2.0 Greenway Background and Context

Prior to articulating the organization, management, implementation, and promotion goals and action strategies for the Susquehanna Greenway, it is important to present a picture of current conditions of the river corridor. This chapter summarizes four years of data gathering, research, surveys, visioning, and concept development. The findings are based on a review of existing documents, extensive field work, and collaboration with the Susquehanna Greenway Partnership Planning Team.

2.1 Greenway Planning

This Strategic Action Plan is the summation of a multi-year, multi-phase planning effort that describes a vision for the greenway, develops a greenway design concept, and establishes an implementation strategy for realizing the Susquehanna Greenway.

The greenway planning process included extensive background data collection, analysis, and documentation. Due to the scale of the Susquehanna Greenway, data was collected on numerous levels: statewide through agencies such as Pennsylvania Department of Transportation (PennDOT) and PA Department of Conservation and Natural Resources (DCNR), regionally through economic development and tourism bureaus, and locally through county databases. This information was supplemented by resident input during public workshops, Reach Advisory Committee (RAC) meetings, and a public opinion survey. Other research, such as the project inventory and the scenic assessment, was conducted through the partnership. The Susquehanna Greenway Partnership Planning Team, SEDA-Council of Governments (SEDA-COG), BLOSS Associates, Pennsylvania Environmental Council, Toole Recreation Planning, Penn State University Department of Landscape Architecture, and Ball State University analyzed all information collected to produce the following documents: The Vision and Values Report, The Community Design Workshops Report, The Greenway Design Concept, and The Public Opinion Survey. These and other documents can be viewed on the website: www.susquehannagreenway.org.
2.2 The Greenway Organization

The Susquehanna Greenway Partnership was formed in June 2001 by the adoption of the Susquehanna Greenway Charter. Preliminary funding from DCNR and other sources enabled the public-private network to initiate greenway planning. The Susquehanna Greenway Partnership was an ad-hoc advocacy organization, comprised of more than 2,000 individuals representing government agencies, non-profit organizations, businesses, and industries. The partnership was established through the Susquehanna Greenway Charter as an organizational foundation for public-private action and regional cooperation in the 22 Pennsylvania counties that comprise the project study area. The organizations that signed the Charter in 2001 included: the Pennsylvania Department of Conservation and Natural Resources, SEDA-Council of Governments, the Susquehanna River Basin Commission, the Pennsylvania Environmental Council, the Northcentral Pennsylvania Conservancy, Lancaster County Planning Commission, Lycoming County Planning Commission, Bradford County Office of Community Planning, and the National Park Service-Rivers and Trails Program.

2.2.1 The Susquehanna Greenway Partnership Planning Team

The Susquehanna Greenway Planning Team is a subset of the partnership and was assembled with the specific purpose to create a Strategic Action Plan for the project. The planning team has served as the guiding force in all elements of project planning for the past four years. It has facilitated meetings of the partnership, led the vision and values planning effort, spearheaded the conceptual planning for the greenway, and directed the work that went into the development of this Strategic Action Plan.

2.2.2 The Planning Team Advisory Committee

Advisors to the planning team include the Department of Conservation and Natural Resources (DCNR), Pennsylvania Department of Transportation (PennDOT), the National Parks Service – Rivers and Trails Program (NPS), and Federal Highway Administration (FHWA). The advisory committee has been instrumental in providing oversight the financial assistance to the Susquehanna Greenway planning process.
2.2.3 Reach Advisory Committees
To assist the planning team in achieving meaningful regional and grassroots input into the greenway plan, reach advisory committees (RACs) were established in each of the six river “reaches”. Each RAC was responsible for facilitating public input and participation and identifying regional issues and opportunities. RACs contributed input into the greenway vision and greenway concept designs.

2.3 Greenway Study Area

The study area for the greenway is defined as the entire Susquehanna River corridor, one-mile on each side of the river. The Susquehanna Greenway includes the North Branch, West Branch, and Main Stem of the river, flowing 539 miles through the Commonwealth of Pennsylvania. For the purposes of creating the greenway plan, and to encourage local input and celebrate regional diversity and distinction, the 500 mile greenway was divided into six segments, or planning “reaches.”

