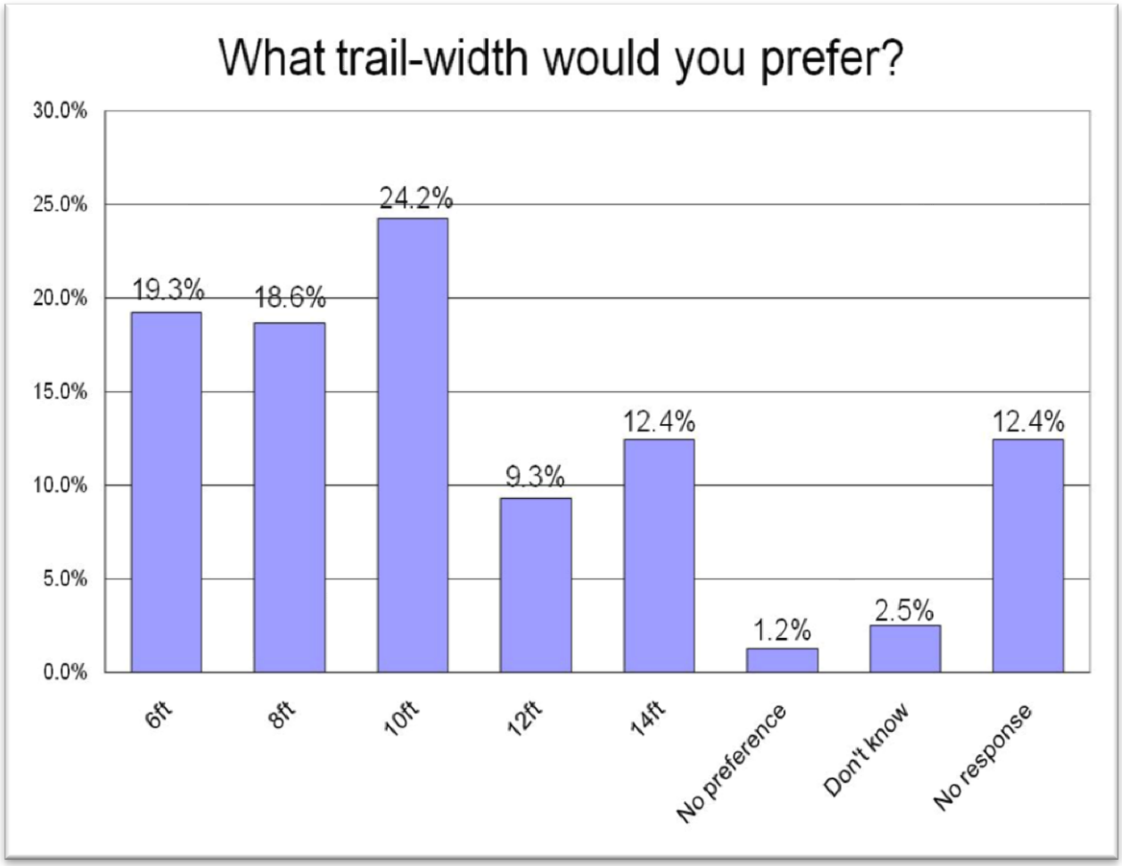
What type of surfacing would you prefer?

The preference for trail surfacing was 32.9% earthen trails, 26.7% paved, 17.4% crushed stone (stone with fines), 8.1% mulch, 4.3% no preference and 10.6% did not respond. The Working Group road bikes along the Junction and Breakwater Trail which has a stone with fines surface. The feedback from the Working Group on the surfacing was positive including comments referring to how natural the stone with fines looks and feels, how compact it is, how easy it is to bike on and how it would not require crack repair like asphalt and concrete. For many, it was their first experience on a stone with fines trail.



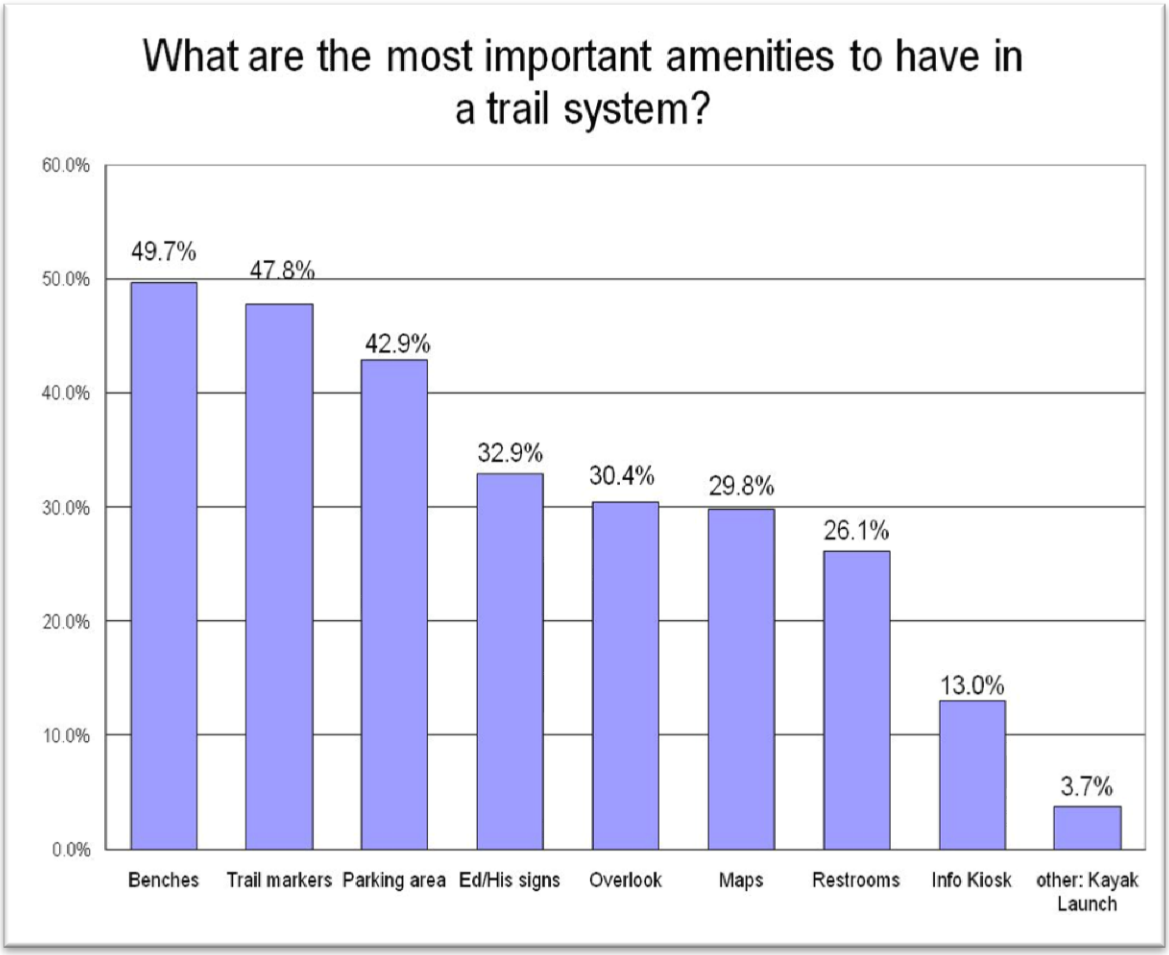
What trail-width would you prefer?

The preference for trail width is spread evenly among the narrowest 3 trail widths. About 62% of the respondents prefer a trail 10 feet or narrower while 23% indicated a preference for a wider trail of 12 to 14 feet. Here are the responses by trail width: 6 feet (19.3%), 8 feet (18.6%), 10 feet (24.2%), 12 feet (9.3%) and 14 feet (12.4%). This question is not typically asked of the general public because most surface widths, like roads and sidewalks, are predetermined.

