Delaware Canal Historic Bristol Borough Daylighting Project

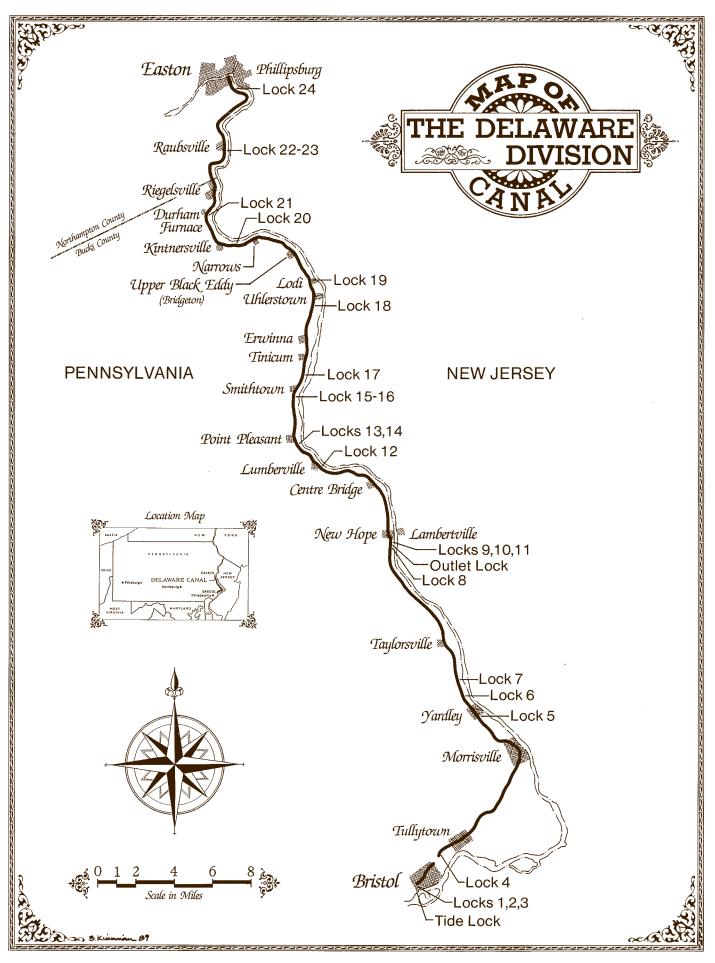


October 2008





Friends of the Delaware Canal



Map of Canal—The Delaware Division taken from "Delaware and Lehigh Canals" - Hugh Moore Historical Park and Museums Center for Canal History and Technology.



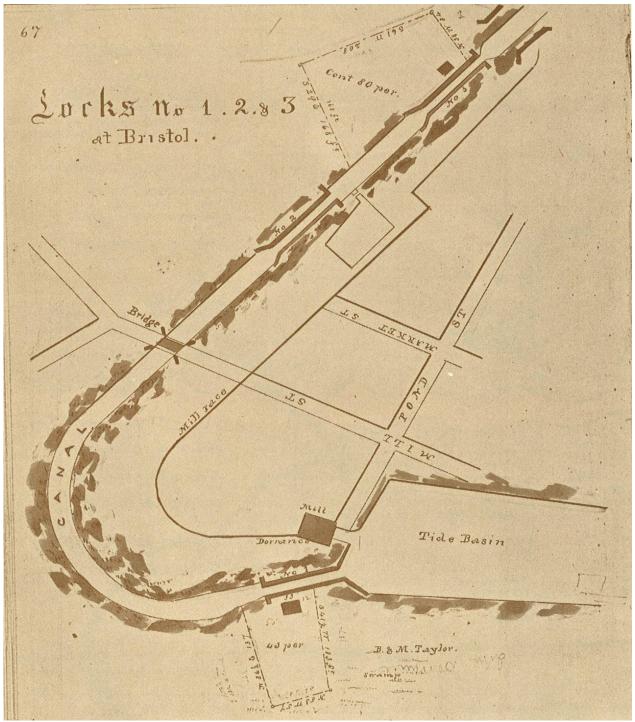
Bristol Canal Sign

Delaware Canal – Historic Bristol Borough Daylighting Project

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he genesis of the canal daylighting project dates back to mid-May of 2007 when representatives of the Historic Delaware Canal Improvement Corporation and the Friends of the Delaware Canal met with staff of Bristol Borough at Beaver Street. A tour of canal sections between Beaver Street and Jefferson Avenue revealed building rehabilitations alongside the canal and the pending demolition of the Snyder-Girotti elementary school buildings. Discussion among the participants led to a decision to explore the potential benefits to Bristol Borough of excavating and restoring the filled sections of the canal. Subsequent meetings with borough staff and council members lead to the development of a proposal to determine the feasibility of such an undertaking.

