GREEN SCAN REPORT
CARNEGIE BOROUGH • 2013

Prepared for Carnegie Borough
by WESTERN PENNSYLVANIA CONSERVANCY

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- Carnegie Shade Tree Commission
- Carnegie Borough Council and Carnegie Mayor
- Carnegie Community Development Corporation
- Andrew Carnegie Free Library and Music Hall

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SECTION ONE: INTRODUCTION

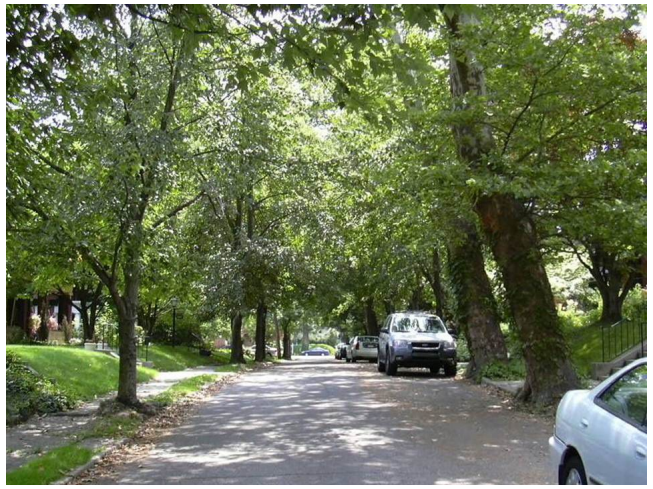
THE VALUE OF GREEN

Research, data and technology are all pointing toward "green" as a crucial strategy for local, national and global prosperity and security. Green buildings, energy-saving technologies and sources of new energy production are important components. Just as important, however, are the very landscapes of our cities, towns, and all the spaces in between.

North Shore Heritage Trail, Pittsburgh, PA.
Photo: WPC.

Mounting evidence underscores the tremendous value of greenery—whether street trees, parks, open spaces and even civic landscapes such as the grounds surrounding public schools, libraries, hospitals and other such institutions. We are learning that softening or even replacing hard surfaces, whether paving, fencing, parking lots or roofs, with living plants can make a tremendous difference in such diverse factors as ambient temperatures, energy consumption for heating and cooling, air quality, mental health and mood, asthma rates, rate of healing for hospital patients and attention spans of children. Furthermore, there is evidence that greener landscapes actually strengthen social interactions, building cohesion, stability and civility within communities.

A well-treed main street in Greenville, SC.
Photo: Eric Fleischauer, Decatur Daily News.



A well-shaded residential street, Pittsburgh, PA.
Photo: WPC.

Green resources almost always provide multiple benefits—health, economic, aesthetic, social and environmental. Few investments by communities offer so many dimensions of value.

Green has the power to transform spaces, communities and people. Green can work on a small scale or large, and

best of all, the parts can be assembled to create an ever larger and more coherent green system that offers benefits across many dimensions of community life.

Chicago green roof, atop City Hall.
Photo: Water Environment Research Foundation.

Greening can take myriad forms: a tree planted in front of a home; a row of street trees arching across a busy thoroughfare; a large park with ball fields and exercise trails; stream-side or hill-side walking paths; hanging baskets or window boxes on Main Street; a "welcome" garden at a community's entrance; a butterfly garden at an elementary school; a community garden producing veggies, herbs and flowers to share with neighbors and family; green hedges camouflaging unattractive chain link; plantings to cool overheated asphalt parking areas; large nature preserves; tiny pocket parks with a bench under a tree for respite and contemplation; rain gardens reducing runoff and storm water overflows that pollute rivers and streams; green walls and roofs transforming standard surfaces to create energy savings and even new habitat; temporary "clean and green" grass and trees or shrubs to stabilize vacant land until desirable development is feasible; specially engineered greenspaces that are designed to absorb storm water from streets, roofs, parking lots and other hard surfaces; to reduce pots of flowers on a high-rise balcony; magnificent maples on the courthouse lawn; bike trails edged by native flowers, grasses and trees. Each and every one of these types of greening has an impact. All are valuable. But how do you know what are your best choices? And which approaches are your best investments?

Happy planters after planting a tree in the Hill District, Pittsburgh. Photo: WPC.

Sprout market and community gardens, Melbourne, Australia. Photo: Sustainable Melbourne.

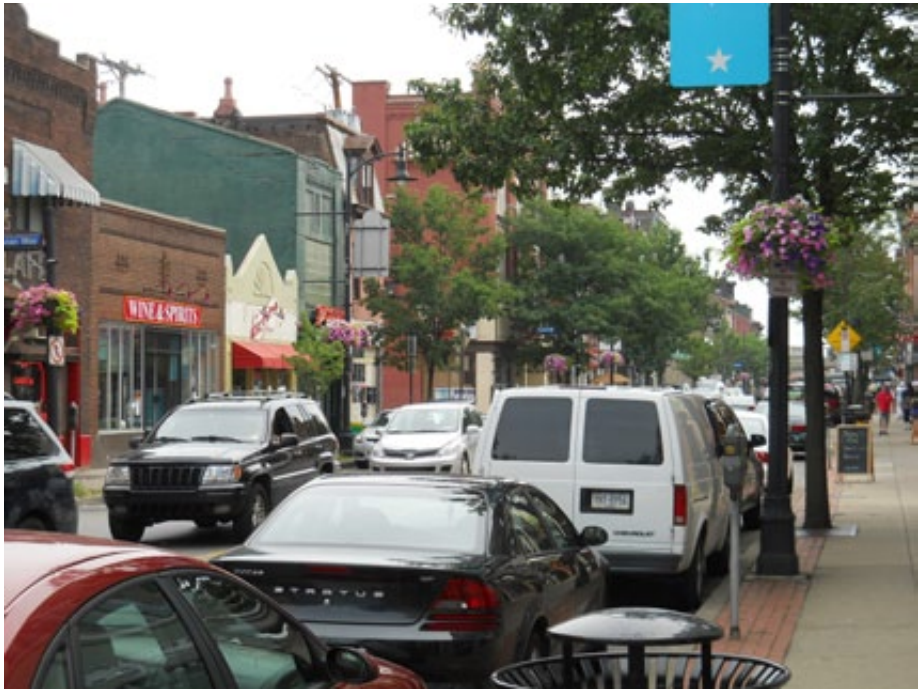
Looking to models provided by a few U.S. cities and numerous other communities around the world, the best greening is

that which is well-integrated into a community's practices and supported by personal and public commitments. Each component of community life can be surveyed for ways to soften and enhance daily experience with green. It is the cumulative impact over time that will produce the greatest benefit to a community. Building your green infrastructure piece by piece can help your community develop a sustainable, thriving, greener environment that enhances all elements of a community's character.

More and more information is being assembled to document the ways that green can improve our communities. From mental health and physical benefits, to actual financial payback, greenery can add value to your efforts to enhance your community's livability. Surprisingly, many green strategies offer cumulative and compounding benefits. The decision to green a roof for instance, or add tree cover to a streetscape, can offer not only benefits in energy use and temperature comfort but also significant reduction in storm water runoff and related pollution or erosion.

SPECIFIC BENEFITS

Once hard to quantify, the benefits of greenspace are increasingly well documented. Some highlights of five primary benefits are presented here, with references to help you explore even more in depth information on those areas that seem most valuable to your community.



Hanging baskets along East Ohio Street, Pittsburgh PA. Photo: WPC.

Health and Mental Health

Information is accumulating about the importance of a green environment to human health. Ranging from the role of green plants to mitigate human pollution, to the healing effects of beautiful green spaces and natural shapes and textures to the evidence that exposure to greenspace directly relates to concentration and cognitive development, these studies and observations are changing the way people understand the built environment and the importance of keeping "nature" fully integrated in our lives. Here are some specific examples of information about the benefits of green to human health:

- Plants cleanse the air of pollutants, absorb carbon dioxide and generate oxygen.
- Children in neighborhoods with more trees have lower rates of asthma. (Lovasi, et al., Journal of Epidemiology & Community Health, May 2008)
- Observing greenery appears to reduce heart rate and blood pressure, reduce stress and even illness-related absenteeism (Stuttgart study, www.livingroofs.org)
- Patients with a view of greenery tend to heal faster with reduced use of pain medication (Texas study, www.livingroofs.org)
- Plants cleanse particulates from rainwater and the ground by absorbing ground-level ozone, carbon monoxide, sulfur dioxide and other GHG, reducing pollution reaching rivers and streams (Capital Regional District, http://www.crd.bc.ca/watersheds/lid/walls.htm)
- 30 minutes in green natural surroundings has been shown to be an effective treatment for children with Attention Deficit Disorder (Louv, Last Child in the Woods. pp. 98-111)
- Community flower gardens have been reported to reduce road rage (WPC survey, 2005, unpublished)
- Working with plants and flowers can create serenity and calm even in difficult environments (Kuo and Sullivan. Environment and Behavior, Aggression and Violence in the Inner City. Vol. 33 No. 4, July 2001 543-571).

Children at Crescent Early Learning Center explore their newly implemented greenspace. Photo: WPC.

Treed business area in Biddy Mason Park, Los Angeles. Photo: Georgia Silvera Seamans | localecology.org.

Community Cohesion

Research indicates a positive correlation between human interaction and the condition of the local environment. Numerous programs across the country have documented the attraction of community greening projects—from vegetable gardens to tree planting to beautification efforts—to many types of people. Greening a neighborhood offers an effective way to bring people together, learn cooperative skills and generate a new attention to the community's quality. Community cohesion then translates into better care-taking, more watchfulness and deterrence of crime or anti-social behavior and energy for more ambitious efforts to improve community facilities and conditions. Here are a few specific examples of the impact of green on community cohesion:

- People in housing projects with more trees know more of their neighbors and interact more frequently and positively with their neighbors (Kuo, University of Illinois at Champagne Urbana)
- People who volunteer in community gardens tend to be more connected to their communities, volunteer for other causes and have a strong affinity with their neighbors (WPC survey, 2005, unpublished)
- Community gardens, pocket parks, shared courtyards, well-tended open space all are strategies which have been documented to support development of safe, crime-free neighborhoods. (Local Government Commission Center for Livable Communities, "Focus on Livable Communities: Land Use Planning for Safe, Crime-free Neighborhoods," Sacramento, CA www.lgc.org)
- Buildings with high levels of greenery had 52% fewer property and violent crimes than those with little vegetation. (University of Chicago Public Housing)

Wilkinsburg community vegetable garden. Photo: WPC.

Neighbors finish up a garden cleanup, Clairton, PA. Photo: WPC.

Water

Management of storm water has emerged as one of the most costly needs of many communities under orders to separate storm drains from sewer systems to reduce overflow of untreated sewage into rivers and streams. As more land is paved, more rain or snowmelt runs off the landscape rather than soaking into the groundwater system. The runoff tends to cause erosion, increase pollution from sediments and destabilize slopes or fragile lands. The runoff often winds up in storm drains that overtax the existing sewer system and lead to pollution of rivers and streams by sewage contaminated storm water.

Greenery is a key strategy for capturing rainwater and holding it for slow release through the groundwater system. Some cities, such as Philadelphia and Chicago, are embarking on aggressive and systemic strategies for adding greenery for this purpose, and they anticipate enormous savings by reducing the required changes to their sewage and storm water infrastructure. Here are a few specific examples of how greenspace can assist with water management:

- In addition to cleansing rainwater of pollutants, plants hold water. Green roofs can reduce runoff by 70-80% in summer and 25-40% in winter. (Germany study, www.livingroofs.org)
- Large trees can intercept upwards of 2,000 gallons of rainfall annually. (Midwest Community Tree Guide)
- Toronto estimated the potential impact of green roofs as saving millions of dollars in infrastructure construction, tens of millions in erosion control, millions in pollution control, and nearly a million in added beach availability due to lower storm water flows. (City of Toronto Green Roofs Study www.toronto.ca/greenroofs/findings)

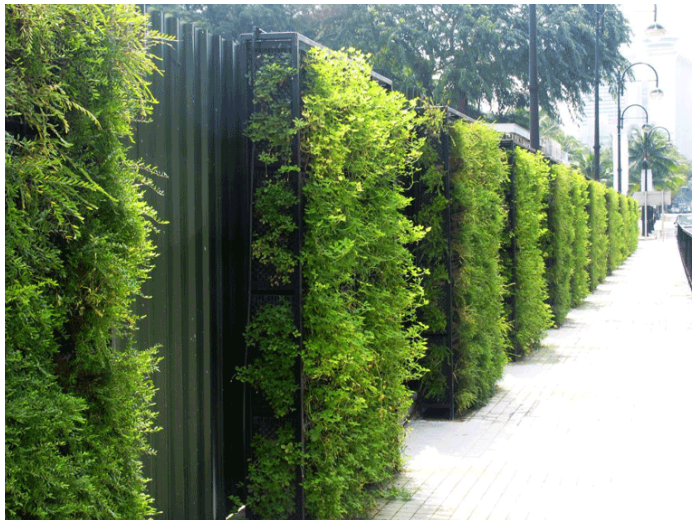
Bioswale implemented in 2013 along Hawthorn Road in Millvale.
Photo: WPC.

Gardens on green roof of Allegheny County Building.
Photo: Eisler Nurseries.

Energy

For decades we have known that it is possible to reduce energy consumption by planting trees that shade from hot sun in the summer, let in sun during the winter, or shelter a structure from prevailing winds. Now more and more techniques for using greenery to achieve energy savings are being devised. From rooftops to walls, from sheltering trees that cool asphalt parking lots or streets to green fencing that serves both an environmental and a boundary purpose, opportunities to take advantage of the cooling or protective character of green plants abound. Here are a few examples of impacts on temperature and therefore energy consumption:

- Plants provide insulation during winter. Winter temperatures that were 32°F under a standard roof are 40°F under a green roof (Trent University study, www.livingroofs.org)
- Turf grass can be upwards of 30°F cooler than paving on hot days (University of Arkansas study).
- 25% to 50% tree cover lowers ambient temp by 4°-8° F (in hot climates); 2-4 degrees estimated for Chicago
- Green roofs can reduce temperature beneath a roof from 90°F to 63°F in the summer. Chicago estimated it could save $100,000,000 each year if all its roof surfaces were greened. (DC Nottingham Trent University study www.livingroofs.org)
- Shaded cars lose less fuel in evaporation from gas tanks, reducing volatile organic compounds by more than a pound a day (Final Parking Lot Shading Study, April, 2001, Chicago)



Green wall panels separating busy road from office park.
Photo: uncredited

Farmers Market in Market Square, Downtown Pittsburgh.
Photo: WPC.

Economic Benefits

It is becoming possible to put a price tag on the economic benefit of greening. From property values near parks, to rises in value when vacant lots are greened, to the return on investing in management and maintenance of greenspaces, to the influence on consumer spending, evidence is being accumulated. Here is a sample of information on the economic benefits:

- Homes in Indiana sold for higher prices if located near greenways (Center for Urban Policy & the Environment, 2003.)
- In Dallas, homes facing parks were found to be worth 22 percent more than homes half-a-mile or more away from such amenities. (Miller, Andrew. "Valuing Open Space: Land Economics and Neighborhood Parks" thesis. MIT Real Estate Development 2001.)
- The availability of green spaces has been shown to be one of the strongest factors predicting residential satisfaction. (Fried, M. "Residential attachment: sources of residential and community satisfaction." Journal of Social Issues 38, 1982. pp. 107-120.)
- The Wharton School, University of Penn., found that a $1 million investment of tree plantings in a stressed community translated to a $4 million gain in property values. (Wachter, S. "The Determinants of Neighborhood Transformation in Philadelphia, The New Kensington Pilot Study." 2005)
- A citywide study in Philadelphia showed that derelict land decreased the value of neighboring homes by 20 percent while green and well-maintained formerly vacant land recaptured the initial loss and added another 17 percent in value, for a total gain of 37 percent. (Wachter, S., Gillen, K.C. "Public Investment Strategies: How They Matter for Neighborhoods in Philadelphia—Identification and Analysis." 2006)
- $750,000 = the increase in tax revenue over a 20-year period following the creation of a community garden. (Been & Voicu, "The Effect of Community Gardens on Neighboring Property Values," New York University, 2006)
- People will travel farther to visit "forested" urban shopping districts and pay 9 to 12% more for parking and goods and services. (Kathleen Wolf, Journal of Forestry, "Business District Streetscapes, Trees and Consumer Response," December 2005.)

Recently implemented gateway plantings in transitional community, Larimer Avenue, Pittsburgh, PA. Photo: WPC.

Green Scan Process

The Green Scan process includes a number of steps to help the community discover its best options for using greening to support community revitalization.

Step One: Create a community committee.
Together with Carnegie's Mayor, Borough Council, Borough Manager, and Borough Engineer, the existing Shade Tree Commission is the ideal community partner given the breadth of its membership, its focus on greening through trees, and the prior efforts of the group to implement improvement to the borough's methods, codes and commitment to green assets. Representatives from the Carnegie Community Development Corporation and the Andrew Carnegie Free Library and Music Hall also contributed significant input through the community committee.

Early spring tree pit planting in Bloomfield neighborhood, Pittsburgh. Photo: WPC.

The Community Committee included the following individuals:

- Steve Beuter, Carnegie Borough Manager
- Jack Kobistek, Mayor
- Pat Catena, President of Council
- Richard D'Loss, Council Member
- John Ferri, President, Shade Tree Commission
- Bridget Van-Dorn, Shade Tree Commission
- Bob Podurgiel, Shade Tree Commission
- Marlene Smith-Pendleton, Shade Tree Commission
- Joanne Letcher, Executive Director, Carnegie Community Development Corporation
- Maggie Forbes, Executive Director, Andrew Carnegie Free Library and Music Hall

Welcome garden, Indiana, PA. Photo: WPC.

The community committee is asked to guide and support the "Green Scan" process. The committee helped make connections with all sectors of the local community government and helps engage the full range of civic participants. The committees was also instrumental in making sure that necessary information on community planning, demographics, existing and planned infrastructure and other elements of community

development was secured. The committee helped assure that the Green Scan incorporates ideas and suggestions from a wide range of interested parties.

Step Two: Background Analysis of Carnegie
WPC staff developed background analysis of Carnegie to guide discussion. Specific data sets that were reviewed and in most cases mapped, include:

- Population demographics (age, race)
- Population distribution
- Existing parks, trails, greenspace and recreational facilities
- Open land and vacant parcels
- Parcel ownership
- Home ownership
- Income
- Cultural, historical or geological assets of note
- Steep slopes, flood plains and other geographic features as needed
- Transportation routes and traffic patterns.

Step Three: Convene Several Meetings of Community Committee
To make sure the Green Scan had broad community support, WPC made efforts to provide as many opportunities for input as possible. This included 21 meetings with members of the community committee, including a final public meeting where the final report was presented. Community committee meetings to support the Green Scan process were set up


Open green lawn, Western Pennsylvania Conservancy main office. Photo: WPC.


Playground parklet in Mt. Oliver, PA. Photo: WPC.

to introduce the process, discuss the benefits of green infrastructure, get community feedback on maps and information collected, identify key assets, assess practicality of ideas, obtain missing information and set priorities. As needed the WPC staff and community committee interviewed key leaders, made numerous site visits and completed additional GIS analyses in preparation for meetings.

Step Four: Complete Final Report
This final report and action plan summarizes background and findings; best opportunities; related cost estimates and suggestions for implementation strategies.

The overall purpose of the Green Scan is to provide Carnegie with an action plan that outlines effective options for utilizing green infrastructure in Carnegie. The scan identifies best options, proposes prioritization of options, offers estimates of costs and suggests potential partners and sources of funding.

Ghost Town trail in Ebensburg, PA, a rails-to-trail project that runs 36 miles in Indiana and Cambria County. Photo: WPC.

Definition of terms

To avoid confusion, we will define a few terms at the outset to clarify meanings. ***Green Infrastructure*** includes systems and practices that use or mimic natural processes to infiltrate, temporarily store, reuse or return water to the atmosphere through evaporation or transpiration. Examples include green roofs, street trees, rain gardens, bioswales, pocket parks, wetlands, and permeable pavement. The direct result of these approaches is to reduce the amount of runoff discharging to surface waters and to reduce storm water flowing into sewer systems to avoid combined sewer overflows into surface waters. Additional environmental and economic benefits include cleaner air, reduction of the urban "heat island" effect and increased energy efficiency. Green Infrastructure can be supplemented or augmented by such structures as cisterns or engineered tree pits that include water storage and engineered soils.

There is sometimes some confusion about the meaning of the term "greenspace" as opposed to open space. For the purposes of this report, ***"greenspace"*** is defined as any space intentionally used for formal or informal outdoor recreation or enjoyment including parks, parklets, ball fields, trails, paths, woods, river edges, public event or gathering spaces. Open space is land that may be green or natural, tended or untended, but not built upon. Some open spaces are vacant land, some are just unused.

Active greenspace includes formal playgrounds with play equipment, ball fields, hiking and bicycling trails, and the like. ***Passive*** greenspace includes parks and parklets that support sitting, walking, informal gatherings, views, bird watching and other less physical outdoor activities.

SECTION TWO: CARNEGIE COMMUNITY PROFILE

HISTORY AND BACKGROUND

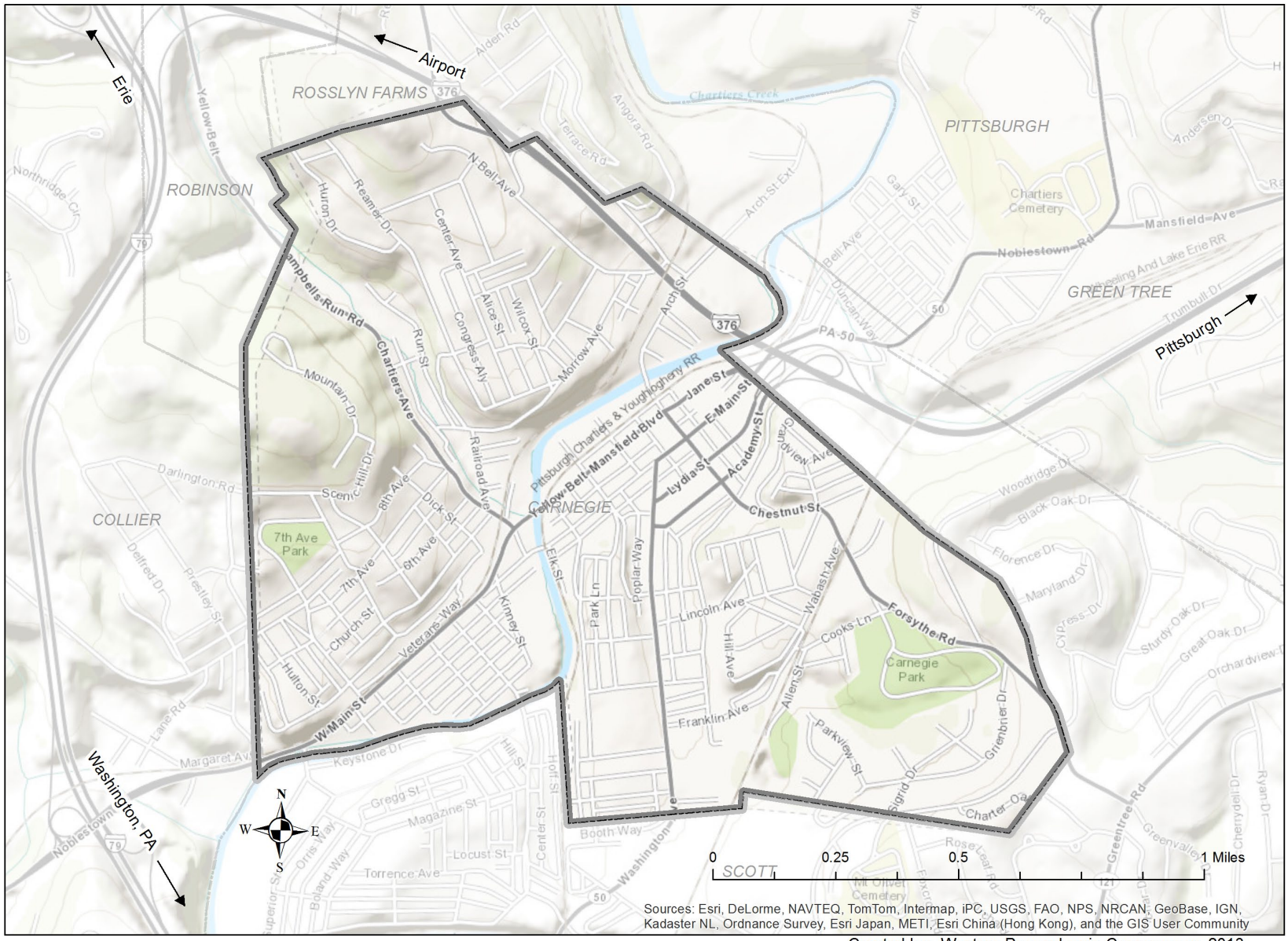
Chartiers Creek provided a navigable waterway for many millennia, leading native Americans to camp there in the summer, where they found abundant hunting, then canoed the "Catfish Path" to the Ohio River to reach their winter camping grounds in Ohio. As soon as European settlers reached the point of the three rivers in Pittsburgh, they began exploring down Chartiers Creek, building settlements and trading posts, one of which was on the flood plain at the oxbow of the creek that would later become Carnegie.

John and James Bell came to the Carnegie area in 1768 on an exploratory trip from Virginia, and settled in the area along with additional siblings a year later. The first post office was established in 1853. Chartiers and Mansfield boroughs, on the west and east side of Chartiers Creek respectively, were incorporated on September 6, 1872. Carnegie Borough was later incorporated on March 1, 1894 combining the two boroughs, as the two shared many of the same municipal services. The residents of the new borough voted to name it after Andrew Carnegie, who later donated and endowed a library for the Borough, which includes a handsome music hall. It first opened in 1901.

Carnegie's train memorial that stands along the south side of the Chartiers Creek. Photo: WPC.

Following European settlement, the earliest industry along with farming was the production of whiskey. Many nearby farms provided the grains that were distilled into the beverages. Western Pennsylvania was a key location for the Whiskey Rebellion at the end of the 18th Century, and markers from this era are present throughout Carnegie. The chief industry became coal mining in the late 1800s and early 1900s; later the main employers were steel mills such as Superior Steel, which had been Andrew Carnegie's company, and Union Electric Steel, still located in the Borough today. Carnegie Borough had a rail yard with connections to several railroads early in the twentieth century; the Pan Handle Railroad ran through the borough. Railroads provided the impetus for the industrial expansion of Pittsburgh and the United States. As was common throughout the entire Pittsburgh region, Carnegie suffered economically with the closure of the many steel mills in the 1970s.

Carnegie Borough



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GOVERNMENT AND CIVIC INSTITUTIONS

The Borough of Carnegie is governed by the Mayor and Borough council. Day to day operations are administered by the borough manager. Borough government also includes the Planning Commission, Zoning Board, Civil Service Commission, and Board of Adjustment. In addition, the Carnegie Shade Tree Commission (STC), who served as the main point of contact for this Green Scan, preserves and enhances the greenery of Carnegie through inventory, planting and maintenance of trees in the public right-of-way as well as planting of annuals in the planters on Main Street in the business district.

Carnegie Borough Building. Photo: WPC.

The Carnegie Community Development Corporation (CCDC) creates and administers programs which enhance and sustain the historic downtown business district, promote affordable and safe housing, and markets Carnegie to the surrounding region.

One of Carnegie's most treasured assets is the Andrew Carnegie Free Library and Music Hall (ACFL&MH), which sits on a wooded hill overlooking the downtown business district. Funded by Andrew Carnegie, the ACFL&MH opened in 1901 and has been serving the community ever since. The recently renovated facility houses a public library, a 400-seat music hall, a reception hall, and the nationally recognized Thomas Espy Post of the Grand Army of the Republic, now preserved as an exhibit.

Carnegie Library. Photo: WPC.

Saints Peter and Paul Ukrainian Orthodox Church (left) and Holy Virgin Russian Orthodox Church (right) on Mansfield Boulevard. Photo: WPC.

Carnegie is served by Carlynton School District, which also serves the boroughs of Rosslyn Farms and Crafton. Carnegie Elementary, located on Franklin Avenue, is one of two elementary schools in the district. Carlynton serves a total of about 1,440 students from kindergarten to grade 12.

Reflecting its immigrant heritage, Carnegie is relatively religiously diverse for such a small area. There are two Orthodox Churches (Ukrainian and Russian), two Lutheran churches, a Ukrainian Catholic church, a Methodist church, an Episcopal church, a Polish Catholic church and a synagogue. Carnegie also has many local fraternal organizations including the Veterans of Foreign Wars (VFW), Fraternal Order of Eagles (FOE), American Legion, Elks, Polish Eagles, Polish Sportsmen, Ancient Order of Hibernians (AOH), and Ukrainian-American Citizens' Club.