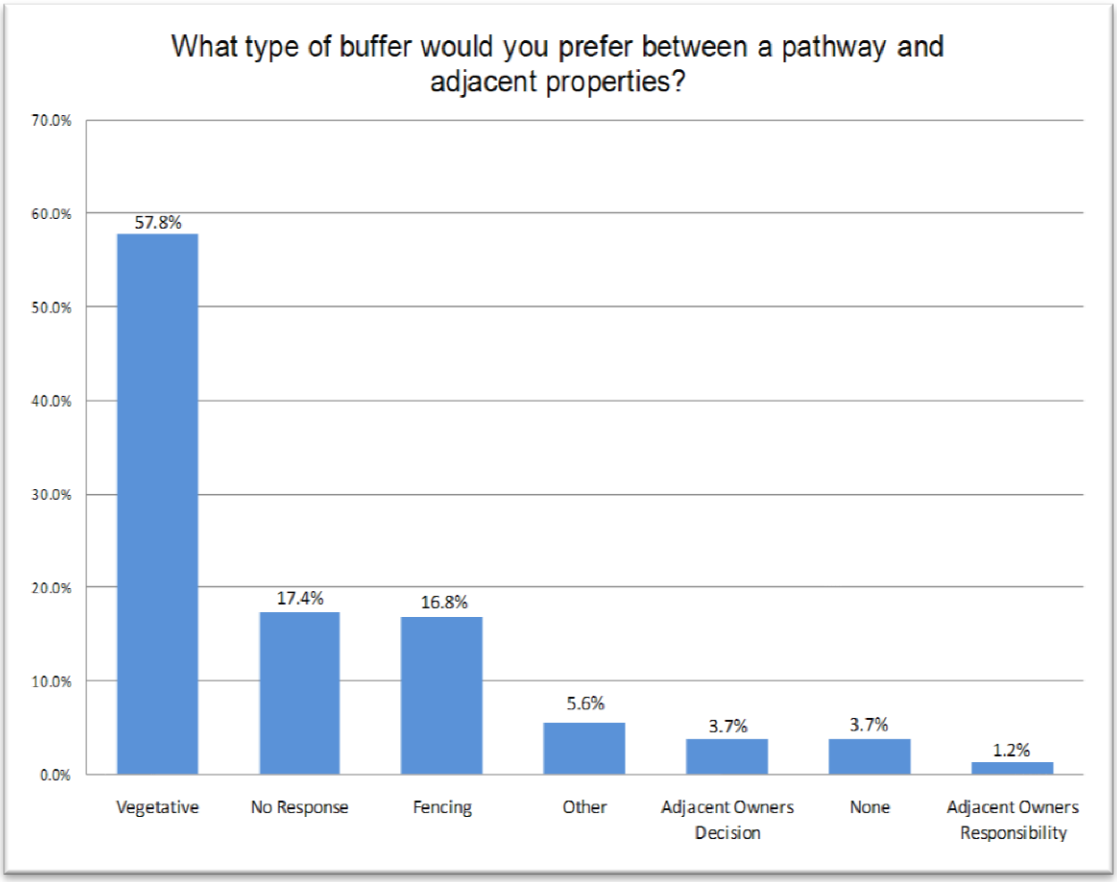


What are the most important amenities to have in a trail system?

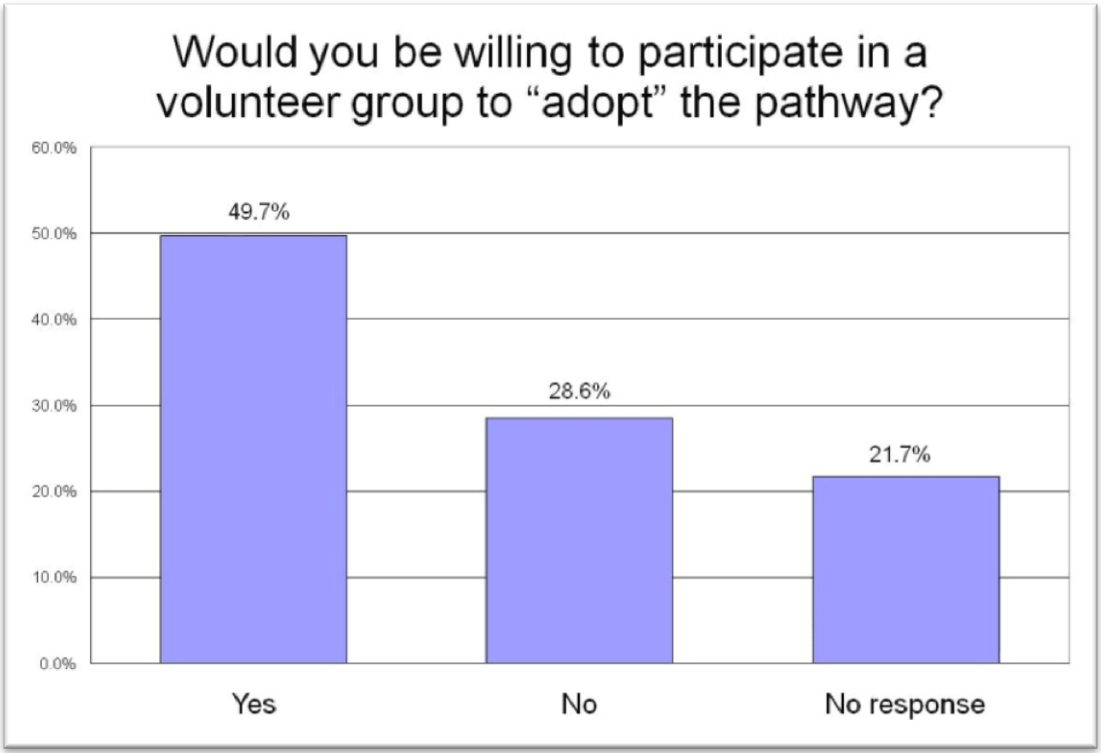
According to the respondents, the most important amenities are benches (49.7%), trail markers (47.8%) and parking areas (42.9%). The second tier of important amenities is education/historical signs (32.9%), overlooks (30.4%), maps (29.8%), restrooms (26.1%) and information kiosks (13%). Even though the majority of residents live within a 1 mile walk of the Canal, the high response that parking areas are an important amenity is a reflection of both our car dependency and the need for walking facilities in the area.



What type of buffer would you prefer between a pathway and adjacent properties?
The majority of respondents favor a vegetative buffer (57.8%) followed by fencing (16.8%). A small number of respondents prefer no buffer (3.1%) and 17.4% did not respond. As far as the written comments, 3.7% responded that the adjacent landowners should be given a choice and only 1.2% suggested that a buffer is the responsibility of the adjacent landowner.



Would you be willing to participate in a volunteer group to "adopt" the pathway?
Trail users can volunteer to be ambassadors for the trail. They could help to maintain the trail, assist and educate other trail users as well as coordinate both in helping to maintain the trail. They would engage other trail visitors and coordinate with local communities and State Parks to oversee the pathway. Almost half (49.7%) responded that they would be willing to participate in a volunteer group. This is very encouraging to see this level of support and volunteering can help foster a sense of place, responsibility and stewardship for the Canal property.



Responses to the Workshop Comment Forms revealed that many residents want to preserve the small town atmosphere, protect the natural environment, incorporate healthier activities in their lives and improve pedestrian and bike mobility in the region. A complete list of responses can be found in Appendix D. Below is a sampling of public comments provided by Workshop participants.

- "DO NOT HESITATE! START NOW! This has been long awaited and will be used everyday all year long (weather permitting) and will be a great asset to all communities."
- "1) The Assawoman Canal corridor is a potential gem to the overall community on many levels. It would connect communities such as Salt Pond with Turtle Walk, Sea Colony & adjacent neighborhoods. 2) Eventually a strong connection from Fresh pond to Assawoman Wildlife Preserve [Area] will build community relationships like no other infrastructure. 3) "It's not just the beach anymore" we need these walkable/bikable & boatable connections. Look at Central Avenue: you would never stroll or walk w/your children down that corridor. There are few opportunities to make livable improvements to our area and this is a major opportunity."

