Master Site Plans for Three Public Parks

BROWN-BRADENBAUGH PARK | SEAL PARK | MARKET SQUARE/VETERANS PARK

Prepared By:

JMT

Millersburg Borough
Dauphin County
Pennsylvania
OCTOBER 2018

MILLERSBURG PENNSYLVANIA FOUNDED 1807

Acknowledgements

The following individuals foresight, perseverance, and continued interest in the project during the planning process were vital in shaping the park master plan.

Study Committee

Brent Boyer	Millersburg Borough Council
Chris Dietz	Millersburg Borough Council
Dana Bellis	Millersburg Borough Planning Commission
John Orr	Upper Paxton Township Supervisor
Joanne Smyre	Millersburg Area Working Together
Maynard Kratzer	VFW Post #5507
Scott Roadcap	Millersburg Area School Board
Hanna Carns	Millersburg High School student, ex-officio
Chris McGann	Millersburg High School student, ex-officio

Funding for this Master Plan Provided By:

This Project was financed in part by a grant from the Community Conservation Partnership Program, Keystone Recreation, Park and Conservation Fund, under the administration of the Department of Conservation and Natural Resources, (DCNR), Bureau of Recreation and Conservation, and Millersburg Borough.
DCNR Grant Agreement No. BRC-TAG-22-14.

Master Planning / Landscape Architecture / Engineering Services:

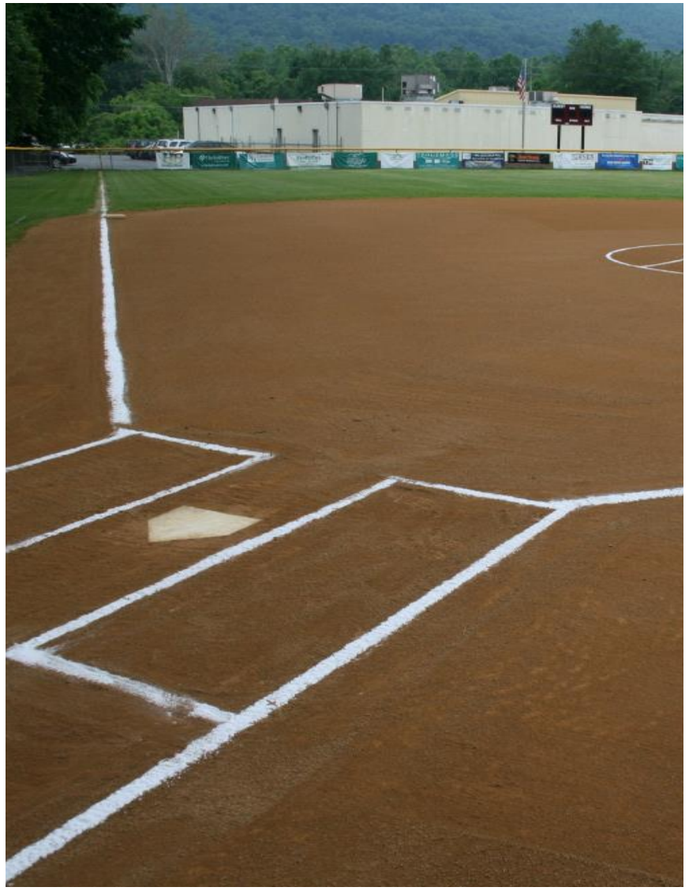
Johnson, Mirmiran & Thompson, Inc.
220 St. Charles Way, Suite 200
York, Pennsylvania 17402

In Association with:

Toole Recreation Planning
6081 Honey Hollow Road
Doylestown, PA 18902

Table of Contents

CHAPTER 1



PLANNING THE PARKS

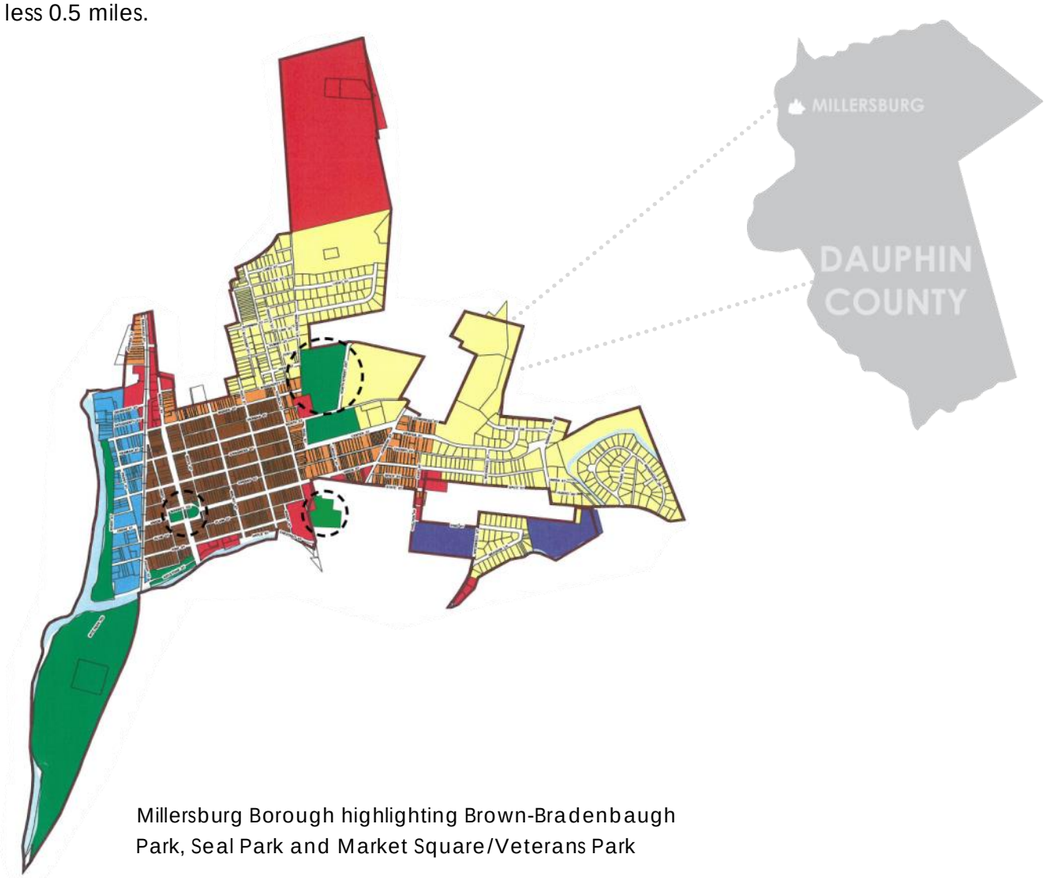
Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

INTRODUCTION

Millersburg Borough is presented with a unique opportunity to strategically plan for the future redevelopment and reinvestment of three of its most prized resources in Brown-Bradenbaugh Park, Seal Park, and Market Square/Veterans Park. Recent improvements to Riverfront Park has highlighted the importance and significance of the parks as community resources within the Borough. The Master Site Plans for each park will formalize a vision for the system as a whole and create a blueprint for future redevelopment and conservation.

Master Plan Locations/Regional Context

The Map below shows the parks' locations in the Borough. Millersburg is situated along the Susquehanna River and is at the confluence of several larger recreational initiatives including the Susquehanna River Water Trail – Middle Section, Lykens Valley Rail Trail the Susquehanna Greenway, the Wiconisco Creek Recreation and Natural Area, and the Ned Smith Center for Nature and Art. The five existing Borough parks are located within walking distance of the downtown, and the distance between each of the three parks being studied in this master plan is less 0.5 miles.



Millersburg Borough highlighting Brown-Bradenbaugh Park, Seal Park and Market Square/Veterans Park

Brown-Bradenbaugh Park

Brown-Bradenbaugh Park is approximately two acres and contains a community girls softball field and bird sanctuary/natural area with a tributary to the Wiconisco Creek. The park includes dugouts, batting cage, restrooms and a concession stand. There is also a small storage structure for softball equipment. It is important the bird sanctuary be maintained due to a deed restriction and the wishes of the donor. The parcel was donated to the Borough in the 1990s. At that time, Seal Glove/Ark Safety purchased a small section of Seal Park (about 1/4 acre). Due to the restrictions of Project 70/DCA, the sale could not go through without adding at least the same area to the park system. The donation of the "bird sanctuary" parcel fulfilled the requirement.

Seal Park

Seal Park is approximately 9.5 acres and functions as a community park. The park is adjacent to the Millersburg Area Middle/High School and the Millersburg Swimming Pool. Seal Park is the focal point for active recreation for young children. The park contains a playground with relatively new equipment, two picnic pavilions, a

restroom structure, little league field with dugouts and field lighting, old tennis courts and passive open space with a small tributary creek (Tanners Run) bisecting the Park.

Market Square/Veterans Park

Market Square/Veterans Park functions as the town center for the Borough. While this area is less than one acre, it acts as a site for many community events, including the annual Cherry Blossom Festival, Christmas Tree lighting ceremony, a regional bicycle race, and several parades throughout the year. Market Square contains a Gazebo that is a historic town landmark, a Bicentennial time capsule, a Girl Scouts free "Little Library," brick walkways and benches. Veterans Park contains the town Christmas Tree and several memorials, including Veterans of All Wars Memorial, Flagpole to honor World War 1 Veterans, Civil War Memorial, Governors Island Cannon Memorial, Centennial/ Founders Memorial Fountain, Swinging Bridge Memory Walk, brick walkways and benches.

Study Purpose

The intent of this study is to explore options that will provide opportunities to enhance recreation in Millersburg Borough by focusing on the three existing parks. The process of developing the Master Plan considered each site's character and amenities, location and connections, adjacent land uses, local community and neighborhood recreational needs and goals, as well as information on current recreation and leisure trends. The Master Plans will outline site-specific data and design concepts as "blueprints" that will guide future improvements of Brown-Bradenbaugh Park, Seal Park, and Market Square/Veterans Park. The planning process will focus on understanding the existing parks and their function in Millersburg Borough, and outline recreation and conservation initiatives to meet the needs and desires of the community. Recommendations and conclusions of the planning process will provide insight into strategies and objectives that will meet the community needs and desires for recreation, universal access, and revitalization of public amenities.

PLANNING PROCESS

Master Planning Process

The planning process for the three park Master Site Plans was designed to create a vision for the parks that harnesses the opportunities of each site while respecting inherent site specific limitations. This process included five parts:

1. Inventory and Assessment
2. Public Participation
3. Development of conceptual alternative designs
4. Final Master Plans
5. Operations and Management Plan

Public Participation Schedule

August 17, 2017	JMT Team	Study Committee Kickoff Meeting #1 -Planning Roles and Process -Park Site Locations -Park Goals and Objectives
October 5, 2017	JMT Team	Student Focus Group (Grade 6th-8th) -Site Review and Context -Gather Student Feedback -Poll Everywhere / Real Time Visioning Key Person Interviews
November 14, 2017	JMT Team	Study Committee Meeting #2 -Site Analysis and Conclusions -Site Context -Key Recommendations
February 3, 2018	JMT Team	Public Meeting #1 -Site Overview -Site Recommendations

-Student Focus Group Results

-Gather Public Feedback

-Key Recommendations

Public Meeting Agenda

10:05 - 10:30 Presentation: Project Background and Overview of Workshop

10:30 - 11:00 Group SWOT Analysis for each park site

11:00 - 11:15 SWOT report summary

11:15 - 11:30 Roundtable Discussion/Rating of Market Square/Veterans Park

11:30 - 11:45 Market Square/Veterans Park Goals Review

11:45 - 12:00 Market Square/Veterans Park improvements report summary

12:00 - 12:30 Lunch

Poll Everywhere - Image Preference Survey

(Market Square/Veterans Park) Park Elements

12:30 - 1:15 Design Team Initial Thoughts

Summary and Concept Diagram Development

1:15 - 1:30 Wrap Up/Next Steps

April 5, 2018	JMT Team	Study Committee Meeting #3 -Review Park Design Concepts -Discuss Alternatives -Pre-Final Design
May 5, 2018	JMT Team	Public Meeting #2 (Cherry Blossom Festival) -Display Park Design Concepts for Public Review and Comment
September 25, 2018	JMT Team	Study Committee Meeting #4 -Present Final Recommendations -Present Operations and Maintenance Plan

COMMUNITY PROFILE

Millersburg Borough is about 3/4 of a square mile, containing approximately 487 acres of largely residential and commercial land use. Millersburg Borough is bordered by the Susquehanna River on the west and Upper Paxton Township to the north, east, and south.

The following demographics were compiled from 2010 US Census data for Millersburg Borough unless otherwise noted.

Population Statistics

2010 Population: 2,557

Children and Youth (0 – 14 years) – 17.4 percent of the total population

Youth and Adults (15 – 24 years) – 12.4 percent

Adults (25 – 34 years) – 13.7 percent

Adults (35 – 44 years) – 12.3 percent

Adults (45 – 54 years) – 13.4 percent

Adults (55 – 64 years) – 9.7 percent

Adults (65 years and over) – 21.1 percent

Gender

Female 52.4 percent and Male 47.6 percent.

Race / Ethnicity

The racial makeup of the Borough is now 97.6% White, 1.2% African American, 0.1% Native American, 0.2% Asian, 0.0% Pacific Islander, 0.1% from other races, and 0.8% from two or more races. Hispanic or Latino of any race was 1.2% of the population.

Median Age

40.4 years; slightly older than Dauphin County's median age of 39.4 years.

Households and Housing

Households with children under age 18: 651 or 54.6% of the total 1,193 households

Persons per Household: 2.14

Occupied Housing Units: 87.7 percent

Total Housing Units: 1,361

Socio-Economic Characteristics

Source: 2011-2015 American Community Survey 5-Year Estimates

Median Household Income: $39,420, about 71% of that of Dauphin County

In Poverty: 9.9 percent

PREVIOUS PLANNING INITIATIVES

Previous planning studies including the Dauphin County Comprehensive Plan dated July 12, 2017, the 2009 Dauphin County Parks, Recreation, Open Space and Greenways Study, and the 2009 Millersburg Open Space and Recreation Plan were reviewed and the following key recommendations were identified and considered as part of the planning process.

Summary

- Provide appropriate parks & recreation facilities and services that are readily accessible to all residents.
- The downtowns of smaller boroughs and townships should be maintained and promoted as local economic centers and/or reinvented to meet current business opportunities;
- Strengthen and enhance the relationships between businesses and local municipalities;
- Prioritize general economic development efforts for:
    1) retaining businesses;
    2) expanding businesses;
    3) starting new businesses;
    4) redeveloping sites; and
    5) attracting businesses.
- Provide connectivity between parks and to other trail and greenway initiatives within the region.
- The Borough parks are scattered. A walking route needs to be created to connect the parks, providing an additional pedestrian experience and providing visitors with access to a wider variety of recreational opportunities.
- Community survey identified the top three recreational programming needs as special events, youth sports, and programming for seniors.
- Ensure the provision, protection and maintenance of a coordinated, efficient and accessible system of public and private recreational parks and facilities which shall meet the needs of current and future residents and tourists.
- Develop a plan for eco-tourism and civic-tourism to draw tourists to the area for natural resource based tourism.
- Provide safe pedestrian and bicycle access from residential areas to recreational, commercial and industrial areas.
- Improve existing parks:
    a) Prepare and maintain a Master Plan for each park.
    b) Repair and maintain existing equipment.
    c) Remove or replace unsafe equipment.
- Have a comprehensive Swimming Pool Feasibility Study prepared by a professional for Millersburg Area Pool.

DATA COLLECTION / BASE MAPPING

Base-mapping data was compiled from the best available information.

The project base mapping was developed from a variety of resources as follows:

1. Deed information was provided by the Borough.
2. ArcGIS LiDAR and site data was compiled.
3. Web Soil Survey Information of Dauphin County, Pennsylvania was collected by utilizing the U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Penn State University College of Agriculture and Experiment Station, Issued August 1981.
4. This information was overlaid on orthographic aerial photography of the area to depict each site's surroundings.
5. The base mapping data was then field verified and supplemented with information gathered by the design team from several site visits over the course of the master planning process.

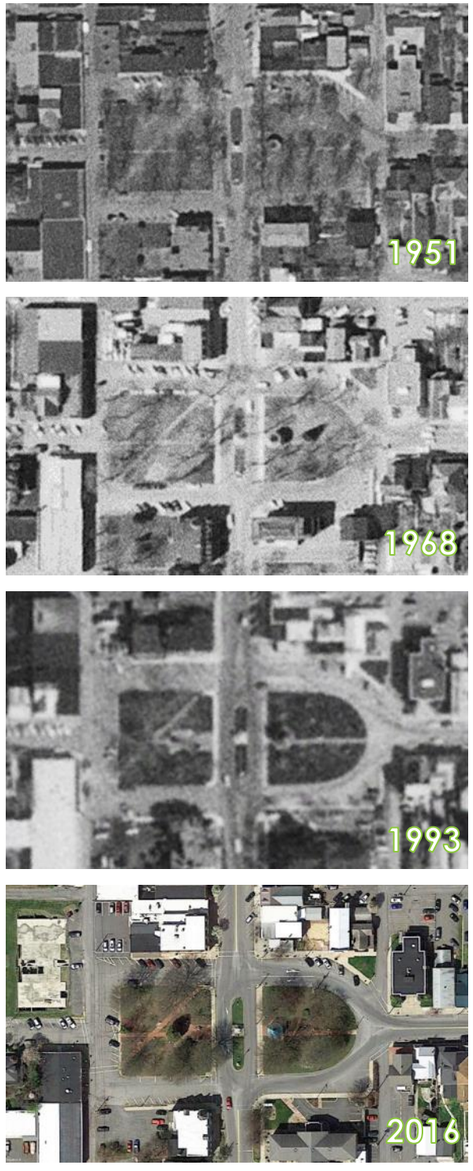
Historical Imagery

Brown-Bradenbaugh Park

The park serves as dedicated land that preserves wooded areas designated as a bird sanctuary and softball field that is now surrounded by commercial and residential development.

Seal Park

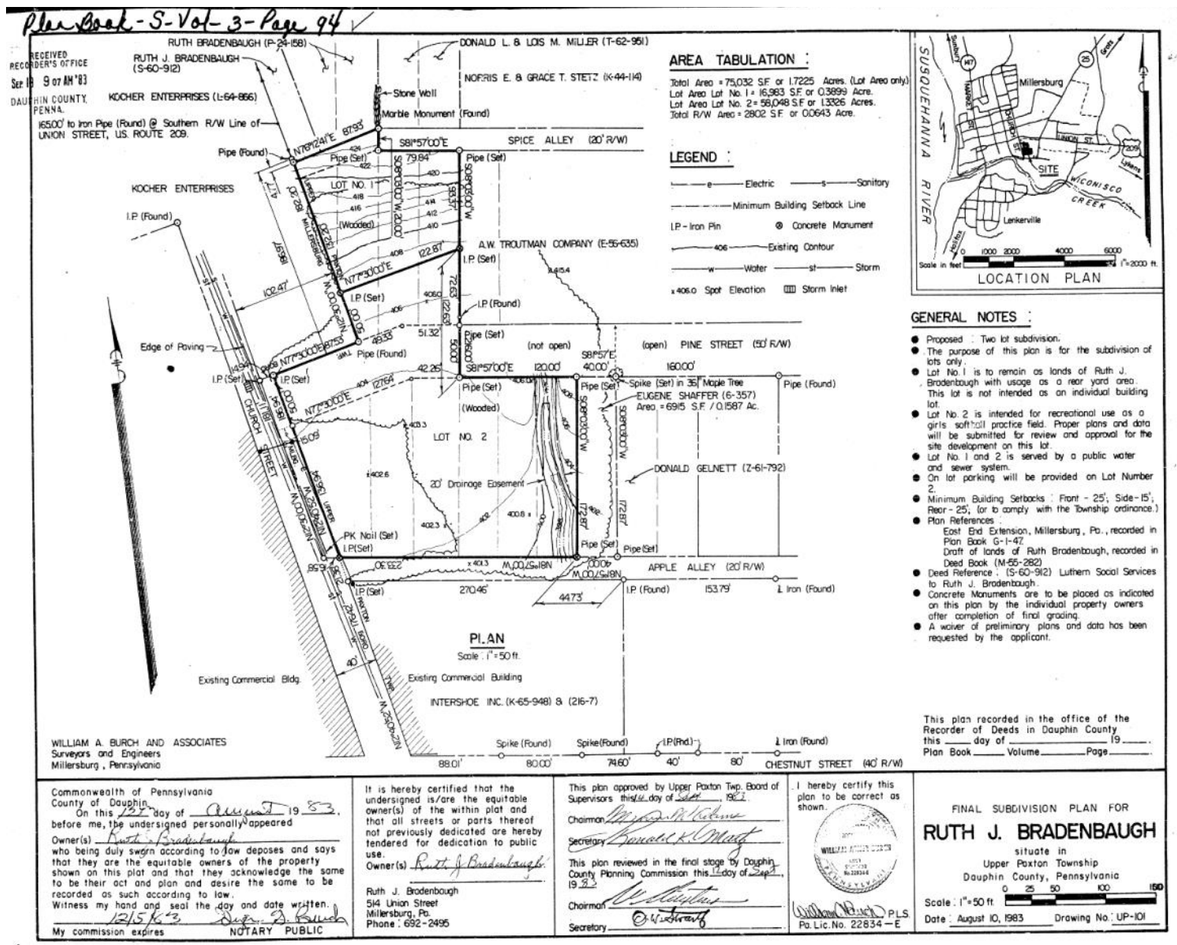
Built in 1970's and dedicated to William Seal and his family, this park has become a hub for active recreation and is surrounded by a neighborhood to the west, public pool and baseball field to the south, and Middle School to the east.

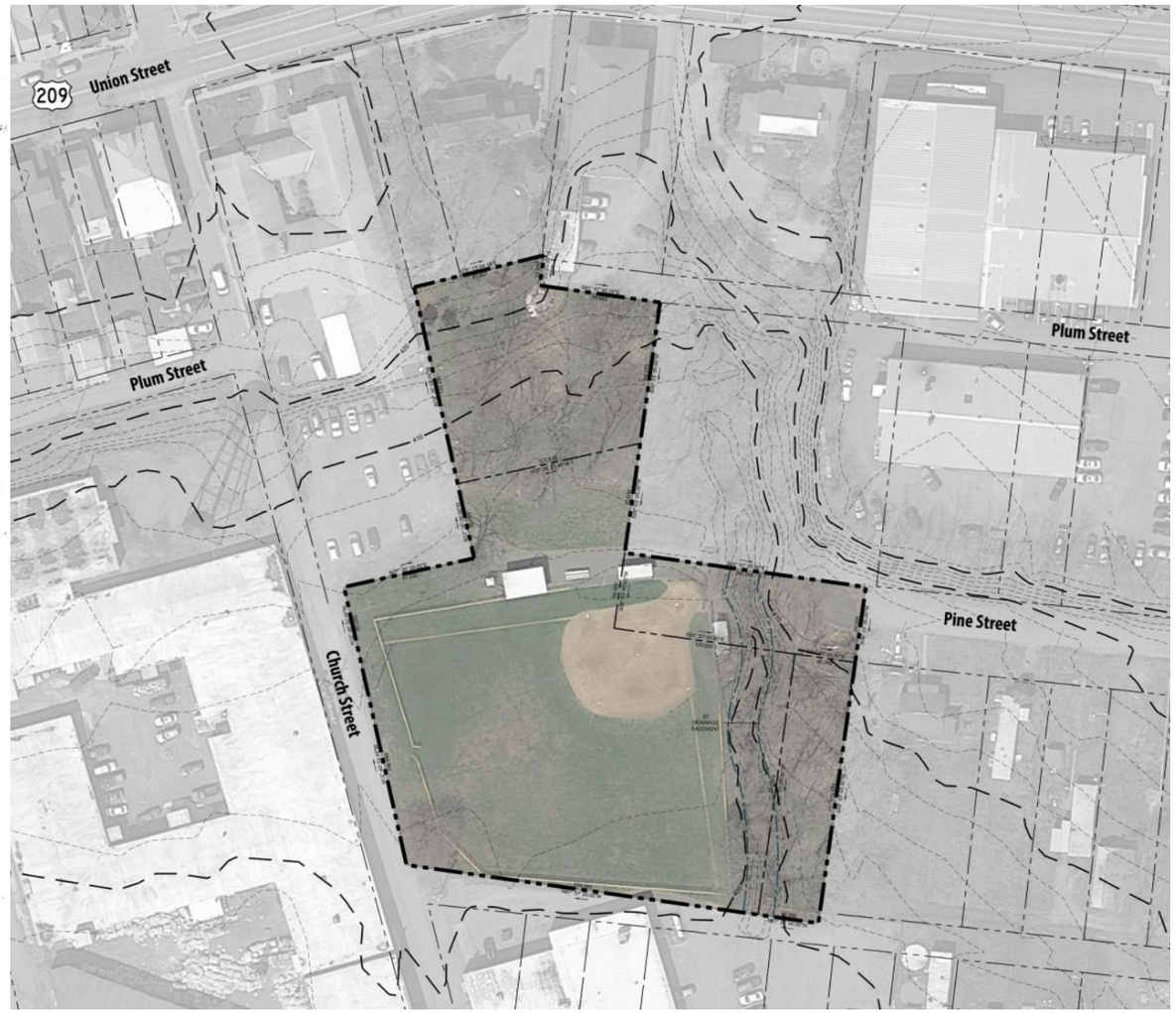


Market Square/Veterans Park

The park is located in the downtown business core and functions as center for town square events with many dedicated and donated iconic features dating back to the late 1800's and early 1900's to today.

Existing Base Map





Brown-Bradenbaugh Park Deed Restrictions

The designated uses of this somewhat overlooked Borough park are softball field, supporting amenities, and bird sanctuary.

"BEING Lot No. 1 on a subdivision plan prepared by William A. Burch and Associates for Ruth J. Bradenbaugh with said subdivision plan being dated August 10. 1983 and recorded in the Recorder of Deeds Office of Dauphin County in Plan Book "S", Vol. 3, Page 94. Said Lot No. 1 contains 16,983 square feet or 0.389 acres of ground.

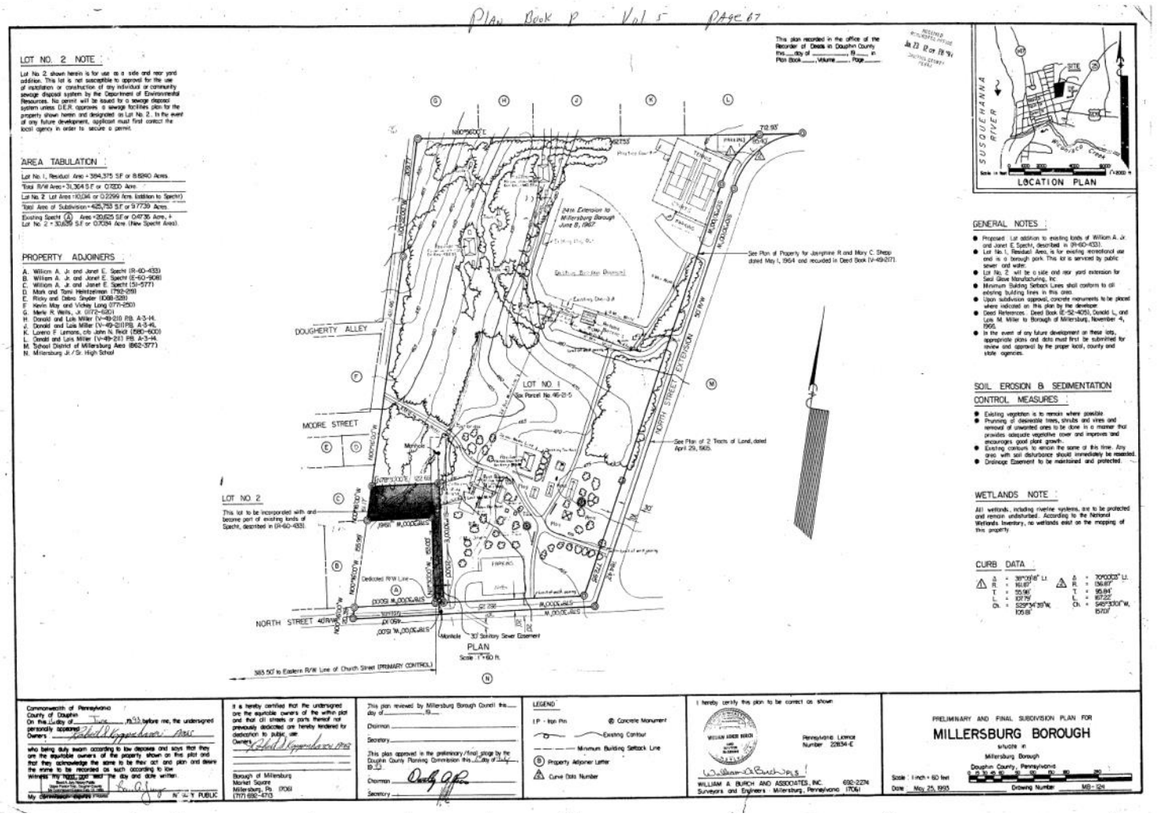
BEING part of the same premises with Lutheran Social Services by a Deed recorded in the Recorder of Deeds Office of Dauphin County in Deed Book "S", Vol. 60, Page 912, granted and conveyed unto Ruth J. Bradenbaugh, the GRANTOR herein.

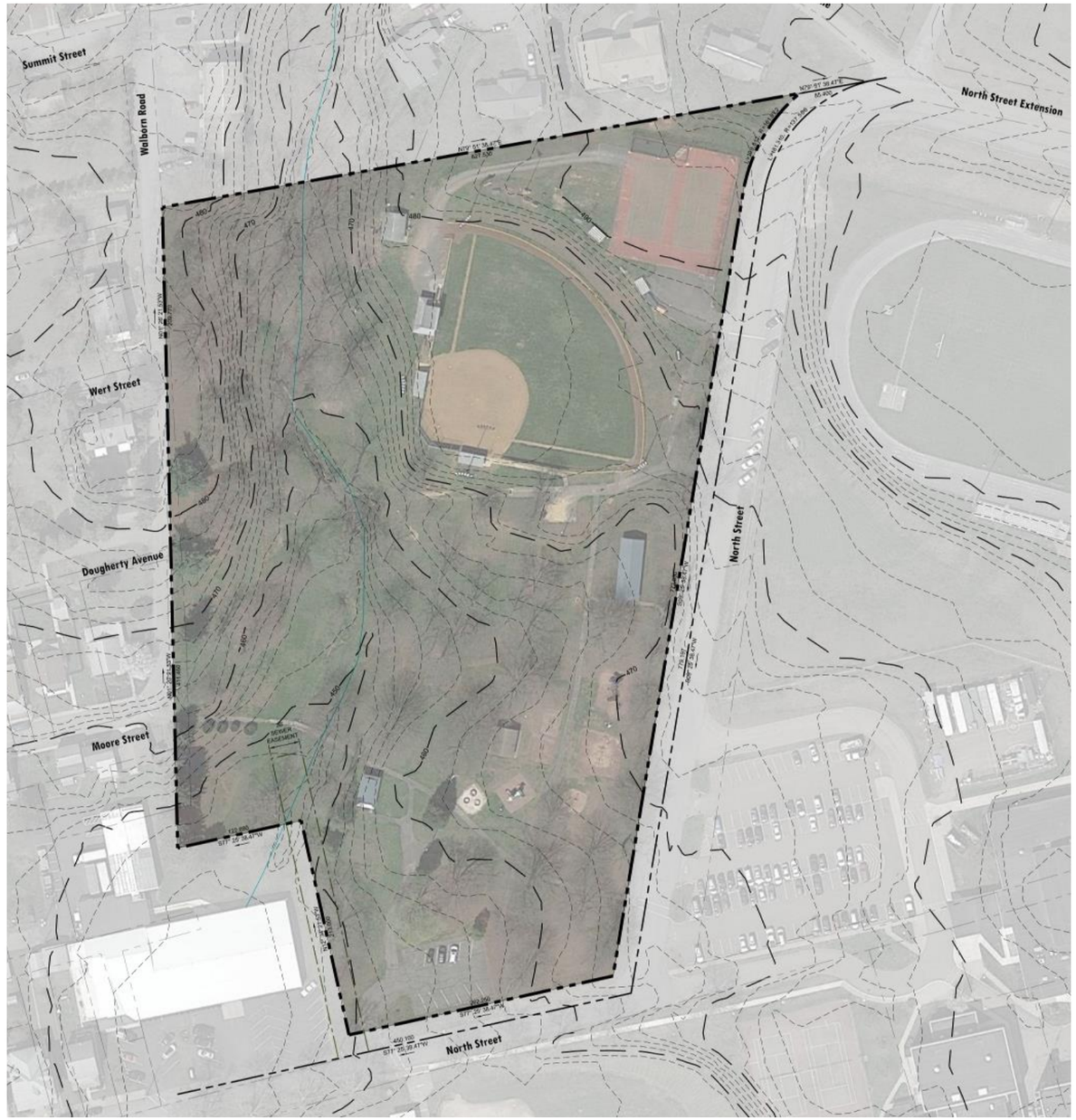
THIS CONVEYANCE IS SUBJECT to the following restrictions:

1. The aforesaid property will be designated by Millersburg Borough as a Borough Park and Bird Sanctuary.
2. That Millersburg Borough will not allow any buildings to be constructed on Lot No. 1 except as may be necessary to further interest of the previous two restrictions, that being a Borough Park and/or Bird Sanctuary.

TOGETHER with all and singular the buildings and improvements, ways, waters, water-courses, rights, liberties, privileges, hereditaments and appurtenances whatsoever thereunto belonging or in anywise appertaining, and the reversions and remainders, rents, issues, and profits thereof; and all the estate, right, title, interest, property, claim and demand whatsoever of the said party of the first part, in law, equity or otherwise, howsoever, in and to the same and every part thereof."

Existing Base Map

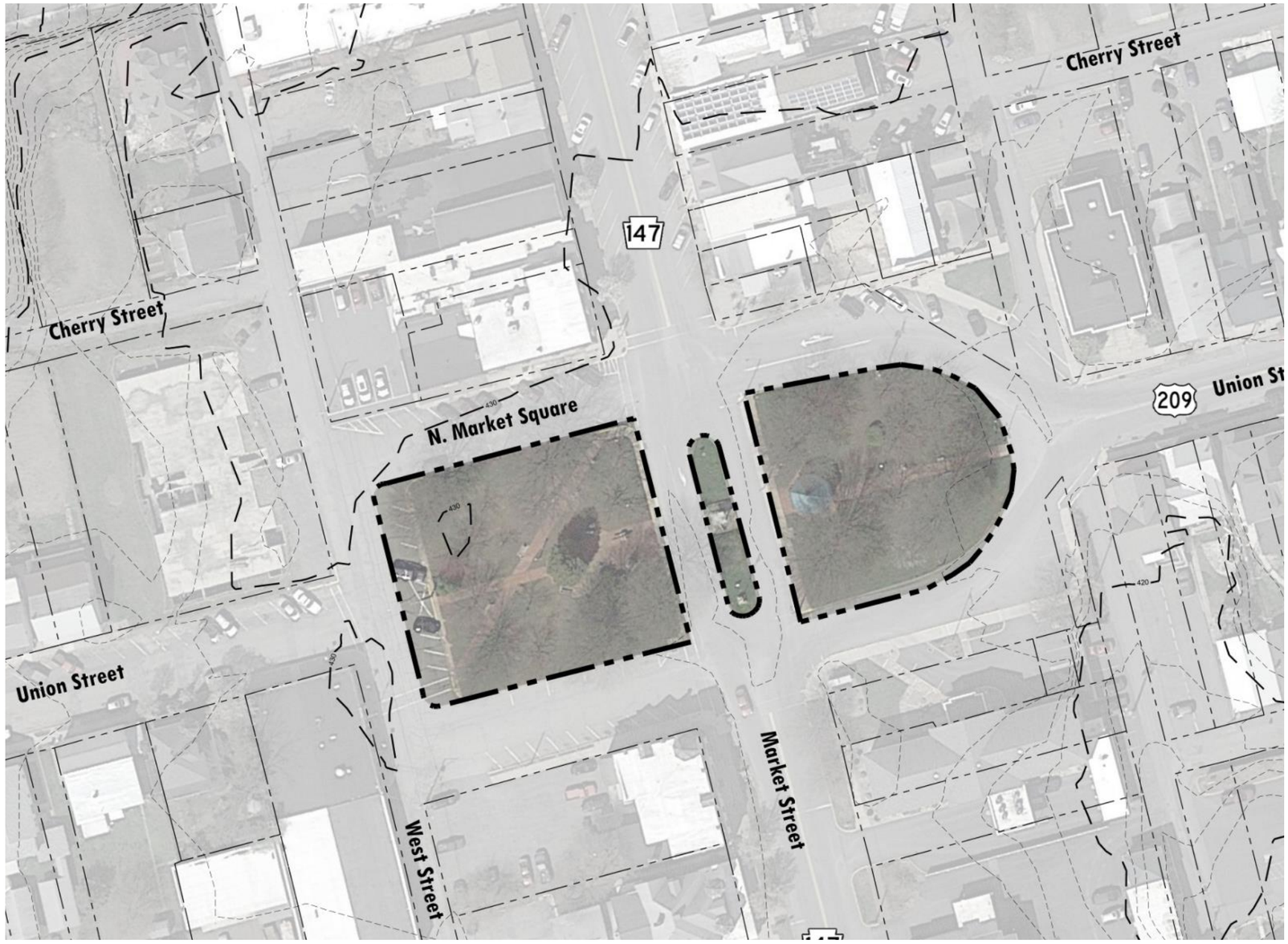




Seal Park Map

Dated May 1993, Seal Park serves as the Borough's second largest park containing mainly active recreation facilities and is situated adjacent to the Millersburg Area Middle School and Johnson Memorial Library.

Existing Site Base Map

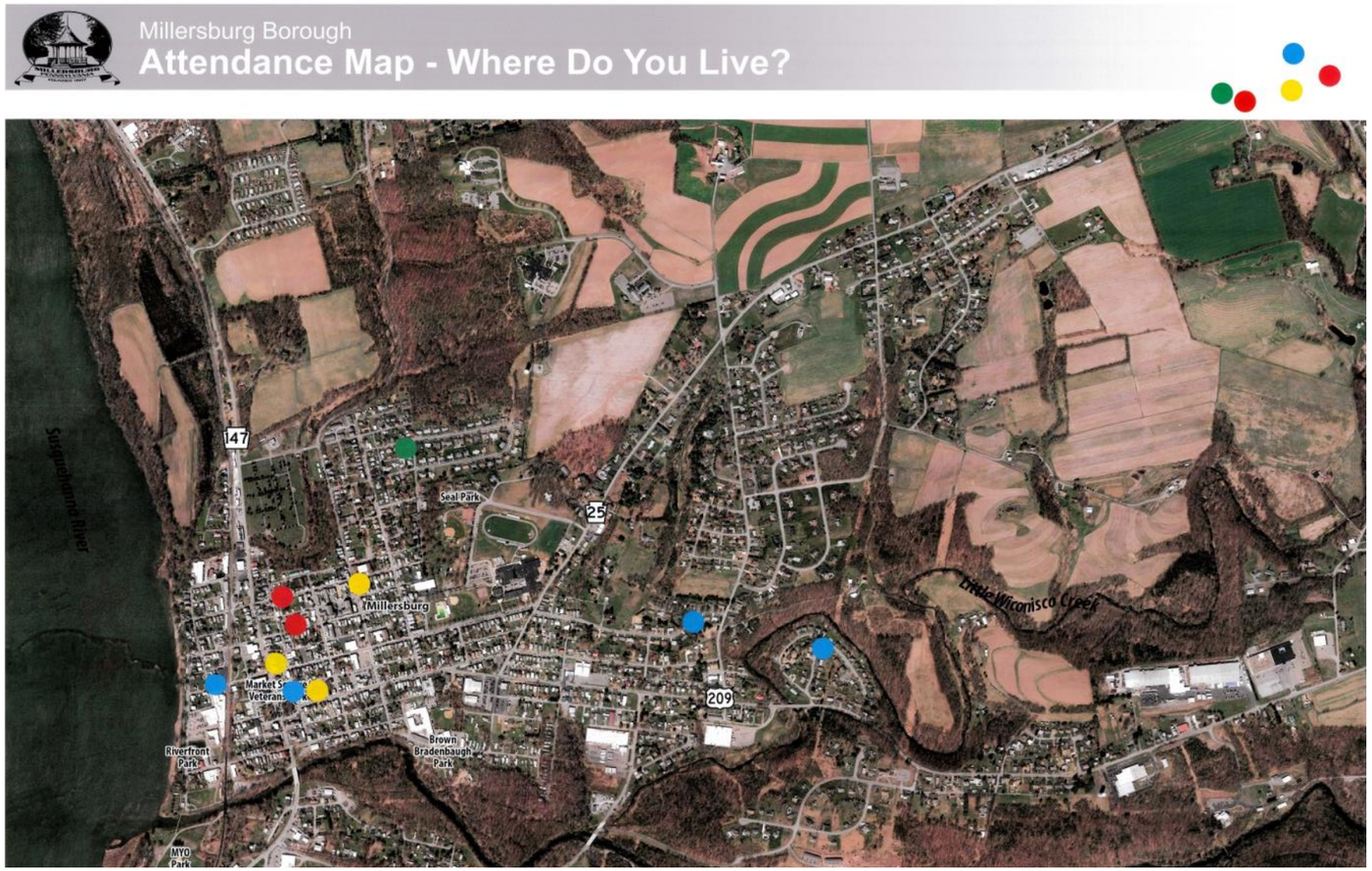


Market Square/Veterans Park

Situated along the main thoroughfare through the core of the business district, the park contains iconic amenities including a music pavilion/gazebo, memorials, and a cherry tree grove lining the perimeter of each park area. The park is recognized as the town center for community events, celebration, appreciation local history, and area of public interest. The combined park area is less than one acre with Veterans Park situated to the west and Market Square situated to the east. The parks are framed by the surrounding roads with Market Street Route 147 dividing the two areas with South Market Square at the southern edge, North Market Square at the northern edge, and West Street to the west of Veterans Park.

This page intentionally left blank.

CHAPTER 2



PUBLIC PARTICIPATION

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

PUBLIC PROCESS

A public participation process was undertaken to gain input from residents regarding development of the parks. Public participation included working with a Project Study Committee (PSC), student focus groups, key person interviews, and public meetings. The process emphasized citizen input to develop relevant Master Plans and strategies that target the existing and future recreation and open space needs of Millersburg Borough.

The public process included the following feedback and data collection exercises during the public meeting:

- Group S.W.O.T. Analysis for each park site (Strengths, Weaknesses, Opportunities, Threats)
- Visual Preference Survey (VPS)
- Roundtable Discussion Rating of Market Square/Veterans Park
- Poll Everywhere Real-Time Visioning Questions and Public Responses
- Concept Site Map Diagram Development

Public Participation

Public participation was a major component in shaping the Park Master Plans. Public participation was important because:

- Neighbors of the parks, borough residents, municipal representatives, user groups, and community leaders have a local understanding and valuable information to contribute to the development of the park Master Plan.
- It provides a forum in which concerns and ideas can be identified, outlined, and addressed.
- It allows for the public education and awareness of the park resources and intrinsic benefits.
- Stewardship and trust are established through community interaction and involvement in the planning process.

The process generated information on specific interests and concerns regarding development of the park, public feedback regarding current and future recreational needs, core values of the community, plan alternatives, and strategies for implementation of phasing alternatives to allow for future growth and change.

Park Study Committee (PSC)

A PSC guided the master planning process and worked with the design team in developing the Master Plans. The PSC met five times during the planning process. The first PSC meeting occurred on August 17, 2017 and was conducted to explore the goals and recommendations for the parks. The group explored current uses, opportunities, types of facilities, concerns, and issues

Summary Comments from Key Person Interviews

- The playground surfacing needs to be routinely maintained.
- Vandalism and security are concerns at Seal Park.
- The square has the potential to be a true "New England" style village green.
- Since the pavilion was removed from the remote area of the park, vandalism has declined, but is still a problem.
- Tanners Run has silted in over the years and should be addressed.
- The entrance to the underground storm water conveyance structure should be secured.
- The Pool Association is a separate entity that receives some funding and support from the Borough and the Township. They are currently undergoing a fundraising effort to renovate the baby pool area. Parking is an issue for the pool.
- The sandbox at Seal Park needs to be removed.
- Traffic is a major concern in and around Market Square/Veterans Park. Could a roundabout work?
- The Cherry Blossom Festival and the Christmas Tree Lighting Ceremony are the two major community events that are held at Market Square/Veterans Park. The park is also used as a staging area for smaller events such the Memorial Day Services, and the Halloween Window Painting contest sponsored by the VFW.
- The safety of pedestrians during events are a primary concern. Market Street is only closed for four events, Tour De Millersburg, Memorial and Halloween Day Parades, and the Cherry Blossom Festival.
- Brown-Bradenbaugh Park is located in Upper Paxton Township, but deeded to the Borough. The park is in need of a new backstop, restrooms, parking agreements, and an announcers booth.
- Seal and MYO Parks are used most by the area daycares. They offer shade, play equipment, shelter, and restrooms. The proximity of Seal Park to the library is also a major advantage for using this park more than the others.
- There needs to be a memorial to honor all veterans.
- The School District utilizes the Wiconisco Creek County Park for Softball games and practices which is approximately three miles from the campus. They currently pay $15.00 to reserve the fields on game days. Lining of the fields is done by school staff. They do not reserve the fields for practices, since there are two fields there they take their chances that at least one field will be open. There are no additional bus fees since the park is part of a regular bus route.
- Develop spaces for people to gather, a reason to come downtown and support economic development.
- Need a kiosk to let people know what business are downtown.