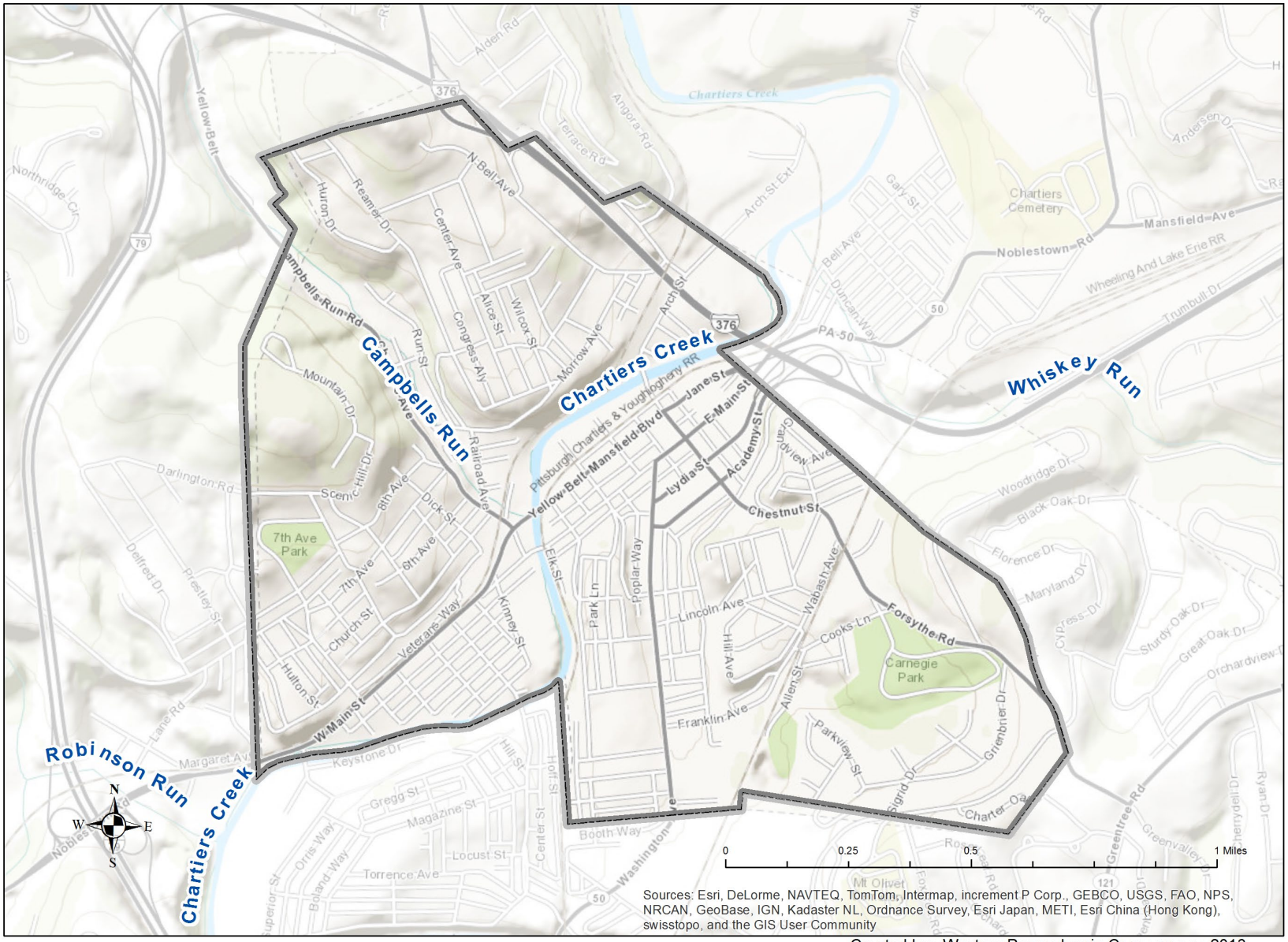
GEOGRAPHY

Carnegie Borough has an area of 1.3 square miles and is five miles from Downtown Pittsburgh. It is bordered to the east and south by Scott Township; to the north by Rosslyn Farms; and to the west by Robinson Township and Collier Township. A small portion of the Pittsburgh neighborhood of East Carnegie borders Carnegie on the northeast. The dominant geographic feature of Carnegie is the valley cut by Chartiers Creek through the hillsides as it winds toward McKees Rocks where it meets the Ohio River. The valley bottom along Chartiers Creek, the most suitable place for early development and eventually for locating the railroads, contains the business district and most of the older buildings and churches.

Chartiers Creek from Carnegie public lot looking east. Photo: WPC.

Carnegie from Ross Colonial Cemetery on Library Street. Photo: WPC.

Creeks in Carnegie



Created by: Western Pennsylvania Conservancy, 2013

Residential neighborhoods encompass most of the developable areas on the hillsides on either side of the valley. The residential neighborhoods are connected to the business district by streets running down the sides of the valley. Most of the undeveloped, vacant land in Carnegie lies on steep slopes where development is not possible. As of 2013, the developable land in Carnegie is essentially "built out," meaning that no more undeveloped land remains available for new development.

TRANSPORTATION FEATURES

From the railroads built in the in the early twentieth century to today's heavily used I-376 Parkway West and I-79, transportation features have a significant impact on Carnegie's landscape and development patterns.

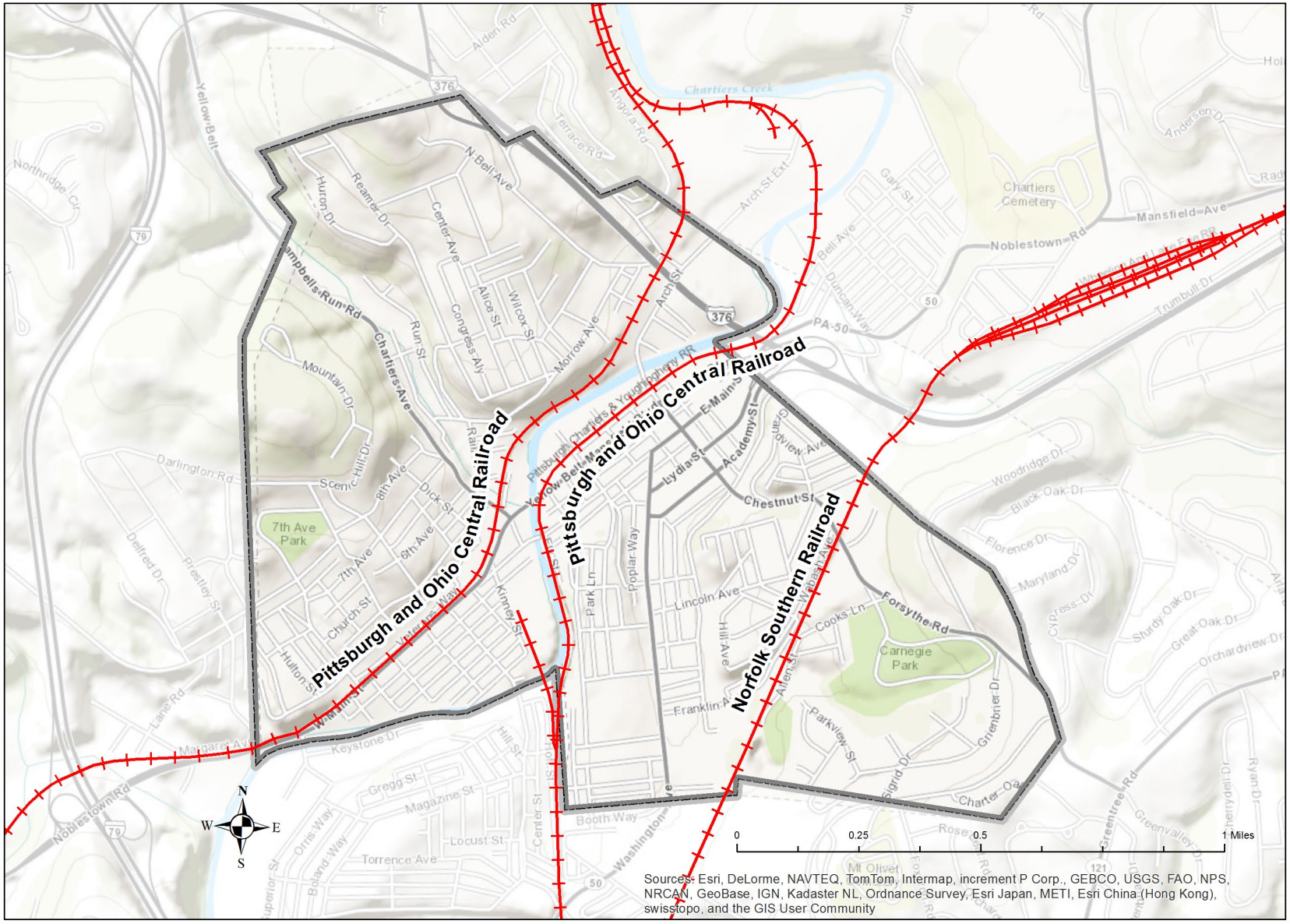
A long history of railroad activity has played a major role in shaping Carnegie's land use. Beginning in the early twentieth century, rail lines running through Carnegie were used to haul coal, some of which was being mined in Carnegie, to local coke ovens and steel mills. To this day, a refurbished signal tower serves as a symbol of Carnegie's past relationship with the railroads. Today, there are three rail lines that traverse Carnegie, but the Borough is no longer a "hub" for rail traffic in the way that it once was. Now, despite still being active lines, the railroads create a perception of public safety and access limitations.

Railroad crossing at entry to Carnegie from the southwest on W. Main Street. Photo: WPC.

The three railroads that pass through Carnegie include the following:

- A division of the old Pennsylvania Railroad, commonly called the Panhandle Route, which connected Pittsburgh to St. Louis, still runs through the center of Carnegie in front of the Borough building. The Panhandle Route is now abandoned from just west of Carnegie to near Weirton, West Virginia. Pittsburgh and Ohio Central Railroad still operates the section of the Panhandle Route that passes through Carnegie; however trains run very scarcely.
- Another section of tracks now operated by Pittsburgh and Ohio Central Railroad, which is still actively used, crosses through the business district at Main Street and at Mansfield Boulevard.
- Tracks now operated by Norfolk Southern also pass through Carnegie, creating a barrier between the Forsythe Hill neighborhood, location of Carnegie Park, and the rest of the Borough.

Railroads Serving Carnegie



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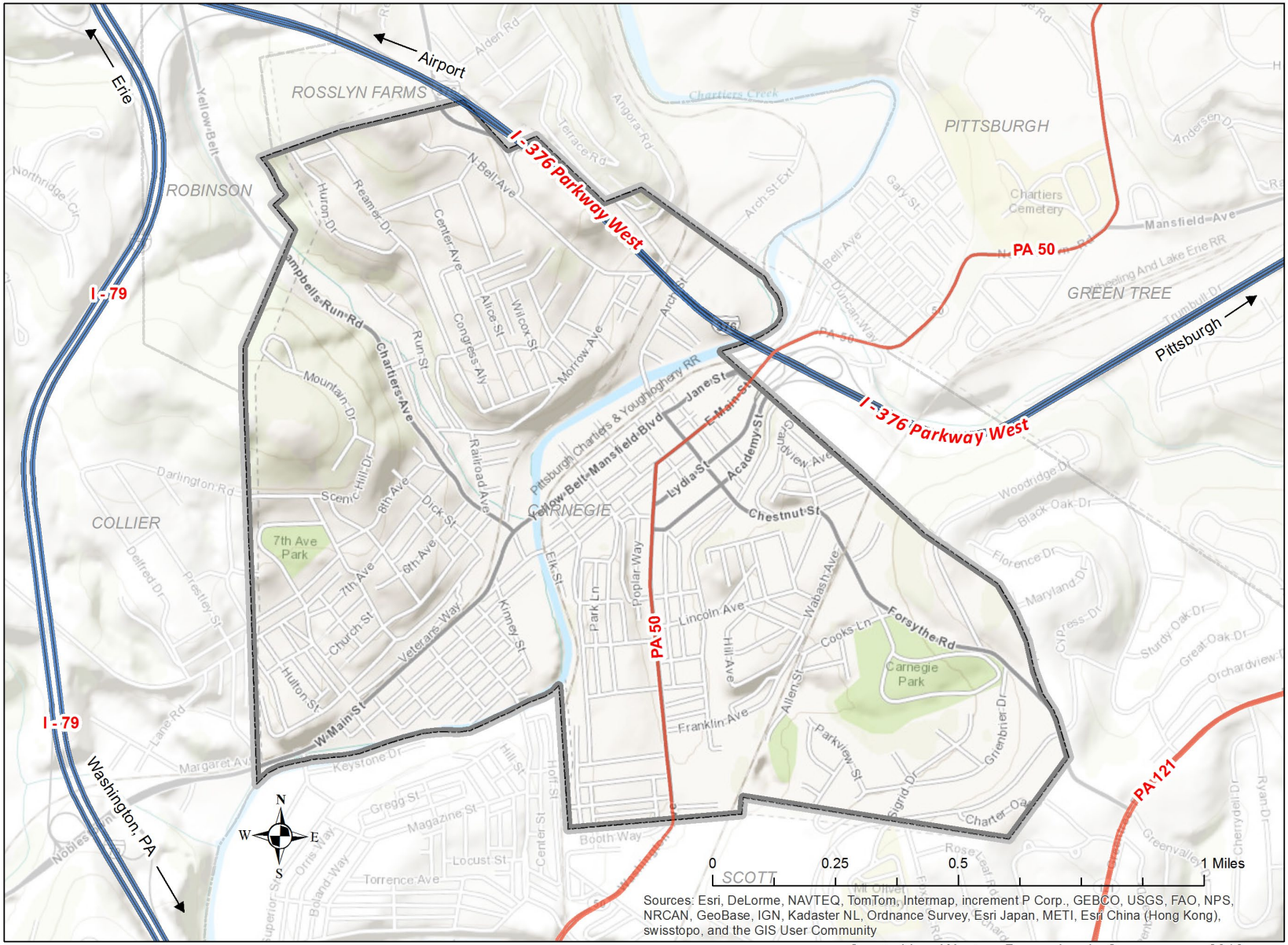
Highways Serving Carnegie



Created by: Western Pennsylvania Conservancy, 2013

Entry into Carnegie from I-376 W. Photo: WPC.

Carnegie is surrounded on two sides by Interstate highways: I-79 on the West and I-376-Parkway West on the Northeast. This location gives Carnegie easy vehicular access to downtown Pittsburgh and to the Pittsburgh International Airport.

On the northeastern end of town, the points of access and egress to and from I-376 create a somewhat complicated traffic patterns and visual barriers. This link to I-376 is very important to the community's accessibility to downtown Pittsburgh and points west, but creates challenges for a natural gateway into the borough.

The main routes running through Carnegie are Mansfield Boulevard/ Main Street and Washington Avenue/PA Route 50. Carnegie is linked with communities to the south by Washington Avenue /Route 50 and to the east and west by Noblestown Road as well as dozens of other feeder roads such as Campbell's Run, Forsythe/ Chestnut and Ewing Roads.

In addition, Carnegie is the terminus of the West Busway with its 250-vehicle commuter parking lot served by two direct routes, 100 West Busway and 33X West Busway. The West Busway is also used by dozens of other routes, including the 28X Airport Flyer and buses to Bridgeville, South Fayette and Oakdale/McDonald.


Gateway into Carnegie, W. Main St.. looking south. Photo: WPC.


Gateway into Carnegie, Carothers Avenue. Photo: WPC.


Port Authority shelter at Main Street/Mansfield Boulevard and Jefferson Street. Photo: WPC.

DOWNTOWN CARNEGIE

Carnegie has a charming business district that lies along Main Street between Chestnut Street and 2nd Street. Most of the buildings are from the first half of the 20th century and create a pleasing pedestrian scale. The business district offers many of the features that create energetic communities—walkability, visual interest, human scale and access to parking. In addition to these features, the business district houses several art and performance venues and several restaurants.

Downtown Carnegie. Photo: Jonathan Denson

Carnegie planter along Main Street. Photo: WPC.

According to the Carnegie Community Development Corporation (CCDC), Carnegie is home to over 340 businesses, including those in the office park and industrial park. Several of these businesses have won notice for their efforts at sustainability. There are many small stores and offices in and around Main Street, including buildings designated for mixed residential and business use. Heavy industry serves as the border between the Borough and Rosslyn Farms and Pittsburgh's East Carnegie neighborhood to the north. Many large old homes along Washington Avenue were converted to house offices. In addition, Carnegie Office Park is located in the northwest corner of the borough, right off the Rosslyn Farms exit of I-376.

POPULATION

The population of Carnegie, like many surrounding boroughs and the city of Pittsburgh itself, has been diminished by changes in employment, suburbanization, and other economic trends. Since 2000, Carnegie has lost about 4.5% of its population, mirroring the loss of population in Allegheny County (4.6%). Since 1970, the population loss was more precipitous—a full 25% compared to the county's loss of 24%. However, even with the population loss, Carnegie continues to be relatively densely populated compared to the county as a whole. In 2010 the Borough had over 4,900 people per square mile compared to a ratio of 1,675 people per square mile for the county. This means that more people need to share the existing green resources of the community.

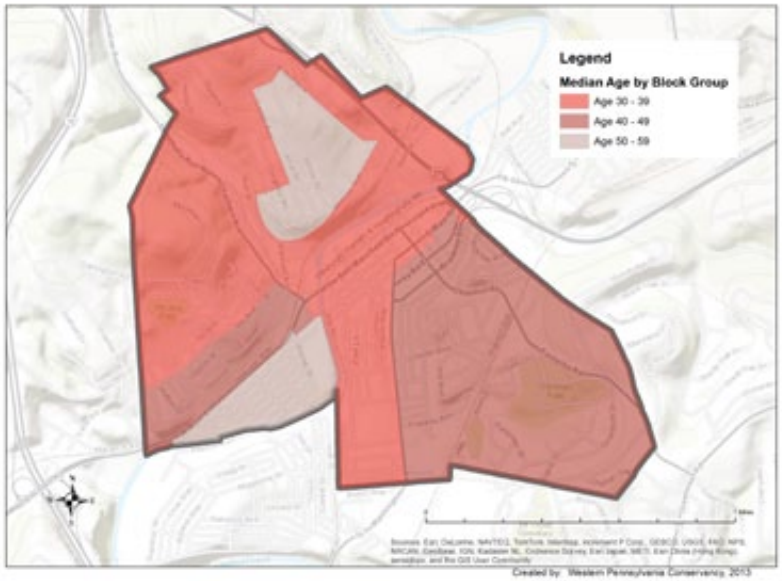
The proportion of people in each age category has remained a close mirror of the county's distribution of ages, with a slightly larger cohort of young adults and a slightly smaller group under 19 years of age. Elders are about 9% of the total population, just as in the county. In terms of green space needs, it is important to have a range of green spaces that cater to each age group—safe play spaces for small children, passive or low-exertion spaces for older residents and plenty of green places that support active enjoyment of the outdoors for the over 19 but under 75 age groups. At the same time, Carnegie has a lower median income than the county and a higher proportion of people in the low income category (18.6% compared to 12.4% for the county). This suggests that a significant number of residents may rely more heavily on local resources than on county or regional green assets that may be difficult to reach or more costly to access.

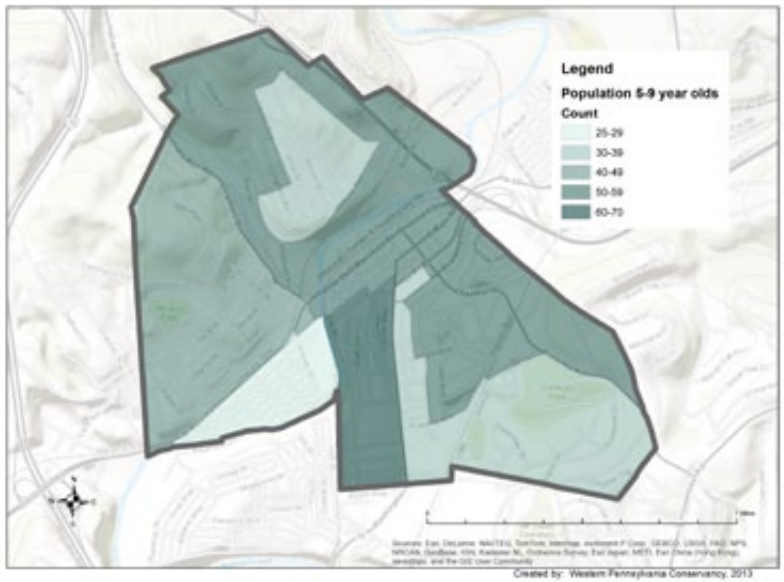
	Population				Population Change			Area	Density
	Pop. 2010	Pop. 2000	Pop. 1970	Pop. 1910	Pop. Change % since 2000	Pop. Change % since 1970	Pop. Change % since 1910	Land Area (sq. miles)	Persons / sq. mile (2010)
Carnegie	7,972	8,389	10,646	10,009	-4.5%	-25.1%	-20.4%	.162	4,930
Allegheny County	1,223,348	1,281,666	1,605,133	1,018,463	-4.6%	-23.8%	+20.1%	730.1	1,676

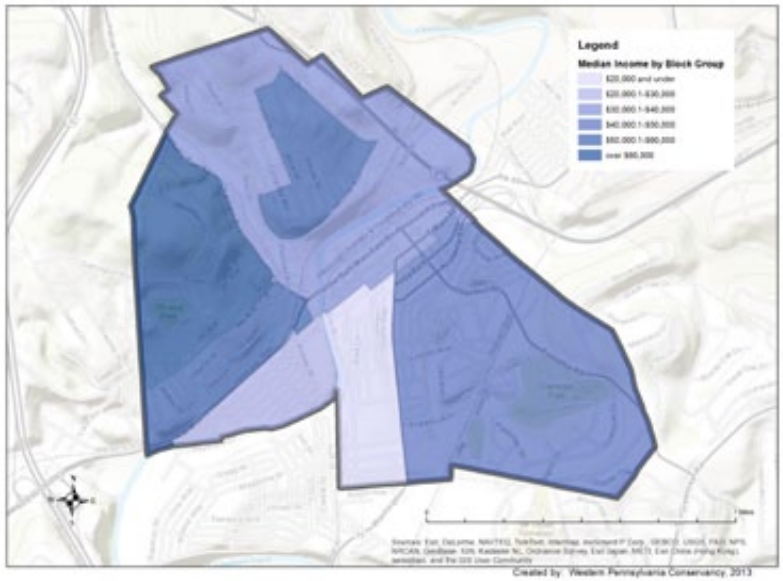
	Race %			Age %				
	African American	White	Other Affiliated	Under 20	20-34	35-59	60-74	75+
Carnegie	7.4%	87.7%	4.9%	19.7%	23.0%	34.6%	13.5%	9.0%
Allegheny County	13.2%	81.5%	5.3%	22.6%	20.1%	34.4%	13.8%	9.0%

	Income		Housing			
	Median Household Income	Est. % Under Poverty Level	% Occupied	% Vacant	% Owner Occupied	% Renter Occupied
Carnegie	$38,811	18.6%	90.1%	9.9%	52.0%	48.0%
Allegheny County	$49,805	12.4%	90.6%	9.4%	64.7%	35.3%

Maps Depicting Median Age (left), Density of Children Ages 5-9 (center), and Median Income (right)







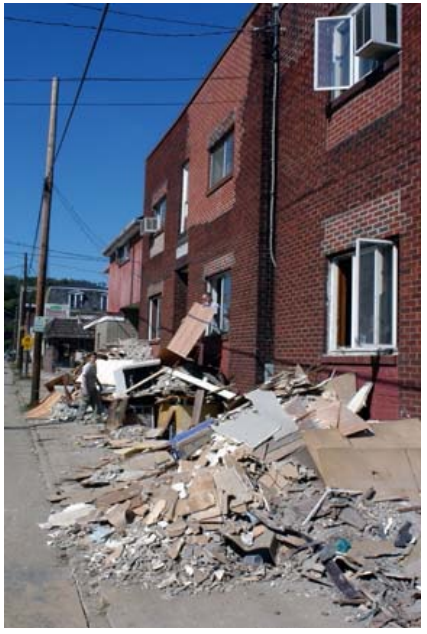
ENVIRONMENTAL FACTORS

Carnegie is affected by several environmental issues, mostly related to the Borough's location along the lower reaches of Chartiers Creek. Water quality issues of Chartiers Creek will be discussed in more detail in Section Four of this Green Scan, but a history of coal mining and other industrial uses in the watershed has caused significant impairment in the form of Acid Mine Drainage (AMD) and other industrial chemicals and heavy metals. Also, sanitary sewerage, both from within Carnegie and from surrounding municipalities, often overflows into Chartiers Creek during storm events due to the Combined Sewerage Overflow (CSO) design of the Allegheny County Sanitation Authority (ALCOSAN) system.

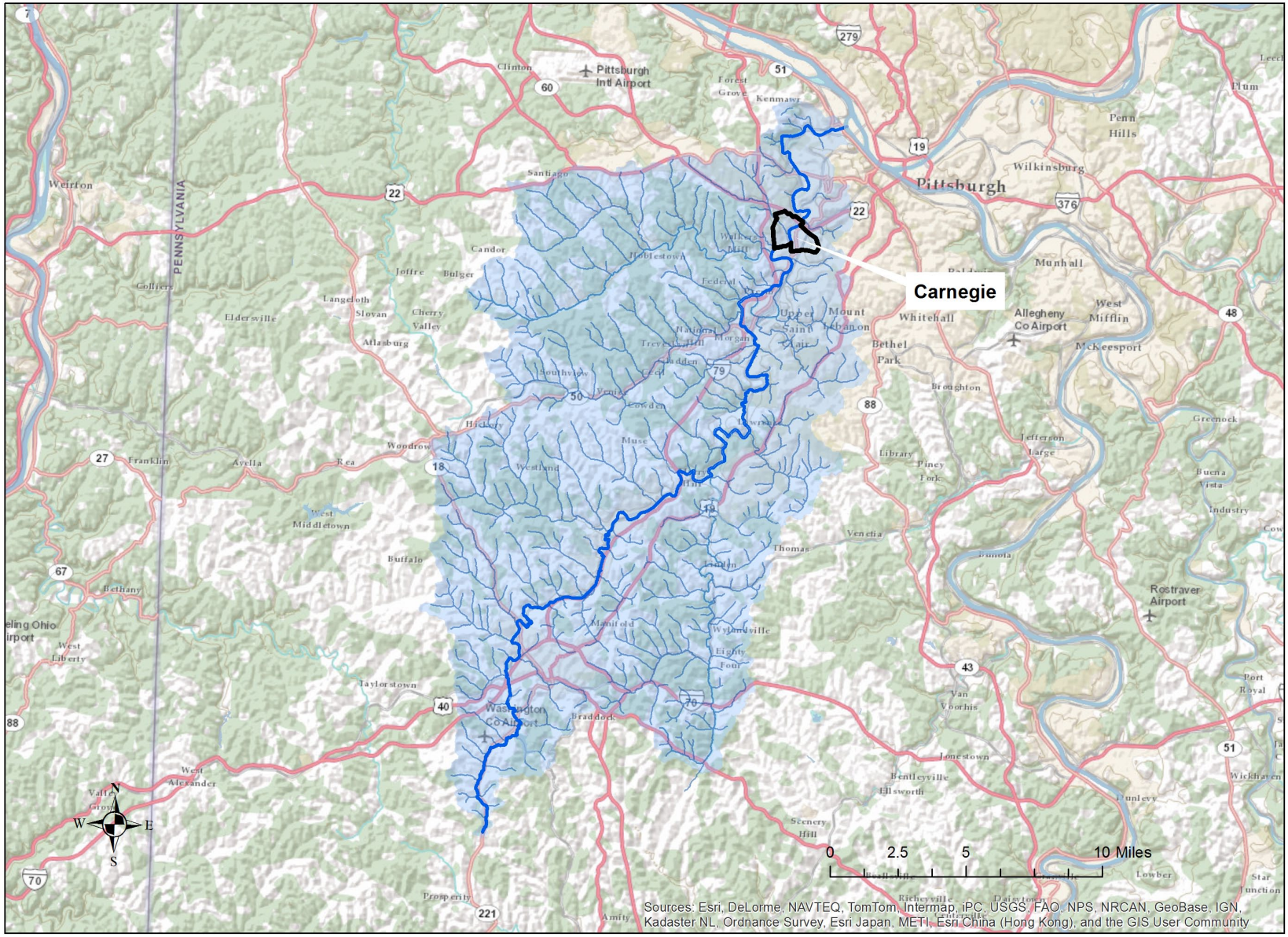
Also related to Carnegie's location in the lower reaches of Chartiers Creek, Carnegie was significantly damaged by flooding as a result of Hurricane Ivan in 2004. Much of the business district, as well as many homes and churches, were damaged. The watershed map below shows how flash flooding can occur when a major storm approaching from the south fills most of the watershed tributaries with maximum storm water levels.