- “I want the greater community to benefit from the wonderful "passive" trail. The Not In My BackYard mentality is self-serving homeowners along the canal who knew the canal and adjacent land was public when purchased.”
- “The Canal needs stewards and this way it will get some”.
- “More and more people want to incorporate healthy activities into their vacations. I have never felt comfortable riding bikes, or walking, on the roads in Bethany. So every time we go to the beach we leave the bikes at home and exercise in the gym!”
- “It [a trail] is very important, however, not to cut any trees down unless it is absolutely necessary.”
- “Make pathway wide enough to allow for easy passing of jogger, walkers, biker, and dog walkers.”
- “I don't think a parking lot would be appropriate anywhere near the canal. The path should be for people living in walking or biking distance to the canal path.”

Concerns of privacy and security were also expressed. The majority of concerns involve the invasion of privacy to adjacent landowners and the real and perceived security concerns that a trail introduces. Examples of these concerns are below.

- “Any buffer placed between our home and the canal would obstruct our view. We are also concerned with potential of increased crime with allowing people access to our rear door so easily.”

- “Property owners along the canal purchased their property for the solitude, trees, nature and privacy afforded by the canal, including myself. I appreciate folks jogging, biking, and walking past the front of my home - that is expected, anticipated and fits well with that environment. Having the same happen behind my house is intuitively different.”

The response below submitted by a Sea Colony resident captures both the public interest and concern for the trail:

> “My husband and I own a property that is adjacent to the canal. We feel strongly that any pathway must maintain the natural appearance and ambiance of the area. We have the obvious concerns about security, noise and litter but we would be happy to share this lovely area with those who would respect our privacy and the natural environment.”

Statewide Outdoor Recreation Assessment

Another form of public input that helped shape the vision is the Statewide Comprehensive Outdoor Recreation Plan (SCORP), a statewide plan outlining both the demand and need for outdoor recreation facilities. In May and June 2008, the Division conducted a telephone survey of Delaware residents to gather information and trends on outdoor recreation patterns and preferences. These findings are the foundation of the 2009-2011 SCORP update which projects outdoor recreation opportunities that meet the public’s recreational needs. (See http://www.dnrec.delaware.gov/parks/Information/Documents/2009-2011_SCORP.pdf)

Because Delaware is home to diverse population centers and varying landscapes, regional variations in outdoor recreation needs are to be expected. Therefore for the purposes of planning and projecting outdoor recreational facility needs, the state was divided into five regions for reporting SCORP results. Common to all regions in Delaware is the need for linear facilities, such as trails and paved pathways that accommodate walkers, joggers, hikers, and bicyclists. These activities ranked high in every region, as well as among different ethnic groups and age categories.

Region 5 of the SCORP Plan incorporates the southeast portion of the state including the Assawoman Canal. Within Region 5, 380 Delaware households completed the telephone survey and 86% of the respondents expected a member of their household to participate in walking or jogging; 65% in bicycling; 40% in hiking; 13% in horseback riding; and 9% in mountain biking. Based on a comparison of findings (from the previously published 2003-2008 SCORP), the trend for trail-related activities continues to be popular among the recreating public.

Furthermore, SCORP identifies major issues of outdoor recreation and conservation concern. In response to the 2008 SCORP telephone survey, 75% of respondents living in Region 5 reported that bike and pedestrian facilities should be a very important funding priority.

The SCORP also queried participants on several aspects of their recreational lifestyles. When asked why they participate in outdoor recreation, telephone survey respondents gave these top four answers: 1) for physical fitness, 2) to be with family and friends, 3) for relaxation, and 4) to be close to nature. A trail along the Assawoman Canal would provide these types of recreation opportunities.

Summary of public input

The overall response was positive for creating a trail along the canal property. The feedback from the SCORP survey and the public workshops consistently highlighted a strong desire by the public for hiking and biking trails. The feedback helped frame specifics on what the trail should contain in terms of access, look and feel and amenities. There were also safety and privacy concerns raised by adjacent property owners. The resulting concept plan was designed to meet the needs of the public while addressing the concerns of the adjacent property owners.

VII. Concept Plan Part I – Working Group Design Guidelines

The Working Group conducted a series of site and field visits to understand the existing conditions and assess opportunities and constraints for developing trails and trail access while preserving valued resources. A field trip to the Junction & Breakwater Trail, between the Cities of Lewes and Rehoboth Beach, provided a good example of trail alignment and widths, surface materials, shared trail uses, resource protection, and proximity to residential homes and businesses. Another field visit along the Canal waterway provided valuable understanding of the vegetation buffer requirements, Canal width constraints, and Canal underpass conditions. Based on these trips and the public inputs, the Working Group created the following design guidelines:

- Foster trail development retaining the current landscape and "look and feel" of the Canal's upland area.
- Link residential neighborhoods and communities that adjoin Canal lands with an upland trail that is context sensitive to the Canal landscape and adjoining development.
- Construct a meandering trail with a tread comprised of "stone with fines" materials that will blend with the natural setting prized by community residents. A stone with fines surface will support bikes, strollers and provides a comfortable walking surface.
- Trail width must be compatible to achieve the following conditions: retain existing trees and vegetation; retain the existing "look and feel" so that a trail blends into the landscape; retains the 20 foot required canal-side buffer; and provides ample buffer between neighbors and trail users.
- Trails should include benches, scenic overlooks, trail way finding markers and wayside exhibits that interpret Canal history and natural resource features.
- Develop new trailhead access spots with information boards, maps, pavilions for shade and picnics. Enhance trail access at Central Avenue, Route 26 and Jefferson Bridge.
- Create or improve canoe and kayak access to the Canal waterway.

VIII. Concept Plan Part II - Visioning the Trail

A great trail is memorable and worth returning to day after day, season after season. The most successful trails start with a purposeful plan that fosters a rich visitor experience and responsible use. Elements, features and amenities typically associated with a great trail are illustrated in this section. Examples of trailheads, trail corridor widths, road crossings, bridge underpasses and overlooks provide graphic representations of what a trail could look like once constructed.

This plan envisions a canal trail that accommodates walkers, hikers, joggers and bikers, meanders between trees and retains as much of the natural landscape as possible. A trail system could connect with existing sidewalks and proposed sidewalks to form an expanded recreational and transportation network for residents and visitors. It could also be adapted to give access to the canal for kayaks and canoes.

Buffers

Terms established by the Corp require a 20-foot vegetative buffer from the high water mark of the canal to maintain bank stabilization and resource protection. The banks of the Assawoman Canal are steeper than a naturally occurring slope because of the undercutting of the banks. The main reasons for this undercutting are the continual back and forth tidal movement, the relatively narrow channel and the proximity of wakes created by water craft. Other factors that determine the rate of erosion are bank height and slope, channel width, soil types and vegetation. In addition to reducing the valuable land and compromising the canopy cover, erosion increases sedimentation and turbidity and decreases light penetration and overall water and habitat quality. Creating a vegetative buffer with native plantings will improve bank stabilization and minimize the impacts of erosion. Further evaluation and assessment outside of this plan will be required to fully understand Canal bank conditions and methods for stabilization. A list of native plants can be found in Appendix E.

Trailhead Access

Ideally, access points approximately every 0.25 to 0.5 miles enable the greatest degree of public access to a trail. Under these conditions, high levels of trail use can be expected. However, the physical setting of the Canal, with its surrounding land development, has limited trail access and limited places to construct public parking. Due to this parking constraint, the trail will be used primarily by area residents and vacationers who might access the trail from home. Details on the existing access sites are outlined in Table 1, Section IX.