“The only thing nice there is the Civil War Statue.”

“A lot of people forget about Brown-**Bradenbaugh Park.”**

“Its just a ballfield what else is there to do there.”

“Towns like this, well let’s just say they are slow to change.”

“The Square needs to be renovated for group gatherings but still be a quiet reflective spot where you can just sit and enjoy the sounds of town.”

“All parks need to be better maintained, visual appearance means everything.”

“The lighting in the square is inadequate.”

“Programs and activities should compliment those at the Ned Smith Center and not **compete.”**

“The square is not a park. There is nothing to do there.”

relating to the parks. Subsequent meetings were held to discuss site opportunities / limitations and constraints, programming, compiled public feedback, design alternatives and the final plan alternatives. Input provided regarding present and potential conditions of the parks was summarized in the project meeting minutes.

Key Person Interviews

The consulting team conducted a series of key person interviews to obtain input regarding the character of the parks. Information was gathered regarding historical and current information about the properties, potential park uses and facilities, recreation trends, and immediate and long-term needs for specific and general recreation opportunities in the area. Key person interviews included members of the community who have an interest and/or insight into the recreation needs of the area or particular interest regarding the park as defined by the PSC. Interviews included:

- Millersburg Area Working Together (MAWT)
- VFW Post #5507
- American Legion Post #326
- Local Business in the Community
- Millersburg Area Girls Youth Softball Association
- Upper Dauphin Sentinel
- Little League
- Millersburg Pool Association
- Ark Safety
- All About Kids Day Care
- Jelly Bean Junction
- Tender Times Child Care Center
- Millersburg School District AD
- DCNR Representatives
- Twin Valley Players

Major Findings from Key Person Interviews:

1. The existing restrooms at Seal Park must be upgraded.
2. People adore the iconic bench swings and want them in all parks.
3. Certain facilities are maintained at high level, but in general the overall parks need better maintenance.
4. Opportunities to redevelop Market Square/Veterans Park can serve as an economic driver for the downtown.
5. Concerns about flooding are associated with Tanners Run due to potential upstream developments. Runoff upstream must be addressed.

6. The spirit of volunteerism is low in the community.
7. The large Christmas tree has been removed.
8. Other than year end picnics at Seal and MYO parks, the parks see very little use by the School District.
9. A major theme that emerged from the key person interviews was how to generate economic activity. Redevelopment, reinvesting and re-programming of the parks can serve as an economic generator.
10. Stormwater management will be a severe limitation to redevelopment efforts at each park site.
11. Shared use agreements should be addressed and formalized for parking at Brown–Bradenbaugh Park.
12. Market Square/Veterans Park is overgrown and isolated and not considered a park by some residents.
13. The monuments, canon, and statue are considered sacred items for Veterans Park.
14. There are opportunities to engage the School District as a partner in recreation and education within the parks.
15. Plan Regionally ACT LOCALLY.
16. There is strong sense of ownership for certain facilities within certain parks. Yearly rental fees are usually waived and groups such as little league and girls softball maintain the fields.
17. There really is not strong entity to promote business in the urban core.

Public Workshop Meeting #1

The purpose of the meeting was to provide the public with an opportunity to provide input into the design and renovations being considered at each of the three Borough parks.

The design team and the public engaged in a serious of small group discussions to further clarify and provide focus related to the proposed improvements, critical issues facing the parks, and potential park elements. A brainstorming/discussion session was conducted to explore site specific park planning opportunities and constraints for each park via a SWOT analysis for each of the parks followed by a group discussion and rating of Market Square/Veterans Park, a prioritization of the goals for renovations and improvements to Market Square/Veterans Park, and finally an image preference survey for Market Square/Veterans Park.

Conclusions from the Public Workshop Meeting

The major findings of the public workshop can be summarized as:

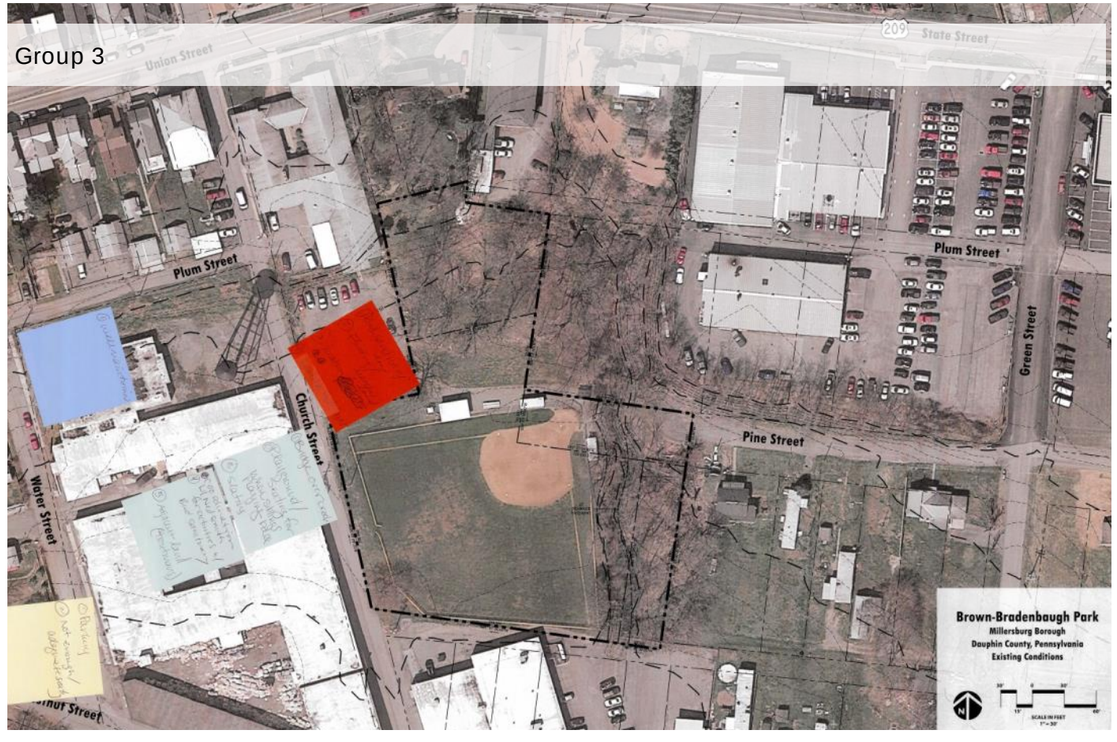
- Parks are the face of Millersburg. This was a major point made in the discussions. The design team noted that this was a potential theme – a "Borough in a Park" as a green and connected community of safe places to walk and bicycle between wonderful parks, the town center, schools, the river and the linkages beyond.
- The master plan should explore the possibility of moving girls softball to the existing youth field adjacent to the pool.
- Make our parks into a system with connections and signage to unify our community as a "borough in a park." Signage is of major importance. (Note: use the Susquehanna Greenway Signage System as the basis).
- The Historical Society is raising money for a Town Clock that should be considered for Market Square.
- While plenty of history is in Millersburg, the design of the parks should not just look back, but also strive to be creative, innovative and forward looking.
- The visual preference survey indicated that traditional building materials were preferred and historical markers must be maintained and incorporated in the design. However, contemporary elements such as lighting and signage should be considered to provide a historical park with a contemporary flare.




Public Meeting - Concept Site Map Diagram Development

Brown-Bradenbaugh Park:

- Parking, seating, and bathrooms were identified as the main needs.
- We love what this park does for kids, especially the girls.
- Improvements including the scoreboard, dugouts, water supply, and infield came from the sports organizations.
- Restrooms is the main need and the softball organization has some funding in place designated for that.
- Outfield is of concern, but not major. They just don't know how to fix it due to the unstable ground beneath and has been a problem for a long time. Sawdust was used in the past address water issues. The outfield fence needs re-shaping.
- The high school is currently playing on a non-regulation size field (men's softball field) but PIAA seems okay, but no one can figure that out. High School girls want to play on a real field!
- Softball organizations does not have enough funding to address ADA and compliance requirements.
- Make the bird sanctuary more than a label.
- Parking is a major issue.
- Bird area – not much of an area. Concerns about tree safety. Some ash trees were removed.
- The eroding of the banks is becoming more and more of a concern.



Group 1

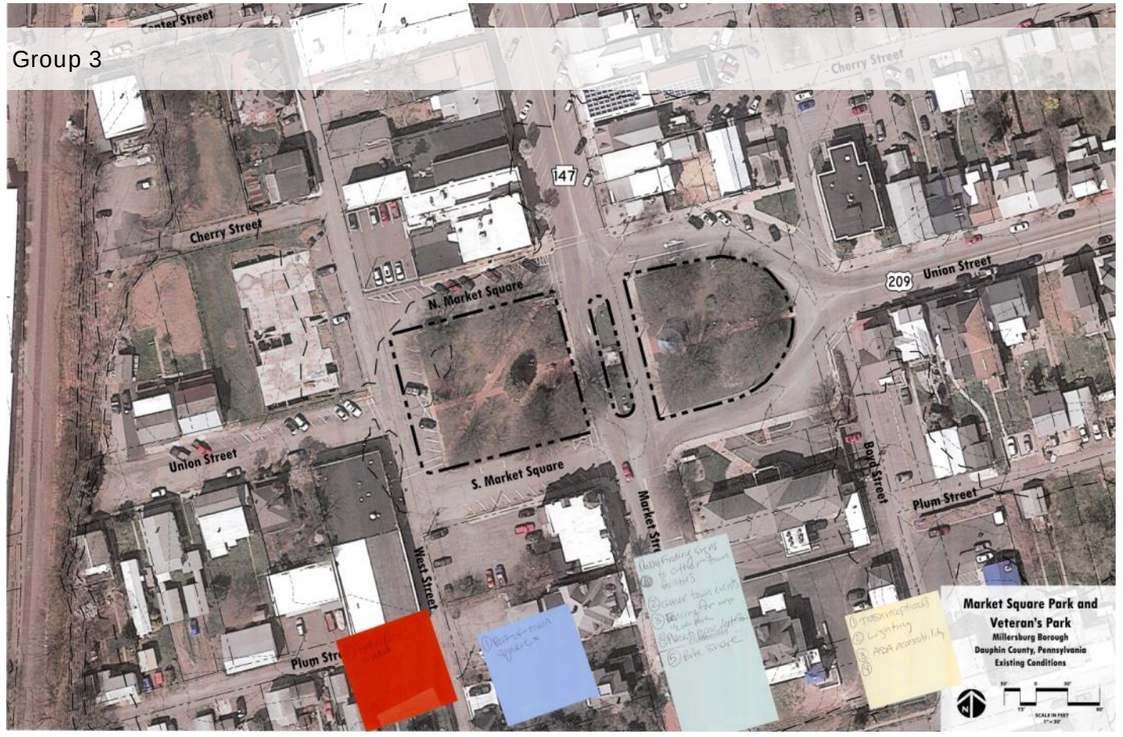
Group 2

Group 3

Public Meeting - Concept Site Map Diagram Development

Seal Park:

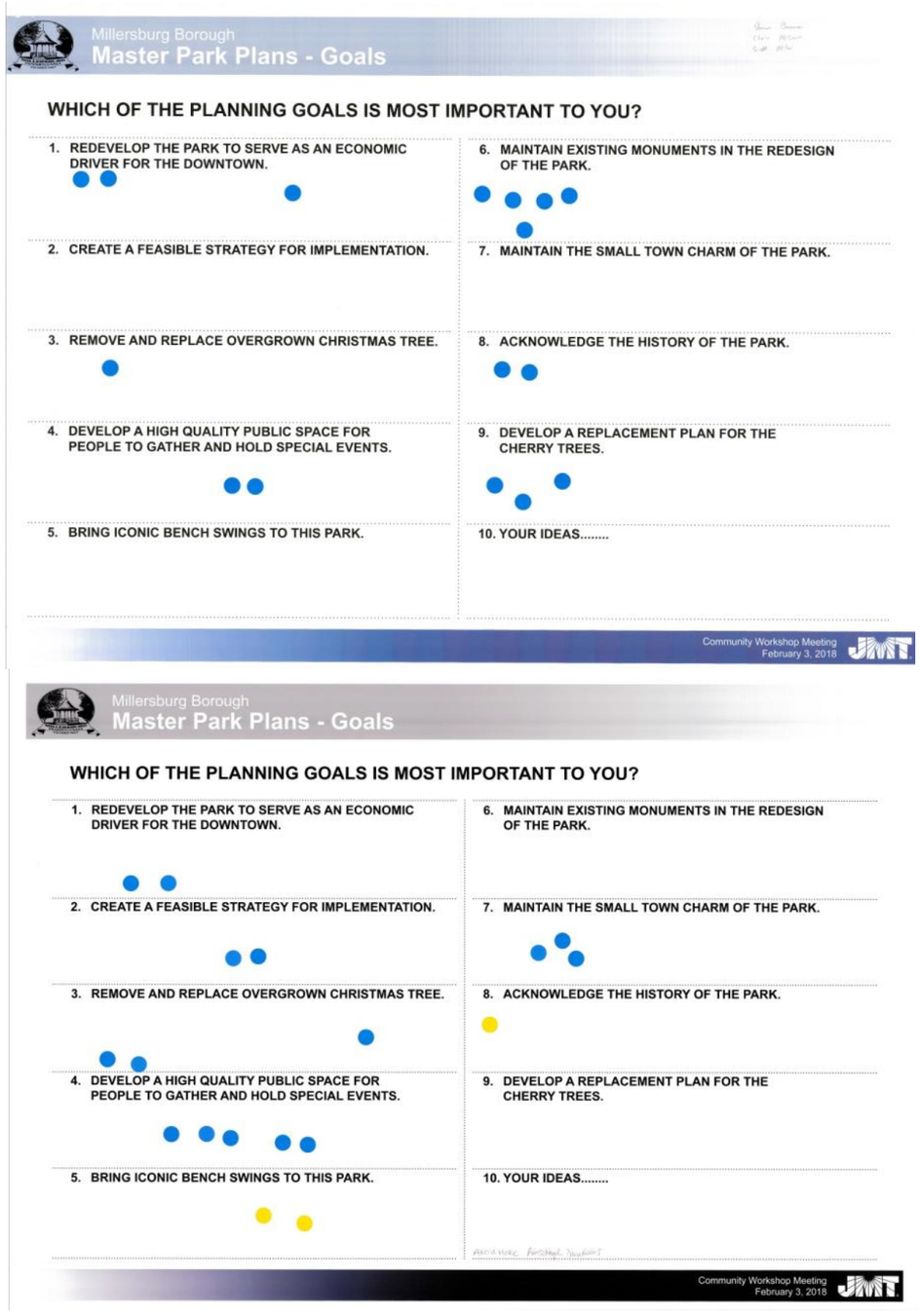
- Not by the river so no winds here. It's our biggest green space.
- ADA access is miserable. You must go all the way around the park to get to certain facilities.
- Least used space with vegetation – although egg hunts are still held at the park, other events like craft fairs were also held there.
- Most conducive to active recreation.
- Is the most used and visible of all parks.
- Would be a good community gardens location.
- Once was an ice rink here.
- So much more space could be used.
- Coordinate with the Middle School and make this a fitness-oriented space.
- Make it a place where people want to be and can spend a lot of time.
- Need more comfortable seating, especially for those watching their kids.



Public Meeting - Concept Site Map Diagram Development

Market Square/Veterans Park:

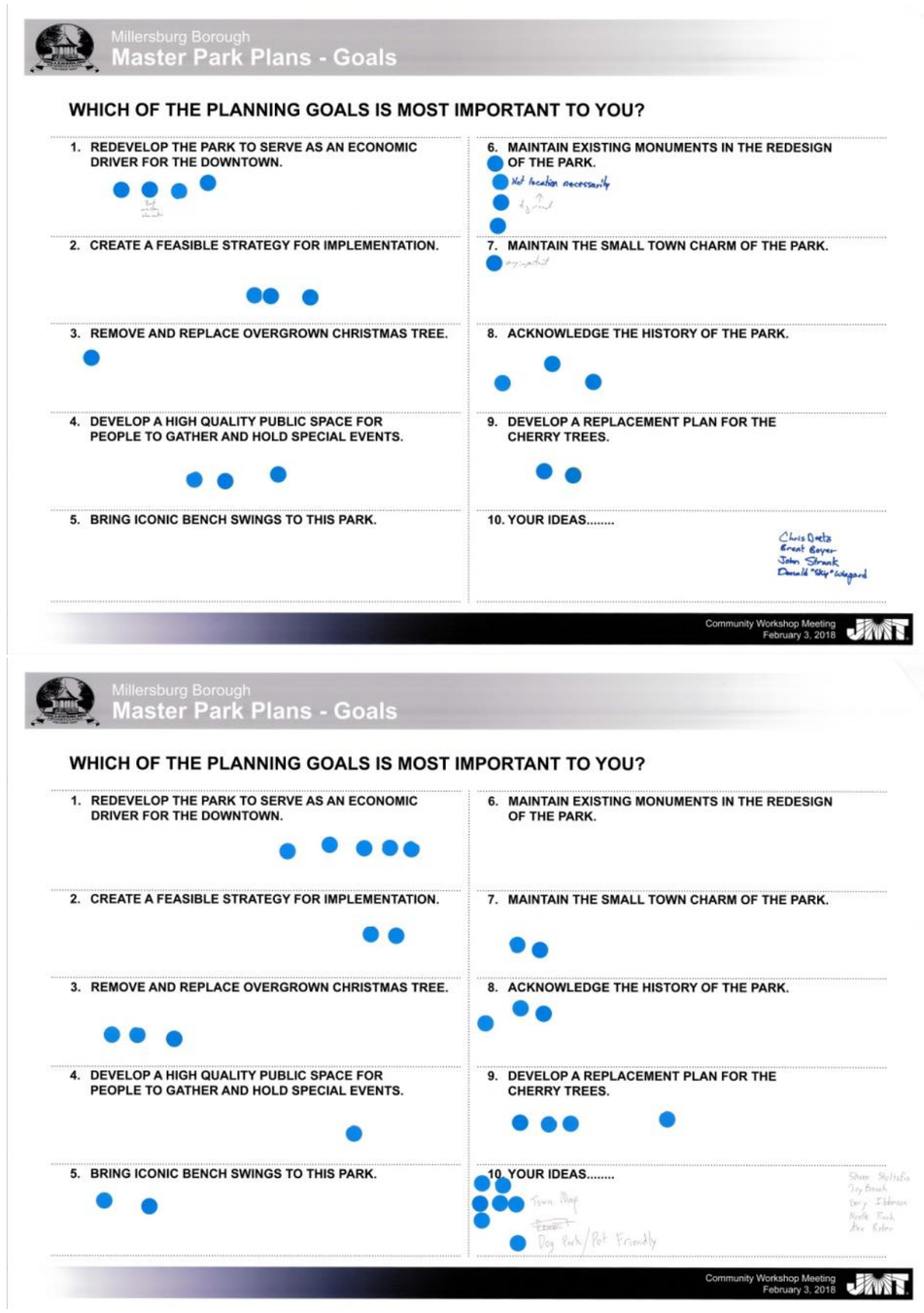
- This park is the calling card for the Borough. It ties with economic development, and the culture and history of Millersburg.
- This park presents greatness opportunities. It is the "face" of the town.
- A town map should be installed here.
- Small events are held here. It is the perfect location for more community events.
- People should use this park for picnics – you can get take-out and then eat in the park.
- The park needs a facelift and updating.
- The only thing here is walkways – look at what can be done in the middle of the park and around the edges!
- Make this a public space that people want to spend time in.
- Goal is to keep the park small but rich in character.
- The Borough wants to maximize investment into its parks and is taking a strategic approach to master planning and securing funding to leverage local money and support form community. This is the reason they have been holding off on Christmas tree replacement and a new billboard.
- Of the nine goals identified for the park, redeveloping the park to serve as an economic driver for the downtown was viewed as the most important, while bringing the iconic swing benches to the park was the least desired.


Millersburg Borough
Master Park Plans - Goals

WHICH OF THE PLANNING GOALS IS MOST IMPORTANT TO YOU?

1. REDEVELOP THE PARK TO SERVE AS AN ECONOMIC DRIVER FOR THE DOWNTOWN.
2. CREATE A FEASIBLE STRATEGY FOR IMPLEMENTATION.
3. REMOVE AND REPLACE OVERGROWN CHRISTMAS TREE.
4. DEVELOP A HIGH QUALITY PUBLIC SPACE FOR PEOPLE TO GATHER AND HOLD SPECIAL EVENTS.
5. BRING ICONIC BENCH SWINGS TO THIS PARK.
6. MAINTAIN EXISTING MONUMENTS IN THE REDESIGN OF THE PARK.
7. MAINTAIN THE SMALL TOWN CHARM OF THE PARK.
8. ACKNOWLEDGE THE HISTORY OF THE PARK.
9. DEVELOP A REPLACEMENT PLAN FOR THE CHERRY TREES.
10. YOUR IDEAS.....

Community Workshop Meeting
February 3, 2018
JMT


Millersburg Borough
Master Park Plans - Goals

WHICH OF THE PLANNING GOALS IS MOST IMPORTANT TO YOU?

1. REDEVELOP THE PARK TO SERVE AS AN ECONOMIC DRIVER FOR THE DOWNTOWN.
2. CREATE A FEASIBLE STRATEGY FOR IMPLEMENTATION.
3. REMOVE AND REPLACE OVERGROWN CHRISTMAS TREE.
4. DEVELOP A HIGH QUALITY PUBLIC SPACE FOR PEOPLE TO GATHER AND HOLD SPECIAL EVENTS.
5. BRING ICONIC BENCH SWINGS TO THIS PARK.
6. MAINTAIN EXISTING MONUMENTS IN THE REDESIGN OF THE PARK.
7. MAINTAIN THE SMALL TOWN CHARM OF THE PARK.
8. ACKNOWLEDGE THE HISTORY OF THE PARK.
9. DEVELOP A REPLACEMENT PLAN FOR THE CHERRY TREES.
10. YOUR IDEAS.....

Chris Oretz
Ernest Boyer
John Stronk
Donald "Sky" Hoegard

Community Workshop Meeting
February 3, 2018
JMT

Visual Preference Survey

As part of the initial public meeting a visual preference survey (VPS) was conducted to allow the community the opportunity to express their thoughts regarding general park design aesthetics, facilities, and programming expectations. The VPS is an innovative and successful technique that enables citizens to evaluate physical images of natural and built environments. The process involves asking participants to view and evaluate a wide variety of slides depicting park amenities, recreation facilities, structures, landscapes and landscape elements, and aesthetics and amenities. Individual scores indicate the level of preference for images viewed during the survey. The results are analyzed to determine general conclusions for park improvements.

Methodology

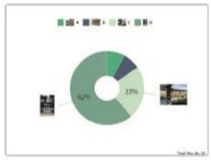
Individuals attending the meeting were asked to view numbered pictures which depicted various images of natural and built environments. Each participant was provided a sheet or a response card to record their response indicating appropriateness or suitability for development in the park. Individuals responded to sixty-two images. Images were rated on a scale of 1 (least preference) to 5 (strong preference). At the end of the meeting, the survey instrument was collected and tallied. Each response option was assigned a corresponding weight factor. The number of responses for each response option was summed and an average response value was calculated for each slide.

See Appendix G for the complete summary results of the visual preference survey.

Summary

The visual preference survey indicated that traditional building materials were preferred and historical markers must be maintained and incorporated in the design. However, contemporary elements such as lighting and signage should be considered to provide a historical park with a contemporary flare.

What is your favorite for Veteran's Memorial Park?

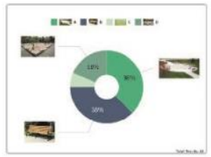


Response options	Count	Percentage
	1	8%
	1	8%
	3	23%
	8	62%

100%
Engagement

13
Responses

Which seating would work best?



Response options	Count	Percentage
	6	38%
	6	38%
	1	6%
	3	19%

100%
Engagement

16
Responses

Focus Group 6th - 8th Grade Students

Student Focus Group Meeting

Millersburg Middle School 6th - 8th Grade Students

On October 5, 2017, a focus group meeting was conducted with students from the Millersburg Area Middle School. Input regrading the existing parks and the need for additional recreational amenities was provided from selected students representing the student council. Poll Everywhere was utilized to gather live responses to specific questions, and group comment cards completed for a round table discussion.

Results:

The student focus group indicated that the school students wanted bathrooms, drinking fountains, courts and a rock climbing wall. Other comments included: Seal Park restrooms need upgraded, add the iconic bench swings to all the parks. Overall the parks need to be better maintained. There are opportunities for Market Square/ Veterans Park to serve as an economic driver for downtown. Address upstream runoff from Tanners Run due to flooding concerns. Remove and replace the overgrown Christmas tree in Veterans Park. Improve safety of pedestrians for special events at Market Square/Veterans Park. Develop spaces for people to gather at Market Square/ Veterans Park. Add a kiosk to let people know what businesses are downtown at Market Square/Veterans Park. Lighting at Market Square/Veterans Park is inadequate.

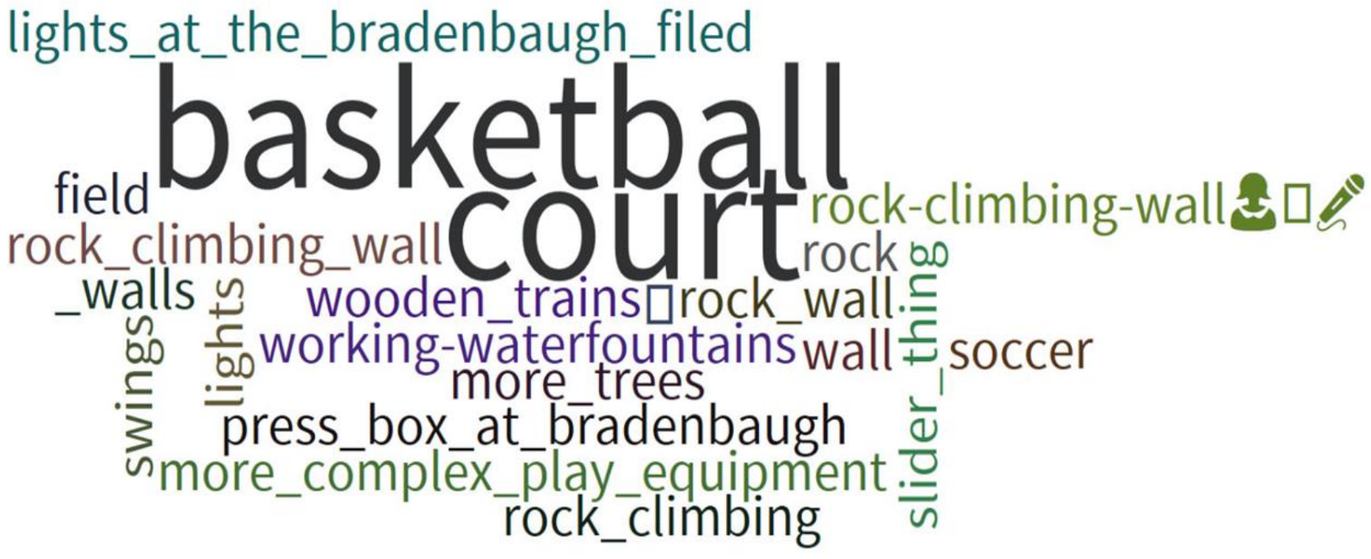
When asked what the top two things they wanted to see in the parks, they concluded the following:

- Clean 'real' restrooms at Brown-Bradenbaugh Park
- Rock wall for entertainment at Seal Park
- Adult swings at Market Square/Veterans Park
- Lights
- Cement tables and chairs
- Drinking water fountains
- Diversity in recreation equipment

Poll Everywhere Real-Time Visioning Exercise

Results and Student Feedback: (Student Council - 20 Students)

- Approx. 81% have been to all parks while 19% had only visited one or two of the parks.
- Question: What do you think is needed in the parks?
- Total Student Responses: The responses of 18 students are illustrated in the Word Cloud below: Of most importance were basketball court, climbing, drink fountains, and play equipment.



Public Meeting #2

The second public meeting was held in conjunction with the annual Cherry Blossom Festival which proved a valuable venue for displaying the concept plans and seeking public input on the designs for each park site.

Support was high for the proposed improvements, securing numerous specific comments which were offered for each park. Reactions were mixed concerning the consideration of the closure of North Market Street. While residents were in support of the idea to create a plaza that could support the downtown and adjacent park activities, there were concerns with the logistics of a permanent closure. Several people noted a monthly closure may be more appropriate.

This page intentionally left blank.

CHAPTER 3

Photos courtesy of: http://www.lykensvalley.org/millersburg

RESOURCE ANALYSIS

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

SITE INVENTORY AND ANALYSIS

Introduction

The development of the Master Site Plans was guided by the analysis of existing site conditions, review of natural and man-made resources, existing facilities usage, consideration of the surrounding land uses, and the assessment of the recreation needs in the community.

The purpose of inventory and Analysis is to:

- Evaluate each site to determine the unique characteristics and appropriate protection and enhancement strategies.
- Evaluate investments needed at Brown-Bradenbaugh Park for it to continue to function as a competitive softball facility.
- Explore natural resources that contribute to the visitors experience at each park.
- Explore the role of each park within the framework of the park system as a whole.
- Fully understand the site characteristics and limitations as the basis of good design.
- Become familiar with the context of the of the region and the site.
- Determine how park construction, development, and long term maintenance costs can be optimal given site conditions.
- Identify specific site needs and park areas of interests to understanding the intended and existing use, layout, and circulation helps.

Site visits were conducted throughout the planning process to evaluate the site characteristics, observe each site's relationship to the surrounding properties, and identify site opportunities and constraints. The findings of the inventory and assessment phase of the planning process are documented below.

History of the Parks

Adapted from Millersburg Centennial Memorial Book of 1907 and the Sesquicentennial Memorial Book of 1957.

Brown-Bradenbaugh Park

The park site consist as 2 parcels totaling 1.72 acres and is located in Upper Paxton Township. The original parcel contained 1.33 acres deeded for use as a practice field for girls softball. An additional 0.389 acres to the north was deeded as a bird sanctuary with restrictions for subject to the property remaining as a Borough Park, and bird sanctuary. In addition no buildings are allowed on the 0.389 acres unless they are in the interest of the park and bird sanctuary. The park currently serves primarily as a girls softball field.

Seal Park

The park consists of approximately 9.5 acres with a wide variety of recreational amenities including a youth baseball field, pavilions, youth playground and tot lot, restrooms, walking paths, tennis courts, on-site parking, and specimen tress. The park was acquired with matching funds from DCA (Department of Community Affairs) in 1967 and recreation facilities developed in 1975. The park is bisected by Tanners Run with a small footbridge providing access between the park and the adjacent neighborhood. The trails and existing footbridge are heavily used by students going to and from school.

Market Square/Veterans Park

Less than an acre, Market Square/Veterans Park was gifted by the Borough's founder. Like many other town squares of this era, it was most likely used to graze livestock and later for sports when baseball began to set roots as the national past time. Over time, it has been developed to serve as the main gathering space for community events and celebrations. This park was meant to be the focal point of the community.

The Park consists of three areas. The area west of SR 147 is know as Veterans Park and includes benches, mature trees, Friends of the Swinging Bridge memorial walk, bicentennial time capsule, and several war memorials including a cannon, veterans of all wars monument, and a civil war

monument. The canon was placed in 1897 pointing to the Susquehanna river. It made its way to Millersburg by railroad as a condemned government relic from Governor's Island New York. It is unclear if it was meant to be a civil war monument. The Civil War monument was erected in 1914 and had repairs completed in in the mid 90's. Within the median is the second area of the park which contains the Daniel Miller Fountain that was erected in 1909 in honor of Millersburg's founder, Daniel Miller. The third areas of the park is located on the east side of SR 147 and is commonly referred to as Market Square Park. This area contains the Millersburg Gazebo and is the focal point of this side of the park area. The gazebo was erected in 1891 and still functions as it was originally intended playing host to open air concerts and public other public and community events.

Park locations

The parks are within 0.5 miles of each other, which allows for increased access to a variety of recreational uses. Each park offers a different user experiences, and recreational uses within reasonable walking, biking, and driving distance between each other, to community amenities, and local neighborhoods.

The setting of each park is also quite different. Brown-Bradenbaugh Park serves as primarily an active sport park that is located on the edge of the Borough within a commercial area. Seal Park is a community park located within a primarily residential area close to other community facilities including the community pool, library, and high school. Market Square/Veterans Park is located in the heart of the Oldtown business district and is bifurcated by SR 147 creating two distinct parks. The urban context and circulation presents challenges for providing safe pedestrian access to and between the two areas of the site. However, the unique location offers great visibility and allows the park to function as a gateway park that is linked to the commercial core. The park is positioned to serve as a catalyst for revitalization of the commercial corridor and to supplement the activities normally associated with downtown commercial businesses.

Park Proximity

Site Analysis - Brown-Bradenbaugh Park

Summary Recommendations from Millersburg Open Space and Recreation Plan

- The park site was developed specifically to provide girls softball facilities and includes dugouts and a concession stand. The concession stand lacks running water and no permanent restrooms exist on site. Spectator bleachers for the visiting team are also missing.
- The site would benefit from additional landscaping to establish a "greener" setting in the midst of a mixed residential and industrial neighborhood. Addition of some play equipment, such as swings, could provide some play opportunities for the siblings of ball players utilizing the park.
- A bird sanctuary is located in the area of right field. Future development at the park should be designed to ensure that this bird sanctuary is maintained.

Additional Site Observations

- Concession/Toilet Building needs to be upgraded.
- ADA access must be provided.
- Parking is limited.
- ADA designated parking is not provided.
- A formal shared use parking agreement is needed as the current parking area utilized for the park is not on park property.
- Consider upgrading backstop and fencing.
- The existing field area is well maintained.
- There is severe erosion associated with the existing stream bank that must be addressed.

Photo Inventory - Brown-Bradenbaugh Park

Photo Inventory - Brown-Bradenbaugh Park

Site Analysis - Seal Park

Summary Recommendations from Millersburg Open Space and Recreation Plan

- The park functions as a community park.
- Its location adjacent to Millersburg Area High School and Middle School, and the athletic facilities associated with those schools, enhances the recreational opportunities of the site.
- Most of the site is not accessible to the physically handicapped, including the restrooms.
- The site slopes to Tanners Run, a tributary creek for Wiconisco Creek.
- Stream bank should be stabilized and appropriate riparian buffers installed. Replacement and or renovations of the existing pavilions should be considered.
- Provide quiet passive alternatives to the active recreational facilities elsewhere in the park.

Additional Site Observations

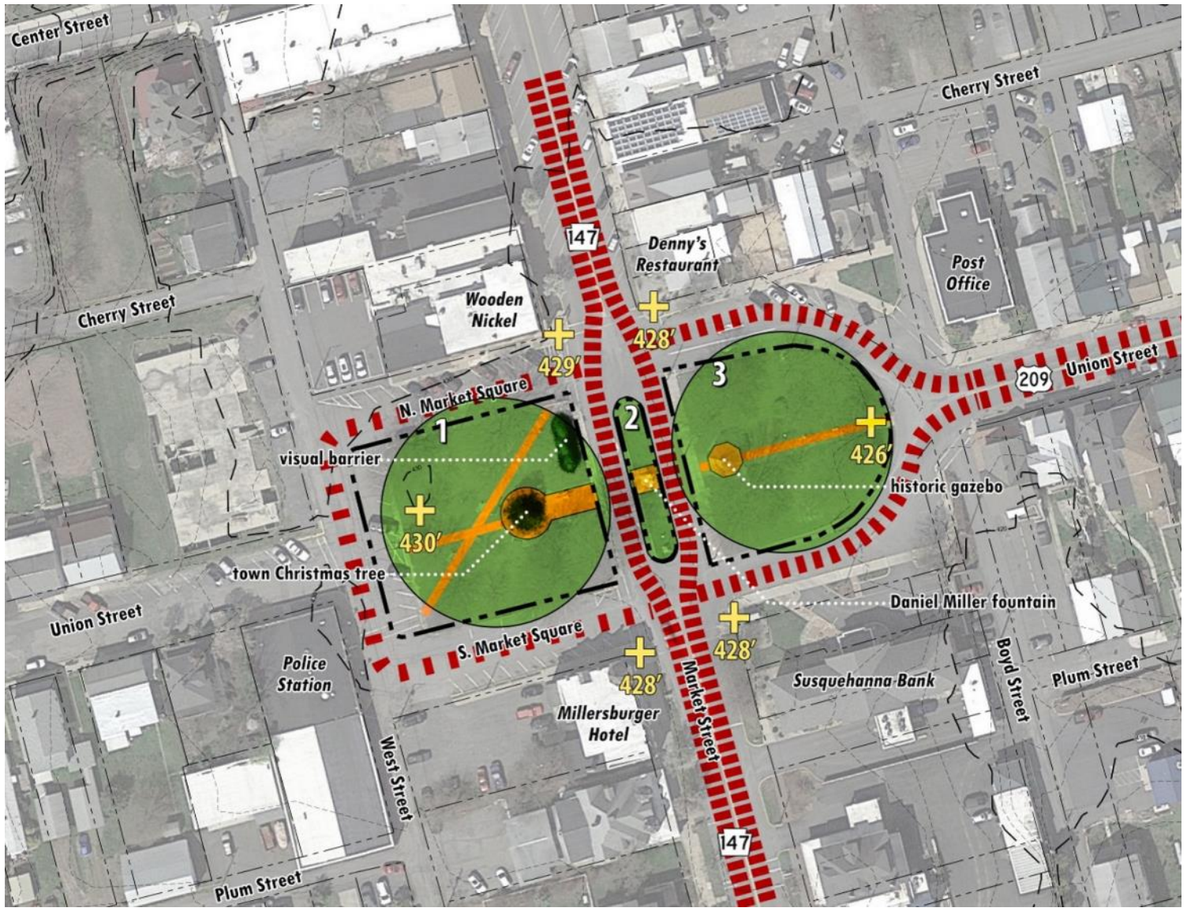
- Consider upgrading existing Toilet building.
- Provide ADA access to play equipment.
- Improve pedestrian access and ADA access within park.
- Variety of trees within the park provides educational opportunities.
- Improve pedestrian crossing and linkages beyond the site.
- The existing stream contains a lot of silt deposits in and around the southern boundary and around the existing footbridge.
- The adjacent existing ballfield at the swimming pool is owned and maintained by the School District. It is used for gym classes and additional practice space for Little League. Opportunities should be explored for additional recreational use of this space.

Adjacent School District ballfield

Photo Inventory - Seal Park

Photo Inventory - Seal Park

Site Analysis - Market Square/Veterans Park



Summary Recommendations from Millersburg Open Space and Recreation Plan

- Market Square functions as the town center for the Borough. The area is well-maintained and acts as the site for many community events.
- While the traditional-style gazebo/bandstand is obviously conducive to a summer concert series or other activities that will draw residents, the pedestrian circulation around the bandstand is very narrow.
- Veterans Park lies west, across Market Street, from Market Square. Veterans Park houses a small plaza with a number of memorials and plaques. It is an area of passive recreation.
- As site amenities have been installed at different times, there is no uniformity of style or materials, which detracts from the appearance of the parks.
- Benches are not oriented in groupings for social interaction.
- An overall design standard should be developed for the parks and implemented as equipment is replaced.
- At the core of the business center, Market Square and Veterans Park provide a natural orientation point to the town. Ideally, the Rail Trail alignment should pass through this idyllic spot.
- Improvements to the sidewalks in the area would encourage greater pedestrian use in the vicinity.

Additional Site Observations

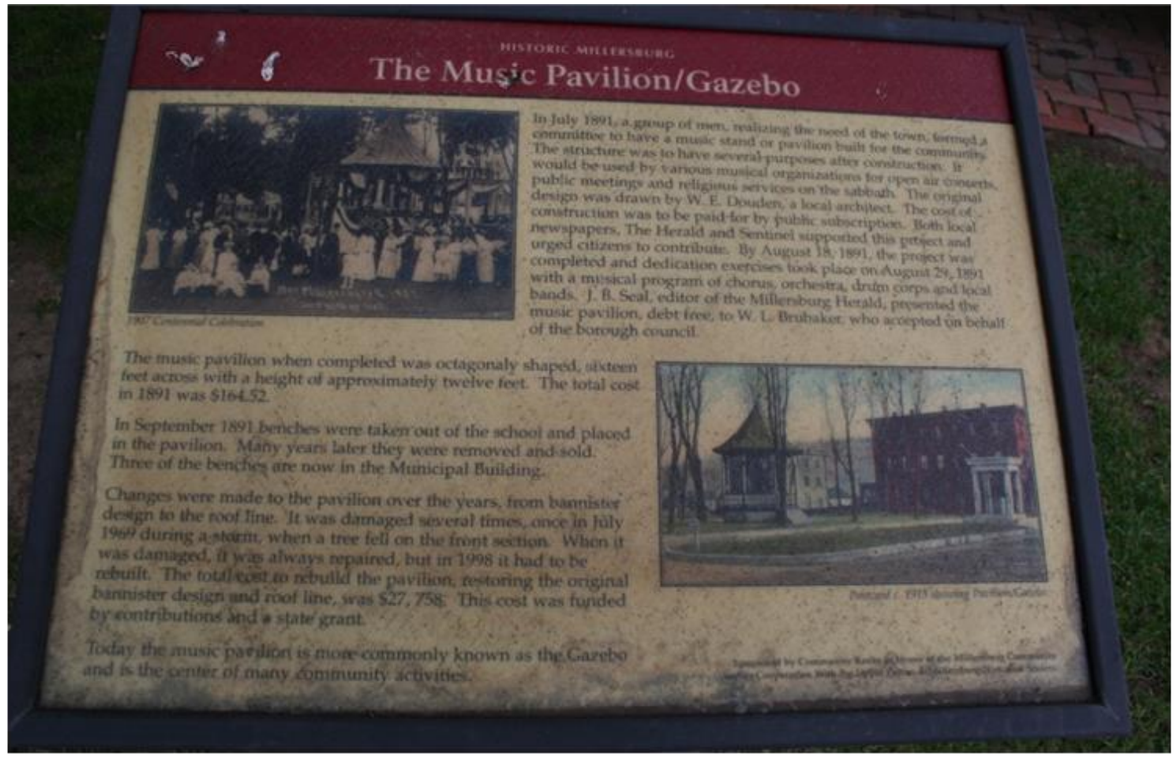
- There is a strong sense of ownership from various organizations regarding Veterans Park.
- The park functions as two separate spaces and are not thought of as a park.
- Turning radius' are inadequate for trucks.
- Electric is inadequate.
- Vegetation is overgrown and in need of pruning. Both the large pine serving as the holiday tree and the existing perimeter cherry trees are at or near the end of their lifespan. A tree replacement program should be developed.
- North Market Street offers a unique opportunity to expand the park area and provide an open gathering area that can supplement both additional park programming and downtown activities to support the commercial corridor.
- The existing soil condition is poor with many tree roots visible and numerous depressions in the park that pond and hold water during rain events.
- The Daniel Miller fountain is no longer working and is purely an isolated relic that is not part of the park functions.

Market Square/Veterans Park

1990's Cherry Tree Replacement Plan

Poor soil conditions and ponding water at Market Square/Veterans Park

Photo Inventory - Market Square/Veterans Park


HISTORIC MILLERSBURG
The Music Pavilion/Gazebo
In July 1891, a group of men, realizing the need of the town, formed a committee to have a music stand or pavilion built for the community. The structure was to have several purposes after construction. It would be used by various musical organizations for open air concerts, public meetings and religious services on the sabbath. The original design was drawn by W. E. Douden, a local architect. The cost of construction was to be paid for by public subscription. Both local newspapers, The Herald and Sentinel supported this project and urged citizens to contribute. By August 18, 1891, the project was completed and dedication exercises took place on August 29, 1891 with a musical program of chorus, orchestra, drum corps and local bands. J. B. Seal, editor of the Millersburg Herald, presented the music pavilion, debt free, to W. L. Brubaker, who accepted on behalf of the borough council.
The music pavilion when completed was octagonaly shaped, sixteen feet across with a height of approximately twelve feet. The total cost in 1891 was $164.52.
In September 1891 benches were taken out of the school and placed in the pavilion. Many years later they were removed and sold. Three of the benches are now in the Municipal Building.
Changes were made to the pavilion over the years, from bannister design to the roof line. It was damaged several times, once in July 1969 during a storm, when a tree fell on the front section. When it was damaged, it was always repaired, but in 1998 it had to be rebuilt. The total cost to rebuild the pavilion, restoring the original bannister design and roof line, was $27, 758. This cost was funded by contributions and a state grant.
Today the music pavilion is more commonly known as the Garebo and is the center of many community activities.