Reach 1 - Upper North Branch: Pennsylvania – New York Boarder to Pittston
Includes Susquehanna, Bradford, Wyoming, and Lackawanna counties

Reach 2 - Lower North Branch: Pittston to Northumberland
Includes Luzerne, Columbia, Montour, and Northumberland counties

Reach 3 - Middle Susquehanna: Northumberland to Harrisburg
Includes Northumberland, Snyder, Dauphin, Perry, Juniata, and Cumberland counties

Reach 4 - Lower Susquehanna: Harrisburg to Pennsylvania – Maryland Border
Includes Dauphin, York, and Lancaster counties

Reach 5 - Upper West Branch: Carrolltown to Lock Haven
Includes Cambria, Indiana, Clearfield, Centre, and Clinton counties

Reach 6 - Lower West Branch: Lock Haven to Northumberland
Includes Clinton, Lycoming, Union, and Northumberland counties
2.4 The Greenway Context

The Susquehanna River is the largest river lying entirely within the continental United States that flows into the Atlantic Ocean. The Main Stem of the Susquehanna meanders from Otsego Lake, New York, through Pennsylvania and Maryland before emptying into the Chesapeake Bay at Havre de Grace. The Main Stem Susquehanna and its West Branch tributary journey 539 miles through five physiographic provinces beginning in the Appalachian Plateau in New York and west-central Pennsylvania, traveling through the Ridge and Valley province and the Blue Ridge province in central Pennsylvania, entering the Piedmont region in southern Pennsylvania, and finally the coastal plain in Maryland where the river joins the waters of the Potomac, Rappahannock, and James Rivers at the Chesapeake Bay.

The Susquehanna River watershed drains a diverse landscape that covers 27,500 square miles, approximately the size of South Carolina, supplying over 80 percent of the upper Chesapeake Bay’s fresh water flow and half of the bay’s overall freshwater supply. The headwaters of the river begin as a trickle and swell to over a mile and a half wide as the waters approach the Susquehanna’s mouth. Flowing at a leisurely pace of three to five miles per hour on average, the Susquehanna is generally shallow and therefore is known as the longest commercially non-navigable river in North America.

2.4.1 Native Americans and European Settlement

The fertile floodplains and abundant resources of the Susquehanna River Valley have made the area a haven for human habitation for more than 10,000 years. Native Americans settled on the islands and along the banks of the Susquehanna using the river for food, water, and transportation by flat bottom boats or dugout canoes. The lower Susquehanna is brimming with archeological wonders, many of which are listed on the National Register for Historic Places, depicting the settlement patterns, burial sites, and culture of the Native Americans. European settlement began at the lower portions of the Susquehanna and extended northward as new resources were discovered and new settlements were established.

2.4.2 Agriculture

The floodplain of the Susquehanna River Valley has the richest, most productive farmland in the world. Lancaster, Lebanon, and York counties continue to yield a high percentage of the east coast’s produce, dairy, and poultry. Nearly one-fourth of Pennsylvania’s landscape is devoted to agricultural production such as dairy, poultry and eggs, cattle and calves, greenhouse and nursery products, hogs, mushrooms, and produce.
2.4.3 Forestry
The vast forests that once covered the Pennsylvania landscape were sought after materials for building new communities. The Susquehanna region was once known as the timber capital of the world, particularly the City of Williamsport. Logs, particularly white pine and hemlock, were floated down the West Branch towards the Chesapeake Bay to mills and factories. After the lumber boom of the late 1800’s, hardwood forests have returned, with 67 percent of the Susquehanna River watershed in forest cover, and nearly 60 percent of the Commonwealth forested. Lumber continues to be a sought-after raw material to supply the large manufacturing industry in the state.

2.4.4 Mines and Quarries
The ridges surrounding the Susquehanna River concealed other precious resources. Many valuable resources were mined from the Susquehanna landscape. Iron ore was a booming industry in the 1800s. Extracted from the ridges of the middle Susquehanna region, the demand was very high for iron during the times of the railroad, particularly during the Civil War. That industry is no longer prevalent in the Susquehanna Valley; however, local quarries continue to export lime and many types of stone and gravel from the area. Pennsylvania has one of the only Anthracite coal veins in the world, located near Wilkes-Barre, and other large bituminous coal deposits are found in the upper West Branch. The demand for coal declined in the early 1900s, but Pennsylvania remains the fourth largest producer of coal in the country.