At a minimum, this plan proposes trailhead access at Ocean View Marina, the Town Road Access site; Central Avenue bridge; Christine Lane; Riga Drive; and Jefferson Bridge at Kent Avenue. Other access points may be created; however, their use may be restricted to Salt Pond, Bethany West, Sea Colony, and Waterside community residents. Image 4 and Illustration 1 below show the existing conditions and a graphic rendering of a proposed trailhead access point adjacent to the Ocean View Marina.

Ocean View Marina Access Site

Image 4 – This site is located on the west side uplands of the Assawoman Canal holdings. Ocean View Marina adjoins the site to the north. A "social" trail has been created by area residents. To illustrate the width of state-owned Canal lands, a Division employee, under the arrow, stands at the Canal's western boundary

Illustration 1 - portrays the potential layout and amenities of a future trailhead. This graphic rendering depicts a trailhead with an information board, shaded pavilion and benches at the site adjoining the Ocean View Marina.

Bahamas Beach Cottages Access Site

Illustration 2 - This graphic rendering represents a potential trailhead located adjacent to Bahamas Beach Cottages. Available space at this trailhead will limit amenities to an information board. An existing parking lot can accommodate a few cars.

On-site parking areas are limited by the nature and size of proposed access points. Sites that may accommodate small parking lots are located at: Ocean View Marina and Town Road north of Route 26 and off of Kent Ave. near the Jefferson Bridge. These sites will require design and engineering to determine how these spots could accommodate limited parking.

Town Road Access Site

Image 5 - View of 0.5-acre property on Town Road in Ocean View, owned by the State Division of Parks & Recreation. The site lies north of the Route 26 bridge and has potential for both land and water trail access.

Image 6 - shows the existing basin at the Town Road property. With improvements, this site will provide an excellent water access to the Canal for recreational paddlers.

Illustration 3 - Town Road property graphically depicting a potential kayak and canoe launch site.

Illustration 4 - This graphic rendering depicts a conceptual design for a trailhead at the Town Road property. Enhancements to this site could include a small parking lot, information board, restrooms and shade pavilion. A footbridge over the basin opening will create an upland trail link. A launch for car top boats, kayaks/canoes, will enable water trail access.

Christine Road Access Site

Christina Road once connected the Mr. Natural bottling plant to Cedar Neck Road. This corridor could be designated as road-to-trail and used as a recreational trail. Reducing the road width and planting native vegetation would greatly enhance the recreational use and aesthetics along this corridor.

Access for the Salt Pond Community

Trail access for the Salt Pond community can occur through an HOA-owned parcel on Oyster Shell Cove. This 0.5-acre parcel, approximately 400 feet north of the water bottling plant, contains wellheads for the Bethany Beach water system. DNREC holds an easement on this parcel for wellhead access. If accommodations for vehicles are necessary along the canal, the trail would have to be designed accordingly. Opportunities for a trail access are limited to Salt Pond residents and visitors.

Access for the Sea Colony Community

Sea Colony is a community of 1,000 high-rise condominium units east of Highway 1 and 1,000 townhouse units west of Route 1. Sea Colony property abuts the state's right of way for one mile east of the canal. Owners generally support the project, with many expressing a willingness to "adopt" the trail if it is developed. Because it is a private community, there would be no public access to the trail through Sea Colony. For Sea Colony owners and guests, potential access points may be considered in the vicinity of the Fitness Center and Canal Court.

Trail Widths

The trail width will be influenced by the variation in landscapes, the required 20-foot vegetative buffer and the proximity to adjacent residences. Creating a trail that provides the user with a quality recreational experience that maintains the vegetative cover and privacy to adjacent property owners will be a challenge at certain locations along the Canal. While it is desirable to have a continuous trail width, site limitations may cause the trail width to vary in places.

At certain places along the Canal, area residents have created "social" trails. These are paths created by repeated use. While a "social" trail is generally 3 to 4 feet wide, shared-use trails are generally five feet or wider. Shared-use trails accommodate various users simultaneously.

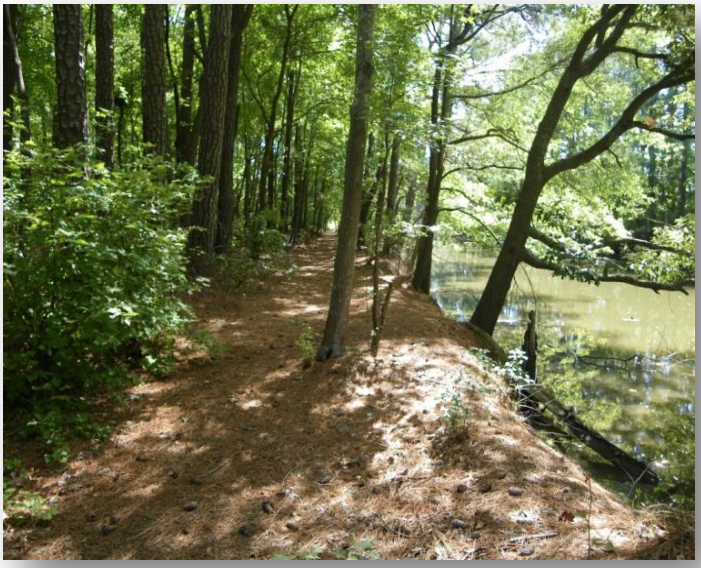


Image 7 - shows the existing Canal lands. At this location, a "social" trail was created by local recreational users. Social trails from adjacent neighborhoods are located at several places along the Canal.

Illustration 5 - This graphic rendering portrays the shared-use recreational trail and water trail. Trail width in this illustration comfortably accommodates different trail users. Existing vegetation remains within the trail corridor. The illustration depicts a stone with fines trail surface which are small particles of crushed rock.

A wider trail would improve sight line distances and offer more space for passing trail users. However, wider trails can increase recreational user's speeds, disturb vegetation and reduce tree canopy cover. The lack of tree cover can negatively impact the flora, fauna and aquatic

life of the canal ecosystem. From the trail user stand point, a wider trail will lessen the meandering trail characteristic and reduce the amount of shade and vegetation. The existing 14-foot wide Christine Road south of Cedar Neck Road is an example of a corridor that does not meander and lacks vegetation and tree canopy.

Image 8 - Christine Lane looking south from Cedar Neck Road. Planting native tree and shrubs will increase shade cover and narrow the trail corridor.

Trail widths can range from as little as 3 feet to as wide as 10 feet and higher. Wider trails are generally located in places where year round population levels are significant. The Junction & Breakwater Trail between Lewes and Rehoboth Beach ranges in width from 6 to 12 feet and is a transportation alternative for pedestrians and bikers. Illustrations 6 to 8, below, show six, eight and ten foot wide trail cross sections and how the various widths can comfortably accommodate recreational trail users.

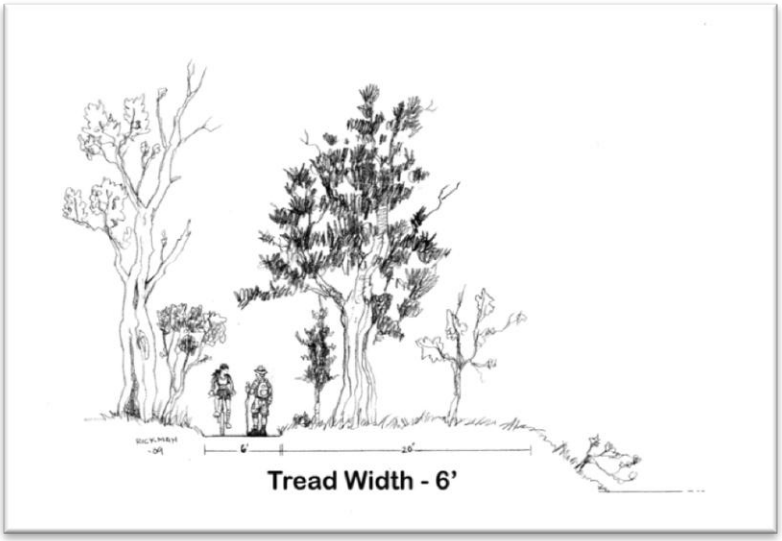


Illustration 6 - depicts a 6 foot wide trail tread. At this width, trail users can comfortably walk side-by-side. Different types of trail users can easily pass moving at a slow pace in a single file.

