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RE-ENVISIONING NOTTINGHAM WAY: A COMPREHENSIVE RESPONSE TO
EAST TRENTON'S POST-INDUSTRIAL LANDSCAPE

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ABSTRACT OF THE THESIS

Re-Envisioning Nottingham Way:

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Urban, post-industrial landscapes across the United States are in desperate need of reimagining. The existence of hundreds of thousands of brownfields around the country, many abandoned and dilapidated, presents an opportunity for repurposing parts of our most culturally significant cities for exciting new uses. This thesis looks at how landscape design could be used to re-envision a brownfield site in Trenton, New Jersey. The design site, part of a larger, 100-acre greenway proposal known as Nottingham Way, is a 12-acre property which lies at the intersection where today's East Trenton neighborhood was first conceived. The final product, Nottingham Way Ecological and Arts Center Park, is the product of a comprehensive design process which examined research and data through five criteria lenses. Once collected, the information was layered together and critically analyzed to highlight useful patterns and relationships. After the narrative of site and neighborhood was clear, design solutions to the site's various challenges were developed. The result is a model for remediated and revitalized landscape transitioned into a public space. Designed as a local and regional park, it also serves as an ecological sanctuary and artist hub, with opportunities for passive recreation and trail connections to the surrounding greenway systems.

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Chapter 1: Introduction

The City of Trenton proposed the Assunpink Creek Greenway Park a few decades ago, with the goal of obtaining every property within a 99-acre delineated greenway boundary. Approximately half of the properties are currently under city ownership and ready for the next stage of the process: contamination remediation across fifteen different sites.

Re-Envisioning Nottingham Way proposes adaptive solutions for a Nottingham Arts and Eco Center Park, part of the future Assunpink Creek Greenway Park in East Trenton, New Jersey. This project aims to align neighborhood planning with a socially engaged decision making process, acknowledging sustainable ecological growth like other cities. East Trenton has fallen to political malfeasance and neglect; impacted by the demise of industry and political disinvestment.

This project uses a comprehensive design process that accounts for the Assunpink Greenway Park sites as well as the surrounding East Trenton Neighborhood (ETN). The design approach focuses on five points to research and analyze solutions for the portion of the greenway known as “Nottingham Way.”

A comprehensive and layered design process is defined as the examination of a landscape through various lenses, to develop new concepts of use for public space. The lenses used in this project include historical, social, political, economic, and environmental factors.

The project is guided by the following research questions.

- A. How does historical, social, political, economic, and environmental information inform a layered, comprehensive approach to urban design?
- B. How does a comprehensive approach to urban challenges lead to innovative design solutions?
- C. How does documentation and description of the design process contribute to the progress of projects with similar challenges?

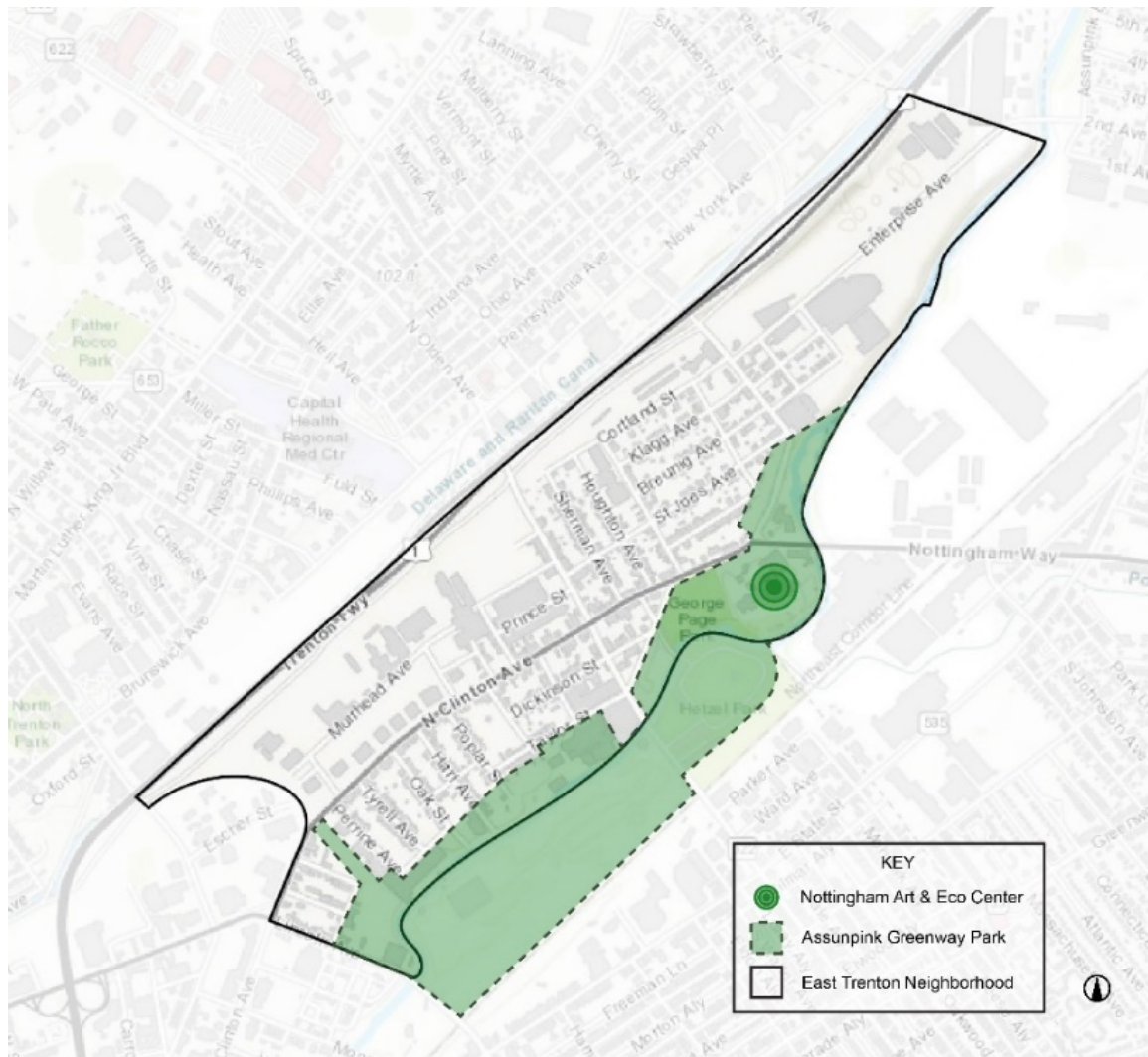


Figure 1: Project Site Delineation Diagram. Source: Author

Research for this project was conducted at varying scales, first regionally and narrowing into the design site. A neighborhood synthesis map delineated which portion of the proposed greenway would be most suitable to work with. The site scale synthesis map was used for design and programmatic brainstorming. The three areas most frequently referred to from here on out are the East Trenton Neighborhood, the Assunpink Greenway Park, and the Nottingham Way Arts and Ecological Center, each represented in a layout diagram (Fig. 1).

The neighborhood occupies over 200 acres, while the Greenway, composed of fifteen different properties, is nearly 100 acres. The Assunpink Creek runs longways through the proposed greenway, along the neighborhood's south edge. The design area - Nottingham Way – is one of five greenway sections as outlined in the East Trenton Brownfields Area-Wide Plan published by ISLES in collaboration with the City of Trenton and the East Trenton Collaborative (ETC). The rest of this paper walks through the project's background, methodology, and design solutions in more depth.

Chapter 2: Urban Landscape Frameworks

2.1 – Post-Industrial and Brownfield Landscapes

Part of the American landscape was shaped by the American Industrial Revolution during the 18th and 19th centuries. Development of new industries, materials, and modes of transportation led to the nation-wide growth of industrial manufacturing centers in and around urban areas. These industries had either fallen due to economic changes or moved overseas, but their effects however are still visible in urban communities. Industrial manufacturing led to beneficial innovations, but also left contaminated and compacted soils, abandoned infrastructure and polluted water bodies. Post-industrial sites in these conditions are referred to as brownfields.

The most troublesome challenges of a brownfield site lay underground, invisible to the eye, in the soil, water table, or underground storage tanks. The wide range of manufacturing activities on brownfield sites, resulted in a variety of potential toxins that pose threats to public health. In the case of the Assunpink Greenway, the variety, concentration, and location of contaminants made it difficult to create feasibility plans for city-wide and site remediation. The city's recent efforts and funding have been focused on investigation and cleanup.

2.2 – Fourth Nature

Plant communities found in urban “wasteland” landscapes, like brownfields, are perceived as wild, weedy, and overgrown, but these landscapes provide habitat for wildlife, stormwater mitigation, contaminant remediation and reduction of urban heat island effects. These manmade or ‘Fourth Nature’ sites develop a successional type of

woodland ecosystem that eventually, if not managed, lead to dense and diverse swaths of invasive plant communities.¹ Instead of being left to develop uncontrollably, by working with existing vegetation creates opportunity to rid the landscape of invasive plants, expand opportunity for beneficial plants, while lowering cost of implementation and care. In addition, many fourth-nature species contain phytoremediation properties.

2.3 – Greenway Parks

The City of Trenton has set their goal to have the future Assunpink Greenway Park contain one-hundred acres of park and open space. Re-linking and agglomerating ecologically fragmented pieces of urban land into an interconnected whole in the form of a greenway, opens opportunities to improve connectivity between postindustrial sites and the surrounding urban landscape. In the case of the Assunpink the land serves as a network on a vast range of scales, from site, to neighborhood, to regional system connecting the Mercer County Park, New Jersey’s D&R Canal Path, and the East Coast Greenway.

2.4 – Social Disinvestment

Following other American cities during the mid to late 20th century, East Trenton neighborhoods faced social, political, and economic disinvestment. Redlining, urban renewal and white flight all factored into the racial profiling, segregation, and social detriment that plagued major cities throughout the nation.

Beginning in the early 1930s, the federal policy called redlining created maps delineating “hazardous” neighborhoods in major cities across the United States. These

¹ CitiNature, “Nature of the Fourth Kind: Berlin”, August 2013, <https://bit.ly/35nhy20>

maps were used to inform newly created homeownership programs where money should and should not be invested. Influenced by racial determinants, a color gradient system presented different levels of risk, with red showing the most ‘hazardous’ areas. While legal segregation was on its way out, redlining served as an informal continuation of segregating marginalized groups, restricting access to basic amenities like banking, insurance, and healthcare.

2.5 – Redlining in Trenton

Several Trenton neighborhoods were deemed hazardous including the East Trenton Neighborhood, which lead to the demise and disinvestment of the area. The redline practice continued until the Fair Housing Act was passed by Congress in 1970.² The Fair Housing Act was created in response to the injustices inflicted on urban communities and works to “[protect] people from discrimination when they are renting or buying a home, getting a mortgage, seeking housing assistance, or engaging in other housing-related activities.”³ A significant step towards reversing the damages of redlining but has not nearly balanced equity between white and non-white people. Even fifty years after it was passed, “the full historical weight of banks’ discriminatory practices is still evident in the persistent racial segregation of communities. African Americans and Latinos continue to be denied mortgages at far higher rates than whites in 61 metro areas.”⁴ New York City based ‘social impact design studio’, *Designing the We*

² Kriston Capps & Kate Rabinowitz, “How the Fair Housing Act Failed Black Homeowners,” *Citylab*, Apr 11, 2018, <https://bit.ly/2SOIQZB>.

³ U.S. Department of Housing and Urban Development, “Housing discrimination Under the Fair Housing Act,” *HUD Office of Fair Housing and Equal Opportunity*, Accessed May 01, 2020, <https://bit.ly/3duk8og>.

⁴ Kriston Capps & Kate Rabinowitz, “How the Fair Housing Act Failed Black Homeowners,” *Citylab*, Apr 11, 2018, <https://bit.ly/2SOIQZB>.

(dtW), created a traveling exhibit called ‘Undesign the Redline, which educates and calls for action on continuing to reverse these effects still seen by redlining today. In a booklet for the project, the firm stated, “we are [still] faced with a legacy of lingering bias, living with the scarlet letter of Redlining, and its cross-generational effects on wealth, income, wellbeing and ownership.”⁵ While a project such as this thesis does not directly approach housing or wealth disparities, it could create the agency for changes in health, well-being and economic growth.

2.6 – Urban Renewal

Urban renewal was a federal policy established by the Housing Act of 1949 and lasted through the early 1960s. The intention of the Act was to improve the livability of cities through large-scale developmental and infrastructural reconstruction. It had devastating consequences – including displacing more than a million people from their homes.⁶ The nation-wide movement brought big changes to the country, most of which caused more grievances than relief. With redlining still an active practice, American cities began to see drastic changes in the form and fabric of cities, disproportionately affecting minority communities.

Claims of ‘slum’ areas containing ‘blight’ were misinformed through a discriminatory lens. The renewal response resulted in the designation of minority, low-income neighborhoods as having problematic living conditions and requiring change. The solutions devised this area in Trenton, for example, not only eliminating historic

⁵ Designing the We, *Undesign the Redline*, New York: DtW, Apr 2017, 3, <https://bit.ly/2yGrNRF>.

⁶ Katharine Schwab, “The Racist Roots of ‘Urban Renewal’ and How it Made Cities Less Equal,” *Fast Company*, Jan 01, 2018, <https://bit.ly/2ziMtiz>.

infrastructure, but also intangible social and economic connections. In 1957, “a team of urban planning students from the University of Pennsylvania predicted [that cities like Trenton] would be socially and economically dead by 1980 unless business and political leaders changed their policies.”⁷ The findings published were largely ignored and local political leaders saw the state of Trenton as very good.

Ironically, the devastation brought on by the pairing of renewal and redlining provided real estate speculators with swaths of residential properties available for redevelopment. The two renewal projects in Trenton at that time were the construction of Route 29 and the Coalport Redevelopment Project.

The Coalport project was a slum clearance that took place in the southern portion of East Trenton. Developers demolished a portion of the existing neighborhood to make way for new business. They also used federal dollars to build a new complex of townhouses and high-rises, called the Miller Homes.⁸ This was a highly problematic decision as no low-income housing units were incorporated, which caused many original residents to be displaced. It later became clear how inhumane it was to tear the community apart like this, but only a very small portion of those displaced were ever provided any aid.⁹

The neighborhoods demographic numbers demonstrate the detrimental effects of urban renewal quite clearly – median household income is a mere \$31,000 versus

⁷ Paul Mickle, “1964: Neighborhood on the Rise,” *Capital Century Trentonian Archive*, Accessed May 01, 2020, <https://bit.ly/2SJM6nS>.

⁸ Paul Mickle, “1964: Neighborhood on the Rise,” *Capital Century Trentonian Archive*, Accessed May 01, 2020, <https://bit.ly/2SJM6nS>.

⁹ Kovisars, *Obituary for a Hometown*, Thales Microuniversity Press, 1974, p. 29.

\$73,000 for New Jersey as a whole, with 42% of families having income below the poverty level compared to 8% for the state. Education levels are also extremely low, despite the handful of schools within East Trenton, with 36% of students not high school graduates, and only 3% attaining an advanced college degree.

These numbers are disturbingly low and attribute not only to difficult living conditions, but also leave a lot to be desired in the housing market. Number of renters are high and vacant homes are plentiful – by 2018, owner-occupied housing units had declined to 30%, and of the 1,150 units 21% are vacant. Along with major neglect of housing infrastructure that this causes, these conditions also “lead to many undesirable trends such as an increase in crime rates, decrease in graduation rates, an increase in health risks, and an increase in vacant properties.”¹⁰ This project does not specifically address any housing issues but could have the agency to make a difference which beneficially impacts livability as a whole.

2.7 – Suburbs, the GI Bill & White Flight

Redlining and urban renewal provided the policy and political structure to segregate neighborhoods, making it difficult for blacks to live or leave and easy for whites to uproot and move to newly created suburbs. The movement of the white population from the disinvested cities to the suburbs was known as ‘white flight’. When World War II was over and troops returned home, housing demands saw a dramatic rise.

¹⁰ ISLES. *East Trenton Neighborhood Brownfield Area-Wide Plan*. Draft, Trenton: ISLES, Apr 2020.

White flight led to mass emigration of white families out of major cities like Trenton, comfortably landing themselves in beautiful, newly constructed suburban homes. Meanwhile, black communities lacked the means or were denied access to such opportunities, left behind in neighborhoods that had succumbed to disinvestment.

The result was a “vast reorganization of power and money that affected American industry, race relations, and gender roles,”¹¹ and those who remained in the metropolitan city areas were faced with lack of resources, financial support, and environmentally degraded landscapes.

¹¹Khan Academy, “The Growth of Suburbia,” *Khan Academy US History Webpage*. Accessed May 01, 2020. <https://bit.ly/2WNFpm6>.

Chapter 3: Site History

The Native Americans who occupied New Jersey and the surrounding area were known as the Lenape people, and are believed to have been living here nearly 10,000 years before the emergence of any European settlers.¹² They often lived along the Delaware River or its tributaries and settled along Trenton's banks. Life was sustained through hunting, fishing, and trade. Interaction with Europeans in the 17th century began with trading of fur and other goods. Eventually, indigenous people were pushed from their native land. Trenton's first settlements were started in 1679 by Quakers who faced religious persecution in England.¹³

3.1 – Trent Towne

William Trent, a prominent landowner played a large role in planning and designing the region, became the city's namesake. The first iteration of the city's name was 'Trent-Towne'. The area currently known as East Trenton started as one large plot of land in the mid-17th century – over a thousand acres – that became subdivided as it changed hands.¹⁴ The land was purchased by Samuel Henry in 1758, who established the gristmill located directly across the creek from the Clinton Commerce Center and Storcella sites and initiated the construction of a stone bridge to connect both sides of the creek, just how the Nottingham Way bridge crosses into the greenway sites today. Two significant road additions made at this time are today's Mulberry Street and North

¹² NPR, "Lenape Indians, The Original Philadelphians," *NPR Webpage*, July 2008, <https://n.pr/3kqgZsH>.