At its February 4, 2008 public meeting, Bristol Borough Council approved the "Delaware Canal Daylighting Project." The project/plan is being prepared by the planning staff of the Heritage Conservancy and financed by the Historic Delaware Canal Improvement Corporation and the Friends of the Delaware Canal.



Map of Canal Locks at Bristol from "The Delaware Canal – a picture story" by Robert J. McClellan

Introduction

Daylighting the Delaware Canal

In the 1960s, portions of the Delaware Canal in Historic Bristol Borough were filled in, covered up,

and, to some degree, forgotten. There were good reasons at the time for filling in the canal. It was no longer needed for the transportation of materials to the industries and businesses that thrived in the community. It held stagnant water and debris. It smelled and was a public nuisance.

Times change

Today, however, it may be advantageous to open or "daylight" portions of the canal for several reasons. The Bucks County Planning Commission recommends that the Snyder-Girotti Elementary School (being moved from its current location over the filled Canal), the borough, and representatives of the Delaware Canal State Park meet to discuss reopening the Canal to



Grundy Mills along Delaware Canal

provide an extension to the Bucks County regional link park network. The Bucks County Waterfront Revitalization Plan and the Borough's updated Comprehensive Plan of 2006 both recommend that filled in portions of the canal be restored. A restored canal will likely:

Revive an important historic feature of Historic Bristol Borough, Provide access and recreation opportunities for Borough residents, and Have positive economic impacts for adjoining businesses, the Mill Street commercial area, and the overall community.

The purpose of this effort is intended to set the stage for the opening of the canal from Washington Street to the land which is the site of the Snyder-Girotti Elementary School. This initial evaluation will include requesting input...the opportunities and constraints of opening the canal...from many interested parties including the residents and property owners along the canal corridor. We'll look into the types of improvements that might be wanted by the people in the community. These upgrades could include bicycle and walking paths, benches, signs, landscaping, lighting, screening, and fencing. We'll also get a ballpark estimate of what the daylighting project will cost.

Several public meetings will be held to keep the community informed during the process. These meetings will include:

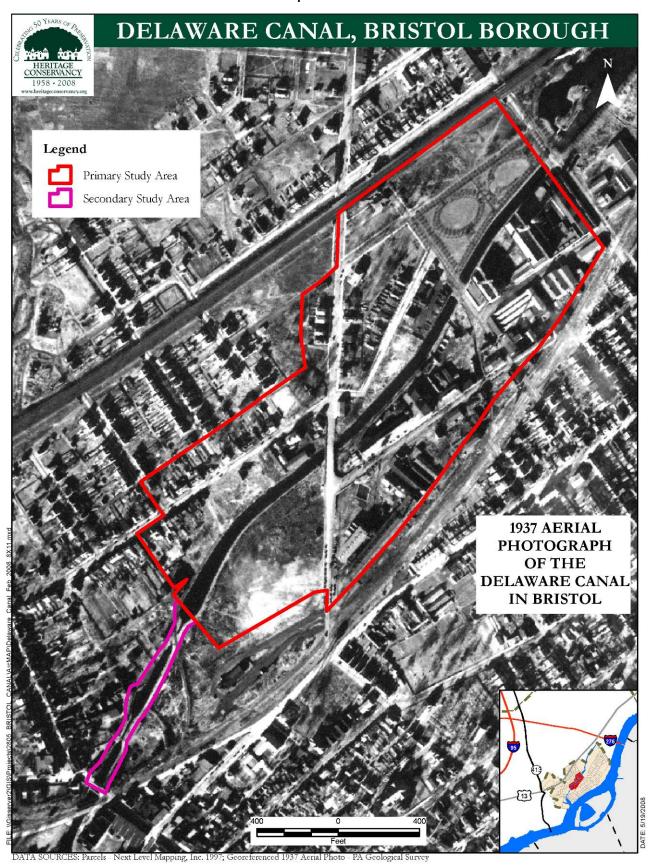
June 25, 2008 – First Public Presentation Meeting (to present findings from the Research and Site Evaluation Phases)

August/September 2008 – Second Public Presentation Meeting (to present findings from the Conceptual Planning and Economic Effects Phases)

September/October 2008 – Third Public Presentation Meeting (to present the final report)

The following sections provide some basic information about the canal and the project.

Delaware Canal 1937 Aerial Map



The Primary Study Area

The primary study area begins at Jefferson Avenue, on the Canal side of the street opposite the Lagoon, and follows the former Canal for approximately 2,800 feet (0.5 miles). Outside the study area, the Lagoon serves as a park and recreation area. A sign by the Canal describes how boats moving from the Lagoon to the Canal used to push against a "bump bridge" at Jefferson Avenue which opened up when a boat hit it and sprung back into place after the boat passed. Today, the section of the Canal that ran under Jefferson Avenue has been filled in.