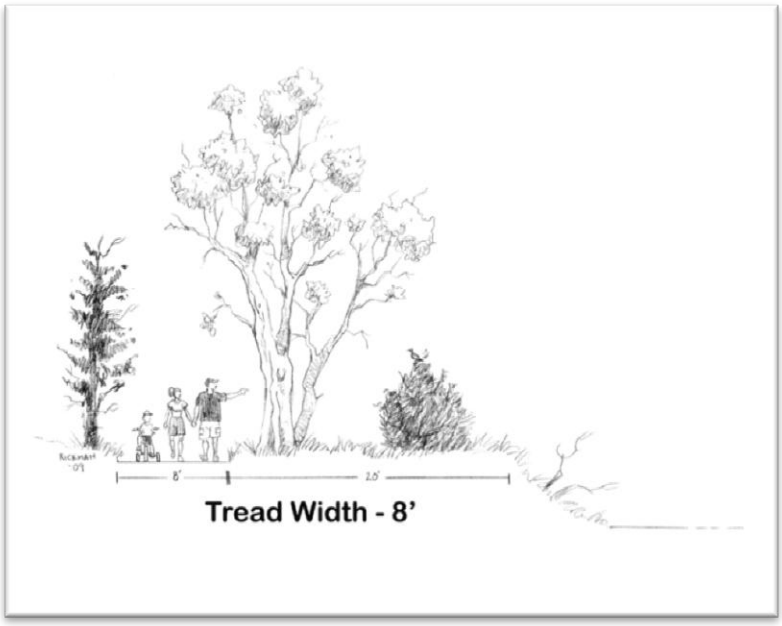


Illustration 7 - depicts an 8 foot wide trail tread. At this width, trail users can comfortably walk or bike ride side-by-side. When approaching others, it is good trail etiquette to walk or bike in a single file. Taking up the full trail width can diminish the trail user experience.

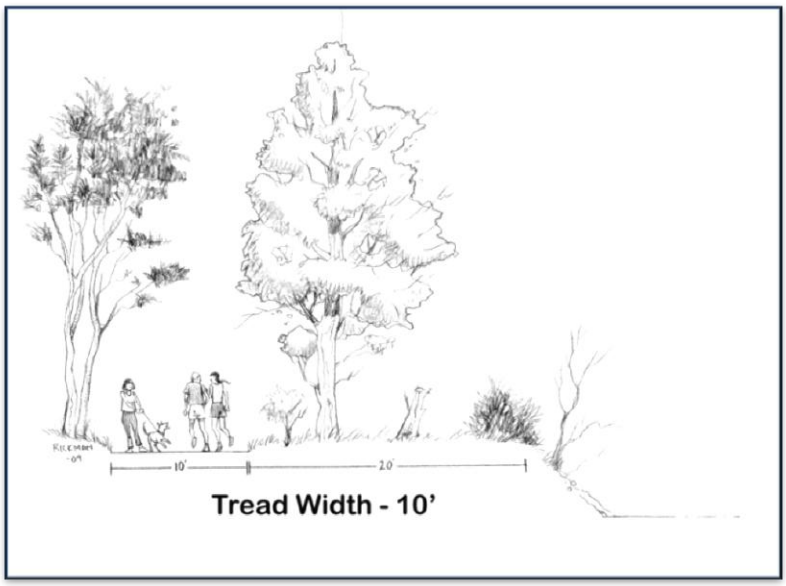


Illustration 8 - depicts a 10 foot wide trail tread. At this width, trail users can comfortably walk or bike side-by-side. When approaching others, it may not be necessary to yield when passing.

Trail Surface

To maintain an accessible route, trail surfaces must be firm and stable. The type of surface should be appropriate to the setting and level of development. Some natural soils can be compacted so they are firm and stable. A surface is considered firm and stable if, 1) a person can ride a narrow-tire bicycle without creating ruts; and 2) narrow plastic wheel stroller with a child can be easily pushed without creating ruts. Firm and stable surfaces allow assistive devices to operate without sinking impairing movement for a person using crutches, a cane, or a wheelchair. A firm and stable surface is also highly desirable to create optimal conditions for recreational trail use.

Earth is a natural surface that under certain conditions is an excellent trail surface. Earthen surfaces are easy on legs and preferred by runners and many trail users. Earthen surfaces may not always meet ADA requirements.

Stone with fines, asphalt and concrete are three types of applied surfacing that meet the "firm and stable" ADA requirements. Crusher fines are small particles of crushed rock. The fines range in particle size from fine dust up to a specified 3/8" maximum and are an excellent surface for high use trails. It provides an excellent tread for bikers, hikers, walkers, joggers and can support strollers. Examples of this surface application are found at the Junction & Breakwater Trail, Cape Henlopen, Killens Pond, Trap Pond and White Clay Creek State Parks. Trails in these locations, while they vary in installation age, remain stable and accessible in all weather conditions. A geo-textile fabric layer below the crusher fines can prevent the fines from mixing and settling with the soft soils and help control vegetation on the trail. A stone with fines surface provides a natural looking trail that is durable. The natural fine gravel-like surface feels more like a trail than a hard surfaced path and would fit well in the Canal's natural setting. It is also permeable which limits puddles in inclement weather.

Image 9 - this section of the Junction & Breakwater Trail, located adjacent to Holland Glade Road north of Rehoboth Beach, is constructed of stone with fines surface.

Image 10 - This is a view from the south end of Christine Lane looking north. The Mr. Natural bottling plant is on the right.

Illustration 9 - depicts a graphic rendering of crusher fines surfaced trail along the canal.

Concrete has the best longevity of all the surface types, has a cleaner surface after rain, is least likely to wash or break apart, is ADA compliant and does not require gravel base rock. However, concrete is more expensive to install, harder on human joints, is an impervious surface and less natural looking than stone with fines. Concrete trail surfaces do not fit the Canal's aesthetic character envisioned by the Working Group. Results from public input (fall 2009 public workshops) also indicated that concrete was not a preferred trail surface.

Asphalt is a good surface that initially is smooth, and if constructed properly contains no cracks, is ADA compliant, and slightly less costly than concrete to install. However, the asphalt edges may crack with vegetation growth. Also, as asphalt dries, its edges crumble. Asphalt has very little structural strength to span moving soil underneath. It requires greater

initial excavation for a rock base that can harm trees and it is an impervious surface. Asphalt also requires a top coat within three years of installation. The public's comments supported asphalt as a preferred surface.

In selecting the trail surface, attention should be given to drainage and soil types to ensure all water is conveyed away from the trail. The Canal area is generally flat with no cross slopes and no sheet flow. Water draining into the canal does so by existing guts and pipes. Therefore, the trail surface should be slightly raised above ground level to assure that water drains off the trail surface.

Both the installation and long-term maintenance costs are important considerations. Stone with fines is the least expensive to install while concrete is the most expensive. Asphalt is roughly 1.5 times the cost of stone with fines and concrete is nearly 3 times more expensive than stone with fines. From a maintenance standpoint, both concrete and asphalt are susceptible to cracking while stone with fines is susceptible to washouts. After considering the cost, aesthetics, usability and durability, the Working Group felt that stone with fines is the preferred trail surface.

Pedestrian/Bicycle Bridges

To create a continuous trail, short bridges will be necessary intermittently along the Canal to cross guts and outfalls joining the canal waterway. The need for bridges may influence implementation of the trail plan in a number of areas. The anticipated engineering study will determine specific needs for the proposal. Table 1, Concept Plan Part III, outlines the number of short bridges required to achieve a continuous trail. Bridges like the one in Images 11 & 12, below, are integral to several State Park Trail systems and trails networks in New Castle County.