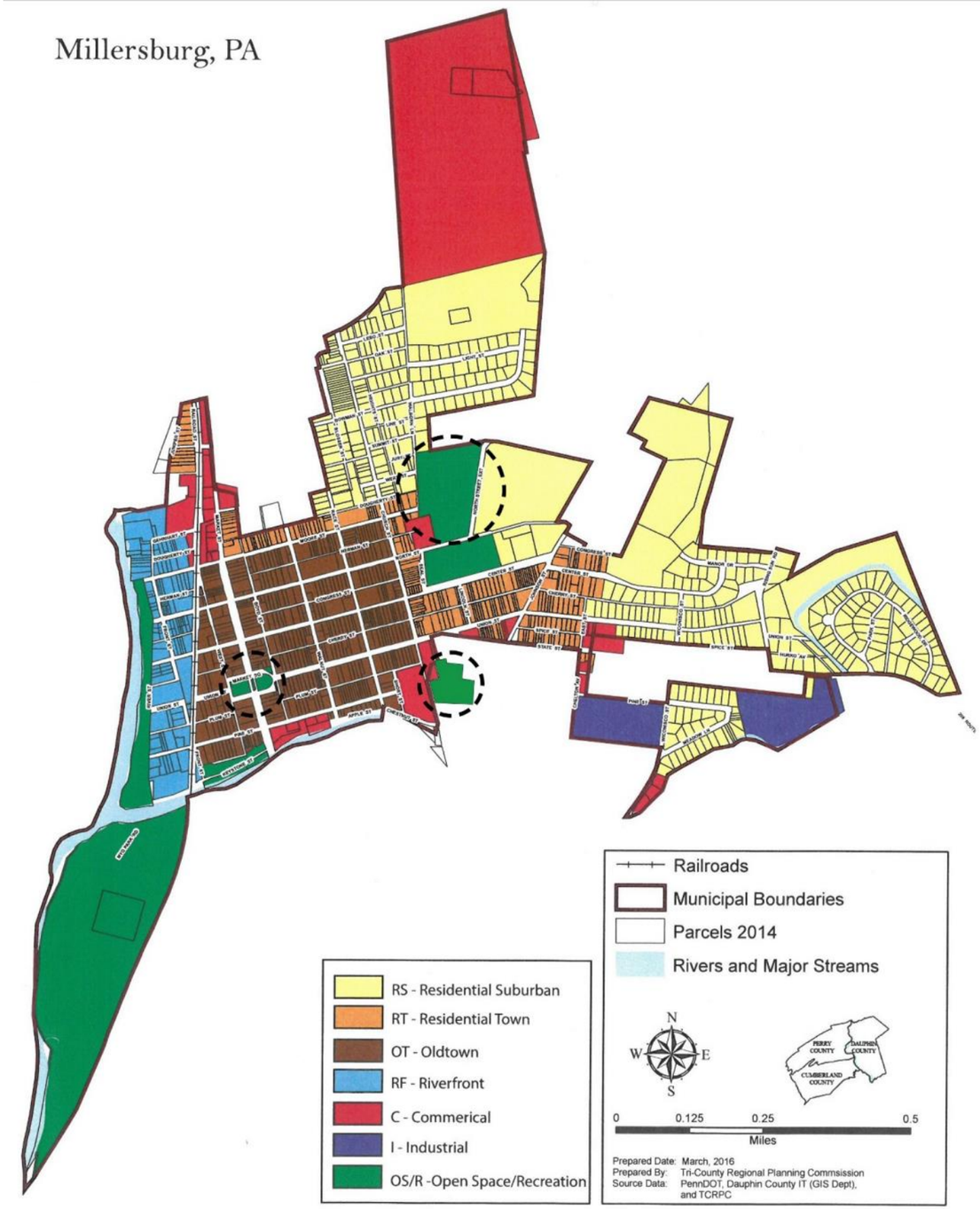

WELCOME TO
MARKET
SQUARE PARK
PARK RULES
PARK HOURS- 8AM-11PM
ALCOHOL IS PROHIBITED
NO WEAPONS / FIREARMS
NO FOUL LANGUAGE
NO PETS ALLOWED
PLEASE DO NOT LITTER
EST. 1807


Bicentennial Time Capsule
November 23, 2007

Market Square: Urban Core

Market Square/Veterans Park is located at the heart of a classic "Market Street" which emphasizes its value. The sites location, historic, and cultural significance presents an opportunity to enhance the overall character of the downtown.

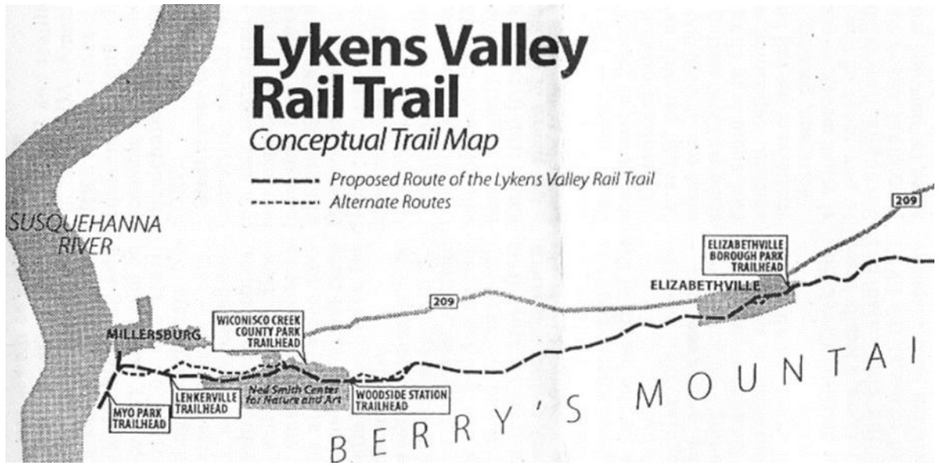
Zoning Map

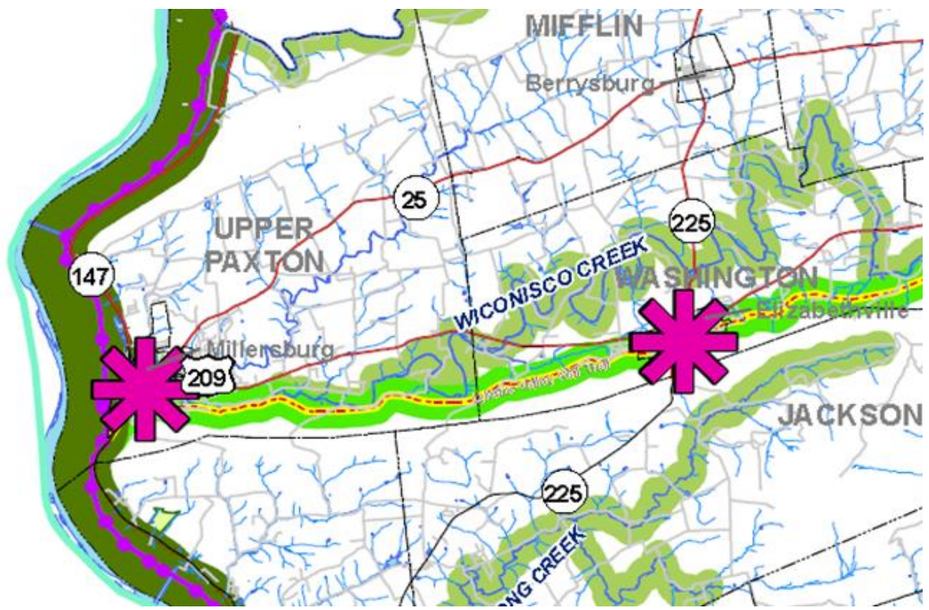


Regional Connectivity

A number of trail initiatives are within the immediate area of the parks that provide and promote regional connectivity including the Susquehanna River Trail and the Lykens Valley Rail Trail. The Lykens Valley Rail-Trail is a proposed trail of approximately 20 miles in Northern Dauphin County. This is an important consideration that will promote linkages between the Boroughs parks and beyond.

The trail will extend from Millersburg to the Schuylkill County line and perhaps to Tower City and beyond. The trail is intended to provide non-motorized recreation for residents and visitors to the Valley. Activities include walking, running, cycling, cross-country skiing, and nature observation.





Roundabout Discussion

During the master planning process it was suggested on several occasions that a roundabout be considered for the intersection of PA 147 and US 209. The planning team took a very preliminary and courtesy look into this suggestion. The existing park would be severely impacted by the amount of land needed to successfully develop a roundabout. Development of a roundabout would further bisect the park creating four separate areas which was not viewed as a desired alternative.

Local Technical Assistance Program (LTAP) Recommendations

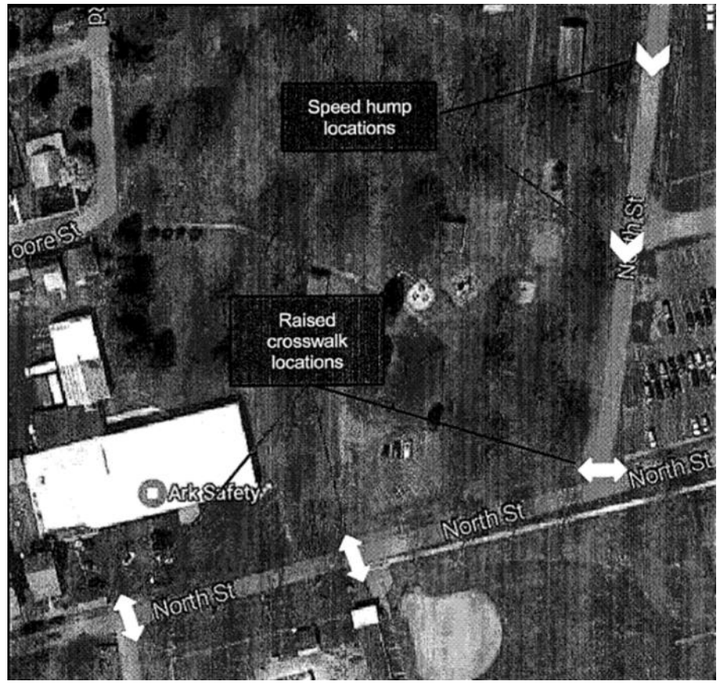
In late 2016, the Borough requested technical assistance regarding the pedestrian crossings near the Millersburg Middle School from LAP (Pennsylvania's Technical Assistance Program). A memo of the initial findings and recommendations was prepared on December 16th, 2016 and included as Appendix I. These recommendations were considered in the layout and design of the trail network within Seal Park. The master plan recommendations realigning and relocating crosswalks with the proposed trail connections and extending the sidewalk along North Street for pedestrian safety and connectivity between the downtown core, park, and school.

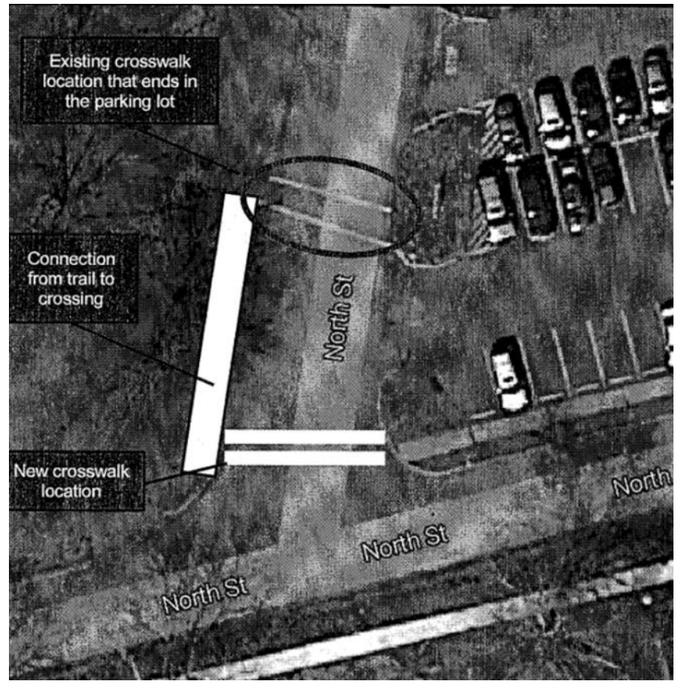
Land and Water Conservation Funds (LWCF) Funding Restrictions

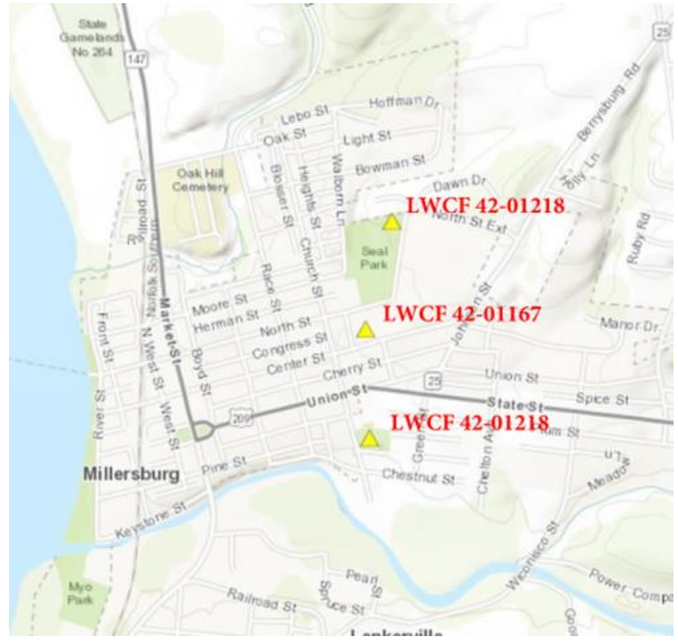
Land purchases with federal funding typically include certain restrictions on uses and or conversions and typically require amenities to remain in perpetuity. Since federal funding was utilized for the purchase and development Seal Park, it was important to identify limitations as part of the site analysis process. During the site analysis process it was noted the existing tennis courts are not utilized due to the state of disrepair. The courts are actually being utilized as a parking area for the adjacent youth baseball field.

Coordination with DCNR concluded that a parking lot could replace the dilapidated tennis courts since it would be serving the recreation amenities in the park. It was further clarified that the parking area could not be used as a municipal, employee, or resident parking area and limited hours and/or parking fees are prohibited and would not be acceptable.

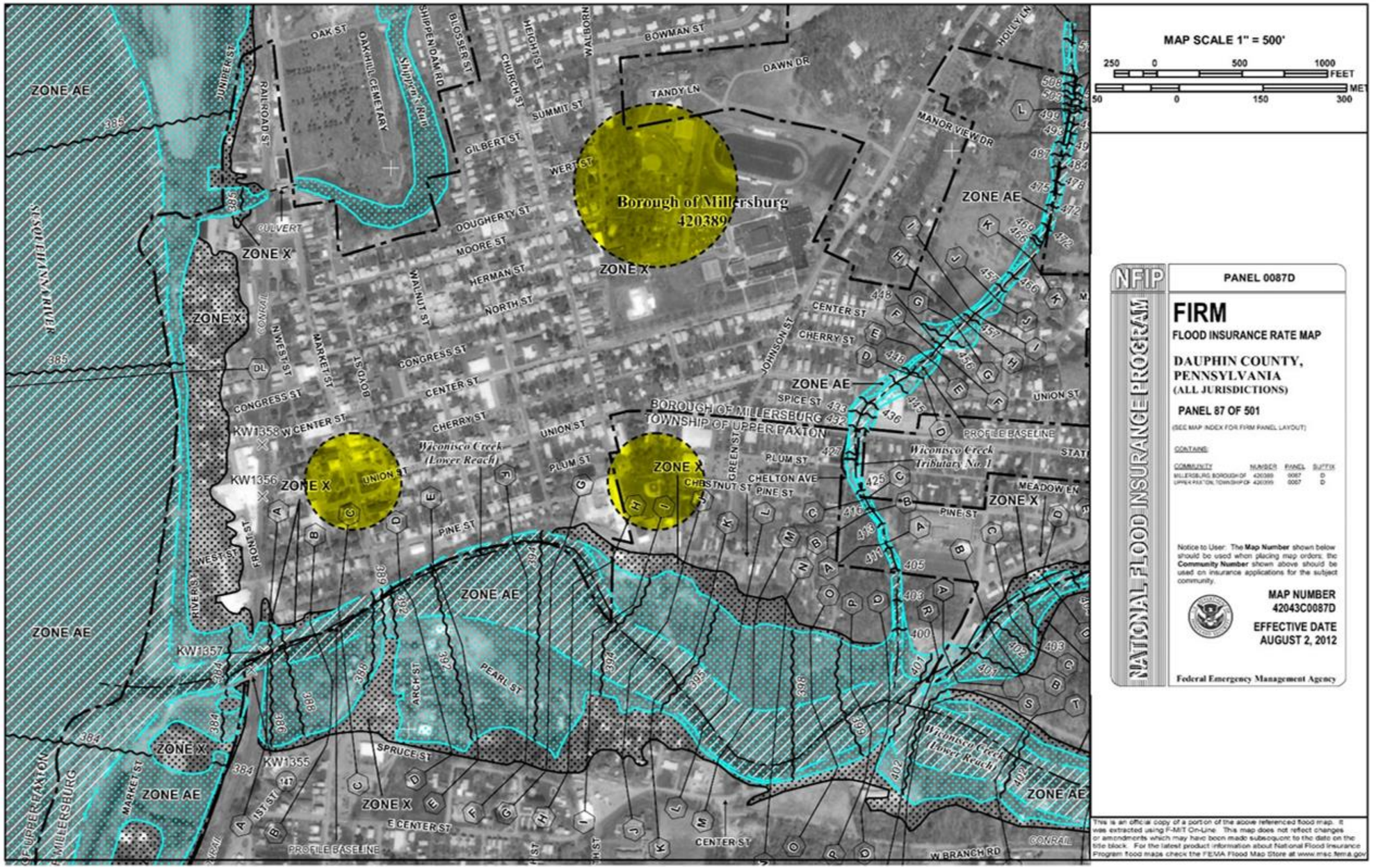
During the course of our coordination with DCNR, earlier correspondence was found discussing this same issue. The same conclusion was reached as outlined in DCNR's 2005 letter included in this report as Appendix H.







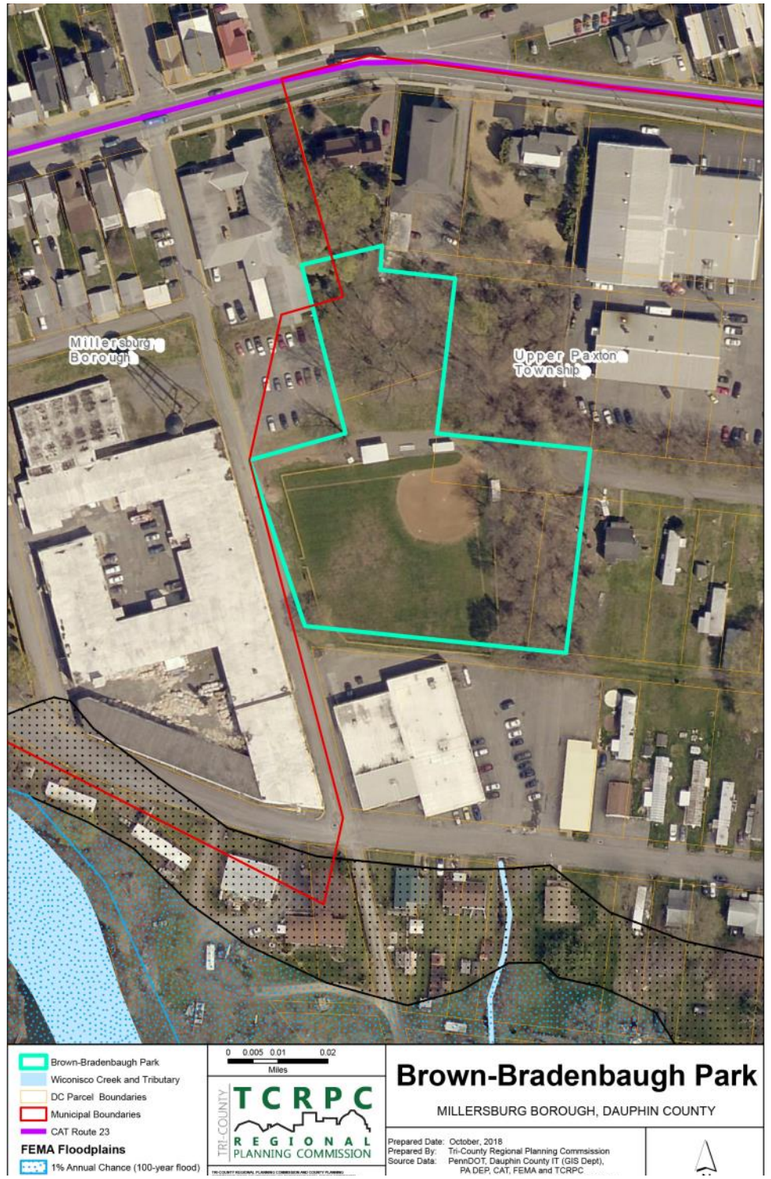
Floodplain Map

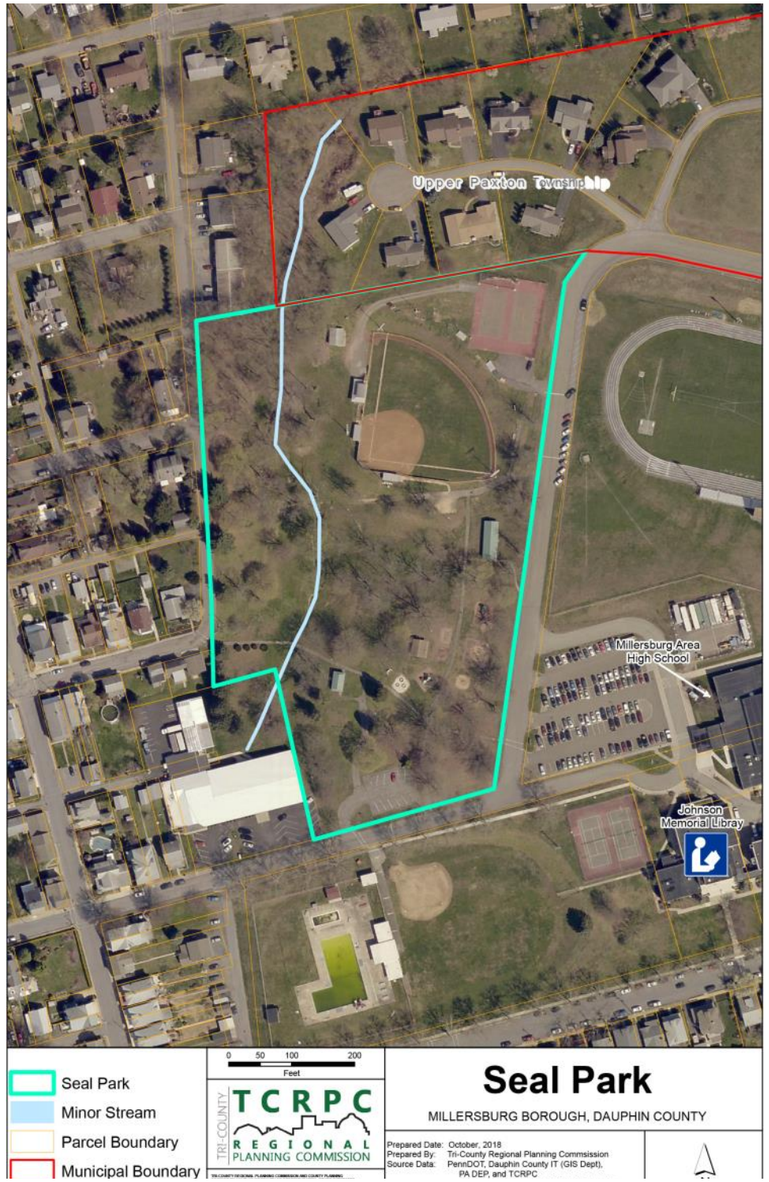


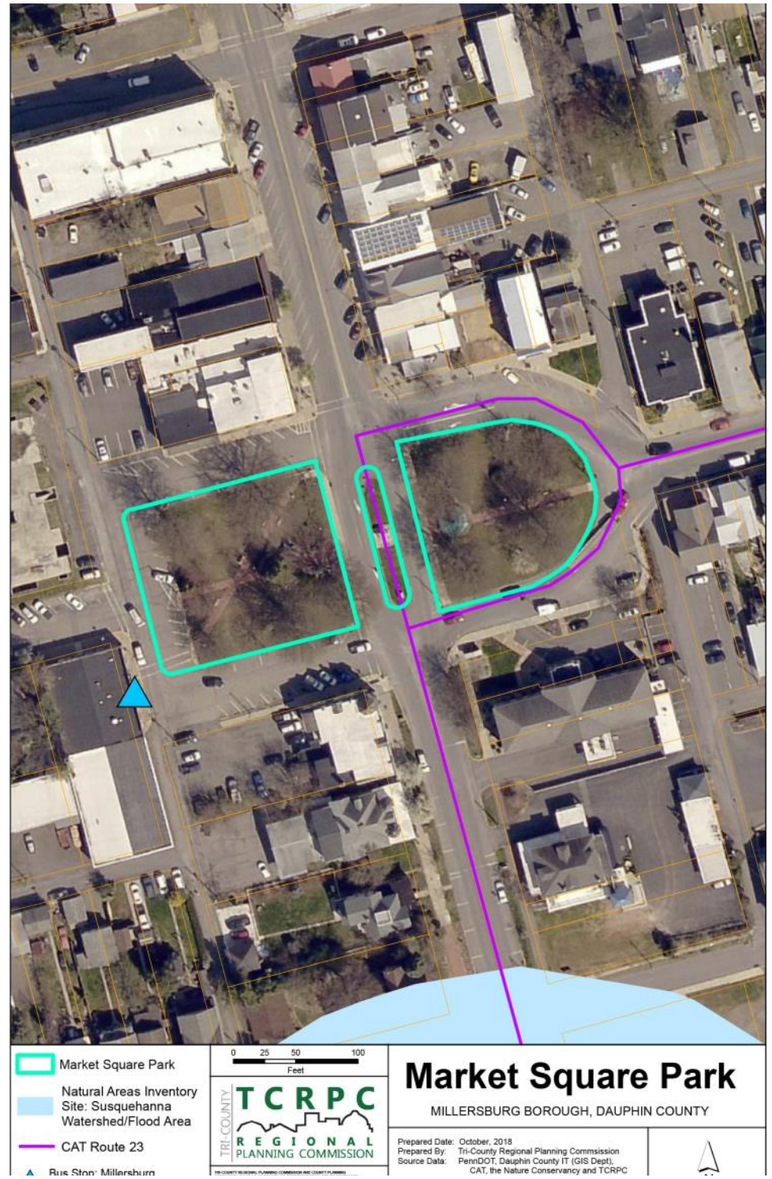
Flood Zones

All three park sites are outside of the FEMA projected flood zone map.

GIS Data Sets







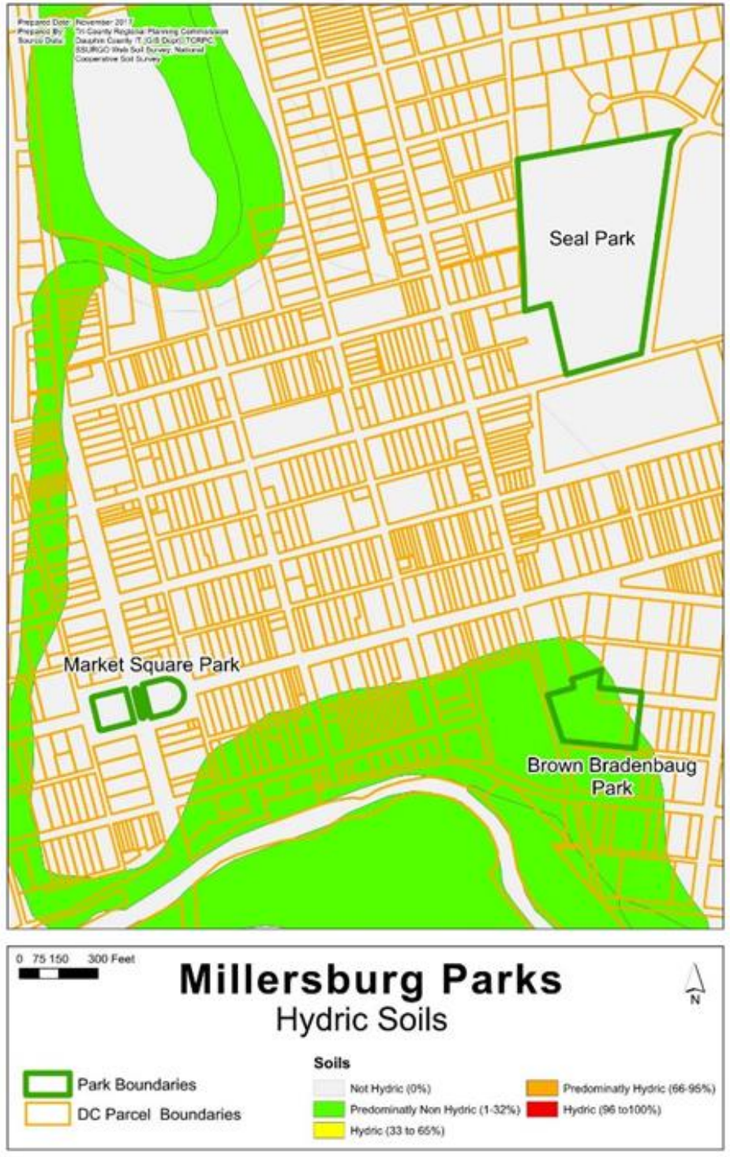
GIS Data Sets

Slopes

Slopes are mainly gradual in the three park sites except for areas of 15%-25% slope within Brown-Bradenbaugh Park, which will affect the application of development of various types of recreation.

Farmland Soils

Seal Park and Market Square/Veterans Park are classified as prime farmland and the majority of Brown-Bradenbaugh Park is not considered prime farmland.



Hydric Soils

Seal Park and Market Square/Veterans Park are identified as not hydric (0%) while the majority of Brown-Bradenbaugh Park is identified as predominantly non-hydric (1-32%).

Site Soils - Brown-Bradenbaugh Park

Soils indicate that the site has no hydric soils, some steep slopes, mainly 20"-40" to bedrock, and more than 80" to water table. These conditions determine the limiting factors and challenges for development on site.

DvB2—Duncannon very fine sandy loam, 3 to 8 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: l4nz
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 50 to 61 degrees F
Frost-free period: 150 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Duncannon and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Duncannon

Setting
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Coarse-silty loess over residuum weathered from sedimentary rock

Typical profile
H1 - 0 to 16 inches: very fine sandy loam
H2 - 16 to 58 inches: silt loam
H3 - 58 to 99 inches: channery silt loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

CkD2—Calvin-Klinesville shaly silt loams, 15 to 25 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: l4nf
Elevation: 300 to 1,400 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 120 to 214 days
Farmland classification: Not prime farmland

Map Unit Composition
Calvin and similar soils: 60 percent
Klinesville and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calvin

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Acid reddish brown residuum weathered from shale and siltstone

Typical profile
Ap - 0 to 7 inches: channery silt loam
Bw - 7 to 22 inches: very channery silt loam
C - 22 to 31 inches: extremely channery silt loam
R - 31 to 41 inches: bedrock

Properties and qualities
Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Site Soils - Seal Park

Soils indicate that the site is well drained, has no hydric soils, minimal slopes of 3-8%, mainly 20"-60" to bedrock, and more than 80" to water table. These conditions determine the limiting factors and challenges for development on site.

CIB2—Calvin-Leck Kill shaly silt loams, 3 to 8 percent slopes, moderately eroded

Map Unit Setting
National map unit symbol: l4nh
Elevation: 300 to 1,500 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Calvin and similar soils: 50 percent
Leck kill and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calvin

Setting
Landform: Hillslopes
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from siltstone

Typical profile
H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 30 inches: channery silt loam
H3 - 30 to 35 inches: extremely channery silt loam
H4 - 35 to 45 inches: bedrock

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Leck Kill

Setting
Landform: Ridges, valleys
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Residuum weathered from shale and siltstone

Typical profile
H1 - 0 to 9 inches: channery silt loam
H2 - 9 to 45 inches: channery silt loam
H3 - 45 to 60 inches: very channery silt loam
H4 - 60 to 70 inches: bedrock

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

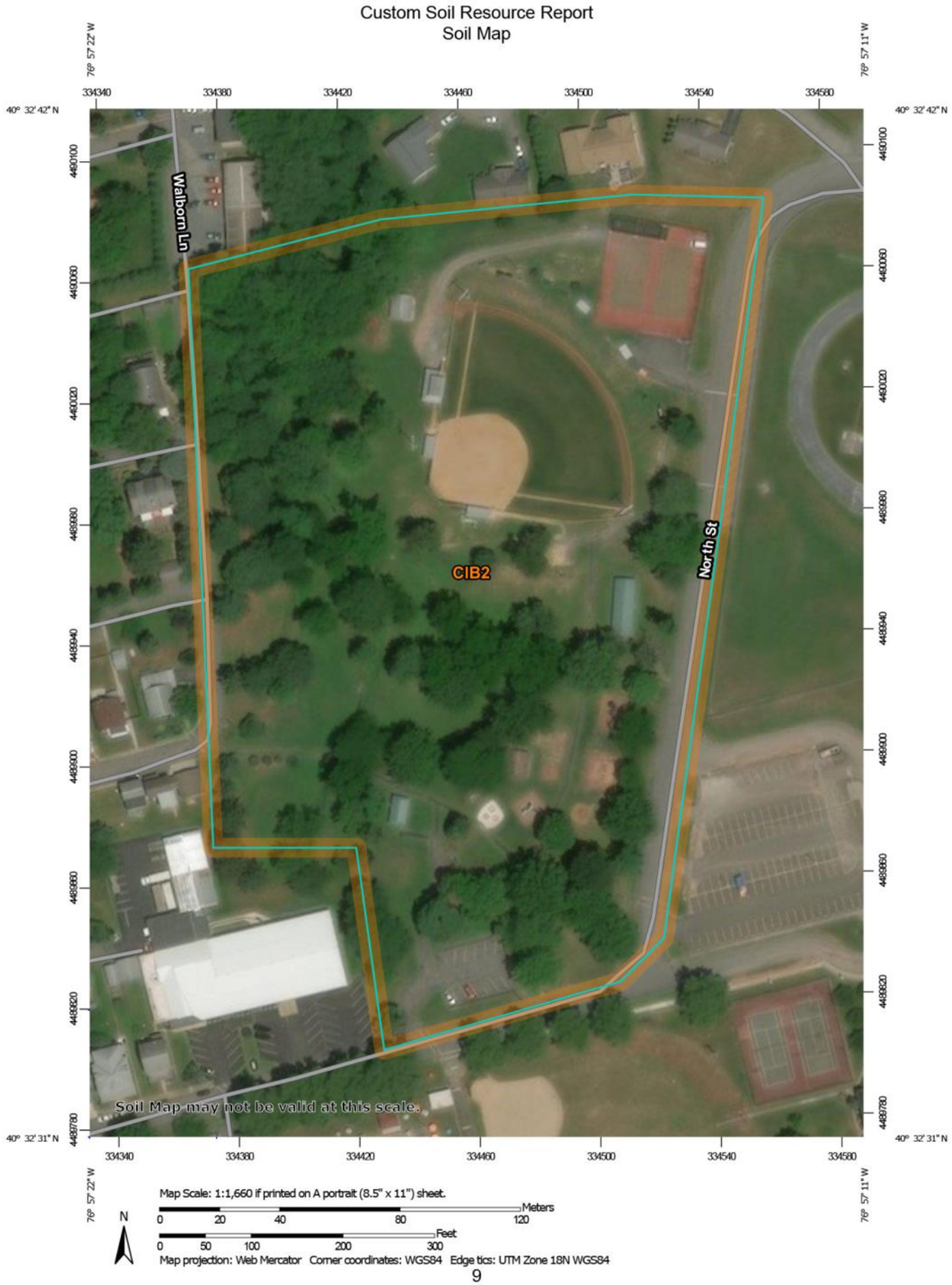
Minor Components

Klinesville
Percent of map unit: 6 percent
Hydric soil rating: No

Blairton
Percent of map unit: 3 percent
Hydric soil rating: No

Bedington
Percent of map unit: 3 percent
Hydric soil rating: No

Hustontown
Percent of map unit: 3 percent
Hydric soil rating: No



Site Soils - Market Square/Veterans Park

Soils indicate that the site is well drained, has no hydric soils, minimal slopes of 3-8%, more than 80" to bedrock, and more than 80" to water table. These conditions determine the limiting factors and challenges for development on site.

Description of Duncannon

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Coarse-silty loess over residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 16 inches: very fine sandy loam
H2 - 16 to 58 inches: silt loam
H3 - 58 to 99 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

CHAPTER 4

PARK MASTER PLANS

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

CONCEPT DESIGNS

The conceptual designs for each park were developed in consideration of the park goals outlined by the Project Study Committee, site limitations, surrounding land uses, and the information compiled from the key person interviews, focus groups, and public meetings.

The planning process for the parks revealed the improvements desired by the residents to address the needs and dynamic uses at Market Square/Veterans Park, improve quality and expanded use at Brown-Bradenbaugh Park, and to revitalize and expand uses at Seal Park. The concept plans were developed with these goals in mind while providing a framework for implementation. Each concept was developed so that improvements could be developed and sustained by the Borough as it continues to enhance its long-term operations and management of the parks.

The conceptual designs were presented at a Study Committee meeting April 5, 2018 and each alternative revised based on the input provided. The revised plans were presented as the pre-final designs at the Cherry Blossom Festival on May 5, 2018 and additional comments taken into consideration in finalizing each concept.

Park Study Committee Design Concept Conclusions

Brown-Bradenbaugh Park

- Although there was a recommendation to continue utilizing portable restrooms at the park, the committee would like to see an overlay plan that shows a permanent restroom building.
- The improvements to the existing ball field adjacent to the swimming pool which is currently owned by the school district was looked at favorably. Members of the committee attended the April 16, 2018 school board meeting and the following resolution was adopted:

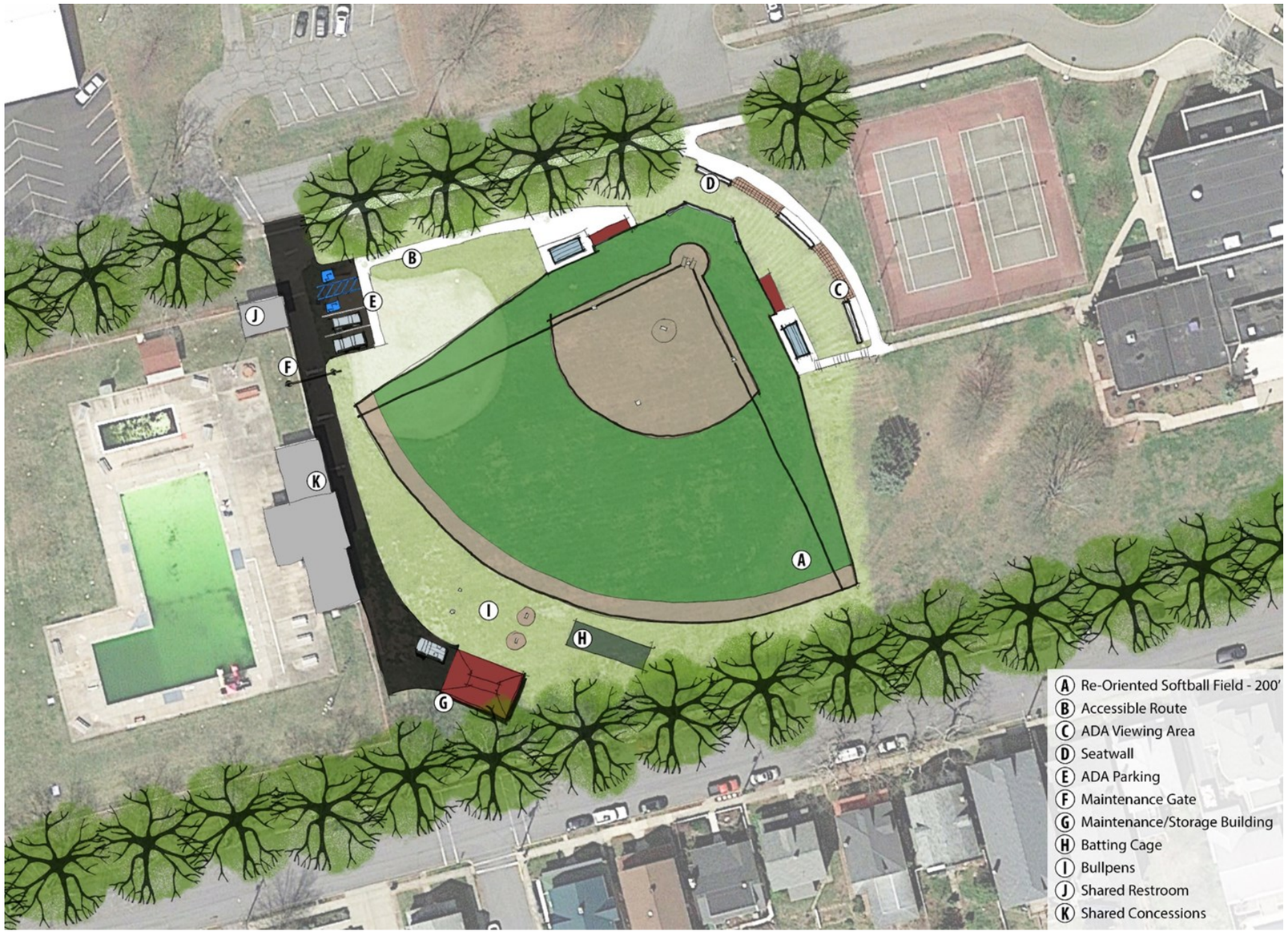
  "It is the recommendation of the Facilities Committee that Millersburg Borough Mast Parks Plan includes the development of a softball field, which meets established PIAA regulations, on the field located beside the Millersburg pool.

  On motion of Mr. Novinger, seconded by Mrs. Mongold, the resolution was approved:

  RESOLVED: Approval is given to Millersburg Borough to include the development of a PIAA sized softball field, on the field located beside the Millersburg pool, in their Master Parks Plan.

  Voting for the resolution: Harris, Minnich, Mongold, Novinger, Roadcap, Savage, Walter, Rothermel; against - none".

If the recommendation to rebuild the existing school district's softball field is advanced, then the field at Brown-Bradenbaugh could be used as a secondary youth/softball field. If the need for an additional field is not warranted then the site could be repurposed to expand the bird sanctuary and create a natural area that could potentially also serve as a flood mitigation site. It should be noted that the School District is considering merging all sports, including softball, with Upper Dauphin School District. The vision at this time is for Upper Dauphin to host softball due to their existing facilities. The timeline calls for this change to happen in the spring, 2024 season, but there has been discussion of accelerating this schedule.



This alternative concept was presented to begin discussions with the School District to investigate a potential partnership to renovate the existing girls softball field and re-purpose Brown-Bradenbaugh to a more natural park that meets more than one need. The investment into Brown-Bradenbaugh should be considered with the overall context of recreation in the Borough. Further investigation is needed to fully explore the potential benefits of this scenario. The proposed concept realigns the existing baseball field to take advantage of the slope providing viewing areas, adding supporting amenities, and forming a layout for improved pedestrian access to and between Seal Park and the School. This location would provide much needed restroom and changing facilities by utilizing existing facilities either at Seal Park, the adjacent pool, or nearby school building.

Park Study Committee Design Concept Conclusions

Seal Park

- The dog park should be removed. The committee agreed with the consultant recommendations that due to the limited size of the area, and the seasonal wetness in that location the park was not a suitable location for that use.
- A second pedestrian bridge should be added, and proposed trail should continue across the stream along the western boundary to provide a continuous loop trail.
- The restroom location will be field verified by the consultant and committee to determine the final location that will be depicted on the master plan.