Resilience in Carnegie following Hurricane Ivan.
Photo: Keith Sparbanie

Main Street Carnegie following Hurricane Ivan.
Photo: www.pubcrawler.com


Hurricane Ivan devastation in Carnegie.
Photo: Keith Sparbanie

Chartiers Creek Watershed

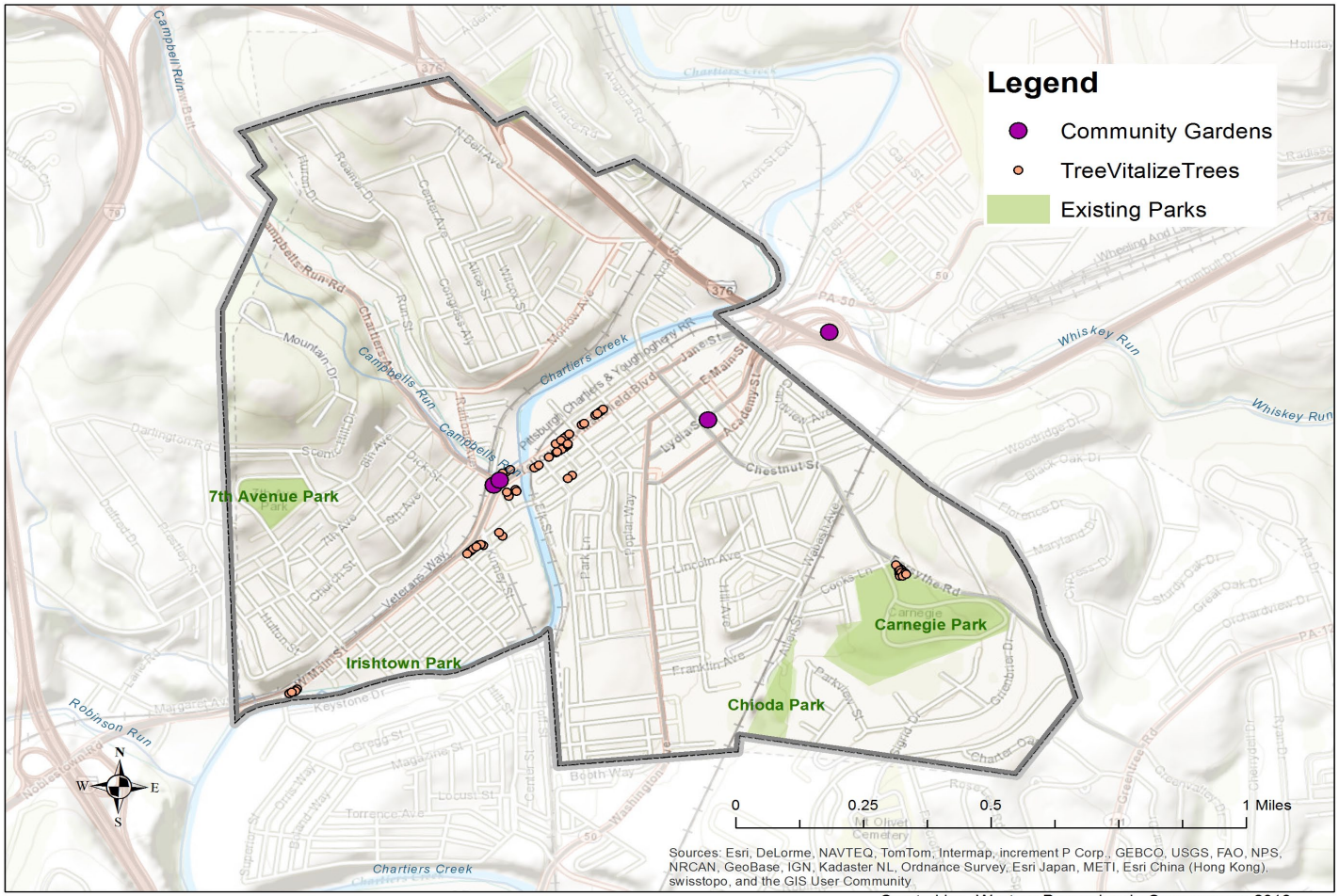


Created by: Western Pennsylvania Conservancy, 2013

SECTION THREE: EXISTING GREEN ASSETS

As a starting point for identifying the best opportunities to invest in greening in Carnegie, this Green Scan includes a review of Carnegie's existing green assets, including parks and open spaces, streetscapes, the urban forest, and community gardens. This section includes a review of the condition of the existing green assets, an assessment of how well these assets meet the community's goals, and a review of the location of existing green assets to determine which areas are not currently well served.

Carnegie Borough Existing Green Assets



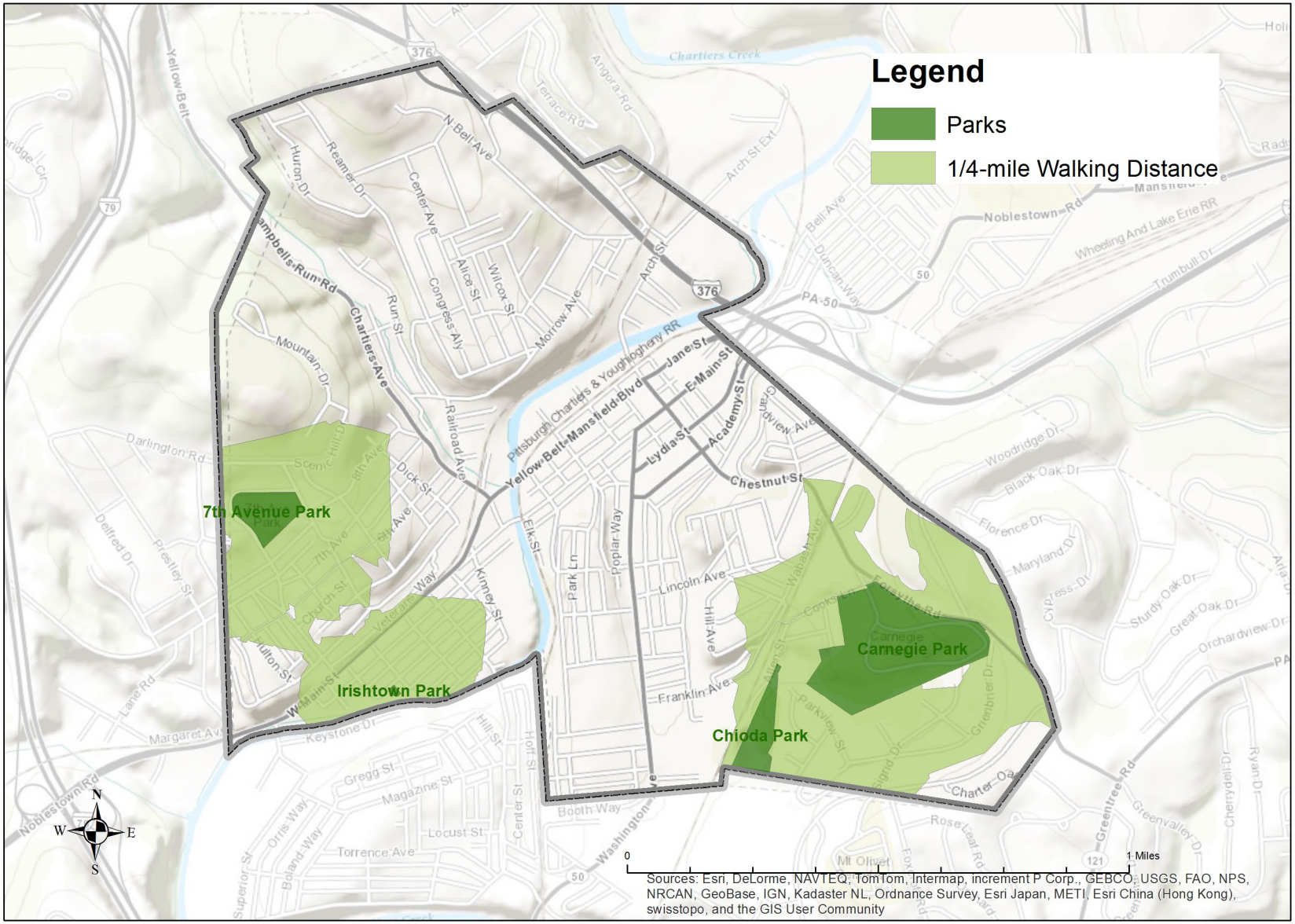
PARKS AND PUBLIC GREEN SPACES

This Green Scan included an assessment of how well Carnegie's existing parks and public green spaces serve the entire Carnegie community. The applicable goal for providing adequate greenspace for a community is to provide between .25 and 1 acre of small park space per 1,000 people within ¼ mile radius (10 minute walk) of populated areas. Small parks will typically offer seating, views, greenery, gathering space or contemplative green space for all ages, but particularly those people who are less likely to use intensive sports facilities such as ball parks (small children or older citizens). In addition it is desirable to have neighborhood or community parks on the order of 15 to 25 acres (1 to 2 acres per thousand people) to offer a greater variety of recreational resources—play equipment, facilities for field games, skating, picnicking, wading pools, and the like.

A Geographical Information Systems (GIS) analysis was conducted to determine what portion of the current population of Carnegie lives within a ten minute walk, following existing streets, of the existing parks. The analysis shown on the map below of existing park space indicates that nearly 75% of Carnegie residents, including those living in several entire neighborhoods, do not have adequate access to any existing parks. About 25% of the population is currently within a one-quarter mile or ten minute walk of an existing park, while existing playgrounds serve approximately 29% of the population of the borough.

Currently the residents of Carnegie, or visitors to the Borough, have access to four public parks: Carnegie Park, Chioda Park, Irishtown Park and the 7th Avenue Park.

Areas with Access to Existing Greenspace



Created by: Western Pennsylvania Conservancy, 2013

Carnegie Park

This important green space is located in the lower southeast corner of the borough. This is the Borough's largest park (at 33.5 acres) and offers the most diverse experiences for park users. The park includes paved driving or walking roads; picnic pavilions; a new dog park for dogs of all sizes; tennis courts; a children's play area with swings and slide and climbing structure; multi-purpose field for football, soccer and cricket; at least one ball field (also called Bagnato Field). Recent investments include the dog park, and a future skate park. The park is graced with a number of handsome older trees that provide shade and an attractive landscape. Carnegie has completed a master planning process for this park and is working on implementing a variety of additional improvements for the park.

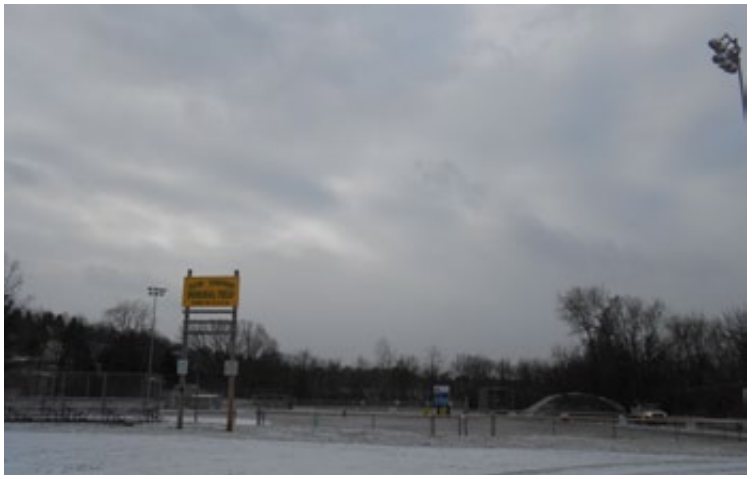
Tree grove in Carnegie Park. Photo: WPC.

Playground at Carnegie Park. Photo: WPC.

Carnegie Park Master Plan

Chioda Park

Also in the southeast corner of Carnegie lies Chioda Park which includes Chioda Field and Bagnato Field. Both of these ball parks are available to residents and visitors and are used for formal and informal ball games by the Carnegie Youth Athletic Association Baseball league and the Carnegie Boys & Girls Club Flag Football league. The park encompasses 5.6 acres.



Chioda Park baseball diamond in winter. Photo: WPC.

7th Avenue Park

This park is on the western side of the borough and provides additional ball field space along with a children's play space with swings and merry-go-round, tennis courts, a basketball court and some paved areas for other games. It also has a sizeable, somewhat informal parking area and some open green space around the facilities. The total area of the park is 6.2 acres.

7th Avenue Park playground. Photo: WPC.

7th Avenue Park view from parking lot. Photo: WPC.

Irishtown Park

This small park (approximately 0.2 acres) is tucked away in the residential Irishtown neighborhood between 5th Street and 6th Street along the edge of Chartiers Creek in the southwest of Carnegie. The park contains a small, well-shaded lawn; a playground recently built with Home Depot through the Kaboom organization; and sitting areas and is completely fenced in as a safety measure for playing children. Serafin's Printing has a building along the road within the park.


Irish Town Park Home Depot Playground. Photo: WPC.


Irish Town Park sitting benches. Photo: WPC.

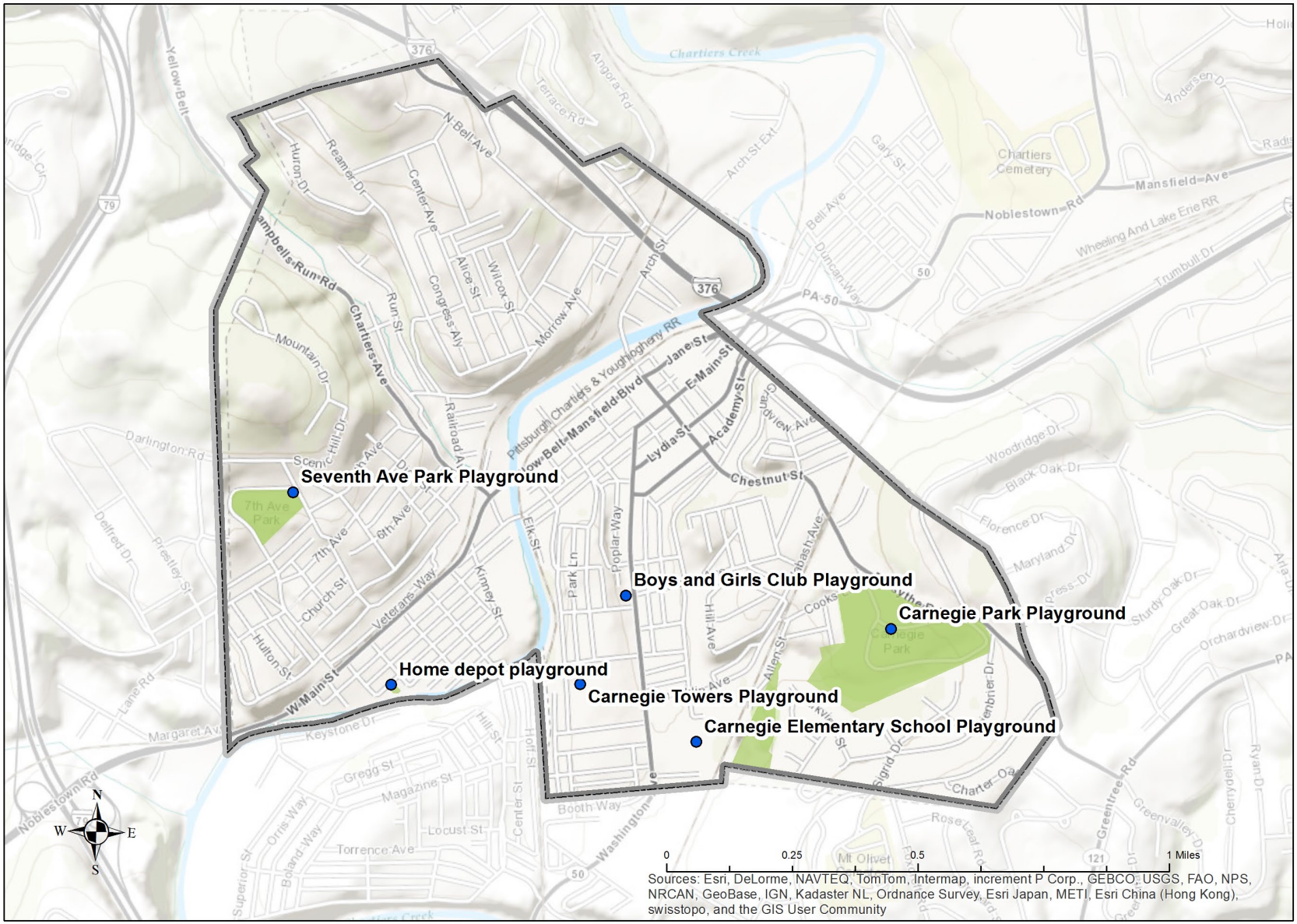

Irish Town Park River Access Photo: WPC.

Playgrounds

There are five publicly accessible playgrounds in the Borough, three of which are located in or adjacent to existing parks, and three of which are near housing developments. In addition, the Boy's and Girl's Club has a playground, but access is limited to hours when the club is open and to children attending club activities.


Playground in Carnegie Towers parking lot. Photo: WPC.

Carnegie Playgrounds



Created by: Western Pennsylvania Conservancy, 2013

STREETSCAPES

Existing planters

There are 95 planters along or just off of Main Street and surrounding areas, spanning six blocks from Sansbury Street on down to Jefferson Street. These planters are all made of concrete and have a wide range of sizes. Some planters are extremely large and others very small. The planters have nice flower designs but it is imperative, given the harsh conditions that flowers in planters face amidst concrete and heat island effect, that they are watered and fertilized diligently throughout the growing season. This will keep them vibrant as long as they are growing. More information is found in the following section, Potential Assets.

Planters and pass-through at Main and Jefferson Streets, Downtown Carnegie. Photo: WPC.

Existing Planter Locations, Downtown Carnegie

Created by: Western Pennsylvania Conservancy, 2013

Gateway Gardens

Western Pennsylvania Conservancy has many gateway and community flower gardens throughout Allegheny County. Two of these gardens reside within Carnegie Borough limits, and one is just outside the Borough. All three of these green assets were installed between 1996 and 1999. The Conservancy raises the money to provide the materials essential for the garden, and it seeks the help of local neighbors, or organizations, to serve as stewards to tend to the gardens throughout the growing season.

One of the largest and most viewed WPC gardens, seen 154,500 times daily according to PennDOT statistics, sits at the Scott-Carnegie Interchange along the outbound side of Parkway West on PennDOT property. This site, 2,800 square feet of annual and perennial beds, is well–tended and a pleasing highlight as travelers use the freeway or head into Carnegie; however as of this report, the site does not have an official tender. The Borough does keep the grass mowed, which is a key component to keeping these large beds a viable and welcoming asset. This site costs approximately $1,300 per year for preparation, plants, water and materials.

WPC gateway garden at Scott-Carnegie Interchange. Photo: WPC.

Another large and highly visible garden sits on Borough property at the corner of Campbell's' Run Road and Mansfield Boulevard on the southwest side of the intersection. Union Electric Steel Corporation, an international company headquartered in Carnegie, sponsors the garden program with recognition at this site. This site costs approximately $1,600 per year for preparation and materials. This garden is seen 30,000 times daily according to PennDOT statistics.


Corporate volunteers plant the garden at Mansfield Boulevard and Campbells Run Road, Carnegie. Photo: WPC.


Gateway community garden at Mansfield Boulevard and Campbells Run Road. Photo: WPC.

At the corner of Lydia and Chestnut Streets, across the street from CVS, sits a third WPC community flower garden. It borders the edge of a recently reconfigured parking lot for Allegheny County Housing Authority. This garden, embedded within the community, is also highly visible (seen 35,500 times daily according to PennDOT statistics) as it is located along the heavily traveled corridor where traffic passes it both coming off of the Parkway exit heading toward Route 50 as well as getting on the Parkway from Mansfield Boulevard. Pennsylvania American Water has been a long-time sponsor of the garden program and has recognition at this site.

WPC staff is able to recruit volunteer groups to help plant and winterize the garden beds at all three of these sites, but has had difficulty identifying stewards to tend to the gardens in an ongoing capacity. A dedicated person or group would ensure long-term maintenance and sustainability for these sites.

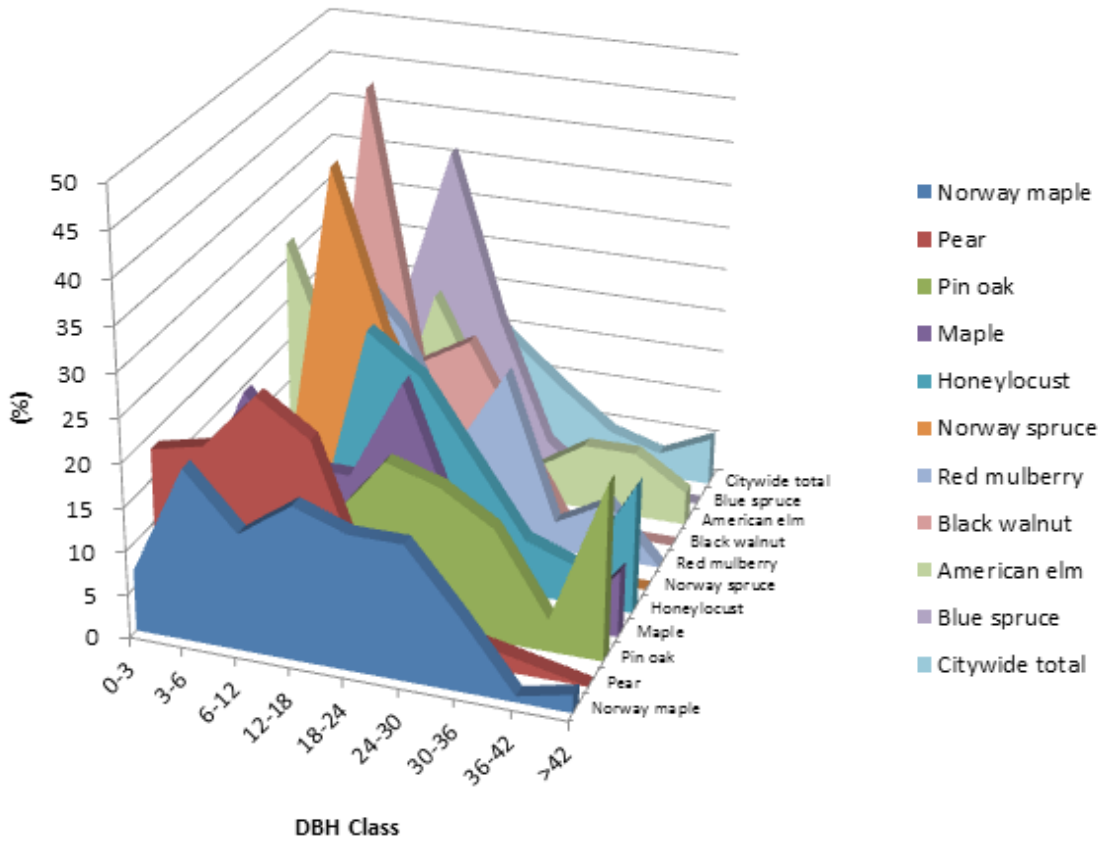
Community garden at Lydia and Chestnut Streets, Carnegie. Photo: WPC.

TREE ANALYSIS

The tree population in Carnegie can be classified into two categories, public and private. The following analysis will focus largely on the tree population in the public right-of-way with minimal reference to trees on private property. Trees in the public domain include street, park and certain residential trees that fall in the public right of way.

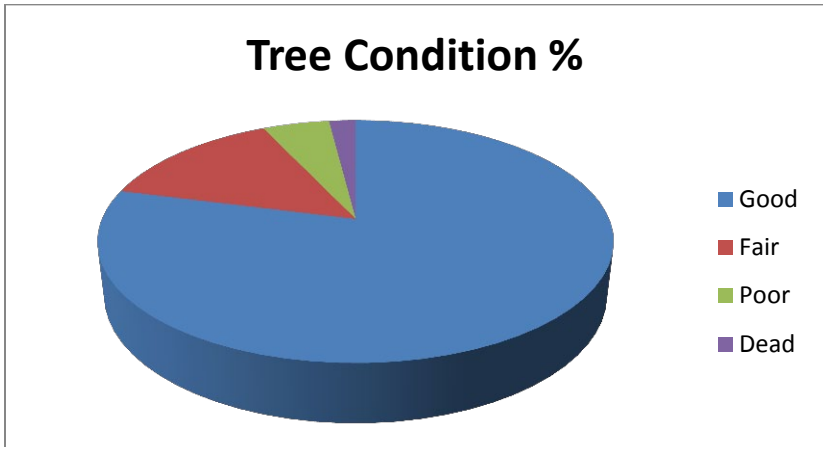
Public trees

Summarized from the i-Tree Streets* tree inventory conducted by the Carnegie Shade Tree Commission, the public tree population of Carnegie consists of 842 trees of 32 different species. The top five tree species are Norway maple, Callery pear, Pin oak, Maple, and Honey locust that constitute 44% of the population. Two of the top five tree species, Callery pear and Norway maple, are invasive and constitute 26% of the overall tree population. Considering the large number of invasive trees, tree replacement strategies should account for the removal of invasive trees and the planting of a diverse mix of non-invasive trees. The population is on the young side, with the majority of trees falling in the 12 to 18-inch diameter class and few trees in diameter classes over 30 inches. The following graph represents the relative age distribution of the top 10 public tree species (%):



*iTree Streets is a software program developed by the U.S. Forest Service.

The trees are in relatively good condition as presented in the following table:



Condition	Tree Count*
Good	664
Fair	118
Poor	24
Dead	20
Total	826

*numbers summarized from the Carnegie i-Tree inventory, please note that 16 trees were not assigned a condition

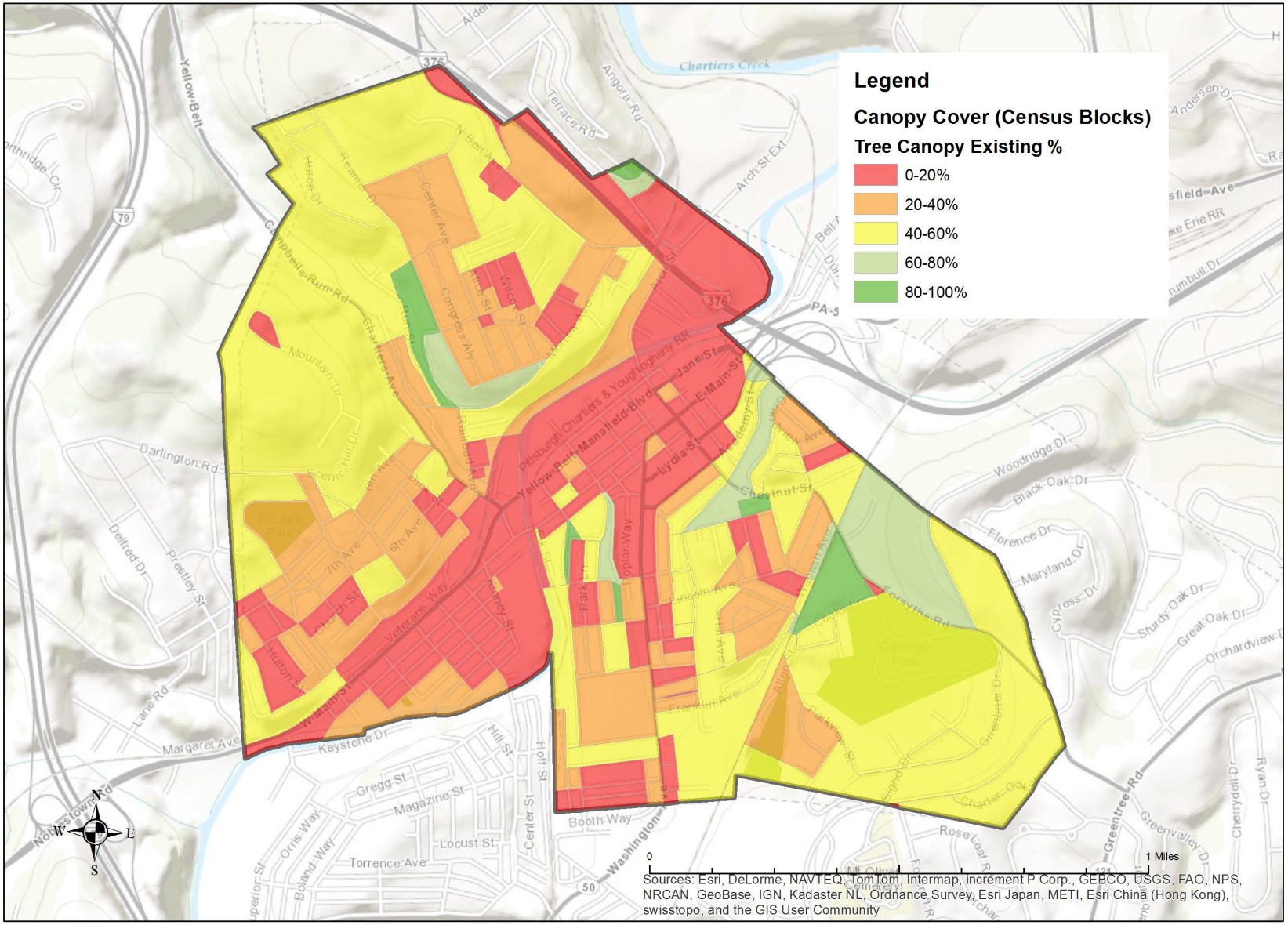
Supplementing the i-Tree report, site reconnaissance during this study found that there is a tremendous opportunity for expanding Carnegie's urban forest with additional tree plantings. Helping to inform future tree planting efforts, the i-Tree inventory in conjunction with the Canopy Cover Analysis discussed in the next section provide a platform to assist urban forestry decision making. Examples of this include improved species diversity, tree distribution across neighborhoods, targeting areas of lowest canopy, and priorities important to Carnegie Borough.

Canopy Cover Analysis

Interpreting the Urban Tree Canopy Assessment conducted by Allegheny County and including both public and private tree cover, it becomes apparent where existing tree canopy is deficient. Analysis of the tree canopy cover by census block can assist the municipality in prioritizing targeted tree plantings and focusing on areas of greatest need. Referring to the canopy map below, the census blocks in red have 0-20% canopy and are the areas of greatest tree need.

The national average for street trees in comparable cities is one street tree for every five persons. Pittsburgh's street tree population is one street tree for every eleven people. The Borough of Carnegie has an estimated street tree population of one public tree for every nine people.