Educational Sign at Lagoon Park (top); Watered portion of Delaware Canal at Jefferson Avenue (bottom)

On a recent sunny winter's day, a group toured the general area. The open portion of the Delaware Canal included in the study area starts at Jefferson Avenue and runs past Grundy Mills, which is currently being converted to condominiums. Educational signs are at either end of the section,

describing the history of the Delaware Canal. Within the Canal itself, some trash has collected at the Jefferson Avenue end. A man fishing there has found carp, sunnies, and large mouth bass. The watered portion of the Canal ends in a culvert at Washington Street.

The filled portion of the canal in the primary study area begins at Washington Street and continues for approximately 2,090 feet (0.4 miles). Washington Street

also once had a bump bridge that went over the Canal, which is now gone. The other side of Washington Street where the Canal is filled in is now a recreational trail. The path is lined with trees. Beyond the trees and metal fencing there are residential and commercial buildings, including the Canal Works, a sizeable historic stone building which has been converted to offices. An educational sign indicates the significance of the Canal Works as an historic building. The path ends at Beaver Street.

On the opposite side of Beaver Street, the primary study area includes the Snyder-Girotti Elementary School. This school was built over an area of the canal that was filled in. Currently a new building is being built adjacent to the study area which will replace the old elementary school, which will allow the canal to be opened up. The southern edge of the school property represents the end of the primary study area.

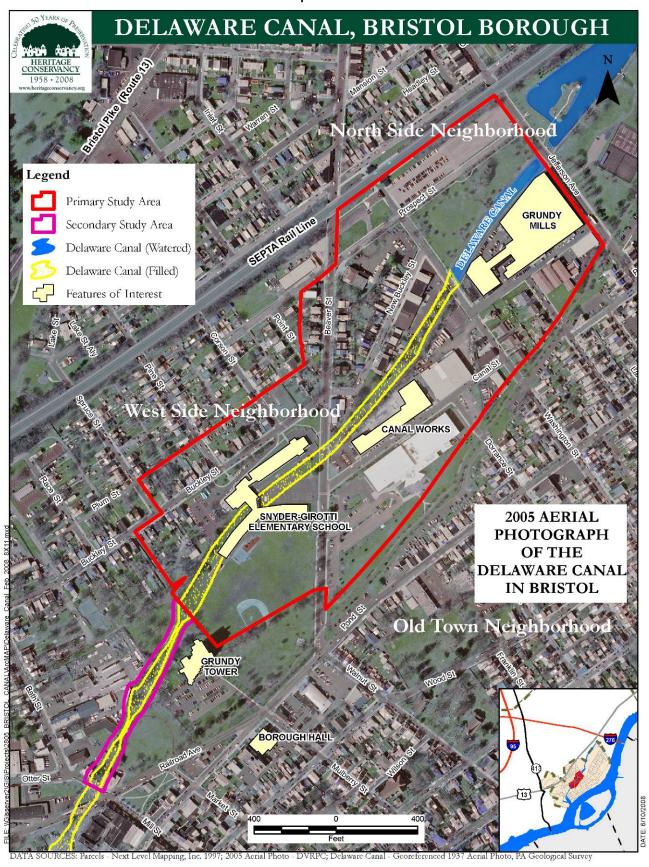
The Secondary Study Area

The secondary study area continues past the school property, following the buried portion of the Delaware Canal for approximately 1,000 feet (0.2 miles). This area returns to a recreational trail, similar to the one in the primary study area. It is also lined with trees and abutted mostly by residential buildings and park areas. These residential buildings include senior citizen housing maintained by the Bucks County Housing Authority. The secondary study area ends at Mill Street.