¹³ VisitPrinceton, "Trenton the Capital of the State of New Jersey," *VisitPrinceton: City of Trenton Webpage*, Accessed August 28, 2020, <https://bit.ly/3eTJY75>.

¹⁴ Dennis P. Waters, "Millham's Journey," *Trenton Historical Society*, May 2019, Slides 6 – 8.

Clinton Avenue. The former connected the area to the Post Road – today’s Route 1 – while the latter offered access to ‘Trenton proper’ in 1768.

3.2 – Ten Crucial Days

Between December 1776 and January 1777, two major battles of the Revolutionary War happened in Trenton. This was the first victory by Washington’s troops over the Hessian army stationed there and was a pivotal moment in the colonists’ war for independence. At one point during their operations, the troops passed through East Trenton, which aided in the success of Washington’s troops over the British. The point at which Henry’s Mill sat along the creek was one of two fording points where troops were able to navigate across the creek with ease.

3.3 – 1800s

It was in the nineteenth century that today’s East Trenton neighborhood, acquired the title ‘Millham’. Initially part of Maidenhead Township – the historical name for present day Lawrence Township – the first official record of the name Millham for the neighborhood was in 1805 when it was mentioned in an obituary; the name Millham did not find its way onto a map for another two decades.¹⁵

3.4 – D&R Canal and Pennsylvania Railroad

The Delaware and Raritan Canal Company and the Camden and Amboy Railroad and Transportation company were formed in the 1830s. Soon after the city became the

¹⁵ Dennis P. Waters, “Millham’s Journey,” *Trenton Historical Society*, May 2019, Slides 20 – 21.

nation's center for iron production, and East Trenton was a main driver.¹⁶ In 1934, the state assumed ownership of the canal properties, eventually designating them as a park in 1974. The properties now support residents in central New Jersey in the form of a linear park. In addition, "used extensively for recreation [and,] under the direction of the New Jersey Water Supply Authority, the canal serves as a water supply for about 1,000,000 customers."¹⁷

Industrial and residential expansion in East Trenton was exponential once the neighborhood's structural roadway framework was set in place by the 1870s. During this time, manufacturing and population exploded. As more factories were built – producing rubber, porcelain, pork roll and more – job opportunities brought an influx of Europeans into the neighborhood for work, and land associations further developed what was once a sparsely populated settlement into a neighborhood.¹⁸

By the 1880s the neighborhood had grown to include over a hundred businesses along North Clinton Avenue, with a streetcar system that made shopping and employment opportunities more accessible to residents.¹⁹

3.5 – 1920s: The Beginning of Decline

By the mid-1920s Trenton based companies sold or merged their businesses with larger national conglomerates. This continued for thirty years, taking a serious toll on the local industries, requiring them to close or relocate.²⁰ Trenton and East Trenton

¹⁶ ISLES Et al., "East Trenton Neighborhood Brownfields Area-Wide Plan [Draft]," May 2020, p. 9 – 10.

¹⁷ Ibid.

¹⁸ ISLES Et al., "East Trenton Neighborhood Brownfields Area-Wide Plan [Draft]," May 2020, p. 11.

¹⁹ Ibid.

²⁰ ISLES Et al., "East Trenton Neighborhood Brownfields Area-Wide Plan [Draft]," May 2020, p. 13.



Figure 2: Enlarged Map of Trenton, NJ, 1900. Source: The Trenton Historical Society.

struggled to compete economically, leading to a downward economic and social spiral. The New Deal and Second World War hinted at recovery, but in the long run industries closed, employment declined and working conditions worsened for many decades to come. In addition, the majority black population was confronted with newly institutionalized forms of racism. Discriminatory practices like redlining, urban renewal and access restrictions within suburbs set the stage for segregated neighborhoods, restricted access to resources, and environmental injustices.²¹

3.6 – The Riots of 1968

The civil unrest of the 1960s resulted in riots in major cities across the United States, including Trenton. Following Dr. Martin Luther King Jr.'s death in 1968,

²¹ Ibid.

residents took to the streets and riots and looting took place. The series of events that unfolded thereafter quickly ended what remained of Trenton's downtown. Amid the chaos, insurance companies dropped business coverage which thwarted any plans to rebuild.²²

The implementation of high-speed roadways during this period physically divided the city and its neighborhoods. Route 29, built in 1930, cut off resident's access to the Delaware river. Route 1, built in 1953, is a major roadway that runs directly through the city, forms an edge for an entire side of East Trenton, making access to the Top Road neighborhood difficult. The physical barriers made by these roads allowed outsiders easier access to jobs in the city.

In the late 20th century, Trenton tried to boost the economic situation by incorporating some major attractions. Arm and Hammer Park was built for baseball fans in 1994, and the Sovereign Bank Arena opened in 1999.²³ These multimillion-dollar investments in the local economy attracted outsiders to visit the city but brought little or no direct benefit to Trenton's downtown and neighborhoods. The Great Recession that began in 2008, together with serious leadership challenges in the city, led to a new wave of abandonment and decline. While some housing and commercial developments have succeeded in recent years, there are still many political and developmental challenges.

At present, East Trenton is challenged with disinvestment, physical decay, and is home to an underserved and economically disadvantaged population. There is much work

²² Mickle, "1968: A city aflame," *The Trentonian*, Accessed 15 June 2020, <https://bit.ly/2IrMISi>.

²³ "Trenton History Facts and Timeline," *World Guides*, Accessed 15 June 2020, <https://bit.ly/2IuMpB7>.

that needs to be done both in the neighborhood and Trenton as a whole, and a greenway would help to strengthen and support community development.

3.7 – The Greenway Sites

Documentation of human manipulation of the creek-side landscape dates back as far as evidence of the three-way intersection being a small village. The intersection and the Nottingham Way bridge have always been an important node for travel and transportation of goods. When manufacturing technology developed, mills expanded into factories and warehouses, and industrial infrastructure spread along roadways and the node. Along with the Nottingham area, the surrounding land supported a variety of uses like freight yards, auto repair shops, a salvage yard, a cemetery, and housing.

In the 19th century the Nottingham Way Area had two flour mills, a sawmill, and a millrace that diverted water from the Assunpink Creek harnessing hydropower for the mills. After the construction of the waterway, the site transitioned to factory use. The CCC property, a former industrial condominium center had a variety of uses until the property was vacated in 1999 after Hurricane Floyd's severe flooding.

The two adjacent Nottingham Way commercial sites, Storcella and Scarpati, have a different timeline of commercial operations. Storcella, the closest lot to CCC, is a triangular space lodged between CCC, the creek, and Nottingham Way. It may have housed an expansion of Murray Rubber, but was converted to a machine shop and storage

space that operated until 1980 when it was purchased by Anthony Storcella who ran Storcella Machine Shop until 1990.²⁴

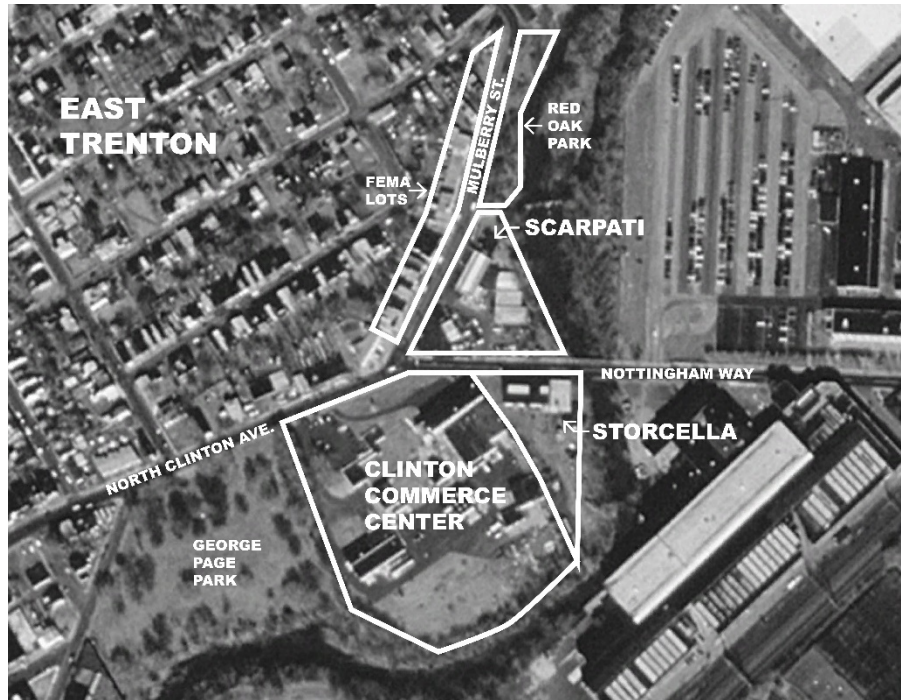


Figure 3: Nottingham Way Layout Diagram. Source: Author

By the early 21st century, CCC and Storcella were abandoned, overgrown and derelict; the only use they got before the city stepped in to restore the sites was by unauthorized entrepreneurs who used the site for illicit activities like cock fights and car repairs.²⁵ A decade after hurricane Floyd struck, the city cleaned both sites, demolishing several buildings and cutting back vegetation. Two structures on the CCC site were left: one an intact building and one a remaining structure of a stairwell. The machine shop structure on the Storcella property also preserved, and along with the stairwell structure,

²⁴ ISLES Et al., “East Trenton Neighborhood Brownfields Area-Wide Plan [Draft],” May 2020, p. 111.

²⁵ Yasenchak, Personal Interview, 07 February 2020.

facades were removed, the frames were reinforced, and the steel beams of the Storcella structure were freshened up with a white coat of paint.

The Scarpati site, named after John Scarpati, who opened the metal recycling business in 1977, had two buildings according to an 1849 Sanborn map – a mill and blacksmith shop – both demolished by the 20th century.²⁶ In the 1930s, the Scarpati site was active with automobile businesses, then scrap metal storage and finally recycling processing.²⁷ The city acquired the site in 2007 and all buildings were torn down in 2010.²⁸

Red Oak Park and the empty FEMA lots are in the project's sites but not within the boundary of Nottingham Way delineated in the Brownfields Area-Wide Plan. Red Oak Park, also called Mulberry Street Park, has been a creek side park for many years, but receives little upkeep as evident in the dilapidated benches and overgrown patches of vegetation. There is the opportunity to reveal pleasing views of the creek not available at the other sites, including a glimpse at the remains of a dam from the mill days. Across Mulberry Street, the FEMA property was formerly residential housing with more than two dozen parcels within the flood zone, the housing area was deemed unsafe by FEMA, and owners were bought out in the early 2000s. The buildings were demolished, and the linear space was restored to a grassy lawn with a row of trees along the sidewalk. These two sites are closely linked to the industrial properties and provide an opportunity for comprehensive design engagement.

²⁶ ISLES Et al., "East Trenton Neighborhood Brownfields Area-Wide Plan [Draft]," May 2020, p. 113.

²⁷ Ibid.

²⁸ Ibid.

3.8 – Development and Remediation

In addition to its deep developmental, industrial past, the greenway sites have been proposed for public open space for more than a century. The Olmsted Brothers' design proposed a park and open space masterplan for an Assunpink Creek Greenway in 1907. They envisioned a radically alternate future for the nearly hundred-acre buffer along the banks of the creek, but the plan was never fully realized. Twenty years ago, the Cassaway Albert concept was accepted, and plans began to develop, but progress has been gradual.

The Brownfields Area-Wide Plan report prepared by ISLES in collaboration with ETC, the city and various other stakeholders is the most dynamic, comprehensive effort at area development to date. The document serves as a holistic approach to neighborhood revitalization and greenway planning and design, considering past remedial investigations and the need for further remediation work. The brownfields program has already acquired and spent millions of dollars for remedial work up to this point,²⁹ but continual collaboration with the DEP's Community Collaborative Initiative (CCI) program and the ETC, as well as additional funding, are necessary for arriving at final stages of development.³⁰

The Nottingham Way Area Remedial Investigation Report, published by LANGAN in December of 2018, focused specifically on contamination within CCC. This report paved the way for remedial action and informed the city's Alternative Remediation

²⁹ ISLES Et al., "East Trenton Neighborhood Brownfields Area-Wide Plan [Draft]," May 2020, p. 25.

³⁰ BEST Advisory Committee Et al., "Brownfields Program Action Plan," June 2018.

Standards (ARS). Once the best remedial actions are determined, funding and a comprehensive landscape design can begin. Supplementary to challenges of contamination and flooding, the eighteen properties are inching closer and closer to being incorporated as park and open space. Today, a skeletal glimpse of historic industrial infrastructure is interspersed among empty swaths of lawn, soil, and concrete, making for a rich and unequivocal aesthetic.

Chapter 4: Research Methodology

The aim of this project to design public open space on a greenway is to establish the East Trenton and the Assunpink Creek sense of place, promote well-being, equity and provide a sustainable development future. To achieve this, a comprehensive approach that identifies the significant components, or areas of analysis of this postindustrial dense urban landscape is required.

The components that identify the space were categorized into five critical layers – historic, social, political, economic, and environmental. This layered approach, is typical in landscape architecture design both in academia and in practice. Categories of related information are mapped, summarized, documented, and analyzed to create a comprehensive plan. Each layer contains information that characterizes the neighborhood, community, and the creek-side site. Surveys, demographic statistics, and reports by Isles, in collaboration with the City of Trenton and the East Trenton Collaborative were used to populate the respective layer of information.

Research documentation also included photographs, videos, written observations, and site sketches. A literature review, stakeholder publications, and other existing secondary data were gathered to generate an accurate depiction of East Trenton and the Assunpink Creek Park sites. Information from several community engagement gatherings held by key stakeholders over the years were relevant to the research.³¹ Documentation gatherings, specifically the brownfield tours and design charrette, allowed for the inclusion of local voices.

³¹ ISLES Et al., “East Trenton Neighborhood Brownfields Area-Wide Plan [Draft],” May 2020, p. 75.

4.1 – Historic Layer

The documented history of Trenton dates to the 1776 – 1777 battle of Trenton. Pivotal moments in the battles against the Kings troops, were documented in series of troop operation maps, the most readable one created in London (Fig. 4). The maps also depicted the Delaware watershed, details of terrain conditions, roadways, changes in elevation, and hydrological features. Much of Trenton’s road infrastructure can be traced to this map.

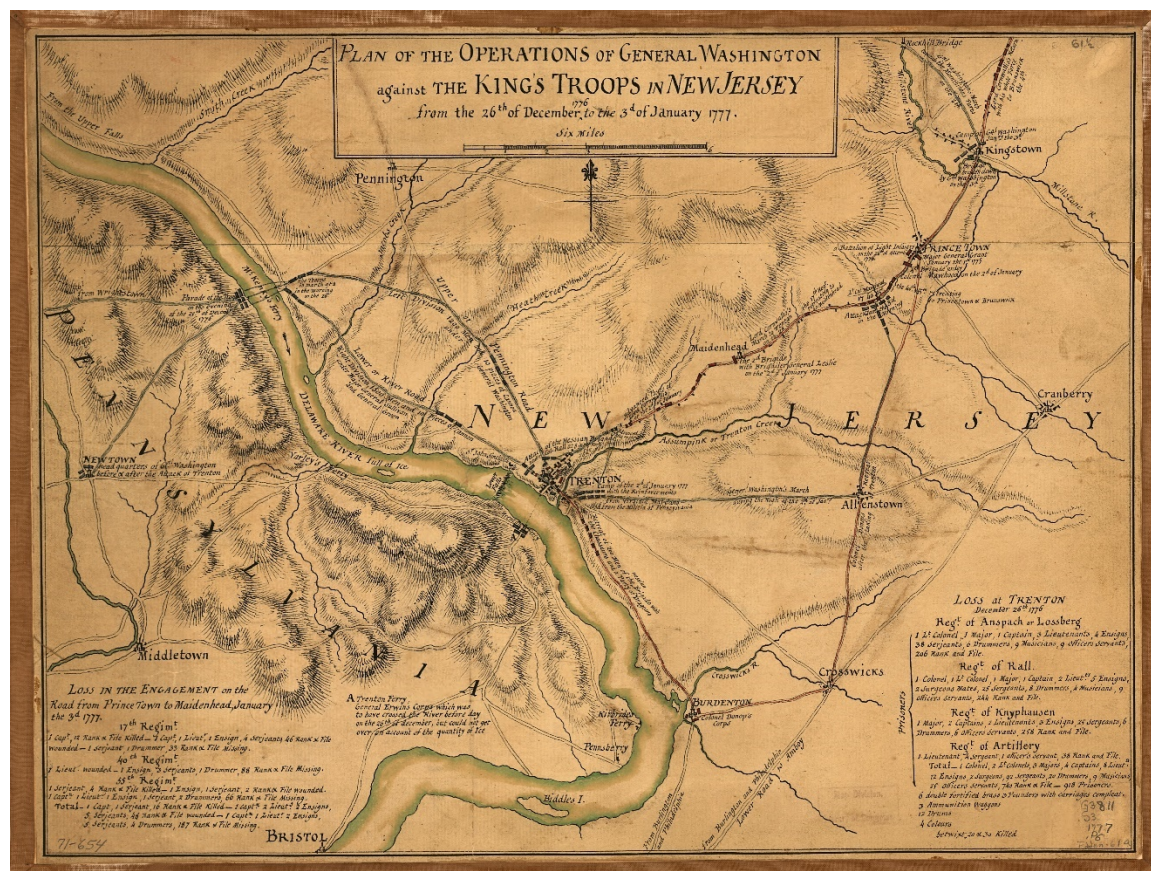


Figure 4: Plan of the operations of Gen. Washington against the King's troops in New Jersey, from the 26th of December to the 3rd of January 1777. Map, April 1777. Faden Collections. Geography and Map Division, Library of Congress.

A similar map was published in the same year depicting the Trenton and New Brunswick Turnpike. This road was a direct connection between the two cities essentially how NJ Route 1 does today. The two paths that meet perpendicularly at the borough of Allentown, New Jersey, resemble the present-day NJ Turnpike cross with Interstate 195. These maps depict the earliest representations of the area landscape and its geographic characteristics.