Carnegie Canopy Cover by Census Block



Created by: Western Pennsylvania Conservancy, 2013

Environmental and Economic Benefits of Existing Trees

The environmental and economic benefits of Carnegie's public trees were calculated using the i-Tree Streets program. Benefit inputs help to define the dollar value of tree-related environmental and economic services associated with trees. Default values based on the specific climatic zone are included for the Borough of Carnegie. The inputs used to determine the environmental and economic benefits include:

- $/Kwh—dollar value of energy savings of electricity
- $/Therm—dollar value of energy savings from reduced heating needs
- $/lb of CO2—dollar value of carbon dioxide (CO2) removed from the atmosphere
- $/lb of PM10—dollar value of particulate matter (PM10) with diameter 10 micrometers or less removed from the atmosphere
- $/lb of NO2—dollar value of nitrogen dioxide (NO2) sequestered from the atmosphere
- $/lb of SO2—dollar value of sulfur dioxide (SO2) sequestered from the atmosphere
- $/lb of VOC—dollar value of volatile organic compound (VOC) sequestered from the atmosphere
- $/gallon of storm water interception—dollar value of water intercepted, through fall and stem flow average home resale value—dollar value that trees add to the sales price of a home

Carnegie's public trees provide $100,113 per year in environmental and economic benefits. Quantifying the annual benefits of trees can assist the shade tree commission and Borough in making the case for more trees and better management of the existing tree resource. It is important to point out that as trees get bigger the annual value of their benefits increase.

Annual Benefits of Public Trees in Carnegie

Energy	CO2	Air Quality	Storm water	Aesthetic/ Other	Total*
$13,728	$2,464	$1,982	$17,399	$64,539	$100,113

*Note-the value of benefits will increase as trees grow.

Community volunteers plant trees in Carnegie though TreeVitalize Pittsburgh program , spring 2013. Photo: WPC.

SECTION FOUR: POTENTIAL GREEN ASSETS

The Carnegie Green Scan process completed two types of analysis regarding opportunities for the borough to add green assets. First, opportunities for adding green assets that would help meet an identified need for additional access to public parks and green space were reviewed. Second, ideas that were generated by the community green scan committee and public comment were reviewed for feasibility, value and practicality.

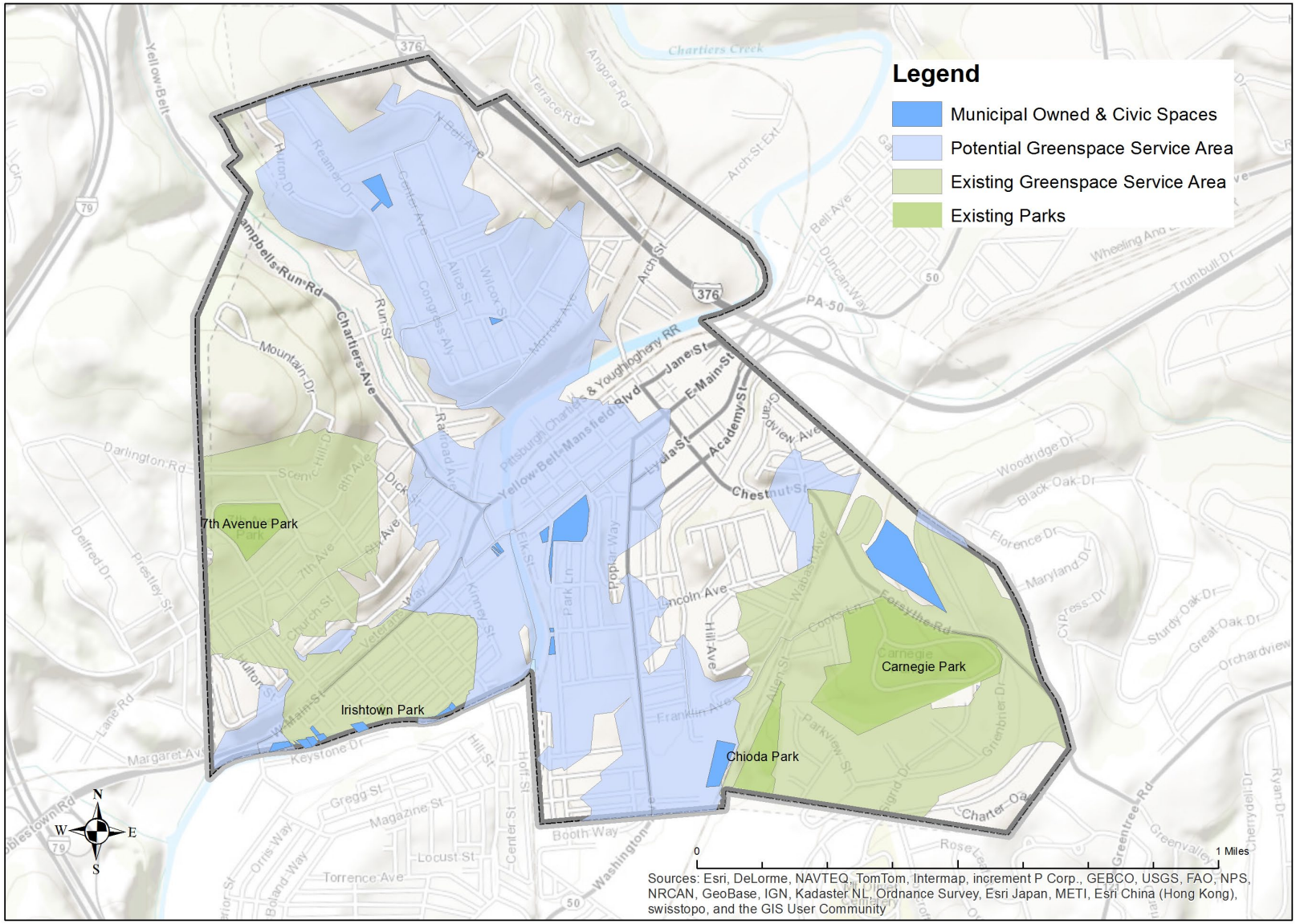
BOROUGH OWNED LAND AND CIVIC SPACES

Based on the GIS analysis of community access to existing parks and green spaces, it became apparent that there is a significant proportion of the population of Carnegie – nearly 75 percent – that does not have easy access to the existing green spaces in the Borough. The analysis reviewed pedestrian paths to existing parks using existing streets and sidewalks.

In addition to this analysis, this Green Scan included an assessment of vacant land in Carnegie which could potentially become dedicated public green space. This assessment looked primarily at properties owned either by the Borough itself or by civic institutions such as the Andrew Carnegie Free Library and Music Hall (ACFL&MH), the Carnegie Community Development Corporation and Carlynton School District. The map below shows green space service areas to which people can easily travel on foot using existing roads and sidewalks and reach a green space within a ten minute walk (about one quarter mile). It also shows an overlay of currently vacant land owned by either the Borough or other civic institutions which, if designated as public green space, would increase such access to nearly 65 percent of the population of Carnegie.

As will be described in the next section, the grounds surrounding the centrally located Andrew Carnegie Library – already a "de facto" public green space – could fill a significant green space access gap within the most densely populated section of the Carnegie if amenities were added to increase its appeal as active open space.

Potential Access to Greenspace



Created by: Western Pennsylvania Conservancy, 2013

STREETSCAPES

A variety of greening strategies can make a significant improvement to community streets, particularly in business districts. Among the options are street planters, hanging baskets, plantings in tree pits and welcome gardens at key intersections on rights of way. Each of these is briefly considered below.

Planters

In Carnegie's business district the existing planters provide a colorful accent to its street and storefronts. It could be possible to add more planters or take steps to make the existing planters more manageable and higher impact. However, adding any new planters, or even slowly replacing some planters over time, entails some costs as outlined below.

Planters at Main Street and Jefferson Street, Downtown Carnegie. Photo: WPC.

In addition to the cost of each planter, which can be considerable, a summer display with annual flowers and a perennial center will cost at minimum $40 and at most $100. A year-round display that includes bulbs, mums and winter evergreens will costs between $150 and $400 depending on plant type, quality and quantity.
It is also important to assess the amount of time and energy required to keep the planters looking at their best.

Currently the planters vary tremendously in size and type of planting. A more consistent display might reduce the amount of cost and caretaking work required to make the planters a highlight for the business district.

Planter Costs

Set up cost	35" to 45" wide	Annual Plant costs Summer only // Year Round	Annual caretaking (watering, feeding, trimming) contracted	Weekly volunteer caretaking per 4 blocks
Plastic	$400 - $600 each	$40 to $100 // $150-$400	$150 to $200	• Up to 2 hours per visit • Planters need to be watered every other day
Concrete	$400 - $800 each	$40 to $100 // $150-$400	$150 to $200	

In terms of maintenance, planters will need to be watered every other day in the growing season (about 24 to 28 weeks) and fertilized and weeded once a week depending on temperature. The average cost for contracting this work out is $150 to $200 per planter per season. If this maintenance can be provided by Borough staff or volunteers, the costs would need to be calculated differently and would likely be greatly reduced.

A variation on adding new planters would be to initiate an effort to slowly shift the sizes of existing planters to become more uniform. Currently the planters in Carnegie are of many different sizes ranging from rather small to enormous . An effort to convert more of the planters to a uniform size or pair of sizes would improve visual impact, potentially make some caretaking easier and make it simpler to calculate costs, both in time and money. However, there would be costs associated with each planter replacement.

Hanging Baskets

An additional strategy for enlivening business district streets can be hanging baskets. Baskets may be difficult to do in Carnegie because of the type of poles and existing banners. In addition, the capital costs of baskets, added to higher maintenance costs and more difficult caretaking due to height and stress for plants in baskets, may not make this a feasible approach to further enhancement of the downtown streets. (Hanging baskets must be watered every day in the season and fertilized once a week for approximately 16 to 18 weeks. Watering is crucial to keeping the baskets looking their best.)

Basic costs for a typical hanging basket program are outlined below:

Hanging Basket Costs

Set up cost	Annual Plant costs	Annual caretaking costs (could be contracted)
$150 - $200 per basket, including bracket, basket and any signage.	$65 per basket	$125 to $200 per basket per season

It is unlikely that it would be feasible to handle basket assembly, hanging and caretaking using volunteer help. Therefore a basket program would have a significant cash cost even if the Borough staff were able to do some amount of the watering and caretaking.

Hanging basket display in Market Square, Downtown Pittsburgh.
Photo: WPC.

Planted Tree Pits

There are a number of tree pits that could be planted with annuals or perennials to add to the main street. It would be possible to use some of the same plants used in the planters to tie the corridor together. If this treatment becomes popular and is well taken care of then the community could look into more permanent (and costly) additions to pits like decorative edging.

Tree pits with guards and plantings outside Penn Station, 34th Street and 7th Avenue, New York City. Photo: unknown.

Planted Tree Pit Costs

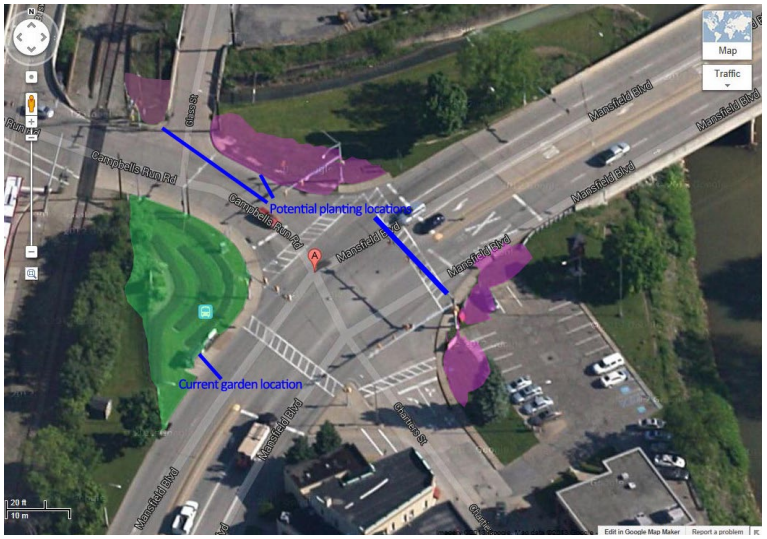
Basic annual planting	$25 to 50 per pit / year
Perennial pit planting	$50 one time first year cost
Special curbed pits	$5,000 to $10,000 per pit
Maintenance including watering (contracted)	$50 to $150 per pit per season depending on size
Maintenance (volunteer)	$25 per season for tools, gloves, brown bags
Water	$2.71 per pit / year

Like planters, flowers in the tree pit will need to be watered every other day while they are in the ground during growing season. They will also need to be weeded on a regular basis. Our average cost for contracting this out is $50 to $150 per pit per season, although Borough staff might be able to handle such tasks at a lower costs and this type of street planting care is very suitable for volunteers.

Gateway Welcome Gardens—Mansfield Boulevard and Campbells Run Road Gateway

As noted in the previous section, at the intersection of Mansfield Boulevard and Campbells Run Road there is currently a WPC community flower garden located in the generous right of way area and adjacent to the creek channel. Interest in additional plantings on the other three corners of the intersection was expressed during discussion with community members. There are several options for added greening at this site.

The current garden has 1,300 square feet of annual plantings and 800 square feet of perennial plantings, a sign and a drip tape irrigation system. To install a new site this size would cost $6,000 to $12,000 depending on layout, site condition and type of irrigation. The current garden costs $1,100 in annual upkeep which covers annual flower costs, site preparation and summer maintenance. The current model for the site and all other WPC community flower gardens has a dedicated volunteer or group of volunteers called stewards who spend at least 2 hours a week for the duration of the growing season—usually 20 weeks—to tend the garden.



Mansfield Boulevard and Campbells Run Road intersection, with current garden location and potential additional garden beds.
Photo: Google aerial photo.


Community garden at Mansfield Boulevard and Campbells Run Road.
Photo: WPC.


Publicly owned lot along Chartiers Creek across from current garden at Mansfield Boulevard and Campbells Run Road.
Photo: WPC

Based on the numbers above as a guide, and taking into consideration that the other three corners would be smaller than the existing garden based on available space, adding gardens to the other three corners would cost $10,000 to $15,000 (or about $5,000 each corner including a watering system but not additional signage) to install and an additional $1,000 a year for upkeep. This also would double the amount of time needed for summer maintenance. Another option would be to add some trees and perennials to the other corners without annual beds. This would bring costs to the $5,000 to $10,000 range (or $1,600 to $3,350 each corner) and, aside from regular perennial bed weeding, would keep maintenance and upkeep time to a minimum after the first three years. The most important consideration would be sufficient watering for new trees and perennials for the first three years after planting to get everything well established and able to survive on normal rainfall.

Gateway Garden Site Costs Summary

Construction per 100 Sq. Ft.	Annual Plants & Site Prep per 100 Sq. Ft.	Volunteer Caretaking	Annual Watering Cost	New Sign Cost
$250 to $720	$75	2 hours per week for 20 weeks	$150	$2,000 to $5,000

One other potential gateway garden site is before the bus stop at West Main Street and Hammond Street. There is a small green space that has a number of newly planted trees and a welcome sign. The ability to add irrigation needs to be researched but if irrigation could be added a garden could be added for between $5,000 to $10,000 (depending on exact size and components) and annual upkeep would cost between $500 to $1000 depending on design.

One other potential welcome site is the I-376 eastbound on-ramp from Rosslyn Road.

Potential location for welcome garden into Carnegie along Rosslyn Road prior to I-376 entry and Bell Avenue. Photo: WPC.

If the addition and expansion of existing gateway sites becomes a reality there are two site features that should be taken into consideration. First is signage. The current welcome signs do not match. A uniform welcome sign could tie together all the sites. Signs can be costly and do require maintenance. A general guide line for cost is $5,000 to $15,000 depending on size and materials. There would also be an additional cost to light the sign if that is desired.

Carnegie welcome sign at the corner of Mansfield Boulevard and Chartiers Avenue. Photo: WPC.

Carnegie welcome sign at the bus shelter entering the Borough from the southwest along Main Street. Photo: WPC.


Carnegie welcome sign and bus shelter entering the Borough from the southwest along Main Street. Photo: WPC.

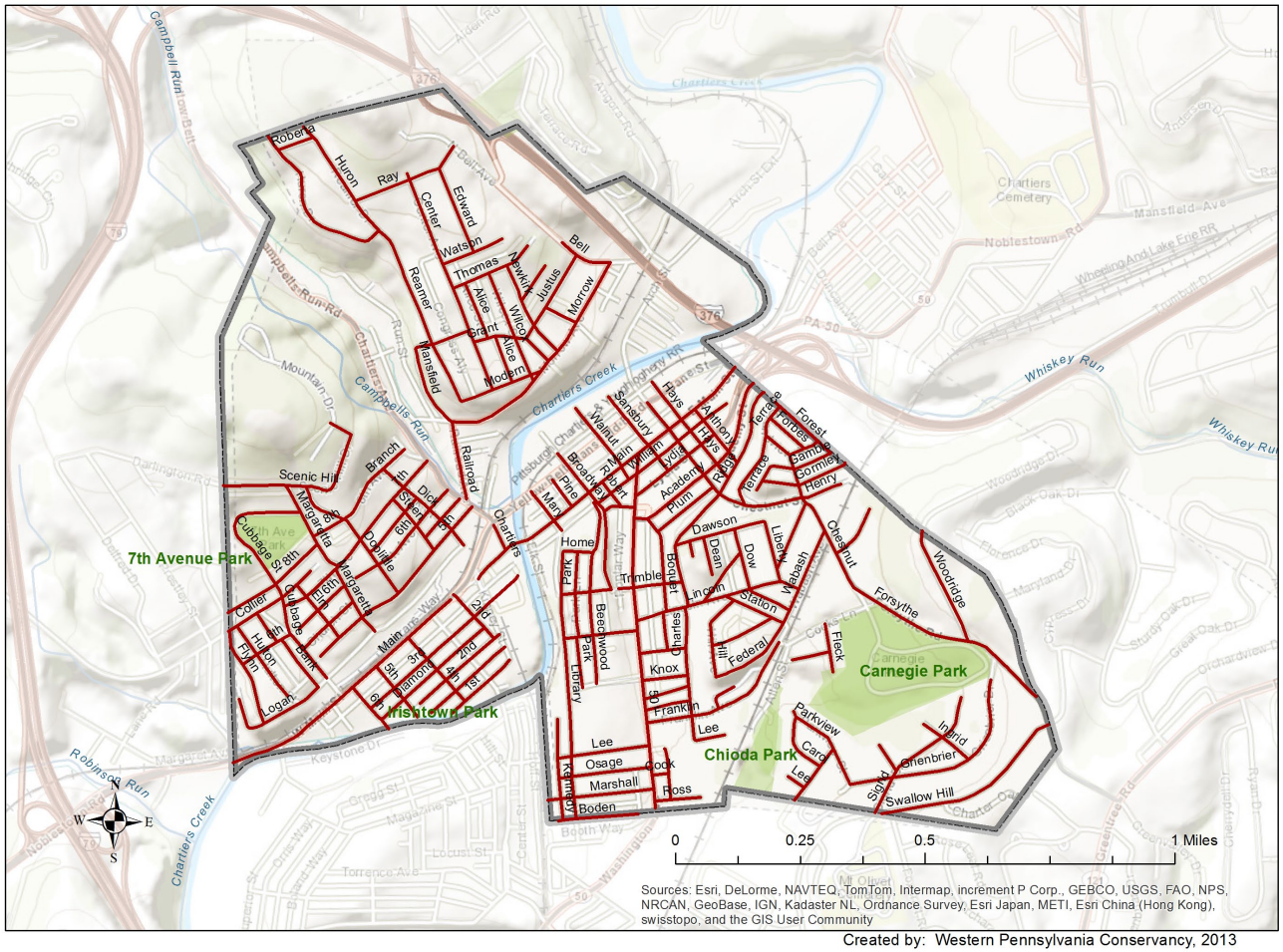
The second design feature that could be considered is to use a favorite plant (perennial or annual), shrub, tree or flower, that can be planted at all sites to tie them together. If this concept were popular the same plant could be used in the street planters and make it a symbol of the community. A spring time planting event could even bring community members together and engage community members for some further volunteer care.


Photo: WPC

TREES

A forester's analysis of potential locations for additional street trees was performed as part of this Green Scan. Street selection was narrowed by removing streets that appear to have adequate cover based on the County Urban Tree Canopy Analysis. Additionally, streets that were previously planted with TreeVitalize trees were removed from the selection, as these areas have been fully planted. The accompanying map identifies the streets with potential tree planting opportunities.

Streets Feasible for Trees



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Created by: Western Pennsylvania Conservancy, 2013

The map shows a tremendous opportunity for adding trees to residential areas with 300 potential new planting sites. Potential planting sites in residential areas include trees in tree lawn areas, trees in sidewalks, and trees in front yards.

The Borough of Carnegie has been active in collaboration with the TreeVitalize Pittsburgh program identifying significant planting opportunities throughout the Borough. And the Borough's current TreeVitalize application is requesting 89 trees for a spring 2014 tree planting. Working in collaboration with the TreeVitalize Pittsburgh program, the Borough can utilize the expertise of the program forester to help target the most appropriate tree planting opportunities.

PARKING LOTS

The Borough of Carnegie currently owns 8 parking lots, which are shown on the aerial photo on the following page. These lots and an additional park-and-ride lot owned by the Port Authority comprise approximately 6 acres of impervious surfaces. While these lots encompass a small fraction of the town's acreage, they are located in high visibility sites in the center of the business district and adjacent to the borough offices. In a flood prone community such as Carnegie, it is valuable to consider removing or reducing impervious surfaces to allow greater absorption of rainwater and any overflows from the creek during significant weather events.

There are numerous approaches to reducing impermeable pavement and many design options allow the retention of the existing number of parking spaces. Several options include:

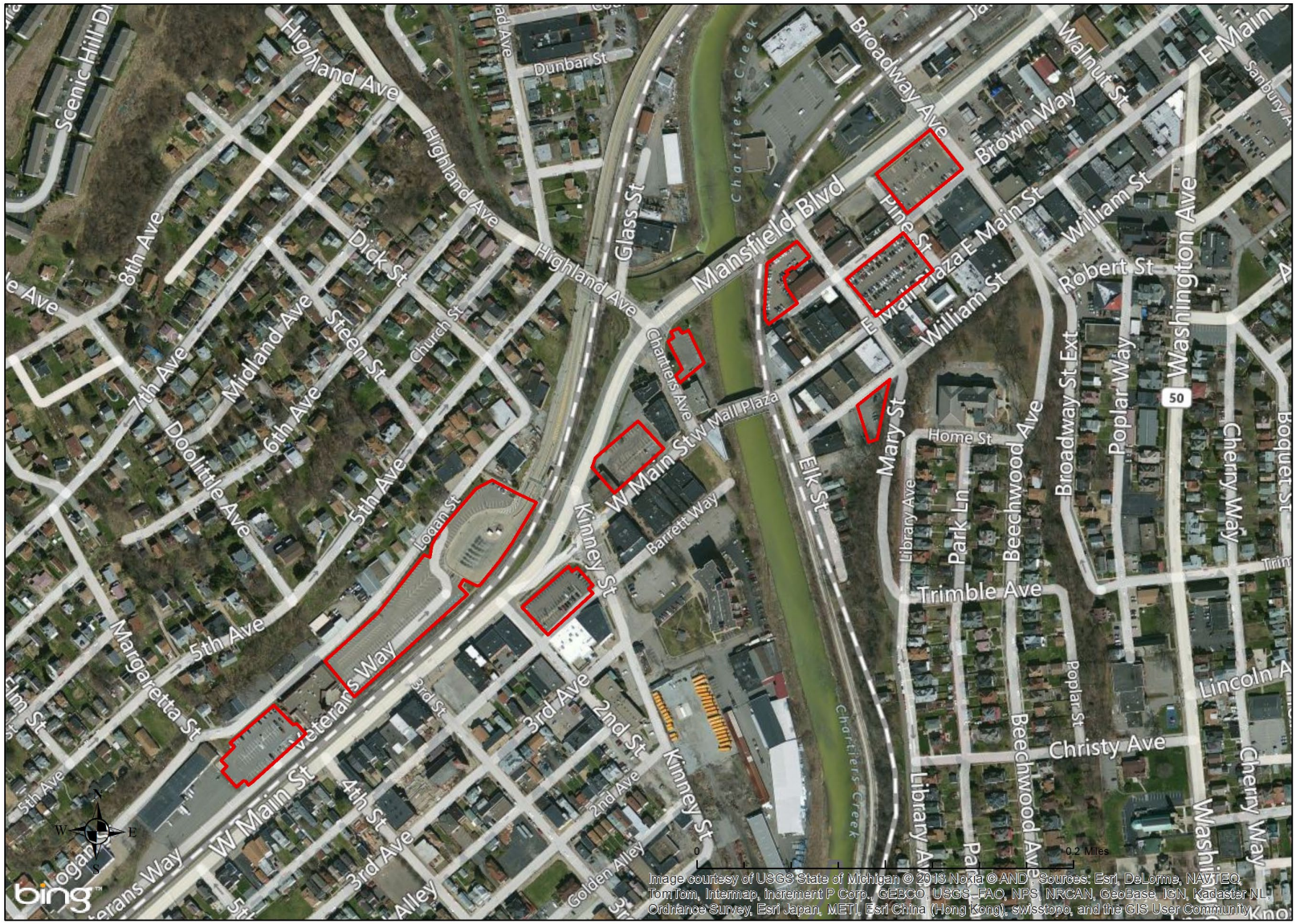
- Adding trees around the perimeter of a site;
- Reconfiguring to add both trees and some planting areas;
- Reconfiguring to add a more significant water capturing feature such as a bioswale; and
- Redesigning to include tree cover, planting areas and permeable paving for maximum water capture.

Carnegie public parking lot along E. Main Street at Walnut Street. Photo: WPC.

◊ Carnegie public parking "Lot 10". Photo: WPC.

Greening the Borough's surface parking lots can add a polished look to the streetscapes and improve nearby property values as well as helping demarcate parking areas. The additional benefits of greening the lots, such as cooling and increasing water capture, will support both property owners and users of the lots.

Carnegie Municipal Parking Lots



Created by: Western Pennsylvania Conservancy, 2013

ROOFTOPS, WALLS AND FENCES

In some communities, rooftops and walls or fences can be an excellent opportunity to add green assets. There is some interest in green roofs in the community, primarily for cost savings, water capture and aesthetic purposes. One green roof is currently being planned for the building that houses Off the Wall Theatre. However, green roofs are a significant investment and are best done when there is great need to replace a roof and when engineering considerations can be readily satisfied. Most opportunities for green roofs and walls exist on private property as well, making it somewhat difficult to use public funds. In a community like Carnegie that is eager to implement green infrastructure, a wise strategy may be to focus on highly visible additions to the public community landscape and then use these assets to generate discussion about additional high impact but less visible options such as green roofs that might eventually involve more private investments.

Bare wall for potential use at the corner of E. Main Street and Chestnut Street. Photo: WPC.

Off the Wall Productions building along Main Street, with potential for a green wall or a green roof.
Photo: Google Street View.

CREEK FRONT

The idea of installing stream access points along Chartiers Creek as it flows through Carnegie was brought up during meetings with Borough officials and Shade Tree Commission members. WPC investigated the feasibility of this idea considering that there are several points where municipal and/or civic-owned land has frontage along the creek. However, several hindering factors suggest that such access locations may not be a high priority for the Borough in the short term.

Over preceding decades acid mine drainage, agricultural and industrial runoff, and sewer overflow made Chartiers Creek one of the most polluted watersheds in Pennsylvania. Although improvements have been made, the watershed remains significantly impaired with excessive levels of PCB and chlordane found in fish tissue samples. In 2001, the US EPA approved a Total Maximum Daily Load (TMDL) guideline for Chartiers Creek, which is a written plan and analysis developed by Pennsylvania DEP to ensure that a water body will attain and maintain water quality standards under the Clean Water Act, which sets a national minimum goal that all surface waters be "fishable" and "swimmable." An information sheet with more details on the Chartiers Creek TMDL can be found in the Appendix. The goals are not readily attainable at this time, and will take considerable additional effort to achieve.

At the same time Combined Sewerage Overflow (CSO) gates along Chartiers Creek in Carnegie create human health risks during overflow events, in which a combination of storm water and raw sewerage is discharged directly into the creek. Finally, the United States Army Corps of Engineers controls activities on the stream bank and is not likely to authorize an access point, particularly as long as there are so many continuing sources of pollution and TMDL is not yet achieved.