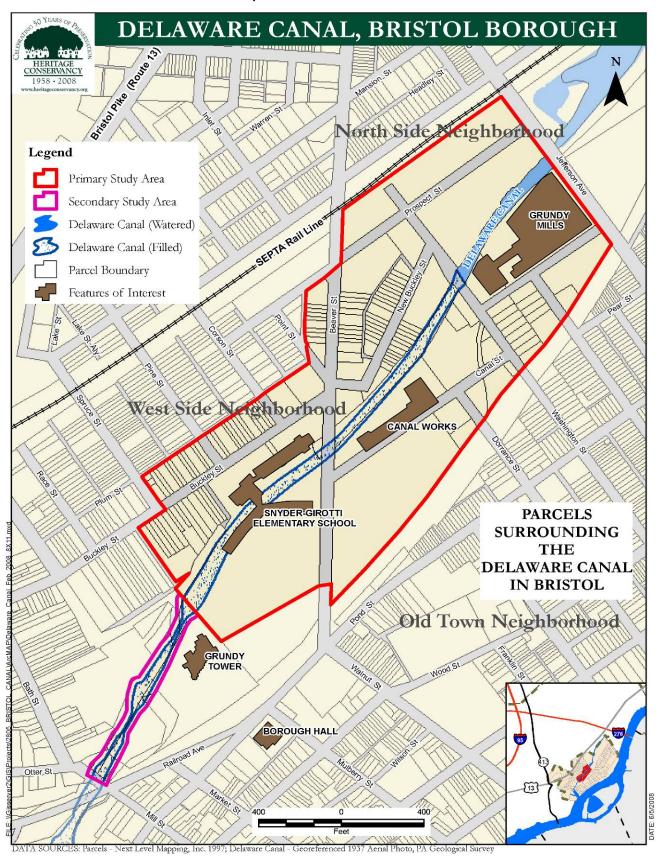


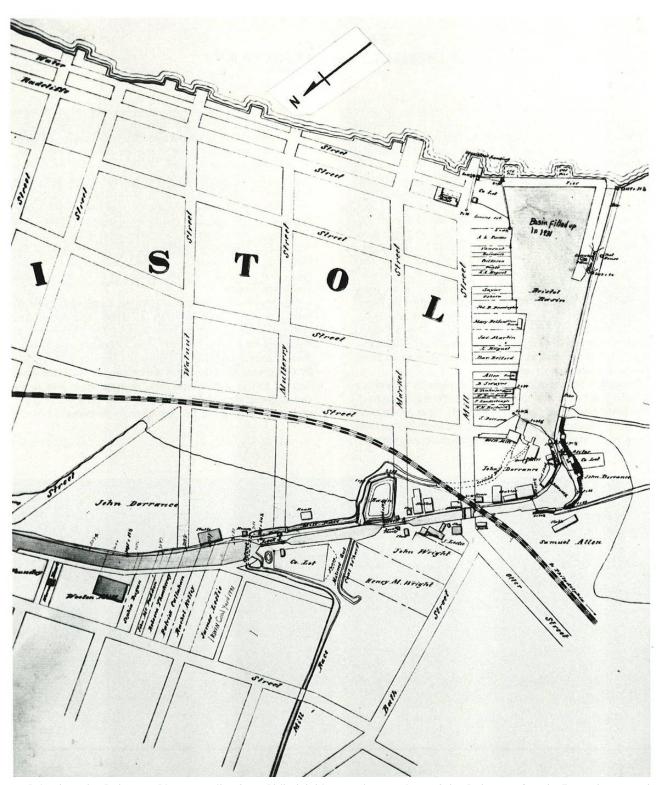
Recreational Trail running through secondary study area

Delaware Canal 2005 Aerial Map



Delaware Canal Parcel Map





Bristol on the Delaware River 17 miles from Philadelphia was the terminus of the Delaware Canal. From there, coalladen boats were towed to Philadelphia. Photo from "Delaware and Lehigh Canals" by Hugh Moore Historical Park and Museum Center for Canal History and Technology.

The Bristol Borough Comprehensive Plan

Completed in July 2006, the Bristol Borough Comprehensive Plan addresses a few key issues relating to the Delaware Canal. Within Chapter 4 (Natural, Historical, and Cultural Resources



Canal Works at Beaver Street

Element), the Comprehensive Plan describes the Canal as a significant historic resource which has been on the "Pennsylvania at Risk" list of endangered historic properties since 1993. For this reason, the Comprehensive Plan agrees with the Bucks County Waterfront Revitalization Plan recommendation to restore parts of the canal that have been filled in.

According to the Comprehensive Plan, restoring the Canal would reinforce Bristol's history as it relates to the Canal. In other communities such as Easton and New Hope, the canal has been restored and has been an element used to promote tourism.

Improved trails and signage would be important in this promotion. The Comprehensive Plan refers to a portion of the canal as the "dry bed," which it recommends restoring first, because it would require less funding and infrastructure improvements.

The following organizations and grant programs are mentioned in the plan to help fund restoration of the canal:

Historic Delaware Canal Improvement Corporation

Pennsylvania Department of Conservation and Natural Resources Growing Greener Program

Federal and State Transportation Funds

Pennsylvania Heritage Park Program

Challenge Cost Share Grants (National Park Service)

Save America's Treasures Program (National Park Service)

A few other recommendations in the Comprehensive Plan relate to the Canal. The plan

recommends converting the Southern End of the Green Lane Light Industrial Area to a Conservation District. The Conservation District designation is used to preserve natural and geographic features. The Southern End of the Green Light Industrial Area provides an important buffer between the Delaware Canal and the Green Lane Light Industrial Park. Currently it is classified as a "Priority 3" site by the Natural Areas Inventory of Bucks County. This means the area has county-wide or local significance with small or degraded populations of rare species. This 15- to 20-acre site is somewhat degraded; made up of old fields, coastal plain forest,