Seal Park - Teen Node

POPP TABLES AS (PLAYABLE) PUBLIC ART

(A) New Parking Lot (33 spaces, 2 ADA)
(B) Memorial Plaza
(C) Bleachers
(D) Batter's Eye
(E) Retaining Wall
(F) Accessible Route
(G) Batting Cages
(H) 8' wide Resurfaced Trail with ADA Connections to Existing Facilities and Playground Equipment
(I) New Restroom Building
(J) Teen Node
(K) Improved Parking Area (18 spaces, 2 ADA)
(L) Boardwalk/Interpretive Platform
(M) Lowland Meadow
(N) Wet Meadow/Stream Restoration
(O) Dog Run
(P) Small Dog Area


Welcome to the Woodland Vernal Pool
The habitat in front of you features a seasonal vernal pool area. Vernal pools are shallow, seasonal wetlands that periodically dry up, making them important for the amphibian life cycle. Vernal pools depend on tree canopy cover. If the forest canopy is removed, the sunlight could dry out the soil enough over the year to allow other plants to emerge and change the habitat over time. Meet the wood frog "Woody" and the spotted salamander "Spotty". Let's follow them through the seasons and see how they use vernal pools.
Summer
What Happens Here in the Summer?
Summer

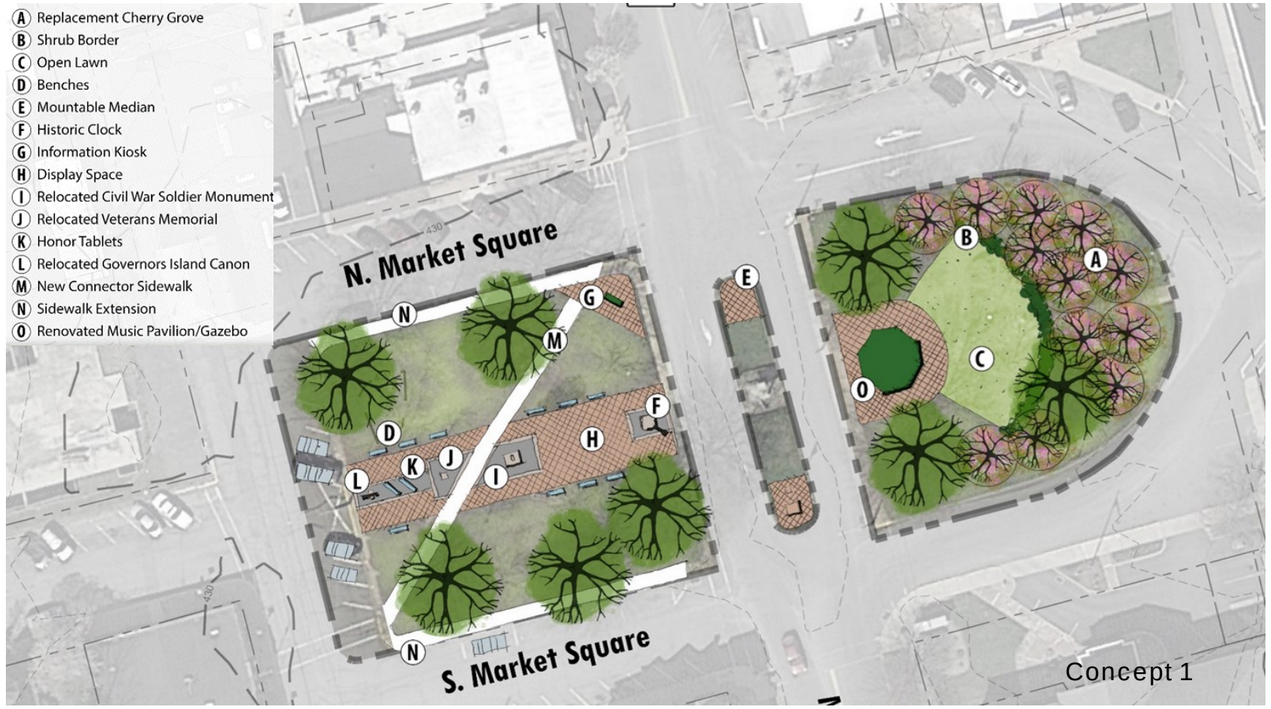

Fothergilla
x intermedia
'Blue Shadow'
FOTHERGILLA
Hamamelidaceae


POLLINATORS' GARDEN

Park Study Committee Design Concept Conclusions

Market Square/Veterans Park

- Ideas from each of the alternatives presented will be combined into one pre-final plan.
- The east side of the park (Market Square) will be shown as depicted in Concept 1 with the following revisions:
  - Only show one row of cherry trees.
  - Add steps to the rear of the existing gazebo.
  - Expand the lawn area.
  - Show the expanded sidewalk area as depicted in Concept 2.
  - Consider alternatives placement of advertising signs at the easternmost end of the park.
- The west side of the park (Veterans Park) will be shown as depicted in Concept 1 with an overlay for the proposed street closure of North Market Square Street to accommodate the pedestrian plaza as depicted in Concept 2.
- The new layout should be revised to include the following revisions:
  - Position the soldier in a central place of honor, and move the other monuments to a quieter, more reflective area of the park away from the traffic on Route 147.
  - Relocate service memorial with flags on the diagonal pathway's west side on the central axis of the park. The Order of Precedence of service flags is the US flag, Army, Marines, Navy, Air Force, and Coast Guard (Coast Guard moves behind Navy in times of war when Coast Guard is in the service of the Navy). There would be an area to the west for adding stone tablets and/or metal plaques recognizing service members names.
  - Keep the cannon as the anchor for the western end of the memorial promenade. This linear hardscaped area along the east-west central park axis will be flanked with benches.
  - Keep the clock in the central location anchoring the eastern end of the promenade and adjacent to route 147 to maximize visibility.
  - Use the open area between the soldier and the town clock for veteran's services and for the annual temporary Christmas tree.
  - Keep the parallel parking on the south side of the park. The existing one -way traffic pattern along South Market Square will remain.



Concept 1

Concept 2


D
F
Plum Street
Plum Street
Pine Street
Church Street
Water Street
A
B
C
D
E
F
G
H
I
J
Brown-Bradenbaugh Park
Final Master Plan
Millersburg Borough
Dauphin County, Pennsylvania
A Expanded Parking Area (39 spaces, 2 ADA)
B Paved ADA Parking
C Accessible Route
D Portable Restroom Enclosure
E Picnic Area
F Bird Sanctuary Enhancements
- Native Plantings
- Bird Boxes
- Clear Dead Trees
- Bird Feeders
G Dedicated Batting Cage
H Bank Stabilization (Imbricated Stone Wall)
I Maintained Lawn
J Existing Storage/Concessions Upgrade
Potential New Restroom Building
October 2018
Park Area: 1.72 Acres
30' 0 30'
15'
60'
SCALE IN FEET
1" = 30'


N
M
L
J
Walborn Road
Wert Street
Dougherty Avenue
Moore Street
North Street
Summer
Summer
POLLINATORS' GARDEN
Seal Park
Final Master Plan
Millersburg Borough
Dauphin County, Pennsylvania
(A) New Parking Lot (33 spaces, 2 ADA)
(B) Memorial Plaza
(C) Bleachers
(D) Batter's Eye
(E) Retaining Wall
(F) Accessible Route
(G) Batting Cages
(H) 8' wide Resurfaced Trail with ADA Connections to Existing Facilities/Playground Equipment
(I) New Restroom Building
(J) Teen Node
(K) Improved Parking Area (18 spaces, 2 ADA)
(L) Boardwalk/Interpretive Platform
(M) Lowland Meadow
(N) Wet Meadow/Stream Restoration
(O) Sidewalk Extension
(P) Maintained Lawn Path
(Q) Bioretention Area
October 2018
Park Area: 8.80 Acres
50' 0' 50'
25' 100'
SCALE IN FEET
1" = 50'


C
K
B
E
J
G
I
M
147
N. Market Square
Union Street
West Street
Market Street
Veterans/Market Square Park
Final Master Plan
Millersburg Borough
Dauphin County, Pennsylvania
A Replacement Cherry Grove
B Shrub Border
C Memorial Plaza with Relocated
- Bicentennial Time Capsule
- Civil War Soldier Monument
- Governors Island Cannon
- Veterans Memorial
- Re-use Friends of Swinging Bridge Pavers
D Benches
E Seasonal Planting Bed
F Renovated Music Pavilion/Gazebo
G Mountable Median
H Sidewalk Extension/Widening
I Historic Clock
J Information Kiosk
K Pedestrian Plaza
L New Connector Sidewalk
M Open Lawn
N Water Fountain
October 2018
Park Area: <1.00 Acres
30' 0 30'
15' 60'
SCALE IN FEET
1" = 30'

Veterans/Market Square Park
Final Master Plan
Pedestrian Plaza Overlay
Millersburg Borough
Dauphin County, Pennsylvania

- (A) Replacement Cherry Grove
- (B) Shrub Border
- (C) Memorial Plaza with Relocated
  - Bicentennial Time Capsule
  - Civil War Soldier Monument
  - Governors Island Cannon
  - Veterans Memorial
  - Re-use Friends of Swinging Bridge Pavers
- (D) Benches
- (E) Seasonal Planting Bed
- (F) Renovated Music Pavilion/Gazebo
- (G) Mountable Median
- (H) Sidewalk Extension/Widening
- (I) Historic Clock
- (J) Information Kiosk
- (K) Pedestrian Plaza
- (L) New Connector Sidewalk
- (M) Open Lawn
- (N) Re-Oriented Angled Parking (13 spaces, 2 ADA)
- (O) Pedestrian Plaza
  - Sidewalk Cafe
  - Outdoor Seating
  - Tables & Umbrellas
- (P) Security Planters
- (Q) Water Fountain

October 2018

Park Area: <1.00 Acres

30′ 0 30′
15′ 60′
SCALE IN FEET
1″ = 30′

CHAPTER 5

RECOMMENDATIONS

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

MASTER PLAN KEY RECOMMENDATIONS

The planning process for the three parks revealed the improvements desired by Borough residents and responds to the immediate and long-term needs of the residents. While the individual master site development plans provide an overall framework for the physical redevelopment of each park, the following recommendations were developed for the system as a whole with an emphasis on the parks' role as a catalyst for revitalization.

1. Plan for the replacement of the Holiday Tree and Cherry Trees in Market Square/ Veterans Park.
2. Develop a Tree and Vegetation Management Plan for the parks.
3. Enhance the Landscaping.
4. Address Accessibility and Circulation within the Parks .
5. Stormwater Management.
6. Develop Tanner Run Floodplain Restoration as a Model Project.
7. Seize the opportunity to utilize Market Square/Veterans Park as a catalyst for revitalization.
8. Become a Destination, not a Drive-Thru.
9. Implement temporary closure (Interim Public Plaza) at North Market Square.
10. Make the Parks a Lively Place with Many Recreation and Educational Opportunities.

1. Plan for the replacement of the Holiday Tree and Cherry Trees in Market Square/ Veterans Park

At its August, 2018 meeting, Brough Council decided to retire the aging evergreen tree centrally located in Market Square/Veterans Park. The decades–old landmark had reached the end of its lifespan. Removal of the tree opens up the park allowing for the reconfiguration of the memorials to create a more unified space that is more flexible in its use. A central plaza area is defined to serve both as a display and small event space. A temporary Christmas Tree will be displayed in the plaza and begin a new tradition for the citizens of Millersburg.

Similar to the evergreen Christmas Tree, the iconic cherry trees are fast approaching the end of their lifespan. They are currently overcrowded and overgrown which creates limited visual access to and within the park. The master plan proposes a replacement grove of cherry trees located in the parks eastern edge (Market Square Park).


US Capital, Washington, DC

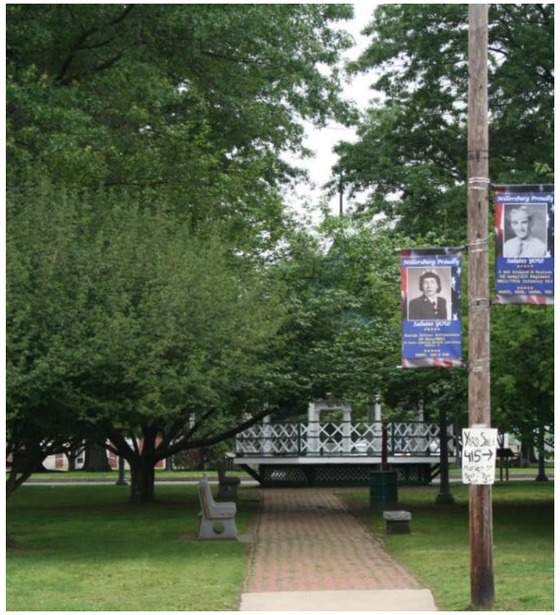

Philadelphia, PA

City of York, PA

Image courtesy of https://www.yorkpa.org/blog/post/12-ways-to-get-in-the-holiday-spirit-in-york-county/

Since the possibility exists that the cherry trees may die before implementation of the proposed improvements at Market Square/Veterans Park, a tree replacement plan should be developed now. The purpose of this Plan is to provide guidance for installing replacement trees, in compliance with Borough requirements and the objectives of the master plan layout. This plan should reflect the concepts outlined in the master plan for removal of the existing cherry trees and establishment of the new grove.

2. Tree and Vegetation Management



The preservation of the existing trees is a high priority for the residents. A long-term Master Planting Plan to identify and replace the aging trees in the Borough Parks should be developed. The first step would be conducting an inventory of the exiting trees, including an evaluation of their age, health, and species. The Master Planting Plan would direct tree removals and show locations and species of new and supplemental tree plantings. An important component of the Master Planting Plan would be development of a maintenance program to keep existing large trees healthy. Basic guidelines would include removal of dead and dying trees, selective pruning to prolong the life of existing trees, and removal of invasive and unwanted species.

3. Enhance the Landscaping

Landscaping should be introduced to solve problems, improve maintenance, and enhance the visual image and functions of the park. Plantings should provide visual interest, promote native wildlife, enhance the image of the park, separate uses, provide areas of shade, reduce maintenance needs, and buffer surrounding landowners. They should also be designed to:

- Provide shade in active areas.
- Expand food and cover for wildlife.
- Facilitate connectivity of vegetative cover.
- Reduce scattered pockets of vegetation which dilute the ecological function and value.
- Buffer sensitive natural resources.
- Improve water quality.
- Enhance settings for environmental education exhibits and programs.
- Mitigate and restore eroded areas, areas of invasive species, or other degraded areas.
- Facilitate the circulation and visitor activities in public use areas.
- Screen adjacent land uses.
- Reduce maintenance costs.

Where landscaping is incorporated into the site, the use of native plant materials should be promoted. Plant material native to the County is adapted to the geographic location and, as a result, will require less maintenance, withstand the extremes in climate change, be less susceptible to disease and pests and propagate naturally. Well-designed landscaping can lower maintenance requirements. Elements such as signs, light posts, and rock boulders throughout the park should be placed within landscaped areas. Maintained meadow planting and lawn mow lines should be established which reduce mowing needs, especially outside of activity areas. Meadows along the trail and access drives should have a mowed edge (the width of a mower deck) to delineate managed parkland. Entrances to the main activity areas should be attractively landscaped with a signature design that designates the area as the entrance to a park facility.

4. Address Accessibility and Circulation within the Parks

The points of entry to the parks set the tone for what the visitor is about to encounter and makes a lasting impression. Access zones must be clearly identified from the adjacent roadways and properties, have a clear and designated entrance points with signage, and provide visual cues for destinations and parking.

Each park design provides accessible routes from the parking area that connects facilities and destination points within the parks. Brown-Bradenbaugh proposes walkways from the parking areas to the restrooms and field area while a loop trail system of varying trail surfaces and widths is provided at Seal Park. Market Square/Veterans Park includes walkways and plaza areas that tie to each facility and the adjacent sidewalk system.

Paved trails must be developed to meet the design requirements of the Americans with Disabilities Act (ADA). The US Architectural and Transportation Barriers Compliance Board adopted specific guidelines for accessibility for natural areas titled: Recommendations for

Accessibility Guidelines: Outdoor Developed Areas. These guidelines apply to all newly design and constructed pedestrian trails. They require compliance with the ADA, but permit departures from the specific technical provisions where certain conditions exist. The trails will be designed to accommodate emergency and maintenance vehicles as necessary.

5. Stormwater Management

Plan now for stormwater management within the parks. Public parks and green open spaces are being valued not just as important gathering spaces for our communities, but for their ability to protect our waterways and mitigate flooding events. "Green Parks" as they are more commonly referred to as, use stormwater management tools such as rain gardens, stormwater tree trenches, porous parking lots and play courts, to capture runoff water from rain and snowstorms, allowing it to absorb into the soil where flowers, shrubs and trees can soak it up.

Traditionally, stormwater management focused on larger scale and regional facilities. However, there is a growing trend towards low impact development (LID) techniques and better understanding of natural hydrologic processes. The focus has shifted towards smaller scale systems that are more context sensitive. Rather than piping stormwater to one central holding facility, runoff is collectively treated on site as part of the natural system allowing groundwater recharge as a means of allowing soils and wetlands to soak up stormwater and to extend the base flows of streams.

The existing parks do not currently have any visible stormwater management facilities which will be required for any proposed improvements in order to capture, manage, and treat increased runoff associated with the redevelopment and expansion. All three parks are within a watershed governed by an approved Act 167 Plan; therefore, additional coordination with Dauphin County and Millersburg Borough will be required to ensure that any proposed activities comply with the stormwater management requirements. Therefore, the project must meet Dauphin County's ACT 167 plan, Millersburg Borough's stormwater ordinance and PADEP NPDES Permit requirements to manage stormwater runoff rate and volume with properly designed BMPs. Millersburg Borough does not currently meet the state's criteria for an MS4 permit requirement, however, these requirements may change and require Millersburg Borough to obtain an MS4 permit which would allow the Borough to benefit from the implementation of these BMPs by receiving stormwater credits and/or offsets based on the amount of runoff treated and pollutants removed and go towards the Borough's future MS4 permit requirements.

6. Develop Tanner Run Floodplain Restoration as a Model Streambank Restoration Project

The segment of stream running through Seal Park is partially silted in and therefore unable to provide flood storage during a storm event. The proposed restoration project aims to reclaim the floodplain by removing fill and grading it to the right elevation and slope to allow water to spread out over the area, instead of overtopping the banks and impacting the park and nearby businesses.

As part of the master planning process, a visual assessment of Tanner Run Watershed was

Existing Conditions

Proposed

conducted to determine existing stream conditions. This was followed by a hydrology and hydraulic analysis to evaluate stream and floodplain restoration as a stormwater management and mitigation facility. The results concluded that this is a viable solution to address the increased runoff from the proposed expansion of Seal Park. In addition, this method would improve downstream flooding and address water quality issue. A detailed summary of the analysis and conclusions is included in Appendix J.

A detailed plan of action should be developed to begin securing grants for the proposed stream restoration work at Seal Park. The restoration will serve as a showcase that will inspire subsequent flood mitigation measures and improvements. As part of the planned improvements the Borough should engage community members about how streams work and demonstrate what a reclaimed floodplain looks like, showing how these restoration efforts would not damage property or devalue businesses. Once community members start seeing results from different floodplain restoration projects, they will want action.

7. Seize the opportunity to utilize Market Square/Veterans Park as a catalyst for revitalization

Parks and recreation facilities are complex elements of a Borough. Parks serve many different uses or can simply provide visual appeal for residents, businesses, and tourists. They act to define the shape and feel of the Borough and its neighborhoods. They can also function as a tool for revitalization. Parks can stem the downturn of a commercial area, help stabilize neighborhoods, and provide a landmark and a point of pride for constituents. For all these things to happen, the Borough needs to be open and aware of the potential of parks to spur revival and support the strategies that are needed to make that happen. According to the Trust for Public Land[1]:

- Parks that serve as central walking, resting, and meeting places can revive failing or threatened commercial areas.
- Renewal takes leadership, vision, and time; with these three ingredients, revitalization tends to attract ever more investment.
- Community residents and the city, working together on a neighborhood park project, can turn around a distressed residential area.
- Parks don't automatically lead to neighborhood revival; before investing, the city should make sure the relation of a park to its surrounding neighborhood will allow revitalization.

There's no guarantee that a public park will be a community amenity. Poorly maintained parks can be frightening places that negatively affect their surroundings. Parks need as much thoughtful attention to design, maintenance and surrounding uses as every other constructed element in the Borough, from housing to retail to commercial to entertainment. Elements to keep in mind when hoping to use city parks for community revitalization:

1. Physical: A park should be both a worthwhile destination in itself and an attractive walking route to use in the course of doing other business.
2. Community Building: Revitalizing a park should provide the opportunity for people in the area or neighborhood to get to know each other and work together for the greater good.
3. Economic: The park should create such a distinctive presence that it gives businesses the opportunity to play off the "signature" to increase the downtown's vitality. For a park in a residential area, the distinctiveness should give homeowners the confidence to renovate and upgrade their own properties.
4. Context: The park must be located in a community that has the economic opportunity and political will to revitalize.
5. Programmatic: Research has shown that the single most important factor in increasing park usage is programming.[2]

8. Become a Destination, not a Drive-Thru

Market Square/Veterans Park is an authentic Town Square that should be celebrated. SR 147 is a major corridor with and average ADT of 7,500. It connects to Sunbury to the north, SR 209 to the east to the Interstate 81 and SR 322 to the south. Market Square/Veterans Park is positioned to capture the attention of drivers and showcase and celebrate the uniqueness of the Borough. A marketing campaign to showcase the square should be developed to allow the park to serve as the gateway that announces your arrival to Millersburg. This could be achieved by a number of creative means such as an Art in the Park program or a unique seasonal light show. The goal would be to capture the attention of passersby and promote all that the town has to offer.

On a larger scale the Borough should consider marketing itself as a River Town and/or Trail Town to capitalize on tourism. While there is no River Town program, the Borough could work with the Susquehanna Greenway Partnership on the River Town concept. The Pennsylvania Environmental Council is getting ready to post information about river towns on its website and that of the Susquehanna Greenway Partnership's.

"Design for people, not cars."

[1]Trust for Public Land. (2002) City Parks Planning Forum: How Cities use Parks for Community Revitalization. American Planning Association 122 S. Michigan Ave, Suite 1600, Chicago, IL 60603; www.planning.org.

[2]Deborah A. Cohen, MD, Bing Han, PhD, Catherine J. Nagel, MLA, Peter Harnik, BA, Thomas L. McKenzie, PhD, Kelly R. Evenson, PhD, Terry Marsh, MPH, Stephanie Williamson, BA, Christine Vaughan, PhD, Sweatha Katta, MPH. (2016). American Journal of Preventive Medicine, "The First National Study of Neighborhood Parks". pp 419 – 421.

9. Implement temporary closure (Interim Public Plaza) North Market Square

The temporary closure of North Market Square as an Interim Public Plaza would transform an otherwise underutilized area of roadway into public space to be enjoyed by patrons of the surrounding businesses as well as park users. As public spaces are becoming more scarce in urban areas temporary parks, parklets, pop-up parks and street closures are becoming common place. They are places that urge residents to linger, socialize, and support local businesses. The strategy behind the implementation of a temporary public space is to inexpensively design and dress up the area for use immediately. Instead of waiting for capital funding to be secured, navigating a long design and permitting process, inexpensive and reliable temporary materials are used. Low cost materials including paint, epoxied gravel for the pavement, movable planters, movable tables and chairs, are used to create and define the space. Research has shown that successful temporary spaces often are transformed to permanent designs within a few years.

The following summary has been adapted from the Urban Street Design Guide for Interim Plazas.

https://nacto.org/publication/urban-street-design-guide/interim-design-strategies/interim-public-plazas/

Application Interim public plazas are most commonly applied when there is a dedicated partner such as a local business or neighborhood association.

Benefits & Considerations - Public plazas have the potential to:

- Make intersections safer, more compact, and easier to cross for pedestrians.
- Slow traffic speeds and mitigate potentially dangerous intersection conflicts.
- Activate a public place by reclaiming space unused or underused by motorists.
- Energize surrounding streets and public spaces, creating foot traffic that can boost business and invigorate street life in a neighborhood.
- Although a small segment of street, loss of liquid fuel funds would be associated with a permanent street closure.

Critical - It is critical that parking is not allowed or permitted within the public plaza. Plazas shall also include ADA compliant tactile warning strips at the crosswalks.

Recommended - Plazas should be defined with the use of low-cost, and durable materials. Prior to implementation, municipalities are advised to post an informational placard advertising the plaza to ensure that local stakeholders are aware of the installation.

10. Make the Parks Lively Place with Many Recreation and Educational Opportunities

Programming is a complex issue for Millersburg Borough. Recreation programs and events are important to the community yet the Borough is without any staff or volunteer board to undertake programs. Furthermore, the Borough offers a significant number of special events supported by community based organizations. For now, the Borough should strive to provide the venues for programs in the parks that could be programmed by other community based organizations.

Consider establishing a future Parks and Recreation Board that could be charged with creating a limited number of community programs, services or activities. Services for children appear to be needed. As cited previously, recent research by the RAND Corporation commissioned to study the use of parks found that the number one factor in getting people to use parks and increasing the use of public parks was programming.

CHAPTER 6

OPERATIONS AND MANAGEMENT

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

About Park Maintenance

With the park master planning process for Market Square and Veteran's, Seal Park, and Brown-Bradenbaugh Park, Millersburg Borough decided to explore maintenance in order to ensure that the future park improvements would be protected, that visitors will have enjoyable experiences, and the Borough's parks will be part of a strategy to attract tourists and serve as a tool for the overall revitalization of the community. This was an important decision, as over the lifetime of a park, about 75 percent of its cost is in maintenance. It is usually easier to secure funds for the acquisition, development, and improvement of parks than it is to secure budget for staffing and associated costs of maintaining a park. An important but un-newsworthy topic, effective park maintenance is the single most important factor in a successful parks and recreation system. There are no ribbon cuttings for removing trash!

Park Maintenance in Millersburg Borough

Millersburg Borough's Public Works Department maintains the parks for the enjoyment of our citizens and visitors.

Millersburg Borough's parks total 20 acres including Riverfront Park, MYO Park, Market Square and Veteran's Park, Brown-Bradenbaugh Park, Millersburg Area Public Pool, and Seal Park. The Borough Manager is actively involved in managing all public properties, including streets and parks. Borough Council is committed to excellence in parks as evident in this park master planning process, improvements to MYO Park, and to the daily operation of the parks and recreation facilities. While this master planning project includes three of the five parks and the town swimming pool, a key aspect of this master planning process was considering these parks as part of the Borough's overall parks and recreation system. They are not discrete parks each unto themselves but are actually part of an overall system that gives Millersburg Borough its identity. Each park has unique features which work together to make the park system appear larger than it really is. That is, the system as a whole with its riverfront park, historic town square, sports fields, natural areas, and public pool seems much larger and impactful than 20 acres.

Management Perspective

Millersburg Borough is a model small community doing great things via consistency in management, public private partnerships, and vigilance in seeking new ways of maintaining public properties. A compact riverfront community of ¾ of a square mile with a population of 2,511, about a half hour from the state capital, the Borough must be creative in park maintenance and management. Not only does the Borough have the traditional park maintenance responsibilities like trash removal, grass mowing, and swimming pool operation, Millersburg has major signature park programs and events that draw thousands of people into the community. These events are key to the economic vibrancy of the community. Such events as the Christmas display require many weeks of work for set up and take down by the Public Works staff. Pennsylvania's oldest transportation system, the Millersburg Ferry, operates out of Riverfront Park and is a major tourist attraction. For tourism agencies to advertise and promote recreation facilities, they must be maintained in a premier condition further underscoring the importance of maintenance in Millersburg where tourism plays an important role in its economic vibrancy.

Millersburg Ferry Boat at Riverfront Park

One the last two, all-wooden, double stern-wheel paddleboats in the U.S., the Millersburg Ferry Boat carries vehicles and passengers across the mile-wide Susquehanna River, between Millersburg in Dauphin County and a landing downriver of Liverpool in Perry County. In a particularly beautiful part of the Susquehanna, where mountains and historic towns press up against the shorelines and islands dot the river, the ferry continues as the oldest transportation system in Pennsylvania. It's included in the National Registry of Historic Places and the Pennsylvania state historic registry. Although the exact date of origin for the ferry is not known precisely, the volunteer Millersburg Ferry Boat Association celebrated its 200thbirthday with music, speakers, presentations and fireworks in 2017 at Millersburg Riverfront Park.

Source:PennLIVE https://www.pennlive.com/wildaboutpa/2017/06/beautiful_pennsylvania_millers.html

Getting by with the Help of Their Friends

A small staff of three full-time and one part-time workers would be hard pressed to perform all the tasks necessary to care for the parks and recreation facilities here, let alone provide the significant programs the Borough offers. These include:

- Christmas Display
- Fireworks Display
- Cherry Blossom Festival
- Tour De Millersburg
- Wine Festival
- Halloween Party and Parade
- Healthy Kids Running Series
- Teener Baseball
- Girls Softball

Organizations that support these events by raising funds and providing significant volunteer support include Millersburg Fire Company, MAWT (Millersburg Area Working Together), youth sports, Lions Club, Rotary Club, and the Parks Committee of Borough Council. At one time, there was a Chamber of Commerce but it has ceased to exist.

Organization and Staffing

Borough Council as the chief elected officials are charged with the duty to provide for the health, safety and welfare of the public. Borough Council sets forth policy and establishes ordinances and regulations. Council forms their subcommittee for parks and recreation: the Parks Committee. There is no Parks and Recreation Board.

The Millersburg Borough Manager is responsible for implementing policies set forth by Council. The Borough Manager is also responsible for day to day operations of the Borough.

The Millersburg Borough Public Works Department maintains all public properties, streets, and parks. Three full-time workers and one part-time seasonal worker perform all the tasks necessary to keep the parks safe, clean, functional, and attractive.

Cost Basis for Maintenance: Budget and Staffing

Budget

About 44 percent of the Public Works Department salaries is spent on park maintenance attesting to the importance of parks in Borough operations. The Borough's budget for parks and recreation is about $86,581 including Public Works salaries, benefits and wages devoted to park maintenance; equipment; supplies; materials; utilities; and related expenses. The Borough generates about $5,000 in pavilion rental fees, user fees, and vendor fees.

As an excellent example of workload cost tracking for all municipalities with a small staff and limited resources, the Borough Manager uses a simple paper and pencil method for tracking workload in park maintenance that would be easily replicated in any community with a limited staff and budget. The beauty and effectiveness is in its simplicity. Workers write their hours on bi-weekly time sheets in three categories: parks, streets, and public properties. With paper and pencil in hand, the Manager adds up the hours in each division of Public Works by which he determines the number of hours spent on park maintenance. Without detailing hours by task or facility, the Manager can still estimate where and what the crew was doing based upon time of year and events occurring.

Using this as an estimate for maintenance, this equates to about $4,329 per acre. In reviewing the hours spent on park maintenance and in light of the programs, it is projected that the actual per acre cost is about $3,000 for $60,000 and the set up time required for the Borough's special events and programs would be about $26,580. The $3,000 per acre is within the appropriate range of cost for maintenance per acre found elsewhere in Pennsylvania.

Staffing

In terms of budget comparisons for staffing, 44 percent of the Public Works Department salaries goes to park maintenance. For three workers at 2,080 work hours per year translates into a total of 6,240 hours. This does not include the Part-Time seasonal employee's hours. Forty-four percent of that equals 2,746 equates to 1.3 Full-Time Equivalent workers. The best parks and recreation systems in the nation have a ratio of about one worker to 18 acres. That is without the scale of the special event supported by the Millersburg Public Work Department. The Borough's ratio for workers to park acres in real time hours is about one worker to 15 acres all totaled but probably more like one worker to about 20 acres considering the set up time for events. The Borough should maintain this ratio of park maintenance workers to park acreage.

Optimal Operations and Budget

The goal of this master planning process in terms of maintenance, staffing, budget and partnerships was to stay within the current level of service and its excellent system of management. Typically park master plans recommend increasing staffing and budget to care for new, additional or improved facilities. This master plan takes a different approach in that the revitalization of aging and well-loved and used facilities should actually make maintenance easier. Instead of looking toward increased costs, this master plan is looking toward cost savings and reductions in maintenance expenditures. Does that mean to reduce budget or staff? No! It simply means that existing staff would be able to do things faster, more efficiently, or easier, enabling them to do things they have not been able to do before. Taking the appearance of the parks, especially Market Square and Veteran's Park to a higher level will help to increase its appeal spurring further tourism and visitation. The recommendation of such facilities as movable chairs and additional seating and tables will require some extra work that could be done as a park partnership project with merchants who will benefit from the Square's increasing visitation to the area and increased use of the Square.

Time saving measures could include:

- Purchase of a Gator to enable the workers to install the hundreds of temporary signs required for each special event.
- Investigation of an LED lighting system for Market Square that could be used year round without the requirement of stringing lights.
- Exploration of trash collection reduction or elimination through policies such as "carry out" in smaller parks and ballfields.
- Development of an urban forestry program to manage trees to both improve the tree canopy as well as to reduce the hours required from storm clean up warranted by fallen trees and limbs.
- Park design for low maintenance such as reductions in trimming requirements. One of the challenges with this concept is that the parks are already existing and design is re-design

not new design. The relocation of things like established trees for low maintenance may not necessarily be cost effective if the reason is reduced trimming.

Examples of Efficiencies and Optimization of Resources through Partnerships and Programs:

Establishment of new or expanded partnerships for Market Square.

Development of a Millersburg Park Friends organization.

- Consider bringing in equipment dealers or manufacturers to evaluate park maintenance equipment to determine if the Borough has the optimal equipment for the jobs performed. Based upon the equipment expert's opinions, develop an acquisition or replacement program for park maintenance equipment. The immediate purchases needed are a large chipper and a tractor.
- Evaluate the potential to contract out maintenance tasks. Such tasks would be tasks that can be standardized with clearly defined, routine and repetitive functions such as restroom maintenance and mowing.
- Consider involvement with one of the Pennsylvania Department of Community and Economic Development's programs such as the Main Street Manager program in which Millersburg could apply for a planning grant followed by an implementation grant to carry out a recommended program. The parks could play a central role in the revitalization strategy explored in a program such as the Main Street Manager program. Cities throughout Pennsylvania that have successfully carried out Main Street Manager programs have included parks in their strategies.

Achieving Borough Goals Through Parks and Recreation

It is important to strive to also maintain a focus on Millersburg Borough's public parks and recreation system as a whole including the three parks being master planned in this project. Fortunately, the level of public support and interest in the parks here is high. Research into successful park and recreation systems elsewhere conducted by the Trust for Public Land and the National Recreation & Park Association offers guidance for how Millersburg Borough can organize its operations as the parks are revitalized. The factors common in successful award-winning parks and recreation systems throughout the United States include the following:

1. Parks must rank high on the political agenda to get funded.[1]
2. The public is involved in the planning, design and operation of the park.
3. The park design conveys a strong vision and purpose for the park.
4. The parks are programmed with many and varied activities for visitors of all ages.
5. The parks and each of their facilities are safe and clean. Clean, attractive appearance is crucial to a park's success and positive perception by the public and the business community.
6. A mix of public and private funding sources support park improvements and operation.
7. Community parks are an organizing element for initiatives such as economic development, neighborhood improvement, increasing livability of the municipality and so on.
8. Parks & recreation future friends' groups or advisory boards, Borough Manages, staff, and elected officials must play a leadership role in insuring that parks are part of overall community and economic planning.[2]

These factors can serve as the model for Millersburg Borough's parks and recreation system. The key recommendations detailed below were derived from the involvement of the Master Plan Study Committee, input from Borough management, key person interviews, and the experience of planning team.

1. Establish the Importance of the Parks with Core Values and a Mission.

Millersburg Borough Park Mission

The mission of Millersburg Borough's parks and recreation system is to improve quality of everyday life for our residents, spur economic development by helping to attract and retain businesses, position the Borough as a tourism destination, and to protect our precious natural resources of clean air and water.

2. Continue to Involve the Public in Park Planning, Design, Programming and Operation.

Public support is vital to park success:

- Continue to involve the public in park planning as the master plans are phased in over time.
- Consider the establishment of a Park Friends group to support the parks and their future improvements, development, programming, and operation.
- Join the Pennsylvania Parks & Recreation Society to take advantage of the current information available about parks, recreation, funding, and technical support. One of their services is a "no match" grant program of $2,500 called RecTAP. The RecTAP grant can be

[1]Harnik, Peter. (2000) Inside City Parks. Washington, D.C.: Trust for Public Land. p xi.
[2]Garvin, Alexander and Berens, Gayle. (1997) Urban Parks and Open Space. (New York: Urban Land Institute) pp 36-40.

used to solve a problem, tackle an issue or seize an opportunity. It would enable the Borough to address a specific idea in a relatively short timeframe. Projects that the Borough could consider include the establishment of a park friends' group; addressing a fundraising initiative; development of the concept for a signage system to be implemented over time; tree management planning; and other subjects that could support the Borough's interests.

3. Implement the Park Master Plans.

Follow the recommendations in phasing in the park improvements. Continue the momentum begun in the master planning process by developing a work plan for year one.

- Consider applying for two grants in the first year in order to stoke momentum: the Pennsylvania Department of Conservation and Natural Resources Community Conservation Partnerships and the Pennsylvania Department of Community and Economic Development. Use the gaming money for the match.
- Look for other community champions to take on a planning element such as a project in Market Square.
- Implement the unfinished recommendation for MYO and Riverfront Parks.

4. Establish a Standardized Maintenance and Management Program.

Over the years that Millersburg Borough has been maintaining public parks, the maintenance requirements have become somewhat normalized. In fact, the Borough has a line item budget for park maintenance. This information will also help in planning the phasing in of the master plan and other park developments or improvements. Workload cost tracking using the time cards and analysis of the time cards with respect to tasks and parks should continue. While current operations are effective, plans such as this should advocate provisions for stabilizing operations over time as staff, managers, elected and appointed officials change over time. The following section outlines an approach for formalizing the park maintenance management system.

Proposed Park Maintenance Guidelines

While the Public Works Department operates with utmost professionalism under the direction of the Borough Manager, the following guidelines are proposed as the foundation for all park maintenance in the future to ensure ending excellence through changes in staff, management and administration. The following guidelines reflect the Borough's approach to park maintenance operations and are merely formalized in writing. These guidelines apply to municipal employees, contractors, and volunteers who assume responsibility for park maintenance tasks.

1. All maintenance will be accomplished in a manner displaying respect and concern for the environment as well as public and private property. Maintenance practices that are rooted in a strong conservation ethic are to be instituted.
2. Maintenance tasks will be accomplished in a way that does not endanger the health or safety of the employees nor the public.
3. All maintenance tasks will be performed as quickly and economically as possible without any loss in efficiency.
4. All equipment and materials will be operated and maintained in such a way as to insure safe, effective use, and long life.
5. Work will be scheduled in such a manner as to make the most use of the resources of other community organizations who are involved or who may become involved.
6. Preventive maintenance will be used in a continuing effort to avoid major problems and correct minor ones.
7. All maintenance work will be performed with a sense of pride.

Park Maintenance Standards

Maintenance standards set forth the level of care that park and recreation facilities receive. They would apply to all Borough parks, not only to Market Square/Veteran's Park, Brown-Bradenbaugh Park and Seal Park.

5. Importance of Assigning Maintenance Standards

Assigning maintenance standards will enable Millersburg Borough to maintain all parks with respect to needs and resources. Targeting the appropriate level of care will enable the Borough to direct resources to balance public use with natural resource conservation. The maintenance standards provide a common frame of reference for the community including elected and appointed officials, borough employees, maintenance staff, administration, contractors, partners, sponsors, park visitors, and the citizens. The common agreement will facilitate discussions and communications about the parks. This will enable elected and appointed officials and Borough management to establish and implement policies on use, fees and charges, volunteer requirements, staffing levels, contractual service requirements, and other issues that may emerge. It will also enable the Borough to communicate with the public about the capacity of the municipality to undertake actions in response to citizen demands on the park(s), park maintenance tasks, natural resource protection actions, requests for additional facilities and/or services, and policies that affect park use.

National Recreation & Park Association Standards: An Approach

The National Recreation and Park Association advocates a system of maintenance modes for parks. Modes refer to the "way of maintenance" ranging from most intensive to least intensive. The important concept of maintenance modes is that not all parks or all facilities within parks must all be maintained at the same high level of service that is never really attainable given limited resources. The level of maintenance for facilities should be related to importance, public visibility and usage. Some facilities are more important than others. Some facilities have greater public visibility and use than others. These would merit a higher level of care. And conversely, limited

resources would dictate that a lower level of maintenance can occur at facilities with less use and visibility. The modes range as follows:

- Mode I - State of the Art Maintenance
- Mode II - High Level Maintenance
- Mode III - Moderate Level Maintenance due to moderate levels of development
- Mode IV - Moderately Low-Level Maintenance
- Mode V - High Visitation Natural Areas
- Mode VI - Minimum Level Maintenance

To protect Millersburg Borough's investment in its parks as well as to provide for public safety and enjoyment of the parks, the following standards are proposed:

Inspections – *Mode I* - Park inspection of the core visitation areas in each park such as the playgrounds and park hubs should be done daily during peak season. Mode V should be done every other week in the natural areas. All formal playgrounds should follow CPSC (Consumer Product Safety Commission) guidelines. The Borough should provide training opportunities to enable maintenance staff to obtain CPSI (Certified Playground Safety Inspector) certification. Recommendations for playground inspections are daily or weekly depending upon use and level of activity.

Turf Care – Turf care for each park would include general park areas which currently takes 24 work hours to mow and trim. Grass is mowed approximately weekly or more or less often if needed.

Bioretention Areas – Mode IV - Over their lifetime. First year requires frequent inspection and monitoring including after a storm with ½ inch of rainfall. Thereafter, quarterly mowing of grass areas. Most work is annual or as needed. The restoration of problem areas such as replacement of dead plants, raking, pruning, mulching and invasive removal.

Ballfields – Mode depends upon level of play from recreational through tournament. This plan recommends Mode II, high level of maintenance. This should be based upon partnerships with community sports leagues and memoranda of agreements.

Disease and Insect Control – Modes would vary by facilities.

- *Natural Areas - – Mode III* - Disease and insect control is done only to insure public safety or when a serious problem discourages public use.

Forestry – A forestry management program should be developed to provide short, medium, and long-range management for the parks. Tree conditions currently result in significant work time for the Public Works Department. Picking up limbs after a storm requires days of work. Typically, municipalities obtain the services of county conservation district or a Pennsylvania Bureau of Forestry Service Forester and/or a private consultant.

Floral Planting – Mode V - Floral planting should only be introduced where there is a community group to maintain them in accordance with a written agreement.

Tree and Shrub Care – Mode IV - requires no pruning and care only to remove safety hazards.

Litter Control – Mode II - Which is once per day five days a week during peak season, weekly during non-peak, and monthly in cold weather months. Litter is always picked up after a special event. For special use facilities such as a picnic pavilion, the permittee should be responsible for litter pick-up and depositing it in park dumpsters while Millersburg Borough would remove it from the park.

Surfaces and Paths – Mode II - So that surfaces are cleaned and repaired when appearance have notably been affected.

Repairs – Mode II - When safety, appearance or function is in question, repairs are made.

Restrooms – Mode I - Should be done at least once per day. Special events or times of high use may warrant more than one service per day.