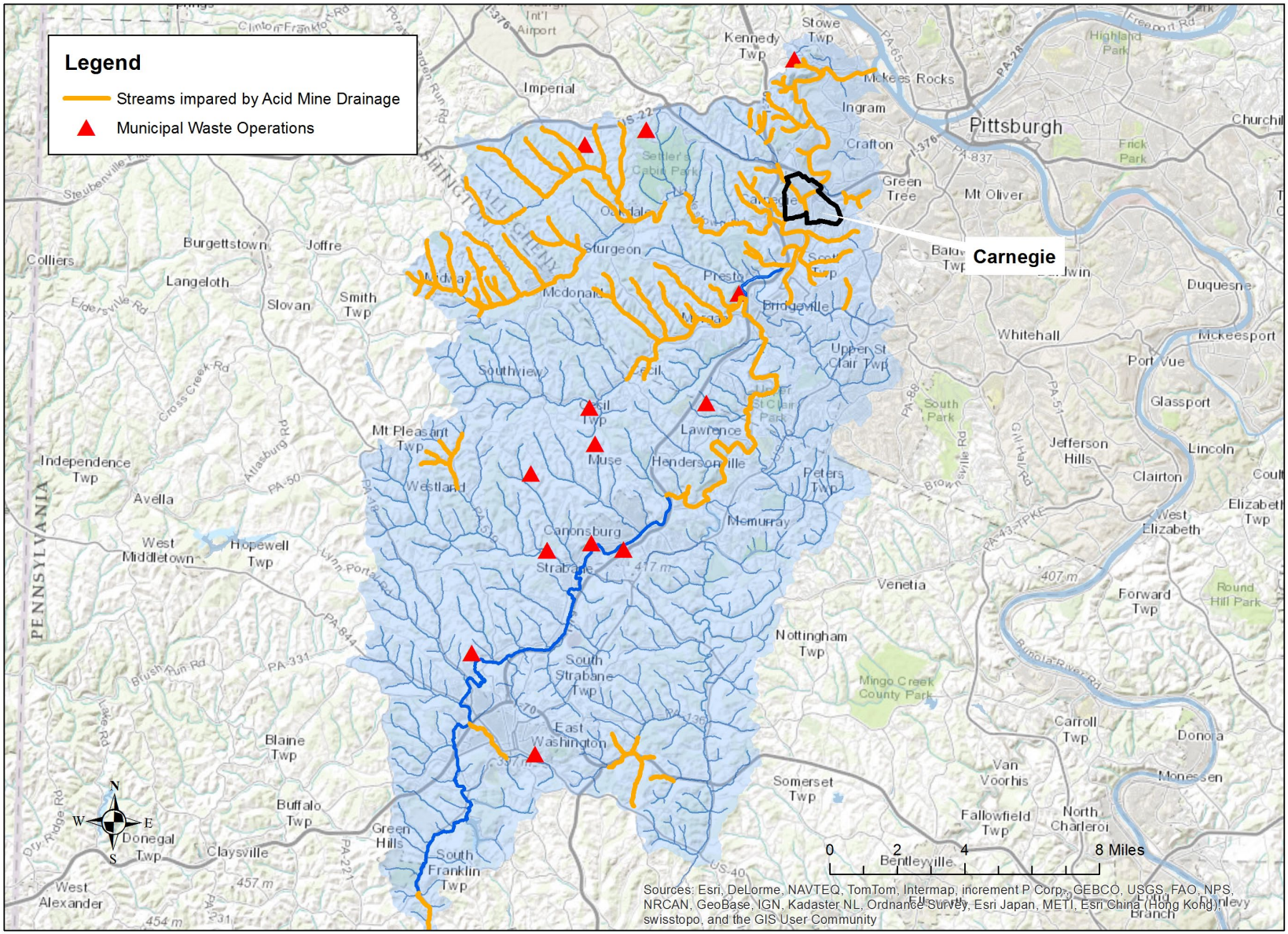
For these reasons public access to the creek front may need to be a future goal once water quality issues are addressed.

Campbells Run along Campbells Run Road
Photo: WPC.

Campbells Run looking upstream where it enters Chartiers Creek.
Photo: WPC.

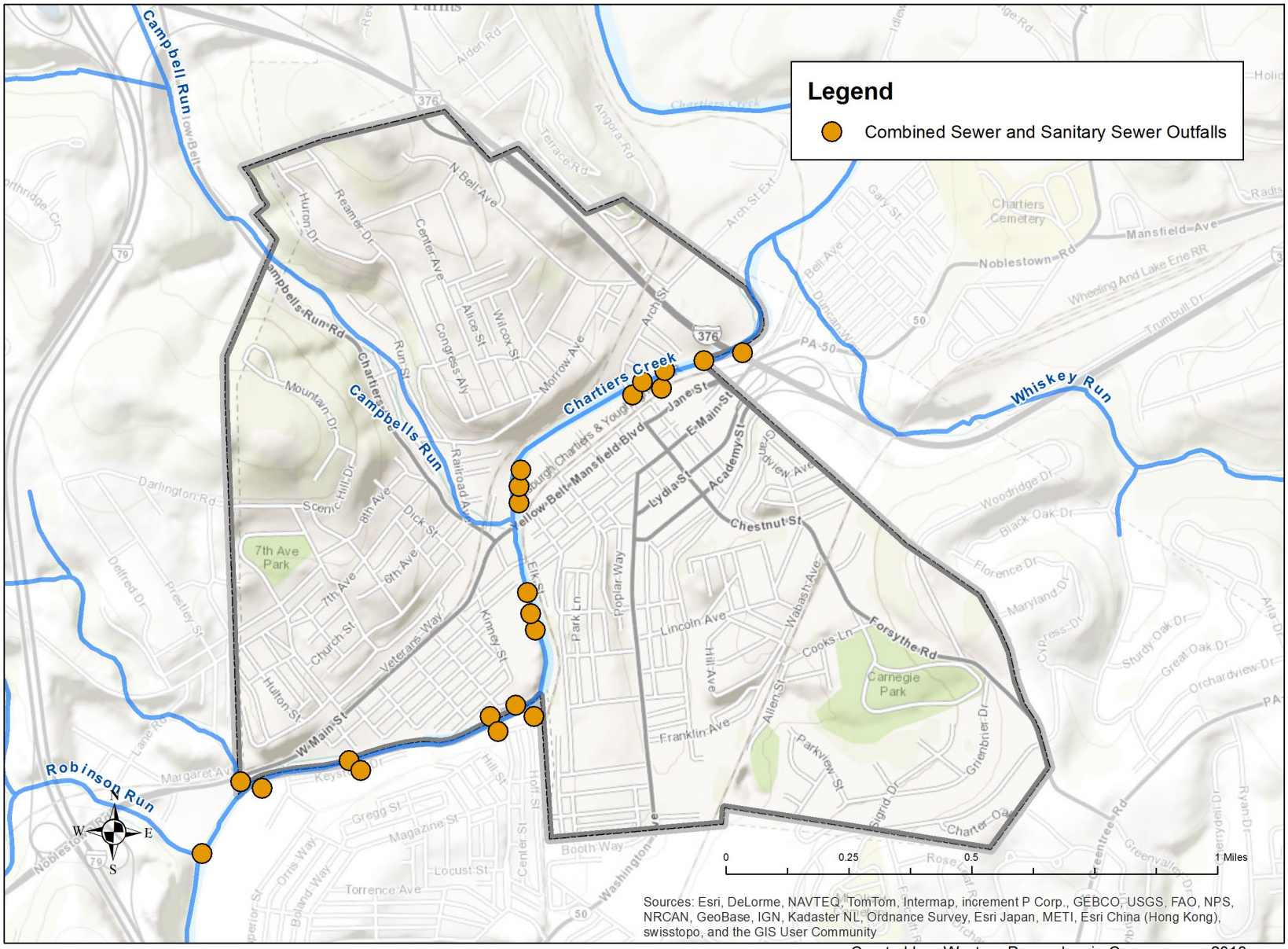
Chartiers Creek CSO gate next to Irishtown Park.
Photo: WPC.

Chartiers Creek Watershed Impairments



Created by: Western Pennsylvania Conservancy, 2013

Combined Sewerage Outfalls Affecting Carnegie



Created by: Western Pennsylvania Conservancy, 2013

VACANT PRIVATE LAND

WPC's analysis of existing green space and opportunities for additional green space identified several opportunities for improving the look of currently unused but privately owned land. A variety of approaches can be used to add value to these spaces using low cost or short-term strategies.

Vacant lot owned by CCDC along W. Main Street and Charities Street. Photo: WPC

Vacant lot at 3rd Avenue and 2nd Street owned by St. Elizabeth Ann Seton Parish. Photo: WPC.

Well maintained greenspace at Ross Colonial Cemetery on Library Street. Photo: WPC.

Various options include simple fencing, simple plantings, or temporary but easy-to-dismantle installations such as modest bioswales or even food gardens. While somewhat more costly to set up, food gardens are ultimately possible to relocate should new development be in the offing. Studies show that simple greening of these sorts can have positive impact on adjacent property values, perception of the space and community engagement. In addition, water capture can be increased and aesthetic impact can be improved.

Simple cost estimates for these approaches include the following:

Type of Improvement	Installation Cost	Annual caretaking
Clean and Green with fence	$3 to $5 per linear foot	$0.05 per linear foot
Low construction bioswales	$10-$20 per sq. foot	Volunteer mowing or weeding for 20 weeks per year
Simple plantings	$3 to $10 per linear foot	Volunteer weeding 2 hours/ wk. for 20 weeks/year

TRAILS

The opportunity to connect Carnegie to the regional rails-to-trail network was explored as part of this Green Scan. Currently, the closest trail connection to Carnegie is the Panhandle Trail, which runs for 29 miles from Weirton, West Virginia to Collier Township, roughly two miles from the boundary with Carnegie, along an abandoned Panhandle Division of the Pennsylvania Railroad. The Panhandle Trail currently links with the Montour Trail, which provides access to the Ohio River near Coraopolis Trail and also to the Great Allegheny Passage in McKeesport. As the maps below indicate, connecting the Panhandle Trail from its current terminus into Carnegie would link the borough to this network of trails. The Pittsburgh and Ohio Central Railroad currently operates the active section of the Panhandle Division beginning at the Panhandle Trail's eastern terminus in Collier Township to the Ohio River in McKees Rocks. This section is still used, albeit not very often.

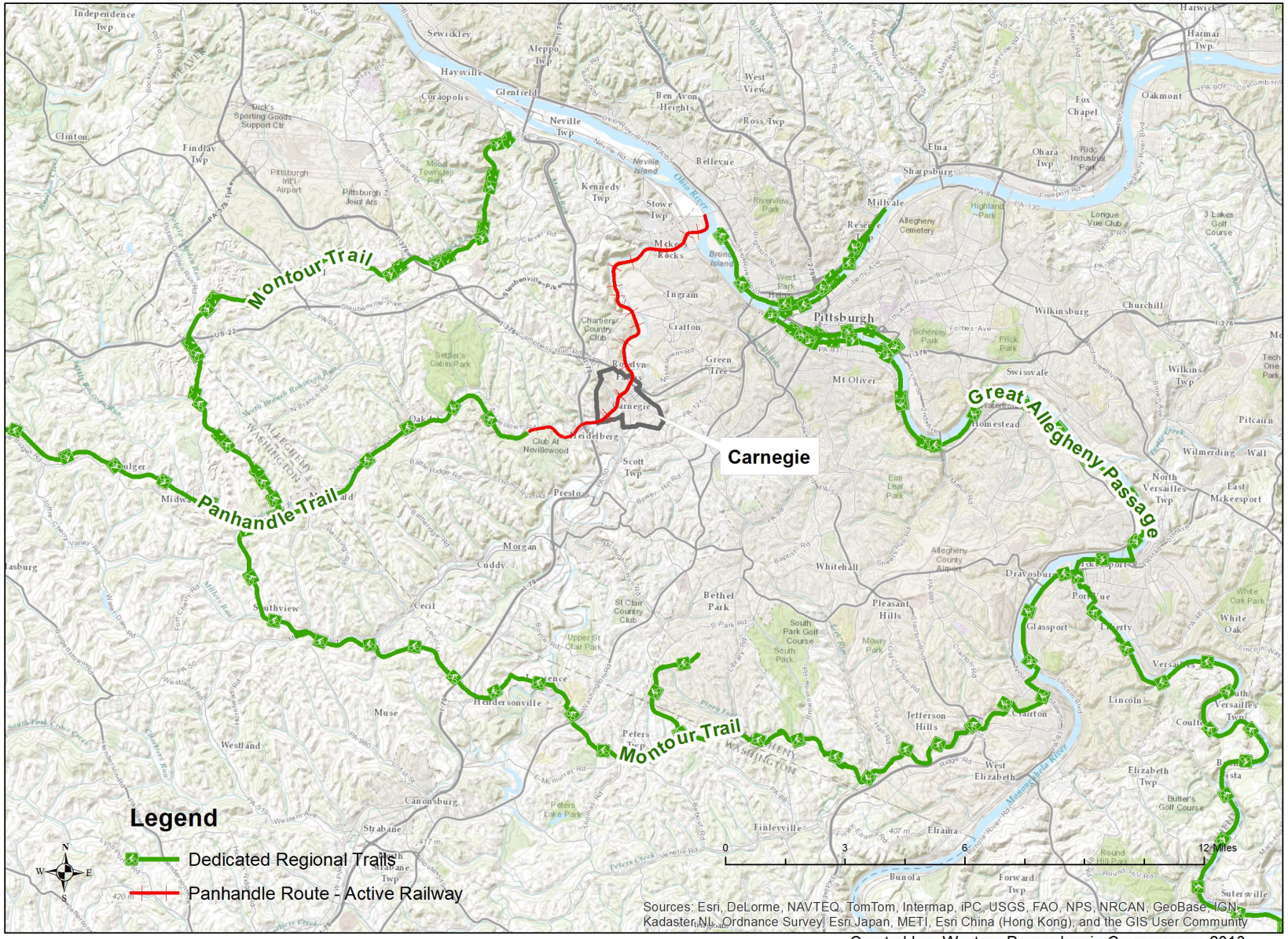
Borough officials have indicated that the railroad is not willing to abandon the section of the line from Collier into Carnegie at this point. Despite funds available for efforts to create Rails-to-Trails, this may not be a priority option at this point in time because of unwillingness of the railroad to abandon the section of the railway for a trail. However, it is important to maintain discussions with the railroad so they know there is interest by the community. Given the high value of trails to communities, the Borough may wish to invest some energy in encouraging neighboring municipalities, most notably Collier Township, to partner in an effort to extend the Panhandle Trail into Carnegie. Since this section of railway is not often used, it may be acceptable to the railroad operator to locate a trail adjacent to the active railway without much conflict with rail traffic.

Montour Trail from the McDonald viaduct.
Photo: onyxlee.

Panhandle Trail that runs from Weirton, WV to Collier Township, PA. Photo: Collier Friends of the Panhandle Trail.

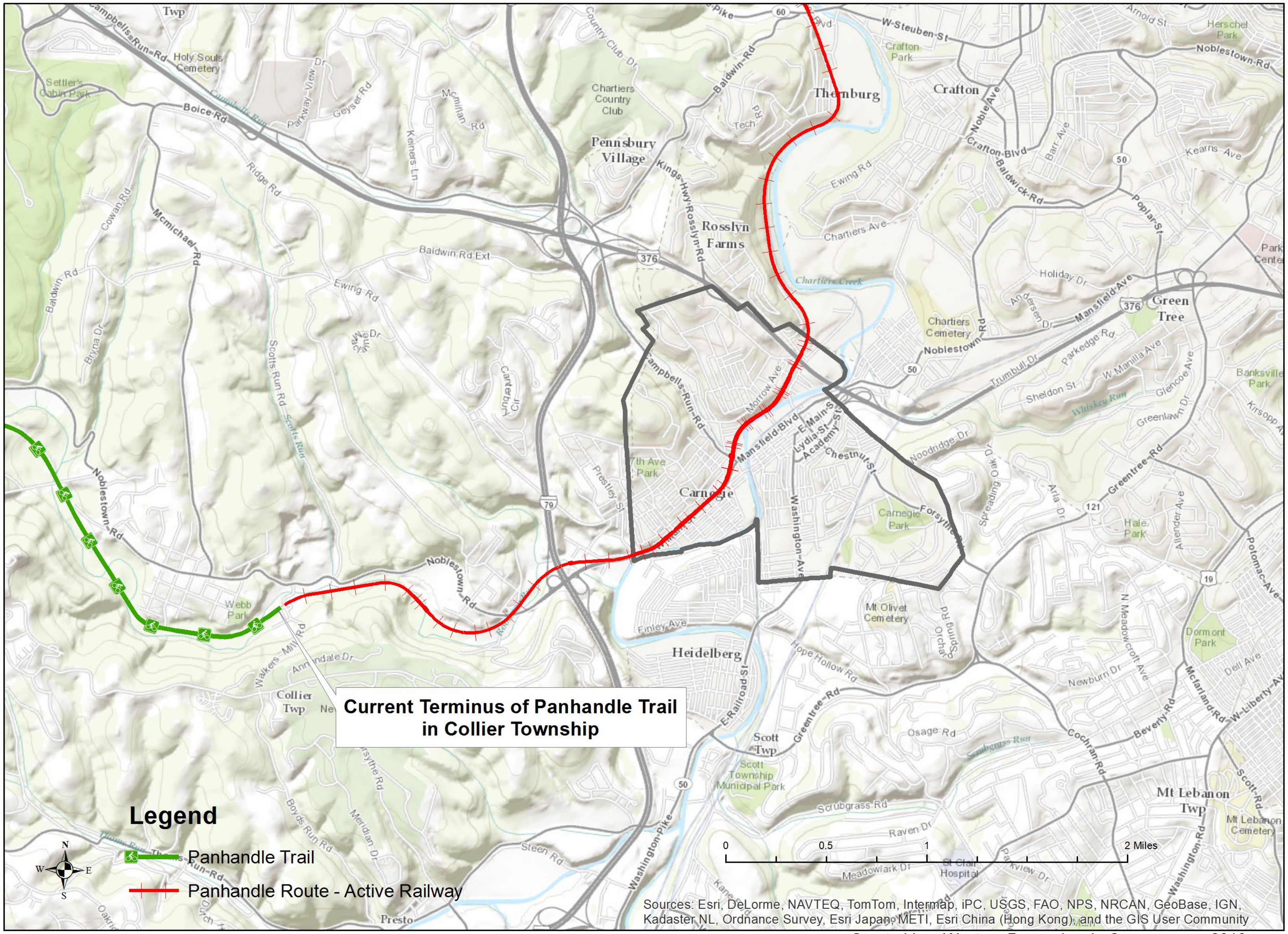
Seldom-used railroad that runs in front of the Carnegie Borough building along Main Street.
Photo: WPC.

Regional Trail Map



Created by: Western Pennsylvania Conservancy, 2013

Potential Rails-to-Trails Connection to Panhandle Trail



Created by: Western Pennsylvania Conservancy, 2013

SECTION FIVE: BEST OPPORTUNITIES AND RECOMMENDATIONS

ACTION OPTIONS SUMMARY

The Borough of Carnegie is poised to make visible and valuable green infrastructure improvements that should lend support to its ongoing efforts to revitalize the Main Street district, to address flooding threats, and improve the overall quality of life for its residents. This green scan identified a range of possible actions and ranked them by their cost, the level of effort required from the community, the time it may take to launch the project, and various types of projects by location or strategy.

The various location and types of project include:

- Parks and public green space;
- Civic green space (Carnegie Library in particular);
- Street trees;
- Greener parking lots;
- Private land.

The green scan reviewed available public park and greenspace and found that a significant number of Borough residents do not have ready access to existing parks. The **parks** themselves offer some excellent opportunities for adding green elements, particularly shade trees at the lower-cost end and bioswales (at a somewhat greater level of cost and effort) to capture and hold storm water. Some additional usable greenspace could be captured by adding elements to the current **welcome gardens** in the Borough. Adding additional flower beds or trees and shrubs to the open space surrounding the existing flower beds could increase the visual and environmental impact of these sites and possibly provide a location for some enjoyable seating or walking paths. In terms of adding green space, however, the relatively scarce amount of open land owned by the Borough will make adding new parks difficult, as well as cost-prohibitive.

A strategy that fills two needs is to add green assets to the **grounds of the Carnegie Free Library**. The Library has a physical and cultural location at the heart of the Borough and, improving the landscaping would round out the extraordinary recent effort to refurbish the handsome Library and theater building in the past few years. More welcoming and multi-purpose grounds, better connected to downtown, and amenities that would encourage use of the grounds for Library and theater patrons would be enhancements that benefit many different constituencies.

Street trees can enhance both the business and residential areas of the Borough. While the total number of possible trees would add up to a significant amount, this type of greening can be phased in over time and the Borough has already built a partnership with TreeVitalize, a Conservancy-managed program that can help defray the costs.

Some of the more dramatic and high impact changes would be related to greening existing **public parking lots.** Both Lot 10 downtown and the Borough building parking lot offer highly visible locations to make a dramatic visual and, potentially, environmental impact. On the lower cost end of the spectrum, simply adding trees and plantings around the lots would change how both locations are perceived. At the upper end of investment, adding green infrastructure, such as bioswales, permeable paving and water-catching planting strips could significantly ramp up the value of the spaces for storm water management.

Finally, there are some short term relatively low cost efforts that could temporarily enhance several **privately owned lots** until future uses are developed. Such green assets might increase the value of the lots to nearby neighbors and enliven the spaces while the wait for future plans to unfold. In particular the CCDC lot downtown is an important one to animate since it currently creates a "hole" in the downtown streetscape.

The following table illustrates this array of potential actions. A map locating these most promising greening projects follows. The remainder of this section details actions, costs, and factors such as good partners, funding sources and sustainability for each idea.

Students add greenery to their school at Pittsburgh SciTech. Photo: WPC.

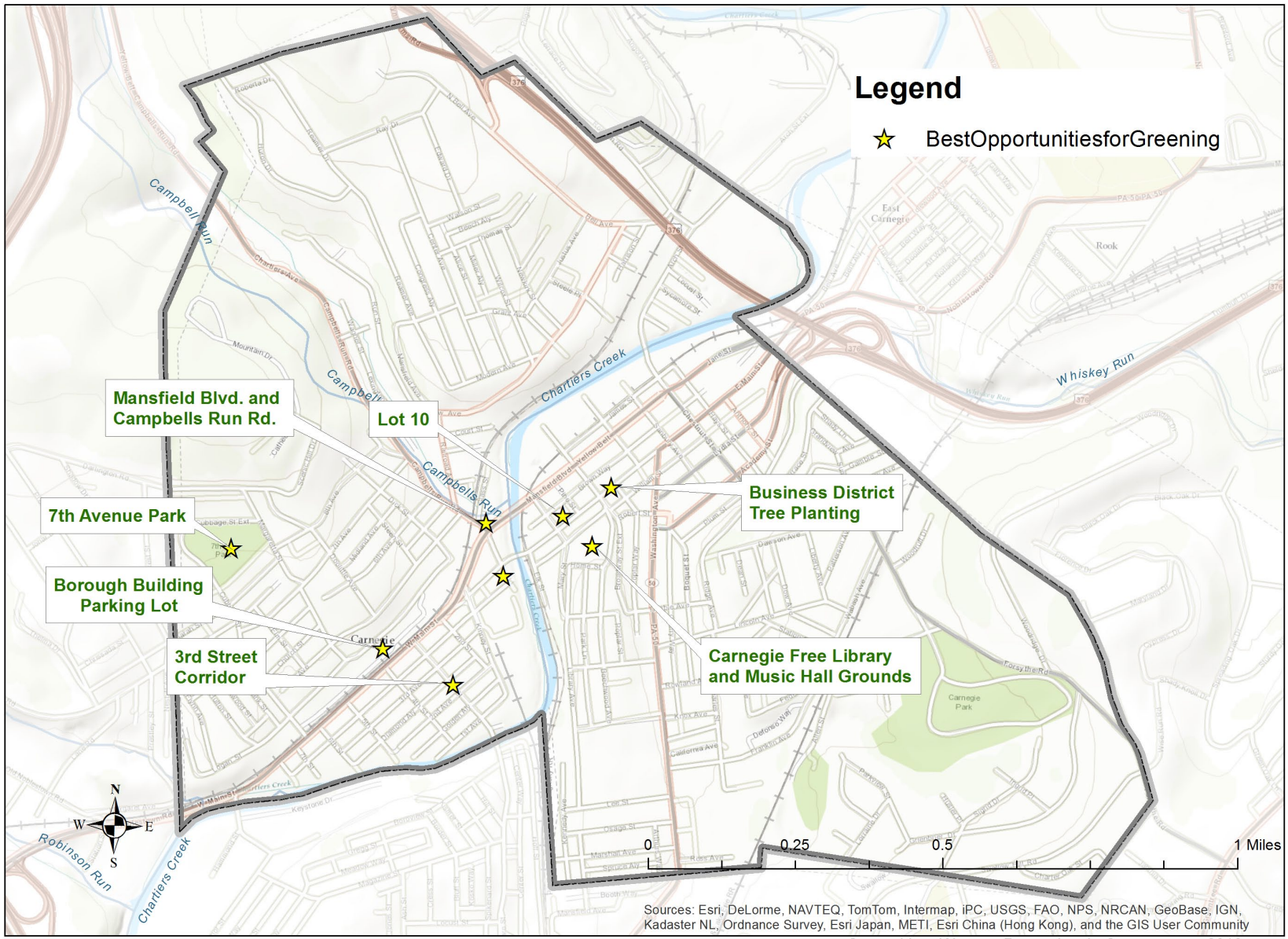
A note on contingency costs: When estimating the cost for a project, there is always uncertainty as to the precise content of the materials in the estimate, how the work will be performed, or existing conditions that may be hidden from plain view. To compensate for these potential unknowns, it is important to factor a cost contingency into any major project budget to ensure that adequate resources are available to cover the unexpected. Some examples of unknown factors that may add to project costs are unknown subsurface utility issues, scheduling delays, lack of bidding competition or unanticipated market conditions. To be safe, it is recommended that between a contingency cost of between 10% and 25% be added to any project budget. More complicated project or projects that are in early conceptual phases should be assigned a higher contingency cost.

A note on compliance with 1990 Americans with Disabilities Act (ADA): Many projects, especially those funded by public funding sources or that are on public property, will require compliance with the 1990 Americans with Disabilities Act (ADA) and the 2010 ADA Standards for Accessible Design. It is important that any design or engineering drawings and all cost estimates factor in design components to ensure ADA compliance. This Green Scan provides some basic information and rough cost estimates for design components that may be required for each green enhancement to ensure ADA compliance. Project managers, engineers, and landscape architects working on project implementation should refer to the 2010 ADA Standards for Accessible Design (http://www.ada.gov/2010ADAstandards_index.htm) to ensure compliance.

Community members plant a gateway garden in Oil City. Photo: WPC.

Penn Hills residents build raised beds for a community vegetable garden. Photo: WPC.

Recommended Best Opportunities for Greening



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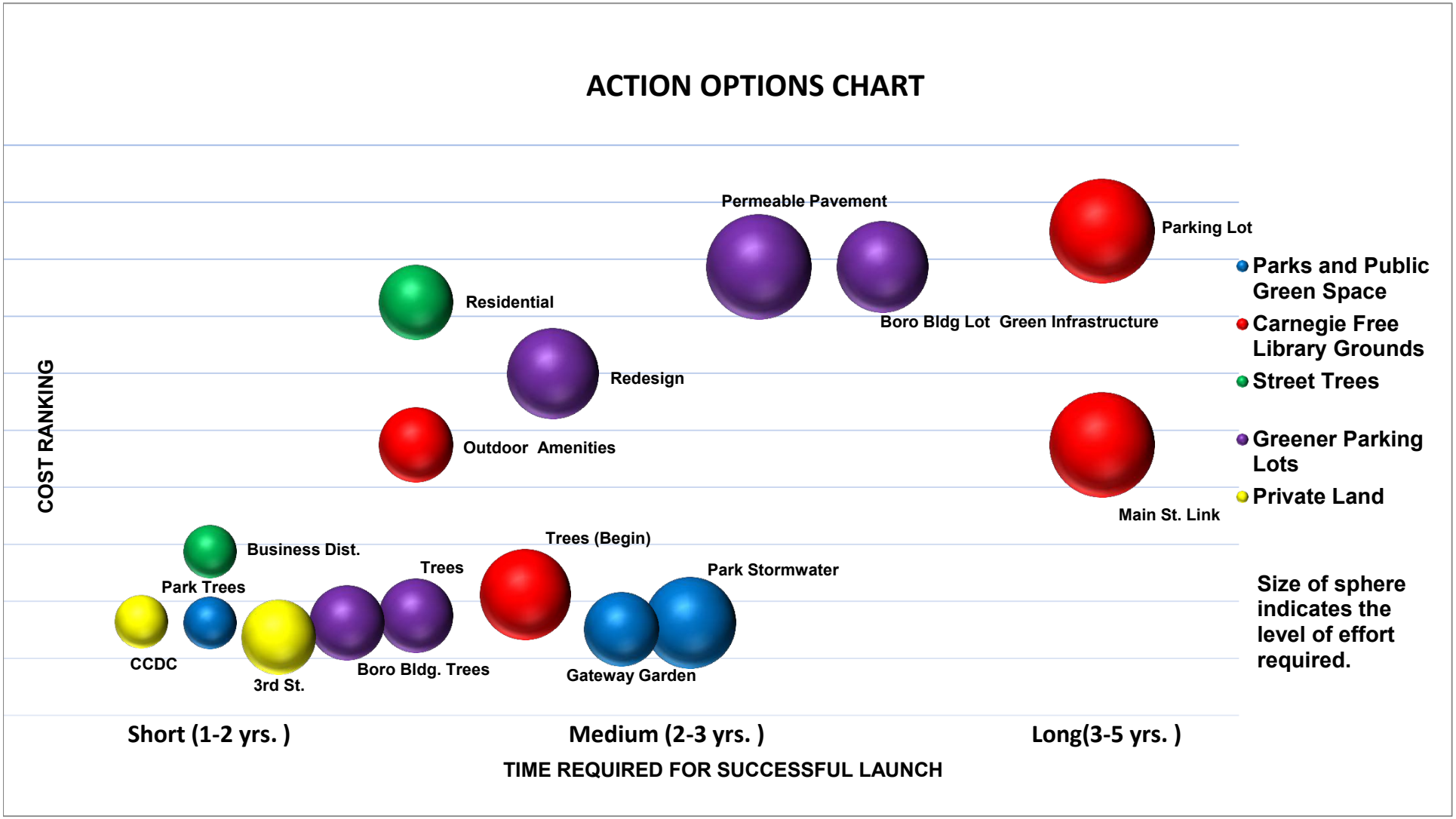

ACTION OPTIONS CHART
COST RANKING
Permeable Pavement
Parking Lot
Residential
Boro Bldg Lot
Green Infrastructure
Redesign
Outdoor Amenities
Main St. Link
Business Dist.
Park Trees
Trees
Trees (Begin)
Park Stormwater
CCDC
3rd St.
Boro Bldg. Trees
Gateway Garden
Parks and Public Green Space
Carnegie Free Library Grounds
Street Trees
Greener Parking Lots
Private Land
Size of sphere indicates the level of effort required.
Short (1-2 yrs.)
Medium (2-3 yrs.)
Long(3-5 yrs.)
TIME REQUIRED FOR SUCCESSFUL LAUNCH

Carnegie Greening Recommendations

	Cost	Level of Effort	Time Required for Successful Launch
		1 = Low 2= Medium 3= Med. High 4 = High	Years
PARKS AND PUBLIC GREENSPACE			
7th Ave Park Trees	$10-$15K	1	1
7th Ave Park Stormwater	$10 - $15K	3	1 to 3
Gateway Garden	$10 -$15	2	1 to 3
CARNEGIE FREE LIBRARY GROUNDS			
Trees	$50-$100K	2	1 to 4
Outdoor Amenities	$5 -$40K	3	2 to 4
Parking Lot	$100 -$200K	4	4
Main St. Link	$50 -$100K	4	4
STREET TREES			
Residential	$50 - $200K	2	1 to 3
Business Dist.	$25 -$50K	1	1
GREENER PARKING LOTS			
Trees	$10-20K	2	1 to 2
Redesign	$100K	3	3
Permeable Pavement	$100-$175K	4	2 to 3
Boro Bldg. Trees	$10-$15K	2	1 to 2
Boro Bldg. Lot Green Infra.	$75-200K	3	3 to 4
PRIVATE LAND			
3rd St.	$ 5 - $10K	2	1 to 2
CCDC	$5 to$20K	1	1

PARKS AND PUBLIC GREEN SPACE

Action 1: Seventh Avenue Park—Tree planting

Seventh Avenue Park provides multiple opportunities to add greenery and green infrastructure. The relatively large and undeveloped land at the park offers recreational opportunity but little in the way of shade and visual beauty. Trees would make a significant contribution to both needs and would provide valuable water capture as well. The Shade Tree Commission has already flagged this area for future trees and planting sites for 25 additional trees have been identified.