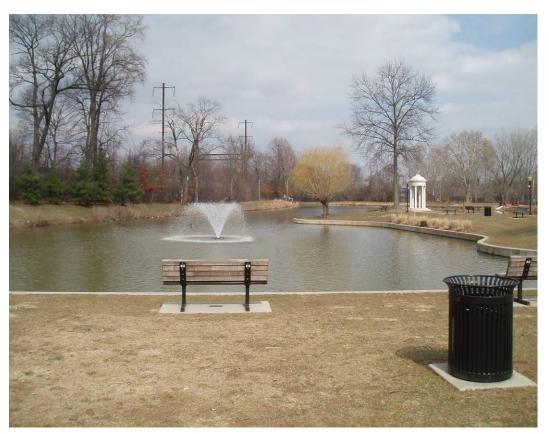


Filled Portion of Delaware Canal behind Canal Works

and emergent wetland habitats; and contains four rare plant species: forked rush, Maryland meadow beauty, round-leaved eupatorium and southern red oak.

In addition, the plan also recommends connecting the Delaware Canal to other important natural areas with trails, directional signage, and stream corridors. Specifically, the plan recommends connecting the Canal to the Silver Lake Nature Center by way of natural stream corridors.

The Conservation Planning Area described in the Comprehensive Plan is reflected in the Borough's Zoning Ordinance as a Conservation Zoning District. Except for the portion of the Canal that runs through the elementary school property, the open and filled-in portions of the Canal are included in this Conservation Zoning District. The ordinance defines this district as "...those areas where, because of natural geographic factors and existing land uses, it is considered feasible and desirable to conserve open space, water supply sources, woodland areas, wildlife, and other natural resources." Uses of land in this district are limited to public and private recreation, parks, open space, conservation, water-use related structures, and activities, plus public maintenance facilities which require conditional use approval. Building coverage is limited to not more than twenty percent.



Lagoon Park on Jefferson Avenue

The History of the Delaware Canal

The Lehigh Coal and Navigation Company pursued the development of the Delaware Canal out of a desire to increase the use of anthracite, known as hard coal, which burned longer and hotter than other fuels without smoke. Josiah White of the Lehigh Coal and Navigation Company had played a major role in the construction of the Lehigh Canal (technically the "Lehigh Navigation") on the Lehigh River, and wanted to do the same on the Delaware River. He envisioned a reconstructed Delaware River with dams and locks big enough for coastal schooners to pass through, but the Pennsylvania Legislature would not approve this. Instead the Delaware Canal was built parallel to the Delaware River as part of the State Canal System.

The Delaware Canal ran for sixty miles from Easton to Bristol, mainly transporting anthracite to the upper tidal portion of the Delaware River. It was made up of 23 lift locks to accommodate an elevation change of 164.4 feet. Bristol was part of the Canal's end reach where Canal boats transferred their goods to coastal vessels on the Delaware River or tugboats pulled Canal boats to Philadelphia.



Canal at Bristol taken from "Images of America: Bristol" by Harold and Carol Mitchener

The greatest traffic along the Canal was right before the Civil War. In 1855, 755,265 tons of coal was transported along the Delaware Canal. This did not include the other products transported, including grain, salt, salt fish and pork, beer, hay and straw, staves, lumber, brick, lime, limestone, iron, iron ore, merchandise, grindstones, and bituminous coal. During this time it cost approximately a half-cent per ton per mile to ship downstream on the Canal, and the boat load was 95 tons, making it very efficient and affordable. After 1855, competition from railroads decreased the use of the Canal.



Mules pulling boats taken from "Delaware and Lehigh Canals"

The boats that traveled along the Canal were generally 87 feet long, 10 ½ feet wide and 7 feet high. When filled with coal they displaced 5 feet of water. They were typically pulled by a team of two mules that walked along the "towpath". Mules were considered more reliable than horses, because they were calmer and less likely to go into the Canal if they became hot or thirsty. The mules only rested while the boat went through a lock and wore muzzles to prevent grazing.

The Canal was open from April to December, from 4 am to 10 pm when the locks closed. The Canal was also closed on Sundays. While the Canal was open, boatmen lived on their boats, often with their families. A minimal crew had two people on board, one to steer and one to act as mule tender. Below deck were hinged bunks and tables that could drop

against the wall to save space, as well as a stove for heating and cooking. Often below deck was decorated with curtains, tablecloths, and pictures. Above deck there was typically a second stove for coffee and keeping warm, as well as a storage box, a wood barrel for drinking water, and a gallon jug of rum or whiskey.

There was no refrigeration on board, so boatmen purchased perishables from farms along the Canal. Sometimes they would sell or trade their coal. Since boats were weighed at the beginning and end of a trip, if coal was sold, the bottom of the boat would be filled with water to make it appear as though the weight was the same. After dropping off their cargo in Bristol they would often purchase another cargo for the return trip.