Policies

As Millersburg Borough's parks are improved, official effective policies need to be in place regarding park operations and use. Policy needs will evolve over time. The point is to spend time on policies that are needed to ensure sustainable operating practices but not to spend time on generating prolific rules and regulations. Policies should make operations easier, smoother, and facilitate the generation of public support. Examples of policies that could be considered in the immediate time frame based upon the current park operations scenario include on the following:

- Revenue Policy – Develop a formal revenue policy for parks and recreation that specifies Millersburg Borough's philosophy on alternative revenue sources and policies on fees and charges, grants, gifts, donations etc.
- Gifts and Donations Policy – It is the intent of Millersburg Borough to encourage and facilitate public and private gifts, bequests, and such contributions that enhance, beautify, improve, supplement, support, or otherwise benefit the Borough's park and recreation system. The true costs of installation, maintenance and cyclic replacement for park donations should be considered as part of the donation price. Provisions regarding the repair and replacement of such equipment should be defined.
- Sponsorships – Millersburg Borough can continue to seek sponsorships for facilities, events and services. The purpose of such sponsorships is to increase the Borough's ability to deliver services to the community and/or provide enhanced levels of service beyond the core levels funded from the municipal general fund. In appreciation of such support, the Borough should set forth a formal policy to provide sponsors with suitable acknowledgement of their contributions. However, such recognition for park and recreation facility improvements should adhere to the aesthetic values and purpose of

Borough parks. In addition, such recognition must not detract from the visitor's experience or expectation, nor would it impair the visual qualities of the parks or be perceived as creating a proprietary interest. The following link connects to Portland, Oregon's policy on sponsorships that can be a model for Millersburg Borough:

http://www.portlandonline.com/shared/cfm/image.cfm?id=155566

- Naming Rights – Naming Rights are a financial transaction and form of advertising in which a corporation, business, individual or other entity purchases the right to name a facility or event, typically for a defined period of time. For large properties like a community building or an athletic field, the term ranges from three to 20 years. The distinctive characteristic for this type of naming rights is that the buyer gets a marketing property to promote products and services, promote customer retention, or increase market share.

  https://www.metroparkstacoma.org/file_viewer.php?id=31256

- Advertising – The intent of an advertising policy is to generate revenues from paid advertising and sponsorships to offset some of the costs associated with producing program brochures and other informative literature, maintaining and improving athletic and other recreation facilities, and procuring capital equipment related to recreational facilities which would not otherwise be funded in the department budget. The policy must be rooted in the aesthetics and mission of the parks as well as the visitor experience. The following link provides a model of an advertising policy from Los Alamos for adaption in Millersburg Borough.

  http://recreationguy.com/wp-content/uploads/2011/09/Recreation-Advertising-Policy.pdf

Risk Management

Having safe facilities for visitors as well as protecting the public investment is essential to Millersburg Borough. Public perception that the parks are safe is important to their success. As part of establishing safe parks that limit the Borough's exposure to liability, effective risk management can help to protect both park visitors and the municipality. Coordination with Millersburg Borough's insurance carrier throughout the development and operation of the park would be helpful in reducing risk. Supportive insurance carriers offer advice, on-site assessment and sometimes grant funding to support safe facilities through proper maintenance management. Their advice will be helpful in identifying and adopting practices to insure visitor and park safety.

Risk Management is a standard operating practice of parks and recreation agencies. Risk includes the possibility that harm could result from a hazard that would cause personal injury, death, property damage, economic loss or damage to the environment. To manage risk in all Borough parks, three steps are needed:

1. Risk Identification and Assessment – It is necessary to identify all of the sources of potential hazards in the parks. The Borough must have knowledge at all times of any risk related to the park. This includes park conditions as well as the employees or volunteers that might make the Borough subject to liability as the result of how they complete their duties, and any other liability.
2. Risk Assessment – Millersburg Borough should inspect and evaluate the parks and each facility as part of its ongoing park and recreation system operating practices. This would also include tracking of the incidents of injury reported in the parks.
3. Risk Management Plan – The Risk Management Plan is important for both safe operations as well as in establishing credibility in case of litigation. The plan should include the following documents all of which should be reviewed by the Borough solicitor:
   - Statement that the Borough is committed to safety for citizens, municipal employees and Borough facilities.
   - Accident forms.
   - Participation forms and waivers.
   - Rental agreements and leases.
   - Program dates and documents.
   - Operations information and policies.
   - Reports for maintenance and procedures.
   - Inspection program and reports.
   - Policy on background checks for Borough employees, volunteers working with children and for permittees of municipal facilities who are providing community recreation services.

6. Funding: A Mix of Public and Alternative Resources

Millersburg Borough supports parks and recreation through a mix of municipal support, some fees and charges and a great deal of support from community based organizations for the special events. Table 1 presents the budget for all Borough parks. Consideration of creating cost centers for each park could be made over time. But in reality with a limited staff and tasks that greatly exceed current work hours available, current methods of using the time sheets, analysis of work hours from the time sheets and tracking of the budget through the current financial tracking monthly works just fine. The one cost center that may be of the most importance would be Market Square and Veteran's Park. The other cost center worth exploring is the time spent on setting up and taking down for Special Events. Table 1 presents this budget that will be the basis for the budgets in subsequent years. As efficiencies are added, the budget could be adapted. This budget for parks and recreation is 7.8 percent of the Borough's overall operating budget which is higher than PA DCNR recommendations reflecting Borough Council's commitment to parks and recreation as an essential public service.

TABLE 1: MILLERSBURG BOROUGH RECREATION AND PARKS BUDGET 2014-2018					
Recreation					
	2014 Actual	2015 Actual	2016 Actual	2017 Through Nov.	2018 Budgeted
452.200 · Donation to Pool Association	4,400.00	3,500.00	3,500.00	4,400.00	3,000.00
452.210 · Swimming Pool Slide	0.00	0.00	0.00	0.00	0.00
452.215 · Payout of Pool Grant	0.00	0.00	0.00	0.00	0.00
452.220 · MARC Donation	0.00	0.00	0.00	0.00	0.00
Total 452 · Recreation	4,400.00	3,500.00	3,500.00	4,400.00	3,000.00
Parks					
454.210 · Park Maintenance Supplies	838.00	1,096.19	1,497.84	648.18	800.00
454.211 · Park Construction Supplies	2,010.01	2,997.86	2,789.78	6,816.24	4,500.00
454.220 · Park Tools	383.36	743.43	782.27	647.44	675.00
454.230 · Park Equipment Gas	1,100.16	755.35	577.87	815.26	750.00
454.250 · Park Equipment Maint. & Supplies	1,526.87	1,528.79	1,708.43	4,037.44	2,700.00
454.260 · Park Maintenance	944.00	637.50	265.69	158.99	450.00

TABLE 1: MILLERSBURG BOROUGH RECREATION AND PARKS BUDGET 2014-2018					
Parks (Cont'd)					
	2014 Actual	2015 Actual	2016 Actual	2017 Through Nov.	2018 Budgeted
454.350 · Park Electric	3,766.11	3,750.81	2,375.30	2,071.31	1,811.00
454.767 · Park Rules Signs	0.00	0.00	0.00	0.00	0.00
454.778 · Tree Removal/Stump Grinding	2,450.00	2,440.00	4,800.00	2,675.00	2,500.00
454.780 · Trash Disposal Service	335.00	372.00	442.00	484.00	450.00
454.782 · Park Bench Plates	160.00	0.00	0.00	0.00	0.00
454.783 · Fireworks Display	2,000.00	2,000.00	2,000.00	1,000.00	1,000.00
454.784 · Tour de Millersburg Bike Race	2,000.00	2,000.00	2,000.00	1,000.00	1,000.00
454.785 · Peer-to-Peer Project	0.00	0.00	0.00	0.00	0.00
454.786 · Swimming Pool Renovations	0.00	0.00	505.40	82.45	0.00
454.787 · Gazebo Flags & Bunting	0.00	0.00	0.00	0.00	0.00
454.788 · Tourism Promotion	1,715.18	200.00	200.00	0.00	0.00
454.789 · Flood Repair	0.00	0.00	0.00	0.00	0.00

TABLE 1: MILLERSBURG BOROUGH RECREATION AND PARKS BUDGET 2014-2018					
Parks (Cont'd)					
	2014 Actual	2015 Actual	2016 Actual	2017 Through Nov.	2018 Budgeted
454.800 · Capital Purchases - Parks	0.00	0.00	0.00	0.00	0.00
454.801 · River Front Park Clean-Up	2,547.50	2,860.00	4,100.00	2,170.00	3,350.00
454.802 · Seal Park Swing Set	0.00	0.00	0.00	0.00	0.00
454.803 · MYO Septic Tank Clean-Out	0.00	0.00	0.00	0.00	0.00
454.804 · Ferry Boat Iron Anchors	0.00	3,153.40	0.00	0.00	0.00
454.805 · Bollard Replacement	2,689.00	0.00	6,095.00	2,872.00	500.00
454.806 · Grant Application Fee	0.00	100.00	40.00	0.00	0.00
454.807 · Seal Park Pavilion Demolition	445.54	750.00	0.00	0.00	0.00
454.808 · RF Park Swing Installation	0.00	24.48	0.00	0.00	0.00
454.809 · MYO Baseball Field Restitution	0.00	750.00	0.00	0.00	0.00
454.810 · Plantings	0.00	0.00	117.11	881.11	540.00
454.811 · MYO Recycling Site Debris Removal	0.00	0.00	8,490.00	2,192.50	2,000.00

TABLE 1: MILLERSBURG BOROUGH RECREATION AND PARKS BUDGET 2014-2018					
Parks (Cont'd)					
	2014 Actual	2015 Actual	2016 Actual	2017 Through Nov.	2018 Budgeted
454.812 · MYO Recycling Site Grading	0.00	0.00	0.00	1,500.00	0.00
454.813 · Master Parks Plan Expense	0.00	0.00	0.00	0.00	19,500.00
Total 454 · Parks	24,910.73	26,159.81	38,786.69	30,051.92	42,526.
Public Works Salaries – 44% for parks	NA	NA	NA	$43,955 Actual	$43,955 Projected
				TOTAL	$86,581 Projected

Table 2 presents the revenues for Millersburg Borough Parks. Potential revenues for parks and recreation could be derived from pavilion rentals, programs, a friend's organizations and user fees.

TABLE 2: POTENTIAL REVENUE SOURCES	
Item	Projection
Pavilion Fees	$5,000
User Fees	$1,500
Vendor Fees	$1,500
Park Friends	$1,000
TOTAL Projections	$9,000.00

Borough Revenue Sources for Grants

Dauphin County receives a Local Share Assessment from gaming proceeds from the Hollywood Casino in Grantville. The County disperse the grant funds through a competitive process to municipalities in the form of grants. These grants have been significant up to the hundreds of thousands of dollars. This funding can be used to match grants from PA DCNR and PA DCED.

PA DCED funds can be used to match PA DCNR funds but the timing on the grant rounds is such that the Borough would have to guarantee matches in grant applications without knowing the potential of using grants for either agency as a match.

See Appendix K for an extensive information sheet on sources of funding for parks and recreation.

Training community based organization on how to fundraise could be considered. RecTAP or PEER grants could be used to retain a fundraising consultant to assist with this effort.

CHAPTER 7

IMPLEMENTATION AND COST ANALYSIS

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

INTRODUCTION

Construction budget estimates for the redevelopment of each park was developed based on the assumption that implementation would occur through a public bidding process. Ideally construction activities should occur in one phase to take advantage of the economy of scale, and to minimize disruption to the site and surrounding neighborhoods. The reality is that few parks are constructed in one phase and most municipalities find it more appropriate to phase construction over a period of time.

Phasing

Typically, park development is completed in phases based on community need, funding opportunities, logical sequences of construction, and considerations for how the park will function. Construction costs for the redevelopment of Seal Park will occur in two phases while both Brown-Bradenbaugh and Market Square/Veterans Park redevelopment can occur under a single phase each. A Separate estimate is provided for permanent improvements to convert North Market Square to a pedestrian Plaza. Each estimate should be viewed as a recommendation for development planning and capital programming.

The overall total cost of all park improvements is estimated between	$3.00 - $3.38M
Brown-Bradenbaugh	$235,000 - $275,000
Seal Park Phase 1 (Stream Restoration/Stormwater Mitigation)	$425,000 - $475,000
Seal Park Phase 2 (General Park Improvements)	$1.4M - 1.6M
Market Square/Veterans Park (General Park Improvements)	$720,000 - $765,000
Market Square/Veterans (Pedestrian Plaza Overlay)	$220,000 - $260,000

Catalyst Projects

It is important to identify and develop projects that can be easily implemented shortly after adoption of the Master Plan to maintain momentum and show commitment to the overall success of the master plan.

The following catalyst projects are being recommended as they meet the immediate goals of the community and complement regional planning activities:

- Implement the temporary closure of North Market Square as and Interim Public Plaza.
- Identify and work with a local volunteer group or eagle scout to establish the bird sanctuary at Brown-Bradenbaugh Park. At a minimum clear weeds and invasive plants and thin dying trees and install bird boxes.
- Work with High School Science Department to develop tree identification markers for all the specimen trees within Seal Park.

CHAPTER 8

APPENDICES

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

This page intentionally left blank.

Appendix A

PRECEDENT PROJECTS

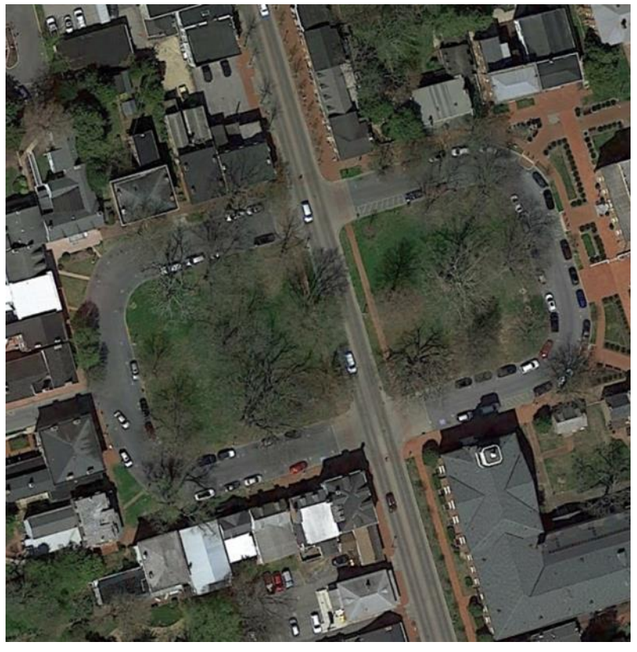
Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

America's Most Beautiful Town Squares

- Centerway Square, Corning, NY
- Yavapai County Courthouse Plaza, Prescott, AZ
- Healdsburg Plaza, Healdsburg, CA
- Market Square, Portsmouth, NH
- Court Square, Bardstown, KY
- The Dover Green, Dover, DE
- Parade Plaza, New London, CT
- City Square Park, Oskaloosa, IA
- Jackson Town Square, Jackson, WY
- Decatur Square, Decatur, GA
- Village Green, Bar Harbor, ME
- The Square, San Marcos, TX

TRAVEL+ LEISURE

Images and information courtesy of http://www.travelandleisure.com/slideshows/americas-most-beautiful-town-squares#the-square-san-marcos-tx



350'x160'

The Dover Green, Dover, DE

340'x130'

Veterans/Market Square Park, Millersburg, PA

The Dover Green, Dover, DE

Centerway Square, Corning, NY

Appendix B

DEVELOPMENT COST ESTIMATES

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

BROWN-BRADENBAUGH PARK

Budget Estimate - Millersburg Borough Parks
Dauphin County, Pennsylvania
General Park Improvements

09.25.2018

ITEM	DESCRIPTION		EST. QTY.	UNITS	UNIT PRICE	TOTAL COST
A.	**Site Improvements**					
A.1	**General Requirements**					**$1,500**
	A.1.1	Entrance Sign/Funding Acknowledgment	1	EA	$1,500	$1,500
A.2	**Site Preparation and Demolition**					**$2,860**
	A.2.1	Strip and Stockpile Topsoil (6" deep)	90	CY	$4	$360
	A.2.2	Demolition / Pavement Removal	0.10	AC	$5,000	$500
	A.2.3	Selective Tree Removal in Bird Sanctuary	1	LS	$2,000	$2,000
A.3	**Erosion and Sedimentation**					**$6,000**
	A.3.1	Soil Stabilization and Controls	1	LS	$4,000	$4,000
	A.3.2	Rock Construction Entrance / Wash Rack	1	EA	$2,000	$2,000
A.4	**Earthwork**					**$350**
	A.4.1	Bulk Excavation and Fill				
		A.4.1.1 Bulk Cut (Common Earth)	50	CY	$3	$150
		A.4.1.2 Bulk Fill (Common Earth)	50	CY	$4	$200
		Balance:		CY		
A.5	**Pavements - Parking / ADA Improvements**					**$12,340**
	A.5.1	Expanded Parking Area (39 Spaces, 2 ADA)	111	SY	$40	$4,440
	A.5.2	Paved ADA Parking (2 ADA)	55	SY	$40	$2,200
	A.5.3	ADA Parking, Signage and Striping	1	LS	$1,800	$1,800
	A.5.4	Wheel Stops	39	EA	$100	$3,900
A.6	**Stormwater Management Allowance**		1	LS	$5,000	**$5,000**
A.7	**Trails**					**$21,600**
	A.7.1	Concrete Walk - Accessible Route	2,700	SF	$8	$21,600
A.8	**Site Structures**					**$67,000**
	A.8.1	Portable Restroom Building	1	LS	$17,000	$17,000
	A.8.2	Existing Storage/Concessions Upgrade	1	LS	$50,000	$50,000
A.9	**Site Amenities**					**$10,300**
	A.9.1	ADA Picnic Tables	2	EA	$1,500	$3,000
	A.9.2	Picnic Tables	2	EA	$1,500	$3,000
	A.9.3	Trash Receptacles	2	EA	$900	$1,800
	A.9.4	Water Fountain / Bottle Filler	1	EA	$2,500	$2,500
A.10	**Athletic Improvements**					**$3,000**
	A.10.1	Relocated Batting Cage	1	EA	$3,000	$3,000
A.11	**Stream and Bird Sanctuary Enhancements**					**$47,500**
	A.11.1	Bank Stabilization (Imbricated Stone Wall)	100	LF	$400	$40,000
	A.11.2	Bird Sanctuary Enhancements Allowance	1	LS	$7,500	$7,500
A.12	**Landscaping**					**$2,130**
	A.12.1	Spread Topsoil 6" Thick, Fine Grade, Fertilize	600	SY	$2.20	$1,320
	A.12.2	General Lawn Seeding	5,400	SF	$0.15	$810
					TOTAL BASE COST :	**$179,580**
					10% DESIGN CONTINGENCY:	**$17,958**
1	Professional Design Fees (15%)					**$26,937.00**
2	Construction Contingency Fund (5%)					**$8,979**
3	Bonding, Mobilization, and Construction Layout (12%)					**$21,550**
	TOTAL PROJECT ESTIMATE					**$255,000**

Page 1 of 1

SEAL PARK - PHASE I

Budget Estimate - Millersburg Borough Parks
Dauphin County, Pennsylvania
Stream Improvements / Stormwater Mitigation

09.25.2018

ITEM	DESCRIPTION		EST. QTY.	UNITS	UNIT PRICE	TOTAL COST
A.	**Stream Improvements / Stormwater Mitigation**					
A.1	**Stream Improvements / Stormwater Mitigation**					**$310,000**
	A.11.1	Wet Meadow / Stream Restoration	1,200	LF	$250.00	$300,000
	A.11.2	Lowland Meadow Seeding	50,000	SF	$0.20	$10,000
					TOTAL BASE COST :	**$310,000**
					10% DESIGN CONTINGENCY:	**$31,000**
1	Professional Design Fees (15%)					**$46,500.00**
2	Construction Contingency Fund (5%)					**$15,500**
3	Bonding, Mobilization, and Construction Layout (12%)					**$37,200**
	TOTAL PROJECT ESTIMATE					**$440,200**

SEAL PARK - PHASE II

Budget Estimate - Millersburg Borough Parks
Dauphin County, Pennsylvania
General Park Improvements

09.25.2018

ITEM	DESCRIPTION		EST. QTY.	UNITS	UNIT PRICE	TOTAL COST
A.	**Site Improvements**					
A.1	**General Requirements**					**$1,500**
	A.1.1	Entrance Sign/Funding Acknowledgment	1	EA	$1,500	$1,500
A.2	**Site Preparation and Demolition**					**$23,100**
	A.2.1	Strip and Stockpile Topsoil (6" deep)	150	CY	$4	$600
	A.2.2	Demolition / Pavement Removal	0.50	AC	$5,000	$2,500
	A.2.3	Selective Tree Removal	1	LS	$5,000	$5,000
	A.2.4	Building Demolition	1	LS	$15,000	$15,000
A.3	**Erosion and Sedimentation**					**$16,000**
	A.3.1	Soil Stabilization and Controls	1	LS	$12,000	$12,000
	A.3.2	Rock Construction Entrance / Wash Rack	2	EA	$2,000	$4,000
A.4	**Earthwork**					**$4,900**
	A.4.1	Bulk Excavation and Fill				
		A.4.1.1 Bulk Cut (Common Earth)	700	CY	$3	$2,100
		A.4.1.2 Bulk Fill (Common Earth)	700	CY	$4	$2,800
		Balance:		CY		
A.5	**Pavements - Parking / ADA Improvements**					**$374,900**
	A.5.1	New Parking Lot (33 Spaces, 2 ADA)	2,000	SY	$40	$80,000
	A.5.2	Improved Parking Area (18 Spaces, 2 ADA)	1,000	SY	$40	$40,000
	A.5.3	Unit Pavers at Plaza / Bleachers / Restroom Bldg/Teen Node	8,000	SF	$18	$144,000
	A.5.4	Bituminous Pavement at Teen Node	60	SY	$40	$2,400
	A.5.5	Bituminous Pavement at Baseball Field	2,500	SY	$40	$100,000
	A.5.6	Wheel Stops	55	EA	$100	$5,500
	A.5.7	Parking Lot Pavement Markings and Signage	1	LS	$3,000	$3,000
A.6	**Stormwater Management Allowance (Bioretention)**		1	LS	$10,000	**$10,000**
A.7	**Trails**					**$160,800**
	A.7.1	8' Resurfaced Trail with ADA Connections	2,800	SY	$40	$112,000
	A.7.3	4' Concrete Sidewalk Extension - North Street	6,000	SF	$8	$48,000
	A.7.4	Painted Crosswalk	4	EA	$200	$800
A.8	**Site Structures**					**$230,000**
	A.8.1	New Restroom Building	1	LS	$150,000	$150,000
	A.8.2	Boardwalk / Interpretive Platform	1	LS	$35,000	$35,000
	A.8.3	Improved Existing Pedestrian Bridge	1	LS	$30,000	$30,000
	A.8.4	Retaining Wall	600	SF	$25	$15,000
A.9	**Site Amenities**					**$64,000**
	A.9.1	ADA Picnic Tables	4	EA	$1,200	$4,800
	A.9.2	Picnic Tables	4	EA	$1,200	$4,800
	A.9.3	Benches	4	EA	$1,000	$4,000
	A.9.4	Trash Receptacles	6	EA	$900	$5,400
	A.9.5	Game Table - Teen Node	2	EA	$1,500	$3,000
	A.9.6	Ping Pong Table - Teen Node	1	EA	$7,000	$7,000
	A.9.7	Water Fountain / Bottle Filler - Teen Node	1	EA	$2,500	$2,500
	A.9.8	Bike Rack - Teen Node	1	EA	$700	$700
	A.9.9	Climbing Structure - Teen Node	1	EA	$12,500	$12,500
	A.9.10	Poured in Place Surfacing- Teen Node	500	SF	$25	$12,500
	A.9.11	Curbing - Teen Node	90	LF	$20	$1,800
	A.9.12	Interpretive Signage	1	EA	$5,000	$5,000
A.10	**Athletic Improvements**					**$44,350**
	A.10.1	Half-Court Basketball - Teen Node	1	EA	$18,000	$18,000
	A.10.3	Bleachers	3	EA	$700	$2,100
	A.10.4	Batter's Eye	75	LF	$150	$11,250
	A.10.5	Batting Cages	2	EA	$6,500	$13,000
A.11	**Landscaping**					**$13,775**
	A.11.1	Spread Topsoil 6" Thick, Fine Grade, Fertilize	500	SY	$2.20	$1,100
	A.11.2	General Lawn Seeding	4,500	SF	$0.15	$675
	A.11.3	Trees	30	EA	$250	$7,500
	A.11.4	Shrubs	50	EA	$60	$3,000
	A.11.5	Perennials	50	EA	$30	$1,500
					TOTAL BASE COST :	**$943,325**
					10% DESIGN CONTINGENCY:	**$94,333**
1	Professional Design Fees (15%)					**$141,498.75**
2	Construction Contingency Fund (5%)					**$47,166**
3	Bonding, Mobilization, and Construction Layout (12%)					**$113,199**
	TOTAL PROJECT ESTIMATE					**$1,339,500**

MARKET SQUARE / VETERAN'S PARK

Budget Estimate - Millersburg Borough Parks
Dauphin County, Pennsylvania
General Park Improvements

09.25.2018

ITEM	DESCRIPTION	EST. QTY.	UNITS	UNIT PRICE	TOTAL COST
A.	**Site Improvements**				
A.1	**General Requirements**				**$1,500**
	A.1.1 Entrance Sign/Funding Acknowledgment	1	EA	$1,500	$1,500
A.2	**Site Preparation and Demolition**				**$10,820**
	A.2.1 Strip and Stockpile Topsoil (6" deep)	80	CY	$4	$320
	A.2.2 Demolition / Pavement Removal	0.10	AC	$5,000	$500
	A.2.3 Selective Tree Removal in Cherry Grove	1	LS	$10,000	$10,000
A.3	**Erosion and Sedimentation**				**$6,000**
	A.3.1 Soil Stabilization and Controls	1	LS	$5,000	$5,000
	A.3.2 Rock Construction Entrance / Wash Rack	1	EA	$1,000	$1,000
A.4	**Earthwork**				**$1,015**
	A.4.1 Bulk Excavation and Fill				
	A.4.1.1 Bulk Cut (Common Earth)	145	CY	$3	$435
	A.4.1.2 Bulk Fill (Common Earth)	145	CY	$4	$580
	Balance:		CY		
A.5	**Pavements / ADA Improvements**				**$168,200**
	A.5.1 Sidewalk Extension / Widening	7,500	SF	$8	$60,000
	A.5.2 Connector Sidewalk	850	SF	$8	$6,800
	A.5.3 Unit Pavers at Median / Intersection / Gazebo / Plaza	5,250	SF	$18	$94,500
	A.5.4 Median Mountable Curb	230	LF	$30	$6,900
A.6	**Stormwater Management Allowance**	1	LS	$55,000	**$55,000**
A.7	**Memorial Plaza**				**$109,934**
	A.7.1 Relocated Monuments	1	LS	$75,000	$75,000
	A.7.2 Reuse 'Friends of Swinging Bridge' Unit Pavers	300	SF	$20	$6,000
	A.7.3 Granite Curb	277	LF	$30	$8,310
	A.7.3 Blue Stone Pavers	865	SF	$20	$17,300
	A.7.3 Post and Chain Fencing	277	LF	$12	$3,324
A.8	**Site Structures**				**$68,000**
	A.8.1 Renovated Music Pavilion/Gazebo	1	LS	$65,000	$65,000
	A.8.2 Information Kiosk	1	LS	$3,000	$3,000
A.9	**Site Amenities**				**$78,900**
	A.9.1 Historic Clock	1	EA	$26,000	$26,000
	A.9.2 Benches	12	EA	$1,000	$12,000
	A.9.3 Trash Receptacles	6	EA	$900	$5,400
	A.9.4 Security Lighting	1	LS	$8,000	$8,000
	A.9.5 Decorative Lighting	1	LS	$25,000	$25,000
	A.9.6 Water Fountain / Bottle Filler	1	EA	$2,500	$2,500
A.10	**Waterline**				**$4,800**
	A.10.1 Extend Existing Waterline toWwater Fountain	80	LF	$60	$4,800
A.11	**Replace Cherry Grove**				**$5,000**
	A.11.1 Cherry Grove Allowance	1	LS	$5,000	$5,000
A.12	**Landscaping**				**$15,205**
	A.12.1 Spread Topsoil 6" Thick, Fine Grade, Fertilize	400	SY	$2.20	$880
	A.12.2 General Lawn Seeding	3,500	SF	$0.15	$525
	A.12.3 Shrub Boarder along Open Lawn	75	EA	$80	$6,000
	A.12.4 Ornamental Shrubs/Grasses	55	EA	$60	$3,300
	A.12.5 Perennials for Seasonal Planting Bed	150	EA	$30	$4,500
				TOTAL BASE COST :	**$524,374**
				10% DESIGN CONTINGENCY:	**$52,437**
1	Professional Design Fees (15%)				**$78,656.10**
2	Construction Contingency Fund (5%)				**$26,219**
3	Bonding, Mobilization, and Construction Layout (12%)				**$62,925**
	TOTAL PROJECT ESTIMATE				**$744,600**

MARKET SQUARE / VETERAN'S PARK

Budget Estimate - Millersburg Borough Parks
Dauphin County, Pennsylvania
Pedestrian Plaza Overlay

09.25.2018

ITEM	DESCRIPTION	EST. QTY.	UNITS	UNIT PRICE	TOTAL COST
B.	**Alternate Site Improvements**				
B.1	**Site Preparation and Demolition**				**$1,000**
	B.1.2 Demolition / Pavement Removal	0.20	AC	$5,000	$1,000
B.2	**Erosion and Sedimentation**				**$2,000**
	B.2.1 Soil Stabilization and Controls	1	LS	$2,000	$2,000
B.3	**Earthwork**				**$525**
	B.3.1 Bulk Excavation and Fill				
	B.3.1.1 Bulk Cut (Common Earth)	75	CY	$3	$225
	B.3.1.2 Bulk Fill (Common Earth)	75	CY	$4	$300
	Balance:		CY		
B.4	**Stormwater Management Allowance**	1	LS	$15,000	**$15,000**
B.5	**Pavements / ADA Improvements**				**$22,400**
	B.5.1 Sidewalk	2,800	SF	$8	$22,400
B.6	**North Market Square Pedestrian Plaza**				**$117,100**
	B.6.1 Unit Pavers at Pedestrian Plaza	5,000	SF	$18	$90,000
	B.6.2 Moveable Café Tables and Chairs	6	EA	$1,500	$9,000
	B.6.3 Café Tables and Chairs with Umbrella	5	EA	$2,000	$10,000
	B.6.5 Plaza Trees	6	EA	$250	$1,500
	B.6.6 Security Planters	3	EA	$1,000	$3,000
	B.6.7 Trash Receptacles	4	EA	$900	$3,600
B.7	**West Street Parking**				**$9,400**
	B.7.1 Vertical Curb	360	LF	$20	$7,200
	B.7.2 ADA Parking, Signage and Striping	1	LS	$2,000	$2,000
	B.7.3 Wheel Stops	2	EA	$100	$200
				TOTAL BASE COST :	**$167,425**
				10% DESIGN CONTINGENCY:	**$16,743**
1	Professional Design Fees (15%)				**$25,114**
2	Construction Contingency Fund (5%)				**$8,371**
3	Bonding, Mobilization, and Construction Layout (12%)				**$20,091**
	TOTAL PROJECT ESTIMATE				**$237,700**

Appendix C

APPLYING SUSTAINABILITY

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

INTRODUCTION

Sustainability and green design considerations have become increasingly important, and applying these values to park design has become a standard. As defined by Creating Sustainable Community Parks: A Guide to Improving Quality of Life by Protecting Natural Resources, a sustainable community park is one where natural resources are protected, wildlife habitats are improved and human recreational uses and maintenance practices do not conflict with, but rather enhance, the surrounding environment. The recently published Draft Guidelines and Performance Benchmarks for Sustainable Sites Initiative, further defines sustainability as land practices "that meet the needs of the present without compromising the ability of future generations to meet their own needs." The green initiative allows for the park to become and maintain self-sufficiency, while reducing the amount of time and cost that must be required to maintain certain areas in both the long and short-terms.

A sustainable park produces the following benefits to a community: economic benefits by attracting users to the park and the surrounding areas where the park resides; environmental benefits by reducing impacts to the environment and providing a safe area for wildlife; and health and safety benefits by giving the community a educational environment, allowing for active activities, and reducing crime, creating stronger/safer neighborhoods surrounding the park.

Do No Harm

Make no changes to the site that will degrade the surrounding environment. Promote projects on sites where previous disturbance or development presents an opportunity to regenerate ecosystem services through sustainable design.

Precautionary Principle

Be cautious in making decisions that could create risk to human and environmental health. Some actions can cause irreversible damage. Examine a full range of alternatives including no action and be open to contributions from all affected parties.

Design With Nature And Culture

Create and implement designs that are responsive to economic, environmental and cultural conditions with respect to the local, regional and global context.

Use A Decision-Making Hierarchy Of Preservation, Conservation And Regeneration

Maximize and mimic the benefits of ecosystem services by preserving existing environmental features, conserving resources in a sustainable manner and regenerating lost or damaged ecosystem services.

Provide Regenerative Systems As Intergenerational Equity

Provide future generations with a sustainable environment supported by regenerative systems and endowed with regenerative resources.

Support A Living Process

Continuously re-evaluate assumptions and values and adapt to demographic and environmental change.

Use A Systems Thinking Approach

Understand and value the relationships in an ecosystem and use an approach that reflects and sustains ecosystem services; re-establish the integral and essential relationship between natural processes and human activity.

Use A Collaborative And Ethical Approach

Encourage direct and open communication among colleagues, clients, manufacturers and users to link long-term sustainability with ethical responsibility.

Maintain Integrity In Leadership And Research

Implement transparent and participatory leadership, develop research with technical rigor and communicate new findings in a clear, consistent and timely manner.

Green Design

The redevelopment of the park provides an opportunity to incorporate green design techniques. Integration of green design principals and techniques for future construction/improvements is encouraged to minimize the impact of park development on the natural resources. Please see Appendix C for the Bureau of Recreation and Conservation Green Principles for Park Development and Sustainability.

Best Management Practices

Development of the park as conceived in this master plan will involve earthwork and construction activities. Best Management Practices (BMPs) are encouraged throughout the construction process to protect the resources and stabilize them through creative design. Best Management Practices will promote a stable future for the site. Detailed Examples of Best Management Practices can be found in Pennsylvania Stormwater Best Management Practices Manual. Some basic examples are listed below for informational purposes and should be considered where applicable in the redevelopment of the park. Incorporation of these facilities will require site specific soils testing to determine infiltration rates and plan for incorporation of applicable BMPs.

FOSTER ENVIRONMENTAL STEWARDSHIP

In all aspects of land development and management, foster an ethic of environmental stewardship - an understanding that responsible management of healthy ecosystems improves the quality of life for present and future generations.

Taken from "The Sustainable Sites Initiative, Guidelines and Performance Benchmarks" American Society of Landscape Architects.

GREEN DESIGN CONSIDERATIONS		
Consideration	Intent	Application
Erosion and sedimentation control	Reduce negative impact on air and water quality.	Provide erosion control measures and best management practices (BMPs) during new construction activities. Eliminate impact to steep slope areas.
Reduce site disturbance	Limit development to appropriate sites to reduce the impact on the landscape and habitat.	Construct improvements within existing clearings or developed areas.
Develop sustainable trails	Limit erosion attributed to inappropriate trail placement.	Develop trails that follow the contour of the land. Use switchbacks to navigate steep terrain where necessary. Eliminate highly erodible trails.
Stormwater management	Limit disruption and pollution of natural water courses, reduce increased runoff and promote infiltration.	Minimize crossings at water courses. Where crossings are necessary, provide measures for efficient passage of water. Utilize porous pavement to promote infiltration of stormwater runoff. Size parking areas to meet parking need and provide turf overflow parking for high use occurrences and special events.
Reduce heat islands	Minimize impact of microclimate.	Provide plantings in the large, expansive parking areas to break up the hard surface and promote infiltration. Dawn to dusk policy where appropriate.
Reduce light pollution	Improve night sky visibility and reduce impact on nocturnal environments.	Limit lighting within the park. Where night lighting is necessary for safety and security, provide shields or specify full cut-off fixtures and only specify the necessary lumens.
Innovative wastewater treatment	Reduce the generation of wastewater and potable water demand.	Provide self mulching or other environmentally friendly treatment alternatives.
Recycled building materials	Limit the use of consumptive building materials.	Utilize recycled plastic and building materials in new construction.
Local materials and suppliers	Support the local economy and reduce the environmental impact resulting from transportation.	Purchase products locally produced.

GREEN DESIGN CONSIDERATIONS		
Consideration	Intent	Application
Maximize solar orientation	Reduce electric needs through proper building orientation.	Orient buildings to take advantage of natural light and heat.
Energy consumption	Minimize use of fossil fuels.	Install a ground source geothermal heat pump system for heating and cooling of buildings. Plant deciduous trees to cool buildings in the summer and allow solar access in winter. Layout and orient buildings and outdoor use areas to take advantage of cooling summer breezes. Connect park sites to regional trail systems so that non-motorized transportation modes can be used to access the site. Install solar powered amenities/features.
Promote water conservation	Reduce water use to lower burden on supply.	Select native and drought tolerant plants to reduce watering and maintenance demands. Mulch landscape areas to retain moisture and minimize the need to water plants.
Use water efficiently	Maximize water collection to reduce burden on supply.	Collect rainwater and runoff in rain barrels for watering landscaping and maintenance needs. Direct rainwater to rain gardens to promote groundwater recharge. Use high efficiency fixtures and composting toilets to reduce demand. Use re-circulating and water treatment systems for splash pads and spray features.
Emphasize and promote recycling	Reduce the amount of new materials required and lower the demand for new materials to be produced.	Reuse existing buildings, materials and infrastructure. Build with salvaged materials whenever available.
Participate in LEED system.	Employ the Leadership in Energy and Environmental Design (LEED) Green Building Rating System on site as the national standard for Green Design.	Use the LEED project checklist for all aspects of design from erosion & sedimentation control to green power and materials.

GREEN DESIGN CONSIDERATIONS		
Consideration	Intent	Application
Constructed treatment wetlands	Remove a wide variety of pollutants such as suspended solids, nutrients, and organic pollutants.	Shallow water-filled basins planted with emergent plant vegetation. Place at stream/drainage-way outfall to water bodies.
Critical area planting	Stabilize slope, improve wildlife habitat, slow stormwater run-off.	Areas of erodible soils and/or steep slope and at the edge of the stream and perimeter of pond.
Filter strip	To trap sediment and convey run-off from paved surfaces to stormwater channels and reduce run-off velocity.	Adjacent to impervious surfaces and on gentle slopes with sheet flow. Adjacent to springs, streams and ponds to filter sediment.
Grass swales	Run-off conveyance, pollution, and sediment filtering device and increased ground water infiltration.	Where natural drainage ways can be incorporated into the stormwater design in lieu of piped conveyance.
Level spreader	To reduce the erosion effects of concentrated run-off and promote infiltration.	Adjacent to paved surfaces and at pipe and channel discharge points.
Stream bank stabilization	Protect critical sections of a stream bank where standard vegetative practices are not feasible or offer insufficient protection.	Banks of springs, streams or swales that need to be stabilized due to unstable soil and steep banks.
Minimize site clearing	Minimize disruption to the site's natural systems and preserve the natural stabilizing and filtering vegetation of the site.	Where development is proposed.
Reduce impervious infrastructure	Reduce stormwater run-off and promote infiltration.	Where development is proposed. Reduce driveway width, parking area dimensions, and paved areas to minimum dimensions. Utilize coarse aggregate porous surface in lieu of impervious pavement. Utilize stabilized turf for overflow parking.
Best management plan for construction activities	To prevent soil erosion, sediment, and other pollutants from entering springs, streams, ponds, etc.	Where development is proposed. Utilize during construction and post-construction period.

DCNR GREEN PRINCIPLES

Bureau Of Recreation And Conservation Green Principles For Park Development And Sustainability

Principle #1: Maintain And Enhance Trees And Natural Landscaping

Natural landscapes provide vital undisturbed habitat for plant and animal species, some of which may be threatened or endangered. Projects of all types can preserve and enhance these habitats by incorporating natural landscaping which is the use of an aesthetic variety of primarily native plantings well adapted to the local climate and soil. Natural landscapes can provide a cost effective alternative to conventional turf lawns. Preserving existing natural vegetation including valuable natural areas such as wetlands, grasslands, and woodlands is a fundamental purpose of natural landscaping.[2]

Designing with a variety of native trees, shrubs, grasses and wildflowers can help eliminate large areas of unnecessary turf lawn. Minimizing the amount of turf lawn while maximizing the natural landscape increases water infiltration rates, reduces the maintenance requirement of expensive lawn equipment, reduces noise and emission pollution, minimizes the use of pesticides and fertilizers, and requires little to no watering. While not maintenance free, a well-established natural landscape requires less money for ongoing maintenance than conventional landscapes. The following are some concepts to think about when designing natural landscapes:

Why Plant Native Vegetation?

Pennsylvania's native plants are those that were growing naturally in Pennsylvania prior to Europeans arriving. Pennsylvania has over 3,081 species of native trees, shrubs, flowers, and other forms of plants. Landscaping with native plants has several appealing factors.

Native plants are: [4]

- Adapted to Pennsylvania's soils and climate thus reducing the need for supplementary watering and other horticultural amendments.
- Native plants are an integral part of the larger biological community involving beneficial and pollinating insects, wildlife and ultimately, all of us.
- Offer food and shelter for many species all year long and are the foundation for a healthy, diverse habitat.
- Require less care and watering when established.
- Thrive with less fertilizer. (Most native plants will not need fertilizer once they are established. When fertilizers are used, they should be of the organic or "slow-release" varieties, should be used no more than once or twice a year, and should be used in as small a quantity as possible.[1]).
- Provide carefree beauty that enhance any garden or landscape and create a special sense of place.
- Native plants growing in their home environment are naturally more resistant to diseases, pests, or physiological disorders.
- When planted along waterways, native plants protect ponds and streams by filtering pollutants and preventing erosion.

Grass Maintenance:

Cool season turf grass, a staple of traditional parks, should be limited to human-use areas such as ball fields and picnic groves. Native cool season grasses, such as Canada and Virginia wildrye, should be used in place of non-native cool season grasses like Kentucky bluegrass and tall fescue. Warm season grasses can be used to establish a meadow to provide wildlife habitat or used as attractive landscaping. Native warm season grasses include big bluestem, little bluestem, and switchgrass.[1]

> Maintenance over a 20-year span for a non-native turf grass landscape can cost almost seven times more than the cumulative costs of maintenance for a native prairie or wetland.
>
> ~U.S. EPA, 2007

- Even if you keep some area in lawn, much can be done to lessen environmental impacts:[3]
- Reduce or eliminate the need for pesticides by practicing Integrated Pest Management. Use a mulching mower so that clippings can remain on the lawn and provide nutrients as they decompose.
- Where the lawn is small, use a non-powered reel mower. (Modern models of the reel mower are much easier to use than the older models).
- Keep gas-powered mowers in efficient operating condition (well-tuned, sharp blades) and raise the cutting height to 3-3.5" during the hot summer months to keep the grass roots shaded and cooler, reducing weed growth, browning, and need for watering.
- If you don't use a mulching mower, compost excess grass clippings in your yard and later use it as a soil amendment around trees and shrubs.
- Learn to tolerate some weeds or a greater variety of plants in the lawn.
- Don't over-fertilize. A slow-release organic fertilizer applied once, in the fall, is usually sufficient.

Enhancing and protecting meadows that contain native grasses and wildflowers is a great way to attract wildlife and save on lawn maintenance equipment costs. Common meadow wildflowers include black-eyed susan, sunflower, aster, and goldenrod. Warm season grasses are

prime habitat for grassland and ground-nesting birds; birds such as bobolink, Eastern meadowlark, and grasshopper sparrow require at least 25 acres of grassland for survival. However, other birds, such as goldfinch, field sparrow, Eastern bluebird, Eastern phoebe, and Eastern kingbird, do occupy smaller grasslands.[7]

Protect Existing Features:

Mature trees enhance air quality and reduce pollution, enhance water quality and reduce erosion, and can reduce energy costs when properly planted around a building. When appropriate, design the site to protect existing trees. During excavation of the project site be sure the trees' root zones are protected. Therefore it is recommended that any excavation occur outside the perimeter of the tree canopy.[5]

Topsoil is the most fertile portion of soil and the most valuable. "It requires 500 years under natural conditions to produce an inch of topsoil." [6] The natural fertility of topsoil promotes healthier grass and reduces the amount of fertilizer required to establish landscape plantings. Therefore one of the most important steps during construction and planting projects is to retain as much existing topsoil as possible. The best option is to stockpile and reuse the topsoil instead of removing it from the site. Using the existing topsoil not only saves money, but also minimizes disturbance that could encourage the growth of invasive plants.

Local and regional greenways are excellent and appropriate locations for natural landscaping. Many greenways contain rivers, streams, or other waterways.[2] In these locations, a variety of native trees, shrubs, grasses and wildflowers planted in buffers adjacent to the stream provide wildlife habitat, bank stabilization, filter pollutant and sediment runoff, and create a healthy stream ecosystem for fish and stream invertebrates. To provide the maximum benefits, a buffer should be 100 feet or more on each side of the stream, although smaller buffers are better than nothing and will still provide some benefits.

Floodplains provide many important services and should be protected from development. Floodplains reduce flood velocities and flood peaks, reduce erosion potential and impacts, provide a broad area for streams to spread out and for temporary storage of floodwater, reduce sediment loads, filter nutrients, process organic and chemical wastes, and moderate water temperature. Maintaining native vegetation in floodplains helps absorb and slow flood waters reducing the impact a flood may have on downstream communities.[8]

Undisturbed soil and vegetation provide important stormwater functions including: water infiltration; nutrient, sediment, and pollutant adsorption; sediment and pollutant biofiltration; water storage and transmission; and pollutant decomposition. These functions are largely lost when development strips away native soil and vegetation and replaces it with minimal topsoil and sod.[11]

Plant Trees:

Maintaining and planting trees have many benefits. Trees reduce CO2 levels and increase oxygen, play an important role in stormwater management by reducing erosion and sediment runoff, improve water quality, help cool our planet by providing the service of carbon sequestration which happens when trees store carbon in their roots and trunks keeping it from entering the atmosphere, save energy when properly planted around a building, increase property values, and studies have shown that trees can significantly reduce stress levels and accelerate healing time.