7th Avenue Park, Carnegie. Photo: WPC.

Costs: $200 per tree, $250 per open site tree hole, $105 per tree for 3 years of maintenance = $13,875

Effort: The 25 potential sites in the 7th Ave Park have been submitted to the TreeVitalize program for consideration. A TreeVitalize forester will conduct official tree site assessments to determine the suitability for trees at a given site. If a site is determined suitable for a tree, the forester will select a tree species. The suitable sites will be forwarded to the Borough of Carnegie for final approval. Upon final approval, tree site preparation will commence and volunteers will be organized for planting the trees. The maintenance of the trees will be the responsibility of the Borough of Carnegie. A cost of $35 per tree per year is a good estimate of maintenance costs per tree. The most significant effort will be for organizing tree planting day, Tree Tender support for the first three years and then annual care by the Borough each year.

Good Partners: Western Pennsylvania Conservancy, Tree Pittsburgh for Tree Tender training, DCNR

Possible Funding Sources: TreeVitalize, "Friends of the Park" group. Neighbors, sports groups, local businesses and others may be willing to support a "Friends of the Park" planting fund for future tree planting and care.

Trees: $200 to $450 each	
25 trees:	$11,250
+ 3 years care:	$2,625
Total:	$13,875

Sustainability: Maintenance is a crucial element to the successful establishment and long-term survival of trees. Initially, a 3 year maintenance plan including watering, mulching, training pruning at year two, and weeding is crucial for the trees establishment. After year three, the trees should be better able to survive on their own and will require less maintenance. There are events that can't be controlled and trees might need to be replaced. Examples of this include branches being torn by people, trees damaged by vehicles, over-salting, insect or disease, etc. As trees are replaced it is important to remember the 3 year maintenance period.

Action 2: Seventh Avenue Park—Storm Water Management Devices

Seventh Avenue Park has enough space to accommodate one or more bioswales, depressions in the ground designed to capture and hold rain water briefly to slow flooding or overflowing of storm water into sewer lines. While each bioswale must be uniquely sited and designed for maximal effectiveness, there are some general guidelines for planning such green infrastructure.

Simple Bioswale:

$10 to $20/ sq. ft.

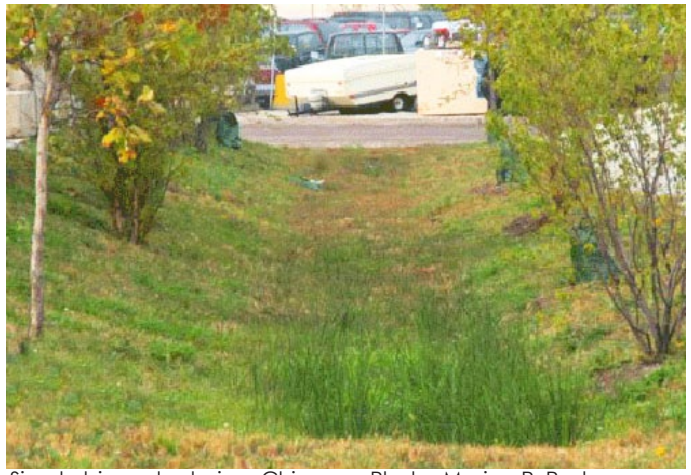
Engineered Bioswale:

$20 to $30/ sq. ft.

Costs: $10 to $30 per square foot. For a site 4' x 50', for engineering, design and construction might cost on the order of $2,000 for a simple design or $6,000 for a more sophisticated structure. A bioswale of 3,300 square feet at a cost of $18 per square foot can capture and hold up to 1,046 gallons per rain event or more than the first 1" of a storm event. (WPC installed such a bioswale in Millvale in 2013.) Capturing the first 1" will prevent storm water from overflowing into the sewer system and then into the river or stream.

Effort: It will take moderate effort to add bioswales to the parks of Carnegie. The borough will need to review its options, commission some basic designs and seek funding for this purpose. Multiple bioswales could be done in succession to reduce the amount of design and fundraising needed at any one time.

Good Partners: Western Pennsylvania Conservancy, DCNR, Rain Garden Alliance, Allegheny County Conservation District



Simple bioswale design, Chicago. Photo: Marina R. Post

Possible Funding Sources: DCNR C2P2 grants, "Friends of the Park" group. Neighbors, sports groups, local businesses and others may be willing to support a "Friends of the Park" planting fund for future tree planting and care and special installations like bioswales. ALCOSAN may be interested in water capture projects; the Allegheny Conservation District sometimes has small grants that could support early steps of a project.

Sustainability: New bioswales will need varying types of care depending on their design. Simple grassed bioswales will just need to be mowed on a regular schedule. More complex bioswales will need a skilled team of volunteers to weed and monitor plants for health and condition. Every several years perennial plants may need to be divided for optimal health. This work could be done by either Borough staff or volunteer crews.

Action 3: Mansfield Boulevard and Campbells Run Road—Upgrade of Gateway Garden

A number of options are available for additional green accents at the existing gateway garden at Mansfield Boulevard and Campbells Run Road. This space contains parcels owned by the Borough and Allegheny County and is in the public right of way.

Option One: Additional Tree Plantings—10 Trees along Mansfield Boulevard near Chestnut Street

Costs: $200 per tree, $250 per open site, $105 per tree for 3 years of maintenance = $5,550

Effort: The 10 potential sites on Mansfield Blvd. have been submitted to the TreeVitalize program for consideration. A TreeVitalize forester will conduct official tree site assessments to determine the suitability for trees at a given site. If a site is determined suitable for a tree, the forester will select a tree species. The suitable sites will be forwarded to the Borough of Carnegie for final approval. Upon final approval, tree site preparation will commence and volunteers will be organized for planting the trees. Three years of care will be needed to help the trees get established; this care can be provided by Tree Tenders or other volunteers. The long term maintenance of the trees will be the responsibility of the Borough of Carnegie. A cost of $35 per tree per year is a good estimate of maintenance costs per tree.

Trees:	$200 to $450 each
10 Trees:	$4,500
+ 3 yrs. Care:	$1,050
Total:	$5,500

Good Partners: TreeVitalize; Carnegie Shade Tree Commission and volunteer Tree Tenders

Possible Funding Sources: TreeVitalize

Sustainability: Maintenance is a crucial element to the successful establishment and long-term survival of trees. Initially, a 3 year maintenance plan including watering, mulching, training pruning at year two, and weeding is crucial for the trees establishment. After year three, the trees should be better able to survive on their own and will require less maintenance. There are events that can't be controlled and trees might need to be replaced. Examples of this include branches being torn by people, trees damaged by vehicles, over-salting, insect or disease, etc. As trees are replaced it is important to remember the 3 year maintenance period.

WPC garden at Mansfield Boulevard and Campbells Run Road with the previous sign style. Photo: WPC.

Option Two: Additional Flower Gardens

For a more dramatic planted area at this site, and to potentially add an area that would be pleasant for sitting, additional flower beds could be added. The costs and considerations are listed below.

Costs: $28 to $57 per square foot of bed, including construction of the bed, added soil, and mulch. Water systems typically add $1,000 to $3,000 a site. The cost of perennials would add about $50 for 100 square feet of bed; annuals would run $35 to 50 per year for the same space. Annual water costs are on the order of $140 per season per bed.

New Bed: $28/ sq. ft.

Water System: $1-3,000

Perennials: $50/ 100 sq. ft.

Annuals: $35 to $50/ year

Watering: $140/ year

For 200 sq. ft. bed: $8,900

Effort: Adding to a gateway garden site will take several types of effort: community consensus on the site's appearance; coordination of a design process; raising installation costs and raising annual caretaking support in the form of new financial sponsors to be recognized on the sign at the site.

Good Partners: Western PA Conservancy; local businesses; Borough; Carnegie service groups or students

Possible Funding Sources: Local or regional sponsors

Sustainability: Flower gardens supported by the Conservancy require a minimum of 2 hours per week for the 20 weeks of the growing season. In addition, a few hours of time are needed for early spring perennial care and fall pull-outs of any annual flowers. Costs for the caretaking should be minimal including grass cutting every 2 to 3 weeks during the summer plus mulch every other year for perennial beds.

Volunteers plant flowers in spring at Mansfield Boulevard and Campbells Run Road garden. Photo: WPC.

CIVIC SPACES: CARNEGIE FREE LIBRARY GROUNDS

The Andrew Carnegie Free Library and Music Hall (the "Library") is central to the Borough both as a symbol of the community and in its location. The Library's programs serve a diverse cross section of the local community. It attracts visitors from near and far; sometimes in large crowds of over 400 at Music Hall performances. The Library is fortunate to be set at the top of a wooded hillside overlooking the Business District. Elements of the landscaping plan that was created for the grounds in 2011 could be implemented to create a more sustainable tree population, to enhance the parking lot surrounding the building, to extend the Library's programs into an attractive outdoor space, and to create a more attractive and greener connection with the Business District. These elements will be treated as a whole, with some specific costs defined for some of the distinct variations on the plan.

Carnegie Free Library of Carnegie. Photo: Carnegie Library.

The analysis of existing greenspace access for Carnegie residents indicates a large space near the center of the Borough without ready availability of a park or formal greenspace. The analysis of public or civic space identified the Library as a central location that, given its mandate and current purpose, could potentially help fill this void by enhancing its grounds and adding elements that would allow the Library landscape to offer citizens several types of green assets. Among these might be quiet sitting and reading areas outdoors, a children's natural play space, a walking path, and potentially a connecting walk that would allow visitors to walk from downtown to the Library up the hillside. The space could also accommodate a significant bioswale to capture runoff from the Library roof or driveway, and greener parking areas to absorb more rainwater and prevent erosion. The Library has already done fairly extensive preliminary design work on many of these elements and for an additional investment the Borough and the Library could see not only completion of the overall building and grounds restoration, but some added and significantly beneficial green assets for the community.

The full Landscaping Plan is provided in the appendices. (see 2011 Landscaping plan)

Action 1: Additional Trees, Tree Maintenance

Costs: A quick review of the existing landscaping plan and visual assessment of existing trees suggests that the current tree population needs to be maintained and supplemented to counter the natural progression of age and decline of some existing trees. It appears that the site could accommodate an additional 104 trees at a cost of $200 per tree, $250 per open site tree hole, $105 per tree for 3 years of maintenance ($35 per tree per year) for a total of $57,720.

Trees:	$200 to $500 each
104 Trees:	$46,800
+ 3 years care:	$10,920
Total:	$57,720

Effort: Upgrading the trees could be done as a part of a complete re-landscaping effort at the Library or separately as an application to a program like TreeVitalize. A forester will need to do a more formal assessment of existing trees to determine potential longevity and to recommend a good mix of supplemental trees to provide a pleasing and healthy mix of types of trees. This effort could also be staged to allow the Library and Borough to manage the planting and fundraising efforts. In addition the Library will need to be prepared to handle basic maintenance and caretaking of new trees for a minimum of 3 years (watering and mulching) to help them get established and off to a healthy start.

Good Partners: Borough of Carnegie, TreeVitalize, friends of the Library, Tree Pittsburgh for Tree Tender training

Possible Funding Sources: TreeVitalize, a friends group interested in the Library grounds, supporters of the theatre who would like to see the grounds be more inviting and usable by performance patrons

Sustainability: The most important element of long-term sustainability is care of new trees. The Library will need to be prepared for short and long-term care of the new trees as well as maintenance for the older trees on the site.

Action 2: Outdoor Reading Area and Children's Amenities

Costs: The Library site offers a wonderful location for several types of outdoor uses. Both a general use outdoor reading area and a children's natural playspace would be ideal uses of Library grounds and encourage patrons and new visitors alike to enjoy the handsome Library grounds. The cost of an outdoor seating area for adults would vary depending on the type of bench and landscaping used. Costs could range from $5,000 to $20,000 for a space that could accommodate 2 to 5 users at a time. A children's play space could also vary in size and complexity from a maze to climbing stumps and stepping stones. A small play space that could accommodate 5 to 10 children at a time could cost from $20,000 to $40,000 depending on specific elements used.

Outdoor reading space: $5-20,000

Natural play space: $20-40,000

Metal Benches: $1,000 to $1,400 each

Effort: This type of addition to the Library grounds will take a two to three month planning and design period, and will require input and guidance from Library staff, members of the public and other appropriate Library partners. Construction should take less than one month although special components such as play elements created from recycled logs might take a longer production period. Ideally this effort would also involve a caretaking group that can do occasional weeding and site care to keep everything safe and welcoming for children and other patrons.

Good Partners: Borough of Carnegie, Western PA Conservancy, friends of the Library.

Possible Funding Sources: TreeVitalize, a friends group interested in the Library grounds, supporters of the theatre who would like to see the grounds be more inviting and usable by performance patrons, parents who would like to have an outdoor playspace for their children, foundations.

Children enjoying their natural playspace at Pittsburgh Roosevelt Elementary. Photo: WPC.

Sustainability: The most important element of long-term sustainability is occasional care of new plants and seating. Volunteers could handle the level of plant care or even weather-proofing of seating or other items as needed very three years.


Students reading in their outdoor quiet space at Pittsburgh Morrow Elementary.
Photo: WPC.

Action 3: Parking Lot Greening

The Library currently has about 50 spaces around its upper perimeter for visitors to use. Given the location at the top of a steep hill and the opportunity to upgrade the grounds of the Library, the parking areas are a prime concern. Given their visibility and proximity to the entrance to the Library, these spaces are one of the first things that patrons notice as they approach, whether by car or on foot.

Costs: The Library can opt for a variety of "greener" parking design ranging from modest reconfiguration and planting areas to fully permeable pavement, bioswales and planted buffers. The cost of these efforts could therefore range significantly based on the chosen materials, amount of engineering and square footage of space involved. Costs could range from $1.75 to $15.00 per square foot. At roughly 7,650 square feet for 50 spaces, costs might be in the range of $135,000 for a more full-scale treatment.

Effort: This type of addition to the Library grounds will take a two to three month planning and design period, and will require input and guidance from Library staff, members of the public and other appropriate Library partners. Construction could take six months to a year depending on the complexity of the design. The overall caretaking of the parking area should be incorporated into the Library's routine maintenance plan. Green design could add some modest costs to caretaking such as a vacuum cleaning every two years for some types of permeable paving—up to $400 to $500/year for vacuum sweeping of a half-acre parking lot.

Design:	$20,000
Construction:	$114,750
Annual care:	$150
Total:	$135,000 + care

Good Partners: Borough of Carnegie, Western PA Conservancy, friends of the Library, local foundations interested in the Library.

Possible Funding Sources: TreeVitalize, a friends group interested in the Library grounds, supporters of the theatre who would like to see the grounds and parking area be more inviting and usable by performance patrons; foundations with an interest in green infrastructure; PennVest.

Sustainability: Long-term sustainability of greener parking would involve occasional care of new plants, which could be provided by volunteers, and ongoing care for new paving systems by Library maintenance staff.

Action 4: Storm Water Management for Parking Lot, Possibly the Library Roof

The Library landscape redesign could also include some specific green infrastructure for storm water capture, from both the parking lot and potentially the large roof of the building. The runoff could be directed into a bioswale that could direct and slow the water to allow absorption before it reaches Carnegie's main street area or the region's creeks and storm drains.

Bioswale: $20 to $30 per sq. foot

Costs: Bioswale costs depend on the complexity of the structure, whether there is monitoring involved and the specific features of the site. Given the slopes at the Library site bioswales in this area may be in the moderate to costly range, from $ 20 to $30 per square foot.

Effort: This type of addition to the Library grounds will take a several month planning and design period, and will require input and guidance from Library staff, the Borough and its engineers, and key partners. Construction could take six months to a year depending on the complexity of the design. The overall caretaking of the designed space should be incorporated into the Library's routine maintenance plan. Plants may need a modest amount of caretaking and monitoring equipment may need to be maintained.

Good Partners: Borough of Carnegie, Western PA Conservancy, friends of the Library, local foundations, ALCOSAN

Bioswale implemented in Millvale by WPC in 2013. Photo: WPC.

Possible Funding Sources: TreeVitalize, a friends group interested in the Library grounds, foundations interested in storm water management, ALCOSAN, PennVest

Sustainability: Long-term sustainability of green infrastructure would involve occasional care of bioswale structures, new plants, and monitoring equipment, most of which could be provided by volunteers.

Action 5: Better Linkage to Main Street

The Library is a key and central institution for the Borough, but it is not readily visible from the business district except for certain vantage points. Because the land surrounding the access to the Library is on the one side steeply sloped and on the other side public land but narrowly situated between two roads, some creative design is needed to improve connectivity between the Library grounds and the downtown area. A variety of options exist including walking paths, plantings, constructed elements such as planters or benches and stairs. All of these elements will require a significant design process and careful guidance to ensure an outcome that honors the history and style of the Library but also connects this eminent building to the heart of downtown. Green plantings can enhance whatever built elements are chosen, whether planters to mark the way and connect to the Main street planters, or hanging baskets that lead people the hill to the Library or a tree colonnade that provides a fitting approach to the Library grounds.

Entrance to Carnegie Library from Beechwood Avenue. Photo: WPC.

Costs: The costs of this enhancement will vary tremendously depending on the design elements selected. Trees will cost between $250 and $500 each; planters between $200 and $500 each for set up and $100 each per year; a natural pathway could include plantings and cost $26 to $30 per square foot. If large trees are used, the cost of plantings will increase by about $1.30 per square foot.

Effort: This type of addition to the Library grounds will take several months of planning and design and require input and guidance from Library staff, the Borough and its engineers, members of the public and other appropriate community partners. Construction could take six months to a year depending on the complexity of the design. The overall caretaking redesigned area should be incorporated into the Library's routine maintenance plan. Costs should be minimal unless a pedestrian pathway adds snow removal needs or other care to current routines.

Trees: $200 to $500 each

Planters: $200 to $500 each

+ Annuals: $100 each year

Path: $26 to $30 per sq. ft.

Good Partners: Borough of Carnegie, Western PA Conservancy, friends of the Library, local foundations interested in the Library, artists groups.

Possible Funding Sources: TreeVitalize, a friends group interested in the Library grounds, supporters of the theatre who would like to see greater access to the grounds from Main Street for patrons, foundations interested in literacy, library history and public art.

Sustainability: Long-term sustainability of a new access connection would involve occasional care of new plants, which could be provided by volunteers, and ongoing care for new paving systems by the Borough or Library maintenance staff.

STREET TREES

Residential Areas

There is considerable potential for adding greenery to the streets of Carnegie residential neighborhoods. A street by street inventory completed by the Borough's Shade Tree Commission and a Urban Tree Canopy Analysis completed by Allegheny County can help identify the best locations and highest need locations for specific trees. Upon review of these two tree analyses, the project forester believes that 300 new trees could

Residential streets in Carnegie lacking street trees. Photo: WPC.

be sited in Carnegie's residential areas. Additionally, to ensure proper placement of trees, a more detailed, street by street assessment of planting potential should be conducted.

Costs: $200 per tree, $475 per tree pit, $105 per tree for 3 years of maintenance = $42,120 for 54 trees. For long-term care, a cost of $35 per tree per year is a good estimate of annual maintenance costs per tree. It is important that these costs can be spread over years as Carnegie works to increase the urban forest in the most beneficial and neediest areas. A good cyclical tree care plan will also spread out the costs of short and long-term tree care for the Borough.

Trees:	$200 each
Tree Pits:	$475 each
300 Trees:	$202,500
+ 3 years care:	$31,500
Total:	$234,000

Effort: The 300 potential sites in the residential neighborhoods can be submitted to the TreeVitalize program for consideration. A TreeVitalize Forester will conduct official tree site assessments to determine the suitability for trees at a given site. If a site is determined suitable for a tree, the forester will select a tree species. The suitable sites will be forwarded to the Borough of Carnegie for final approval. Upon final approval, tree site preparation will commence and volunteers will be organized for planting the trees. The maintenance of the trees will be the responsibility of the Borough of Carnegie. The Borough will need to organize volunteers to help plant and care for trees as well as anticipate the effort of caring for trees for the long term.

Good Partners: Western Pennsylvania Conservancy, Tree Pittsburgh for Tree Tender training, DCNR, Carnegie Shade Tree Commission, business and building owners, Borough Department of Public Works.

Possible Funding Sources: TreeVitalize; downtown businesses; developers; a Shade Tree Commission "memory fund" or other way for the public to support new trees. It is sometimes possible to begin a matching fund or memory fund that people donate to in order to remember important family or community events. The Shade Tree Commission could begin such a fund and help facilitate tree plantings each year based on the gifts.

Sustainability: Maintenance is a crucial element to the successful establishment and long-term survival of trees. Initially, a 3 year maintenance plan including watering (25 gallons per week through the growing season), mulching, minor pruning at year two to train the tree into the best shape for its location, and weeding are crucial for the trees to become well established. After year three, the trees should be better able to survive on their own and will require less maintenance. The key need will be for occasional watering in times of heavy drought, and routine maintenance pruning. In addition, there are events that can't be controlled and trees might need to be replaced. Examples of this

include branches being torn by people, trees being struck by vehicles, over-salting, insect or disease damage. As trees are replaced it is important to remember the three year maintenance period. The cost of this routine tree care (about $35 per year per tree) needs to be factored into the Borough's plans for the long term.

Business District

One of the simplest and most visible ways to green the business district of Carnegie is to continue to add street trees. A survey of potential sites has been done in partnership with TreeVitalize. The survey identified potential locations for an additional 54 street trees in the business district.

Costs: $200 per tree, $475 per tree pit, $105 per tree for 3 years of maintenance = $42,120 for 54 trees. For long-term care, a cost of $35 per tree per year is a good estimate of annual maintenance costs per tree. Again it is useful to these trees could be planted over a period of years if needed.

Effort: The 54 potential sites in the business district have been submitted to the TreeVitalize program for consideration. A TreeVitalize forester will conduct official tree site assessments to determine the suitability for trees at a given site. If a site is determined suitable for a tree, the forester will select a tree species. The suitable sites will be forwarded to the Borough of Carnegie for final approval. Upon final approval, tree site preparation will commence and volunteers will be organized for planting the trees. The maintenance of the trees will be the responsibility of the Borough of Carnegie. The Borough will need to organize volunteers to help plant and care for trees as well as anticipate the effort of caring for trees for the long term.

Trees:	$200 each
Tree Pits:	$475 each
54 Trees:	$36,450
+ 3 years care:	$5,670
Total:	$42,120

Good Partners: Western Pennsylvania Conservancy, Tree Pittsburgh for Tree Tender training, DCNR, Carnegie Shade Tree Commission, business and building owners, Borough Department of Public Works.

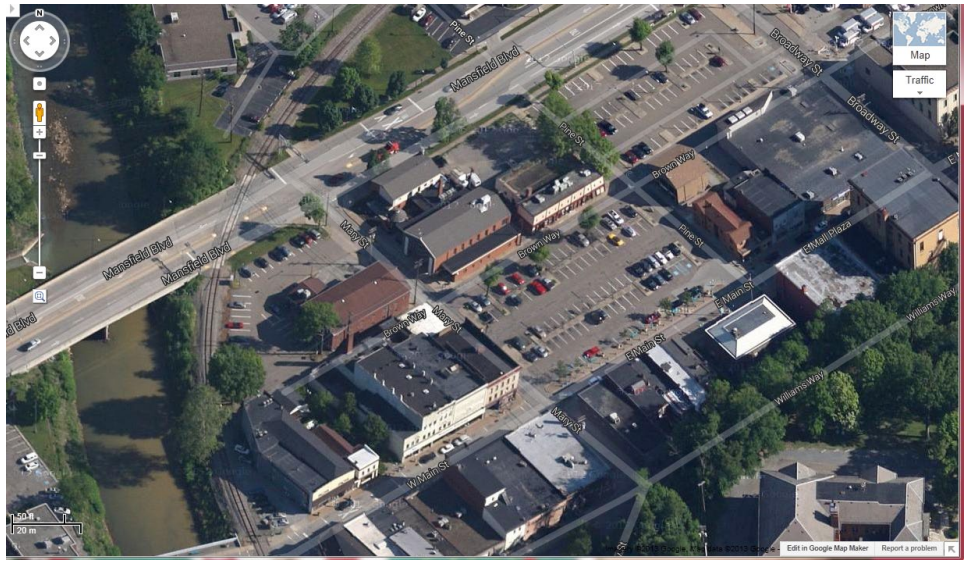
Possible Funding Sources: TreeVitalize; downtown businesses; developers; a Shade Tree Commission "memory fund" or other way for the public to support new trees. It is sometimes possible to begin a matching fund or memory fund that people donate to in order to remember important family or community events. The Shade Tree Commission could begin such a fund and help facilitate tree plantings each year based on the gifts.

Sustainability: Maintenance is a crucial element to the successful establishment and long-term survival of trees. Initially, a 3 year maintenance plan including watering (25 gallons per week through the growing season), mulching, minor pruning at year two to train the tree into the best shape for its location, and weeding are crucial for the trees to become well established. After year three, the trees should be better able to survive on their own and will require less maintenance. The key need will be for occasional watering in times of heavy drought, and routine maintenance pruning. In addition, there are events that can't be controlled and trees might need to be replaced. Examples of this include branches being torn by people, trees being struck by vehicles, over-salting, insect or disease damage. As trees are replaced it is important to remember the three year maintenance period. The cost of this routine tree care (about $35 per year per tree) needs to be factored into the Borough's plans for the long term. In addition, property and business owners will need to be recruited and informed of best caretaking practices for snow removal to reduce salting toxicity to the trees, and to solicit watering support and tree pit maintenance.

GREENER PARKING LOTS

Lot 10

Lot 10 is a Borough-owned parking lot that sits along East Main Street in the center of the Business District. It is one of the most heavily-used parking lots in the Business District currently, and demand for parking is predicted to increase as redevelopment of the Business District moves forward. Borough officials have plans to renovate Lot 10 in the near future to improve the function and visual appeal of the lot without losing parking spaces. Borough officials also show strong interest in incorporating greening strategies into the redesign that improves management of storm water and that replaces existing unhealthy trees and adds new trees. The current design of the lot includes approximately 16 tree pits in a space of 34,000 square feet with some 81 spaces. Currently, only three of the tree pits have trees. Further, the trees in the existing tree pits are in poor health and need to be replaced.



Aerial view of Lot 10, Downtown Carnegie. Photo: Google Aerial View.

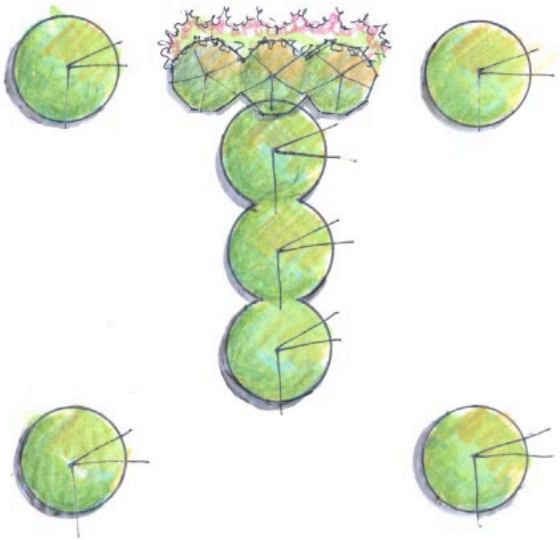
There is a range of greening opportunities available for Lot 10 depending on the Borough's overall goals for the lot and on the renovation budget. The following is a list of options ranging from the simplest, least costly to the most complex and costly upgrade options.