Lock #4 taken from "Images of America: Bristol" by Harold and Carol Mitchener

Lock keepers managed the locks on the Canal, which would lower or raise boats when the ground elevation changed. As a boat approached the lock it would sound a conch horn and the lock keeper would respond with a whistle or a bugle, to let the boat crew know whether or not to approach the lock or wait until another boat had passed through. Locks were typically 95 feet long and 11 feet wide. With the exception of the double locks in New Hope, locks could only allow one boat to pass through at a time and it took approximately 12 minutes to pass through a lock.

With the Canal as a major "conduit for goods and commerce," Canal towns developed which were made up of coal yards, warehouses, and large mills manufacturing wool and other textiles. This resulted in a number of neighborhoods made up of worker housing. Those living along the Canal used the Canal for fishing, swimming and ice skating. Except for the areas right along the Canal, most of the surrounding regions remained agricultural.

As commercial traffic decreased, pleasure boating became common along the Canal. By the 1930s, the Canal fell into disuse, made obsolete by the railroads. On October 27, 1931, the last boat passed along the Canal and the land was deeded to the Commonwealth of Pennsylvania. During the 1940s the Commonwealth turned it into a linear park, thanks to the residents of Bucks County insisting on its preservation for its scenic beauty. Originally designated Roosevelt State Park, the name was changed to The Delaware Canal State Park in 1989.



Boatmen knew when they saw the clock at Grundy Mills; they were almost at the end of their trip down the canal. (Picture from "Images of America: Bristol" by Harold and Carol Mitchener)

During the mid-1950s a portion of the Canal was eventually filled in for the Warren Snyder School (today Snyder-Girotti Elementary). Today the Canal is a National Historic Landmark and a National Recreation Trail.

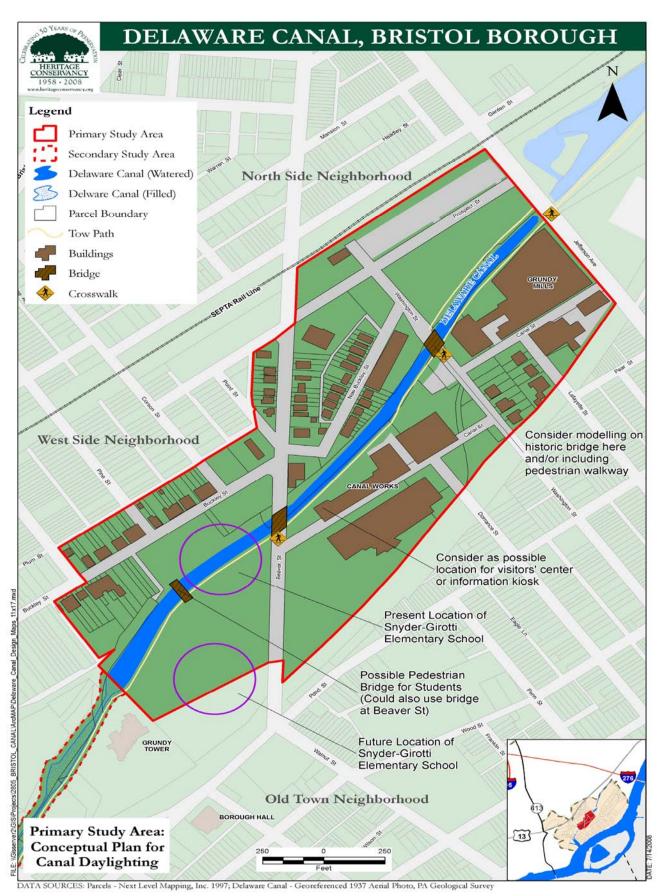


Sketch of mules pulling boat taken from "The Delaware Canal-a picture story" by Robert J. McClellan

Concept Plan for Daylighting the Delaware Canal



Historic Bristol Borough



Overview Map - Concept Plan for Daylighting Delaware Canal

Introduction

On June 25, 2008, a public meeting was held in the Borough Hall to solicit the community's input on opening this section of the canal and, if there was interest in that project, what types of improvements should be provided along the canal. Many attendees expressed support for opening the canal and relayed stories about learning to swim, fish and ice skate in or on the canal. Recommendations from people in the community included:

- Any improvements should reflect the canal's historic character.
- A tow path should be provided and designed to restore its historic integrity.
- Educational signs would provide important information on the canal and Historic Bristol Borough.

There was no interest in park benches, trash receptacles and other types of landscape furniture. Limited lighting may be useful. Attendees said the opened canal would support Historic Bristol Borough's identity. They also noted that the canal and tow path would likely promote tourism and support or increase property values. This would especially be true if the locks were restored as Historic Bristol landmarks.