What we today identify as East Trenton was known as Millham during the 19th century. Documented on an 1835 map of the city of Trenton and its vicinity, the map shows property lines, roads, water bodies, and commercial and institutional buildings (Fig. 5). At the time East Trenton was a small grouping of mills and a blacksmith shop.



Figure 5: 1835 Map of Trenton, NJ, cropped to East Trenton. Source: Rutgers University

The intersection of three major road arteries meeting to form a node shown here are still present today in North Clinton Avenue, Mulberry Street and Nottingham Way. From earliest formation of the neighborhood as a small manufacturing village the node plays a role in city's development.

Nottingham Way had the only bridge across the Assunpink for a mile in either direction. The mill race that diverted from the creek is also visible. This intersection is currently a significant node. The larger cluster of buildings seen on the map sat on the property which eventually became Clinton Commerce Center.

This and similar maps published later in 1849 were primarily created to display land tenure and property ownership and they also provided insight into the relationship between terrain, road location and settlement. For instance, Millham's earliest mill buildings were at a creek bend to redirect a portion of the Assunpink's water through a constructed millrace to generate power for manufacturing, hence why this plot of land has seen so much interaction over time. At this point, Trenton's street grid first became apparent, the same general grid that can be seen today.

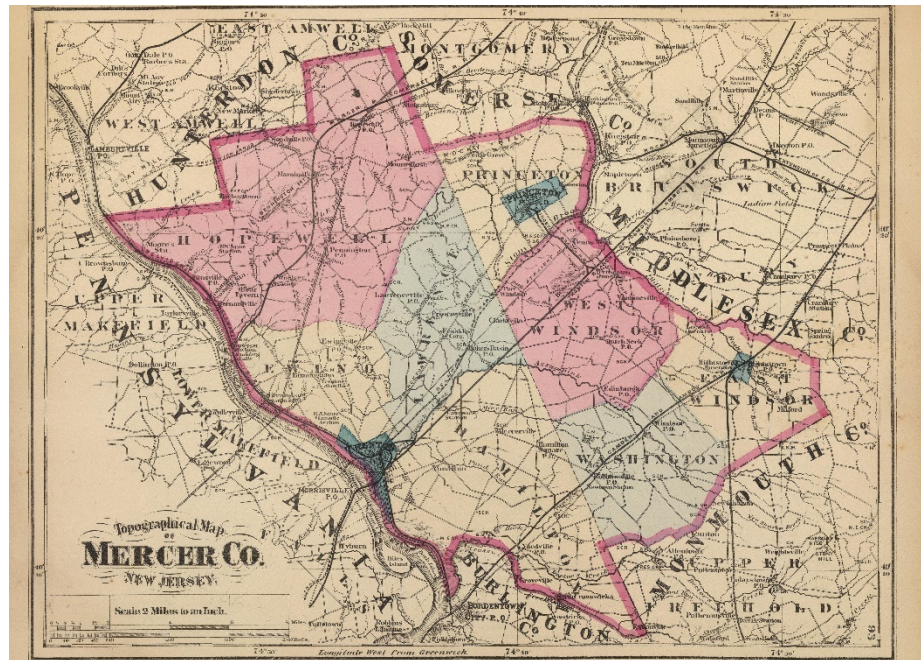


Figure 6: Topographical Map of Mercer County, 1872. Source: David Rumsey Collection, DavidRumsey.com, accessed 23 Jul. 2020, <https://bit.ly/3jsuDMq>.

The 1872, “Topographical Map of Mercer County” displays an advanced infrastructural network (Fig. 6). It documents primarily features settlements, townships, carriage roads, railroads, schools, churches, and water bodies. At this point, Trenton had a substantial downtown area and high level of connectivity to surrounding regions via railroad, canal, and turnpike.



Figure 8 Real Estate and Insurance Map of the City 1882 (Cropped).
<https://doi.org/doi:10.7282/T37D2V0H>.

The 1882 Map of the City of Trenton shows the commercial growth and development in the area and a street grid that divided land into blocks (Fig. 8).

In 1907 The Olmsted Brothers design firm proposed a preliminary plan for an Assunpink Creek Parkway (Fig. 9). Between the 19th and 20th centuries, the Olmsted family – Frederick senior, Frederick junior, and his half-brother John Charles – were responsible creating park systems in dozens of major U.S. cities.³² In Trenton, Frederick senior’s “most prominent work is the design of Cadwalader Park and the plan for the Cadwalader Heights neighborhood.”³³ Their proposal encompassed ideas for a vegetated trail system to follow the creek’s path from today’s Mill Hill Park up to just past Mulberry Street Park.³⁴ The parkway proposal was never realized but the Assunpink

³² “Olmsted Brothers,” *The Cultural Landscape Foundation*, Accessed 25 July 2020, <https://bit.ly/35rfF4p>.

³³ ISLES Et al., “East Trenton Neighborhood Brownfields Area-Wide Plan [Draft],” May 2020, p. 45.

³⁴ ISLES Et al., “East Trenton Neighborhood Brownfields Area-Wide Plan [Draft],” May 2020, p. 45.

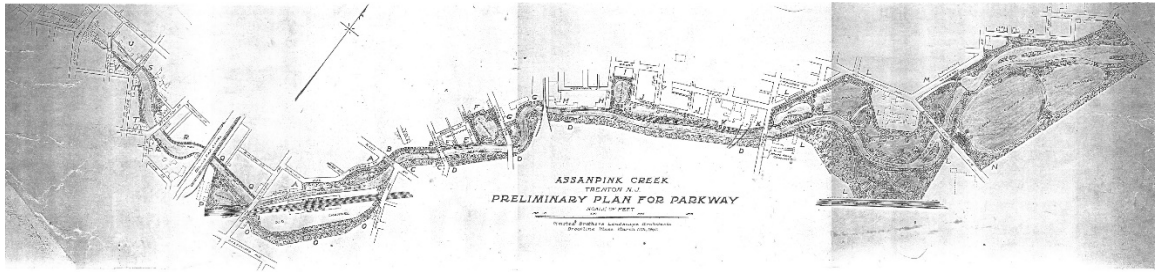


Figure 9: 1907 Olmsted Brothers Assunpink Master Plan. Source: ISLES

Greenway Park planning retains some of the aspects of the plan like a trail network that flows through a series of creekbank park spaces.



Figure 10: Aerial Photograph of the Murray Rubber Company, 1924, Hagley ID, J. Victor Dallin Aerial Survey collection (Accession 1970.200), Audiovisual Collections and Digital Initiatives Department, Hagley Museum and Library, Wilmington, DE 19807. https://digital.hagley.org/70_200_00304F.

The 1924 aerial photo by the Dallin Aerial Survey Company shows the mass of factory infrastructure that existed within the Nottingham Way area (Fig. 10).

By 1995, displaced and demolished buildings and structures left leaving contaminants that infiltrated in into the soil and water. Nottingham Way's infrastructure footprint was the last sign of the official businesses abandoned on the properties. After demolition early in the 21st century, the Nottingham Way properties remained the same, untouched, and free of developmental change. A series of tests were conducted to measure soil and hydrologic contamination. The most recent was completed in 2018. Infrastructural changes from 1947 to 1995 are shown with two parts of the USGS quadrangle map series (Fix 11).

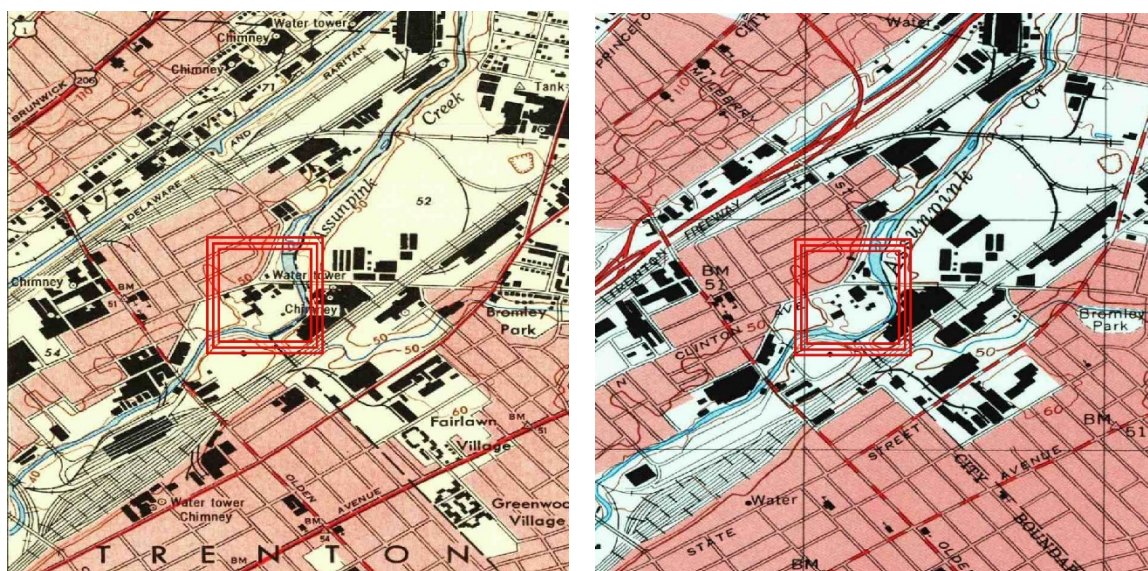


Figure 11: USGS 1:24000-scale Quadrangle for Trenton East, NJ, Left: 1947; Right: 1995, U.S. Geological Survey. <https://bit.ly/3jMPOsX> <https://bit.ly/2Ems1zD>

4.2 – Social and Cultural Layer

Despite the neighborhood's physical decay, the social fabric is still vibrant. It has an arts community and the various fooderies that make up many of the storefronts. A collection of maps, conversations with local stakeholders, and records of community meetings all tell the story of the social and cultural scene.

4.2.1. Zoning and Land Use

The 150 acres that make up East Trenton are zoned for three main uses: residential, industrial, and commercial (Fig. 12). The residential land makes up about half of the parcels divided down the middle by North Olden Avenue. The residential sections are mostly surrounded by commercial and industrial use. The industrial zones make up a quarter, while different stretches of commercial equal another 20%.

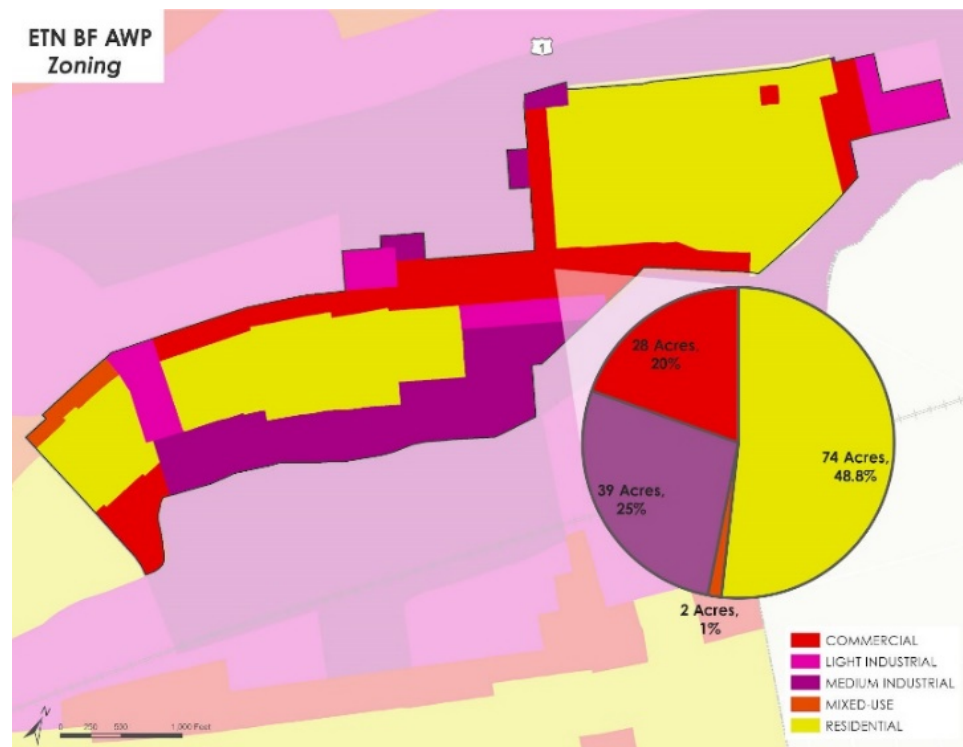


Figure 12: East Trenton Zoning. Source: ISLES

The lower North Clinton commercial area is a southwest gateway to the neighborhood, while the upper Mulberry St. commercial district the northern gateway. The largest of the neighborhood's three commercial districts is the upper North Clinton commerce district. It serves as East Trenton's center point, where two main roads, North Olden Avenue and North Clinton Avenue intersect. This is the heart of the neighborhood, mostly zoned for commercial and residential use, and is where many institutional and community assets are located.

4.2.2. Community & Neighborhood Assets

The neighborhood's community assets – churches, community centers, schools, and parks – are scattered across its extent. Various institutional, commercial, and recreational spaces provide residents with many of their basic needs. A handful of schools, churches, and community centers are some of the institutional establishments that serve the community. While Taylor Pork Roll and the Trenton Blacksmith are two of the area's most well-known businesses, there are also a good selection of eateries, bars, convenience stores, auto repair shops, and more. One thing that is absent is a supermarket, places to buy groceries are limited to small convenience stores.

There is little open space within the neighborhood; the only planned park is Sonny Vereen Playground, which has a ball court, small playground, and some basic amenities typical of an urban park. George Page Park and Hetzel Field lie along the neighborhood's perimeter, where it meets the Assunpink. Both are between a five- and fifteen-minute walk from any given point within the neighborhood. George Page Park is mostly an open expanse of lawn with a small memorial plaza, scattered picnic benches, and a playground. Across the Assunpink Creek at Hetzel Field are two baseball fields, a

public outdoor pool, and a path around the perimeter of the property with a small pedestrian bridge over the creek that connects to the George Page playground.

Between these three larger parks, and two smaller ones, there is a lack of open space for East Trenton's nearly 4,000-person population. All together, they make up only 8% of the neighborhood. UN-Habitat, a United Nations program for human settlements and sustainable urban development, calls for cities to have between fifteen and twenty percent of land dedicated to open space.³⁵ To reach twenty percent, roughly 30 acres of open space would need to be added. There is a long way to go to reach this minimum, but with a 100-acre greenway in the works, the goal will hopefully be reached sometime in the next decade.

4.2.3. Infrastructure survey: Areas of Concern

An infrastructural survey conducted by ISLES and the ETC surfaced areas of concern along the streets and sidewalks of the neighborhood. The map shows potholes, sidewalk deterioration, and areas where tree and lamp post maintenances are needed (Fig 13). Most of these concerns are under consideration within the area-wide plan for future maintenance. Only a few of these points are along the greenway, but they all still directly affect its network accessibility to surrounding assets.

³⁵ Scruggs, "How Much Public Space Does a City Need?," *Next City*, January 2015, <https://bit.ly/3ks8htJ>.

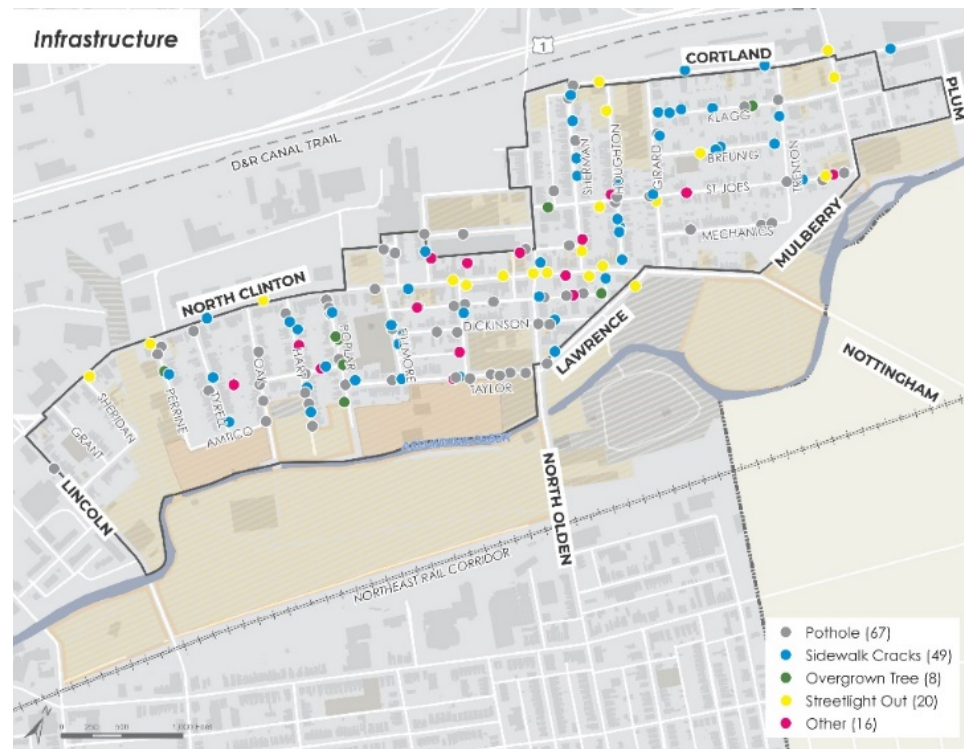


Figure 13: Infrastructure Survey. Source: ISLES

In addition to the creek-side sites sometimes experiencing floods, regular rain events also create flash floods along neighborhood streets, frequently disrupting traffic.³⁶ Of the several major flash flood areas along neighborhood streets, two are located along Nottingham Way, one of which is located right at the busy intersection. Flooding is a major issue along the creek banks where stormwater does not drain quickly enough. This was addressed in the planning and design of Nottingham Way.

³⁶ ISLES Et al., “East Trenton Neighborhood Brownfields Area-Wide Plan [Draft],” May 2020, p. 64.