- ◊ Option 1: Upgrade the existing tree canopy to add trees to all existing pits
- ◊ Option 2: Re-design parking configuration to add more tree pits
- ◊ Option 3: Re-design parking configuration and re-purpose or eliminate Brown Way to add more tree pits, curb cuts and a rain garden
- ◊ Option 4: Incorporate permeable pavement on part or all of the lot

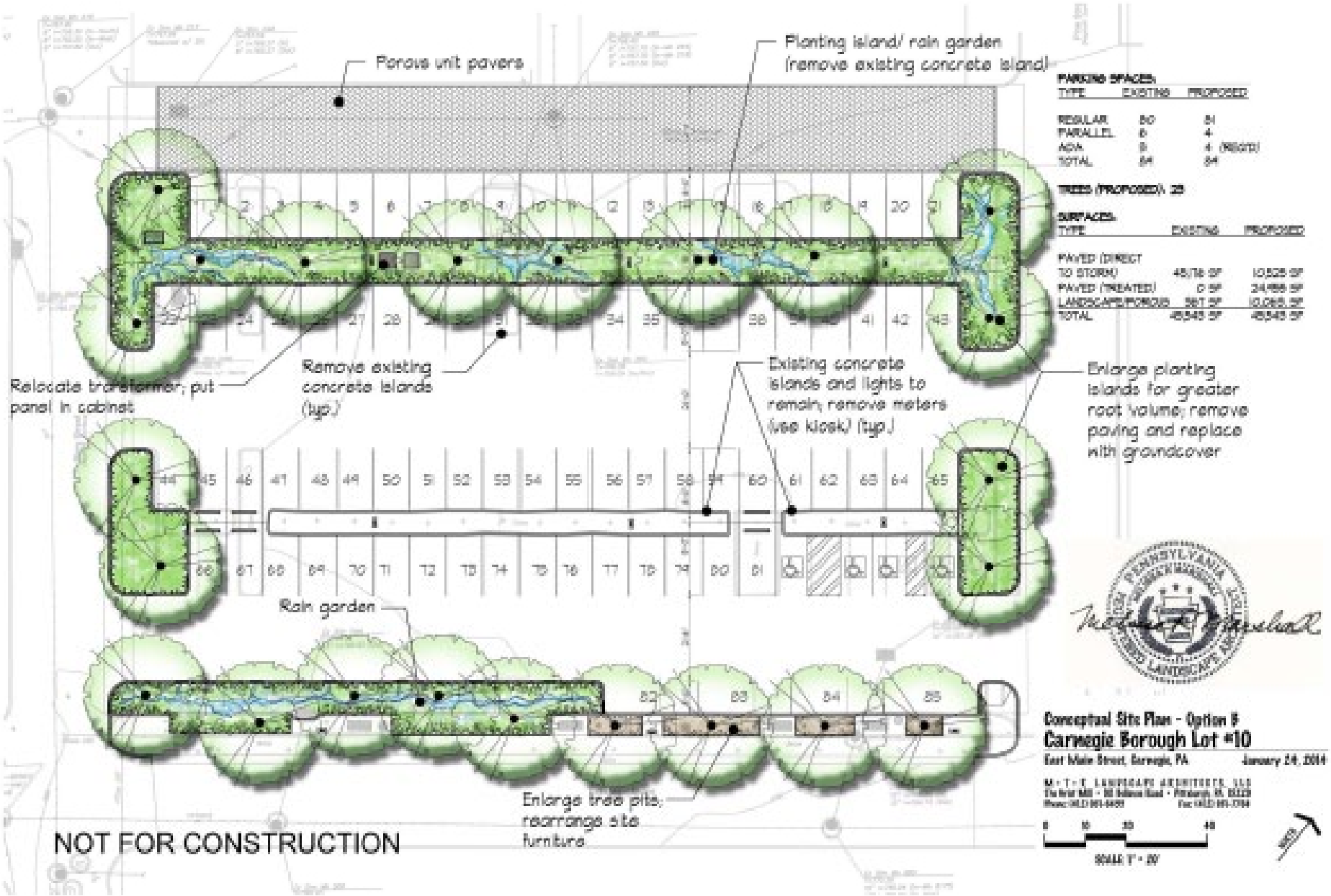
Lot 10, Downtown Carnegie Photo: WPC

Step by step process for implementation

- MTR concept drawing based on site survey by KLH Engineers, found on the following page
- Reconfiguration of Brown Way – make one way to provide additional space to install a rain garden and/or wider tree pits on the northwest side of the parking lot (borough must take action on road designation)
- Fundraising
- Construction



Basic parking lot conceptual planting design.


Porous unit pavers
Planting island/ rain garden (remove existing concrete island)
PARKING SPACES:
TYPE EXISTING PROPOSED
REGULAR 80 81
PARALLEL 0 4
ADA 3 4 (RELOC)
TOTAL 84 84
TREES (PROPOSED): 25
SURFACES:
TYPE EXISTING PROPOSED
PAVED (DIRECT TO STORM) 45,178 SF 10,525 SF
PAVED (TREATED) 0 SF 24,956 SF
LANDSCAPE/PERVIOUS 367 SF 10,065 SF
TOTAL 45,545 SF 45,545 SF
Relocate transformer; put panel in cabinet
Remove existing concrete islands (typ.)
Existing concrete islands and lights to remain; remove meters (use kiosk) (typ.)
Enlarge planting islands for greater root volume; remove paving and replace with groundcover
Rain garden
Enlarge tree pits; rearrange site furniture
NOT FOR CONSTRUCTION
Conceptual Site Plan - Option 5
Carnegie Borough Lot #10
East Main Street, Carnegie, PA
January 24, 2014
0 10 20 40
SCALE: 1" = 20'

Costs:

Trees Only:	$12,480
Add Tree Pits:	$8,950 to $12,800
Reconfigure:	$32,000 to $55,000
Add Permeable Paving:	$17 -340,000
Total:	$12,480 to $420,000

Option 1: Upgrade existing tree canopy

- ◊ 16 2" caliper trees, balled & burlapped: $3,200 (at $200 per tree)
- ◊ Site prep, concrete removal, planting: $7,600 (at $475 per tree pit)
- ◊ Annual maintenance, watering, mulching, pruning: $1,680 for 3 years (at $35 per tree per year)

Total: $12,480

Option 2: Re-design parking configuration to add more tree pits

- ◊ Additional design work to reconfigure parking spaces to allow more trees pits and trees: $5,000
- ◊ Additional trees, 2" caliper, balled and burlapped, $200 each—5 additional trees = $1,000; 10 trees = $2,000
- ◊ Additional construction of pits: $475/pit, 5 tree pits = $2,375; 10 tree pits = $4,750
- ◊ Additional tree care for 3 years (at $35 per tree per year): $525 for 5 trees; $1,050 for 10 trees

Total: $8,900 to $12,800

Option 3: Re-design parking configuration and re-purpose or eliminate Brown Way to add more tree pits, curb cuts and a rain garden

- ◊ Additional design work to add Brown Way space and bioswales to space: $10,000
- ◊ Additional trees and plants: depending on design $2,000 to $10,000
- ◊ Rain garden or small bioswale costs: depending on design $10,000 to $25,000
- ◊ New paving as needed: $10,000?

Total: $32,000 to $55,000

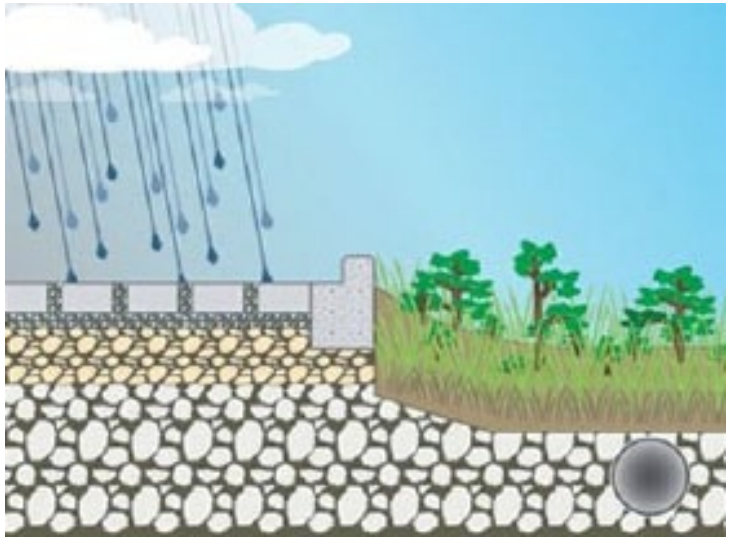
Example of a typical bioswale planting strip.
Photo: www.sitephocus.com

Option 4: Incorporate permeable pavement

Lot 10 is approximately 34,000 sq. ft. Adding permeable paving to a lot this size will cost approximately:

- ◊ Asphalt: $2.00 per square foot (installed) $68,000
- ◊ Porous Concrete: $2.00 to $6.50 per square foot (installed) $221,000
- ◊ Grass/gravel pavers: $1.50 to $5.75 per square foot (installed) $199,500
- ◊ Interlocking Concrete Paving Blocks: $5.00 to $10.00 per square foot (installed) $340,000

Total: $17,000 to $340,000



Detail of porous pavement and bioswale design example.

Effort: Regardless of the level of greening desired by the Borough in the Lot 10 re-design, the project will require a significant amount of effort from Borough staff, landscape architects, engineers, and construction contractors throughout the design and implementation. Because implementing this project would require a high level of technical expertise, most of the work would likely be done by contractors.

Good Partners: WPC can provide technical assistance during design and implementation, and can help to identify funding sources; CCDC; Shade Tree Commission; TreeVitalize; PennVest; ALCOSAN

Possible Funding Sources: The Borough has approximately $90,000 budgeted for rehabilitation of Lot 10. Also, if the rehab involves reconfiguration of Brown Way, funds would be allocated to perform a sewer line upgrade for the lines currently running under the street. Because excavation work would be conducted related to the sewer line upgrade, this project could provide a good opportunity to leverage the $90K the Borough has available for the parking lot rehab.

Other possible funders include TreeVitalize (the Borough can apply for trees in Lot 10 on the fall 2014 TreeVitalize application; the application for fall of 2014 will be available at the end of 2013 with

Example of porous paver parking spaces along asphalt road.

the application deadline in March 2014); PennVest — no grant funding currently available, but grants may become available to implement Green Infrastructure projects related to ALCOSAN's obligations under the Consent Decree. Loans to municipalities of up to $11 million are available from PENNVEST to cover design and construction costs associated with capital improvement projects that demonstrate water quality benefits. Interest rates are 1% to 4% depending on the resulting increase in user rates (parking fees) and terms depend on the useful life of the asset being financed. Also Pennsylvania DEP has provided grants for implementing storm water management projects in the past, but no grants are currently available.

Sustainability: Greener parking lots will entail some short and long term care. New plants and especially trees will need to be watered and weeded for the first three years to help the plants get established. Bioswales require routine maintenance annually in the form of occasional weeding or dividing of plants for optimal performance. Permeable paving may require annual cleaning to retain good water penetration of about $400 to $500 per ½ acre per year.

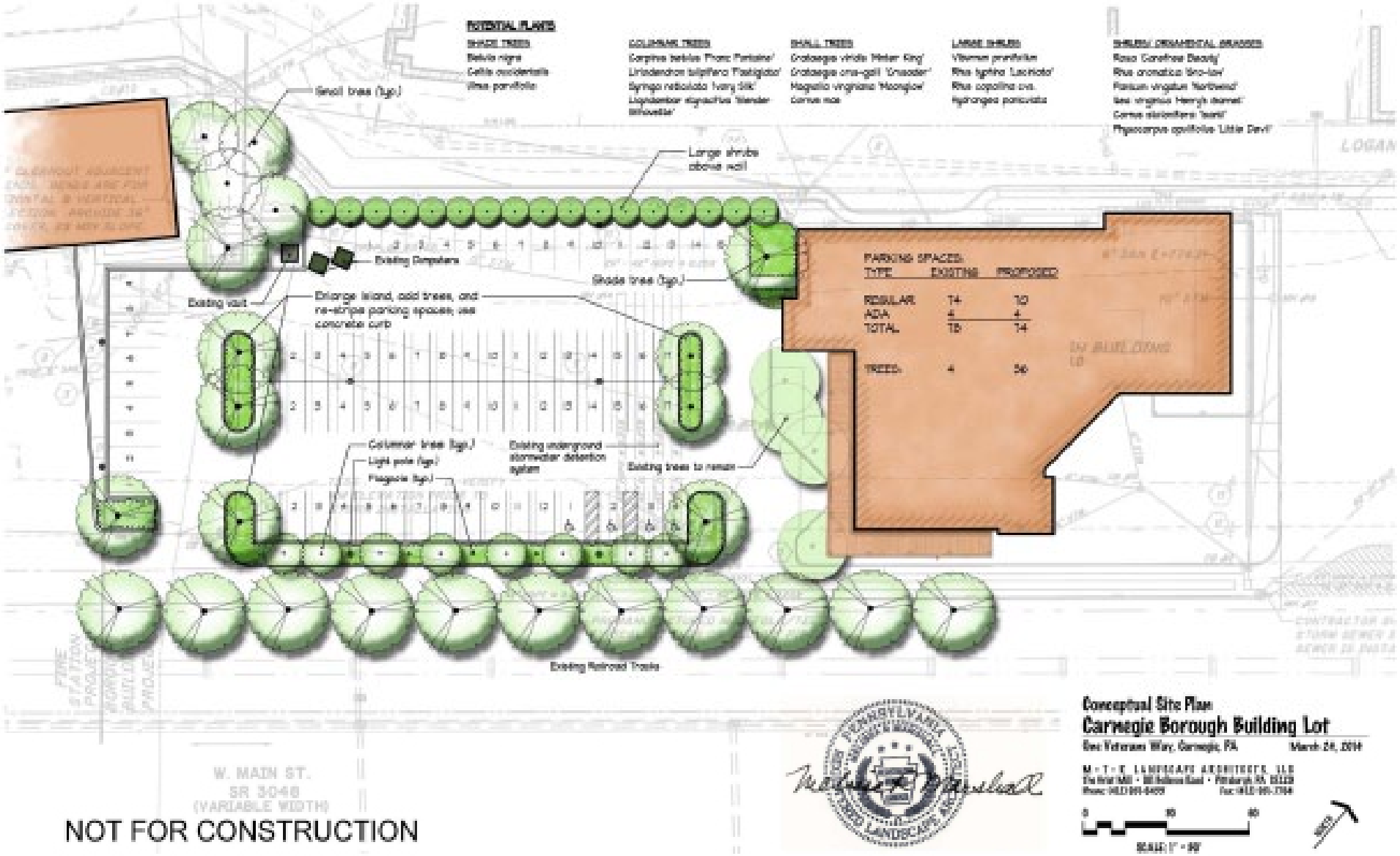
Borough Building Entryway and Parking Lot

The Borough building is an excellent opportunity for the municipality to demonstrate its values and interest in greening the community right in front of the location where all official Borough business is conducted. As a public space, highly visible, and the seat of government, the site is ideally situated to provide a model pilot project that will show the public how green infrastructure can improve public facilities and contribute to the solution of various issues such as local flooding, heat island effect and air quality. This site has ready potential for 10 to 20 trees and more if spaces are reconfigured providing increased storm water-capturing bioswales and a handsome linkage to the Borough building. A concept drawing of the parking lot changes can be found on the following page.

Carnegie Borough Building. Photo: WPC.

Costs: $200 per tree, $475 per tree pit hole cut, $105 per tree for 3 years of maintenance = $7,800 for 10 trees, $15,600 for 20 trees. The total cost of a project that might include reconfiguring the lot, adding bioswales or planting strips and permeable paving would need to be determined by a design and engineering team, but a rough total is provided in the green box to the right.

Trees Only:	$13,500
Add Tree Pits:	$475 each
Reconfigure:	$32,000 to $55,000
Add Permeable Paving:	$175,000
Total:	$200,000

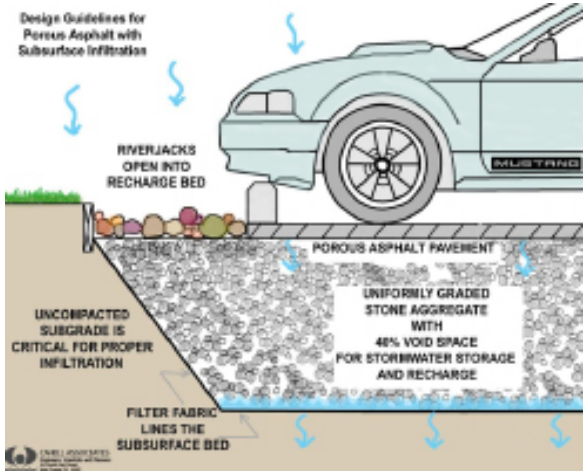

POTENTIAL PLANTS
SHADE TREES
Betula nigra
Celtis occidentalis
Ilex parvifolia
COLUMNAR TREES
Carpinus betulus 'Fnsc Fastigiata'
Liriodendron tulipifera 'Fastigiata'
Syringa reticulata 'Ivory Silk'
Liquidambar styraciflua 'Slender Silhouette'
SMALL TREES
Crataegus viridis 'Winter King'
Crataegus crus-galli 'Cruzam'
Magnolia virginiana 'Moonglow'
cornus mas
LARGE SHRUBS
Viburnum prunifolium
Rhus typhina 'Laciniata'
Rhus copallina cvs.
hydrangea paniculata
SHRUBS/ ORNAMENTAL GRASSES
Rosa Carefree Beauty
Rhus aromatica 'Gro-low'
Panicum virgatum 'Northwind'
Ilex virginica 'Henry's Garnet'
Cornus stolonifera 'Isanti'
Physocarpus opulifolius 'Little Devil'
Small trees (typ.)
Large shrubs above wall
Existing Dumpsters
Shade trees (typ.)
Existing vault
Enlarge island, add trees, and re-stripe parking spaces; use concrete curb
PARKING SPACES:
TYPE EXISTING PROPOSED
REGULAR 74 70
ADA 4 4
TOTAL 78 74
TREES: 4 36
Columnar trees (typ.)
Light pole (typ.)
Flagpole (typ.)
Existing underground stormwater detention system
Existing trees to remain
Existing Railroad Tracks
W. MAIN ST.
SR 3048
(VARIABLE WIDTH)
NOT FOR CONSTRUCTION
Conceptual Site Plan
Carnegie Borough Building Lot
March 24, 2014
0 30 60
SCALE: 1" = 30'

Effort: Turning the Borough parking lot into a model of green parking lot design would be a significant effort, starting with planning and design, proceeding to fundraising and continuing through construction.

Good Partners: Shade Tree Commission, key business partners, ALCOSAN, PA American Water

Possible Funding Sources: PennVest, DCED, TreeVitalize for trees

Sustainability: The care of a truly green parking lot with permeable paving would take some specific plans for upkeep which usually involves some vacuum sweeping of the paving once a year at a cost of $400 per ½ acre. New trees or other plantings will have to be watered weekly during the growing season for the first three years; thereafter regular rainfall should be adequate. Some minor weeding of tree pits or planting areas may be needed; this is a good task for volunteers.



Computer generated picture of shade cover with perimeter tree plantings.

Carnegie Borough building parking lot. Photo: WPC.

Example of open cell porous paving. Photo: Unknown.

PRIVATE LAND

3rd Street Corridor

3rd Street at 2nd Avenue, Carnegie. Seton Church vacant lot is in the background on the right. Photo: WPC.

The 3rd Street corridor running through Irishtown between Main Street and the boundary with Scott Township at Chartiers Creek is currently undergoing a streetscape renovation, which will include upgrades to the curbs and sidewalks, new lighting, additions of bump-outs at two intersections (2nd Ave and 3rd Ave) that include space for low-growing shrubs, as well as at least two additional street trees. Drawings of the renovation plan are included in the Appendix. Because this renovation is currently underway, there is little opportunity in the short term for additional streetscape greening, such as additional street trees.

However, there are two properties owned by St. Elizabeth Ann Seton Church (Seton) along the corridor, one parking lot and one vacant lot, which provide several greening opportunities. The parking lot at northeast corner of 3rd Street and 2nd Ave is where the Seton Carnegie Farm Stand is held every Wednesday during the growing season. The existing asphalt parking lot surface is suited to the lot's use for parking and for the weekly farm stand. However, the site has no existing trees and could greatly benefit from tree planting on the perimeter of the lot, especially for the purpose of contributing shade to the parking lot and for venders and customers of the farm stand. The current design of the sidewalks surrounding the lot and the ongoing 3rd Street corridor rehabilitation limit the number of tree planting opportunities on the perimeter of the site in the short term. Also, because the lot has been repaved recently, incorporating tree pits into the middle of the lot will not be possible for the foreseeable future.

Seton also owns a vacant grass-covered lot at the southwest corner of 3rd Street and 2nd Ave, which is directly across 2nd Avenue from Seton's parking lot. Seton has no immediate plans to either sell or redevelop the lot, and is interested in temporary greening solutions for the space beyond maintaining it with regular mowing. For the short term, Seton would like to keep options open for future sale or redevelopment of the lot, so any greening options should be relatively temporary and easy to remove. There are several possibilities ranging from very simple to more involved that are possible for this site.

Walking Path: $26 to $45/sq. ft.

Simple fence: $3 to $5 per linear foot or $2,075

Food garden: $3,000 - $7,000

Costs: Rail fence: $3 - $5 per linear foot.

- ◊ Community food garden startup costs will be about $5,000 - $7,000
- ◊ Ten 4'x 8' raised beds made from lumber will cost $200/bed including hardware (assuming access to power, circular saw, and drill) or $2,000
- ◊ Soil and soil amendments for 10 4'x 8' raised beds: $150-$350
- ◊ Irrigation system for ten 4'x 8' raised beds: $1,000-$2,000
- ◊ Basic garden tools (rakes, hoes, shovels, wheel barrows, buckets, harvest knives etc.): $500+
- ◊ Machines/equipment (rototiller, seeders, mowers, trimmer): $2,000
- ◊ Annual costs will run about $500 including additional soil/soil amendments, plants and seeds, mulch, pest control.

Effort: For simple fencing and mowing of these lots, a modest amount of effort is required by the landowner. Concerted effort will be needed to initiate the more ambitious potential upgrades to these lots such as a community food garden. For such an effort, a core group is needed to organize neighbors who wish to participate, to coordinate work tasks, maintain the space and help gardeners learn skills and locate needed resources.

Good Partners: Grow Pittsburgh offers technical, educational, and material assistance to communities interested in establishing community gardens through its Allegheny Grows program. The application round for the 2014 growing season has passed. The application round for the 2015 growing season should be open in late July. Contact Marisa (marisa@growpittsburgh.org or 412-362-3769 x103) at Grow Pittsburgh with questions.

WPC regularly partners with Grow Pittsburgh to install Community Food Gardens. WPC's primary role is usually to install irrigation systems, which involves working with municipal water suppliers to develop a tap-in, then installing the irrigation system.

Natrona Heights Community vegetable garden, established through Allegheny Grows program. Photo: WPC.

Possible Funding Sources: Allegheny Grows, foundations interested in food security.

Sustainability: For a community garden, the most important element is a dedicated and enthusiastic group of neighbors interested in growing food together. It will fall to this group to help every gardener make the most of a garden plot, to keep the overall site in good condition, and to introduce new people to the opportunity to grow fresh food in the community. The costs of sustaining the gardens will be modest, but some work is needed to keep paths and perimeters mowed, equipment and tools tidy, and weeds under control.

WPC staff and volunteers assemble raised beds at Rosalinda Sauro Sirianni Memorial Garden in Bellvue as part of the Allegheny Grows program. Photo: WPC.

Vacant CCDC-owned Lots on Main Street

This site includes five adjacent vacant lots along West Main Street in the Business District. The CCDC lots are bookended by the Historical Society of Carnegie History Center and Off the Wall Theater. Because of its location in the business district, the CCDC is interested in redeveloping the lots in the future, but there are currently no immediate development prospects. One area near the Historical Society building is currently used as an informal pedestrian walkway between West Main Street and 3rd Avenue, but the lots are otherwise not used.

The Shade Tree Commission saw the opportunity for some beautification on the site, and received a grant from the Pennsylvania American Water Company to plant a row of sunflowers beneath a collage of hanging murals along the west side of the Historical Society building.

The site is a good location for greening projects, keeping in mind, however, that the CCDC would like to redevelop the site if a good opportunity arises. Because of this, the ideal greening strategy should have a relatively temporary timeline. There are many possibilities that meet this criteria ranging from very simple to somewhat involved.

CCDC-owned vacant lot along E. Main Street. Photo: WPC.

Simple

- ◊ Stabilized walking path to better facilitate pedestrian traffic between Main Street and 3rd Avenue.
- ◊ Grading the lots to prevent erosion and seeding with low-mow grasses
- ◊ Rail fence (with planted border) along sidewalk on Main Street to eliminate/limit pedestrian traffic (ideally, built to direct pedestrians toward the stabilized path.

More involved

- ◊ Community food garden
- ◊ Event space

Walking Path: $26 to $45/sq. ft.

Simple fence: $3 to $5 per linear foot or $2,075

Food garden: $3-7,000

Costs: Simple wooden fence to delineate the area (415') will cost from $3 to $5 per linear food or a total of $2,075 for this area. A planted border would add about $1,000. A stabilized walking path would run $26-$45 per square foot for a 10' wide path of crushed, compacted aggregate or bluestone. If salvaged yellow bricks from a nearby building demolition were used for the walkway, it's possible that this could save some money on materials, but may increase costs of installation compared to a simpler crushed aggregate path. Grading and seeding will be minimal at about $0.50 to $.075 per square foot.

A more complicated installation such as a community food garden would have startup costs of $5,000 to $7,000 and could include the following:

- ◊ 4'x 8' raised bed made from lumber: $200/bed including hardware (assuming access to power, circular saw, and drill)
- ◊ Soil and soil amendments for 10 4'x 8' raised beds: $150-$350
- ◊ Irrigation system for 10 4'x 8' raised beds: $500
- ◊ Basic garden tools (rakes, hoes, shovels, wheel barrows, buckets, harvest knives etc.): $500+
- ◊ Optional machines/equipment (rototiller, seeders, mowers, trimmer): $2,000

Annual costs to care for the garden site will be less than $500, including additional soil/soil amendments, plants and seeds, mulch, and pest control.

An event space is probably more costly than makes sense given the likelihood that this space will eventually be rebuilt as part of the downtown business district.

Effort: While they are quite simple modifications that wouldn't take much time or money to install, the labor involved in adding a stabilized walking path, grading and seeding the lots, and adding a rail fence would best be done by contractors.

Good Partners: WPC can offer design/build assistance for installation of a stabilized walkway, rail fence, and related garden plantings. WPC also regularly partners with Grow Pittsburgh to install Community Food Gardens. WPC's primary role is usually to support construction, install irrigation systems and perimeter plantings.

- Grow Pittsburgh: Offers technical, educational, and material assistance to communities interested in establishing community gardens through their Allegheny Grows program. The application round for the 2014 growing season has passed. The application round for the 2015 growing season should be open in late July. Contact Marisa (marisa@growpittsburgh.org or 412-362-3769 x103) at Grow Pittsburgh with questions.
- Shade Tree Commission
- Local businesses and civic organizations

Possible Funding Sources: DCED; Allegheny Together; County Economic Development.

Sustainability: Any green solution applied to this area will need regular tending. In this case there would need to be minimal grass cutting or attention to plantings; a walkway would need to be shoveled for snow during winter. This work could potentially be carried out by volunteers if need be.

An example of Clean and Green treatment of a vacant lot in Philadelphia, including mowing, fencing, and tree plantings. Photo: Pennsylvania Horticultural Society.

FINAL WORDS

Phasing

Remember that by phasing selected actions the costs and pressure of completing a greening strategy can be eased. Many of the recommendations of this green scan are in the lower tier of cost and the short to medium time frame. For instance, while the Borough can use hundreds of trees in its residential areas, they do not all have to be planted at once, and planting a number of trees each year will allow the Borough and the Shade Tree Commission time to organize residents, build support and prepare for the eventual caretaking of new trees.

Layers

Remember that some opportunities have many layers. For instance, the Carnegie Library grounds could be enhanced first with trees, then with a children's playspace, then with an outdoor reading area, then with greener parking and rainfall capture areas and finally with a pathway and gateway enhancements to better connect the Library visually and physically to the downtown area. It might take some years to put all these components in place, but by breaking the enhancements into segments, it will be easier to identify the most popular or most needed elements, and do the planning and fundraising for the projects that will complete the whole vision.

Models

Remember that sometimes an example can convince people to do more in the future. One transformed parking lot that vividly shows people how much more attractive and functional such a space can be may provide a convincing model that enlists more investment from new partners. Greening can be a "contagious" approach to community improvement that gains momentum with each new element that is implemented.

Costs

Remember that while there will be a significant cost for some types of greening, these investments will provide multiple types of benefits. Moreover,

Green parking lot, Cultural District, Downtown Pittsburgh. Photo: WPC.

community greening has long been an area where local community investment in the form of volunteers and donations has created highly successful projects. Even in tough economic times, it is possible to scale green improvements to fit available volunteer capability and modest government investment. As times improve, communities that value their green assets can build such elements into new development.

The Power of Green

Carnegie is in a great position to use the power of green to enhance its immediate present and support its future. With the engagement of the Borough, the leadership of the Shade Tree Commission and a broad sector of the public interested in this approach, the Borough has many of the elements that are necessary for successful greening projects. Greening has the potential to be a rallying point for community improvement that can involve citizens from school children to seniors, from business owners to cultural institutions, from novices to skilled members of the community. The power of green is found in the multifaceted benefits and the profoundly satisfying experience of improving the living landscape of the community. Carnegie has the elements in place to begin to harness this power for all its citizens.

Carnegie volunteers plant trees with TreeVitalize program. Photo: WPC.

APPENDICES

REFERENCES

Chen, C., Loeb, C. & Herr, J. (2001). Adaptation of WARMF to Calculate TMDL for Chartiers Creek Watershed in Pennsylvania, Prepared for: US Environmental Protection Agency, Region 3. 1650 Arch Street Philadelphia, PA 19103-2029, Pennsylvania Department of Environmental Protection, Bureau of Watershed Conservation, Division of Water Quality Assessment and Standards, P.O. Box 8555, Harrisburg, PA 17105-8555 and The Chartiers Creek Watershed TMDL Stakeholder Group, Pittsburgh, PA. San Ramon, CA: Systech Engineering, Inc.

Tri-Community Steetscape - Allegheny County (2012) sponsored by Heidelberg Borough, Scott Township and Carnegie Borough.

Information Sheet
Proposed Total Maximum Daily Load (TMDL)
for Chartiers and Little Chartiers Creeks

What is being proposed?

A Total Maximum Daily Load or TMDL plan has been developed to improve the water quality in the Chartiers and Little Chartiers Creek basins.

Who is proposing the plan? To whom? Why?

The Pennsylvania Department of Environmental Protection (DEP) is proposing to submit the plan to the US Environmental Protection Agency (EPA) for review and approval as required by the federal regulations.

In 1995, EPA was sued for not developing TMDLs when Pennsylvania did not do so. DEP has entered into an agreement with EPA to develop TMDLs for certain specified waters over the next several years. DEP developed this TMDL in compliance with the state/EPA agreement.

What is a TMDL?

A Total Maximum Daily Load (TMDL) sets a ceiling on the pollutant loads that can enter a waterbody so that the water will meet water quality standards. The Clean Water Act requires states to list all waters that do not meet their water quality standards even after pollution controls required by law are in place. For these waters, the state must calculate how much of a substance can be put in the water without violating the standard, and then distribute that quantity among all the sources of the pollutant on that waterbody. A TMDL plan includes waste load allocations for point sources, load allocations for nonpoint sources and a margin of safety.

The Clean Water Act requires states to submit their TMDLs to EPA for approval. Also, if a state does not develop the TMDL, the Clean Water Act states that EPA must do so.

What is a Water Quality Standard?

The Clean Water Act sets a national minimum goal that all waters be "fishable" and "swimmable". To support this goal, states must adopt water quality standards.

Water quality standards are state regulations which have two components. The first component is the designated use, such as "warm water fishes" or "recreation". States must determine the uses supported by each of their waters. The second component relates to the instream conditions necessary to protect the uses. These conditions, or "criteria", are physical, chemical or biological characteristics such as temperature, the minimum concentration of dissolved oxygen, and the maximum concentrations of toxic pollutants.

It is the combination of designated uses and criteria that make up a water quality standard. If any criteria are being exceeded, then the uses are not being

met, and the water is said to be violating water quality standards.

What is the purpose of the plan?

The Chartiers and Little Chartiers Creek watersheds were determined to be impaired because excessive levels of PCB and chlordane were found in fish tissue, resulting in a fish consumption ban. The plan includes a calculation of the allowable loading for PCB that will meet the water quality objective.

Why were Chartiers and Little Chartiers Creek watersheds selected for a TMDL?

In 1998, DEP listed Chartiers and Little Chartiers Creeks under Section 303(d) of the federal Clean Water Act as impaired due to elevated PCB and chlordane levels in fish tissue. The first fish consumption advisory was issued on December 12, 1979 due to PCB contamination. This advisory applied to carp from Canonsburg to Mouth on Chartiers Creek watershed. The stewide release on June 26, 1986 added largemouth bass to eh advisory because of chlordane contamination. The inclusion of Little Chartiers Creek was done in August 1992 when the advisory was re-issued for Chartiers Creek. Therefore, the 1998 303(d) list reflected an additional impaired segment, on Little Chartiers Creek from Canonsburg Lake to mouth.

What pollutant does this TMDL address?

The proposed plan provides calculations of the stream's total capacity to accept PCB and chlordane. Based on evaluation of the concentrations of PCB and chlordane in fish tissue, it has been determined that PCB and chlordane are a cause of impairment to the Chartiers and Little Chartiers Creek basins.

Where does the pollutant come from?

The production and use of PCB in the United States was banned in 1979. PCB was introduced into the environment while its use was unrestricted. Once in a waterbody, PCB becomes associated with solids particles and enters the sediments. PCB is very resistant to breakdown and can remain in sediments for many years. One known source of PCB in the watershed is the Cooper Power Systems site, located in Cecil township and Washington County (NPDES # PA 0001937). During the manufacturing process of transformers, oils containing PCB were used. Improper maintenance practices at the site resulted in PCB soil contamination which, over time, eroded off the site into area streams.

Chlordane is a man-made organochlorine compound that was widely used as a broad-spectrum agricultural pesticide before its use was restricted to termite control around building foundations. All uses of chlordane have been banned since April 1988. Chlordane may be introduced to surface waters through contaminated ground water or surface runoff, and therefore a non-point source contaminant. Once in a waterbody, chlordane becomes associated with solids particles and enters the sediments.

PCB and chlordane may also have been introduced through contaminated groundwater or surface runoff from other unknown sources.

How was the TMDL developed?

PCB and chlordane are a probable human carcinogen. The Department's water quality toxics management program controls carcinogens to an overall risk management level of one excess case of cancer in a population of 1 million. In other words, the probability of an individual getting cancer is increased by a factor of 1 in 1 million. The TMDL for PCB and chlordane was developed by calculating the maximum amount of the pollutant that could be discharged under design conditions without violating the water quality criterion of 0.00004 ug/L for PCBs and 0.0005 ug/l for chlordane (micrograms per liter.)

The Department uses the harmonic mean flow as the design condition for dealing with carcinogens because it represents a long-term average exposure to a pollutant.

How much pollution is too much?

The maximum amount of PCB that can be safely absorbed by Chartiers and Little Chartiers Creeks under design conditions is 0.0000369 lbs/day. The maximum amount of chlordane that can be safely absorbed by Chartiers and Little Chartiers Creeks under design conditions is 0.000461 lbs/day.

How will the loading limits be met?

Based on readily available information, the Cooper Power Systems site is the only known source of PCB in the Chartiers and Little Chartiers Creek basins. As part of the remedial action plan for the site the Environmental Cleanup and Water Management sections are monitoring this facility through an NPDES Permit (# PA0 001937) and a Consent Order & Agreement (CO &A) signed on February 4, 1993. Via this NPDES permit the level is expected to reduce aquatic toxicity and bioconcentration of PCB through exposure to contaminated sediment or consumption of aquatic organisms. PCB and chlordane levels are also expected to decline in the watershed due to bans on use and natural attenuation, such as the covering of contaminated sediments with newer, less contaminated materials and the flushing of sediments during periods of high stream flow.

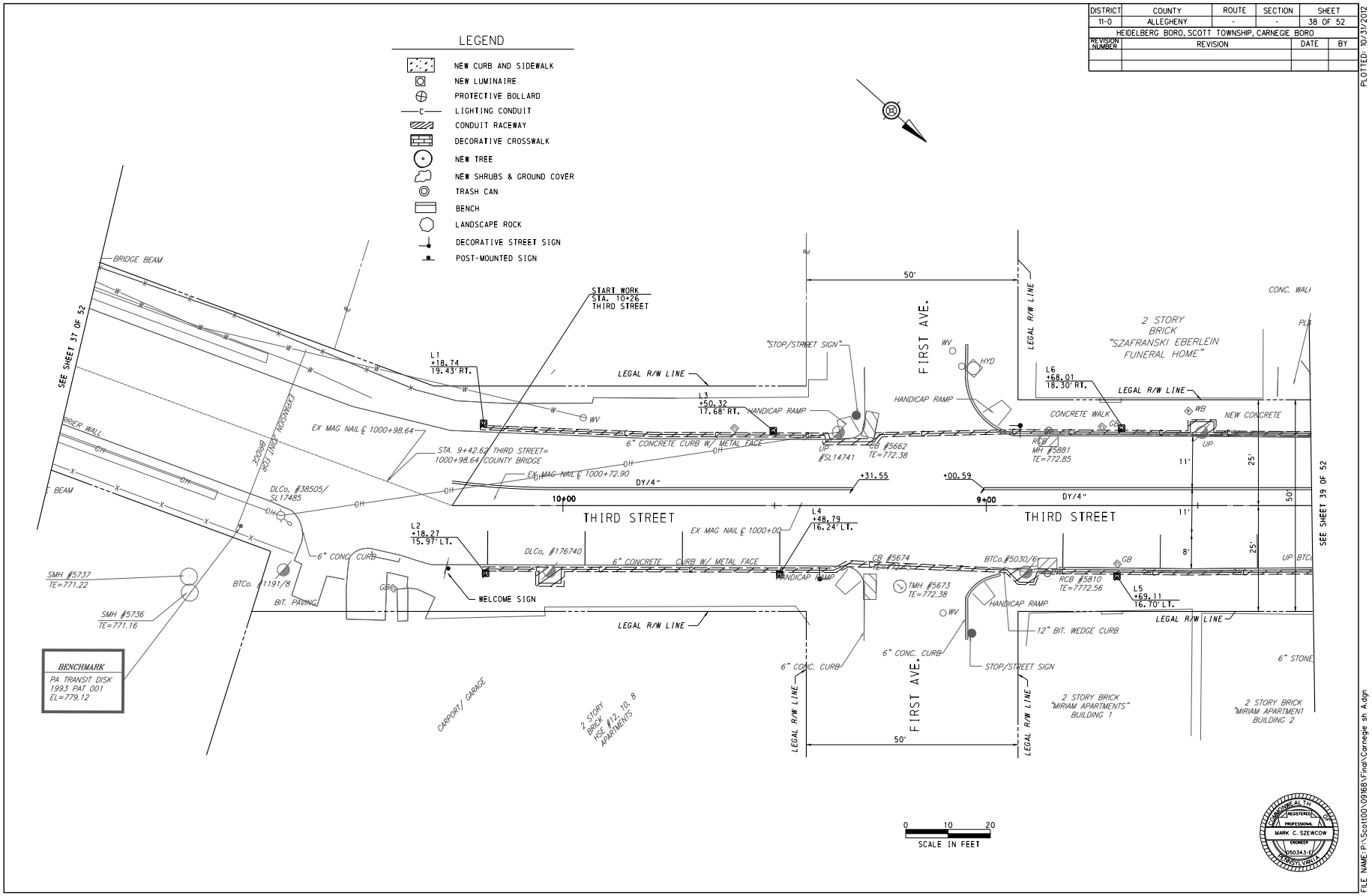
How can I get more information on the TMDL?

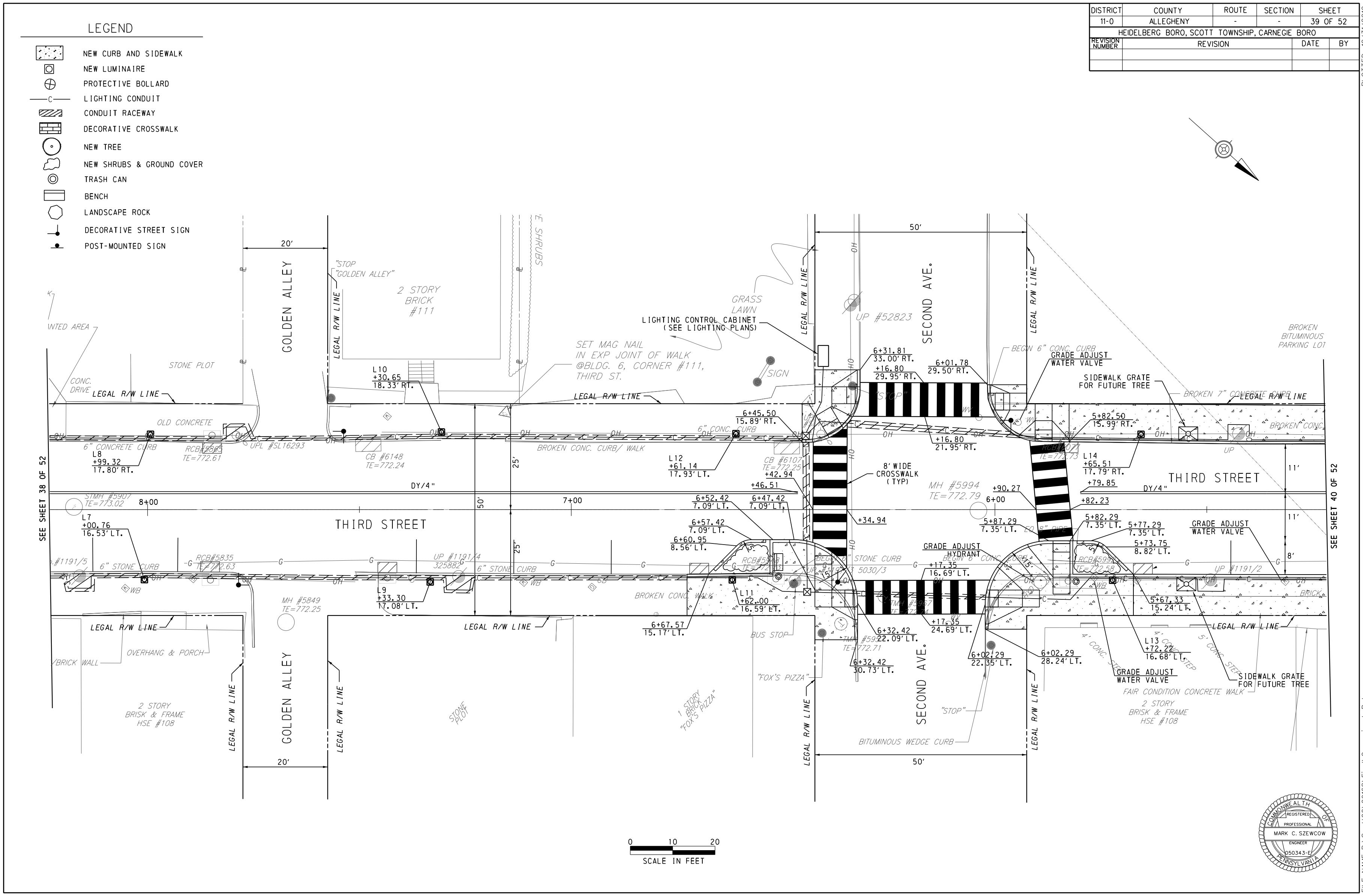
To request a copy of the full report, contact Bharati Vajjhala at (412)442-4202 or by writing to her at Pennsylvania Department of Environmental Protection, 400 Waterfront Drive Pittsburgh, PA 15222-4745, or e-mail her at vajjhala.bharati@dep.state.pa.us.

How can I comment on the proposal?

You may provide e-mail or written comments postmarked no later than November 29, 2000 to the above address.

Tri-Community Steetscape - Allegheny County;
sponsored by Heidelberg Borough, Scott Township and Carnegie Borough, pages 38-41

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COUNTY ALLEGHENY
ROUTE -
SECTION -
SHEET 39 OF 52
HEIDELBERG BORO, SCOTT TOWNSHIP, CARNEGIE BORO
REVISION NUMBER
REVISION
DATE
BY
PLOTTED: 10/31/2012
LEGEND
NEW CURB AND SIDEWALK
NEW LUMINAIRE
PROTECTIVE BOLLARD
LIGHTING CONDUIT
CONDUIT RACEWAY
DECORATIVE CROSSWALK
NEW TREE
NEW SHRUBS & GROUND COVER
TRASH CAN
BENCH
LANDSCAPE ROCK
DECORATIVE STREET SIGN
POST-MOUNTED SIGN
THIRD STREET
SECOND AVE.
GOLDEN ALLEY
LEGAL R/W LINE
SEE SHEET 38 OF 52
SEE SHEET 40 OF 52
LIGHTING CONTROL CABINET (SEE LIGHTING PLANS)
8' WIDE CROSSWALK (TYP)
GRADE ADJUST WATER VALVE
GRADE ADJUST HYDRANT
SIDEWALK GRATE FOR FUTURE TREE
2 STORY BRICK #111
2 STORY BRISK & FRAME HSE #108
1 STORY BRICK "FOX'S PIZZA"
SET MAG NAIL IN EXP JOINT OF WALK @BLDG. 6, CORNER #111, THIRD ST.
BROKEN BITUMINOUS PARKING LOT
BITUMINOUS WEDGE CURB
FAIR CONDITION CONCRETE WALK
BUS STOP
0 10 20
SCALE IN FEET
MARK C. SZEWCOW
PROFESSIONAL ENGINEER
050343-E
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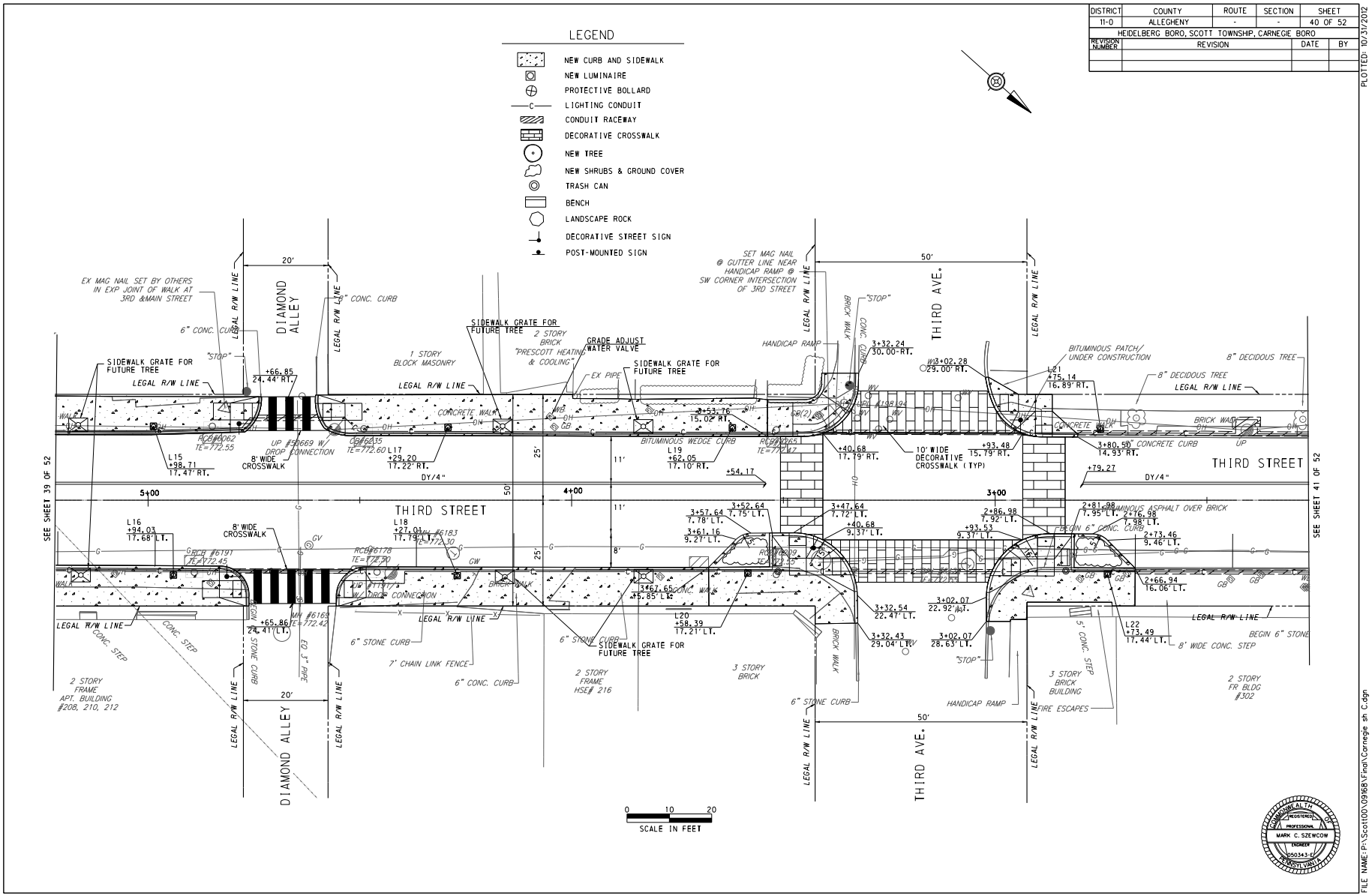
LEGEND
NEW CURB AND SIDEWALK
NEW LUMINAIRE
PROTECTIVE BOLLARD
LIGHTING CONDUIT
CONDUIT RACEWAY
DECORATIVE CROSSWALK
NEW TREE
NEW SHRUBS & GROUND COVER
TRASH CAN
BENCH
LANDSCAPE ROCK
DECORATIVE STREET SIGN
POST-MOUNTED SIGN
DISTRICT 11-0
COUNTY ALLEGHENY
ROUTE -
SECTION -
SHEET 40 OF 52
HEIDELBERG BORO, SCOTT TOWNSHIP, CARNEGIE BORO
REVISION NUMBER
REVISION
DATE
BY
PLOTTED: 10/31/2012
DIAMOND ALLEY
THIRD AVE.
THIRD STREET
LEGAL R/W LINE
SIDEWALK GRATE FOR FUTURE TREE
GRADE ADJUST WATER VALVE
HANDICAP RAMP
8' WIDE CROSSWALK
10' WIDE DECORATIVE CROSSWALK (TYP)
BITUMINOUS PATCH/ UNDER CONSTRUCTION
BITUMINOUS WEDGE CURB
BITUMINOUS ASPHALT OVER BRICK
6" STONE CURB
7' CHAIN LINK FENCE
8' WIDE CONC. STEP
5' CONC. STEP
HANDICAP RAMP
FIRE ESCAPES
2 STORY FRAME APT. BUILDING #208, 210, 212
2 STORY FRAME HSE# 216
3 STORY BRICK
3 STORY BRICK BUILDING
2 STORY FR BLDG #302
SEE SHEET 39 OF 52
SEE SHEET 41 OF 52
SCALE IN FEET
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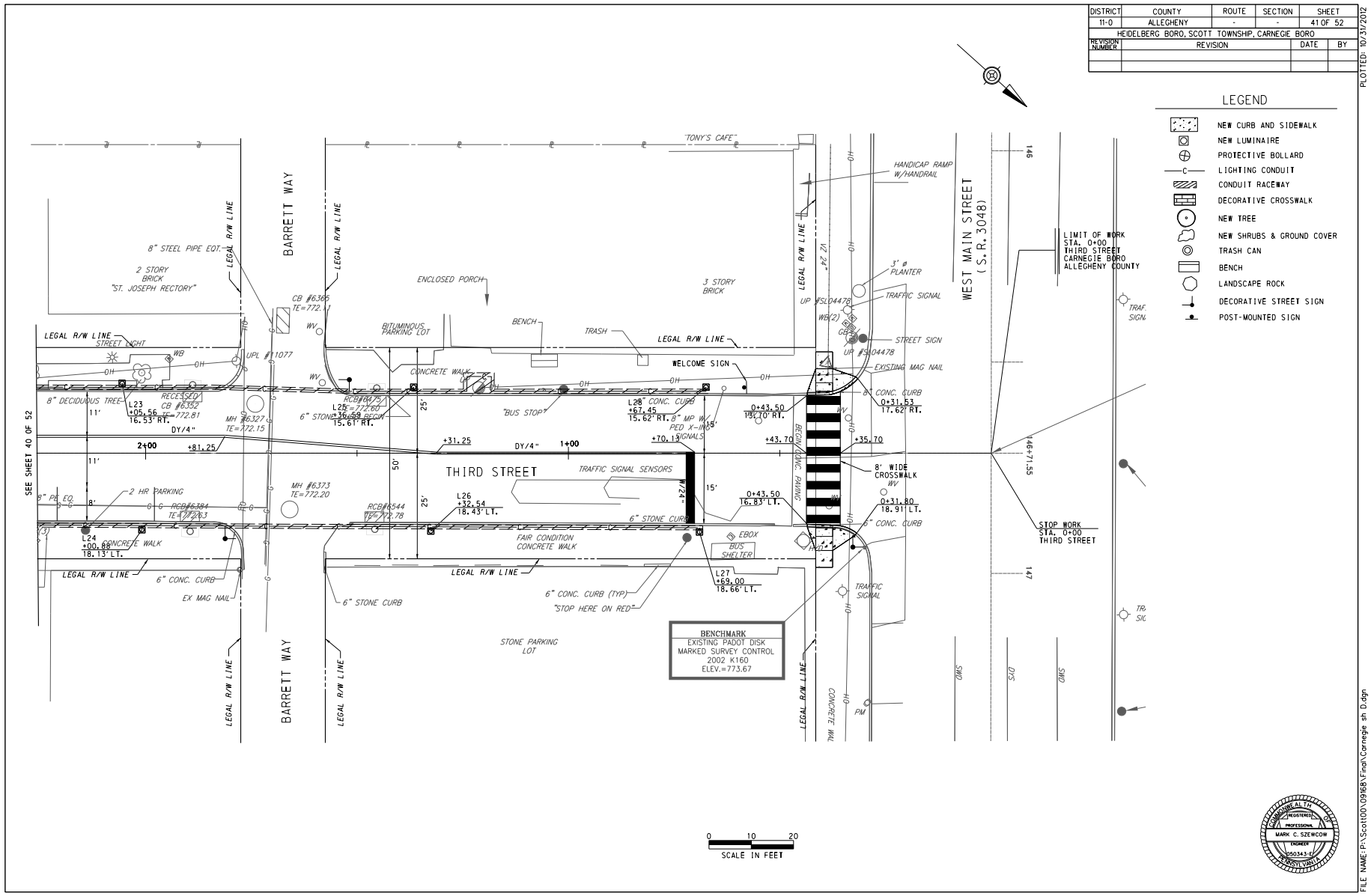
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ROUTE -
SECTION -
SHEET 41 OF 52
HEIDELBERG BORO, SCOTT TOWNSHIP, CARNEGIE BORO
REVISION NUMBER
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DATE
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LEGEND
NEW CURB AND SIDEWALK
NEW LUMINAIRE
PROTECTIVE BOLLARD
LIGHTING CONDUIT
CONDUIT RACEWAY
DECORATIVE CROSSWALK
NEW TREE
NEW SHRUBS & GROUND COVER
TRASH CAN
BENCH
LANDSCAPE ROCK
DECORATIVE STREET SIGN
POST-MOUNTED SIGN
BARRETT WAY
WEST MAIN STREET (S.R.3048)
THIRD STREET
"TONY'S CAFE"
2 STORY BRICK "ST. JOSEPH RECTORY"
3 STORY BRICK
ENCLOSED PORCH
BITUMINOUS PARKING LOT
STONE PARKING LOT
CONCRETE WALK
BENCH
TRASH
"BUS STOP"
WELCOME SIGN
HANDICAP RAMP W/HANDRAIL
3' ø PLANTER
TRAFFIC SIGNAL
STREET SIGN
EXISTING MAG NAIL
8" CONC. CURB
8' WIDE CROSSWALK
6" CONC. CURB
6" STONE CURB
6" CONC. CURB (TYP)
"STOP HERE ON RED"
TRAFFIC SIGNAL SENSORS
8" MP W/ PED X-ING SIGNALS
FAIR CONDITION CONCRETE WALK
EBOX
BUS SHELTER
2 HR PARKING
8" DECIDUOUS TREE
8" STEEL PIPE EOT
5" PE EQ
RECESSED CB #6352
CB #6365 TE=772.1
MH #6327 TE=772.15
MH #6373 TE=772.20
RCB #6475 TE=772.60
RCB #6384 TE=772.63
RCB #6544 TE=772.78
UPL #1077
UP #SL04478
WB(2)
GEBO
LIMIT OF WORK STA. 0+00 THIRD STREET CARNEGIE BORO ALLEGHENY COUNTY
STOP WORK STA. 0+00 THIRD STREET
LEGAL R/W LINE
STREET LIGHT
EX MAG NAIL
L23 +05.56 16.53' RT.
L24 +00.88 18.13' LT.
L25 +36.59 15.61' RT.
L26 +32.54 18.43' LT.
L27 +69.00 18.66' LT.
L28 +67.45 15.62' RT.
0+43.50 15.70' RT.
0+43.50 16.83' LT.
0+31.53 17.62' RT.
0+31.80 18.91' LT.
+81.25
+31.25
+70.13
+43.70
+35.70
2+00
1+00
DY/4"
SEE SHEET 40 OF 52
146
146+71.55
147
BENCHMARK
EXISTING PADOT DISK
MARKED SURVEY CONTROL
2002 K160
ELEV.=773.67
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SCALE IN FEET
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MARK C. SZEWCOW
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