Pennsylvania, through the Department of Conservation and Natural Resources (DCNR) the Bureau of Recreation and Conservation and the Bureau of Forestry has developed a Public Private Partnership, through regional collaboration, to address the loss of tree cover in Pennsylvania. This program called TreeVitalize has established goals to plant one million shade trees, restore forests along streams and water protection areas, build capacity for long term urban forest management, establish strong urban forestry partnerships in all 14 metro areas in Pennsylvania, and train 10,000 citizens to plant and care for trees; over a five year period. To learn more about TreeVitalize and to find out how you can get involved visit: http://www.treevitalize.net/.

Compost:

Leaves, grass clippings and other yard debris clog landfills, taking up 20-40% of landfill space. This so-called waste is actually a valuable natural resource that once decomposed, offers a nutrient rich organic matter that can be a source of mulch or can be added to soil as a natural fertilizer. Compost can also help soil retain some of its moisture content. Compost can be made on-site, or can be brought in from a municipal composting facility.[3] To learn more about composting visit: http://www.howtocompost.org/.

INVASIVE PLANT REMOVAL:

An invasive non-native plant is one that is not natural to the ecosystem under consideration, and when introduced cause or are likely to cause harm to the economy, to the environment, or to human health. Invasive plants can be trees, shrubs, vines, grasses, or flowers, and they can reproduce rapidly by roots, seeds, shoots, or all three.

Why are invasive plants so detrimental?

Natural predators and diseases can't compete when non-native plants are introduced. Most invasive plants are introduced from other continents, leaving behind in their native homeland natural controls like pests, diseases and predators, which serve to keep these species in check. Due to this absence of natural controls, invasive plants reproduce rapidly and can form stands that exclude nearly all other plants. In the process, they damage natural areas, altering ecosystem processes and displacing desirable native plant species.

Plants like kudzu, purple loosestrife, and garlic mustard are displacing native plants and degrading habitat for native insects, birds, and animals.

Invasive plants endanger some rare and threatened native species of plants and animals, which

are especially vulnerable because they occur in such small populations.

Invasive non-native plants often do not provide as much food and other habitat value as native plants do.

Invasive plants, even when grown in a cultivated yard, can spread, escape, and cause landscape maintenance weeding problems for years to come.

Some invasive plants release toxic chemicals that kill other plants.

Land managers who are faced with the daunting task of managing or controlling invasive species on natural lands rely on resources like the "Invasive Exotic Plant (IEP) Management Tutorial for Natural Lands Managers" in order to implement effective management, control and education programs: http://www.dcnr.state.pa.us/forestry/invasivetutorial/index.htm. This tutorial provides a "one-stop-shop" for natural resource managers who are interested in organizing on-the-ground efforts to prevent, manage and control IEPs.[9]

References:

[1] DCNR. Creating Sustainable Community Parks. A Guide to Improving Quality of Life by Protecting Natural Resources.

http://www.dcnr.state.pa.us/brc/publications/

[2] U.S. Environmental Protection Agency. A Source Book on Natural Landscaping for Public Officials.

http://www.epa.gov/greenacres/toolkit/chap1.html#PURPOSE

[3] U.S. Environmental Protection Agency. Mid-Atlantic Region Green Landscaping.

http://www.epa.gov/reg3esd1/garden/what.htm

[4] National Wildlife Federation. Native Plants. American Beauties- Why Use Native Plants?

http://www.abnativeplants.com/index.cfm/fuseaction/home.why/index.htm

[5] Santa Monica Green Building Program. Inventory, Mark and Protect Topsoil, Trees and Vegetation to be Retained.

http://greenbuildings.santa-monica.org/construction/topsoiltree. html

[6] Franklin Soil and Water Conservation District Natural Resource Conservation Service and the U.S. Department of Agriculture, Natural Resource Conservation Service. Importance of Topsoil.

http://www.druby.net/joomla/images/pdf_docs/topsoil.pdf

[7] Natural Lands Trust. Meadows in Southeastern Pennsylvania.

http://www.natlands.org/uploads/document_28200794705. pdf

[8] Ohio Department of Natural Resources. Division of Water Fact Sheet. Natural Benefits of Floodplains.

http://www.dnr.state.oh.us/Portals/7/pubs/pdfs/fctsht50.pdf

[9] Department of Conservation and Natural Resources (DCNR) Invasive Exotic Plant Tutorial for Natural Lands Managers.

http://www.dcnr.state.pa.us/forestry/invasivetutorial/index. htm

[10] Maryland Department of Natural Resources- Forestry. The Benefits of Urban Trees. Urban and Community Forestry: Improving Our Quality of Life.

http://www.dnr.state.md.us/Forests/Publications/urban.html

[11] Building Soil. Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 2009 Edition.

http://www.soilsforsalmon.org/pdf/Soil_BMP_Manual.pdf

Additional Resources:

Arbor Day Foundation. The Value of Trees to a Community.

http://www.arborday.org/trees/benefits.cfm

Earnst Seed Company.

http://www.ernstseed.com/seed_mixes. aspx

National Wildlife Federation. Create a Certified Wildlife Habitat.

http://www.nwf.org/backyard/

The University of Tennessee. A Landowner's Guide to Native Warm-Season Grasses in the Mid-South.

http://www.utextension.utk.edu/publications/pbfiles/PB1746.pdf

U.S. Environmental Protection Agency. GreenScapes Alliance.

http://www.epa.gov/greenscapes/

http://www.epa.gov/reg3esd1/garden/

Pennsylvania's Composting Home Page. Department of Environmental Protection.

http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?a=1338&q=469423

Pennsylvania Department of Conservation and Natural Resources. Landscaping with Native Plants in Pennsylvania.

http://www.dcnr.state.pa.us/forestry/wildplant/native.aspx

iConserve Pennsylvania. Plant Natives.

http://www.iconservepa. org/plantnatives.html

Bureau Of Recreation And Conservation Green Principles For Park Development And Sustainability

Principle #2: Connect People To Nature

When designing a site for public use (whether a park, trail, greenway, playground, or community pool) there is a concept called "human well-being" that is addressed in the National "Sustainable Sites Initiative Standards and Guidelines Report"[1] and should be considered during development of the site plan. Listed below are several ideas taken directly from the Report.[1] The Department of Conservation and Natural Resources (DCNR) iConserve program also provides for the connection of human well-being to outdoor recreation, conservation, and stewardship. Learn more about iConservePA at: http://iconservepa.org/.

Provide Opportunities For Interaction With Nature

Provide a diverse landscape to support a broad range of users and activities; including spaces for physical activity, nature/discovery trails, access paths to streams, way-finding features, and "cues to care," which are design devices (such as mowed edges or low fences) that communicate that a naturalistic landscape welcomes users.

Design Spaces That Address Children's Needs

Provide pedestrian-only areas so children and youth can play without concern for traffic. Provide parks and open spaces that serve several residential areas, which give children a sense of place and belonging. Provide interesting landscape places (designed and naturalistic) that enable exploratory play. For example, boulders for climbing, streams for discovery, open meadows with trails, sensory gardens (where children can touch, smell, and even taste plants), and large trees and other natural features for hide-and-seek and unstructured games.

Provide Opportunities For Passive Experiences With Nature

Maintain all possible trees on-site. Optimize water views or provide fountains. Place and configure plantings that achieve other ecosystem services (such as rain gardens for infiltration and stormwater management) to provide visual amenities. Establish nature trails, and wildlife viewing areas.

Educate Site Users

Create demonstration gardens that allow visitors to observe biodiversity and learn how they can establish the same type of garden at their home. Protect wetlands and other natural areas and provide interpretive materials to educate about the benefits provided by these features. Facilitate wildlife viewing and learning, by establishing bird boxes and observation areas with educational exhibits about the types of wildlife visitors might see. Provide interpretive materials or stations that inform about local ecosystems and their functions. Incorporate signs that explain how "no mow zones" are beneficial for humans and wildlife.

Provide Spaces For Social Interaction

Create small theme gardens (such as color, texture, smell, butterfly, etc.). Create "community greens" that can serve as outdoor meeting rooms, break or study spaces, and spaces for organizational events and celebrations. Ensure that user spaces are safe and secure using Crime Prevention through Environmental Design (CPTED) principles (see www.cpted-watch.com for more information).

Support On-Site Food Production In Healthy Environments

Establish a Community Supported Agriculture (CSA) area for local residents to enjoy growing their own vegetables on a designated plot of land.

Consider Local Cultures/Communities And Their Needs

Identify local groups of potential users and provide amenities that address the needs or support the culture of local people.

Plant Trees

Trees are beneficial additions to any site. Planting trees should be considered during the planning and developing of all recreational sites. Trees have direct human benefits such as creating effective sound barriers that can muffle urban noise almost as effectively as stone walls; producing oxygen, absorbing and locking away carbon dioxide, and cleaning the air by intercepting airborne particles, reducing heat, and absorbing such pollutants as carbon monoxide, sulfur dioxide, and nitrogen dioxide. Trees shade and cool reducing the need for air conditioning in the summer and break the force of winter winds, lowering heating costs in the winter. Trees fight soil erosion and reduce water runoff and sediment deposition after storms.

References:

[1] Sustainable Sites Initiative. Standards and Guidelines: Preliminary Report. November 1, 2007.

http://www.sustainablesites.org/report.html

ADDITIONAL RESOURCES:

Penn State University, College of Agricultural Sciences Cooperative Extension. From the Woods. Community Forests.

http://pubs.cas.psu.edu/FreePubs/pdfs/uh173.pdf

Arbor Day Foundation. Nature Explore.

http://www.arborday.org/explore/classroom/index.cfm

Recreation Management. Nature and Nurture, Trends in Play Design.

http://www.recmanagement.com/feature_print.php?fid=200907fe02

Local Harvest. Community Supported Agriculture.

http://www.localharvest.org/csa/

Principle #3: Manage Stormwater Naturally

Stormwater runoff occurs when excess water from rainfall and snow events flows across paved streets, parking lots, rooftops and construction sties. This runoff can be a significant source of pollution and sedimentation ending up in our lakes, rivers, streams and other water bodies.

The following are stormwater impacts of conventional development (including parks and recreation areas):

- Increased flooding
- Increased runoff volume
- Decreased evapotranspiration and groundwater recharge
- Increased frequency of runoff events
- Erosion and stream channel changes
- Decreased stream baseflow
- Impacted aquatic life
- Pollutant and temperature impacts to streams
- Goals of natural stormwater management:
  - Capture and detain stormwater runoff as close to the source as possible;
  - Reduce the volume of stormwater entering the combined sewer system;
  - Filter stormwater to remove pollutants before the runoff enters groundwater, streams, or wetlands;
  - Use and promote methods that provide multiple environmental benefits; and
  - Use techniques that are less costly than traditional piped solutions.

Consider the following on your site to prevent stormwater from becoming an issue.

Create and Enhance Riparian Buffers

Riparian buffers and riparian forest buffers are areas of vegetation alongside streams and other bodies of water that mitigate floods, recharge groundwater, prevent erosion and sedimentation of the stream, trap pollutants within plant roots, improve aquatic and terrestrial species habitat, and provide optimum food for stream communities. In these locations native vegetation (ideally a variety of native trees, shrubs, grasses and wildflowers) provides wildlife habitat, bank stabilization, and water quality benefits.[1] Although smaller buffers will still provide some benefits, to provide the maximum benefits a buffer should be a minimum of 100 feet on each side of a perennial or intermittent stream, river, lake, pond, and reservoir. For those bodies of water designated as Exceptional Value or High Quality waters, the minimum width should extend to 150 feet.[4] Below is a list of tips for managing buffers:[3]

- Provide some public access to the water, but keep vegetation clearance to a minimum.
- Avoid work in streams, wetlands or waterways whenever possible.
- Don't alter a stream bank or shoreline unless you're returning it to a natural state (banks should normally be sloping and covered with vegetation).
- Soil disturbance should not take place within the buffer by grading, stripping of topsoil, plowing, cultivating, or other practices.
- Motorized vehicles should not be stored or operated within the riparian forest buffer.
- Remove/manage invasive exotic species to keep them from spreading.
- Improve riparian buffers by planting native trees, shrubs and ground covers that are tolerant of wet or seasonally flooded sites.
- Avoid or minimize the use of pesticides and fertilizers near water-bodies.

Protect Wetlands and Critical Recharge Areas

Wetland functions include water quality improvement, floodwater storage, fish and wildlife habitat, aesthetics, and biological productivity. Wetlands within and downstream of urban areas are particularly valuable, counteracting the greatly increased rate and volume of surface-water runoff from pavement and buildings. They also recharge groundwater and trap sediment, fertilizers, and pollutants. Construction and other forms of disturbance should be avoided in and near wetlands. A vegetated buffer should be maintained around wetlands wherever possible. Man-made wetlands cannot duplicate all the functions of a natural wetland, so it is critical that natural wetlands be protected whenever possible.[1]

Critical recharge areas are typically large contiguous areas of land that allow precipitation and other surface waters to infiltrate through the soil to recharge the groundwater. Without constant recharge, periods of drought could leave streams and wells dry, thus affecting available drinking water and wildlife habitat. Practicing green and sustainable initiatives (such as those outlined in this series of fact sheets) when developing in or near a wetland or critical recharge area can ensure that these features are preserved and remain fully functional.[1]

Design Natural Stormwater Management Systems

Natural stormwater management can be more cost-effective than traditional gray infrastructure of pipes and treatment facilities. There are many best management practices (BMPs) for natural stormwater management that minimize the impact of impermeable surfaces such as roads, rooftops, and parking lots. These BMPs can include designing narrower roads; permeable

surfacing for roads, parking lots, trails, walkways, etc.; rain gardens and vegetative swales; and rainwater catchment systems for rooftops. The remaining runoff can be directed to native grass swales or rain gardens. Even just planting more native trees near impermeable surfaces can reduce the need for large, expensive stormwater management systems.[1]

Alternative Pavers

A technique for green parking utilizes alternative pavers that can range from medium to relatively high effectiveness in meeting stormwater quality goals. Alternative pavers are permeable or semi-permeable surfaces that can replace asphalt and concrete and can be used for driveways, parking lots and walkways. The different types of alternative pavers include gravel, cobbles, wood mulch, brick, grass pavers, turf blocks, natural stone, pervious concrete, and porous asphalt.[2]

Stormwater Wetlands

Stormwater wetlands (also called constructed wetlands) are structural practices similar to wet ponds that incorporate wetland plants in a shallow pool. As stormwater runoff flows through the wetland, pollutant removal is achieved by settling and biological uptake within the practice. Stormwater wetlands are fundamentally different from natural wetland systems. They are designed specifically for the purpose of treating stormwater runoff, and typically have less biodiversity than natural wetlands both in terms of plant and animal life.[2]

Common Stormwater BMPs

- Rain/recharge gardens/bioretention
- Vegetated filter strips
- Vegetated swales
- Porous pavement with infiltration beds
- French drains/dry wells
- Vegetated roofs
- Cisterns/rain barrels/capture reuse
- Constructed wetlands
- Riparian corridor restoration
- Revegetation/reforestation

Non-structural Stormwater BMPs

- Protect sensitive/special value features
- Protect/enhance riparian areas
- Protect natural flow pathways
- Cluster uses at each site; build on the smallest area possible
- Minimize total disturbed area
- Minimize soil compaction
- Revegetate and reforest disturbed areas, using native species

References:

[1] DCNR. Creating Sustainable Community Parks. A Guide to Improving Quality of Life by Protecting Natural Resources.

http://www.dcnr.state.pa.us/brc/publications/

[2] The Stormwater Manager's Resource Center.

http://www.stormwatercenter.net/

3U.S. Environmental Protection Agency. Mid-Atlantic Region Green Landscaping- Stormwater Control and Managing Natural Areas.

http://www.epa.gov/reg3esd1/garden/stormwater.htm

http://www.epa.gov/reg3esd1/garden/protect.htm

Department of Environmental Protection. Bureau of Watershed Management. Riparian Forest Buffer Guidance.

http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-76604/394-5600-001.pdf

Additional Resources:

Dauphin County Conservation District. Stormwater Best Management Practices Tour.

http://www.dauphincd.org/swm/bmptour.html

EPA. Functions and Values of Wetlands.

http://www.epa.gov/owow/wetlands/pdf/fun_val.pdf\

Final PA Stormwater Best Management Practices (BMP) Manual - (363-0300-002).

http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1437&q=529063&watershedmgmtNav=|

Office of Environmental Health Hazard Assessment & the California Water & Land Use Partnership. Low Impact Development. A Sensible Approach to Land Development and Stormwater Management.

http://www.scwrp.org/pdfs/CALWALUP-flier.pdf

Pennsylvania Department of Environmental Protection. The Wellhead Protection Program In

Pennsylvania: An Overview.

http://www.dep.state.pa.us/dep/subject/advcoun/ag/Whppover.doc

Shermans Creek Conservation Association. Up The Creek Newsletter. Riparian Buffers? What are Riparian Buffers?

http://www.shermanscreek.org/2007JanNewsletter.pdf

The Stormwater Authority. Best Management Practices.

http://www.stormwaterauthority.org/bmp/default.aspx

U.S. Environmental Protection Agency. Watersheds. "After the Storm."

http://www.epa.gov/weatherchannel/stormwater.html

Water Environment Research Foundation. Using Rainwater to Grow Livable Communities. Sustainable Stormwater Best Management Practices.

http://www.werf.org/livablecommunities/

U.S. Environmental Protection Agency. Storm Water Technology Fact Sheet- Porous Pavement.

http://www.landarch.uiuc.edu/resources/courses/coursewebsites/LA441Web/Readings2006/EPA-PorousPaving.pdf

U.S. Environmental Protection Agency. Using Smart Growth Techniques as Stormwater Best Management Practices.

http://www.epa.gov/dced/pdf/sg_stormwater_BMP.pdf

Principle #4: Conserve Energy

The best way to save energy is not to spend it.

Renewable energy and energy efficiency mean less air pollution (including mercury, nitrogen oxides and carbon dioxide), less water consumption and less waste. It means less dependence on foreign oil and more self-sufficiency. It means less ground level ozone, less acid rain and less particulate matter in the air. Ultimately, this means improved health. There are many opportunities to include renewable energy technology and energy efficiency techniques in site design. Please consider these different alternative energy sources and energy efficiency techniques to power your facilities as you move forward with your project planning and site design.

Accomplishing Energy Efficiency

The following are some techniques that can be incorporated in your site design to help save energy and money, and benefit the environment at the same time:[8]

Include in your site planning a mandatory maintenance schedule for your building to:

- Clean filters
- Replace belts
- Commission the building (give your building a "tune-up")
- Achieve a certain percentage of energy consumption

HVAC Rehab

Use state-of-the art, high efficiency, heating, ventilation and air conditioning (HVAC) and plumbing equipment, chillers, boilers, and water heaters, etc. Use variable speed drives on fan and pump motors. Use heat recovery ventilators and geothermal heat pump technology for up to 40% energy savings.

- Programmable system to turn on during the day and off at night
- Fan cycler/censor to replace or attach to heat pump
- Waterless urinals
- Censored faucets
- On-demand controls in shower houses (faucets, toilets, lighting, fans)
- Instantaneous water heaters
- Sky lights
- Light level meter or dimming system
- Reduce outdoor night-time light pollution by avoiding over-illumination of the site and use low cut-off exterior lighting fixtures which direct light downward
- Use energy efficient T-8 and T-5 bulbs, high efficiency electronic ballasts, and lighting controls. Consider using indirect ambient lighting with workstation based direct task lighting to improve light quality, reduce glare and improve overall energy performance in general office areas. Incorporate sensors and controls and design circuits so that lighting along perimeter zones and offices can be switched off independently from other interior lights when daylighting is sufficient in perimeter areas
- Use Energy Star certified energy efficient appliances, office equipment, lighting and HVAC systems

Solar

Solar technologies use the sun's energy to provide heat, light, hot water, electricity, and even cooling, for many different types of facilities. Solar power is probably the cleanest, most viable form of renewable energy available and it can be used in several forms to help power your facility. Many gardens use solar lights or solar garden water features.[2] A variety of technologies have been developed to harness solar energy. In Pennsylvania, these technologies include: Photovoltaic systems (produces electricity), solar hot water heating, and passive solar heating and daylighting.[6]

Wind

Wind is a clean, inexhaustible, indigenous energy resource that can generate electricity. Wind energy is one of the fastest-growing forms of electricity generation in the world.[1, 3] Pennsylvania has good wind resources in portions of the state. Municipalities and non-profit organizations can use small wind turbines for on-site energy generation.[7]

Geothermal Heat Pump

The ten feet of earth directly beneath the surface maintains a nearly constant temperature between 50° and 60°F (10°-16°C). Like a cave, this ground temperature is warmer than the air above it in the winter and cooler than the air in the summer. Pennsylvania has low to moderate temperature resources that can be tapped for direct heat or for geothermal heat pumps. Geothermal heat pumps take advantage of this resource to heat and cool buildings.[1]

Biomass and Biofuels

Biomass and biofuels provide an excellent opportunity to heat and power buildings. Heating options may include the installation of a wood chip heating system, wood pellet furnace or boiler systems, corn furnace, or simply using a biodiesel blended heating oil commonly referred to as a bio-heat product. Biofuels can be used to power small-scale workshop machinery and electricity generators as well as vehicles.[1]

Fuel Cells

Fuel cells are an option that local governments can consider when exploring alternative energy choices and distributed energy technologies. A fuel cell is a device that converts the chemical energy of a fuel into electricity with heat and water as the major by-products. There are several types of fuel cells and different fuels used for electricity generation.[1]

Using Plants to Reduce Heating and Cooling Needs

Plants can significantly reduce a building's energy needs; it is cooler in the shade of trees during the summer and warmer behind vegetation that block winter winds. The general rule is to plant deciduous trees (those that lose their leaves in winter) on the south and west sides of a building where the sun's rays are most direct and intense. These trees will provide shade during summer, but permit the winter sun to provide warmth. Where there isn't room for trees, shrubs and vines can provide similar benefits. Extensive use of trees to shade buildings, streets, driveways and other large paved surfaces can even cool entire communities. To reduce winter heating costs, plant evergreen trees and shrubs as windbreaks. Most cold winds come from the north or west (though this can vary locally), so on those sides of the building plant a dense row of evergreens that maintain branches low to the ground. Where new construction is planned consider "greenroofing" where roofs are specially designed to accommodate plants. Such roofs provide insulating value that further reduces heating and cooling needs and can be very long-lasting when properly maintained.[4, 5]

A FEW TECHNIQUES TO CONSIDER:[3]

- Optimize building orientation, massing, shape, design, and interior colors and finishes. By maximizing the use of controlled natural day lighting artificial lighting energy use will be significantly reduced. Provide shades or daylight controls where needed.
- Use high performance low-e glazing. Consider insulated double glazing, triple glazing or double pane glazing with a suspended low-e film. Selective coatings offer optimal light transmittance while providing minimal solar gain and minimal heat transmission. Window frames, sashes and curtain wall systems should also be designed for optimum energy performance including the use of multiple thermal breaks to help reduce energy use.
- Avoid the use of HCFC and Halon based refrigeration, cooling and fire suppression systems. Optimize the use of natural ventilation and where practical use evaporative cooling, waste heat and/or solar regenerated desiccant dehumidification or absorption cooling. Identify and use sources of waste energy.
- Identify ways to use high-recycled content materials in the building structure and finishes. Consider everything from blended concrete using fly ash, slag, recycled concrete aggregate, or other admixtures to recycled content materials such as structural steel, ceiling and floor tiles, carpeting, carpet padding, sheathing, and gypsum wallboard. Consider remanufactured office furniture and office partition systems, chairs and furniture with recycled content or parts.
- Explore the use of bio-based materials and finishes such as various types of agriboard (sheathing and or insulation board made from agricultural waste and byproducts, including straw, wheat, barley, soy, sunflower shells, peanut shells, and other materials). Some structural insulated panels are now made from bio-based materials. Use lumber and wood products from certified forests where the forest is managed and lumber is harvested using sustainable practices. Use resource efficient engineered wood products in lieu of full dimension lumber which comes from older growth forests.
- Evaluate all products and systems used for their ability to be recycled when they reach the end of their useful life. Preference should be given to products and systems that facilitate easy, non-energy intensive separation and recycling with minimal contamination by foreign debris.
- Recognize that transportation becomes part of a product or building materials embodied energy. Where practical, specify and use locally harvested, mined and manufactured materials and products to support the regional economy and to reduce transportation, energy use and emissions.
- Develop a strict waste-management practice to divert construction wastes from reaching the landfill.
- Use materials and resources found on the site in the site design and construction.

References:

[1] Department of Environmental Protection. Alternative Energy.

http://www.depweb.state.pa.us/energy/cwp/view.asp?a=1379&q=485551

[2] American Solar Energy Society. Go Solar: How to get started with solar energy.

http://www.ases.org/index.php?option=com_content&view=article&id=162&Itemid=7

[3] U.S. Department of Energy. Energy Efficiency and Renewable Energy. State Energy Alternatives. Alternative Energy Resources in Pennsylvania.

http://www.eere.energy.gov/

Alternative Resources

i. http://www.eere.energy.gov/states/alternatives/resources_pa.cfm

For a project to become LEED certified, it is required that the project follows energy efficiency, environmentally conscious methods, as defined by the LEED Green Building Rating System, Version 3, 2009, in the following areas:

- Sustainable Sites
- Water Efficiency
- Energy & Atmospheric
- Materials & Resources
- Indoor Environmental Quality
- Innovation in Design
- Regional Priority

Principle #5: Integrate Green Design and Construction

The ideal "green" project preserves and restores habitat that is vital for sustaining life. The site and all structures on the site become net producers and exporters of resources, materials, energy and water rather than being net consumers. In other words, a green building is one whose construction and lifetime of operation assure the healthiest possible environment while representing the most efficient and least disruptive use of land, water, energy and resources. The optimum design solution is one that effectively emulates all of the natural systems and conditions of the pre-developed site – after development is complete.[1]

Green infrastructure means restoring floodplains to their naturally functioning system instead of building taller levees. It means planting trees, preserving open space and installing features like rain gardens, grass swales and green roofs, rather than enlarging sewers or building costly new treatment plants. It means retrofitting buildings and homes with water-efficient plumbing and rainwater capture systems instead of constructing an expensive water supply dam.

Green Design can Save Money

While many green materials and technologies do cost more, it has been demonstrated that many green strategies and technologies actually cost the same and some even cost less than traditional "not-so-green" technologies. Often the key to a cost effective green building and site design lies within the interrelationships and associated cost and performance trade-offs that exist between different building systems. For example, the use of high performance windows and window frames increases the initial building costs, however the resulting reduction in the size and cost of the buildings heating and cooling system more than offsets the added cost of the better glazing system. The result is a building that has a comparable or perhaps even a lower first cost, a higher comfort level, lower energy use, and lower energy bills and operating cost for the life of the building.[1] Leadership in Energy & Environmental Design (LEED) Green Building Rating System™.

A voluntary, consensus-based standard to support and certify successful green building design, construction and operations. LEED is transforming the marketplace by providing a nationally recognized certification system to promote integrated, whole-building design practices in the building industry.[2]

For a project to become LEED certified, it is required that the project follows energy efficiency, environmentally conscious methods, as defined by the LEED Green Building Rating System, Version 3, 2009, in the following areas:

By blending the right mix of green technologies that cost less with green technologies that cost the same or slightly more, it is possible to have a very green building project that costs the same as a conventional one.

Vegetative Green Roofs

A green roof, or rooftop garden, is a vegetative layer grown on a rooftop. Green roofs have a layer of living plants on top of the structure and the waterproofing elements.

Why are vegetative green roofs such a good idea? [4]

They reduce roof stormwater runoff. In some cases this can help reduce the size of stormwater pipes, and the amount of stormwater that needs to be treated by municipal water treatment. They also filter pollutants from rainfall.

Green roofs also protect the roof membrane from sunlight, which breaks down the roofing material. Having even a couple inches of soil helps to greatly extend the life of the roof, and a longer lifespan means less material ends up in landfills from reproofing buildings after the membranes have failed.

They reduce energy use: Green roofs absorb heat and act as insulators for buildings, reducing energy needed to provide cooling and heating.

A green roof is also a source of oxygen and provides a habitat for some birds and insects. They

reduce air pollution and greenhouse gas emissions: by lowering air conditioning demand, green roofs can decrease the production of associated air pollution and greenhouse gas emissions. Vegetation can also remove air pollutants and greenhouse gas emissions through dry deposition and carbon sequestration and storage.

References:

[1] Governor's Green Government Council. Green Buildings.

http://www.gggc.state.pa.us/gggc/cwp/view.asp?a=515&g=156866

[2] United States Green Building Council- LEED.

http://www.usgbc.org/DisplayPage.aspx?CategoryID=19

[3] Governor's Green Government Council. What is a Green Building?

http://www.gggc.state.pa.us/gggc/lib/gggc/documents/whatis041202.pdf

[4] EcoGeek.ORG. Green Roofs: An Introduction with Pretty Pictures.

http://www.ecogeek.org/content/view/902/

Additional Resources:

Governor's Green Government Council. Guidelines for Creating High Performance Green Buildings.

http://www.gggc.state.pa.us/gggc/cwp/view.asp?a=515&g=156978

United States Green Building Council.

http://www.usgbc.org/

Department of Environmental Protection. Pennsylvania's Recycling Page.

http://www.dep.state.pa.us/dep/deputate/airwaste/wm/RECYCLE/Recycle.htm

Green Center of Central Pennsylvania.

http://www.greencentralpa.com/

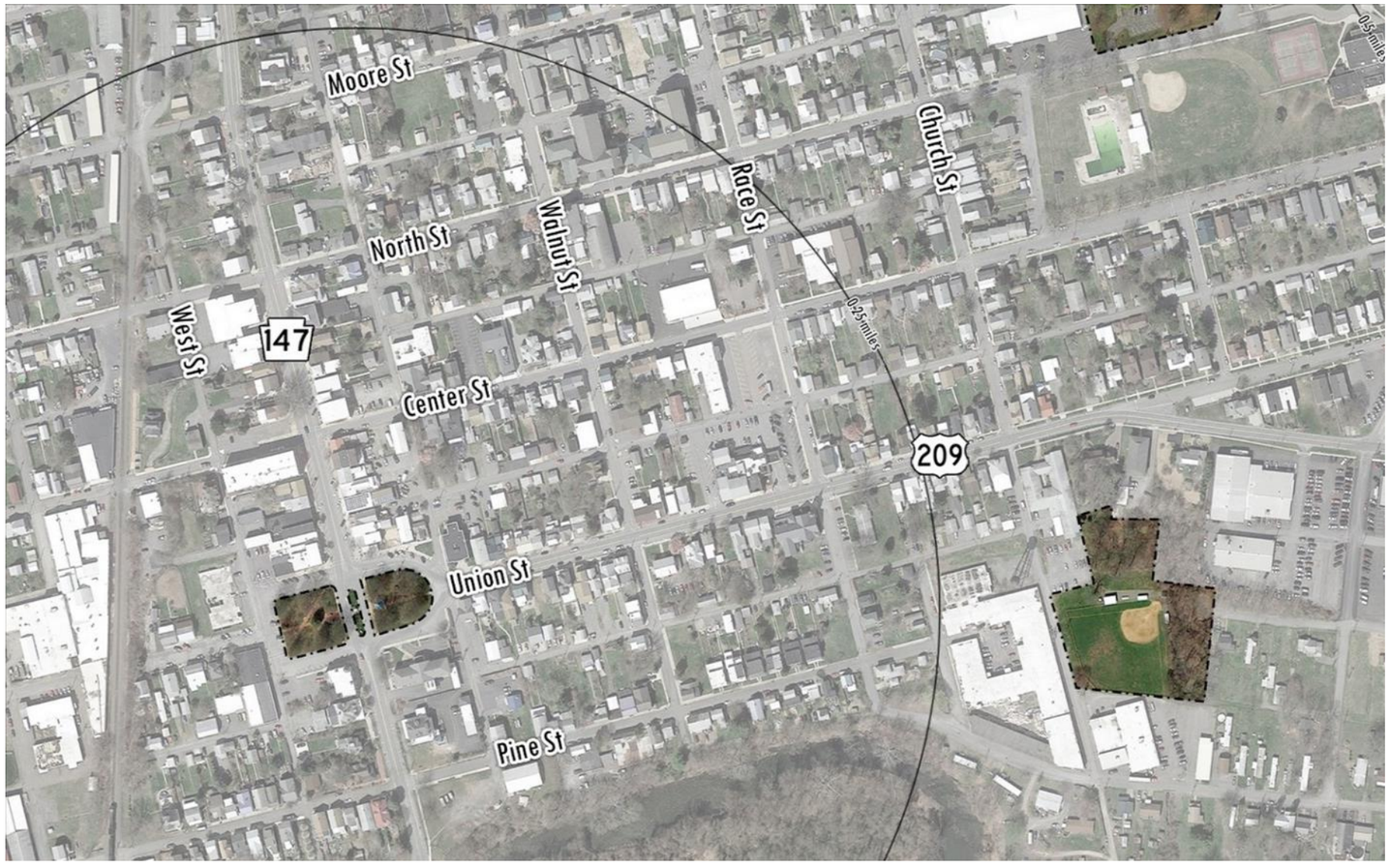
2009 LEED New Construction and Major Renovations.

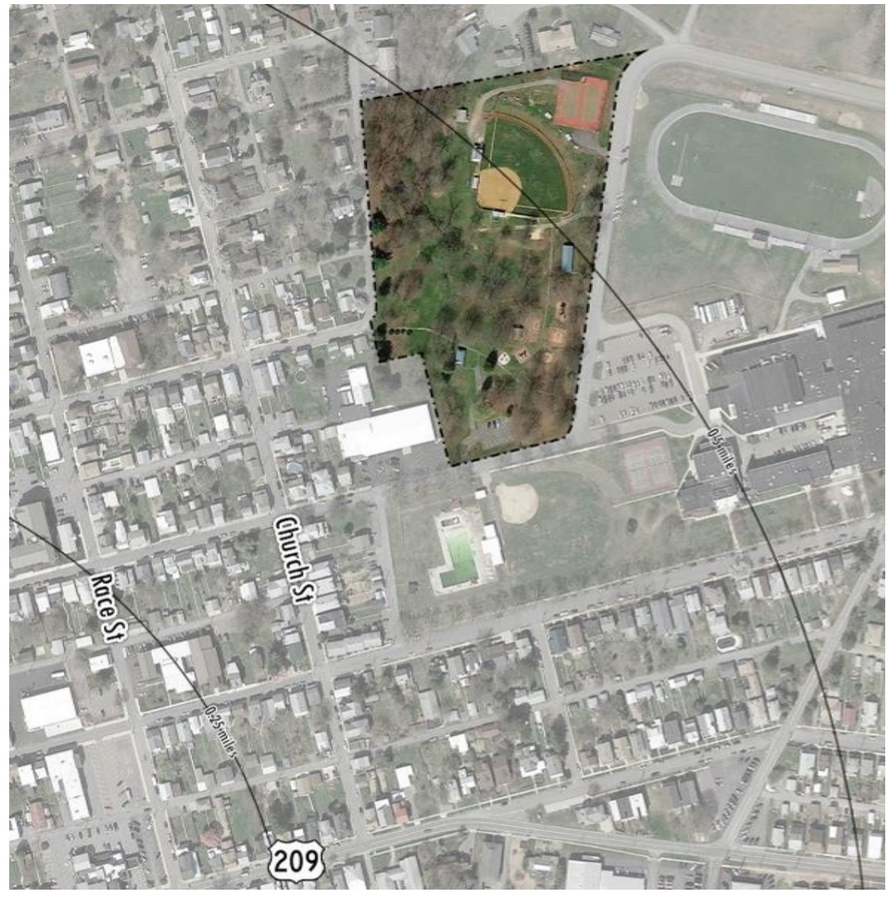
http://www.usgbc.org/ShowFile.aspx?DocumentID=5546

Chicago Center for Green Technology.

http://egov.cityofchicago.org/city/webportal/portalEntityHo-meActiondo?entityName=Chicago+Center+for+Green+Technology&entityNameEnumValue=161

Appendix D





PENNSYLVANIA NATURAL DIVERSITY INVENTORY (PNDI) REPORT

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

INTRODUCTION

The Pennsylvania Natural Diversity Inventory Environmental Review Tool (PNDI ER Tool) enables the public to perform online PNDI searches for potential impacts to threatened, endangered, special concern species and special concern resources in PA. Anyone including property owners, consultants, project planners and PA DEP or PA CCD staff can access the tool for PNDI project screening.

The PNDI ER Tool is used prior to submitting permit applications to DEP or during any project pre-planning phases. The user performs the search online using the ER Tool, prints the results from the search (called "PNDI Environmental Review Receipt") and follows the instructions on the receipt. For more information about the receipt results and what they mean, please visit the PNDI Receipt page.

In order to adequately provide for the protection of special concern species and resources while also reducing the number of false hits when conducting PNDI searches, it is important that the correct project area and type is entered into the PNDI ER Tool. If you believe you have entered the information incorrectly, please rerun the search.

Large Projects

Some projects are too large to be drawn in the PNDI Environmental Review Tool and are therefore called "Large Projects." To find out if your project is a Large Project, please visit the Large Project Information Page.

Early Coordination

Because the Environmental Review Tool is easily accessible to the public, it is recommended that PNDI coordination be completed prior to project development and submission of any permit applications. During instances when the PNDI search indicates potential impacts, early consultation with the proper special concern species or resource jurisdictional agencies (preferably prior to plan development) is crucial. Early consultation not only minimizes associated delays and cost, but also facilitates the integration of more effective conservation measures into project planning.

Source:

http://www.gis.dcnr.state.pa.us/hgis-er/PNDI_Introduction.aspx.

RESOURCE AGENCY JURIDICTION

A PNDI ER Tool web-site inquiry generates on-line search results concerning the potential impacts of a project to special concern species and resources. Four government agencies have jurisdiction over the protection of these resources:

U.S. FISH AND WILDLIFE SERVICE

Federally listed, proposed & candidate species.

Statute: Endangered Species Act of 1973 16 U.S.C. §§ 1531 et seq.

PENNSYLVANIA GAME COMMISSION

PA state-listed birds and mammals.

Statute: Game and Wildlife Code 34 Pa. C.S.A. §§ 101 et seq.

PENNSYLVANIA FISH AND BOAT COMMISSION

PA state-listed fish, reptiles, amphibians, and aquatic organisms.

Statute: Fish and Boat Code 30 Pa. C.S.A. §§ 101 et seq.

PENNSYLVANIA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

PA state-listed plants, natural communities, terrestrial invertebrates and geological features.

Statute: Wild Resources Conservation Act 32 P.S. §§ 5301 et seq.

1. PROJECT INFORMATION

Project Name: Millersburg Borough Master Parks Plan
Date of Review: 9/13/2018 10:13:48 AM
Project Category: Recreation, Campgrounds/parking lots, playgrounds
Project Area: 134.19 acres
County(s): Dauphin
Township/Municipality(s): MILLERSBURG; UPPER PAXTON
ZIP Code: 17061
Quadrangle Name(s): MILLERSBURG
Watersheds HUC 8: Lower Susquehanna-Penns
Watersheds HUC 12: Bargers Run-Susquehanna River; Lower Wiconisco Creek
Decimal Degrees: 40.541318, -76.957478
Degrees Minutes Seconds: 40° 32' 28.7438" N, 76° 57' 26.9194" W

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

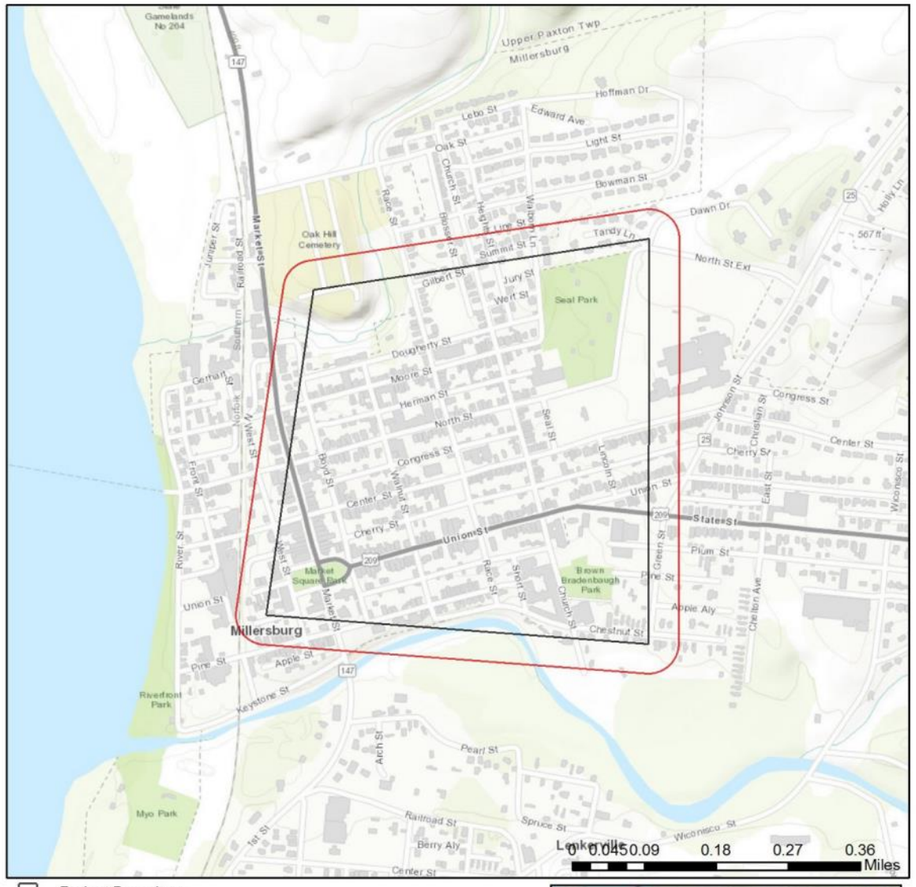
As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Millersburg Borough Master Parks Plan

Project Boundary
Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Millersburg Borough Master Parks Plan



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are valid for two years (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies strongly advise against conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service
RESPONSE:
No impacts to federally listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name:_____
Company/Business Name:_____
Address:_____
City, State, Zip:_____
Phone:(_____)_____Fax:(_____)_____
Email:_____

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

_____ _____
applicant/project proponent signature date

This page intentionally left blank.

Appendix E

GREEN STORMWATER INFRASTRUCTURE

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

Green Infrastructure in Parks

Green infrastructure in parks is established first by building partnerships between park and stormwater agencies to utilize park land for green infrastructure. Green infrastructure in parks will lead to opportunities to enhance stormwater management capacity, park improvements, and funding for the park. The main goals of green infrastructure in parks is to promote and enhance overall environmental, economic, and social benefits.

How Green Infrastructure Can Enhance Parks

Recreation Value – Creating or enhancing amenities and environmental quality.

Park Appeal – Combines function of runoff management with design to apply native plantings, creates strategic topographic function, interest, and layout for amenities.

Enhance Social and Environmental Equity – Addresses environmental justice by combining parks and green infrastructure to create benefits for the entire community by improving environment, quality of life, and providing access to public amenities.

Reduces Maintenance – stormwater utility funds for improved drainage, reduce erosion, and eliminate standing water.

Improves Drainage – provides options to mitigate drainage and flooding problems.

Education – provides opportunities to educate public with interpretive signage about the importance and types of measures that reduce stormwater pollution at various level and applications.

Economic Benefits – can be installed to earn stormwater utility credits, maintenance funding, or have BMPs managed by an outside party depending on types and approaches take by the local municipality.

Water Quality – stormwater volume and pollutant reductions which can help meet municipality regulatory requirements.

Environmental Benefits – improves urban heat island effects and overall environmental and ecosystem quality with the incorporation of green space and native perennial, shrub, and tree plantings attracting wildlife.

Combining Parks and Green Infrastructure

Green Infrastructure serves parks by utilizing open areas for absorption and park infrastructure areas built or retrofitted to treat stormwater or drain to enhanced pervious surfaces including parking lots, visitor centers, playing fields, paved trails, walkways, and roads, wetlands and drainage systems.

Common Questions / Concerns

Why choose green infrastructure over traditional gray infrastructure?

Benefits of choosing green infrastructure include:

- Attractiveness, effectiveness and multifunctional capacity.
- Habitat for beneficial wildlife / pollinators.
- Ability to reduce maintenance and eliminate mosquito breeding habitat.
- Can incorporate existing park features / natural and man-made.
- Potential to reduce infrastructure costs.