2.4.5 Land Use Urban Areas
The resources surrounding the Susquehanna financed the growth and development of the cities and boroughs found along the river today. Larger urban areas, such as the cities of Williamsport, Wilkes-Barre, Sunbury, and Harrisburg exist, serving as regional hubs and urban accents to the numerous small towns and rural landscapes that characterize the river corridor. The Susquehanna Greenway study area contains nearly 250 municipalities.
2.5 Greenway Opportunities and Challenges

The following categories summarize overall opportunities and challenges for the Susquehanna Greenway. Region specific strengths, weaknesses, opportunities, and threats are listed in Appendix A.

2.5.1 Historical and Cultural Resources
The Susquehanna River Valley has been a home to people for centuries. Many artifacts remain from the Native American and early European settlers. Museums and exhibits across the state commemorate events that occurred in the Susquehanna River Valley. Rock art, or petroglyphs from the Native Americans, iron furnaces, viaducts, tunnels, bridges, the canals and railroads, and historic buildings all provide a glimpse into the history and culture of the river. This resource is invaluable for communicating the Susquehanna’s story.

2.5.2 Location and Access
Although some regions of the greenway are isolated and not easily accessible, the majority of the greenway is in close proximity to major highways, airports, and large population centers. The centrally located confluence of the North and West Branches, near the hub of Sunbury is also a transportation hub, where US Routes 11 and 15 and Interstate 80 are easily accessed for travel in any direction. Interstates 81, 83, 99, and 180, US routes 22, 220, and 322, and the Pennsylvania Turnpike also provide access to the Susquehanna Greenway. Air travel is easily accommodated by each network hub city. Therefore, the populations of New York, Philadelphia, Pittsburgh, and Baltimore/Washington, D.C. can easily be tapped for weekend trips to explore the Susquehanna.
2.5.3 Urban Areas and Amenities
Although the Susquehanna Valley has numerous small river towns, urban attractions and amenities such as lodging, dining, entertainment, and shopping are accessible from anywhere in the river corridor. These urban areas have the resources to host conferences and events and serve as a greenway gateway from which a trip or tour could be organized.

2.5.4 University and Health Care Institutions
There are also a variety of state and private colleges and universities throughout the region, which continuously exposes thousands of young people to the region each academic year. The region’s health care system, retirement communities, and rehabilitation centers provide another type of user who may benefit from the presence of the greenway for therapeutic healing and treatments.

2.5.5 Invasive Species and Bio-Diversity
Invasive plants, insects, and diseases have threatened common plant species of the Susquehanna River Valley. Invasive plants choke out native plants competing for soil, water, light, and space. Many species were introduced to the area, such as the Norway maple and white birch. Perennials, such as purple loosestrife and Japanese knotweed, are vigorous growers that out compete native grasses, sedges, and shrubs which wildlife depend on for food and shelter.

The woolly adelgid is an insect threatening Pennsylvania’s state tree - the eastern hemlock. This insect, related to the aphid, feeds on the branches of the hemlock causing the needles to drop in late summer and the branches to die back. Needle-less hemlocks are becoming a common site due to the “Hemlock Blight.” While species such as the eastern hemlock are threatened, other species, such as the American chestnut have been wiped out as a result of the Chestnut Blight. First reported in this country in 1904, the Chestnut Blight, an Asian fungus, killed all mature trees by 1950. Efforts to control the rapidly spreading invaders and reintroduce the hemlock and chestnut to the United States are currently underway.
2.5.6 Nutrient Pollution
Typically excess nutrients enter the river system in the form of nitrogen and phosphorus from farming fertilizers (farm runoff) and point-source sewage discharge. Altogether the Susquehanna is responsible for 21 percent of the phosphorus and 40 percent of the nitrogen found in the Chesapeake Bay. Once in the water, nitrogen and phosphorus contribute to excessive algal growth, which eventually consumes oxygen needed by fish and other wildlife. Thick algae can also block sunlight necessary for aquatic plants, needed by fish for food and shelter.

2.5.7 Sediment Pollution
Sedimentation is another major problem throughout the Susquehanna basin. Excessive run-off caused by streambank erosion, streambed scour, and development washes soil into streams and the river. Croplands also contribute to the sediment pollution of nearby waterways. When sediments enter the water, the sunlight is blocked and important spawning habitats may be destroyed.

Forests and riparian buffers are shown to reduce pollutants from entering streams and rivers. Plants trap nutrients in their root systems, stabilize soil to prevent streambank erosion, and filter toxins to lessen their impact on the watershed. There are several initiatives, such as the USDA’s Farm Service Agency, Conservation Reserve Enhancement Program (CREP) program, to encourage the planting of riparian buffers and other agricultural best management practices.

2.5.8 Toxins
Nearly 12,500 pounds of toxic metals flow through the Susquehanna each day, according to the Chesapeake Bay Management Study. Industrial and municipal wastewater treatment plants discharge toxins. Urban runoff from city streets along with farm pesticides and herbicides also contribute to the toxic mix. Toxins are linked to lowered reproduction and increased stress on the health of aquatic animals. This also impacts the food chain, as toxins enter fish tissue, posing a threat to the health of other animals and humans, who consume the fish. Toxins also may contaminate groundwater.

Acid mine drainage (AMD) is one of the most obvious water quality issues along the Susquehanna River.
Acid mine drainage (AMD) is one of the most obvious water quality issues along the Susquehanna River. AMD is particularly a problem in the lower North Branch and upper West Branch. In the affected sections of the river, there is a reddish-orange tint to the water due to the underlying rocks stained by decades of continued exposure to AMD. One study shows that 52,000,000 gallons of dissolved iron are discharged per day into the river. The Butler Mine Tunnel in Pittston is on the US Environmental Protection Agency’s National Priority List. Efforts are underway to develop man-made wetland filters to absorb the iron and to reclamation mine lands.

2.5.9 Barriers to River Access
Because of utility and transportation corridors that parallel the river, many barriers exist that prevent visual and physical access to the river. The remains of the canal system that parallel the river provide insight into the area’s past, as well as restrict access to the river. The railroad lines and roadways that are prevalent along both sides of the Susquehanna also prevent access to the river. Many of the Susquehanna’s boroughs have a physical disconnect from the river. Main streets that parallel the Susquehanna usually provide a backdoor to the water’s edge and public access points are not commonly found in downtown areas.

2.5.10 Dams
There are several dams on the Susquehanna River that serve recreational and industrial uses. Impoundments change the water levels of the river and increase flooding risks to up river communities along the Susquehanna’s banks. While the impounded areas provide a place for motorized recreation on the water, they create a barrier for anything traveling up or down river. For long distance water trips, boat portage is necessary. However, dams led to the total loss of migratory fish populations in the early 1900’s. The native shad species must migrate upriver to sustain their population. With the installation of fish passage mechanisms at the large hydroelectric dams on the lower Susquehanna River, shad populations are making a comeback, although migration continues to be limited.
2.5.11 Flooding
The Susquehanna River Valley has an extensive history of damaging floods. Over the past century, many cities and boroughs along the Susquehanna have built levee systems and flood walls to protect people and property. Although these flood protection measures have proven to be an overall success, the resulting structures create a barrier to river access. Levee systems present a physical and visual barrier to the Susquehanna, although the levee itself can be adapted for recreational use, such as in Kirby Park, across the river from the City of Wilkes-Barre. The trail system, built on top of the levee system, provides spectacular views to the Susquehanna River and to the City of Wilkes-Barre. Floodwalls also restricted physical and visual access to the river. However, new technology and creative design can provide functional flood protection, while improving access to the river and its recreational amenities. The City of Sunbury is currently developing a master plan to reconnect the city’s historic downtown and residential neighborhoods to the Susquehanna riverfront, through the use of engineered flood gates in the existing flood control wall.

2.6 Scenic Assessment
The Susquehanna River meanders through a dynamic visual landscape of ridges and valleys, cities, towns, farmland, and forests. A scenic assessment of the river corridor was completed to characterize the visual character and scenic qualities of the river corridor and to provide baseline information to conserve and protect the visual landscape of the river.