4.2.4. Traffic, Circulation, & Lack of Walkability

East Trenton has hindrances to safe and easy travel. The roadway infrastructure does not support the type or quantity of vehicular use. Large trucks going to and from remaining factories and warehouses blocks traffic. Auto shops cause clutter in the streets with client's cars parked along the roads and sidewalks. These conditions make driving through the neighborhood difficult and unsafe.

There is also a lack of adequate parking that worsens the busy, congested streets and limited public transportation. This leaves many locals to rely on walking or bicycle to get around. Young students travel on foot to get to school. So, the poor planning and deteriorated condition of the streets make vehicular and pedestrian travel difficult and unsafe. The success of the greenway and development of the community depend on circulation and street infrastructure.

It will be important to consider higher volume of travel through peripheral gateways and main roads. On top of this, for the greenway to function as part of a larger network to surrounding parks and trails to support bikers, joggers, and the like, a closer observation of walkability and bike lanes is crucial. Nottingham Way Area itself is split into three parts across two different roads, and the current feasibility to cross a recreational from one space to another along a tight three-way intersection is unimaginable.

4.2.5. Community Outreach

ISLES in collaboration with the ETC conducted a mix of community meetings, focus groups, on-site workshops, and neighborhood block parties to educate and engage the community. Valuable input was documented, while the greenway plans were promoted. Information, knowledge, and opinions were both shared and collected during the two brownfield tours at four locations along the greenway. Two community design workshops were then held just a few days after the brownfield tours that attracted a small crowd of people to each. The charettes began similarly to the tours in that participants were briefed on the project, then a discussion was conducted before everybody broke into three groups to work on designs for different parts of the greenway. Nottingham Way was the focus of one of the three groups during each workshop.

There were a mix of site-specific interests and concerns for the Nottingham Way area. Some specific interests included ideas for programming, permanent uses of the rehabbed buildings and structures, and connections that could be made between the park and surrounding institutions. A desire expressed for inclusion of music and arts is something that the park could fulfill, as well as a pedagogical aspect that touches on both industrial and African American history. The nearby Woodrow Wilson school is just one institution that could use something like an environmental education center, which is something allowed for the repurposing of the building according to the Green Acres program. There was also discussion of mini golf, and dirt biking. More than one mentioned the need to fix up Red Oak Park, both by cleaning it and improved seating. In addition, a few concerns were expressed, first that any entertainment infrastructure could be damaged by flooding, and second that too many projects were being taken on at once.

4.3 – Political

In 1850, Trenton's ward map had just two wards; east and west. The city was about half the current size, with East Trenton just outside of the northeastern arm of the east ward. Another map published in 1890 displayed eleven wards, labeled one through eleven, with East Trenton in the eighth ward. Trenton's current political map has four wards: north, east, south, and west. The East Trenton neighborhood is in the north ward. These maps are redrawn every ten years in accordance with U.S. census figures and used to delineate the governing boundaries. A council member oversees each ward, and acts as the representative who makes decisions for neighborhoods within their ward.

Some wards have a suburban makeup, and others are urban. Some are well developed and others in distress. These variations reflect redlining decisions in the 1930s, with green, "best" areas located within today's west ward and redlined "hazardous" parts of the city fell within the north ward. The north ward had no area that ranked within the top two tiers. The east and south wards were mostly yellow, "definitely declining" patches, with bits of blue "still desirable" areas scattered throughout.

Even though redlining was banned with the Fair Housing Act of 1968, East Trenton and much of Trenton's downtown center experience its aftereffects. This is evident in the lack of economic development in redlined areas, as well as the neglect by politicians in positions of power over the last several decades. For this reason, the Assunpink Greenway project is an essential piece to the efforts to realign historically discriminated neighborhoods with equity and fair opportunity. Designing and planning public open spaces, and the rehabilitation of street and housing infrastructure are part of a broader response to these inequalities.

4.4 – Economic

As a result of devaluation of many Trenton neighborhoods, the economic state of East Trenton is left with all but promising statistics, especially in comparison to state levels. Limited opportunity is left for the community, leaving them to confront many economic challenges without necessary experience or finances. Planned open space such as an Assunpink Greenway Park will not be able to address the myriad of economic concerns, but it would enhance the neighborhood's sense of identity, establish more recreational amenities, and benefit community health, all of which are contributing factors to the general economic state.

Lack of proper education makes economic determinants such as well-paying jobs and homeownership difficult to obtain. Unemployment is 10%, median household income is very low, and percentage of families living below the poverty level is high. The less visible economic barriers have created a snowball effect that is impossible to break out of. Trenton's physical barriers are also a limiting factor for job prospects and overall community growth. Since Route 1 cuts right through the city to both suburban Pennsylvania on the one side and New Jersey suburbs on the other, getting to and from Trenton's governmental district is a breeze for more affluent outsiders with better means of travel. Therefore, work within the governmental district, where many of the city's jobs are located, is snatched up by people living outside of Trenton, leaving little economic possibility for locals with job qualifications.

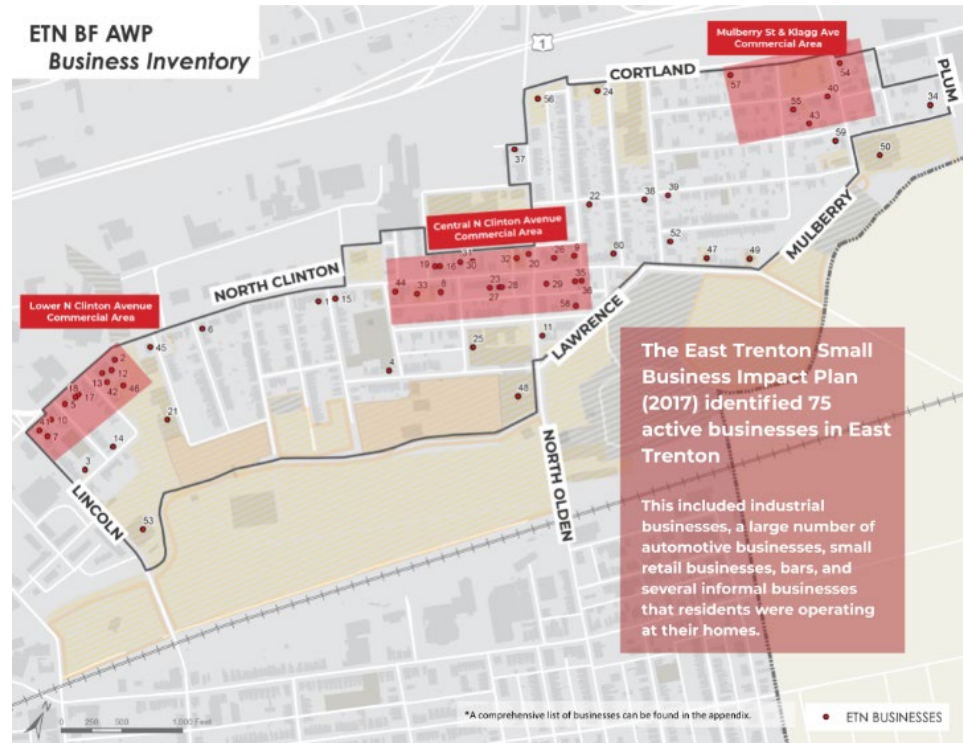


Figure 14: Business Inventory. Source: ISLES

This is not to say East Trenton residents do not work – many of them are employed and there are an impressive number of small local businesses. An inventory map created for a Small Business Impact Plan shows seventy-five East Trenton businesses that were active in 2017, many clustered within the three commercial zones, several others are scattered about as well (Fig. 14). The map includes a wide variety of business types including industrial, automotive, retail, as well as several informal ones operated from within homes. Within these businesses are also a handful of bars and restaurants, most of which have little opportunity for outdoor dining within such dense streets and narrow sidewalks. In a time when the restaurant business has been turned upside down by a pandemic and outdoor dining is the only solution, flexible outdoor spaces in parks could be transformed into pop-up markets, eatery vendors, or food trucks

to allow many of these places to remain in operation. Not only could Nottingham Way offer more than enough space for these types of things in nice weather, but would create opportunity for larger neighborhood gatherings, which are already popular within the community, inside a more natural, calming atmosphere.

Home ownership levels are also very low – the historic inability for residents to own their homes has led to high rental rates. In 2018, almost as little as 30% of homes in East Trenton were owner-occupied, down 10% from 2000. With locals not able to invest in the housing stock, outside investors are attracted to purchase buildings and rent to lower-income residents.³⁷ To save money, both investors and homeowners often defer property maintenance, which has left many buildings and lots in a state of disrepair. It has also made for a highly unstable property market that has lots of vacancies, crime, and other problematic conditions.³⁸

The state of vacant housing and properties is a major economic consideration. A Vacant Property Survey, created in 2019, creates a visual reference that contrasts vacancies in more vibrant colors against other, non-vacant uses in more neutral tones (Fig 15). This is a very useful map, because it plainly states the overwhelming mass of vacant, neglected, and in some cases dilapidated properties. The vacant areas consist mostly of empty lots, but also include dozens of abandoned homes, storefronts, and other buildings. The map's downside is its deceptive representation of Nottingham Way. Both Clinton Commerce Center and Storcella are classified as "Park / Open Space," just as the adjacent existing parks are. This may either be a misrepresentation, or because of the

³⁷ ISLES Et al., "East Trenton Neighborhood Brownfields Area-Wide Plan [Draft]," May 2020, p. 23.

³⁸ Ibid.

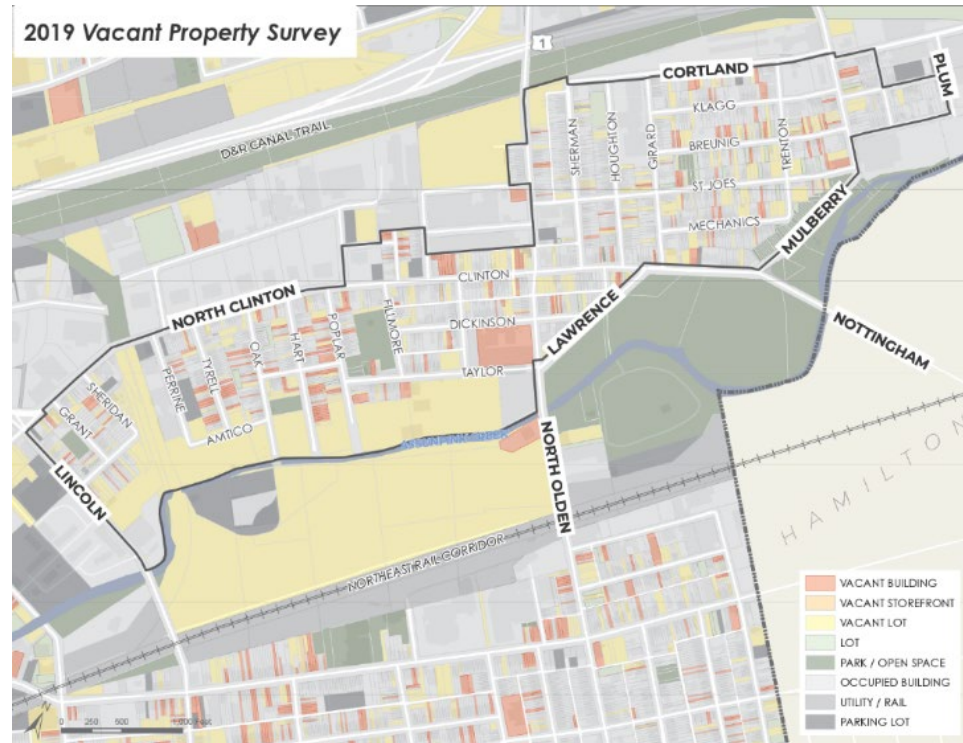


Figure 15: Vacant Property Land Use Map. Source: ISLES

small stints of work – mostly investigative – that have been recently executed. Either way, the two properties account for 5% of the combined neighborhood and proposed greenway site area, which is a significant amount to represent as open space when it is still contaminated and should be kept vacant until remediated.

A large swath of future greenway land is rail-owned by NJ Transit, but the city also owns or has been able to acquire dozens of vacant properties within the proposed greenway and neighborhood itself. Shown is an existing ownership map, and while it does not categorize each property throughout East Trenton, rail-owned and city-owned properties are highlighted (Fig 16). A useful reference and planning tool for the greenway, it represents which spaces the city has most authority over, presenting them as the best contenders for repurposing or revitalization efforts. NJ Transit, a major railway

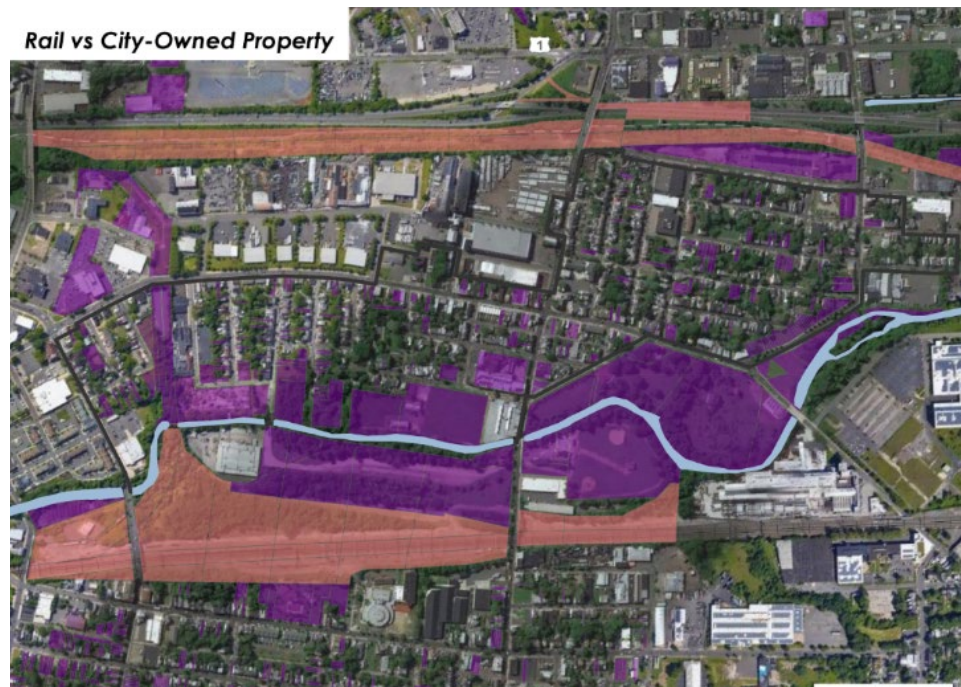


Figure 16: Ownership Map. Source: ISLES

company for the state, also owns a large portion of greenway land adjacent to the Northeast Corridor line, much of which has been vacant for years. It is unclear whether the city will be able to obtain parts from them at any point, but for the time being, obtaining access with easements is the best option.

As for the Nottingham Way properties, a portion of the land was purchased in 2005 with the help of a Green Acres grant from the NJDEP. This allowed the city to afford CCC and Storcella with only 2% interest, however there are rules and regulations that limit what can be done with the properties. The standards for outdoor use is more relaxed than for any indoor activities or facilities, which must be programmed to support

the outdoor uses. This means that any repurposed use of the buildings must serve as an extension of the outdoor ecological landscape and passive recreational opportunities.³⁹

4.5 – Environmental

Every year, climate change is more of a concern for major cities, especially those located along major water bodies. Both the Delaware River and the Assunpink Creek have caused serious flooding and significant damage to Trenton, a trend that will continue even more so into the future.

Parts of the greenway and the neighborhood are located within flood-prone areas (Fig 17). While stormwater frequently collects along East Trenton roads, its regular impact on homes and infrastructure has been mitigated. The main concern lies in the

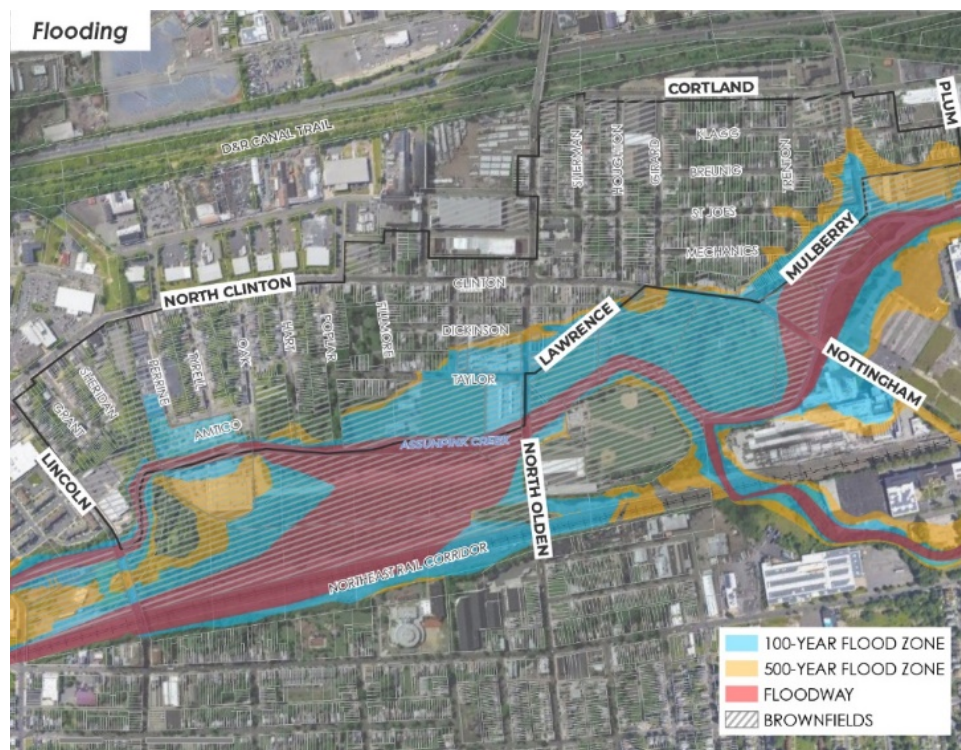


Figure 17: Flooding Zone Map. Source: ISLES

³⁹ Yasenchak, Personal Interview, 07 February 2020.

planning of any future development within the regulatory floodways or 100-year zones. This encompasses all of Nottingham Way, and requires that any potential future uses – programming, infrastructure, building rehabilitation – be planned accordingly. Increasing the capacity for resilient communities and cities should be a major goal. Many strategies can be employed to address ecological and environmental stressors, which also facilitate resiliency to “social, economic, and technical systems and infrastructures so as to still be able to maintain essentially the same functions, structures, systems, and identity.”⁴⁰

Contamination is another concern. During floods, silt that washes up from the creek bed carries toxins, depositing more into the already contaminated soil. Contamination must be addressed- most pressing, the myriad of chemicals and heavy metals in the top several feet of soil layer. The use of historic fill across the greenway and parts of the neighborhood contributed to the number East Trenton brownfield sites. Coal ash in these soils contains polycyclic aromatic hydrocarbons (PAH), a group of more than 100 cancer-causing chemicals. This historic fill is the most widespread reason for contamination across the greenway sites.