Will it attract nuisance wildlife and pests such as mosquitoes?

If designed and maintained correctly it will not:

- Implement a mix of plants to attract beneficial wildlife.
- Select green infrastructure elements that eliminate standing water that could serve as mosquito breeding habitat, and design facilities to drain in 72 hours and/or ensure permanent pools don't become stagnant.
- Nuisance wildlife can occur in all parks, but good design and management practices such as eliminating food sources and providing securely covered trash receptacles can reduce or eliminate problems.
- Inspect practices regularly to remedy any problems.

Will stormwater features be unattractive or unsafe?

Not if green infrastructure is used:

- Green infrastructure practices are typically integrated into the landscape and rely mainly on soils, vegetation, and infiltration to reduce runoff.
- Traditional stormwater management creates detention basins and wet ponds that are often unsightly and need fences to keep the public.
- Green infrastructure features can be designed with aesthetics in mind and can even incorporate benches, art, or sculptural designs.

How to maintain public safety and limit liability?

If possible, design features to infiltrate runoff:

- Design stormwater elements that minimize the risk potential for park users such as eliminating trip hazards, adding crushed stone paths, or designing boardwalks or viewing platforms.
- Create water feature areas with the public in mind promoting informed design, clear sight lines, and natural features such as wetland fringes can reduce or eliminate hazards.
- Limit access to gently sloping bank areas around water features by adding natural screens and barriers, and allow public access where it can be controlled or monitored by park staff.

What are the funding and maintenance needs?

Funding:

- Stormwater utilities often have program funding that can be used to construct and maintain stormwater features in parks.
- In some cases, stormwater management agencies may provide direct funding to parks to operate and maintain stormwater management features that the stormwater utility builds in the park or areas adjacent to the park.
- Depending on the jurisdiction, costs can be shared across agencies.
- Grants might be available from the state or other granting organizations, such as nongovernmental agencies that have an interest in enhancing the park and the community in general. Examples of such funds include community revitalization, smart growth, or watershed restoration funds.
- A wider range of grants could be available because of the multifunctional nature of such projects that may have park enhancement, as well as watershed, and neighborhood improvement grants.

Funding Maintenance:

- If the community has a stormwater utility, money can be set aside for green infrastructure maintenance.
- If both parks agencies and stormwater agencies receive general funds, a maintenance budget can be negotiated and allocated according to each agency's responsibilities.
- When deciding to engage in creative management arrangements such as these, be sure that funds are budgeted before the project is constructed and that long-term operation and maintenance needs are incorporated into the continuing operating budget. This will help ensure that adequate funds are allocated to the agency responsible for the maintenance burden.

Maintenance Duties:

- If funds are allocated to supplement the existing park maintenance activities, park maintenance staff or contractors managed by the park can perform the necessary maintenance.
- Most green infrastructure practices can be maintained by landscape professionals who have received some supplemental training specific to the stormwater practices being implemented.
- In other cases, the stormwater agency might want to either directly manage maintenance or oversee maintenance to ensure proper functioning of the stormwater management practices.
- Maintenance responsibilities can also be divided between the park maintenance staff and staff trained or managed by the stormwater utility, depending on the practices employed. For example, maintenance of bioretention facilities typically can be taken care of by the regular landscape crews as long as they understand what to mow and weed and how to identify problems. More difficult maintenance activities, such as the use of vacuum sweepers for permeable pavements or the maintenance of water features, could be performed by the stormwater utility.
- Ideally, the details, responsibilities, and funding allocations should be worked out in a memorandum of understanding (MOU) or other such agreement between agencies
- Most vegetative practices like rain gardens are maintained like any landscaping - weeding, pruning, digging, and removing trash.
- Rainwater harvesting practices require simple cleaning of gutters and downspouts.
- Permeable pavement is low maintenance but can benefit from occasional vacuum sweeping.

Process for Implementing Green Infrastructure

1. Identify and Engage Partners – Determine interest and funding opportunities.
    a. Government Agencies – Local, transportation departments, school districts, community colleges and technical schools, public health agencies, planning agencies, sustainability agencies.
    b. Community Partners – Neighborhood and community associations, business improvement districts, watershed groups, friends of parks, urban forestry advocates, local businesses and garden clubs .
2. Build Relationships – Work with partners to identify common mutually beneficial goals.
3. Leverage Funding Opportunities – Funds can be utilized from partnerships with departments such as water providers, stormwater utilities, and watershed and environmental groups.
4. Identify Green Infrastructure Opportunities – Strategically plan for location(s) of green infrastructure in park that will maximize benefits.
    a. Capture runoff, target hard surfaces, take advantage of areas with infiltration potential, and protect riparian areas and floodplains.
5. Plan for Maintenance – Define roles and responsibilities, perform maintenance and repairs.
    a. Create a memorandum of understanding (MOU) to define role and responsibilities of the agencies, ensure optimal performance of park/green infrastructure facility, engage community service organizations, and recognize potential for green jobs.
6. Undertake High-Visibility Pilot Projects – Consider selection of one or more high-visibility pilot sites to gain support from community to implement more green practices
    a. Opportunities to advertise the purpose and benefits of the projects, highlight community partnerships, donors, and volunteers involved in the application of the project.

ACTION	BENEFIT TO PARKS
Convert turf areas with high maintenance requirements to bioretention areas or other naturalized areas.	Reduces maintenance and other costs associated with the management of turf.
Install cisterns or rain barrels to collect roof runoff for irrigation.	Reduces potable or recycled water use.
Install permeable pavement or pavers.	Reduces runoff, pavement maintenance, and use of deicers.
Amend soils to improve infiltration.	Eliminates standing water and mosquito breeding habitat.
Install bioretention in underutilized perimeter areas.	Reduces runoff and flooding and beautifies low-use landscaped areas.
Include educational signage describing BMPs and stormwater impacts.	Creates opportunities for environmental education.
Install green roofs.	Increases lifespan of roof, lowers energy cost, and manages stormwater.
Remove unnecessary impervious surfaces.	Reduces runoff and decreases erosion.

Useful Resources

- City Parks, Clean Water: Making Great Places Using Green Infrastructure Trust for Public Lands 2016.
- Tools, Strategies and Lessons Learned from EPA Green Infrastructure Technical Assistance Projects USEPA 2015.
- How Cities Use Parks for Green Infrastructure American Planning Association, City Parks Forum.
- Green Jobs in Your Community USEPA.
- Green Infrastructure Opportunities that Arise During Municipal Operations USEPA 2015.
- Greenforce Initiative Jobs for the Future 2016.

These green infrastructure actions can help park agencies meet one or more of the following goals and priorities, including:

- Enhancing park aesthetics with natural drainage.
- Providing recreational opportunities in underserved communities.
- Meeting the demand for better park features.
- Reducing landscape and facility maintenance.
- Improving drainage in low-lying areas.
- Eliminating mosquito breeding habitat.
- Improving the quality of compacted urban soils.
- Providing habitat for ecological diversity.
- Sharing costs among agencies.
- Providing ideal locations for green stormwater management.

This summary was adapted from:

Green Infrastructure in Parks:

A Guide to Collaboration, Funding and Community Engagement

U.S. EPA, Office of Water – June 2017

This page intentionally left blank.

Appendix F









Audubon

Images courtesy of:
https://www.audubon.org/

PLANTING FACTSHEET FOR BIRD SANCTUARY

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

Bird Sanctuary at Bradenbaugh Park

At Brown-Bradenbaugh Park the bird sanctuary can be enhanced with strategic native plantings to diversify the ecosystem and attract a variety of birds to the area. The site already contains established vegetation and stream which is a major draw for birds and wildlife. With careful planning and implementation, a native plant garden can benefit and attract bird species by providing food and habitat.

How To: A Bird-Friendly Sanctuary

The Audubon fact sheet covers the steps to plan and create a native plan garden to attract birds. Essentially having a selected site with the best possible conditions that will allow the native plants to be planted at the correct time of year and grow successfully is the key. The native plants will then attract birds with the plant selection, other habitat features, and site conditions. Planning the native plant garden includes considering the plantings layout by grouping of species, utilizing a color pallet, maintaining weeds and invasives, creating natural habitat elements, and focusing on plant species that provide high variety and quality of bird food.

Step 1: Identify specific site location and conditions for the plantings and select corresponding native plants and consider consulting the local native plant society on supporting plant species.

Step 2: Plant in Spring or Fall on cooler days and understand maintenance needs to establish the plants.

Step 3: Prepare the planting site to be free of grass and weeds, have nutritious soil, and consider edging.

Step 4: Plan the planting area with grouping of plant species, selecting color palettes, and adding habitat features for birds.

Step 5: Maintain the garden by removing weeds and invasives and also allow for natural habitat areas.

Step 6: Focus on plants that offer the most variety and quantity of bird food, such as; red tubular flowers, native flowers with seeds and bushes with berries.

532 Number of butterflies and moths native oak trees support. Non-native ginkgo trees host just FIVE.

Statistics courtesy of Audubon, The Impact of Native Plants.

Water-wise, drought-tolerant native plants reduce water use, especially critical in drought-stricken, arid parts of our country.

96 percentage

Land birds that feed insects to chicks. Native plants are nature's bounty.

1,200

U.S. crops that depend on pollinators to grow. Native plants are essential for pollinators - from birds, bees, butterflies, and bats.

80 million Number of pounds of pesticides homeowners apply to the 40 million acres of lawns in the U.S. each year. Native plants, on the other hands, support a vibrant balance of predator and prey insects and thrive without pesticides.

Your native garden joins a collective effort to give back to birds and plant hope for their future.

Spend more time with birds and less time with noisy lawn mowers that pollute the air and water.

800 million Estimated number of gallons of gas Americans burn in lawn mowers annually. This produces significant amounts of CO_2 and other greenhouse gases that drive climate change.

Appendix G

VISUAL PREFERENCE SURVEY

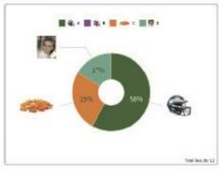
Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

Public Workshop - Millersburg Master Plan

Current run (last updated Feb 28, 2018 8:36am)

11	10	12	95%
Polls	**Participants**	**Average responses**	**Average engagement**

Who is going to win the superbowl?

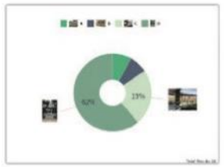


Response options	Count	Percentage
	7	58%
	0	0%
	3	25%
	2	17%

90%
Engagement

12
Responses

What is your favorite for Market Square Park?

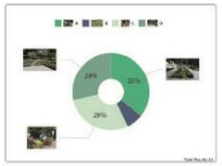


Response options	Count	Percentage
	1	8%
	1	8%
	3	23%
	8	62%

100%
Engagement

13
Responses

Which planting would work best?

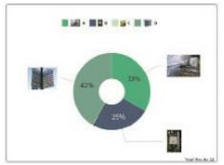


Response options	Count	Percentage
	5	36%
	1	7%
	4	29%
	4	29%

100%
Engagement

14
Responses

Which is your favorite style of signage?

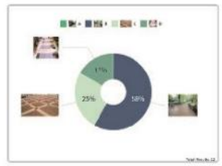


Response options	Count	Percentage
	4	33%
	3	25%
	0	0%
	5	42%

100%
Engagement

12
Responses

Which building material would work best?

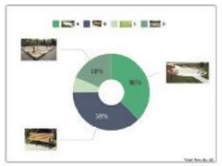


Response options	Count	Percentage
	0	0%
	7	58%
	3	25%
	2	17%

100%
Engagement

12
Responses

Which seating would work best?

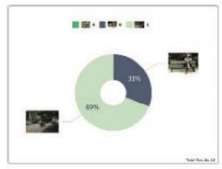


Response options	Count	Percentage
	6	38%
	6	38%
	1	6%
	3	19%

100%
Engagement

16
Responses

Which image represents your favorite installation of public art?

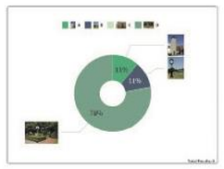


Response options	Count	Percentage
	0	0%
	4	31%
	9	69%

80%
Engagement

13
Responses

Which amenity would fit best in the park?

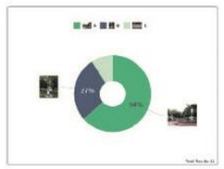


Response options	Count	Percentage
	1	11%
	1	11%
	0	0%
	**7**	**78%**

80%
Engagement

9
Responses

Which amenity would fit best in the park?

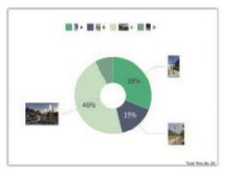


Response options	Count	Percentage
	**7**	**64%**
	3	27%
	1	9%

100%
Engagement

11
Responses

Which light fixture would fit best in the park?

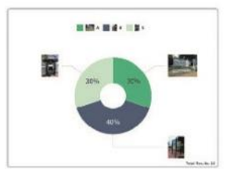


Response options	Count	Percentage
	4	31%
	2	15%
	**6**	**46%**
	1	8%

100%
Engagement

13
Responses

Which kiosk would fit best in the park?



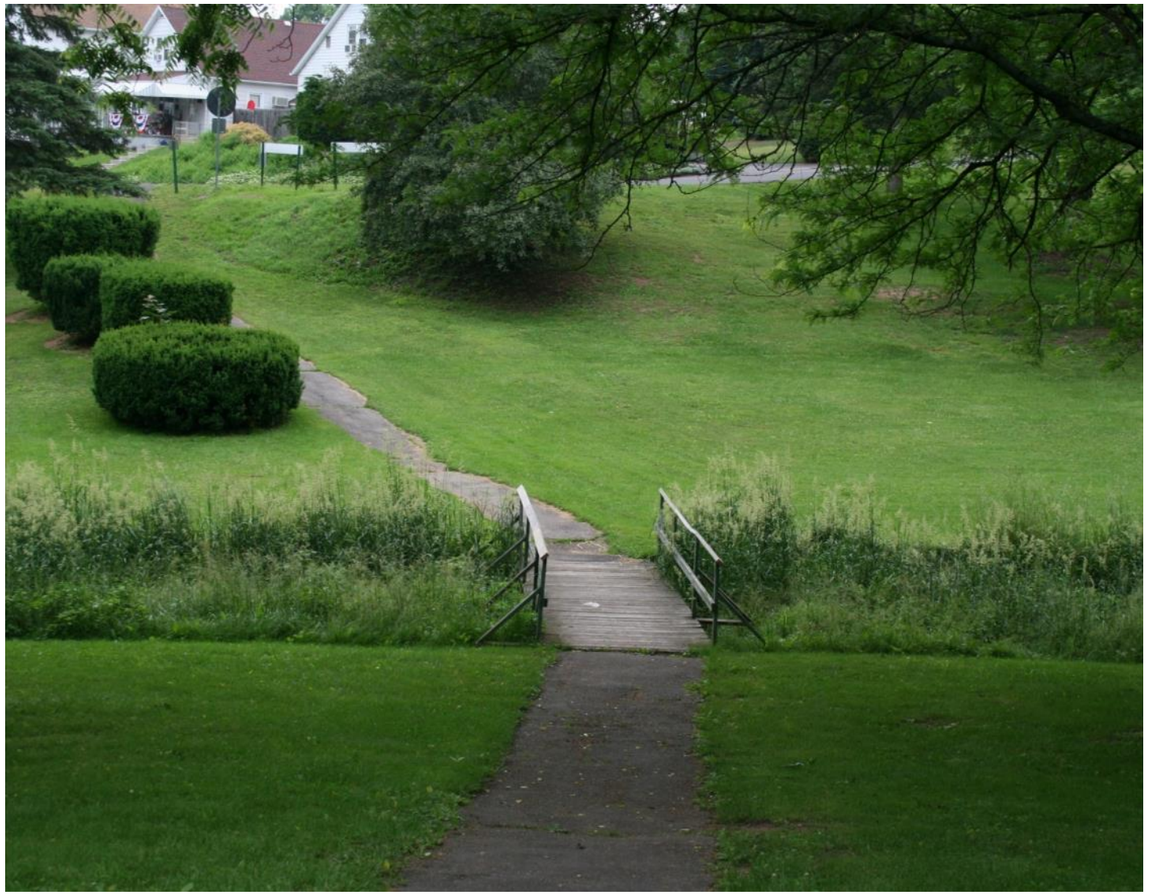
Response options	Count	Percentage
	3	30%
	**4**	**40%**
	3	30%

90%
Engagement

10
Responses

This page intentionally left blank.

Appendix H



DCA PROJECT 70 ACQUISITION - SEAL PARK

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

Pennsylvania Department of Conservation and Natural Resources

Rachel Carson State Office Building
6th Floor • P.O. Box 8475
Harrisburg, Pennsylvania 17105-8475
May 12, 2005

Bureau of Recreation and Conservation

717-705-8533
Fax: 717-772-4363

Mr. Skip Wingard, Borough Manager
Millersburg Borough
101 West Street
Millersburg, PA 17061

RE: Seal Park
Project 70 Acquisition
Change in Use

Dear Mr. Wingard:

This is in response to your letter of January 21, 2005 to Greg Gove and to confirm our telephone conversation of May 9, 2005 regarding proposed improvements to Seal Park including the removal of obsolete tennis courts and the use of the old tennis court land for parking for the adjacent ball field. As we discussed on the telephone, you assured me that the ball field is not used exclusively by the Little League Association but that, in fact, it is open to public use on a nondiscriminatory scheduled and unscheduled basis. As long as this is the case, the change in use from tennis courts to parking for the ball field will not be considered a conversion under the requirements of Project 70.

If you have any questions please call me at (717) 772-3742 or my e-mail address is mischneide@state.pa.us.

Sincerely,

Michael R. Schneider
Recreation and Park Supervisor
Bureau of Recreation and Conservation

cc: Lori Kieffer Yeich, Regional Recreation and Park Supervisor

Millersburg Boro

From: "Schneider, Michael (DCNR)" <mischneide@state.pa.us>
To: "Millersburg Boro" <mbborough@comcast.net>
Sent: Wednesday, May 18, 2005 11:49 AM
Subject: RE: Millersburg Seal Park

Skip,

As long as the Little League does not have exclusive use of the field, other organizations have an opportunity to schedule and use the field in the same manner as the Little League and if the field is open to general public use went not scheduled, there shouldn't be a problem.

Mike Schneider

-----Original Message-----
From: Millersburg Boro [mailto:mbborough@comcast.net]
Sent: Wednesday, May 18, 2005 10:30 AM
To: mischneide@state.pa.us
Cc: Millersburg Date File
Subject: Millersburg Seal Park

Mr. Schneider:

Received your letter of: 5/12/05 and have a question concerning the language "it is open to public use on a nondiscriminatory scheduled and unscheduled basis".

The Little League does indeed have a schedule for their games but all other times the field is available and used by the general public.

Am I misinterpreting this requirement?

Skip Wingard
Millersburg Borough Manager

5/18/2005

Appendix I

LTAP PEDESTRIAN CROSSING RECOMMENDATIONS

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

Memorandum

To: Chris McGann, Millersburg Borough, Dauphin County

From: Patrick Wright, LTAP

Date: December 30 2016

Subject: Pedestrian Crossings, Millersburg Borough

Background

In response to a technical assistance request by Millersburg Borough, we met to examine pedestrian crossings near the Millersburg Middle School. The Borough is concerned about the safety of the crossings, coupled with the traffic that occurs during student pick-up/drop-off times.

We drove and walked the area around the middle school (see Figure 1). The Borough noted several areas of concern, including:

- Two mid-block pedestrian crosswalks on Center Street, one that leads to the entrance of the middle school, and one that leads to the entrance of the library.
- A pedestrian crosswalk across North Street near the parking lot for the middle school.
- A pedestrian crosswalk across North Street that leads to the pool/ball fields
- A pedestrian crosswalk across North Street at Seal Street.

Figure 1: Study Area

The Borough also indicated that traffic speed on North Street is a concern, and that buses have difficulty negotiating the intersection of North Street/Church Street.

References

Before discussing a concept for the pedestrian crossings at each location, note that field observations, discussions with municipal personnel, highway safety research, and traffic engineering experience are largely responsible for the content and findings of this memo. In addition, specific references that were consulted include:

- Current edition of the 2009 Manual on Uniform Traffic Control Devices
- PennDOT Publications 46, 111, 236, and 383
- Pedestrian Road Safety Audit Guidelines and Prompt Lists, FHWA SA-07-007, July 2007
- Improving Pedestrian Safety at Unsignalized Crossings, NCHRP Report 562, 2006
- An Overview and Recommendations of High-Visibility Crosswalk Marking Styles, Pedestrian and Bicycle Information Center, August 2013
- Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations
- Pedbikesafe.org, website for pedestrian safety guide and countermeasure selection
- Pedbikeinfo.org, website for the FHWA sponsored Pedestrian and Bicycling Information Center

Pennsylvania LTAP is willing to clarify and provide additional information relating to any of the potential solutions listed.

Center Street Discussion

Center Street is a local two-way, two-lane Borough street with parking and sidewalks. There is a marked pedestrian crossing across Center Street to the entrance of the Middle School, and another marked crosswalk at the library entrance. Center Street is posted at 15 mph, and there are no longitudinal pavement markings.

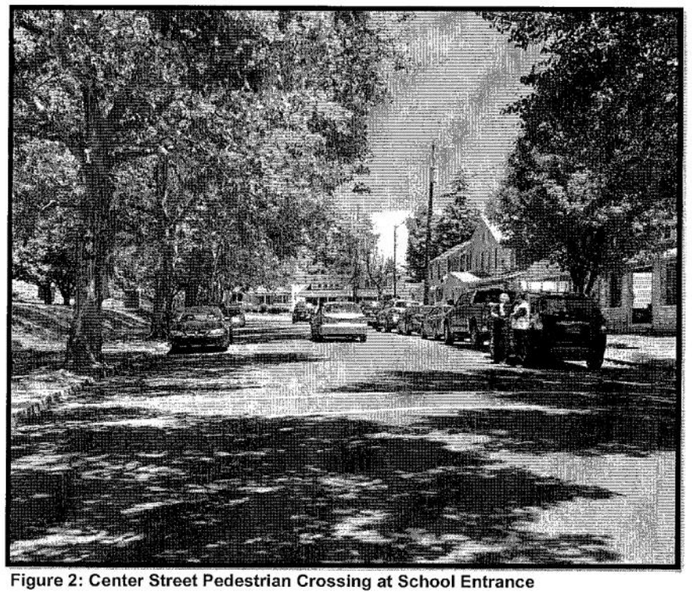


Figure 2: Center Street Pedestrian Crossing at School Entrance

As a lower volume, lower speed residential street, marking pedestrian crossings across Center Street is not a high risk, per national safety research. However, since mid-block pedestrian crossings may be less expected by motorists, the Borough can enhance the visibility of the crosswalks by considering some of the following options:

- Adding a new fluorescent yellow green School Crossing Sign (S1-1) in both directions at the crosswalks. Remove the existing school crossing signs.
- The School Crossing signs should be supplemented with a Downward Diagonal Pointing Arrow Plaque (W16-7p). These signs must be placed as close as practical to the crosswalk.
  - **Section 7B.12 School Crossing Assembly: Standard:**
    01 **If used, the School Crossing assembly (see Figure 7B-1) shall be installed at the school crossing (see Figures 7B-4 and 7B-5), or as close to it as possible, and shall consist of a School (S1-1) sign supplemented with a diagonal downward pointing arrow (W16-7P) plaque to show the location of the crossing.**

- Adding a reflective stripe in the sign posts of the School Crossing Signs
- Installing In-Street Pedestrian Crossing signs (R1-6) at each crossing.
- Repainting the crosswalk marking to PennDOT Type C (block or continental pattern) standards using thermoplastic marking materials.
- Adding "SCHOOL" pavement markings on Center Street in advance of the crosswalk. Details for the marking are in PennDOT Pub 111, Section TC-8600, Page 9.
- Supplementing the School Crossing Signs (S1-1) with flashing lights. Several types of flashing lights are approved by PennDOT, including: flashing LED's embedded in the signs, a flashing warning beacon, or Rectangular Rapid Flashing Beacons (RRFB's). If you choose to use a flashing warning device, consider making the lights push button activated (as opposed to constantly flashing or flashing based on a timer). The crossing guard (or any pedestrian) can activate the signs when needed. Since the flashers are electrically powered, you will need PennDOT approval and a permit for the devices.
- Eliminating any unnecessary signs in advance of the crossing to improve the conspicuity of the School Crossing Signs.
- Installing a School Advance Crossing Assembly (consisting of a School Crossing Sign (S1-1) with an Ahead Plaque (W16-9p)). Per the MUTCD Table 2C-4, for a posted speed of 15 mph and a stop condition warning, this sign should be located at least 100 feet before the crossing.
- Increasing enforcement of driver behavior at the crosswalk, including drivers yielding to pedestrians in a crosswalk. Police presence near the crosswalk will also improve driver compliance.
- Enforcing parking regulations near the crosswalks. Per Title 75, PA Vehicle Code Section 3353, motorists are not allowed to park within 20 feet of a crosswalk. The Borough can also consider restricting parking further to improve visibility of the crosswalk.
- Adding street lighting at the crossing. Most pedestrian crashes occur during low light conditions (dusk, dawn, and nighttime).
- Also, consider upgrading the ramps to be ADA compliant. In the future, installing curb extensions (or bump outs) per PennDOT Publication 383 will enhance the crossing. If speeding is a concern on Center Street, both crossings can be considered for raised crosswalk locations (See Figure 3).
- Lastly, make sure to install all signs in accordance with PennDOT Publication 111 sign installation details, including a minimum height of 7 feet from the ground to the bottom of the sign assembly, and at least a one foot offset from the face of curb.

Figure 3: Example of a Raised Crosswalk in York, PA

North Street Discussion

North Street is a two-way, two lane Borough street. It runs on the northwest side of the school, and is the main access route for parents, teachers, and school buses. There are parking areas on both sides of North Street, as well as a park, trails, ball fields, and the community pool. North Street is posted at 15 mph.

As with the low volume low speed Center Street, permitting pedestrian crossings across North Street is not an issue. However, due to the intensity and mix of traffic during school start/end times, plus the parks, trails, and pool, the Borough should clearly mark and identify the crosswalks.

The Borough may also want to consider traffic calming devices along North Street. Traffic calming devices can regulate the speed of traffic past the school and park areas.

Given those two objectives—clearly establishing the crosswalks and traffic calming, the Borough can consider the following:

- Adding a raised crosswalk at each crossing location
- In addition to the raised crosswalks, the Borough can consider adding speed humps at other locations to regulate the speed of traffic along North Street through the entire area (See Figure 4). PennDOT Publication 383 recommends that speed humps are used in a series of devices to regulate speed.

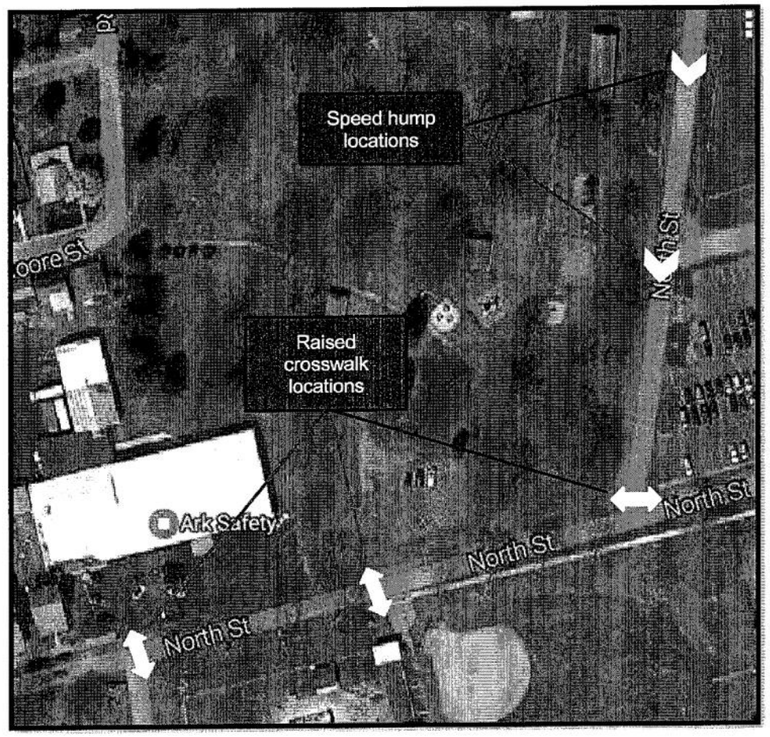


Figure 4: Suggested traffic calming device locations

- Note that speed humps do reduce and control speed. However, they do have other side effects that are noted in PennDOT Publication 383. The Borough should work closely with the school, emergency responders, and the police to address access issues created by speed humps. Split speed humps (or speed pillows) are an alternative that may have less impact on larger response vehicles. Furthermore, a formal traffic calming policy/study (per the requirements of Publication 383) should be completed prior to implementation.

- For signing and markings for the crosswalks, refer to the Center Street crosswalk suggestions. For signing and marking requirements for the speed humps, refer to PennDOT Publication 383.
- Consider relocating the pedestrian crossing at North Street and the school parking area to line up with the existing sidewalk on the side of the parking lot (see Figure 5). Currently, the crosswalk ends in the parking lot with no clear path to navigate through the parking area. Further, the crossing is close to an intersection, which is a more appropriate location for a crosswalk. This would require a connection from the trail to the crossing location.

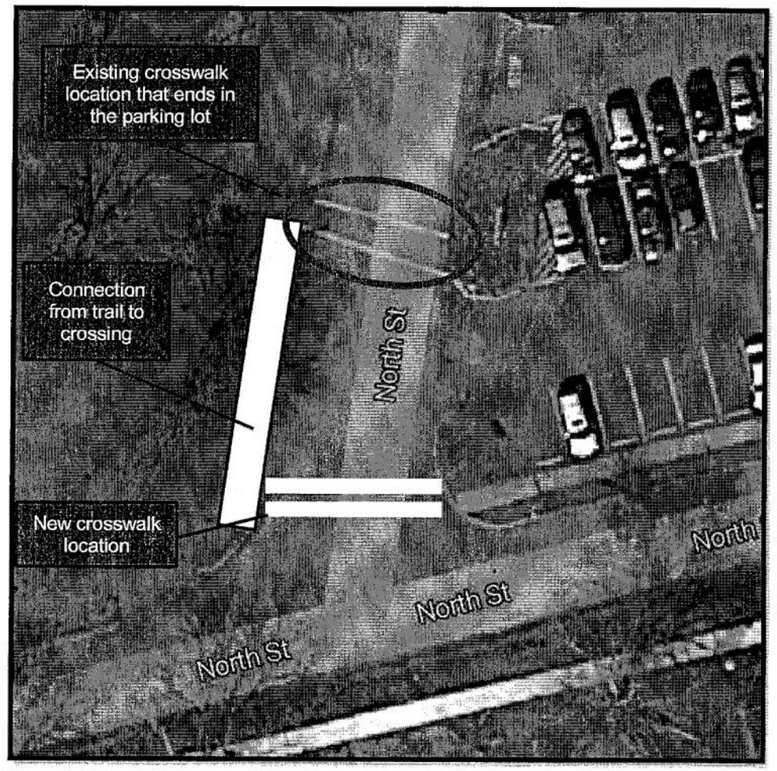


Figure 5: Relocation of crosswalk to connect trail and sidewalk

- Similarly, the other crossings on North Street near the pool and at Seal Street should be coordinated with sidewalks and trail access.

At the intersection of North Street and Church Street, the Borough indicated that the narrow street and tight curb radii make it difficult for school buses and other traffic to negotiate during pick-up/drop-off times. The intersection is currently all-way stop controlled (see Figure 6). North Street west of Church Street is one-way westbound. North Street and Church Street are both about 24-26 feet wide near the intersection. On North Street, east of the intersection, parking is restricted to the north side of the street. On Church Street, parking is restricted to the east side of the streets.

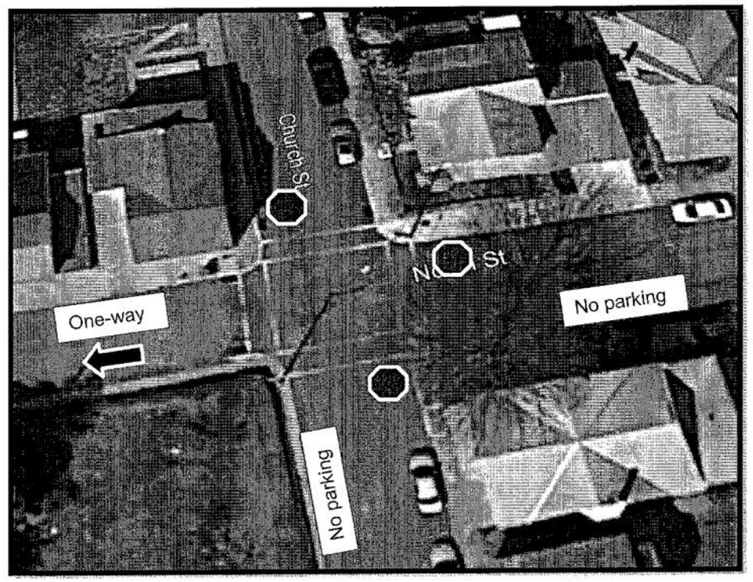


Figure 6: Intersection of North Street and Church Street

With 24 feet curb to curb on North Street, minus an 8-foot parking lane, that leaves 16 feet for two travel lanes. While this width is appropriate for a residential street with low volumes and low speeds, the narrow travel lanes can be difficult to navigate for buses coupled with other traffic during the busy school periods.

There are several options the Borough can consider, including:

- Restricting parking along both sides of North Street east of the intersection. This can be done permanently or just during school pick-up/drop-off times. This would provide more lane width for buses and vehicles to negotiate the intersection. This may also have a negative impact to residents on the street that use the parking.
- Make North Street one-way westbound. This can also be done permanently or just during school periods. Some school districts (such as Camp Hill and

Annville) use police to temporarily create one-way flow patterns during school pick-up/drop-off periods.

- If North Street is made one-way westbound, this can start at Seal Street (see Figure 7). Seal Street can then be used to access the school. However, Seal Street is narrow itself, and should be considered for a one-way northbound.
- The other option is to make North Street one-way from the school parking area to Church Street, and create a one-way circulation pattern for picking up/dropping off at the school.
- While considering the one-way street options, the Borough will also need to review the impacts on residents, emergency response, the school, parks and other Borough services by conducting appropriate studies.

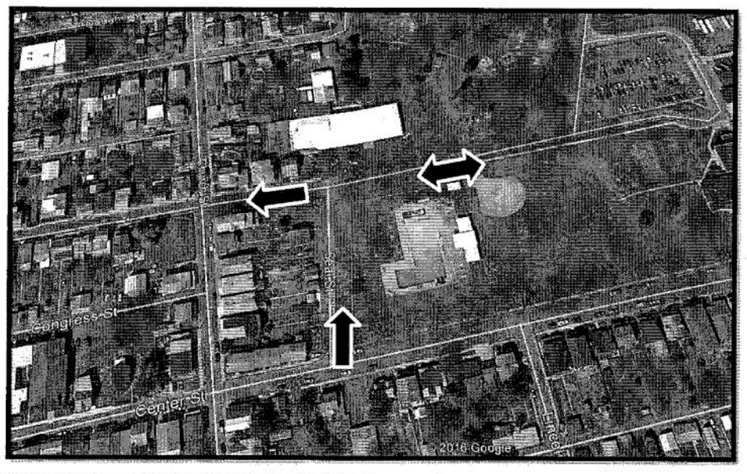


Figure 7: Flow pattern option for North Street

Summary and Next Steps

Based on a field view of the study area and a review of the PennDOT standards and guidelines, LTAP developed a suggested series of signing, pavement marking, and traffic control schemes for improving pedestrian access and circulation along Center and North Streets. The Borough can consider implementing some of the lower cost signing recommendations in the short term, and should conduct more detailed studies for the traffic calming and one-way street scenarios.

Appendix J

GEOMORPHIC ASSESSMENT AND CONCEPTUAL HYDROLOGY AND HYDRAULICS ANALYSIS

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

INTRODUCTION

A geomorphological investigation and preliminary hydrologic and hydraulic analysis was performed along Tanner Run within Seal and Brown-Bradenbaugh Park's as a result of the Millersburg Borough proposed Master Site Plan. The investigation was performed in order to understand the existing stream corridor and stream stability conditions within Tanner Run and to determine whether stream and floodplain restoration efforts within Seal Park would meet proposed stormwater management requirements associated with the Millersburg Borough Master Site Plan and possibly provide benefits for any future MS4 permit requirements.

The geomorphological investigation and visual watershed assessment performed within and adjacent to the Tanner Run watershed provides information on the existing hydrology, in-channel hydraulics, stream geomorphology and provides an evaluation of the existing channel stability for Tanner Run, specifically within Seal and Brown-Bradenbaugh Park's. Visual and geomorphic assessments were performed beginning in the headwaters of Tanner Run located about a half mile north of the Millersburg Area Senior High School, extended downstream through Seal Park, within Millersburg Borough, and concluded at the downstream culvert inlet at the Brown-Bradenbaugh Park near Chestnut Street.

Watershed Conditions and Visual Geomorphic Assessment

The following narrative provides information that was used to perform the visual assessment of Tanner Run. Information obtained included general watershed information, i.e. watershed size and land use, along with geologic and hydro-physiographic information that helps understand the fluvial processes within Tanner Run. We have also performed a preliminary historic investigation and have identified some possible causes of the existing stream channel conditions within Tanner Run and are described below.

Watershed Delineation, Hydro-Physiographic Region, and Existing Land Use

The Tanner Run watershed drainage area is approximately 145 acres with a drainage area of approximately 75 acres to the culvert at North Street. Tanner Run is a first-order headwater tributary to the Wiconisco Creek that eventually confluences with the Susquehanna River. The watershed is located within the Ridge and Valley hydro-physiographic province and is dominated by linear ridges with low to moderate relief and linear valleys along the Susquehanna River. The watershed consists mainly of residential and lightly urbanized conditions with very little open space, specifically those located within Seal and Brown-Bradenbaugh Parks. The headwater conditions of the Tanner Run watershed is currently in agricultural use with corn being the main crop, however, this area only makes up a small percentage of the watershed or roughly 10 percent of the entire watershed. Tanner Run is listed as an unnamed tributary to the Wiconisco Creek by the Pennsylvania Department of Environmental Protection (PADEP) and is identified as a Warm-Water Fishery (WWF) within the PADEP Chapter 93 *Water Quality Standards*.

Historical and Anthropogenic Influences

In many floodplains and stream corridors throughout modern-day Pennsylvania and the Eastern United states, the valley bottoms adjacent to waterways no longer serve their natural purpose as intended in a stable and natural channel environment. Rather, these floodplain surfaces are high, eroding terraces created by past impacts such as the construction of mill dams/ponds and more recent alluvial deposits or "legacy" sediments that filled in the valleys. These conditions are a result of poor land-use practices from the early 1700s to the 1950s, known as the post-settlement era. See *Figure 1*. Additionally, floodplain encroachments, such as bridges, roadways, infrastructure and utilities have been located within and along our waterways that have minimized the functionality of these floodplain areas.

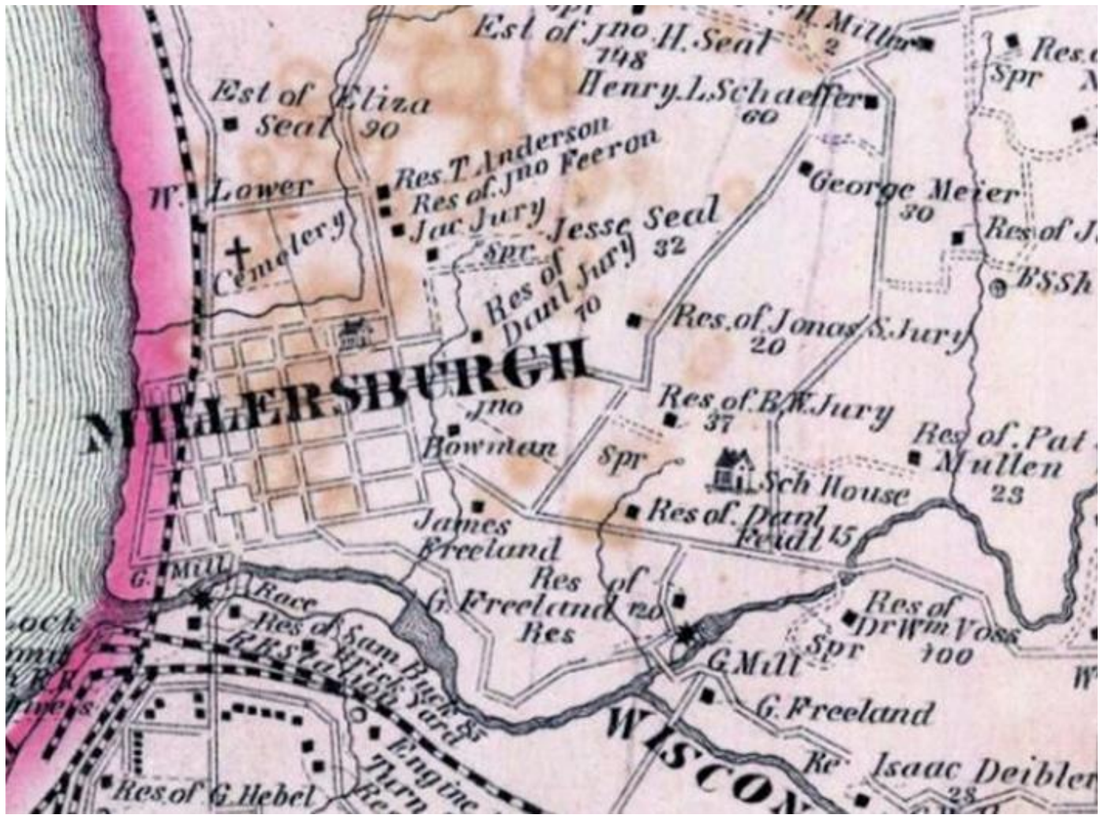


Figure 1. Atlas map of Millersburg Borough showing grist mill (G. Mill) and dam located at confluence of Wiconisco Creek and Tanner Run as well as upstream on Wiconisco Creek.[1]

These post-settlement impacts, along with modern encroachments, have filled the floodplains with a thick layer of loamy material ranging anywhere from 2 to 20 vertical feet. The floodplains that existed prior to settlement appear to only have had a thin layer of organic-rich silt loam of

[1] Map of Upper Paxton Township, Combination Atlas of Dauphin County PA, 1875, Everts & Stewart.

less than two feet near the surface. Therefore, today's terraces are not providing the same functions that historically stable and natural channels performed. The deeply incised stream channels we see today were only recently (<300 years) formed as response to the accumulation of legacy sediments. The flat, well-developed floodplains that existed along our waterways prior to the post-settlement era allowed high channel flows easy access (flooding), typically numerous times per year. In many cases the pre-settlement streams may not have been the single-thread channels as we see today. Instead, these pre-settlement streams were small and branching channels with extensive vegetated wetlands that stored very little sediment and were very efficient carbon sinks (Walter and Merritts, 2008). This anabranching channel condition is also prevalent in headwater systems where valley bottoms exhibit multi-channel low flow conveyance areas, thus providing a more diffuse flow pattern providing increased stability and encouraging surface water infiltration.

This frequent connection of flow to the original floodplains provided enhanced water quality benefits by removing sediments through frequent deposition occurring in the floodplain areas, efficient denitrification because rooting zones extended into or very near base flow elevations, regular exchange of organic materials between the channel and the floodplain, improved groundwater recharge and infiltration, and limited in-channel shear stresses to non-erosive levels during high flooding events by spreading out flows into the well-developed valley flats.

During settlement and on through rapid urbanization, from the 18th century up through the first half of the 20th century, much of the vegetation disappeared through land clearing for timber, agriculture, commerce, and settlements. Massive erosion from upland slopes into stream and river valleys ensued. To make it easier for farming and other human activities, meandering stream channels were moved from the lowest elevations in the valley centers to the higher elevations at valley edges, and in the process usually were straightened. Elevated channel beds and floodplains were no longer closely connected to groundwater supplies; therefore, flows were composed predominantly of surface water runoff, with temperatures far exceeding that of the groundwater.

More recently, post-settlement alluvium has washed from the hillsides and upland areas into our stream channels and valleys. Additionally, channel re-location and straightening is ubiquitous throughout the Northeast. Modern streams with overly high stream banks and excessive boundary stresses readily cut through post-settlement sediment fills, resulting in highly erosive conditions.

Rivers and streams in our region have experienced this post-settlement alluvium depositional period for over 200 years and more recently, over the past 30 to 40 years, and are beginning to transition into a degradational state because of the natural evolutionary processes in incised channels and the direct and indirect impacts of urbanization. This process of channel degradation through the post-settlement alluvium is highly detrimental to downstream environments and creates excessive sediment loads to downstream receiving waterbodies.