Rendering of Daylighted Canal at Canal Works

Concept Plan

Using this feedback, Heritage Conservancy has come up with a concept plan for Daylighting the Delaware Canal in Bristol.

The concept plan focuses on opening the Canal within the primary study area, from Washington Street to Beaver Street and from Beaver Street to the edge of the Snyder-Girotti Elementary School Property. The tow path runs along the southeast side of the Canal, as it did historically. This side of the Canal is alongside the businesses and away from the more residential, northwest side of the Canal. This provides residents living along the Canal with a scenic view, but keeps Canal activity away from their homes.

In addition to opening the Canal and restoring the towpath, the following ideas should be considered:

Crosswalks should be added where needed where the Canal meets the road

- Improve educational signage as needed
- Provide a visitors center, possibly at Canal Works
- Restore Locks at a minimal cost

Future Projects

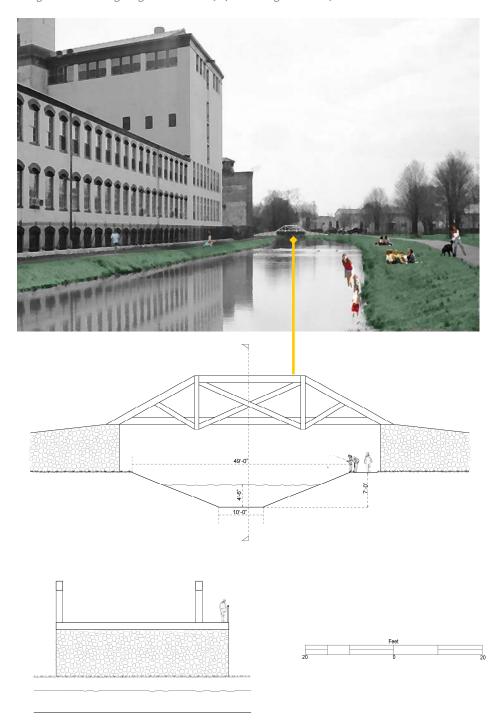
For the long-term, the Canal should be watered where it meets the streets, making bridges necessary. To the extent possible the bridges should be modeled on the "bump bridges" that once crossed the Canal in Bristol to maintain the historic integrity. Bump bridges were unique to Bristol and a functioning bump bridge could be a significant landmark to attract visitors. These should include a walkway for pedestrians to cross the Canal.

It is also important to consider how the school will access the property on the other side of the Canal. The Snyder-Girotti school is currently being relocated from its present location over the historic Canal, but will still want to make use of the entire property. Students could access the property from a pedestrian walkway on the bridge at Beaver Street. Depending on the school's needs, it may also make sense to provide a pedestrian bridge on school property.



Daylighted Canal at Washington Street, looking towards Beaver Street

Open Canal by Grundy Mills, showing possible addition of bridge at Washington Street (modeled on historic bridges in Bristol going over Canal.) (See image below:)



Elevation of possible bridge and section through bridge showing possible pedestrian walkway.

Potential Economic Impacts

There are a number of references that support the idea that the canal and the path would provide positive economic effects for the community. John L. Crompton, Distinguished Professor at Texas A&M University, wrote a book titled The Proximate Principle: The Impact of Parks, Open Space and Water Features on Residential Property Values and the Property Tax Base. Crompton reviewed a number of studies that showed "Significant positive impacts were recorded for properties on the ocean, on lakes and on canals." Property values along or near the watered canal would be enhanced.

As for the possible impacts of the tow path, Crompton reported that some homebuyers may be concerned about privacy loss, people flow and noise. He goes on to stress, "For other potential buyers, especially perhaps those with young children, hiking, biking and linear recreation activities may be a central feature of their lifestyle, so access to trails far outweighs the perceived negative outcomes. ... Across the studies there was broad consensus that trails have no negative impact on either the sale-ability of property (easier or more difficult to sell) or its value." The book notes that fencing or screening can address privacy concerns. As for nonresidential properties, the study states that commercial properties along trails sell for slightly higher values. (Referring to an article in 'The Indianapolis Star' in 2002, "Multiply those few dollars by a few thousand square feet, and it's a tidy premium.") For the portion of the canal to be opened, it may be best to provide the new tow path along the river side, rather than on the residential side, of the canal.

In addition to the positive impacts on property values, linear parks have positive economic effects on communities. There are numerous studies and reports that describe and quantify how visitors contribute to the local economy. National Heritage Areas (NHAs), including the Delaware and Lehigh National Heritage Corridor (D&L), add greater value in several ways. The 27 Congressionally designated National Heritage Areas across the United States are intended to preserve, promote and celebrate their region's heritage, culture and natural resources. Partnerships

MAJOR SUMMER EVENTS IN 2008

June 29th - Celtic Day Festival
July 27th - Puerto Rican Day Festival
August 10th - Afro American Festival
September 7th - Italian Day Festival
September 20th - DooWop Concert
October 18th - Historic Bristol Day

with community leaders, residents, businesses and local governments work to draw in visitors to the heritage sites, the communities and other attractions. For example, in 2001 D&L and Heritage Conservancy prepared a Bristol Borough Heritage Linkage Plan: Inventory, Analysis and Recommendations along the Proposed Trail Loop for areas along the canal trail, the waterfront and Mill Street. This plan supports the Borough's revitalization efforts. One physical outcome of the plan was the erection of signs which provide information on the community's history and the canal for trail users.

Studies of five NHAs, including the D&L, have estimated the direct and indirect economic impacts of visitor spending. Tourism generates jobs and income for the local economy through their spending on lodging, food, souvenirs and other retail purchases, local travel, and other goods and services. An indirect impact would be an increase in local business taxes.

Historic Bristol Borough enjoys a unique location in the Delaware and Lehigh National Heritage Corridor. Rather than being a place along the way, Historic Bristol Borough is an origin and destination for visitors. Parking opportunities are located at Bristol Marsh, in the Mill Street commercial district and along Radcliffe Street. Refreshments and meals are available in the town center area. The Bristol Riverside Theater, Grundy Museum, numerous historic buildings and pedestrian ways, including the canal tow path, enhance the community as a destination of interest. Concerts are held at the waterfront park beginning June 1 through September 7 from 6:00 to 8:00 p.m. every Sunday evening. Throughout the summer and autumn, a variety of festivals and concerts will draw visitors into the community.

The East Coast Greenway is a 3,000 mile long path system in the making. The project aims to connect cities and towns on the east coast from Key West, Florida, to Calais, Maine, and into Canada. It has been called the Urban Appalachian Trail and intended to promote health and economic benefits in the communities along the way. The East Coast Greenway Alliance is an organization established to promote the use of the trail system which includes a marketing program to benefit local businesses such as B&Bs, bike shops, food stores and restaurants. The marketing efforts will, among other activities, feature area events and festivals in the communities the trail crosses. The East Coast Greenway would pass through Historic Bristol Borough along Pond Street to Jefferson Avenue to the Lagoon Park and then along the Delaware Canal State Park tow path. The portion of the Canal to be daylighted and the adjoining tow path would be one of many spur paths connected to the main greenway or, in time, replace the trail currently intended to be located along the Borough's streets.

As for the future, Pennsylvania Department of Conservation and Natural Resources' plans to improve the tow path north of Bristol will make the Borough an ideal place for serious walkers and bicyclists to park and start a good day's exercise along the canal...and then end back at a Bristol eatery or other attraction.

The economic impacts, either for property owners or to the greater community, are likely to be enhanced by improvements to the canal and its tow path.

Community Response

On September 10, 2008, a second public meeting was held at Bristol's Borough Hall to review the concept plan for daylighting the Canal. During this meeting, community members responded to the plan and offered comments.

One concern expressed was related to the street approaches to new bridges. The approach grades do not seem appropriate, particularly at Washington Street. Although the historic character of the bridges was well supported, the approach grades are an engineering matter that would be addressed at a later time. The current project focuses only on opening portions of the canal and providing a tow path. Bridge reconstruction is a matter for future discussion.

One community member expressed a concern about geese creating nuisances to those living and walking along the Canal. Elissa Thorne of the Delaware and Lehigh Heritage Corridor recommended native plantings and limited mowing to discourage geese coming to the Canal area.

The remaining questions were largely about appearance. Since a number of residential yards are located along the Canal, some felt there should be codes to enforce yard good maintenance. Another community member suggested that a consistent look or character be created along the Canal route. It was also emphasized that protecting mature trees is important, so great care should be taken when opening the Canal. A final comment was mentioned about stagnant water and again it was understood that proper engineering would be needed to prevent this problem. Based on previous comments from Pennsylvania's Department of Conservation and Natural Resources at the June 25 public meeting, adequate flow can and would be provided.

The greatest concern of most community members, however, was that the concept plan only represented daylighting a small portion of the Canal. Most community members at the meeting wanted to see the entire Canal opened, including extending the Canal under roads such as Jefferson Street where it has been interrupted. Based on these comments, Heritage Conservancy would recommend that this first concept plan be a stepping stone towards opening the entire Canal through Historic Bristol Borough.



(above) Toll collector and toll house at the tide lock. Tolls were collected here and at New Hope and Mauch Chunk. In the background are some of the industrial buildings on the edge of the canal basin. (below) Lock 2 at Bristol. The "doghouse" to the left of the bridge protected the gears for opening and closing the lock.



Photos from "Delaware and Lehigh Canals" by Hugh Moore Historical Park and Museum Center for Canal History and Technology.



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