The two Nottingham Way sites have a long history of industrial and manufacturing use with a complex contaminant brownfield inventory. The sites have a wide variety of toxins, including PAH’s, PCB’s, and heavy metals. Each has been thoroughly measured and analyzed, with one area excavated and capped already.

Trenton’s brownfields coordinators have not yet devised a remedial plan but are in the process of obtaining alternative remediation standards (ARS) for the sites. If

⁴⁰ “Resilience,” Resilient City, Accessed 15 August 2020, <https://bit.ly/2Iy7JFm>.

approved by the NJDEP, “...the concentrations of allowable contaminants on site [would increase] to a more realistic level for passive use,” based on a consent decree.⁴¹ The new standard would assume the sites be planned for passive recreational use only, while the current standards are based on residential use that involves much more frequent contact. This is the most cost-effective scenario because it would require less hotspots to be remediated and would help realize a park more quickly.

Flooding and contamination are challenges to the process of implementing a park in addition to funding design, construction, and management. Yet other characteristics of the sites make it a great location for a park.

Topographic conditions were considered and mapped first to create elevation contours that serve as a base for the other environmental sub-criteria. Completed by

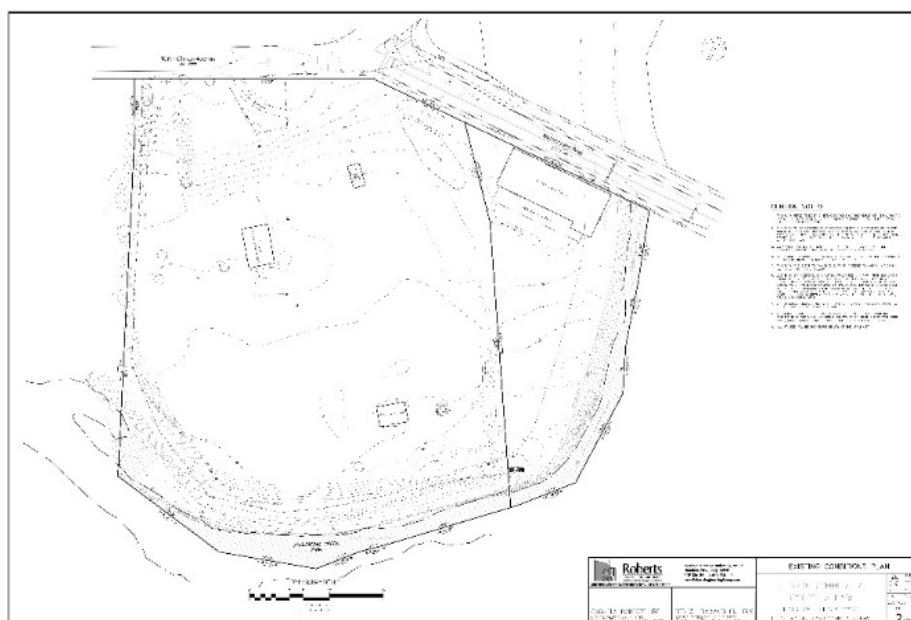


Figure 18: Roberts Topographic Survey, 2018. Source: The City of Trenton

⁴¹ ISLES Et al., “East Trenton Neighborhood Brownfields Area-Wide Plan [Draft],” May 2020, p. 109.

Roberts Engineering Group LLC in 2018, a survey map indicates site elevations, existing infrastructure, and other details about the sites and their immediate surroundings (Fig. 18). Elevation data was extracted and used to create a strictly topographic map. Contour lines were interpolated so every line would represent one foot. Most of the terrain is relatively flat, gently graded toward the Assunpink until nearly the edge, where a berm sits. The berm runs just along the backside of CCC along the creeks edge, is much longer than it is deep, and only sits about five feet above ground level. On the other side, the creek bank drops down several feet to water's edge, which is also a wetland. Along with these more drastic land formations, the berm transforms into the higher land of George Page Park, creating a several-foot incline between it and CCC that runs along their border. None of these elements of the sites' topography are cause for concern and blend well within the design.

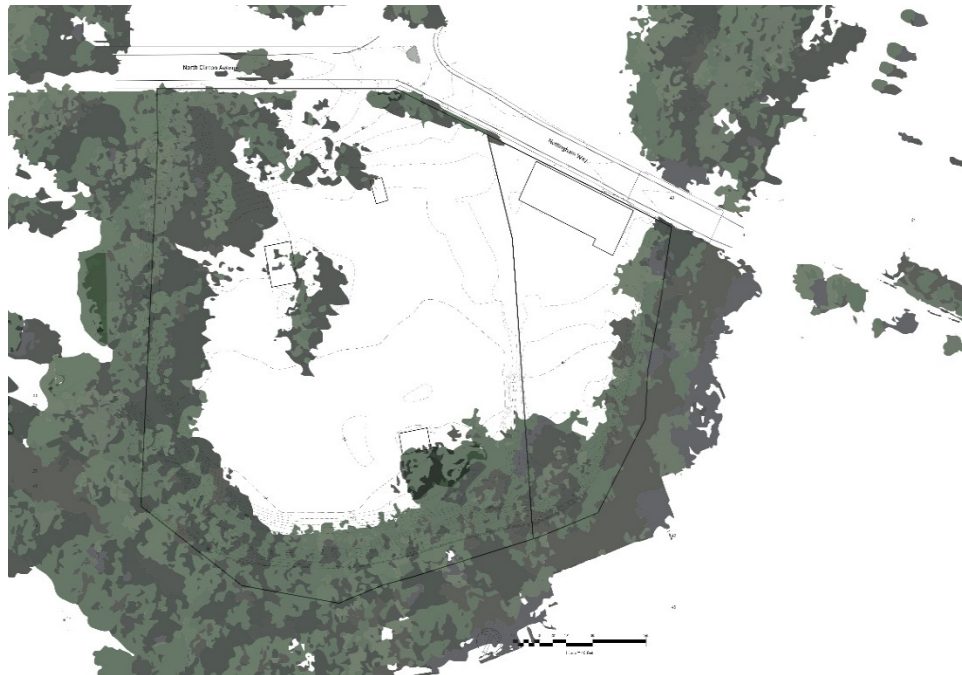


Figure 19: Tree Canopy. Source: Author

The topography set a base for different layers to form maps of other environmental sub-criteria. Patches of forest along the creek and between CCC and George Page Park is indicated on a canopy layer map that was created with extracted imagery from Google Earth (Fig. 19). Since the design aims to keep as much existing vegetation intact as possible, the canopy cover map highlights which areas will be treated as forest, and which as brushland and meadow. Another vegetative map by ISLES shows types of natural landscapes throughout neighborhood and greenway, which considers Nottingham Way as deciduous brush and shrubland, with a strip of deciduous wooded wetlands back along the Assumpink (Fig. 20). Between these two, a layout plan for vegetative community management is formed that can address enhanced health and

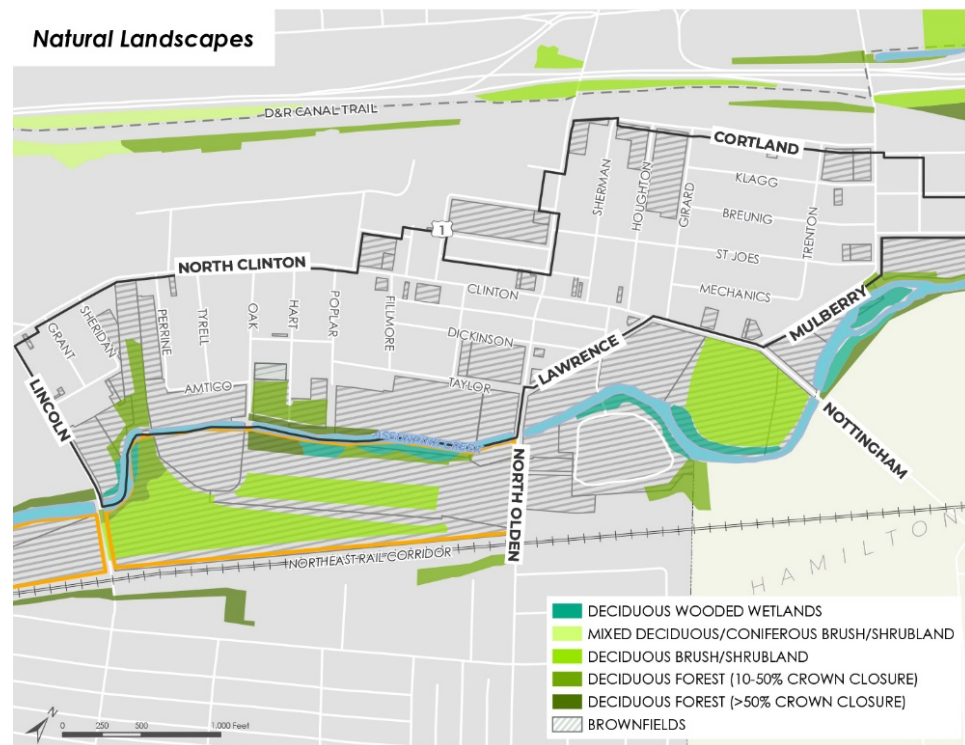


Figure 20: Vegetative Cover. Source: ISLES.

diversity of the spontaneous, vegetative communities found at the site, as well as a management plan for invasive species.

A second, similar ecological “Wildlife Habitats” map by ISLES depicts East Trenton’s patches that are already supporting certain, beneficial forms of wildlife (Fig. 21). It is comprised of two ranks: Rank 1) Habitat-Specific Requirements, and Rank 4) State Endangered Species Habitat. Area designated for habitat-specific requirements accounts for a buffer of a few hundred feet along each side of the Assunpink. This land is representative of areas meeting “certain suitability requirements such as minimum size or core area criteria for endangered, threatened, or special concern wildlife species, but that do not have any confirmed occurrences of those species.”

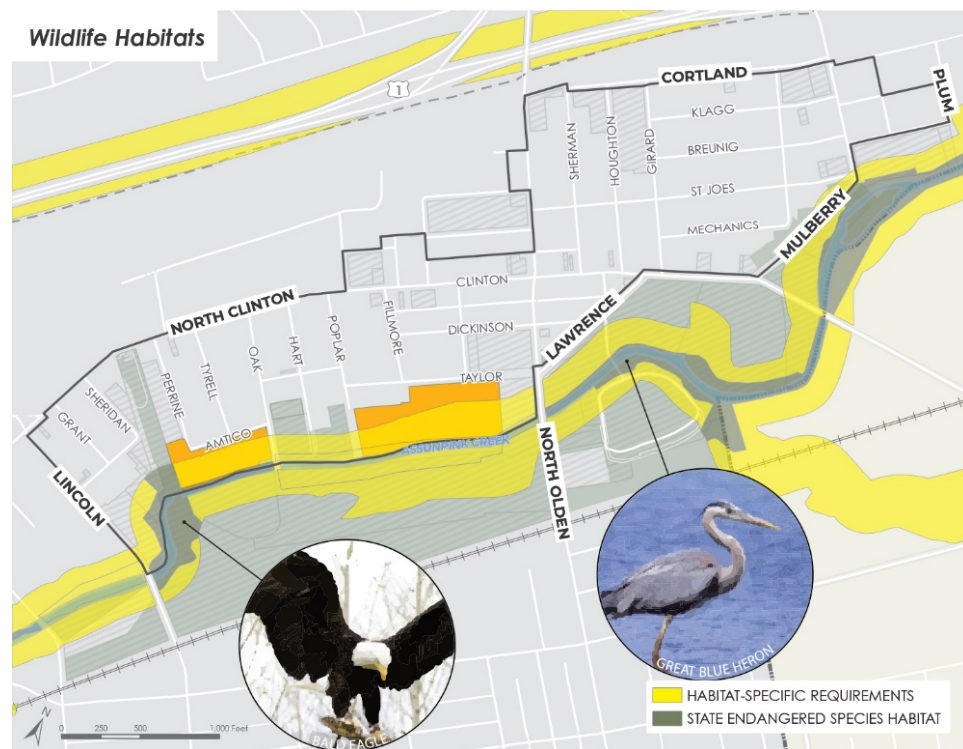


Figure 21: Wildlife Habitats. Source: ISLES

State endangered species habitat is of a similar makeup as rank 1, but with confirmed sightings of NJ endangered species, such as bald eagles and the great blue heron. “The Rank 1 and 4 designations by NJDEP indicate a special attention to the surrounding Assunpink Creek due to either evidence of a species population decline, inherent vulnerability to environmental deterioration, or habitat modification that would result in a species becoming threatened.” While such extreme habitat fragmentation continues to happen every day, remaining patches such as these should be treated with respect and interest in possibly expanding where possible. Many more elements of environmental criteria could be incorporated, but these few hit all bases of importance and highest relevance to the sites themselves. Whether a challenge or opportunity, the above data has great influence on the sites’ planning and design.

Chapter 5: Analysis

5.1 – Initial On-Site Impressions

Documentation of initial visits to the neighborhood and different greenway sites emphasized Nottingham Way as a perfect contender to be used as a catalyst site and next location for design implementation for the greenway. Clinton Commerce Center and Storcella, visible to the constant flow of traffic, easily grab attention with their two steel frame structures and provoke wonder. Densely vegetated, the two properties contain a myriad of vegetative typologies and ecological communities.

The proximity of the five disconnected Nottingham Way properties creates the potential to bring lasting change to the intersection through a well-connected, cohesive plan. Adjacently connected to the north and across the street are the FEMA lots on one side, with Scarpati and Red Oak Park on the other. South of Nottingham Way lie George Page Park and Hetzel Field, divided from CCC and Storcella by fencing, forest patch, berm, and the creek. Opening these physical barriers to create flow between the parks and Nottingham Way, a significant portion of the future Assunpink Greenway Park sites would be melded together to establish a strong network of active and passive recreational opportunities, transitioning the area from just a transit node into a gateway hub.

The three streets that converge at the intersection are also physical barriers. Safe and easy pedestrian movement between sites as well as to and from the neighborhood presently is not a priority within the current roadway infrastructure design. Along with planning and design of the sites themselves, the street and transportation network in and around the sites should also be emphasized. If approached in accordance with guidelines

such as the “Complete Streets Initiative,” the entire right of way could be designed and operated to “enable safe access for all users, regardless of age, ability, or mode of transportation.”⁴²

5.2 – Neighborhood Synthesis Map

In the first step of analysis, a synthesis map was created that layered important components reviewed up to this point together into one document (Fig. 22). It was used as a tool to demonstrate and further understand the five greenway sections, the neighborhood, and how they communicate with each other and their surroundings. Hatched with white diagonal lines and outlined in green display the five sections: from left to right they are Amtico Square, Fisher and Pukala, the Freight Yards, 104 Taylor,



Figure 22: Neighborhood Synthesis Map. Source: Author

⁴² “What are Complete Streets?,” *Smart Growth America*, Accessed 09 September 2020, <https://bit.ly/38DyTpi>.

and Nottingham Way. In the Brownfields Area-Wide Plan, Amtico and Taylor are the two catalyst sites, while the rest are “Strategic Brownfield Areas” ⁴³

Through the suitability analysis this project partook, Nottingham Way was highlighted as an optimal candidate to serve as a catalyst site. Its properties straddle one of the neighborhoods six gateways, they are centered around a significant circulatory node, and lie adjacent to the northern residential mass and two commercial stretches. Also, merging and expanding the three existing parks within the Assunpink Park boundary would unify one-third of the proposed 99-acre park, and act as a teaser for what is yet to come.



Figure 23: Enlarged Synthesis Map. Source: Author

⁴³ ISLES Et al., “East Trenton Neighborhood Brownfields Area-Wide Plan [Draft],” May 2020, p. 82.

Within the neighborhood itself there are three commercial districts, overlaid with a blue rectangle, between which two distinct residential corridors lie. Dispersed evenly among the top and bottom are six main gateway entries which, shown with white arrows, are where majority of traffic into and out of the neighborhood travel through. Another main component of the map is the four white circle symbols that represent where the neighborhood's four nodes of highest activity are located. Each of the top three nodes are situated within one commercial corridor, while the fourth is situated at the most northeast of the five greenway sections, a much less densely developed Nottingham Way.

Historically significant, the node lies along the same three-way intersection that the entire neighborhood and surrounding areas were first developed around. Less of a destination point for commerce than it once was, it now serves as a thruway for pedestrian and vehicular travel. Prime location for the return to an accessible and productive landscape.

All other greenway properties that are adjacent to higher-traffic road arteries are difficult to catch a glimpse of while passing by. Views of Nottingham Way are less obstructed so any developmental changes here would get the most attention and visibility. Designing and implementing a new plan for the heavily trafficked area could help market the greenway project by sparking interest, spreading the word, and increasing support of locals and visitors. This is a major consideration, and one that does not apply to either of the current designated catalyst sites.

Another more likely vision of system's connections is planned connections to and from the D&R Canal Park Trail (Fig. 24). The canal trail that once yielded access for boats between the Delaware and Raritan rivers is now repurposed as a 65-mile recreational trail that links New Brunswick to Trenton and further continues up the Delaware to Frenchtown. The trail is part of a much larger planned route for along the entire east coast known as the East Coast Greenway (ECG), which "connects 15 states, 450 cities and towns, and 3,000 miles of people-powered trails from Maine to Florida — the country's longest biking and walking route." ⁴⁴ The route, a combination of gravel trail, paved trail, and roadways, sets the stage for a future ECG developed entirely of recreational pathways. An extension through the Assunpink Greenway would expand the ECG's mass of paved pathway for those traveling through by bike. While much from within the criteria layers had to be left out of the synthesis map, it communicated enough to transition the project into analysis and support the decision to use Nottingham Way as a prime catalyst site and next property to come up with a design plan for.

5.3 – Setting the Narrative: Nottingham Way

The most pertinent pieces for the future of Nottingham Way Park are its current social and environmental conditions, and the narrative of events leading up to the present. This narrative, which began where white settlers first encountered the land, can be portioned into three main chapters, or building blocks: industry, vacancy, and the present day. The most blatant factor of influence is the old industrial infrastructure left behind on the CCC and Storcella properties. Alone, the structures inform a significant portion of the

⁴⁴ "East Cost Greenway Map," *East Coast Greenway*, Accessed 20 September 2020, <https://bit.ly/38D8fNm>.

site and neighborhood's first building block. Their second building block, also represented physically but in a less blatant manner, is seen in the spontaneous vegetation and wilder, post-industrial aesthetic. This atmosphere of the space gives it a certain feel that speaks to the abandonment and neglect experienced by the greenway properties and neighborhood. The third and final building block is ongoing. Written in part by the neighborhood's current demographic and networks in place, and in part by the wants and needs expressed by the community – both overtly and covertly – it is a synthesis of all that has been touched upon until this point, manifested into a design and phasing plan for the space to capture and display its own narrative.

The period where Nottingham Way was commercially and industrially engaged was very formative, conditioning the properties with complications, leaving behind industrial ruins of another era, only to become one day vacant. After the rubber and chemical manufacturing that occurred from 1851 through the mid-20th century, the buildings at Clinton Commerce Center and Storcella began to house various tenants who repurposed the buildings for things like automobile repair, a wood shop, and production of electronics and fireworks.

After the City of Trenton acquired CCC in 2005, most of the site's buildings, structures and impervious surfaces were demolished in 2010, just three structures were left behind. One is an intact, mildly dilapidated but structurally sound, stone building. Another is the steel frame of what used to be a three-story stairwell for a building that is no longer.⁴⁵ The third is a second steel beam frame of another building originally part of

⁴⁵ LANGAN Et al., "Remedial Investigation Report Addendum," December 2018, p. 942.

the late rubber production complex. The two steel frames were stripped of their façade and had their bones rehabilitated when the rest of the infrastructure was demolished.

This brings us to the third chapter which is in the midst of being written. The Green Acres Program by the NJDEP that funded the city's purchase of the sites has influenced their potential development. Green Acres funding regulations note that any future use must support the outdoor uses of the sites. While dozens of acres of other greenway properties have been planned for active recreation, Nottingham Way is best suited for passive purposes such as walking, jogging, biking, outdoor classrooms, as well as enjoying and interacting with nature. The structures, then, will support such use. Not only do the structures communicate their history through their industrial-era manufacturing aesthetic – which should be further embraced if any modeling were completed – but they also provide space to serve as educational centers.

Another chance for visual gestures to the site's past lies in the neighborhood's growing mural collection. At the downtown intersection where North Clinton Ave. crosses North Olden Ave. has two beautiful murals from local artists on the side of buildings. If those artists, or any other local mural artists, were commissioned to bring their work into Nottingham way to embellish the exterior of one or more of the structures with visual reflections and commentary on past events leading up to the present, it could help tie neighborhood and greenway identities together. From the Great Migration, to the Industrial Revolution, and even things like redlining, the mural could serve as a visually symbolic timeline. This would be just one element of a theme of the park as a pedagogical landscape.

As Nottingham Way transitioned from the period of industrial to vacant, it took on a pronounced post-industrial aesthetic. Without any plan by landowner or involved entity, a portal to a new dimension of productive landscape was opened – spontaneous ecosystems.

Upon completion, the nearly hundred-acre greenway will offer more than enough recreational space for East Trenton residents and people from other nearby neighborhoods. Aside from locals, regional visitors will be welcome and the different greenway sections should be planned accordingly.

With a large youth and young adult population present in and around the area, courts, fields, and play equipment will be a big part of the overall park. Much of the other four sections have larger expanses of open lawn than Nottingham Way that would be great for sports complexes. The Area-Wide masterplan has delineated much of these spaces for active recreation spaces leaving Nottingham Way open to other possibilities. In the greenway masterplan document, a large portion of the other greenway sites will be turned into active recreational amenities in the years to come, enough to satisfy the needs of surrounding residents and allow for Nottingham Way to be programmed for passive recreation.

5.4 – Systems, Networks, & Programming

Aside from capturing the history through aesthetics, atmosphere, and programming, the local social, cultural, ecological, and environmental systems inform the creation of a place-based design for a series of public spaces that make up Nottingham Way Park. Perhaps most influential are the social needs of the community, as they are

who will ultimately be occupying the space. For this, it is important to look inward into the neighborhood's existing cultural systems.

Perhaps the most frequently expressed interest that came from the engagement exercises with the community was somehow integrating the local music and arts scene as a prominent feature within Nottingham Way. As far as music goes, whether it's a night of jazz at the Candle Light Lounge, DJs and open mics at Trenton Social, or the underground music scene that frequents the Mill Hill Basement, the city's musical roots run deep. The local art scene can also be experienced in many shapes and forms.

A traditional approach would be to explore exhibitions at the Trenton City Museum, BSG Gallery, or Homefront's ArtSpace. Then, just outside the city, a mile away from East Trenton, is a major New Jersey art space with a museum, sculpture garden, and arboretum known as Grounds for Sculpture. If these possibilities were not enough, the city also puts on an annual 24-hour art event, Art All Night, hosted by ArtWorks Visual Arts Center, which draws in visitors from all over the state and beyond.

Aside from these official establishments and occasions, one can find artists' creations right in downtown East Trenton. Two murals and an artist-created bicycle fence are visible from the East Trenton Collaborative. Infusing Nottingham Way Park with influence and essences from these events, pieces, and places, would give the park a new, productive purpose. In the post-COVID era, it will be especially important to plan outdoor alternatives for once indoor-only activities. Grounds for Sculpture has already achieved this with their outdoor gallery display rooms for sculpture art. This could serve as foundation for what Nottingham Way Park's inclusion of art might look like.

In addition to artistic connections between Nottingham Way and East Trenton's downtown, the park's proximity to local commercial, non-profit, and institutional entities would make programming the park for use by local establishments an easy connection to make. For years, East Trenton Collaborative has been responsible for hosting dozens of events and gatherings for its residents. Seniors bingo in the park, neighborhood cleanups, block parties, and participation in the event National Night Out are just a few of the many things that have been held in the past.

Other connections could go beyond just local community members and link to other networks. Churches and schools could hold indoor or outdoor events. The structure at Storcella could be given a new façade that is permanent on the second floor but has retractable walls on the first, so the space is flexible between indoor and outdoor. Classes could be hosted inside and outside for students at Woodrow Wilson Elementary School to spread awareness of and education about things like local history and ecology as part of the school curriculum.

Since two of the neighborhood's three commercial districts are within a five-minute walk of Nottingham Way, with many eateries within, extension of dining space outdoors into more atmospheric spaces could be made possible in warmer weather. By designing either a temporary space for the likes of food trucks, or a more permanent one with repurposed shipping containers, local cuisine could be readily available for commercial or institutional events, neighborhood gatherings, or just during busy summer weekends or afternoons.

Aside from a desire to see inclusion of music and arts into Nottingham Way, other main concerns and interests need to be addressed. First, although establishing

Nottingham Way Park would annex existing Red Oak Park into its boundary, the park has not been well maintained and could use a design overhaul. Not only do benches need replacing, vegetated areas need maintenance, but there it is possible to further open up the bank to look out onto the creek. Second, there was interest within the community to see the linear stretch of FEMA lots, currently just open lawn, to be an extension of Grounds for Sculpture. Since all five Nottingham Way sites will be used in large part for passive recreation, outdoor gallery rooms with sculptures and works of art could be incorporated into the entire site.

Anybody passing through on the greenway trail would only get a small glimpse of the sites' ecological communities. In addition to serving as a recreational connector piece for greenway trails, additional trails within the park would make it possible to walk or jog through the site. A frequent concern raised is that many folks from the community have negative associations with wilder landscape such as that which the final design may assume. By drawing visitors through different spaces and outdoor rooms, enticing engagement with the subtle charms of nature would hopefully help rekindle positive connections with the environment.

With social opportunity also come restraints and challenges. The most imminent threat comes from the vehicle-centric nature of the intersection. A trail for bikers and joggers through the greenway sites with a possible connection to the D&R Canal Trail would cross and run along roadways at various points. For this to be successful, users must experience it with a sense that it was meant to be done. Adequate wayfinding, shared lanes, and multiple safe crossing points are just some of the features that would

allow North Clinton Avenue, Nottingham Way, and Mulberry Street to be considered more complete, pedestrian-friendly streets.

After the removal of several buildings and majority of impervious surfaces, Clinton Commerce Center and Storcella were given even more freedom to accumulate pioneer vegetation and wildlife habitats. The sites are filled with a rich and diverse ecosystem that is made up of three landscape typologies: forest, forest edge, and meadow. The forest runs along the creek, between CCC and George Page Park, and along North Clinton Avenue for a bit. Across much of the center is mostly meadow, with young saplings scattered here and there. Between the meadow and forest is a buffer of forest edge, where more a shrubbier and brush-filled layer exists.

The effect felt by this layout is that the space feels almost enclosed, sectioned off by either tall trees or traffic, with a wide expanse of low-growing plants throughout the middle. And while some of the vegetation within these three distinct ecological communities is categorically invasive, a large portion of it is not and could be beneficial to maintain within a planting plan for the sites.

Another consideration is how the planting plan could be created in accordance with the site's contamination records. While some toxins will be either excavated or capped, some may be left in the soil. And while they might not necessarily be a risk to human health, there is still the chance that they could be removed over time through phytoremediation. After an initial report from 2012, the most comprehensive contamination report to date was completed and released in 2018. The document, produced by LANGAN Engineering and Environmental Services, Inc., titled "Remedial Investigation, Action Report, and Workplan" focused strictly on Clinton Commerce

Center. Before the investigation, previous work outlined a general understanding of what toxins were present, but this report provided detail of where hotspots were located, possible causes, contamination levels, and more. The most serious contaminants fall under the categories of either polynuclear aromatic hydrocarbons, petroleum hydrocarbons, polychlorinated biphenyls, and various heavy metals. The report ended with conclusions and recommendations and has given the city a much better idea of what levels of remediation they are faced with.

Officials from the city are still in the process of coming to a settlement on alternate remediation standards (ARS) for the sites, which will determine how serious of a remediation job will be necessary. A similar planning and remediation process has been underway at Jersey City's Liberty State Park over the last couple of decades, where a consent decree was put into effect where standards were changed to allow public access for passive recreation. The consent decree laid out the terms of explanatory signage needed to provide warning for the site's visitors about the presence of contamination, instructing them not to cause any disturbances to the soil.

Recent visualizations that LANGAN created showing the most pressing contaminants in accordance with the proposed ARS informed a heat map created to demonstrate the areas of highest importance (Fig. 23). The map only shows contamination found at soil boring points, not data from ground water monitoring wells, so it sets the stage solely for remedial management of site soils. The site's hydrologic contamination was not considered for this map because it is more difficult to pinpoint than the toxins bound to soil.

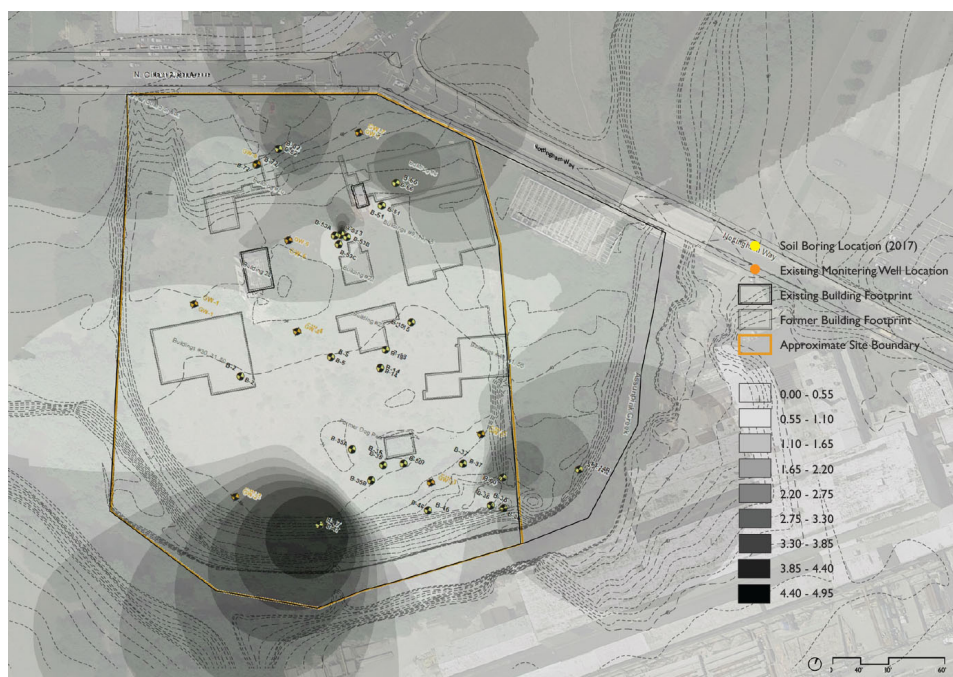


Figure 25: CCC Contamination Heat Map. Source: Author

That said, this heat map was created using the summation of the log transformed soil data, which then created a Ronil order based upon a scale of zero through five, zero being the lowest concentration and five being the highest. The toxins under consideration for remediation are a combination of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), heavy metals, and polychlorinated biphenyls (PCBs).

The heat map delineated five areas where the soil is most contaminated. Areas with levels higher than the proposed ARS would be remediated with either hotspot removal or capping, while areas that do not exceed the standards could use a combination of phytoremediation over time and a similar structure to that of Liberty State Park, informing visitors with signage. A combination of approaches such as this would be the most cost-effective and manageable solution.

After brownfield considerations, the other biggest environmental challenge for Nottingham Way is the creek-side flooding. The terrain of Scarpati, Storcella, and Red Oak Park is nearly as low as the average water level that all three falls within a regulatory floodway, frequently flooded during significant storm events. The rest of Nottingham Way, CCC and FEMA lots, are also flood-prone within the 100-year flood zone. While they are not as at risk, all five Nottingham Way Sites should be created with the assumption that one day they will be submerged in water.

Confronting this data means creating a park that is permeable and resilient. Hardscaped surfaces should only be used where necessary and constructed to be as permeable as possible. Plantings, especially within the regulatory floodway, should be flood-resistant and able to control erosion so they hold the soil in place, minimizing further movement of contaminants. The combination of highly vegetated land cover with constructed catchment areas would help with site permeability, helping them to act as a sponge and reduce encroachment of water into the street. Lastly, the three structures must also be designed so that they resist water damage.

Finally, it is important to note that attention has been brought to the lack of funding for maintenance of Trenton's public parks and spaces. Since the City of Trenton

has trouble keeping up with maintenance of its existing parks, Nottingham Way Park could be planned for very little maintenance. Through phased implementation with a goal of ecological designs that eventually regulate themselves, maintenance could be reduced to litter cleanup, emptying of trash, and recycling receptacles, and building upkeep. For landscape architects and city planners, an agenda to create such a place as the Assunpink Greenway Park only strengthens the possibility for economic growth. Amenities for recreation, programmable spaces, and periodical maintenance would all create opportunity to bring more income in to the community and create more jobs.

5.5: Case Studies

Observation of case studies was pivotal for the project's comprehensive design approach. As with many other professions, case studies inform, inspire, and provide important understandings and conclusions of past projects with similar contexts or which used a complementary research and design process. Within landscape architecture and design, case studies provide a historic basis for which design solutions were successful and others that proved otherwise. The case studies chosen – Brooklyn Bridge Park and Bethlehem SteelStacks Campus – have overlapping contextual conditions with the Assunpink Creek Greenway; adjacent to water bodies, soil contaminants, and a post-industrial. In each scenario, the conditions and challenges were uniquely approached, yet used a similar comprehensive process as this project does.

5.5.1. Brooklyn Bridge Park

Brooklyn Bridge Park (BBP) is a 1.3 mile long, 85-acre waterfront park located at the mouth of New York City's East River. Completed in 2018, it is recognized as a well-

established, post-industrial urban revitalization project. The park was developed by the Brooklyn Bridge Park Development Corporation and designed by a multidisciplinary team led by the landscape architecture firm Michael Van Valkenburg and Associates (MVVA).

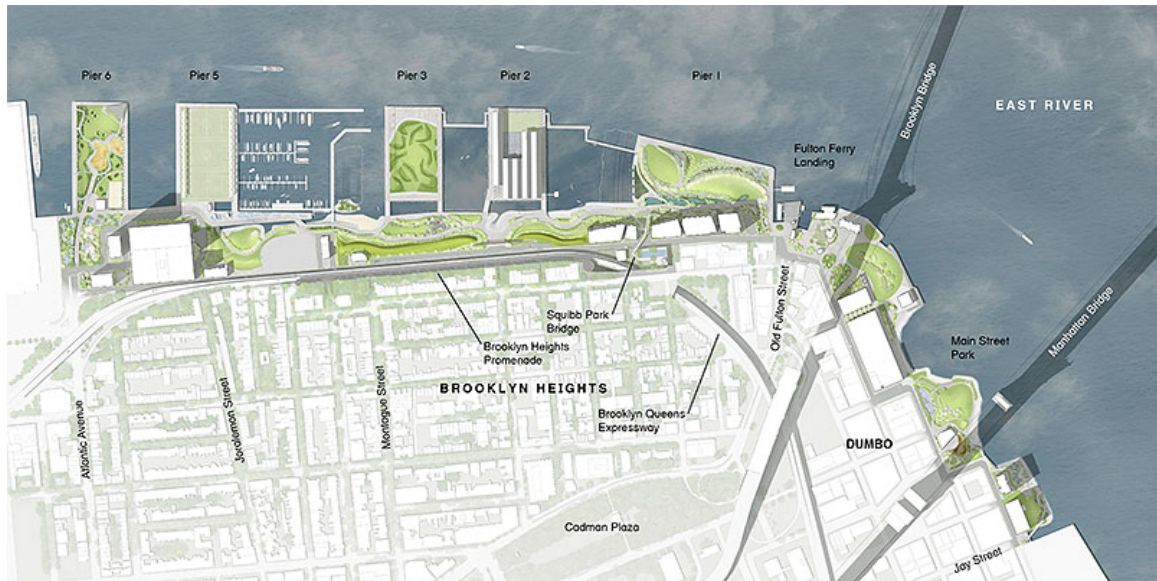


Figure 26: Brooklyn Bridge Park Master Plan. Source: MVVA

The park vision is to connect the past and the entropic nature of wild ecosystems and industrial ruins, aiming to “preserve the dramatic experience and monumental character of the industrial waterfront...”^{46 47} This is achieved through material selectivity and recycling, urban junctions and gateways, community engagement and flood protection.

⁴⁶ Raver, “Here Comes Everybody,” *Landscape Architecture Magazine*, December 2018, <https://bit.ly/2lu3ZVF>.

⁴⁷ “Brooklyn Bridge Park Master Plan,” *Michael Van Valkenburgh Associates*, Accessed 10 October 2020, <https://bit.ly/2Unosy0>.

Any new materials or fixtures that were introduced were purposefully simple and durable to withstand the urban coastal environment, in turn keeping with the aged, industrial aesthetic. Wherever possible, salvaged materials were incorporated, and intact building frames and marine infrastructure were repurposed and reinforced where possible. Site-specific plant material, materials sourced to match the aesthetic and play into resiliency, and interactions between the two were selected as another spectacle of the park. Material craftsmanship, design coherence, and the separation of intimately composed outdoor garden rooms from unpleasant highway noise and cool waterfront microclimate, are all elements that generate a pleasant, calm experience. It pulls the visitor away from the harsh urban landscape without feeling out of place.



Figure 27: Constructed Salt Marsh at Pier One. Source: MVVA

The site was as an industrial space tightly wedged between the East River and the Brooklyn Queens Expressway. After design studies and input, three points of public access, referred to as “‘urban junctions,’ nexuses of program and landscape were a lifeline to the surrounding neighborhoods. The public meetings supported the initial vision to reconnect and engage Brooklynites with the water’s edge in ways that were not possible for over a century. ⁴⁸ This became a major concept behind the park design and the creation of a network of edge experiences that would return opportunity for human interaction with the magnificent riverbank.

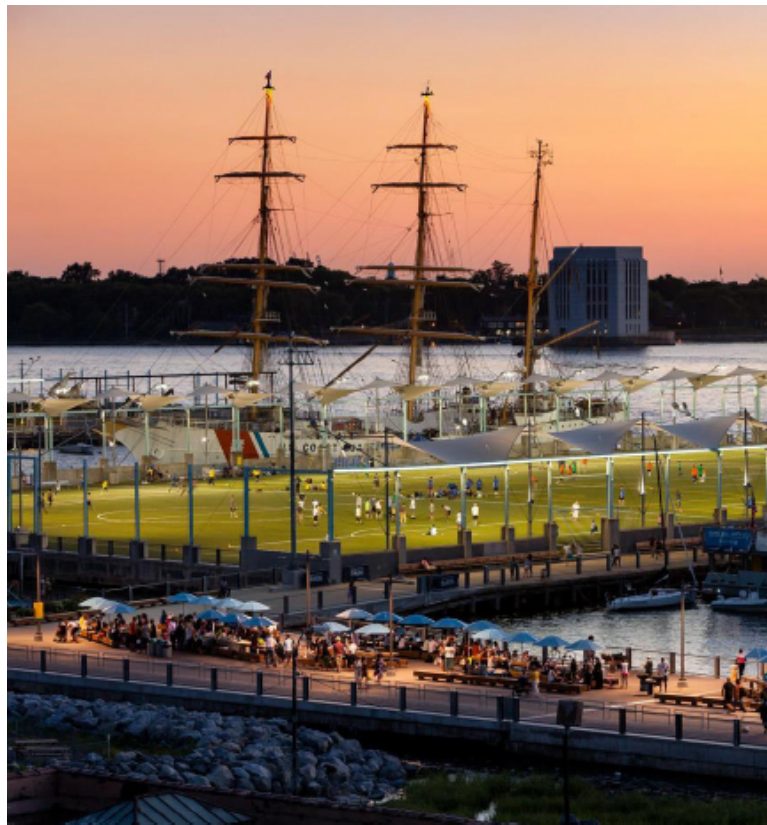


Figure 28: Pier 5 Picnic Pavillion and Sports Complex. Source: MVVA

⁴⁸ Ibid.

To keep the public informed on plans and progress, various forms of communication – presentations, mailings, site tours, and a park website – were developed. After close to 300 public meetings with landscape architects, community groups, and residents, the voices and visions from the community were expressed and incorporated into the plans.

Design Implications for East Trenton

In the time of rapid global warming, coastal cities look to implement parks and urban open space that have a higher level of expectation. Central to the BBP and East Trenton designs are the following questions: How can a park accommodate high levels of human activity and program within a resilient cityscape that reintroduces productive ecosystems and wildlife habitat? How is a park envisioned to mitigate storms, provide wetland re-creation, incorporate stormwater reuse, and build constructed ecologies to establish a dynamic threshold between river and city?

The holistic ecological awareness developed in BBP, where constructed ecologies are not designed as pure nature, but as part of an urban experience that “thrives in the heart of a populous city”⁴⁹ will be useful in East Trenton. For example, planted woodland patches that will evolve through succession and an extensive series of diverse micro-environments for stormwater-sustained ecosystems, can be used to minimize irrigation while mitigating runoff.⁵⁰ The BBP design also guides a viewer along the water’s edge, pointing their focus towards and away from the river from one moment to the next.

⁴⁹ Ibid.

⁵⁰ “Park as Process: Brooklyn Bridge Park,” *Urban Omnibus*, September 2020, <https://bit.ly/2JZqWk5>.

5.5.2. Bethlehem SteelStacks Arts & Cultural Campus: Reclaiming the Country's Largest Post-Industrial Brownfield

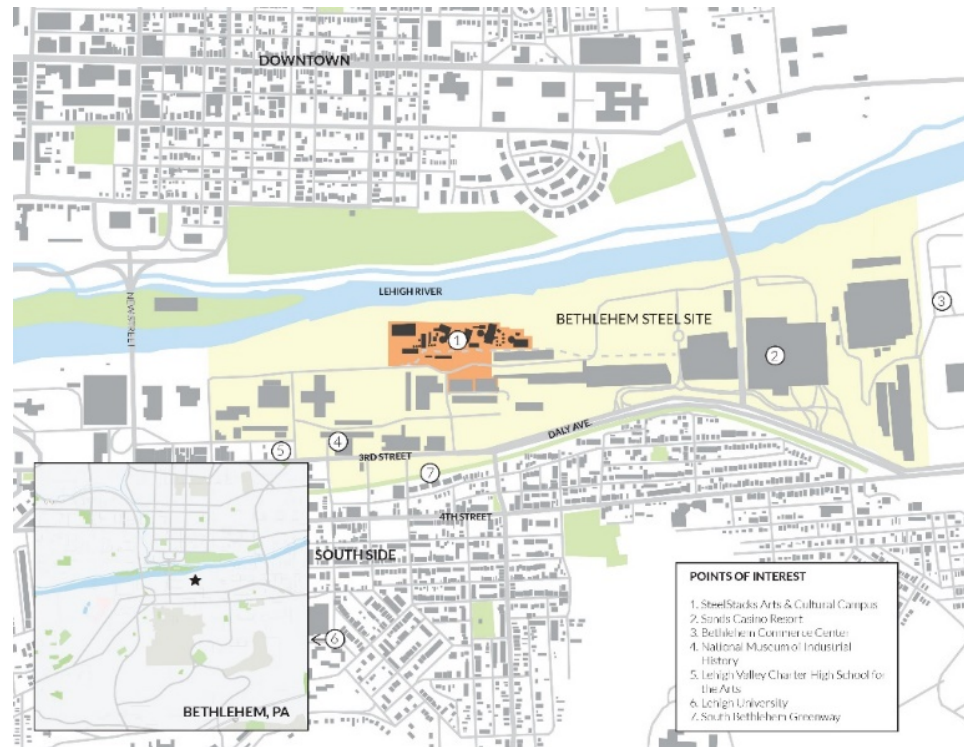


Figure 29 Bethlehem SteelStacks Context Map. Source: WRT

Bethlehem SteelStacks Arts & Cultural Campus in Pennsylvania, is a 9.5-acre, \$93.5 million urban revitalization project located in the country's rust belt, along the Lehigh River. The park complex, in what once was a 20th century industrial powerhouse known as the Bethlehem Steel Corporation, was designed by Wallace Roberts and Todd (WRT) Planning and Design.⁵¹ The campus' post-industrial terrain, located at the

⁵¹ "SteelStacks Arts and Cultural Campus," WRT, Accessed 15 October 2020, <https://bit.ly/2Umjstt>.

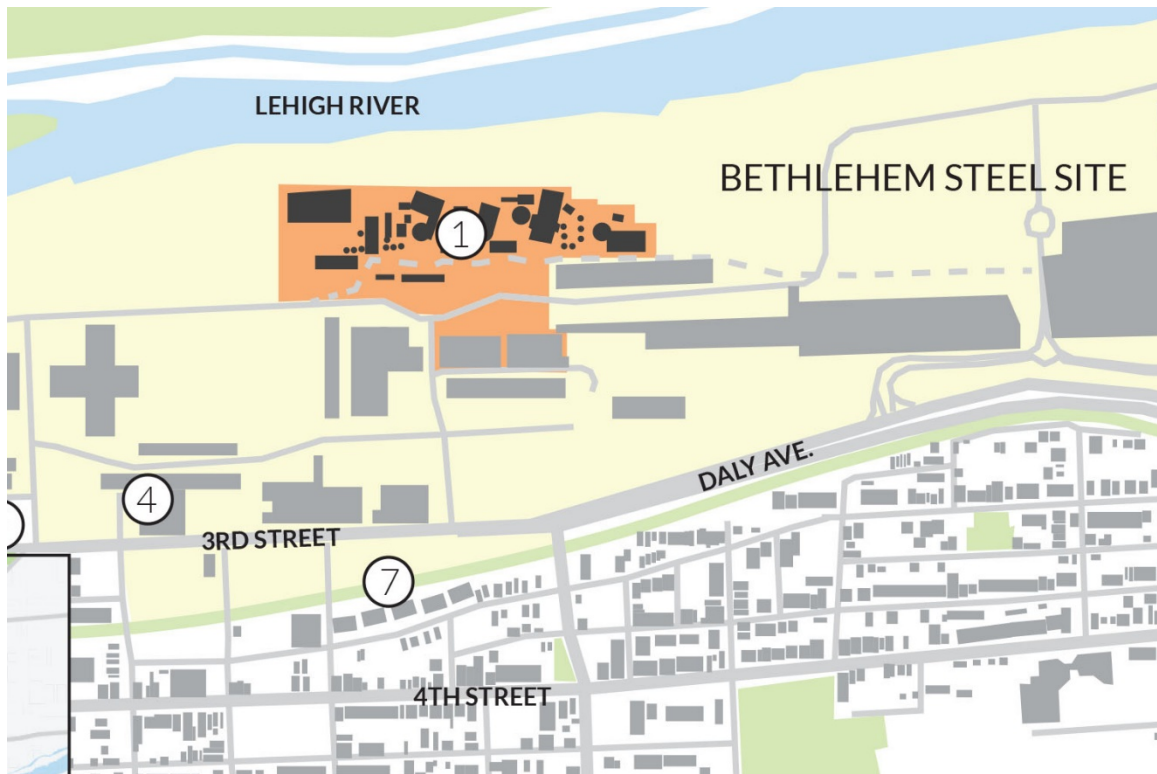


Figure 30: Enlarged Context Map. Source: WRT

number 1 symbol in the context map, is in the largest brownfield site in the country (Fig. 30).

In 2000, Bethlehem Redevelopment Authority sought to transition a portion of the post-industrial terrain towards revitalization efforts, establishing the 126-acre Bethlehem Works which houses the SteelStacks campus and park. WRT's goals for the project were to establish a successful catalyst park and arts and cultural campus which told the story of steelmaking and steelworkers, while preserving, restoring, and adaptively reusing the site itself. This provided neighboring communities with the opportunity to reclaim the land which once supported them and offered opportunity for newly developed assets, programming, education, and financial growth. The campus is now like a 'town green' bringing new urban life into Bethlehem, in support of regional smart growth initiatives.

responsibly developed concept that focused on engagement and user experience through interesting visual appeal, interactive elements, and direct reference to the region’s historic heritage and evoking the “tough and rugged” spirit of the place.⁵²

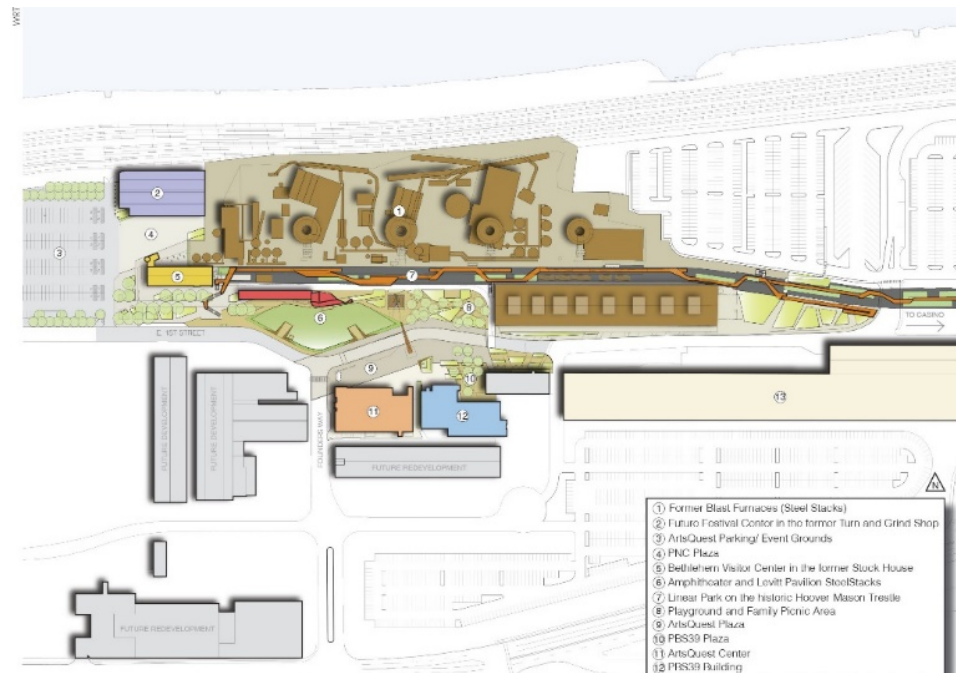


Figure 31: Bethlehem SteelStacks Master Plan. Source: WRT

The space includes buildings, historic infrastructure, and the network of open space. Prominent sections include the blast furnaces, a visitor center, performance pavilion, the trestle park and play and picnic grounds. The space also includes the ArtsQuest Center. The design overall connects history, open space, sustainability, adaptive reuse in a vibrant way that creates a significant urban space from a contaminated riverfront industrial property.

⁵² “SteelStacks Arts & Cultural Campus,” *ASLA*, Accessed 15 October 2020, <https://bit.ly/38Cs3Ap>.



Figure 32. Panoramic View of SteelStacks Campus. Source: WRT

Design Implications for East Trenton

The historic implications of brownfield sites in urban areas, the site's proximity to water and the fact that Bethlehem's population is only two thousand less than that of Trenton's, creates interesting parallels between this design and the Assunpink Greenway.



Figure 33: View from the Hoover-Mason Trestle. Source: WRT



Figure 34: Retired Blast Furnaces at Night. Source: WRT

In revitalizing an abandoned site, WRT created access to education on the areas rich heritage and contributed to a heightened sense of community identity and belonging for visitors.⁵³ “Re-forging a cultural link between historic downtown Bethlehem, the Lehigh River, Lehigh University, and the manufacturing heritage,” it sets great precedence for the transformation of post-industrial landscapes into civic spaces. Overall, the project has proven to be a prime example of how the typology of an urban Rust Belt landscape can be adaptively reused to help reinvigorate local social, economic, and environmental networks in both an innovative and sustainable manner.

⁵³ “SteelStacks Arts & Cultural Campus,” *ASLA*, Accessed 15 October 2020, <https://bit.ly/38Cs3Ap>.

Chapter 6: Design

A programmatic master plan for all five Nottingham Way sites was created to outline potential uses for each (Fig. 27). The map provides program ideas for the three northern-most sites – FEMA’s former housing lots, Mulberry Street Park, and Scarpati, as well as specific programming for the two southern properties, Clinton Commerce Center and Storcella, and possible trail and pathway connections between each.

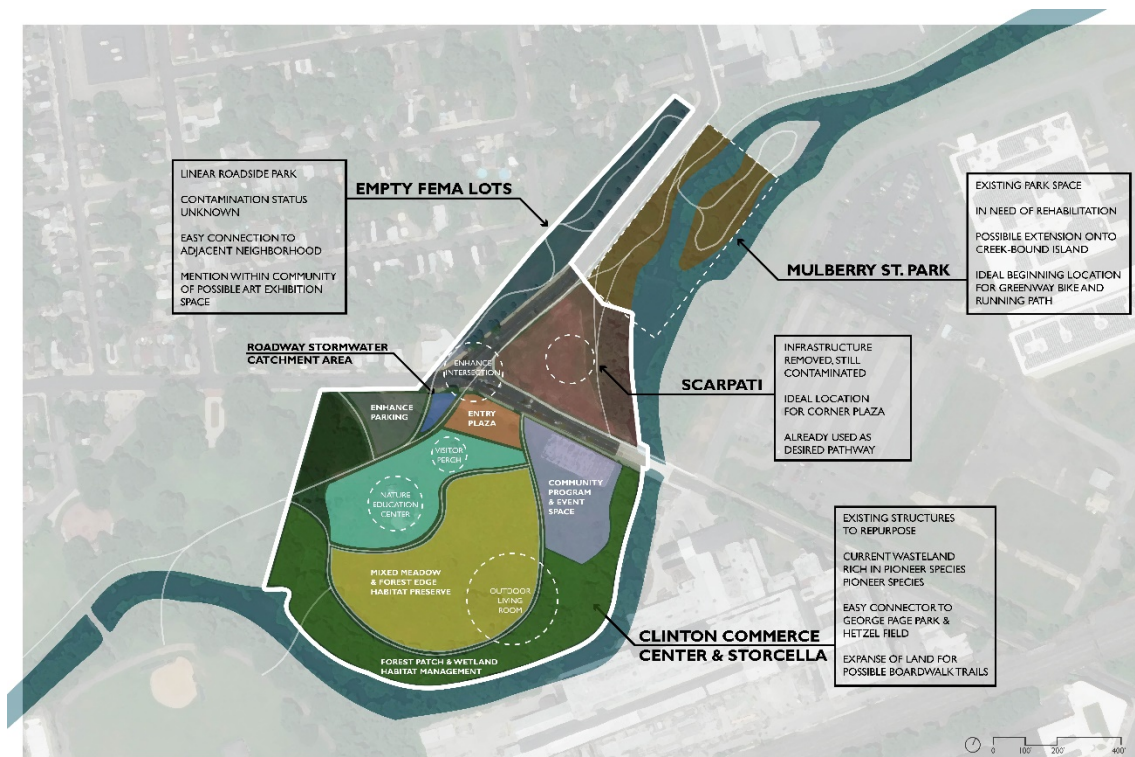


Figure 35: Nottingham Way Programmatic Plan. Source: Author

The three-way intersection is the main connection point. Designed for vehicular use it will be re-engineered as a roundabout or a more pedestrian-friendly thruway, creating safer and more effective means of traveling by foot between each divided property.

Both Scarpati and the empty FEMA lots require additional contamination investigations. The FEMA properties will serve as a pocket park. Its connection to the bend Mechanics Avenue, the outermost residential street in proximity to Nottingham Way, will create a pedestrian gateway from the neighborhood to its perimeter. This point will contain a small plaza that serves as a thruway. The remaining space on each side will offer a pathway to allow people an enjoyable walk along Mulberry Street. Plantings and garden features will add aesthetic value and mitigate stormwater runoff.

The goals for Scarpati are to have open views of the creek. A vegetated buffer from the intersection will provide the experience of crossing from one property to another and that be part of the future greenway's recreational trails.

The design focus site, Nottingham Way Ecological and Arts Center Park, is located at Clinton Commerce Center and Storcella. It provides a highly programmable landscape with opportunity for activity and recreation, and an urban-scale ecological sanctuary and artist space. It has a trail network and gathering spaces around the existing, rehabilitated buildings.

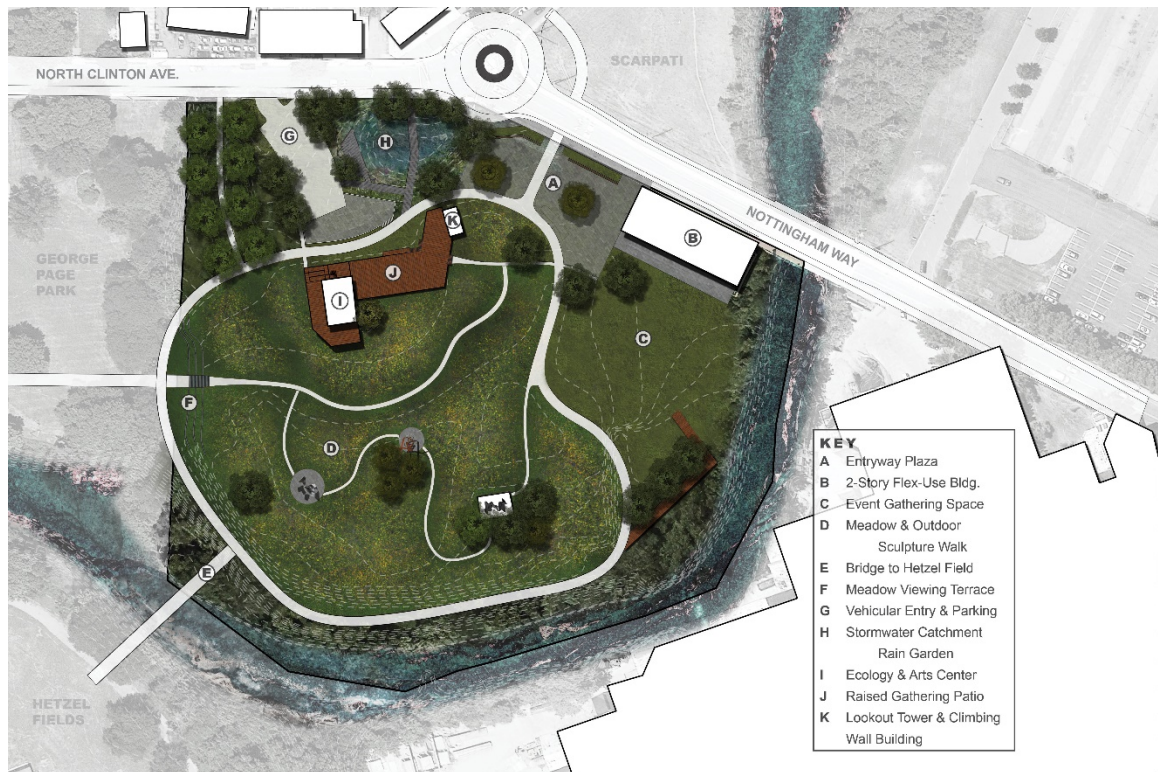


Figure 36: Nottingham Way Ecological and Arts Center Park Site Plan. Source: Author

The park's primary organizational feature is the pathway system (Fig. 36). It works with existing topography to create smooth and interesting navigation of the site. It has major circulatory arteries, like the perimeter trail with views of every part of the site and sections of the creek. Smaller pathways further into the site create more intimate spaces. New pedestrian connection points at three points along the property boundary connect the site to its surroundings in new ways with a main entry point from the road, a gateway to George Page Park, and a bridge over the creek to Hetzel Field. Once the entire greenway is complete, these intersection nodes will connect its different sections and support safe and easy travel for walkers, joggers, and bicyclists interested in taking longer routes.

The pathway system moves joggers and bikers through the site and brings visitors into the space. Signage and wayfinding will make navigation clear and enjoyable. A fourth entry point from Nottingham Way is both an access point for visitors, and a parking lot for nearby residents.

The northern portion of the park contains three large gathering spaces and programmable areas, connected to the three adjacent buildings. Each one has a slightly different purpose, as do the buildings. An entryway plaza is the first (Fig. 36), and an open lawn is the second. Both sit up against the site's largest structure, labeled B on the site plan. The two-story building is planned as a flex-use space. The second floor is for storage of material and equipment meant to support organized events and activities. The ground floor will have retractable, garage-style doors that can raise during flood events

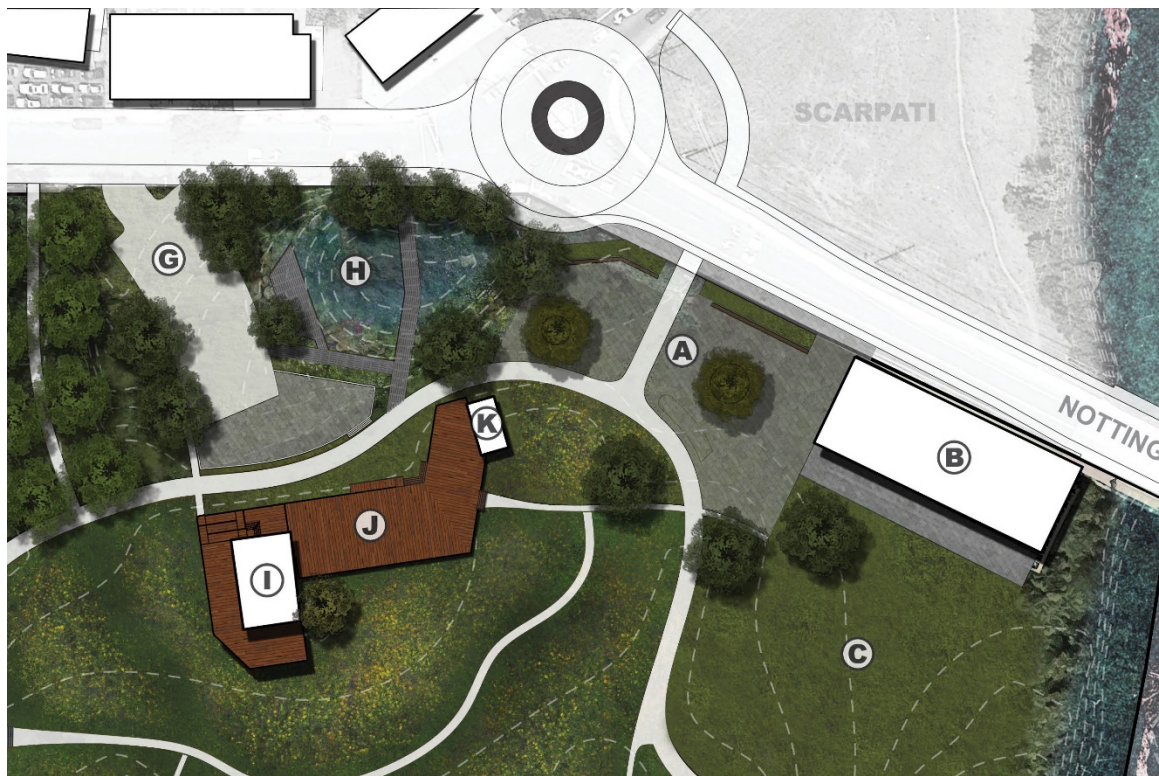


Figure 37: Enlarged Site Plan Zoom-In. Source: Author



Figure 38: Perspective of Main Pedestrian Entryway Plaza. Source: Author

and to open the space up in nicer weather. Its floor plan will be left open to provide ample room for markets and big events. The two gathering spaces just outside the doors are an outdoor extension of the building in spring, summer, and fall.

Upon entering the plaza, visitors are greeted by the largest building on the left and the taller, lookout tower to the right, labeled K on the site plan. The three-story former stairwell has been fitted with two main attractions, an observatory deck on floor three, and a climbing wall on the side face. Continuing the path to the right of this lookout tower guides the user towards the final building, labeled I on the map, a physical space for the ecological and art center, with an office, studio, and gallery space inside. The ground floor is several feet above ground, so flooding is not an issue. It is preceded by a large wooden deck, the third large gathering area (Fig. 36). The deck has old shipping containers retrofitted as storefronts for local eateries, cafes, and bars to have temporary

concession stands. The adjacent parking on the other side of the path has an additional space for food truck parking.

In addition to the indoor space for the ecological and art center, its backyard terrain is a large meadow and sculpture viewing area. The leisurely walk guides visitors through the meadow, with select spaces that open for placement of sculpture by local artists. It is an outdoor gallery and environmental walk, something the neighborhood has little free and local access to.



Figure 39: Perspective of ecological Center Outdoor Patio. Source: Author

Outside of recreation and program, the park will be environmentally productive and sustainable. Existing ecological communities will maintain the existing forest and meadow intact as much as possible and manage them for further success. A constructed rain garden just below the intersection acts as a catchment basin for stormwater to prevent flash floods in the streets. The rain garden lies along a portion of the site's contamination, so excavated soil will be taken and treated off-site. The entrance plaza to the right is another contaminated area, which will be capped by the plaza. Further back into the site, the rest of the contamination will be remediated through phytoremediation.

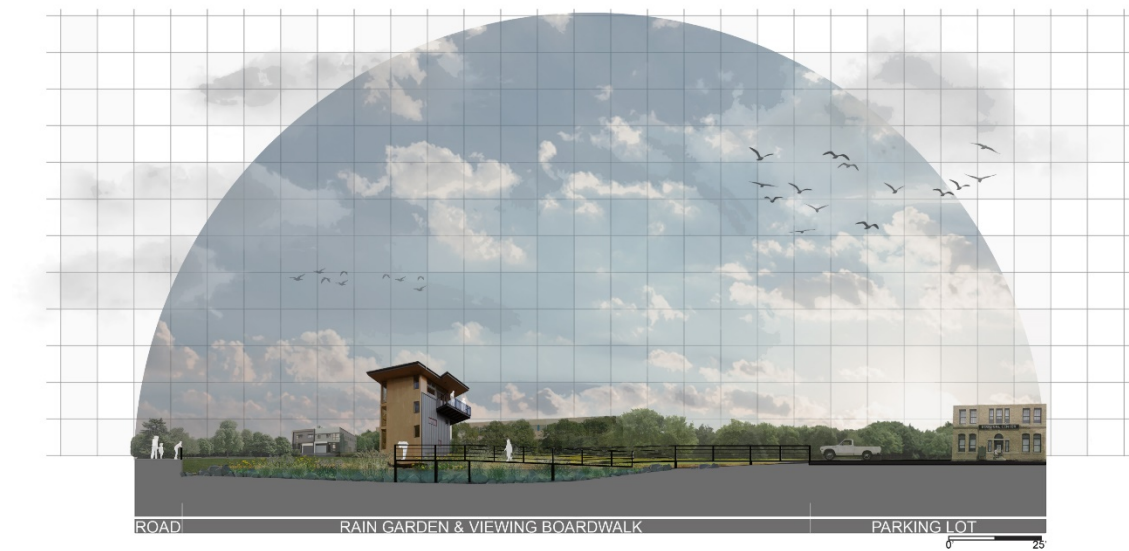


Figure 40: Section Cut Through Rain Garden. Source: Author

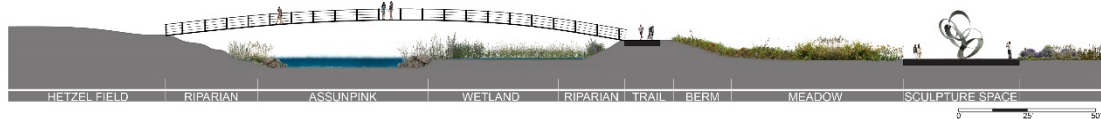


Figure 41: Section Cut Through Assunpink Creek. Source: Author

Chapter 7: Conclusion

The comprehensive design approach made way for a thorough examination of the landscape which was valuable to the development of highly informed solutions. Every piece of information collected through the five criteria lenses created opportunity for documentation and analysis of the most pertinent pieces of the puzzle. The most important bits were then layered together in the synthesis phase, highlighting connections and relationships, thus informing what a next chapter of the site's long-standing narrative might look like.

To address the project's first research question – how does historical, social, political, economic, and environmental information inform a layered, comprehensive approach to urban design – each of the five categories were filled with relevant data. Initially, an overwhelming amount of information was collected, necessary for understanding all the cards at play before making a move. Once everything was reviewed and analyzed, only what was needed was extracted and prepared for the synthesis stage.

Through analysis and synthesis, the second research question – how does a comprehensive approach to urban challenges lead to innovative design solutions? – was answered. The transition from collection of information in response to local challenges, then translated into design solutions was a several-step process that did not follow a single linear trajectory. One major benchmark of this process was creation of the neighborhood synthesis map that compiled different existing cartographic elements together into one document. From this, relationships between site and neighborhood characteristics became evident, directly informing design decisions. This method of

synthesis mapping was also done by hand at the site scale, and in a similar vein through the written paper. Each of these synthesis exercises directly informed planning and programming of the site's final design.

Any answer to the final research question – how does documentation and description of the design process contribute to the progress of projects with similar challenges? – lies in the document's composition. Ideally, an urban design project such as this will not only add value to the design site, but also serves as precedence and inspiration for future projects with similar contexts. The process was iterative with many moving parts and each step was captured either visually or through literature. Each piece of the comprehensive process was then composed logically and cohesively, so that the methods used could be recreated and utilized by others. With these intentions in mind, the success in contributions to the world of urban landscape design can only be measured in the years after publishing.

The final product, Nottingham Way Ecological and Arts Center, brings much needed natural landscape features, recreational opportunity, and programming for event and activity. It will be a catalyst for the future greenway. It offers a social and ecological sanctuary for local and regional communities, with potential for economic growth. Not only would the indoor venues offer year-round use, but the eco and art center could also play a part in establishing a new NGO that would care for the park, organize events, and be the entity of facilitation for the park.

The project's concepts of use for pedagogical features, activities, and regenerative and resilient design will all contribute to East Trenton's social livelihood, cultural wellness, and connection to heritage. Once a place that's sole purpose was economic

opportunity will be reinvigorated with financial productivity for the local economy.

Urban, post-industrial brownfields in need of redevelopment such as this one are found all throughout the country, many with very similar contexts. This project aims to be precedence and inform other similar projects.

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