Due to limitations that include narrowness of Canal upland property, height conditions over navigable waterways, and accessibility requirements, building a footbridge that spans the canal midway between the vehicular bridges does not appear likely. This restriction makes public access to a Canal trail extremely important at existing bridge locations.

Image 11 - This short wood-framed bridge is a typical example applied to narrow trail links. The bridge deck surface is a composite material with good skid resistant qualities allowing sunlight to pass through.

Image 12 - Fiberglass structural bridges fit well in natural surroundings and offer environmentally friendly crossings. Fiberglass bridges like this one, are durable, light weight, easy to install, cost effective, and require little maintenance. Fiberglass bridges can be found in State, county and local parks.

Image 13 - This footbridge is constructed with painted steel components.

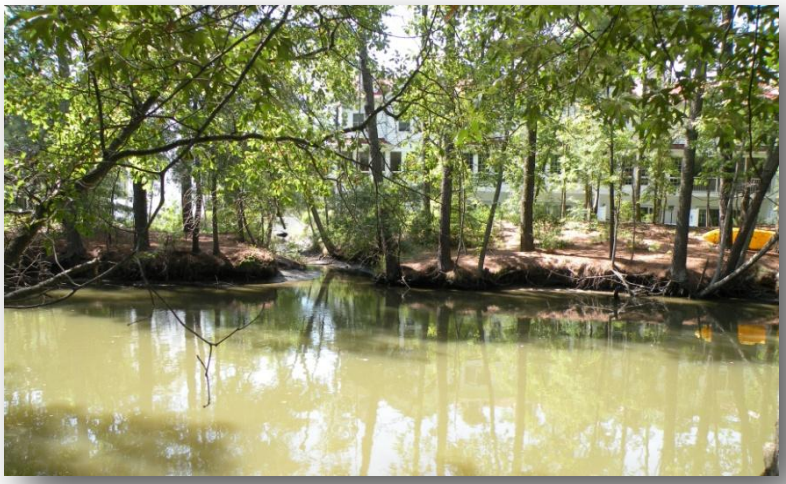


Image 14 – This is a view looking west across the canal at the Community of Waterside.

Illustration 10 - depicts a short foot bridge crossing that would provide trail continuity over narrow guts located at several places along the Canal banks.

Road Crossings

The Delaware Department of Transportation (DelDOT) maintains three vehicle bridges that cross the Canal. All three bridges are important for vehicular movement and serve as arteries in this busy region. These bridges are also important for trail user access and for trail system continuity. These crossings include Central Avenue/Cedar Neck Road, Route 26 and Kent Avenue/Muddy Neck Road. The most important safety consideration for a continuous recreational trail is the movement of trail users at road crossings.

The preferred method for trail users to safely cross a road is over or under the traveling lanes and not on them. It is not envisioned at this time that a pedestrian bridge is practical due to the road height above the nearby canal banks where the trail would be located. A trail underpass at the existing bridges is a possibility but the restrictions due to clearance and water elevation in the Canal makes this option very limiting. Therefore, at-grade road crossings are likely for this Canal trail.

Since there are no traffic signals within a convenient distance of the Canal, it will be necessary for trail users to cross the roads both at-grade and mid-block. Any at-grade crossing will require evaluation by the Department of Transportation to determine if a crossing will be permitted. At a minimum, at-grade crossings should consist of pedestrian warning signs as well as vehicle and pedestrian pavement markings. This type of at-grade crossing of Route 26 is depicted in Illustrations 11.

Image 15 - Bicycle riders westbound on the road shoulder of the Route 26 bridge.

Image 16 - a view from the Route 26 Bridge looking east toward Bethany Beach. Both a road shoulder and sidewalk exists.

Illustration 11 - depicts a bicycle/pedestrian crosswalk including signage and road markings. The orange arrow points to a connecting trail.

A safer way for trail users to cross is when all vehicular traffic is stopped at an intersection. These pedestrian activated crossing are found in many locations including the intersection of Kent Avenue and West Way Drive, about 0.5 miles east of the Canal. See Image 17.

However, there are no road intersections near the canal to retrofit this type of pedestrian crossing. To improve pedestrian and bicycle safety at roadway crossings where no traffic lights exist, a **H**igh-intensity **A**ctivated cross**W**al**K**, or HAWK devices, are in use around the nation. A HAWK signal remains dark until a recreational trail user approaches. At the press of a button, the overhead signals flash yellow, followed by a solid yellow and a solid red, stopping traffic so the pedestrian or bike rider can safely cross. After the trail user safely passes, the signal goes dark again and traffic flows freely.

Image 17 - a view of the Kent Ave. and West Way Drive intersection. Bicyclists activated the crossing and can safely cross Kent Ave. while all vehicular traffic is stopped.

Images 18 - a pedestrian signal located on Boulden Blvd. along the Industrial Tract Trail in New Castle County. When activated by a pedestrian or bike rider, the blinking yellow lights warn on-coming drivers that a walker or bike rider is crossing the roadway.

Images 19 - Cross Alert® warning devices notify drivers that bicyclists or pedestrians are crossing ahead and in the travel lane. Though not currently installed in Delaware, a device such as the Cross Alert® is a pedestrian activated system.

Image 20 - Cross Alert® warning device shown at a bike and pedestrian trail crossing.

Bridge Underpasses

Bridge underpasses can provide bikers and pedestrians with an uninterrupted and preferred trail experience. At the Central Ave/Cedar Neck bridge, an underpass is unlikely due to the steep banks and level bridge design. The steep slopes near the bridge are susceptible to erosion and the level bridge design reduces the clearance needed for an underpass. Therefore, an at-grade crossing is likely at this location.

The Route 26 bridge is expected to be the main access point for many area residents because of its central location, existing sidewalks and the lack of public access points especially east and south. Getting bikers and pedestrians safely across this busy corridor is an important consideration. Ideally, an underpass would allow trail users to utilize the wide shoulders and existing sidewalks adjoining the bridge eliminating an at-grade road crossing. Some concerns for an underpass at this location are the limited overhead clearance of the support structure and the peak water level in the Canal after a rain event. Another factor to consider is any underpass must be designed so that is won't compromise the integrity of the bridge supports. The illustrations that follow depict what underpasses at Route 26 could look like.

At the southern part of the Canal, Jefferson Bridge where Kent Ave and Muddy Neck Road intersect has the best potential for an underpass especially on the east side where the overhead clearance may be sufficient. An underpass would allow trail users from South Bethany to access the trail without crossing Kent Ave.

Bridge underpasses are desirable for a continuous and safe trail experience that avoids interactions with vehicles. This is the preferred method for trail users to enjoy the Canal. However, additional analysis will be required to determine if underpasses are possible. If future analysis determines that underpasses are not possible, the Working Group feels that options for pedestrian crossings, discussed in the previous section, can be implemented.

Image 21 - Underpasses may be created with box culverts or other structures. This trail underpass was incorporated into bridge support structure. This underpass is located below the Route 92 bridge crossing the Brandywine Creek in Brandywine Creek State Park.

Image 22 - looking north in the direction of the Route 26 bridge.

Illustration 12 - This artist rendering depicts a trail user approaching Route 26. Here a hiker can walk up to Atlantic Avenue or continue north on the trail passing under the Route 26 bridge.

Image 23 - looking south under the Route 26 bridge.

Illustration 13 - depicts an underpass at Route 26. Additional information is required to assess the feasibility for this underpass; overhead clearance and tidal fluctuation are considerations at this location.

Images 24 and 25 - pedestrian underpasses along the Boulder Creek Path in Boulder, Colorado allow uninterrupted trail use; avoiding street traffic and safe passage.

The Boulder Creek Path links neighborhoods, a library, shopping district, hotels and schools. It is very popular with bicyclists, walkers, and joggers. Benches and native vegetation are placed at visually interesting spots. An occasional kayaker paddles the creek.

Water Access

Creating an official water trail within the Canal waterway will enhance kayaking and canoeing opportunities. Furthermore, a Canal water trail could become part of a regional water trail network connecting points within the Inlands Bays region and watershed. Canal dredging was completed in 2010 when the canal channel was deepened to permit uninterrupted navigation by water craft.

Presently, unofficial water access occurs at Ocean View Marina and Kent Avenue. Canoes, kayaks, and other small water craft can be launched from these locations. The Town Road is strategically located near the mid-point of the Canal waterway and could serve as water and trail access point as well as a parking facility (see Illustration 3). All three sites will require enhancements to increase flow and site utility.

Just below the south entrance to the Canal, water access is available at the Assawoman Wildlife Area at Strawberry & Sassafras Landings on Miller Creek and at Mulberry Landing on Dirickson Creek. Fenwick Island State Park provides bay access at Tower Bay and at the Coastal Kayak Rental concession.

Images 26 - view of the undeveloped boat launch located south of Kent Avenue at the Jefferson Bridge. This site is an ideal location to access the Canal's southern end across from the Assawoman Wildlife Area.

Image 27 – an existing Canal access at Ocean View Marina on Elliott Avenue.

IX. Concept Plan Part III – Trail Segment Details

The Assawoman Canal Trail Concept Plan divides the planning area into four segments. Opportunities and constraints for trail design and development are outlined for each segment. Table 1, below, summarizes the characteristics of each segment. The constraints and opportunities for each segment are outlined in greater detail.

<u>Table 1</u> – Segment Assessment Overview

	Segment 1 West Side - Route 26 to North end	**Segment 2** East Side - Route 26 to North end	**Segment 3** West side - Assawoman Wildlife Area to Route 26	**Segment 4** East side - Black Gum Drive to Route 26
Distance	6,200 feet (1.2 miles)	5,800 feet (1.1 miles)	8,900 feet (1.7 miles)	8,500 feet (1.6 miles)
Adequate land width to accommodate a trail & buffers	Adequate for trail Several homes very near property line Several homes/units within 15 feet of property	Adequate for trail Several homes very near property line Several homes/units within 15 feet of property	Less than Adequate for trail Many homes/units very near property line Few homes/units within 5 feet of property	Adequate for trail Few homes/units very near property line Many homes/units within 15 feet of property
Trail Access	Ocean View Marina (exists) Central Ave Bridge Town Road site Rt 26 bridge and future sidewalk links	Central Ave Bridge Christine Lane Salt Pond (community) Rt 26 bridge and future sidewalk links	Rt 26 bridge and future sidewalk links Riga Drive undeveloped Church property Jefferson Bridge	Rt 26 bridge and future sidewalk links Sea Colony Rec Center Jefferson Bridge
Possible Parking	Ocean View Marina Town Road property	None	None	North and south side of Jefferson Bridge
Footbridges	1 bridge at Town Road property ~ 30 linear ft	1 substantial structure to span Loop Canal ~ 120 linear ft	5 bridges ~ 190 linear ft	5 bridges ~ 210 linear ft
Road Crossings	Central Ave/Cedar Neck; Route 26	Central Ave/Cedar Neck Route 26	Route 26; Kent Ave (to S. Bethany)	Route 26; Kent Ave (to S. Bethany)
Water Access	Ocean View Marina Town Road site	water link from Loop Canal neighborhoods	Riga Drive	Bethany West (neighborhood access) south side of Jefferson Bridge (exists)
Wetlands	None	None	Present in southern portion of Segment 3	Present in southern portion of Segment 4
Features	View at north end of canal Potential for Trailhead at Town Road Moderate tree cover	Landscaping and buffer improvements needed along Christine Lane Potential removal of bottling facility Sparce tree cover	Network connection from Rt 26; Adjacent undeveloped private parcels Good tree cover	Unimproved trail at Bahamas Cottages Good tree cover
Comments	Wet area north of Marina At-grade crossing - Central Ave	Proximity to residences in some locations Steep banks and sloughing Loop Canal is a constraint	Waterside property feet from property line	Limited public access except for vehicular bridges Wetlands south of Kent Ave

Segment 1- West side of Canal, Between North End and Route 26

Segment 1 contains 6,200 linear feet (nearly 1.2 miles) of Canal land located between the northernmost end and Route 26 - Atlantic Avenue/Garfield Parkway. Over 1 mile in length, this section lies within the Town of Ocean View's municipal boundary. Segment 1 is located north of Route 26 and is represented in Map 5.

The northernmost property in Segment 1, known as the Mitchell property and located where White Creek and the Canal join, is a 1-acre parcel owned by the Division of Parks & Recreation. The Mitchell property has the potential to serve as the northern extent of a land-based trail with an observation deck overlooking White Creek and beyond. However, trail considerations are on hold until plans for the property are determined. Site design and additional planning is needed to determine if the trail will extend to this parcel.

The Ocean View Marina site has the potential to support both trail and water trail access. It is envisioned that this site would have a trailhead with a pavilion or picnic shelter serving as a destination and scenic overlook. Trailhead amenities could include an information board, maps, and interpretative panels. A water trail launch at this location will enable kayakers and canoeists to access the Canal waterway and explore White Creek and the Inland Bays. Accommodations for limited parking require further analysis.

Steep canal banks under the Central Avenue bridge limit clearance for a trail underpass creating the need for an at-grade pedestrian/bicycle crossing at this location. There is a sidewalk on the Central Avenue bridge adjacent to the southbound travel lane but currently there are no sidewalks approaching the bridge.

Neighborhoods connected by regional sidewalks will promote trail usage. Considerations for a safe pedestrian/bicycle road crossing include standard roadway crossing signs, piano key striping, a reduced speed zone, and potentially a mid-block pedestrian-activated traffic light system. Ocean View's plan for new sidewalk construction will greatly enhance community walkability while creating links to the Assawoman Canal. Sidewalk construction will be phased over the next 5 years including the Central Ave. improvements.

Located on Town Road north of Atlantic Avenue is a 0.5-acre site owned by the Division. Once known as the Elechko property, the Town Road site could serve as a trailhead with both land and water trail access. This site could include an information board with a regional trail/park map and other information, way finding signs, interpretative panels, and parking for a few vehicles. Other amenities might include a shade pavilion and restrooms. Because of its small size, further detailed design analysis would determine the site's capacity for these elements. Water access from this site places paddlers at just over the 1 mile point south into the Canal and opposite the Loop Canal entrance.

The four (4) potential access points in Segment 1 (Map 5) are approximately 0.25-miles (1/4 mile) apart meeting ideal access standards.

Existing cuts, or narrow drainage ways, in the Canal banks will require the construction of short foot bridges in some locations to maintain trail continuity. In Segment 1, a foot bridge is required at the Town Road site where it intersects the Canal waterway (see Map 5).

Segment 2 - East side of Canal, Between Canal's Northern End and Route 26

Segment 2 is approximately 5,800 linear feet (1.1 miles) and borders the communities of Collins Park and Salt Pond and the Town of Bethany Beach. Segments 1 & 2 are represented on Map 5.

Christine Lane parallels the Canal south of Cedar Neck Road for approximately 2,450 feet (nearly 0.5 miles). This gravel lane, within the State-owned Assawoman Canal property, was historically used for truck access to the Mr. Natural water bottling plant. Only one homeowner uses the Christine Lane for residential access; alternatives are being sought to change the homeowner's access via other means. Converting the road into a trail could occur by narrowing the roadway surface. Plantings could enhance area aesthetics, provide shade and protect the bank which is slumping in some areas along the road. The Salt Pond community could have ready trail access for walking, hiking and biking.

The bottling plant operation is vacating the site and the building is expected to be demolished. This site could be transformed into a scenic overlook and interpretative wayside exhibit node. (See Illustration 9) Further design and analysis is required to determine trail-associated uses at this location.

Approximately 700 linear feet separate the bottling plant and the Loop Canal entrance. The Loop Canal is approximately 100 foot wide where it meets with the Assawoman Canal. Because the Loop Canal is a navigable waterway, bridge design must meet certain height requirements regulated by the U.S. Coast Guard. In addition, Americans with Disabilities Act (ADA) regulations must be met to aid in access for persons with disabilities. Designing a bridge that meets the federal standards, fits in with the natural setting and is sensitive to adjacent homeowners will require extensive engineering. Therefore, bridging the Loop Canal is not viewed as a high priority at this time.

Segment 3 - West side of Canal between Route 26 to Assawoman Wildlife Area

Segment 3 is approximately 8,900 linear feet long (1.7 miles) and borders the Town of Ocean View and the communities of Ocean Way Estates and Waterside. See Map 6 for details.

The Route 26 right-of-way owned by DelDOT is an essential component for trail access. A small wedge of land at Riga Drive and Atlantic Avenue, approximately 0.1 acres, is part of the bridge right-of-way. This location can provide hikers, walkers, and bicyclists with access to a Canal trail via an underpass if possible. An information board with a trail map would be the key trailhead element at this location. The limited size restricts other trailhead amenities. Little opportunity for parking exists, further reinforcing the neighborhood park aesthetic of the Assawoman Canal.

The Route 26 Canal bridge has sidewalks on both sides running continuously from this point east to the Atlantic Ocean. West of the bridge, sidewalks are incomplete but are scheduled to continue into Millville with upcoming road improvements. The road shoulders are marked for shared use with bicycles. There is no existing pedestrian crossing at the Route 26 bridge, although crossings are in place at signaled lights at West Avenue (0.5 miles west of canal) and Kent Avenue (1 mile east of the canal).

Clearance under the Route 26 bridge may be sufficient to design and develop a trail underpass enabling continuous, uninterrupted trail use. If an underpass at Route 26 is not possible, an at-grade crossing in close proximity to the bridge is essential.

Opportunities for trail access south of Route 26 were few at the time this Concept Plan was finalized. An access from Riga Drive, located in Ocean Way Estates is approximately one-half mile south of Route 26. Limited site improvements could include an information board with a trail map.

Between Ocean Way Estates and Waterside are two undeveloped parcels. Both parcels are currently in agricultural use. Peninsula United Methodist Homes (PUMH), a property owner, plans to develop a retirement community for active adults similar to PUMH's Manor House in Seaford and Heron Point in Chestertown. PUMH and the Division have agreed, in principal, to a connection between the future community and Canal lands.

A second parcel, known as the Canal Landing at West Bethany is immediately south of the PUMH parcel and immediately north of the Waterside community. This development project went through the Preliminary Land Use Service review in 2006. The site is still undeveloped. Potential access from this proposed community can be incorporated in the project's design.

There is little or no set back between the residential homes within Waterside and the Canal lands. Maintaining a twenty foot buffer along the Canal edge, close proximity of homes, tidal influences and wetland resources makes trail development through this section of Segment 3 a significant challenge.

Jefferson Bridge, the Canal's southernmost vehicle bridge, contains wide shoulders but no grade-separated sidewalk. Kent Ave has a narrow marked bike lane. Muddy Neck Road has wider shoulders but no share the road markings.

The trail, south of Jefferson Bridge, could provide a breathtaking view of the Assawoman Wildlife Area. Amenities may include an observation deck and interpretative signage. The trail on the west side of the canal would terminate at this point.

Small cuts or drainage guts landward from the Canal range from 10 to 30 feet wide. To maintain trail continuity, short foot bridges across these features will be required. Illustration 10 provides an example of how a typical footbridge would look within the Assawoman Canal landscape.

Segment 4 - East side of Canal, Route 26 to South Bethany

Segment 4 is approximately 8,500 linear feet long (1.6 miles) and borders Bethany Beach, Sea Colony and Bahamas Beach Cottages. Jefferson Bridge, the southernmost Canal crossing, is the best candidate of the 3 canal bridges for an underpass. Although traffic currently is the lightest of the 3 canal crossings, an increase in traffic is anticipated as developed continues west of the Canal. Segments 3 & 4 are represented on Map 6.

Currently, there are no public access points between the Jefferson and Route 26 bridges. However, there is an informal water access point within the Bethany West community and a

land trail community access at both Sea Colony and Bahamas Beach Cottages. These locations are depicted on Map 6.

A community recreation area in Bethany West contains a non-impounded storm water drainage system. Currently, paddlers are able to access the canal from this site. Due to the configuration of private property boundaries, pedestrian/bicycle access from Bethany West does not appear possible. The entire western boundary of Bethany Beach adjacent to the canal is residential properties with no public canal access except for the Route 26 Bridge. Any possible access points at the ends of residential streets would involve private property and will not be considered for public access at this time.

Residents and visitors of Sea Colony could potentially have community-only access to the Canal trail from the Recreation Center which has an outdoor pool and indoor facilities. A second potential access point in Sea Colony is located in the vicinity of Canal Court. These two sites could provide a connection for hikers, walkers and bicyclists that reside or vacation in Sea Colony.

Just north of Jefferson Bridge lies the Bahamas Beach Cottages community. An existing 1,200 foot (1/4 mile) trail is in place along the Canal. The trail is used regularly by area residents and vacationers. Access to the trail is gained through the community at several locations and the trail stops abruptly due to a storm water outfall. Portions of the trail will require realignment to comply with the 20 foot buffer setback. Existing wet soils must be considered in this section of Segment 4.

Although wetlands resources exist south of Jefferson Bridge, it appears that a trail is possible from Black Gum Drive connecting residents of South Bethany to the canal. Points south of Black Gum Drive are regulated wetlands. Therefore, the canal's southern point on the east side will be the public access from Black Gum Drive.

The road right-of-way at the Jefferson Bridge, southeast of Kent Avenue, is presently utilized for water access. This undeveloped launch is used by motorized and non-motorized boaters and can accommodate 3 to 4 cars. Its proximity to the Assawoman Wildlife Area and the Little Assawoman Bay makes this an excellent location for waterway access. This informal launch is undeveloped and enhancing this site for water trail access would improve area aesthetics and utility.

Several storm water outfalls and small guts originating from within subdivisions are present. These drainage ways are not navigable and vary from 10 to 30 feet across. To maintain trail continuity, short footbridges through this segment will be required. Appendix F is a photo log of these segments.

X. Conclusion and Recommendation

This Concept Plan is the result of local community leaders working together to determine if a pathway is possible and has public support. This plan is a step toward improving the recreational potential of the Assawoman Canal land for bicycle and pedestrian activities and enhancing access to the Canal for non-motorized water craft. The plan recognizes the importance of the Canal lands for wildlife habitat, bank stabilization and natural resource protection. The Working Group envisions a sustainable trail that minimizes the environmental impacts, enhances the land with native landscaping and creates buffers for both bank stabilization and adjacent property owners concerns.

Community involvement, through the Working Group, has been a critical component to this plan which provided a valuable dialogue with the communities adjoining the Canal. This partnership guided the vision, developed the Concept Plan, and became a conduit for public input and outreach. The public interactions led to greater respect and understanding of the Canal, better awareness of area recreational needs, and potential issues to be addressed.

This plan provides a key part of an integrated network of recreational trails in southeast Sussex County. It integrates the residential neighborhoods and communities that adjoin the Canal while retaining the current landscape and "feel" of the Canal's upland area. The Assawoman trail development will make significant contributions to the community and neighborhood livability. The trail will expand recreational opportunities, provide places to enhance physical fitness, and provide regional network linkages (alternative transportation) to communities, businesses and the coast.

The Working Group recommends entering into the design and engineering stage for shared-use trail development. The design and engineering may be completed incrementally by the municipalities and communities in partnership with the Division of Parks & Recreation. The Working Group will guide future steps in developing the trail bringing new recreational opportunities to the region.

XI. Appendices

A. Bird Species in block 199 & 210
B. Working Group Meetings & Timeline
C. Public Workshop Comment Form
D. Public Workshop Responses
E. Native Plant List
F. Photo log