The scenic assessment characterized the river corridor by delineating over twenty landscape types, such as forested hillside, rolling agriculture, urban, town, and suburban landscapes. These landscape types were then rated for their scenic quality, sensitivity to change, and visual absorption. The scenic assessment was produced through extensive field work and photo documentation. The results of the scenic assessment field work were digitized by the SEDA-COG GIS department, creating a unique GIS data set. The scenic assessment resulted in identifying highly scenic areas, a visual characterization of the river landscape, and identification of threatened areas where visual protections are needed. See the map on the following page for an example of scenic assessment mapping.
Scenic Assessment Mapping Example
2.7 The Greenway Vision

The Susquehanna Greenway Partnership captures the inspiration and values of the Susquehanna Greenway through the following vision:

The Susquehanna Greenway is a place and a journey that connects people and communities to the Susquehanna River and to its enduring story. The Greenway unveils the spirit of the River - renewing awareness of its distinctive scenery and its natural and cultural heritage. It is a destination shaped by diverse people and the pursuit of their dreams.

The Susquehanna Greenway balances the needs of generations today and tomorrow; conserves the environment for all living things; and creates healthy and successful communities, wide-ranging recreation, and economic prosperity. The Greenway celebrates the Susquehanna River as a place of timeless value, shared memories and experiences - a place to use and enjoy, and to treasure always.

2.8 Greenway Concept Design

The Greenway Vision is expressed upon the river landscape through the creation of the Susquehanna Greenway concept design. Using the “Hubs and Spokes” model (shown on the following page) from the State Greenway Action Plan, a unique design language, legend and plan graphics were developed for the Susquehanna Greenway.

An inventory of greenway components was completed with the assistance of GIS mapping data, reviews of existing plans and studies, RAC meetings, and a series of greenway design workshops (see Appendix B). A green space framework was developed by mapping the following elements: scenic views, significant ridges, steep slopes, state forests and game lands, preserved farmland, river accesses, historic sites and districts, and “special places.” Local input during meetings and community design workshops guided concept development, envisioning a network of trails and natural areas linking destinations along the river corridor.

Existing, planned, and conceptual greenway elements are listed in the project matrix and geographically depicted on greenway concept design maps. The Susquehanna Greenway Concept Design, depicted on 21 separate panel maps (see the panel example on facing page), graphically illustrate and communicate the long-term potential for the greenway to establish a network of trails and open space (see appendix). The Susquehanna Greenway Concept Design was converted to GIS data for use by counties and to support regional and local greenway planning initiatives.
2.8.1 Hubs (Greenway Places and Destinations)

- **Network Hub** - A primary origination and destination point. The Cities of Harrisburg, Wilkes-Barre, Williamsport and Sunbury are considered Network Hubs.

- **Journey Point** - Smaller than a Network Hub, but still a major origination or destination point. These are the river towns of the river corridor, such as Lock Haven, Towanda, Lewisburg, Bloomsburg, Duncannon and Columbia.

- **Way Point** - A “stand-alone” location such as a school, a park, an historic site, or natural area. Way Points can be sub-categorized as themes such as community, preservation, recreation, historic, or re-development.

- **Satellite Hub** - A significant destination point, outside the established greenway study area, that may attract greenway visitors.

- **River Access** - Areas that provide safe and convenient access to the Susquehanna River.

- **Portal** - A major gateway, typically associated with a regional highway transportation link into the greenway study area. A portal may contain wayfinding signage, visitor information, rest area, and educational functions.

2.8.2 Spokes (Greenway Journeys and Connections)

- **Network Corridor** - seeks to describe the greenway study area by moving beyond an arbitrary one mile corridor. The Network Corridor seeks to define the Susquehanna River landscape.

- **Major Corridor** - Regionally significant greenway corridor that is inter-county in its scale, connecting major hubs.

- **Minor Corridor** - Inter-Municipal in scale, three or more miles, linking waypoints and access points to hubs and journey points.

- **Spur** - small scale greenway connection, generally less than three miles or contained within a single municipality. A spur may link remotely located hubs that are not close to the larger corridors.

- **Link** - A connecting pathway within a corridor. May be a single-function trail for biking, an interpretive trail, or a wildlife corridor.