The current conditions with Tanner Run show clear evidence of some of the anthropogenic and historic influences as described above, including channel straightening, incision, and highly erodible streambanks as a result of post-settlement land-clearing and landscape alterations. This current condition will be further explained below in the Visual Geomorphic Assessment section.

Visual Geomorphic Assessment

The visual assessment of Tanner Run has been divided into three reaches for discussion, consisting of the headwater area and upstream supply reach, the project reach located within Seal Park, and the base level control reach. The visual assessment also included the stream corridor in the Brown-Bradenbaugh Park located upstream of Chestnut Street.

The upstream supply reach, for discussion purposes, is located upstream of Seal Park and contributes to the sediment load being transported to the project reach and further downstream. The project reach is identified as the reach of stream that generally begins at the upstream limits of Seal Park and extends downstream to the inlet of the culvert system near North Street behind Ark Safety Company. The discussion of the downstream base level control reach provides information on either natural or man-made features currently affecting the long-term streambed elevation throughout the upstream reach, specifically the culvert system at the downstream limits of Seal Park near North Street. Tanner Run enters into this 48" reinforced concrete pipe (RCP) culvert system and is conveyed through a complex culvert system to the Brown-Bradenbaugh Park where it then is conveyed in an open channel system downstream through the park and then enters into another culvert system which passes under an existing parking lot and Chestnut Street before discharging to the Wiconisco Creek. For this purpose, the base level control for Tanner Run would consist of the 48" RCP culvert inlet system upstream of North Street and the downstream culvert inlet system that is located upstream of Chestnut Street near the Brown-Bradenbaugh Park. Maintenance of such culvert inlet systems would provide the necessary base level control for both parks from a long-term fluvial geomorphic stability analysis.

a. Upstream Sediment Supply Reach

The headwaters portion of Tanner Run begins within the existing agricultural fields located upstream and behind the residential properties to the north and east of Dawn Road and Bowman Street, respectively. The landscape eventually transitions into a more confined valley condition that is bound to the south by forested conditions with residential homes located along Dawn Road and Bowman Street to the north. The corridor between these two residential developments consists of manicured backyards that drain away from the homes and to the southwest towards Seal Park. The area behind these existing residential homes consists mainly of a grass-lined swale with no defined stream channel. See Photograph 1.

Based upon the geomorphic characteristics of Tanner Run within this area, the "stream" channel condition is basically a grass-lined swale with no real defined channel and therefore provides a minimal amount of sediment to the downstream condition. Additionally, the sediment being delivered to this grass-lined swale condition from the upstream agricultural fields mainly consists of fine-grained sediments that are deposited in the grass-lined swale as it acts as a filtering mechanism. However, this "stream channel" condition rapidly transitions into

Photograph 1. Headwater conditions upstream of Seal Park near Bowman Street, looking upstream.

a

severely incised and somewhat entrenched stream that is highly disconnected from a functional floodplain, specifically along the left valley margin as seen in Photograph 2. The stream channel is now a source of erodible sediments from degradation and the undercutting and erosion of its streambanks. This geomorphic transition zone, or headcut, between the grass-lined swale and the downstream degraded and incised stream channel will continue to move upstream, eroding the landscape and creating an upstream stream channel condition similar to the downstream condition.

This channel incision begins immediately downstream of the open lot along Bowman Street (possible acting as a stormwater detention facility) and continues downstream into Seal Park. See Photograph 3 for incised channel condition immediately upstream of Seal Park near the apartments at Walborn Road and Summit Street. Streambanks in this area range from two to four feet in height and therefore the stream is highly disconnected from a functional floodplain. The channel also appears to have been historically straightened and channelized.

Photograph 2. Incised stream channel with highly erodible streambanks, looking downstream.

Photograph 3. Incised and straightened stream channel behind Walborn Road apartments, looking downstream.

b. Seal Park Project Reach

This incised stream channel condition persists into Seal Park and continues approximately 1,000 feet downstream through the park until it transitions into a somewhat well-connected stream channel condition. This condition is present for approximately 100 feet before Tanner Run enters into the 48" RCP box culvert system near North Street. Throughout the upper section of Seal Park the streambanks range in height between three to five feet in height with 1) an existing concrete slab bridge crossing, 2) an abandoned concrete bridge crossing abutment along the channel, and 3) a single span wooden bridge in the downstream area near the 48" RCP culvert. See Photographs 4, 5, 6 and 7 for existing stream channel conditions in the upper reaches of Seal Park and the single span wooden bridge in the lower section.

Photograph 4. Straightened, incised, and undercut streambanks with concrete slab bridge crossing, looking upstream.

Photograph 5. Incised stream channel disconnected from a functional floodplain with 3.0' to 4.0' eroding and undercut streambanks with concrete slab encroachments in background, looking upstream.

Photograph 6. Somewhat incised stream channel that is disconnected from a functional floodplain with moderately eroding and slumping streambanks along left valley margin, looking upstream.

Photograph 7. Fairly well-connected stream condition near downstream wooden bridge, looking upstream.

As can be seen in Photographs 4, 5, and 6, streambanks are highly vertical and eroding, contributing to high sediment loads being delivered downstream to the Wiconisco Creek and Susquehanna River, and ultimately contributing to the sediment impairments of the Chesapeake Bay. These incised conditions vary drastically from the well-connected stream channel within the lower 100 feet of the project reach to the upstream incised channel throughout the park; however, the conditions in the last 100 feet are mainly a result of the inefficient transport of sediments into the 48" RCP pipe culvert system. Because the 48" RCP pipe culvert maintains the elevation of the streambed and is promoting inefficient transport of sediment, the lower 100-foot reach upstream of it has subsequently filled in due to aggradation or filling in of the stream channel and thus creating these low streambank conditions. See Photograph 7.

The geomorphic characteristics, specifically the low streambank heights and the high connectivity to its adjacent floodplain within this lower reach would be similar to the stream restoration improvements that would be proposed within and immediately upstream of Seal Park. This proposed stream and floodplain restoration design approach for the Tanner Run impairments within Seal Park could possibly provide Post Construction Stormwater Management (PCSM) requirements for the Seal Park Master Site Plan improvements. Potential reductions in flow rate and volume created by the proposed stream improvements within Seal Park would also provide environmental benefits to the reach within Seal Park, as well as provide downstream flow conditions, specifically to the downstream receiving stream within Brown-Bradenbaugh Park.

c. Downstream Base Level Reaches

As previously described, the 48" RCP culvert system at the downstream limits of Seal Park is acting as the long-term base level control and will maintain the existing streambed elevations as long as the culvert remains in place.

For the Brown-Bradenbaugh Park stream reach and the lower section of Tanner Run, the channel is severely eroded and highly incised throughout the entire reach. This channel incision is leading to eroding streambanks and lateral channel migration towards the adjacent ball fields. This incision process is also leading to continued vertical degradation which will further exacerbate streambank erosion and lateral adjustments. See Photographs 8 and 9 for eroding and incised stream channel conditions within Brown-Bradenbaugh Park. Additionally,

the culvert system at the lower limits of Brown-Bradenbaugh Park is also acting as the long-term base level control and will maintain the existing streambed elevations as long as the culvert remains in place.

Photograph 8. Severely incised and entrenched stream channel with 4.0'-5.0' eroding streambanks migrating towards ball field, looking upstream.

Photograph 9. Severely incised and entrenched stream channel with 4.0'-5.0' eroding streambanks migrating towards ball field, looking downstream.

The stream channel conditions within the Brown-Bradenbaugh Park also need to be stabilized to minimize further erosion along the streambanks. This ongoing streambank and lateral erosion is currently negatively affecting the adjacent ballfields. Stabilization measures within this reach may include the removal of floodplain encroachments, streambank grading, stream restoration, and/or stabilized (imbricated) rock walls to arrest the streambank erosion and lateral adjustment. It should be noted that due to the existing infrastructure within this park, stream and floodplain restoration activities would not provide the flow and volume reductions as maybe identified in Seal Park due to the limited area adjacent to the stream corridor to meet the stormwater management requirements associated with the Millersburg Borough Master Site Plan. Additional geomorphic and scour analyses should be performed to evaluate long-term stream corridor stability recommendations.

Overall, the stream channel condition within Tanner Run exhibits some of the identified historic and more modern day impacts typically associated with land development activities within a given watershed. The stream channel within Seal Park has undergone severe vertical adjustments that are migrating upstream that will continue to promote streambank erosion and lateral adjustment. These fluvial processes will generate excessive sediment loads that will be transported to the downstream condition near North Street and will continue to fill in this area further reducing conveyance and possibly increase flooding. Stream and floodplain restoration activities could be implemented along these impaired reaches to address these impairments and to improve long-term stability, flooding, sediment imbalance, stormwater management, and other environmental benefits such as improved water quality, wildlife enhancements, and environmental recreation. Millersburg Borough has an opportunity to concurrently address some of the Chesapeake Bay watershed issues with this restoration design approach and assist in meeting the Pennsylvania State Water Plan goals as well as assist in addressing goals identified in the Dauphin County Comprehensive Plan.

Hydrology and Hydraulics Conceptual Analysis - Seal Park

In order to determine the suitability and feasibility of stream and floodplain restoration within Seal Park to manage post construction stormwater requirements, JMT performed a conceptual and preliminary Hydrology and Hydraulics analysis to determine if this design approach will meet the requirements of the Millersburg Borough Stormwater Management Ordinance, Dauphin County Act 167, and the NPDES General Permit for Stormwater Discharges from Construction Activities (PAG-02). The following narrative describes and outlines or analysis.

A. Procedures and Assumptions

A hydrologic analysis of the contributing drainage areas to Tanner Run was performed using the Hydraflow Hydrograph Extension software for AutoCAD by Autodesk. Hydrology was calculated using SCS TR-55 methodology and was routed utilizing SCS TR-20. One watershed was used to model the existing and proposed conditions.

The Modified Attenuation-Kinematic Channel Routing method is used for reach routing. This method is based on the Discharge - Flow Area relationship:

$$Q=xAm$$

where: Q=Flow Rate

A=Flow Area

x and m are coefficients relating Q and A for a given channel

The channel routing routine provides a basis for evaluating the effect of the proposed stream restoration design and the resulting increased cross-sectional area and storage volume. The watershed model was modified to reflect the proposed condition by modifying the reach routing coefficients to reflect the proposed channel conditions. The proposed land development improvements to Seal Park will have negligible effects to the Runoff Curve Number (RCN) and the drainage area and would therefore have similar discharges for both existing and proposed land development conditions. However, performing the Modified Attenuation-Kinematic Channel Routing methodology for both the existing and proposed stream corridor improvement conditions will identify changes in discharge due to changes in the proposed channel cross sectional area. Rainfall data was taken from NOAA Atlas 14 data.

The results of these models yield the existing and proposed hydrographs for each design storm event. These values were used to evaluate compliance with the requirements of the Millersburg Borough Stormwater Management Ordinance, Dauphin County Act 167, and the NPDES General Permit for Stormwater Discharges from Construction Activities (PAG-02). Requirements include mitigation of proposed flow rates to existing flow rates for the 2-, 5-, 10-, 25-, 50-, and 100-year storm event and mitigation of the 2-year 24-hour runoff volume increase.

a. Existing Conditions

Weighted Curve Numbers (CN) were developed based on existing land cover and soil types. Appropriate RCN values were selected from SCS TR-55. Time of concentration path was developed utilizing LiDAR and existing cover imagery. The existing conditions 100-year peak flow calculated by the TR-20 hydrology model for Tanner Run was 263.33 cfs. This flow was applied at the upstream end of the project site for a conservative design approach.

Reach routing coefficients (x and m) for the existing conditions were developed using HEC-RAS and a regression analysis. Existing flow areas (A) for a range of flow rates (Q) at each channel cross section were evaluated in HEC-RAS. A rating curve relating Q and A was developed based on a weighted average flow area of all the cross-sections through the proposed floodplain restoration reach. To establish the weighted average flow area for a particular flow rate, the mean area for each distance between two cross-sections was determined, and then multiplied by the distance between cross-sections to calculate the total volume for that distance. The cumulative sum of volumes was divided by the total reach length to yield the average flow area for a particular flow rate. A range of seven flow rates representing design storm discharges was used to develop the rating curve. A weighted average flow area provides the most accurate representation of the available storage volume at various flow rates. A regression equation was fit to the rating curve to determine the x and m coefficients.

b. Proposed Conditions

The proposed conditions within the Seal Park include restoring Tanner Run to a condition where the stream channel regularly has access to a function floodplain, i.e. increased wetted perimeter for conveyance. This proposed stream corridor design approach not only provides the long-term stability for Tanner Run it also provides increased infiltration and the associated water quality benefits that may assist in meeting local municipal separate storm sewer system (MS4) requirements. Within the proposed stream corridor condition, the stream will actively utilize a functional and well-connected floodplain area during higher flow events which will then recede back into the primary baseflow channel that is comprised of low, well-vegetated streambanks. The associated floodplain area would consist of herbaceous flowering plants and shrubs to promote this stable and functional system.

The reach routing coefficients for Tanner Run through the site were adjusted to reflect the proposed floodplain conditions as described above. The same weighted average flow area procedure was used to develop a rating curve for the proposed condition. A regression equation was fit to the rating curve and x and m coefficients were developed.

B. Hydraulic Results

The following describes the results of the conceptual hydraulics analysis for the proposed stream restoration improvements at Seal Park. For supporting calculations, see the Appendix J.

a. Peak Flow

Millersburg Borough Stormwater Management Ordinance requires mitigation of proposed flow rates to existing flow rates for the 2-, 5-, 10-, 25-, 50-, and 100-year storm event. Peak flow rate reductions are caused by a change in the cross-sectional flow area of Tanner Run with the stream mitigation. By increasing the flow area throughout the stream for all storm events, the x and m coefficients decrease and increase, respectively, and the Qout of the model decreases from existing conditions. The existing and proposed peak flow rates at the downstream limit of the Tanner Run Project Site are summarized in Table 1. The last column shows a percent reduction of the flow rate from existing to proposed condition.

TABLE 1: PEAK FLOW SUMMARY

Design Storm	Existing Discharge (cfs)	Proposed Discharge (cfs)	% Reduction
1 YR	44.59	43.29	-2.92%
2 YR	66.63	64.92	-2.57%
5 YR	101.58	99.07	-2.47%
10 YR	131.95	130.29	-1.26%
25 YR	181.15	179.79	-0.75%
50 YR	226.00	224.89	-0.49%
100 YR	278.78	278.11	-0.24%

b. Volume Control

The NPDES General Permit for Stormwater Discharges from Construction Activities and Control Guidance 1 (CG-1) from the PA BMP Manual, require that the difference between the existing and proposed condition 2-year 24-hour runoff volume be managed. This volume has been calculated based on the procedures given in the BMP manual. The required recharge volume for the project site improvements is 975.80 cubic feet (cf).

The floodplain restoration project includes the removal of legacy sediment. As discussed earlier in this report, Floodplain Restoration increases the available surface area of the floodplain and increases the frequency that the floodplain is accessed by the stream. The existing channel conveys the 2-year runoff event, so the existing "floodplain" is not accessed except during very large, infrequent events. The proposed floodplain will be accessed by much smaller and more frequent events. This significant alteration in channel geometry creates increased opportunities for infiltration through the restored floodplain surface. The establishment of a deep-rooted native vegetation in the floodplain further

enhances the infiltration capacity of the soil as well as the evapo-transpiration potential. Significant increases in groundwater recharge are anticipated especially for the 2-year 24-hour and more frequent storm events that account for the large majority of the annual rainfall events.

To account for the increased infiltration capacity in the floodplain, the proposed 2-year wetted surface area was multiplied by the design proposed infiltration rate to estimate the proposed 2-year infiltration rate in cubic feet per second. This value was compared to the existing 2-year infiltration rate (cfs) which was calculated similarly by multiplying the existing 2-year wetted area times the existing surface infiltration rate. Both existing and proposed infiltration rates were assumed to be 0.1 in/hr. based off prior infiltration testing and a conservative design approach. The increase in wetted surface area from existing condition to proposed condition is 25133.67 sf. The volume infiltrated into the restored floodplain for a 2-yr 24-hr storm is 5026.73 cf. The volume provided by the floodplain restoration adequately provides the runoff volume mitigation required for the proposed Seal Park improvements.

Conclusions

Overall, highly altered stream morphology and channel hydrology were identified within the study area, widely due to historic and present-day land use practices. Additionally, the reaches within Tanner Run, specifically the Seal Park Project Reach, would benefit from stream and floodplain restoration efforts. Such restoration approaches align with the requirements of the Millersburg Borough Stormwater Management Ordinance, Dauphin County Act 167 Plan, and the NPDES General Permit for Stormwater Discharges from Construction Activities (PAG-02).

Supplemental calculations can be found in the pages following.

Project__Millersburg Stream Restoration Job No.__17-10640-001
Subject__Change in Runoff Volume Sheet No.____1____ of ___1____
Computed By__JAB___ Date_2/1/17 Checked By__ Date _

PROJECT: Millersburg Stream Restoration
Drainage Area: Volume Increase
2-Year Rainfall: 3.40 in

Total Site Area: _____ acres
Protected Site Area: _____ acres
Managed Area: _____ acres

Existing Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff[1] (in)	Runoff Volume[2] (ft^3)
Impervious		178,160	4.09	98	0.20	0.04	3.17	47063.93
Woods, Good	B	277,913	6.38	66	5.15	1.03	0.75	17369.56
Open Space, Good	B	411,642	9.45	79	2.66	0.53	1.49	51112.22
Row Crops, SR	B	1,111,651	25.52	75	3.33	0.67	1.23	113944.23
Residential, 1/4 Acre	B	945,688	21.71	81	2.35	0.47	1.63	128455.95
TOTAL:								357945.89

Developed Conditions:

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff[1] (in)	Runoff Volume[2] (ft^3)
Impervious		185,130	4.25	98	0.20	0.04	3.17	48905.18
Woods, Good	B	277,913	6.38	66	5.15	1.03	0.75	17369.56
Open Space, Good	B	404,672	9.29	79	2.66	0.53	1.49	50246.77
Row Crops, SR	B	1,111,651	25.52	75	3.33	0.67	1.23	113944.23
Residential, 1/4 Acre	B	945,688	21.71	81	2.35	0.47	1.63	128455.95
TOTAL:								358921.69

2-Year Volume Increase (ft^3): 975.80

2-Year Volume Increase = Developed Conditions Runoff Volume - Existing Conditions Runoff Volume

1. Runoff (in) = $Q = (P-0.2S)^2 / (P+0.8S)$ where
   P = 2-Year Rainfall (in)
   S = (1000/CN)-10
2. Runoff Volume (CF) = Q x Area x 1/12
   Q = Runoff (in)
   Area = Land use area (sq. ft)

Note: Runoff Volume must be calculated for EACH land use type/condition and HSGI.
The use of a weighted CN value for volume calculations is not acceptable.

Project Millersburg Stream Restoration Job No.___17-10640-001_____
Subject__Weighted Runoff CN____ Sheet No.____1____ of ___1____
Computed By__JAB___ Date_1/31/18 Checked By____ Date _

Check one: ☑ Present ☐ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio	CN[1/] Table 2-2	CN[1/] Table 2-3	CN[1/] Table 2-4	Area ☒ acres ☐ mi2 ☐ %	Product of CN x area
---	Impervious	98			4.250	417
CIB2 - B	Woods, Good Condition	66			6.380	421
CIB2 - B	Open Space, Good Condition	79			9.290	734
CIB2 - B	Residential, 1/4 acre	75			21.710	1,628
CIB2 - B	Row Crops, Straight Row	81			25.520	2,067
[1/] Use only one CN source per line				Totals ➡	67.150	5267

CN(weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{5266.860}{67.150} = 78.43$; Use CN ➡ 78

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	2	10	100
Rainfall, P (24-hour)	in	3.4	4.95	8.43
Runoff, Q	in	1.5	2.7	5.8

Project: Millersburg Stream Restoration
Subject:_TC Calculation_
Computed By__JAB___ Date_1/31/18

Job No.__17-10640-001__
Sheet No.____1____ of ___1____
Checked By____ Date _

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Location Tanner Run
Circle one: (Present) Developed
Circle one: (T_c) T_t

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet Flow (Applicable to T_c only)		Segment ID	AB		
1. Surface description			Smooth		
2. Manning's roughness coeff., n			0.150		
3. Flow length, L (total L < 150 ft)		ft	100.00		
4. Two-yr 24-hr rainfall, P2		in	3.40		
5. Land slope, s		ft/ft	0.073		
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5} s^{0.4}}$	Compute T_t	hr	0.094	+	= 0.094

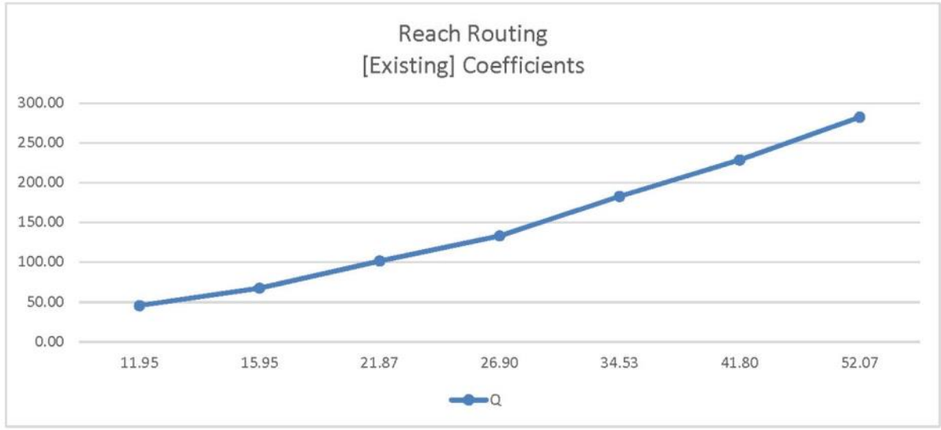
Shallow Concentrated Flow		Segment ID	BC		
7. Surface description (paved or unpaved)			Unpaved		
8. Flow length, L		ft	1714.00		
9. Watercourse slope, s		ft/ft	0.044		
10. Average velocity, $V=Ks^{0.5}$		ft/s	3.38		
11. $T_t = \frac{L}{3600V}$	Compute T_t	hr	0.141	+	= 0.141

Channel Flow		Segment ID	CD	DE		
12. Cross sectional flow area, a		ft^2	0.47	9.00		
13. Wetted perimeter, p_w		ft	3.79	12.32		
14. Hydraulic radius, $r = \frac{a}{p_w}$		ft	0.12	0.73		
15. Channel slope, s		ft/ft	0.03	0.03		
16. Manning's roughness coeff., n			0.030	0.030		
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$	Compute V	ft/s	2.15	6.84		
18. Flow length, L		ft	1254.00	402.00		
19. $T_t = \frac{L}{3600V}$	Compute T_t	hr	0.162	+ 0.016	=	0.178

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr	0.414
	min	24.82

Project Millersburg Stream Restoration Job No.__17-10640-001__
Subject Reach Routing Coefficient Sheet No.____1____ of ___8____
Computed By__JAB___ Date_1/31/18 Checked By____ Date _

REACH ROUTING COEFFICIENT REGRESSION ANALYSIS



$Q = xA^m$
where:
Q = Flow Rate
x = Power Coefficient
A = Flow Area
m = Power Exponent

Profile	Q	A	Log Slope	Product of slope and difference in Q	m	x
1 YR	45.54	11.95	1.36		1.359	1.564
2 YR	67.42	15.95	1.36	92	1.359	1.564
5 YR	101.58	21.87	1.30	44	1.339	1.634
10 YR	132.92	26.90	1.30	41	1.329	1.671
25 YR	182.74	34.53	1.27	64	1.314	1.738
50 YR	228.30	41.80	1.16	53	1.284	1.889
100 YR	282.14	52.07	0.96	52	1.223	2.242

Profile	Qout Model	Aout Model	Aout Rating	mout Rating	Aout % Error	mout % Error
1 YR	44.59	11.76	#N/A	#N/A	#N/A	#N/A
2 YR	66.63	15.81	15.80	1.359	0.04%	0.000
5 YR	101.58	21.87	21.87	1.339	0.00%	0.000
10 YR	131.95	26.75	26.74	1.330	0.03%	0.000
25 YR	181.15	34.30	34.28	1.315	0.04%	0.000
50 YR	226.00	41.48	41.44	1.286	0.09%	0.002
100 YR	278.78	51.56	51.43	1.227	0.26%	0.004

[Project Name - Existing Conditions]

REACH ROUTING WEIGHTED AVERAGE FLOW AREA

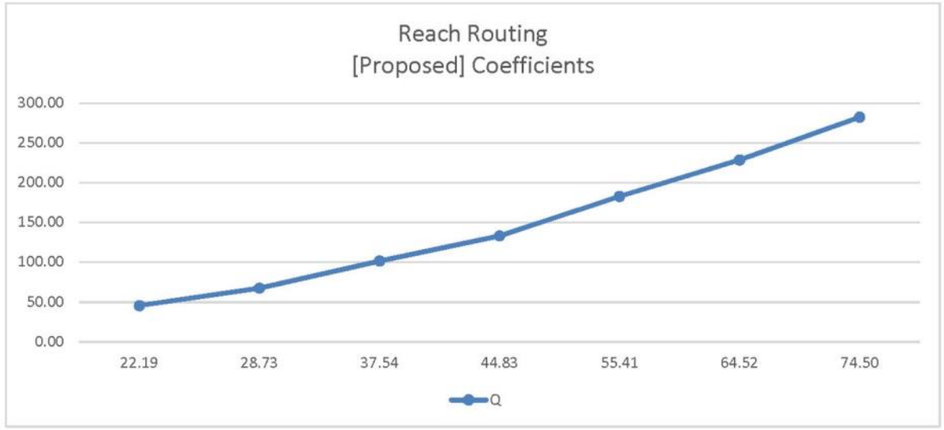
TOTAL CHANNEL LENGTH: 700 FT

REACH	RIVER STATION	PROFILE	Q TOTAL	FLOW AREA	AVG AREA	INCREMENTAL REACH WEIGHTED AREA
			(CFS)	(SQ FT)	(SQ FT)	(SQ FT)
Tanner Run	954.9337	1 YR	45.54	8.68		
Tanner Run	954.9337	2 YR	67.42	11.57		
Tanner Run	954.9337	5 YR	101.58	18.02		
Tanner Run	954.9337	10 YR	132.92	23.85		
Tanner Run	954.9337	25 YR	182.74	33.36		
Tanner Run	954.9337	50 YR	228.30	42.98		
Tanner Run	954.9337	100 YR	282.14	54.12		
Tanner Run	824.5116	1 YR	45.54	8.62	8.65	1.611644521
Tanner Run	824.5116	2 YR	67.42	11.42	11.495	2.141717199
Tanner Run	824.5116	5 YR	101.58	15.37	16.695	3.110567085
Tanner Run	824.5116	10 YR	132.92	18.71	21.28	3.96483184
Tanner Run	824.5116	25 YR	182.74	23.69	28.525	5.314700575
Tanner Run	824.5116	50 YR	228.3	27.98	35.48	6.610537297
Tanner Run	824.5116	100 YR	282.14	32.93	43.525	8.109459861
Tanner Run	733.6352	1 YR	45.54	8.92	8.77	1.138551469
Tanner Run	733.6352	2 YR	67.42	11.93	11.675	1.515688529
Tanner Run	733.6352	5 YR	101.58	16.18	15.775	2.047964586
Tanner Run	733.6352	10 YR	132.92	19.73	19.22	2.495206297
Tanner Run	733.6352	25 YR	182.74	25.1	24.395	3.16704254
Tanner Run	733.6352	50 YR	228.3	29.74	28.86	3.746704149
Tanner Run	733.6352	100 YR	282.14	34.98	33.955	4.408154517
Tanner Run	620.9989	1 YR	45.54	8.68	8.8	1.4159992
Tanner Run	620.9989	2 YR	67.42	11.51	11.72	1.88585348
Tanner Run	620.9989	5 YR	101.58	15.51	15.845	2.549603105
Tanner Run	620.9989	10 YR	132.92	18.89	19.31	3.10715279
Tanner Run	620.9989	25 YR	182.74	23.93	24.515	3.944684135
Tanner Run	620.9989	50 YR	228.3	28.27	29.005	4.667165545
Tanner Run	620.9989	100 YR	282.14	33.16	34.07	5.48216963
Tanner Run	500.7502	1 YR	45.54	8.32	8.5	1.460162786
Tanner Run	500.7502	2 YR	67.42	11.02	11.265	1.935145151
Tanner Run	500.7502	5 YR	101.58	14.82	15.165	2.605102194
Tanner Run	500.7502	10 YR	132.92	18.04	18.465	3.171988922
Tanner Run	500.7502	25 YR	182.74	22.83	23.38	4.01630658

Tanner Run	500.7502	50 YR	228.3	26.94	27.605	4.742093376
Tanner Run	500.7502	100 YR	282.14	31.81	32.485	5.580398599
Tanner Run	358.4291	1 YR	45.54	7.77	8.045	1.635676071
Tanner Run	358.4291	2 YR	67.42	10.29	10.655	2.166330458
Tanner Run	358.4291	5 YR	101.58	13.9	14.36	2.919615709
Tanner Run	358.4291	10 YR	132.92	16.97	17.505	3.559044079
Tanner Run	358.4291	25 YR	182.74	21.54	22.185	4.510562291
Tanner Run	358.4291	50 YR	228.3	25.57	26.255	5.338057829
Tanner Run	358.4291	100 YR	282.14	39.64	35.725	7.263458996
Tanner Run	254.2352	1 YR	45.54	14.99	11.38	1.693895117
Tanner Run	254.2352	2 YR	67.42	20.26	15.275	2.273659746
Tanner Run	254.2352	5 YR	101.58	27.87	20.885	3.108699431
Tanner Run	254.2352	10 YR	132.92	34.13	25.55	3.80307735
Tanner Run	254.2352	25 YR	182.74	43.12	32.33	4.812269696
Tanner Run	254.2352	50 YR	228.3	49.79	37.68	5.608608789
Tanner Run	254.2352	100 YR	282.14	57.03	48.335	7.194588795
Tanner Run	181.8211	1 YR	45.54	9.07	16.565	1.713627952
Tanner Run	181.8211	2 YR	67.42	12.42	22.55	2.332768507
Tanner Run	181.8211	5 YR	101.58	17.3	31.235	3.231220591
Tanner Run	181.8211	10 YR	132.92	21.55	38.615	3.994672102
Tanner Run	181.8211	25 YR	182.74	27.91	49.47	5.117607896
Tanner Run	181.8211	50 YR	228.3	35.01	59.905	6.197095229
Tanner Run	181.8211	100 YR	282.14	43.94	72.455	7.495376594
Tanner Run	146.3895	1 YR	45.54	9.14	9.105	0.460863883
Tanner Run	146.3895	2 YR	67.42	12.08	12.25	0.620053
Tanner Run	146.3895	5 YR	101.58	16.27	16.785	0.849599151
Tanner Run	146.3895	10 YR	132.92	19.74	20.645	1.044979117
Tanner Run	146.3895	25 YR	182.74	26.18	27.045	1.368925174
Tanner Run	146.3895	50 YR	228.3	38.6	36.805	1.862942911
Tanner Run	146.3895	100 YR	282.14	55.48	49.71	2.516149766
Tanner Run	83.3347	1 YR	45.54	9.03	9.085	0.818361226
Tanner Run	83.3347	2 YR	67.42	11.82	11.95	1.076435514
Tanner Run	83.3347	5 YR	101.58	15.87	16.07	1.447558051
Tanner Run	83.3347	10 YR	132.92	19.26	19.5	1.756526571
Tanner Run	83.3347	25 YR	182.74	24.34	25.26	2.275377497
Tanner Run	83.3347	50 YR	228.3	28.71	33.655	3.031584706
Tanner Run	83.3347	100 YR	282.14	33.8	44.64	4.021094674

Project Millersburg Stream Restoration Job No.___17-10640-001__
Subject_Reach Routing Coefficient__ Sheet No._____5_____ of ___8_____
Computed By__JAB___ Date_1/31/18 Checked By____ Date _

REACH ROUTING COEFFICIENT REGRESSION ANALYSIS



$Q = xA^m$

where:
Q = Flow Rate
x = Power Coefficient
A = Flow Area
m = Power Exponent

Profile	Q	A	Log Slope	Product of slope and difference in Q	m	x
1 YR	45.54	22.19	1.52		1.520	0.410
2 YR	67.42	28.73	1.52	102	1.520	0.410
5 YR	101.58	37.54	1.53	52	1.524	0.405
10 YR	132.92	44.83	1.52	48	1.522	0.407
25 YR	182.74	55.41	1.50	75	1.517	0.414
50 YR	228.30	64.52	1.46	67	1.506	0.430
100 YR	282.14	74.50	1.47	79	1.499	0.440

Profile	Qout Model	Aout Model	Aout Rating	mout Rating	Aout % Error	mout % Error
1 YR	43.29	21.47	#N/A	#N/A	#N/A	#N/A
2 YR	64.92	28.02	27.98	1.520	0.15%	0.000
5 YR	99.07	36.93	36.89	1.524	0.10%	0.000
10 YR	130.29	44.24	44.21	1.522	0.06%	0.000
25 YR	179.79	54.81	54.78	1.517	0.06%	0.000
50 YR	224.89	63.88	63.83	1.507	0.06%	0.001
100 YR	278.11	73.79	73.75	1.500	0.05%	0.000

Project Millersburg Stream Restoration Job No.___17-10640-001__
Subject_Reach Routing Coefficient__ Sheet No._____7_____ of ___8_____
Computed By__JAB___ Date_1/31/18 Checked By____ Date _

[Project Name - Proposed Conditions]

REACH ROUTING WEIGHTED AVERAGE FLOW AREA

TOTAL CHANNEL LENGTH: 700 FT

REACH	RIVER STATION	PROFILE	Q TOTAL (CFS)	FLOW AREA (SQ FT)	AVG AREA (SQ FT)	INCREMENTAL REACH WEIGHTED AREA (SQ FT)
Tanner Run	954.9337	1 YR	45.54	8.68		
Tanner Run	954.9337	2 YR	67.42	11.57		
Tanner Run	954.9337	5 YR	101.58	18.02		
Tanner Run	954.9337	10 YR	132.92	23.85		
Tanner Run	954.9337	25 YR	182.74	33.36		
Tanner Run	954.9337	50 YR	228.30	42.98		
Tanner Run	954.9337	100 YR	282.14	54.12		
Tanner Run	824.5116	1 YR	45.54	8.62	8.65	1.611644521
Tanner Run	824.5116	2 YR	67.42	11.42	11.495	2.141717199
Tanner Run	824.5116	5 YR	101.58	15.37	16.695	3.110567085
Tanner Run	824.5116	10 YR	132.92	18.76	21.305	3.969489772
Tanner Run	824.5116	25 YR	182.74	23.71	28.535	5.316563748
Tanner Run	824.5116	50 YR	228.3	27.98	35.48	6.610537297
Tanner Run	824.5116	100 YR	282.14	32.95	43.535	8.111323034
Tanner Run	733.6352	1 YR	45.54	17.65	13.135	1.705230734
Tanner Run	733.6352	2 YR	67.42	23.1	17.26	2.240752377
Tanner Run	733.6352	5 YR	101.58	30.14	22.755	2.954132117
Tanner Run	733.6352	10 YR	132.92	35.92	27.34	3.549372537
Tanner Run	733.6352	25 YR	182.74	44.58	34.145	4.432820969
Tanner Run	733.6352	50 YR	228.3	51.42	39.7	5.153990114
Tanner Run	733.6352	100 YR	282.14	59.38	46.165	5.99329858
Tanner Run	620.9989	1 YR	45.54	18.73	18.19	2.92693471
Tanner Run	620.9989	2 YR	67.42	24.34	23.72	3.81676148
Tanner Run	620.9989	5 YR	101.58	31.8	30.97	4.98335173
Tanner Run	620.9989	10 YR	132.92	37.85	36.885	5.935128465
Tanner Run	620.9989	25 YR	182.74	46.68	45.63	7.34227767
Tanner Run	620.9989	50 YR	228.3	54	52.71	8.48151339
Tanner Run	620.9989	100 YR	282.14	62.39	60.885	9.796944465
Tanner Run	500.7502	1 YR	45.54	20.85	19.79	3.399602533
Tanner Run	500.7502	2 YR	67.42	26.8	25.57	4.392513227
Tanner Run	500.7502	5 YR	101.58	34.29	33.045	5.676597559
Tanner Run	500.7502	10 YR	132.92	40.68	39.265	6.745093151
Tanner Run	500.7502	25 YR	182.74	49.11	47.895	8.227587838

Reach Routing Spreadsheet.xlsx

Tanner Run	500.7502	50 YR	228.3	56.58	55.29	9.497929461
Tanner Run	500.7502	100 YR	282.14	64.35	63.37	10.88594303
Tanner Run	358.4291	1 YR	45.54	21	20.925	4.254384311
Tanner Run	358.4291	2 YR	67.42	26.58	26.69	5.426500227
Tanner Run	358.4291	5 YR	101.58	34	34.145	6.942219942
Tanner Run	358.4291	10 YR	132.92	40	40.34	8.201761677
Tanner Run	358.4291	25 YR	182.74	48.68	48.895	9.941128835
Tanner Run	358.4291	50 YR	228.3	56.37	56.475	11.48226303
Tanner Run	358.4291	100 YR	282.14	64.07	64.21	13.05491119
Tanner Run	254.2352	1 YR	45.54	20.65	20.825	3.099768525
Tanner Run	254.2352	2 YR	67.42	26.91	26.745	3.980951222
Tanner Run	254.2352	5 YR	101.58	35.12	34.56	5.144201691
Tanner Run	254.2352	10 YR	132.92	41.77	40.885	6.085668002
Tanner Run	254.2352	25 YR	182.74	51.58	50.13	7.461771724
Tanner Run	254.2352	50 YR	228.3	59.37	57.87	8.613858561
Tanner Run	254.2352	100 YR	282.14	68.11	66.09	9.837392644
Tanner Run	181.8211	1 YR	45.54	19.55	20.1	2.079319157
Tanner Run	181.8211	2 YR	67.42	25.44	26.175	2.707770096
Tanner Run	181.8211	5 YR	101.58	33.48	34.3	3.5482909
Tanner Run	181.8211	10 YR	132.92	39.63	40.7	4.210362671
Tanner Run	181.8211	25 YR	182.74	48.75	50.165	5.189504752
Tanner Run	181.8211	50 YR	228.3	56.45	57.91	5.990715044
Tanner Run	181.8211	100 YR	282.14	65.02	66.565	6.886063666
Tanner Run	146.3895	1 YR	45.54	24.27	21.91	1.10900908
Tanner Run	146.3895	2 YR	67.42	30.98	28.21	1.42789348
Tanner Run	146.3895	5 YR	101.58	39.36	36.42	1.843455531
Tanner Run	146.3895	10 YR	132.92	46.37	43	2.176512571
Tanner Run	146.3895	25 YR	182.74	56.31	52.53	2.658888497
Tanner Run	146.3895	50 YR	228.3	65.09	60.77	3.075969046
Tanner Run	146.3895	100 YR	282.14	73.59	69.305	3.507981483
Tanner Run	83.3347	1 YR	45.54	20.29	22.28	2.006944206
Tanner Run	83.3347	2 YR	67.42	26.62	28.8	2.594254629
Tanner Run	83.3347	5 YR	101.58	34.74	37.05	3.337400486
Tanner Run	83.3347	10 YR	132.92	41.37	43.87	3.951734394
Tanner Run	83.3347	25 YR	182.74	51.04	53.675	4.834951986
Tanner Run	83.3347	50 YR	228.3	59.47	62.28	5.610075634
Tanner Run	83.3347	100 YR	282.14	69.09	71.34	6.426184903

Reach Routing Spreadsheet.xlsx

This page intentionally left blank.

Appendix K

PARKS, RECREATION, AND OPEN SPACE FUNDING SOURCES

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

Funding sources change frequently in terms of type, grant amount and the priorities of the funding organization. The following list is presented as links to the current online resources.

STATE AND FEDERAL FUNDING

Recreation, Parks, Trails, and Conservation

- Finding the Green: A Guide to State Funding Opportunities for Conservation, Recreation & Preservation Projects
- Growing Greener Environmental Stewardship Fund: Community Conservation Partnerships Program Grants (PA Department of Conservation and Natural Resources), Watershed and Environmental Education Grants (PA Department of Agriculture), Drinking Water/Sewer Infrastructure Grants (PA Infrastructure Investment Authority)
- Keystone Recreation, Park & Conservation Fund: Community Conservation Partnerships Program Grants (PA Department of Conservation and Natural Resources), Historic Preservation Grants (PA Historical and Museum Commission), Library Grants (PA Department of Education)
- Land and Water Conservation Fund: LWCF funding is intended to protect national parks, areas around rivers and lakes, national forests and national wildlife refuges from development, and to provide matching grants for state and local parks and recreation projects. LWCF Success in Pennsylvania
- U.S. Department of Agriculture has several hundred funding sources including ones that apply to urbanized areas such as Millersburg Borough
- PA Council on the Arts: Arts and Culture Grants
- PA Conservation Reserve Enhancement Program (CREP)
- PA Department of Community and Economic Development Variety of technical assistance programs and funding opportunities including: Greenways, Trails and Recreation Program and Watershed Restoration and Protection Program, Multimodal Transportation Fund, Flood Mitigation Program (FMP), H20 PA (Flood Control Projects, Unsafe Dam Project and Storm Water Projects), Sewage Facilities Program (SFP)
- PA Department of Transportation: Transportation Grants
- PA Fish and Boat Commission: Fishing, Boating and Aquatic Resource Conservation Grants
- PA Land Trust Association: Conservation Easement Assistance Program
- The Center for Rural Pennsylvania: Research Grants

Athletic Grants and Foundations

- Finish Line Youth Foundation: Program Development, Facility Improvement and Emergency Assistance Grants
- National Football League Grassroots Program: Capital Field Improvement Grants
- Target: Youth Soccer Program Development Grants
- Tony Hawk Foundation: Skatepark Grants
- United States Golf Association: Junior Program Development Grants
- US Soccer Foundation: Program Development and Field Improvement Grants
- National Gardening Association: School and Youth Garden Program Development Grants

Other Grant Funders and Foundations

- Council on Foundations
- Foundation Center
- GovSpot
- Grants.gov
- Grantsmanship Center
- National Recreation and Park Association
- PA Community Foundations

Accessibility – Sources of Information

- PRPS Inclusion Task Force
- Model Aquatic Health Code (MAHC): An All-inclusive Model Public Swimming Pool and Spa Code
- National Center on Accessibility
- National Recreation and Park Association
- National Recreation and Park Association: Embracing
- Access & Inclusion to Succeed
- Temple University Collaborative: Community Inclusion Resources

Appendix L

PUBLIC COMMENT

Master Site Plans for Three Public Parks
Millersburg, Pennsylvania

The following comments were provided to Borough Council upon completion of the final master plan and will be considered in future planning initiatives for implementation.

Excerpt from the February 13, 2019 Council meeting minutes:

President Dietz recognized Erick Wolochuk who addressed the Council regarding the proposed Master Parks Plan. Mr. Wolochuk's concern was that the proposal to install a temporary pedestrian cut-off in front of the Wooden Nickel would negatively impact local businesses by eliminating 25-30 parking spaces and prohibiting tractor trailer delivery to a number of businesses in the immediate area. President Dietz requested that Mr. Wolochuk provide his comments in writing with the intent of incorporating the public's comments into feedback to JMT, the plan designer. Additionally, Manager McGann reported that the Kathy Weiss, the Pool Board President, also has comments regarding the proposed softball field adjacent to the swimming pool. President Dietz directed Manager McGann to contact JMT regarding submitting concerns and comments on the proposed plan.

The following is from the Millersburg Area Pool Association, Inc.:

Millersburg Area Pool Association, Inc.

February 10, 2019

These are a few concerns expressed by the Millersburg Area Pool Association about the proposed park plan.
1.the balls being hit into the pool
2.the patrons trying not to be hit by balls as they enter or leave the pool
3.balls hitting cars parked on Center Street
4.the public using pool restrooms when they are being used for storage in the pool off-season and they are also winterized
5.restrooms being used when pool is not open and the public entering other parts of the pool and office area
6.taking over our storage shed to use for park use
If you would like to discuss any of the above or other concerns, please feel free to contact me.

Thank you,
Kathy Weiss
Kathy Weiss, President
Millersburg Area Pool Association
717-395-7971

Millersburg Area Pool Association Kathy Gehring Weiss, President 120 Lincoln Lane Millersburg PA 17061

Master Site Plans for Three Public Parks

BROWN-BRADENBAUGH PARK | SEAL PARK | MARKET SQUARE/VETERANS PARK

Prepared By: