

**POLITECNICO**

MILANO 1863

Scuola di Architettura Urbanistica Ingegneria delle Costruzioni  
Corso di Laurea Magistrale in Ingegneria Edile - Architettura  
A.A. 2022/2023

**Stitching The City Together:**

Urban Design Recommendations for Improving  
Connectivity and Mitigating Water Rise Impacts

Relatore Prof. Arch. Bruna Vendemmia

Tesi di Laurea di Elif Cetin  
Matricola 963524



An aerial photograph of a suburban neighborhood. The image shows a grid of streets with houses, trees, and swimming pools. The houses are mostly single-story with gabled roofs. There are many green trees scattered throughout the neighborhood. Several swimming pools are visible, some with blue covers and others with blue water. A large road with multiple lanes is visible in the lower half of the image, with several cars driving on it. The overall scene is a typical suburban residential area.

**Stitching The City Together:**  
Urban Design Recommendations for Improving  
Connectivity and Mitigating Water Rise Impacts



I would like to express my sincere gratitude and appreciation to the following individuals who have played a vital role in the completion of my thesis:

First and foremost, I would like to extend my deepest appreciation to my thesis supervisor, Bruna Vendemmia. Her unwavering support, guidance, and expertise throughout this research journey have been invaluable. Her dedication and insightful feedback have significantly shaped the outcome of this thesis.

I also would like to thank David Grahame Shane from Columbia University, who provided invaluable guidance and support throughout the development of my research. His expertise and constructive criticism have greatly contributed to the quality and depth of my work.

## Acknowledgments

Additionally, I would like to acknowledge and thank my family for their constant encouragement and belief in my abilities. Their unwavering support, both emotionally and financially, has been an endless source of motivation for me. I am grateful for their understanding during the long hours and late nights dedicated to this thesis.

I am also indebted to my friends and colleagues who have stood by my side, offering encouragement, motivation, and helpful discussions throughout the research process. Your insights and camaraderie have made this journey more enjoyable and meaningful.

To everyone mentioned above and those who have supported me in various ways, please accept my heartfelt thanks for your contributions. This thesis would not have been possible without your unwavering support and belief in my abilities.

Thank you.



## Abstract

This thesis focuses on the challenges of urban development and climate change in South Amboy (New Jersey, USA) with an emphasis on addressing the impact of water rise. Coastal communities like South Amboy are at significant risk of water rise induced by climate change in the next 100 years, which could have severe consequences for the city's infrastructure, economy, and residents. To tackle this threat, the thesis proposes a comprehensive approach to urban design that repurposes underused areas and enhances connectivity within the city.

South Amboy is a typical American suburb with single-family houses arranged in a grid-like pattern with almost no public space, developed to support industrial development along the Raritan basin. The thesis argues that repurposing underused areas, such as abandoned properties, vacant lots, and brownfields, can constitute an interesting strategy to revitalize these settlements and create new public spaces for the city, offering an alternative model to TOD. Moreover, by transforming these areas into green spaces and other sustainable infrastructure, the city can reduce the impact of water rise and promote a more livable, resilient community.

Furthermore, the thesis proposes improving connectivity within South Amboy to foster a more cohesive and vibrant community. This involves enhancing pedestrian access and promoting mixed-use development that supports various activities and services. By connecting different parts of the city and promoting walkable neighborhoods, the city can reduce its dependence on cars and encourage a more sustainable, healthy way of life.

The thesis concludes by providing practical insights and recommendations for implementing these strategies by developing a project of a pedestrian and cyclable path around the city: the green loop, with a multiscalar approach. By doing so, South Amboy can mitigate the impact of water rise and foster a more equitable and livable community for all its residents.





Acknowledgments	iii
Abstract	v
<b>01. Introduction</b>	<b>1</b>
1.1 Context and Background	3
1.2 Research Objectives	7
1.3 Research Problem	8
1.4 Expected Outcomes	9
1.5 Theoretical References	10
1.6 History of Southern Waterfront	11
<b>02. Navigating Fragmented Space and Climate Change In American Suburbs</b>	<b>13</b>
2.1 Growth of American Suburbs	15
2.2 Drosscape	19
2.3 Transforming Urban Space	21
2.4 Climate Change Effects on Waterfront Cities	25

INDEX

<b>03. Analysis at the Site</b>	27
3.1 Existing Land Use	29
3.2 Existing Zoning	33
3.3 Flood Plains	37
3.4 Land Use & Floodplain Integration Map	39
3.5 Population Density	41
<b>04. Case Studies</b>	43
4.1 High Line in New York City	45
4.2 The BIG U	47
4.3 The Green Loop	49
<b>05. Circulation and Borders</b>	51
5.1 Park & Open Space	53
5.2 Roadway Network	55
5.3 Public Transportation System	56

INDEX

INDEX

<b>06. Project</b>	<b>59</b>
6.1 Urban Fabric	61
6.2 Vacant Area in South Amboy	65
6.3 Strategy	67
6.4 Masterplan	73
6.5 Urban Park	75
6.6 Health Line	77
6.7 Highway	79
6.8 Boulevard	81
6.9 Ribbon Line	83
6.10 Waterfront	85
6.11 Passerella	87
<b>07. Conclusion</b>	<b>89</b>
7.1 Sources	91
7.2 Bibliography	93

Figure 1 : Regional Location of South Amboy	3
Figure 2 : Regional Location Aerial View	4
Figure 3 : South Amboy Railway Connection	5
Figure 4 : Railway Connection Diagram between New York and South Amboy	6
Figure 5 : Southern Waterfront Development over the years	11
Figure 6 : Overlap of the waterfront line	11
Figure 7 : 2123 - Future Assumption	12
Figure 8 : O.C. United States	15
Figure 9 : Ward and Centre Garden City	16
Figure 10 : Veterans- if buying a Farm, House or Business, learn about Guranteed Loans	17
Figure 11 : Suburban sprawl	18
Figure 12 : Drosscape South Amboy	19
Figure 13 : Drosscape Diagram	20
Figure 14 : Integrated spatial model of the metropolis - Chicago School	21
Figure 15 : Intervention on border	22
Figure 16 : Evolution of urban form in the USA	24
Figure 17 : Fort Lauderdale, Florida, is at risk from rising sea levels	26

## List of Figures

## List of Figures

Figure 18 : Coastal high-tide, or "nuisance" street flooding in Norfolk, Virginia	26
Figure 19 : Existing Land Use	29
Figure 20 : Suburban houses of South Amboy	32
Figure 21 : South Amboy Train Station	32
Figure 22 : N Broadway street	32
Figure 23 : View from Waterfront Walkway park	32
Figure 24 : Existing Zoning	33
Figure 25 : Flood Plains	37
Figure 26 : Floodplain in South Amboy	38
Figure 27 : Flood wall constructed along waterfront walkway	38
Figure 28 : Land Use&Floodplain Integration Map	39
Figure 29 : Population Density	41
Figure 30 : Highline view between the buildings	46
Figure 31 : Highline view	46
Figure 32 : Highline city view	46
Figure 33 : Highline plan on the map	46
Figure 34 : The Big U perspective view	47
Figure 35 : The Big U plan	47
Figure 36 : The Green Loop render	49

Figure 37 : The Green Loop initial connections	50
Figure 38 : The Green Loop sections	50
Figure 39 : The Green Loop diagram	50
Figure 40 : Park & Open Space	53
Figure 41 : Roadway Network	55
Figure 42 : Public Transportation	56
Figure 43 : Urban Fabric	61
Figure 44 : Blow-up Maps	63
Figure 45 : Solid-Void Diagrams	64
Figure 46 : Vacant Area in South Amboy	65
Figure 47 : Strategy	67
Figure 48 : The Loop	69
Figure 49 : The Loop Timeframe	70
Figure 50 : The Loop Sections	71
Figure 51 : Masterplan	73
Figure 52 : Urban Park New Settlement Section	75
Figure 53 : Urban Park Railway Section	75
Figure 54 : Urban Park Collage	76
Figure 55 : Health Line Section	77
Figure 56 : Health Line Collage	78
Figure 57 : Highway Section	79

## List of Figures

Figure 58 : Highway Collage	80
Figure 59 : Boulevard Section	81
Figure 60 : Boulevard Collage	82
Figure 61 : Ribbon Line Section	83
Figure 62 : Ribbon Line Collage	84
Figure 63 : Waterfront Section	85
Figure 64 : Waterfront Collage	86
Figure 65 : Passerella Section	87
Figure 66 : Passerella Collage	88

## List of Figures

**INTRODUCTION**

**01**



Chapter 01 introduces the context of the study, highlighting the challenges faced by South Amboy in terms of urban development and climate change, with a particular focus on water rise. The chapter also includes the research problem statement, research objectives, expected outcomes, and theoretical references. Additionally, it explores the history of the Southern Waterfront area, shedding light on its past development and significance.



Figure 1: Regional Location of South Amboy

South Amboy is a suburban waterfront city in Middlesex County, in the United States of America in the state of New Jersey, located on Raritan Bay.

The City of South Amboy can trace its economic roots to the shipping and manufacturing industries along the majority of the northern New Jersey coastline. Situated on the Raritan River, South Amboy has historically benefited from its river-side location, primarily shipping Pennsylvania coal to New York City.

The rail lines that arrived in the 1830s were a catalyst for the economy and continued to move the City's development.

South Amboy was incorporated as a township in 1798 and remained one for 90 years before it became a borough in 1888. Finally, on April 11, 1908, South Amboy was formally incorporated as a city.

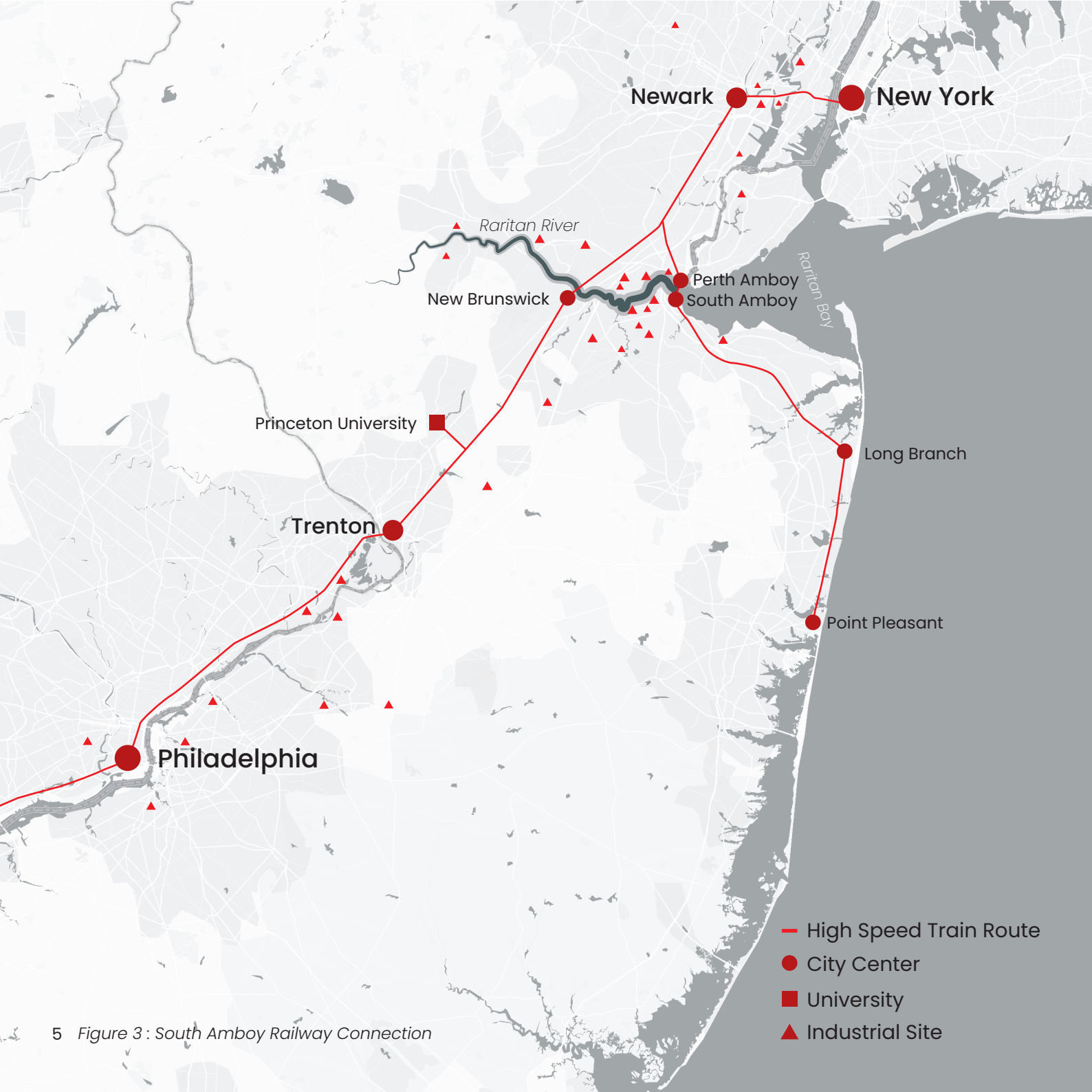
Today, South Amboy comprises roughly 6.9 square km, which includes 3.8 square km of land, and according to the 2021 United States Census Bureau, it is home to 9,320 residents. The City is accessible, with Routes 9 and 35 running through the City and a train station located in the west of the City, servicing the New Jersey Transit Coast Line, which brings commuters north to Newark, Hoboken, and New York City as well as further south to shore towns.

Source: United States Census Bureau, NJGOV

## 1.1 Context & Background



Figure 2: Regional Location Aerial View



Newark

New York

Raritan River

New Brunswick

Perth Amboy

South Amboy

Raritan Bay

Princeton University

Trenton

Long Branch

Point Pleasant

Philadelphia

— High Speed Train Route

● City Center

■ University

▲ Industrial Site

5 Figure 3 : South Amboy Railway Connection

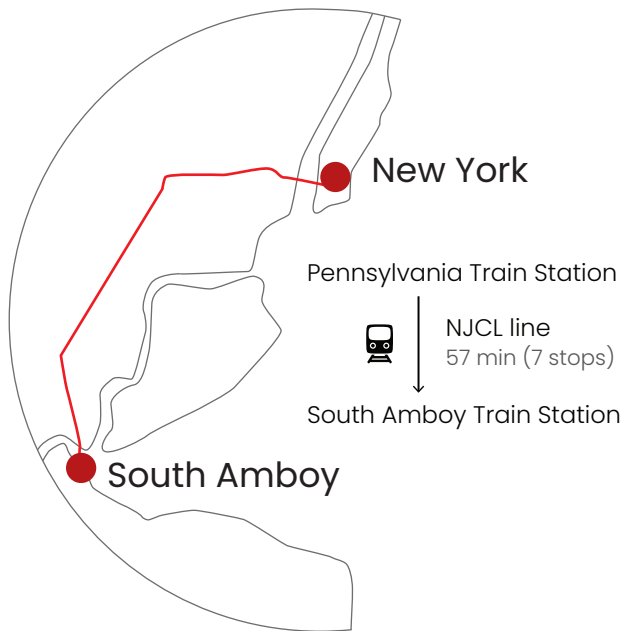


Figure 4 : Railway Connection Diagram between New York and South Amboy

Source: *Urban Colossus: Why is New York America's Largest City?* by Edward L. Glaeser (2005)

South Amboy is part of a bigger connection network and is located between the cities of New York and Philadelphia. This network encompasses various other municipalities and includes Princeton University.

In the face of future challenges, it is anticipated that residents of New York will increasingly seek alternative living spaces for several reasons, including overcrowding and rising water levels. South Amboy, with its convenient railway connection to New York and close proximity, stands out as a potential new residential destination for these individuals.

One of the primary motivations driving the search for new living spaces is the issue of overcrowding in New York. As the city's population density reaches unprecedented levels, competition for resources intensifies, leading to housing shortages and a decline in the overall quality of life for some residents. In light of this, individuals are increasingly seeking regions offering a more secure and sustainable living environment.

This phenomenon is already underway, exemplified by the ongoing implementation of the Transit-Oriented Development (TOD) project in New Brunswick.

South Amboy presents an option as a potential new residential destination for New Yorkers. Its key advantage lies in its excellent railway connectivity to New York, enabling convenient travel and maintaining accessibility to the city's economic and cultural opportunities. The proximity of South Amboy to New York is also a significant advantage, as it allows individuals to maintain ties with their existing social and professional networks while enjoying a more relaxed and less crowded environment.

This thesis aims to thoroughly examine the factors and circumstances that impact South Amboy and shape its future development, with a specific focus on addressing the city's lack of public spaces.

South Amboy, characterized by a transition from industrial areas to predominantly residential neighborhoods, currently faces the challenge of social sustainability. To achieve a comprehensive examination, South Amboy has been reviewed at both local and regional scales, considering land uses, anticipated climatic conditions, and the current absence of quality public spaces.

The initial stage of the thesis involves identifying the primary planning challenges that the city is facing, including the impact of climate change and the lack of public spaces. With rising sea levels, South Amboy is vulnerable to severe floods, necessitating the development of flood resilience measures. Additionally, the city's transition between public and private spaces is crucial to improving its appeal and promoting sustainable urban development. The lack of public spaces not only diminishes the city's social fabric but also restrains its potential for sustainable urban development. By recognizing the situation of a city without accessible public spaces, this thesis seeks to highlight the importance of public spaces that foster social cohesion and a sense of community.

Furthermore, the thesis will investigate the existing relationship between the city, water, and connections, with a particular focus on optimizing this connection to enhance the city's public spaces for the benefit of its residents. By identifying the primary planning challenges, proposing practical solutions, and addressing the absence of public spaces, this thesis aims to provide a plan for the development of South Amboy. The plan will prioritize flood resilience, sustainable urban development, and the creation of functional public spaces that significantly enhance the city's livability.

## 1.2

### Research Objectives

## Research Question

Is it possible to develop a strategy for connecting underused spaces in the city of South Amboy, with the aim of improving the quality of public spaces and mitigating the impact of rising water levels?

## 1.3

### Research Problem

This research question aims to explore the potential strategies for re-purposing underutilized areas in South Amboy to improve connectivity within the city and mitigate the impact of climate change-induced water rise. The question is particularly relevant in the face of rising sea levels, which pose a significant threat to low-lying coastal areas such as South Amboy. The study will involve a comprehensive review of existing conditions and case studies on re-purposing abandoned or underutilized areas and addressing the impacts of water rise and establishing better connectivity in urban areas. In addition, the research will involve identifying specific strategies that are feasible and effective in the context of South Amboy. The study aims to develop a design strategy that effectively addresses the impact of water rise in South Amboy, while simultaneously enhancing the quality and quantity of public space, facilitating sustainable urban development.

- **Identification of underused areas:** The thesis will likely involve mapping and analysis of South Amboy to identify areas that are currently underutilized or have the potential for redevelopment. This could include vacant lots, areas with low foot traffic. By identifying these areas, the thesis could provide insights into where new development could occur without contributing to urban sprawl or further crossing into natural areas.
- **Design recommendations:** Based on the analysis of underused areas, the thesis could provide recommendations for repurposing these spaces to address the impact of water rise in South Amboy while also focusing on improving the quality, availability, and accessibility of public spaces. This might involve designing new green spaces, enhancing existing public parks, improving public transportation infrastructure to facilitate access to public spaces, or creating new mixed-use developments resilient to flooding and promoting vibrantly and inviting public spaces.
- **Mitigation strategies:** In addition to design recommendations, the thesis could also explore strategies for mitigating the impact of water rise in South Amboy, including the installation of green infrastructure to absorb and filter stormwater runoff. Additionally, the thesis could investigate potential relocation options for buildings that are at risk of being affected by flooding.
- **Improved connectivity:** To enhance the impact of the proposed green infrastructure, the thesis could recommend strategies for improving connectivity between fragmented and/or abandoned green spaces in South Amboy. This could involve the creation of green corridors and improved infrastructure.

## 1.4

### Expected Outcomes



## 1.5

### Theoretical References

The theoretical framework of this research draws upon various key works in the field of urban studies and design. Edward W. Soja's 'Postmetropolis: Critical Studies of Cities and Regions' (2000) provides valuable insights into urbanization and the evolving forms of urban space in the contemporary world. Alan Berger's 'Drosscape: Wasting Land in Urban America' (2006) explores neglected and abandoned areas in urban and suburban environments, shedding light on the concept of 'drosscape.' Philip Langdon's 'A Better Place to Live: Reshaping American Suburbs' (1994) offers a comprehensive examination of the development and challenges faced by American suburbs. Robert Fishman's 'The Rise and Fall of Suburbia' (1991) delves into the history and socio-economic implications of the American suburb. Additionally, Balica, Wright, and van der Meulen's (2012) study on flood vulnerability index and climate change impacts provides a framework for assessing coastal cities. Alan Berger's 'Designing the Reclaimed Landscape' (2008) emphasizes the ecological and social context of designing degraded or abandoned landscapes. Lastly, Andre Corboz's exploration of the palimpsest concept in 'The Land as Palimpsest' informs our understanding of how the layered history of a landscape can guide design decisions. These works collectively form the foundation of this research, offering valuable perspectives on urban development, suburbanization, landscape design, and climate change resilience.

# 1.6 History of Southern Waterfront



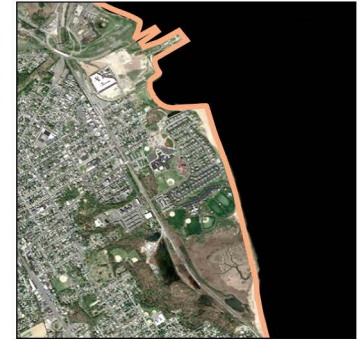
1947 - Prior to Dredging



1953 - During Dredging Process



1995 - After Dredging Process



2023 - Current Condition

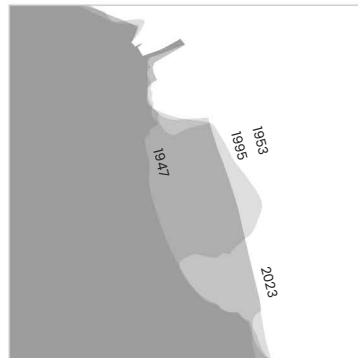
Figure 5 : Southern Waterfront Development over the years

In the year 1947, the region was under the dominion of the Raritan River, devoid of any terrain. The shown image bears does not resemblance to its antecedent form, prior to the introduction of land reclamation measures. The image is depicting the land in its natural state, unadulterated by human intervention.

The Southern Waterfront Area is an example of the City of South Amboy's ongoing development, which has been physical in this instance. Most of the land was artificially created in the 1950's by the United States Army Corps, who utilized sediment from the Raritan Bay. Furthermore, in the 1980's, additional fill was placed on top of the 1950's dredging.

At this point, we can see that the area, which was reclaimed from the sea, started to merge with the city. In the 1995 image, after the land reclamation, people began to shape the landscape, resulting in a network of trails that weave in and out of the greenery.

South Amboy waterfront currently comprises residential areas, educational facilities such as a Middle High school, and a Waterfront park. However, it is essential to acknowledge that the city's accessibility and spatial connectivity face challenges, leading to fragmented spaces and limited accessibility for residents.



In this overlap, we can see the progress of the waterfront during the process of sea filling. As the waterfront advanced towards the sea, from 1953 to 1995, it appears to have slightly receded.

Figure 6 : Overlap of the waterfront line

- Waterfront
- 1947 —
- 1953 —
- 1995 —
- 2023 —

## History of Southern Waterfront



Figure 7: 2123 - Future Assumption

*In the scenario of 2123, certain areas previously reclaimed from the sea have once again become submerged. In addition, other regions unaffected by the dredging activities of the 1950s have also been inundated. Furthermore, certain inland areas will also experience submersion. In summary, in this hypothetical scenario, the sea has advanced upon previously reclaimed areas and affected various inland regions.*

It is essential to establish a connection between the research question and the areas that rising water levels will impact. By addressing how to develop a strategy for connecting underused spaces in South Amboy, we can address the impact of rising water levels and improve the quality of public spaces. This will allow us to explore potential solutions and interventions to mitigate the effects of flooding and enhance the city's resilience. By examining the specific areas mentioned, such as residential zones, commercial areas, and public facilities, we can identify opportunities for improvement and propose strategies that address both the water level rise and the need for enhanced public spaces.

Waterfront  
2123 

**NAVIGATING  
FRAGMENTED SPACE AND  
CLIMATE CHANGE IN  
AMERICAN SUBURBS**

02

Chapter 02 delves into fragmented space and climate change in American suburbs, focusing on South Amboy. It discusses the growth and characteristics of American suburbs, emphasizing their typical features such as low-density development and lack of public spaces. In addition, the concept of "drosscape" is explored, which refers to abandoned or underused areas within suburban landscapes. The chapter also examines the transformative potential of urban space and highlights the effects of climate change on waterfront cities.

The growth of American suburbs is a phenomenon that can be traced back to the early 20th century. During this time, advances in transportation and infrastructure made it possible for people to live outside of the city and commute to work. The development of the automobile and the expansion of public transportation systems allowed for greater mobility, and suburban living became a viable option for many Americans.



This image from Orange County in the United States showcases American suburbs. It is located on the west coast of US, whereas South Amboy is on the east. However, it can be seen that even on the two different edges , suburbs show significant similarities.

Figure 8 : O.C. United States  
Source: Neal E. Johnson (2019)

One of the earliest examples of suburban development was the Garden City movement, which began in England in the late 19th century. This movement aimed to create self-contained communities surrounded by green spaces. The Garden City movement quickly spread to the United States, influencing the design of many early suburbs. These homes are typically detached, with front and back yards, and often have a garage or driveway for off-street parking. The streets are wide and designed for automobile use, with sidewalks that are sometimes separated from the street by a strip of grass.

The Garden City approach can contribute to a more balanced and integrated community in South Amboy. The movement emphasizes mixed-use development, which conveniently combines residential, commercial, and industrial areas. By creating a diverse range of amenities and services within close proximity, residents can live in improved convenience and a stronger sense of local identity.

## 2.1

### Growth of American Suburbs

The map of Ebenezer Howard's "Garden City of Tomorrow" presents a concept that has had a significant influence on urban planning and suburban development. The Garden City movement aimed to create self-contained communities emphasizing green spaces and balancing urban and rural elements. While South Amboy may not directly align with the original Garden City concept, there are some parallels that can be drawn. The idea of incorporating green spaces and promoting a balance between residential, commercial, and public areas resonates with the Garden City vision. Although the physical implementation may differ, the underlying principles of creating cohesive and well-designed communities can inform the planning and development strategies for South Amboy. By leveraging the insights from Ebenezer Howard's Garden City concept, South Amboy can improve the quality of public spaces, enhance connectivity, and foster a more sustainable and livable environment for its residents.

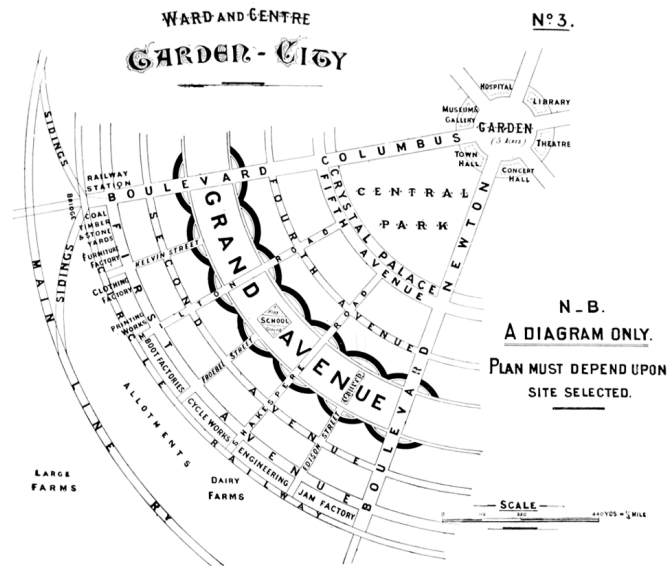


Figure 9 : Ward and Centre Garden City  
 Source: [gutenberg.org](http://gutenberg.org) (accessed on 10.05.23)

Source: The Rise and Fall of Suburbia by Robert Fishman (1991), A Better Place to Live: Reshaping American Suburbs by Philip Langdon (1994), Garden Cities of To-morrow by Ebenezer Howard (1898)

The post-World War II era saw a dramatic expansion of suburban development in the United States. The GI Bill, which provided benefits to veterans, made it possible for many Americans to purchase homes in the suburbs. In addition, the Federal Housing Administration (FHA) provided mortgage insurance for new homes, making it easier for developers to build and sell homes in the suburbs.

Many Americans were drawn to the suburbs during this time because of the promise of a better life. Suburban living was seen as a way to escape the city's congestion, pollution, and crime. In addition, suburbs were marketed as safe, clean, and family-friendly communities, and they were often advertised with happy families enjoying spacious homes and well-manicured lawns.

However, the growth of American suburbs was not without its problems. As more people moved to the suburbs, cities began to decline. Urban decay, white flight, and a lack of investment in urban infrastructure led to a widening wealth gap and increased social and economic inequality.



*Figure 10 : Veterans- if buying a Farm, House or Business, learn about Guranteed Loans*

This item is one of the posters printed during the period of 1941-1945 to inform individuals about the GI Bill.

*Source: catalog.archives.gov  
(accessed on 10.05.23)*

*Source: A Better Place to Live: Reshaping American Suburbs by Philip Langdon (1994),  
Garden Cities of To-morrow by Ebenezer Howard (1898)*

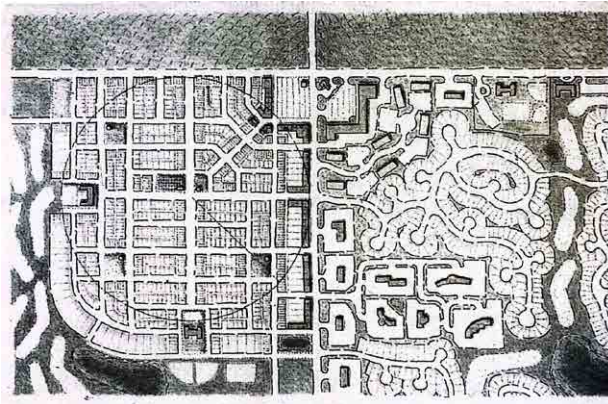


Philip Langdon's book, *A Better Place to Live: Reshaping American Suburbs*, highlights a concerning trend referred to as "The Rise of Marketing and Decline of Planning." Since marketing is one of the most valued aspects in businesses because it holds significant importance for profit, any resistance to it must be fixed or eliminated. The architects and planners have to offer such plans that are accepted by the sales and marketing teams.

As a consequence, neighborhoods with a high density of dwellings were created, leading to a lack of public spaces. Inevitably, public spaces play a critical role in the lives of inhabitants, but in the absence of these spaces between houses, public spaces were forced to be separated. This resulted in fragmented neighborhoods lacking cohesion and continuity.

These mentioned circumstances led to the creation of Suburban sprawl as we know it today. In the case of South Amboy, this phenomenon is evident in the fragmented nature of the city's infrastructure and the absence of cohesive public spaces. By drawing upon Langdon's observations, the thesis can shed light on the challenges faced by South Amboy and propose strategies to address the lack of public spaces, improve urban planning practices, and create a more cohesive and sustainable suburban environment.

Despite these challenges, the growth of American suburbs continued throughout the second half of the 20th century and into the 21st century. Today, suburbs are home to a majority of Americans, and they continue to be marketed as desirable places to live. However, there is growing awareness of suburban development's challenges, including sustainability, social equity, and access to resources and opportunities. It is essential to address these challenges to have a functioning and sustainable communities.



*Figure 11: Suburban sprawl*

*Source: A Better Place to Live: Reshaping American Suburbs by Philip Langdon (1994)*

Suburban sprawl, depicted on the right, creates a rupture. Everyday life stops such as stores and offices are kept apart, which forces people to drive to these destinations.

On the other hand the traditional neighborhood design, connects community's elements into a network of streets that provides choices of how to reach places on foot, on a bicycle, or in a motor vehicle.

Drosscape is a term invented by architect and urban designer Alan Berger to describe the neglected and underutilized spaces in urban areas. These spaces can include abandoned industrial sites, vacant lots, and brownfields. Berger argues that these spaces are not simply empty or useless but instead have the potential to be repurposed and transformed into valuable assets for urban communities.

Traditionally, urban planning and development have focused on creating functional and efficient spaces for commerce and transportation. However, this approach has often come at the expense of more organic and community-oriented spaces. As a result, dross has accumulated in cities, creating a range of social, economic, and environmental problems.

The concept of drosscape challenges traditional approaches to urban planning and development, calling for a new emphasis on the potential of neglected and underutilized spaces. Berger proposes a range of strategies for reclaiming and repurposing these spaces, including converting abandoned industrial sites into parks and green spaces, using vacant lots for community gardens and small-scale agriculture, and redevelopment of brownfields for mixed-use developments that serve the needs of urban communities.

## 2.2

### Drosscape



Figure 12: Drosscape South Amboy

Various industrial areas and in between the abandoned space, the continuation of the vacant zone from South Amboy Sayreville, West of South Amboy, New Jersey, US

Source: GoogleEarth

Source: *Drosscape: Wasting Land in Urban America* (2006)

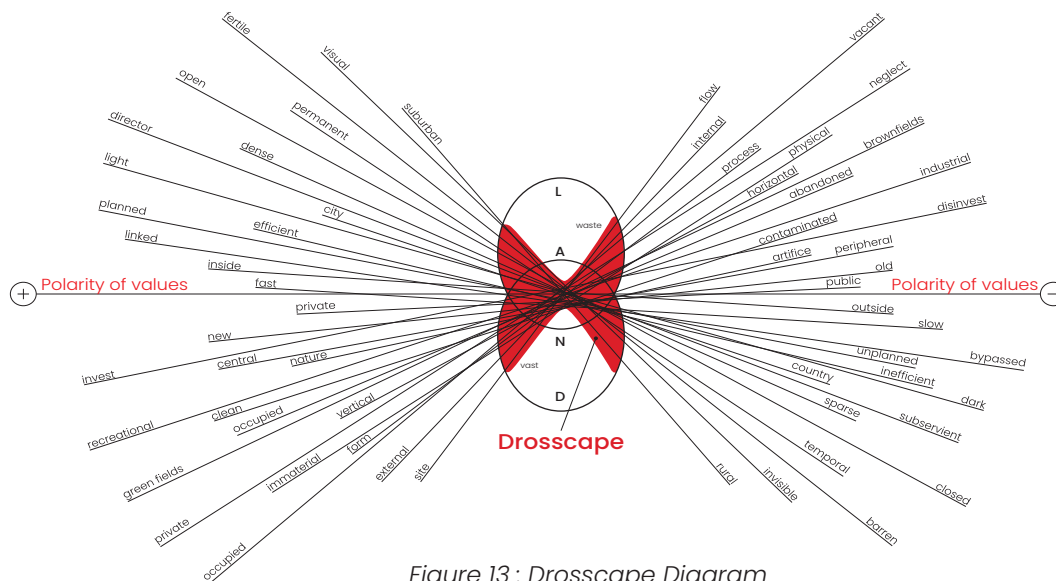
Repurposing dross landscapes poses challenges related to contamination, funding, and community engagement. Thorough analysis is required to assess environmental conditions while securing financial resources through public-private partnerships is crucial. Additionally, community engagement ensures local involvement and a shared vision for redevelopment. By addressing these aspects, the thesis aims to provide a comprehensive framework for transforming drosscapes into valuable urban assets, contributing to sustainable urban revitalization.

According to the book *Drosscape: Wasting Land in Urban America* (2006) by Alan Berger, the origins of the term "dross" comes from the Old English word for "refuse." The author traces the evolution of the concept of dross in Western philosophy and literature, from its negative definitions as waste and excess to its more positive associations with the potential for transformation and renewal.

The potential of neglected and underutilized spaces in urban areas can be restored by rethinking the concept of dross and embracing its potential for transformation.

As seen in the map of 'Existing Landuse' (p.29), there are vacant and abandoned spaces around South Amboy. These areas are in the definition of drosscape, and they have the potential to be repurposed and make connections throughout the city.

Overall, the concept of drosscape offers a fresh and innovative perspective on urban planning and development. By emphasizing the potential of neglected and underutilized spaces, urban planners and designers can create more sustainable, livable, and equitable cities that better serve the needs of their communities.



Drosscapes appear out of a united zone of vast and waste. However, other values stretch the drosscape into an unstructured entity emerging from various social circumstances.

Source: *Drosscape: Wasting Land in Urban America* (2006) (diagram is re-elaborated by the author)

Figure 13 : Drosscape Diagram

In the book "Postmetropolis," Edward Soja examines how cities are transforming in the 21st century and identifies the creative use of underused urban spaces as a key aspect of this transformation. He argues that these spaces, such as empty lots and abandoned buildings, can be transformed to meet the needs of communities and create more inclusive urban environments.

Soja also identifies three distinct urban revolutions that have shaped the development of modern cities. The third urban revolution, according to Soja, began in the mid-20th century with the rise of post-Fordist capitalism and the emergence of a new kind of urbanism. This new urbanism is characterized by the "postmodern" city, which is marked by decentralization, globalization, and the fragmentation of urban space.

In addition to exploring the potential of underused urban spaces, Soja also analyzes the relationship between modernity, urbanization, and industrial capitalism. The emergence of postmodern urbanism has created new possibilities for social and cultural expression and new forms of domination and inequality.

## 2.3

### Transforming Urban Space

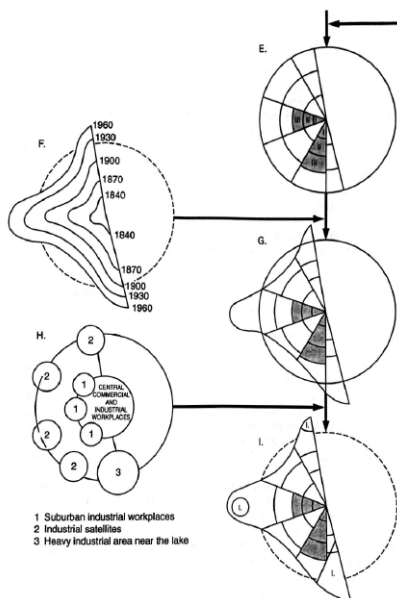


Figure 14 : Integrated spatial model of the metropolis - Chicago School

Source: Brian J. L. Berry and John D. Kasarda, Contemporary Urban Ecology, New York: Macmillan, and London: Collier Macmillan, 1977: 125, figure 7.13, integrated spatial model of the metropolis

Source: *Postmetropolis: Critical Studies of Cities and Regions* by Edward W. Soja (2000)

Soja argues that this new urbanism has led to the emergence of the "Thirdspace." Thirdspace is a hybrid space that combines physical space, virtual space, and imaginative space. It is a space open to new possibilities and forms of social and cultural expression. Thirdspace is a crucial site for cultural production, as it is in these spaces that we negotiate and construct our identities, social relationships, and understanding of the world. Therefore Thirdspace is a dynamic and constantly changing space shaped by individual and collective experiences and interactions.



*Figure 15 : Intervention on border*

This is an example of an intervention in an area described as a Thirdspace, located on the border of the United States and Mexico. The intervention aims to engage the neighborhood by creating public areas and contribute to the vibrant bi-national community.

*Source: Drosscape: [utep.edu/rubin/exhibitions/past/third-space](http://utep.edu/rubin/exhibitions/past/third-space) (accessed on 12/05/23)*

Drawing inspiration from Edward W. Soja's seminal work, "Postmetropolis: Critical Studies of Cities and Regions" (2000), the thesis embraces the concept of the third space. Soja defines the third space as a realm of possibilities where innovative urban transformations take place. In the context of this thesis, the third space represents a catalyst for creative solutions to address the challenges of water rise and climate change in South Amboy. By incorporating Soja's ideas, the thesis seeks to encourage innovative thinking and inspire urban design strategies that prioritize sustainability and resilience.

*Source: Postmetropolis: Critical Studies of Cities and Regions by Edward W. Soja (2000)*

Given that crises are a natural part of the urban experience and have been present throughout history, several types of crises that cities have faced, including economic, political, environmental, and social crises, have pushed the development and evolution of cities over time. However, crises can be both negative and positive and provide opportunities for new forms of urban development and social change.

Community involvement's importance in transforming underused urban spaces and responding to crises more democratically and sustainably is a highly effective approach. By understanding the history and dynamics of urban development, it is possible to work towards creating more equitable cities in the future.

In "Designing the Reclaimed Landscape," Alan Berger discusses the transformative potential of abandoned or underused areas in urban environments. He argues that these spaces can be repurposed through strategic urban design interventions to become valuable assets for the community. By creatively repurposing these areas as new parks, housing developments, or transportation corridors, urban designers and planners can transform them into vibrant and productive spaces that contribute to the overall livability and sustainability of the city. This work provides a framework for thinking about how urban design can help reclaim and repurpose neglected urban landscape areas and how these interventions can contribute to a more equitable and sustainable future for cities. In the case of South Amboy, transforming neglected areas into urban spaces is a crucial way to enhance quality. In addition, this approach will result in the creation of diverse neighborhoods throughout the city, promoting healthy urban growth and development.

Finally, it is crucial to recognize that the transformation of underused urban spaces and the response to crises in a more sustainable way is a complex and ongoing process. It requires the involvement of various cooperations, community members, local authorities, and private entities. Moreover, it is necessary to address the power structures that shape urban development and to challenge the dominant narratives that perpetuate inequality and exclusion. By aiming toward more urban environments, it is possible to create cities that reflect the diversity and potential of the communities they serve.

*Source: Postmetropolis: Critical Studies of Cities and Regions by Edward W. Soja (2000),  
Designing the Reclaimed Landscape by Alan Berger (2008)*

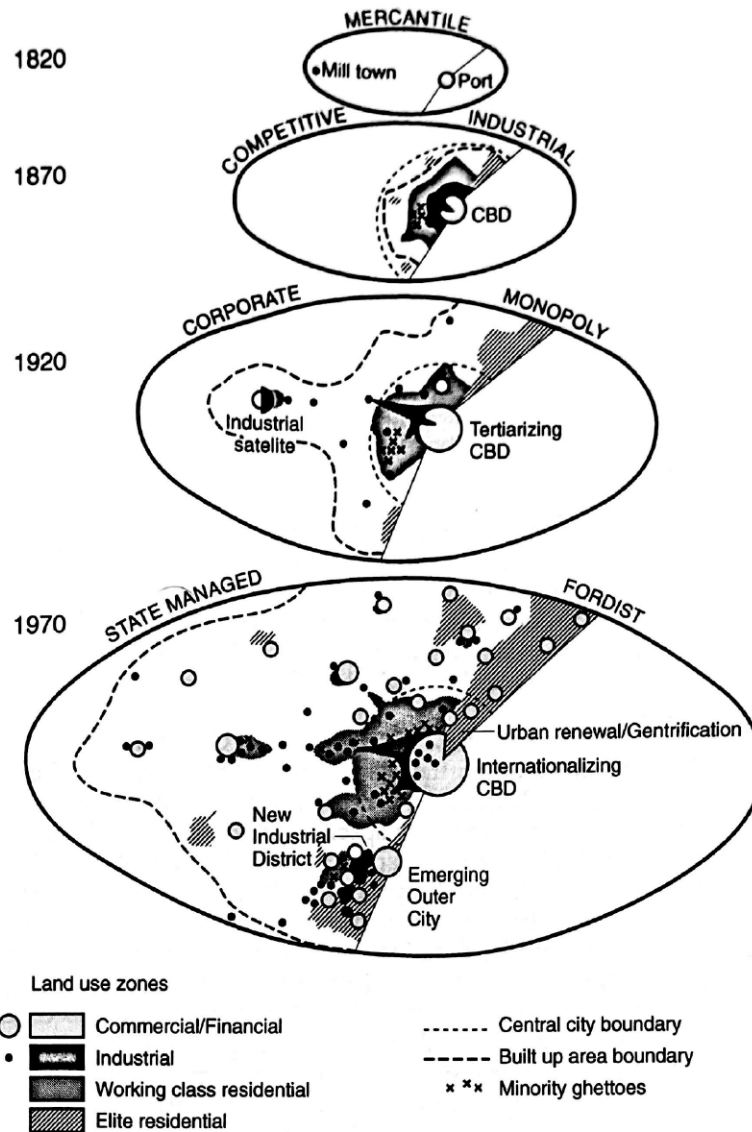


Figure 16: Evolution of urban form in the USA  
 Source: Soja, *Postmodern Geographies*, Verso, 1989: 174

Climate change is profoundly impacting waterfront cities worldwide, with rising sea levels and more frequent and intense storms causing flooding and damage to infrastructure. In the book "A flood vulnerability index for coastal cities and its use in assessing climate change impacts, Balica, S. F., Wright, N. G., & van der Meulen, F. (2012)" the authors explore the ways in which climate change is affecting these cities and offer a tool to assess their vulnerability to flooding.

Waterfront cities are particularly vulnerable to the effects of climate change because they are situated at the interface between land and sea. As sea levels rise, the risk of flooding and storm surges increases, threatening homes, businesses, and critical infrastructure such as airports and power plants. In addition, higher temperatures and changing rainfall patterns can increase existing water management problems, leading to droughts or flooding.

The authors propose a flood vulnerability index to help coastal cities to assess their risk and develop strategies for adaptation. This index considers a range of factors, including sea level rise, storm surge potential, topography, land use, and the presence of critical infrastructure. By using this index, cities can identify areas of high vulnerability and prioritize adaptation measures such as building sea walls, improving drainage systems, and relocating critical infrastructure.

In the case of South Amboy, this area has already been identified by the city, and in this thesis, the flood index is not used; rather than relying solely on a flood index, which may not capture the complexity of the city's vulnerability to water rise, the thesis takes an approach by considering various elements that contribute to the city's exposure to flooding.

Such as topography, presence of infrastructure, urban fabric, etc...

## 2.4

### Climate Change Effects on Waterfront Cities

*Source: A flood vulnerability index for coastal cities (2012)*



Overall, climate change presents significant challenges for waterfront cities worldwide. The flood vulnerability index proposed in "A Flood Vulnerability Index for Coastal Cities and Its Use in Assessing Climate Change Impacts" provides a valuable tool for assessing and addressing these risks. However, it will require consistent efforts by governments, businesses, and communities to implement effective adaptation strategies and ensure the long-term resilience of these cities.

It is safe to say that South Amboy will be affected by climate change due to its location and other factors. The city is located on the Raritan Bay, which makes it vulnerable to sea-level rise, storm surges, and flooding. According to the FEMA floodplain map (FloodPlain p.37), there is a significant risk of flooding in South Amboy, especially considering the ratio of flood expectations to the city's land area.

Moreover, rising temperatures and more frequent heatwaves may also pose a threat to the city's residents, particularly the elderly and vulnerable populations. Additionally, the increase in precipitation and the frequency of extreme weather events such as hurricanes and heavy rainfall may cause significant damage to the city's infrastructure, buildings, and transportation systems.

To mitigate the impacts of climate change, it is crucial to develop adaptation strategies tailored to South Amboy's specific needs and challenges. These strategies include improving the city's stormwater management systems, enhancing coastal protection measures, and promoting green infrastructure solutions. Through a comprehensive and collaborative approach, South Amboy can become a more resilient and sustainable city better equipped to face the challenges of climate change.



Figure 17: Fort Lauderdale, Florida, is at risk from rising sea levels

Source: [climate.nasa.gov](https://climate.nasa.gov)



Figure 18: Coastal high-tide, or "nuisance" street flooding in Norfolk, Virginia

Source: [climate.nasa.gov](https://climate.nasa.gov)

**ANALYSIS AT THE SITE**

03

Chapter 03 involves an in-depth analysis of the study site, South Amboy. It explores various aspects of the site, including the existing land use patterns, zoning regulations, flood plains, and population density. Special attention is given to the integration of land use and floodplain mapping to understand the vulnerability of different areas to water rise. The analysis provides a comprehensive understanding of the current state of the site, serving as a basis for further exploration and interventions.

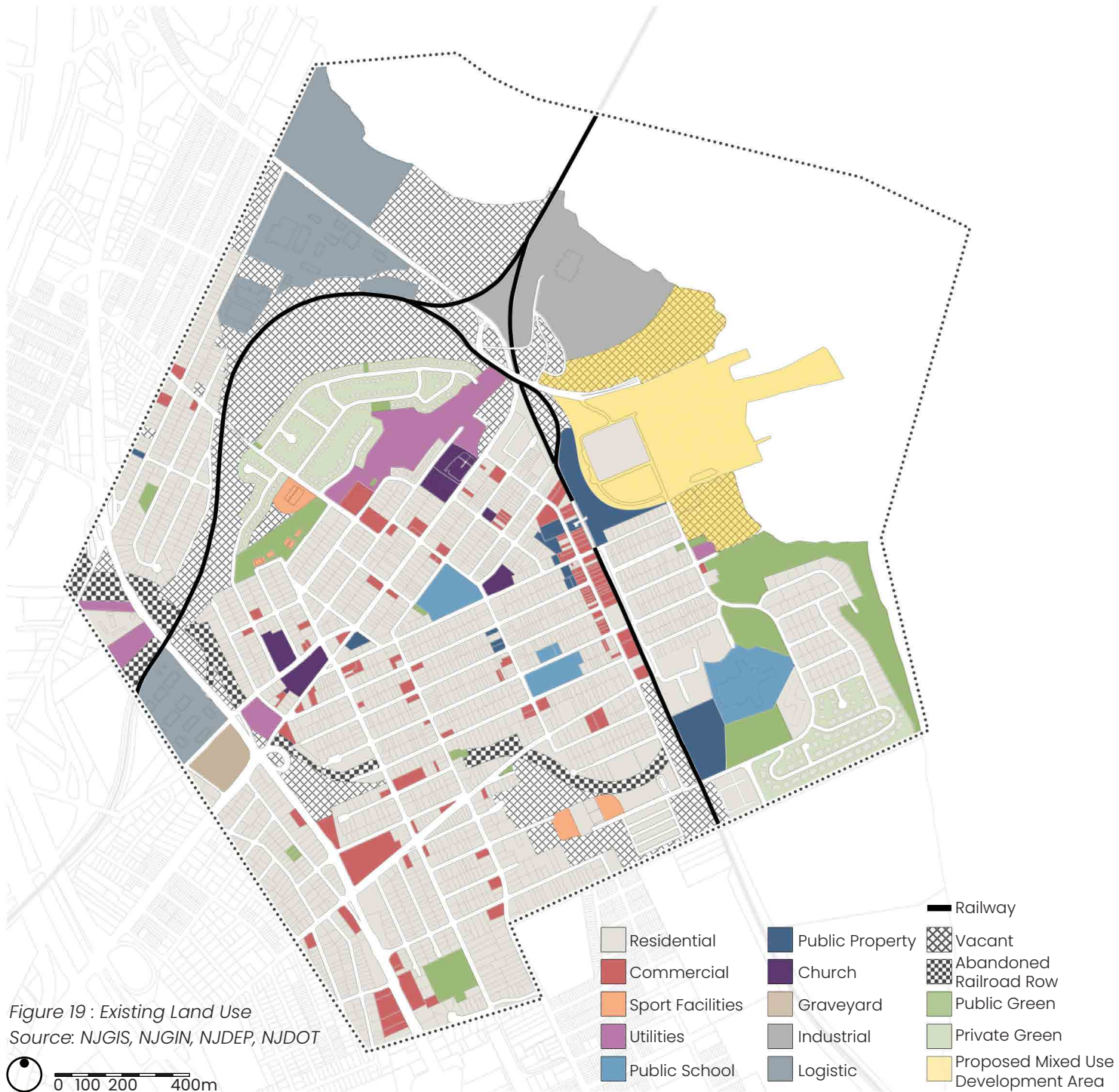


Figure 19 : Existing Land Use  
 Source: NJGIS, NJGIN, NJDEP, NJDOT



## 3.1

### Existing Land Use

South Amboy has an area of approximately 4 square kilometers (7 square kilometers, including water). Approximately 31% of the land in the city is dedicated to residential land use, making it the largest land use category. The city's commercial land use encompasses 7.6% of its area and the area that is the most concentrated is called N Broadway located on the east part of the city. This land use is primarily concentrated along North Broadway in the downtown core, where local neighborhood businesses have been established. Even though there are only six parcels zoned for industrial and logistic use, this land use accounts for roughly 6.4% of the city's total land area, mainly due to the substantial size of these parcels. Previously, industrial land use dominated much of the waterfront, but with the continuing redevelopment occurring in the city, these areas are slowly diminishing. The second largest land use category in South Amboy is vacant land, which is around 16% of the city's total land area. Again, this is mainly due to the departure of industrial and freight railroad uses, which previously occupied much of this space.

## Challenges and Opportunities

The city of South Amboy exhibits a high density of residential, commercial, and public spaces, alongside large lots for industrial and logistic purposes, primarily due to the existence of railways for over a century. The railways initially served as transportation for coal from the southeast to the northwest, between Philadelphia and New York. The effect of this connection is still seen as the large areas kept their function as it was in the past, however, in a different industrial subject other than coal. Furthermore, as a result of this line of work, South Amboy used to have a harbor for also transportation of coal in the area that is now planned to be a mixed-use development. Nevertheless, these railways are used for public transportation nowadays, and the harbor no longer exists.

In addition to the large industrial areas, the city of South Amboy also includes several vacant areas. When considering the ratio of city size to vacant land, these vacant spaces occupy a significant proportion of the city's land, second only to the residential areas. Moreover, these abandoned spaces often connect with each other through the abandoned railway row.

The public green areas in South Amboy are primarily concentrated along the waterfront. Although the city contains small parks, the remaining green areas are often overlooked and neglected as vacant spaces.

South Amboy's challenges include the railway cutting the connections into multiple parts. However, the presence of the railway also offers convenient access to the city through the railway, making it a valuable option for public transportation. Another challenge is that the residential areas are so dense without interruption in most of the plots, and there are several neglected spaces in the middle of the city.

On the other hand, South Amboy is well connected with other cities and even states through various transportation networks, including different kinds of highways, railways, vehicle bridges, and railway bridges (as elaborated in the Roadway Network Map p.55). However, despite being a waterfront city, it no longer offers sea transportation services.

Existing Land Use

South Amboy features a grid system at its center, primarily dedicated to residential living areas; however, in the northern part of the city, the streets have been shaped by the railway, resulting in a considerable distance from the railway. Such movements and the presence of neglected spaces provide an opportunity to better utilize the vacant areas and create connections.



Figure 20 : Suburban houses of South Amboy  
Source: southamboynj.gov



Figure 21 : South Amboy Train Station  
Source: southamboynj.gov



Figure 22 : N Broadway street  
Source: southamboynj.gov



Figure 23 : View from Waterfront Walkway park  
Source: southamboynj.gov

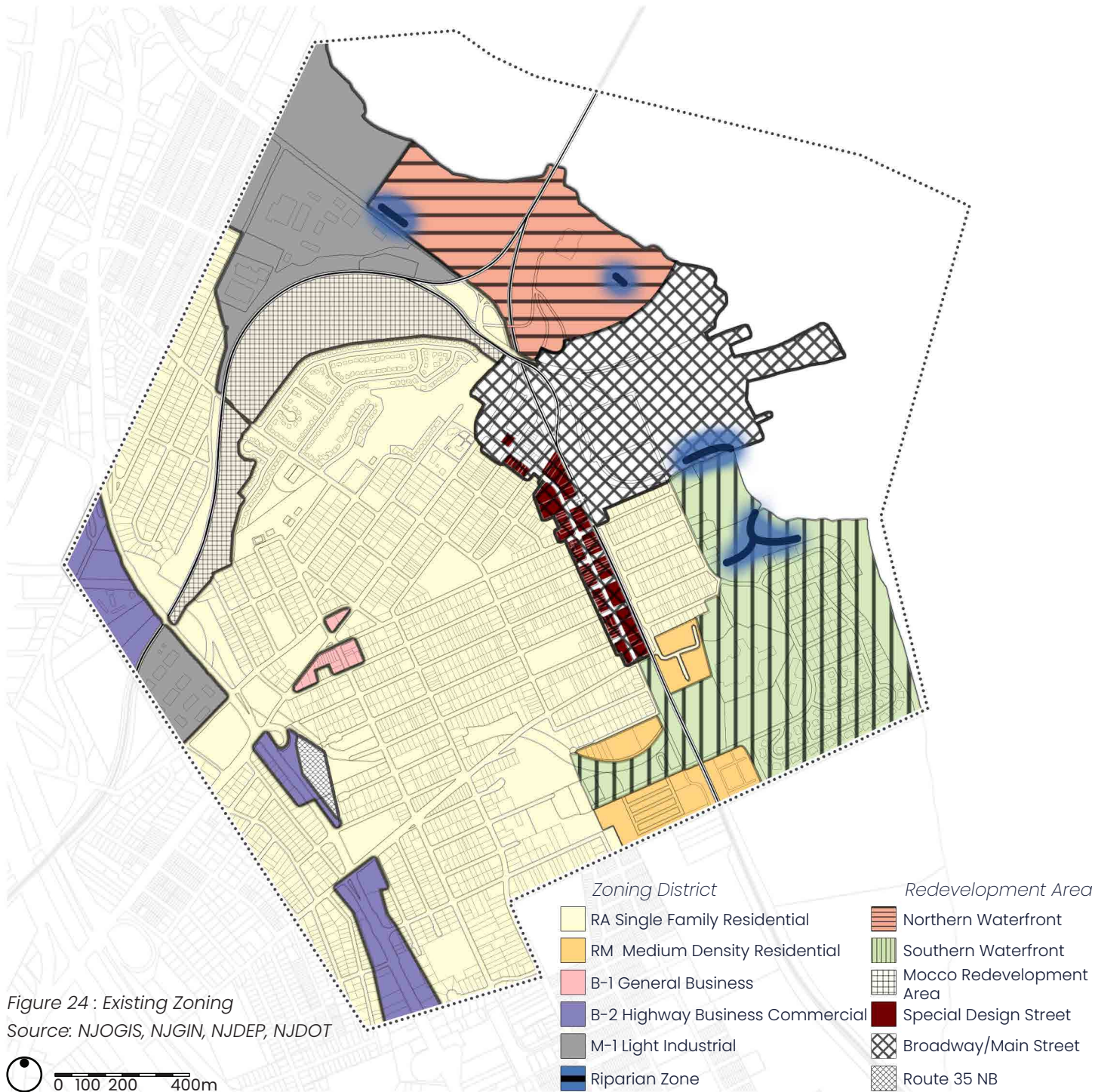


Figure 24 : Existing Zoning  
 Source: NJOGIS, NJGIN, NJDEP, NJDOT





## 3.2 Existing Zoning

### Zoning District

#### *RA Single Family Residential*

The purpose of the RA zoning district is to designate areas suitable for detached single-family residential homes, with each home situated on its own legal lot.

#### *RM Medium Density Residential*

Multiple Residential Zoning District. The RM Zoning District is intended to provide for areas appropriate for multi-unit residential developments containing attached or detached dwelling units.

#### *BI General Businesses*

Refers to an allowable business use under these three key aspects; Offices; Research and Development (R&D) of products or processes purposes.

#### *B-2 Highway Commercial*

The highway commercial (B-2) zoning district is designed to accommodate business and retail uses that provide merchandise and services that motorists desire directly from or for motor vehicles.

#### *M-1 Light Industrial*

Only Light Manufacturing is allowed. Unlike heavy manufacturing, which provides goods for other businesses, products produced in a light industry go directly to the customers—the average spans no more than 11,000 m<sup>2</sup>.

#### *Riparian Zone*

Lands occur on the edges of natural water elements, such as before the uplands. It is not a wetland but has very close features.

## Redevelopment Area

### *Northern Waterfront*

The Northern Waterfront Redevelopment Areas was designated by the City as an area in need of redevelopment on April 4, 1995. The goal of the redevelopment plan was to "construct a development to complement the existing southern waterfront redevelopment mixed-use plan."

The intention of the Northern Waterfront Redevelopment Area and the Southern Waterfront Redevelopment Area was to achieve an appropriate balance of industrial, residential, commercial, and public uses as contemplated by the City since the review of the waterfront began in 1988.

### *Southern Waterfront*

The Southern Waterfront Redevelopment Area was designated by the City as an area in need of redevelopment on August 23, 1989, and a redevelopment plan was adopted on February 14, 1995.

The goal of the Southern Waterfront Area is to "construct a mixed-use development that will complement the existing South Amboy community." At the time of this Master Plan, the Southern Waterfront Redevelopment Plan has been implemented through the development of waterfront parkland, a community middle/high school, a library, ball fields, as well as single-family and townhome units.

### *Mocco Redevelopment Plan*

The Mocco Redevelopment Area was designated by the City as an area in need of redevelopment on May 20, 2002. However, no redevelopment plan has been prepared. The 32-acre Area includes the former rail yards in the city's northern section.

### *Special Design District*

In 1993, the City established a Special Design District and a Broadway Facade through an ordinance. The primary focus of the district is to complement the architectural periods spanning between 1880 and 1930. Stylistic features and examples of skilled craftsmanship are encouraged to be treated with sensitivity during renovations, additions, and new construction.

### *Broadway/Main Street*

The Broadway/Main Street Redevelopment Area was designated by the City as an area in need of redevelopment on August 2, 2001. The portion of the area located along Broadway is primarily a special design district created to fund and manage facade improvements to revitalize the traditional retail core of South Amboy. In addition, this central downtown “spine” has been the subject of significant streetscape improvements, including new curbs, sidewalks, utility upgrades, and new street lighting.

### *Route 35 Northbound Redevelopment Area*

The Route 35 Northbound Redevelopment Area was designated by the City as an area in need of redevelopment on March 19, 2003. The goal of the Route 35 Northbound Redevelopment Area is to “construct a development to provide commercial, retail, and personal service uses...” and to do so in a manner that complements the surrounding area. The redevelopment plan was amended in 2015 to include multi-family residential as part of its permitted uses. As of this Master Plan, this area has not yet been redeveloped and contains surface parking as well as vacant and active commercial uses.

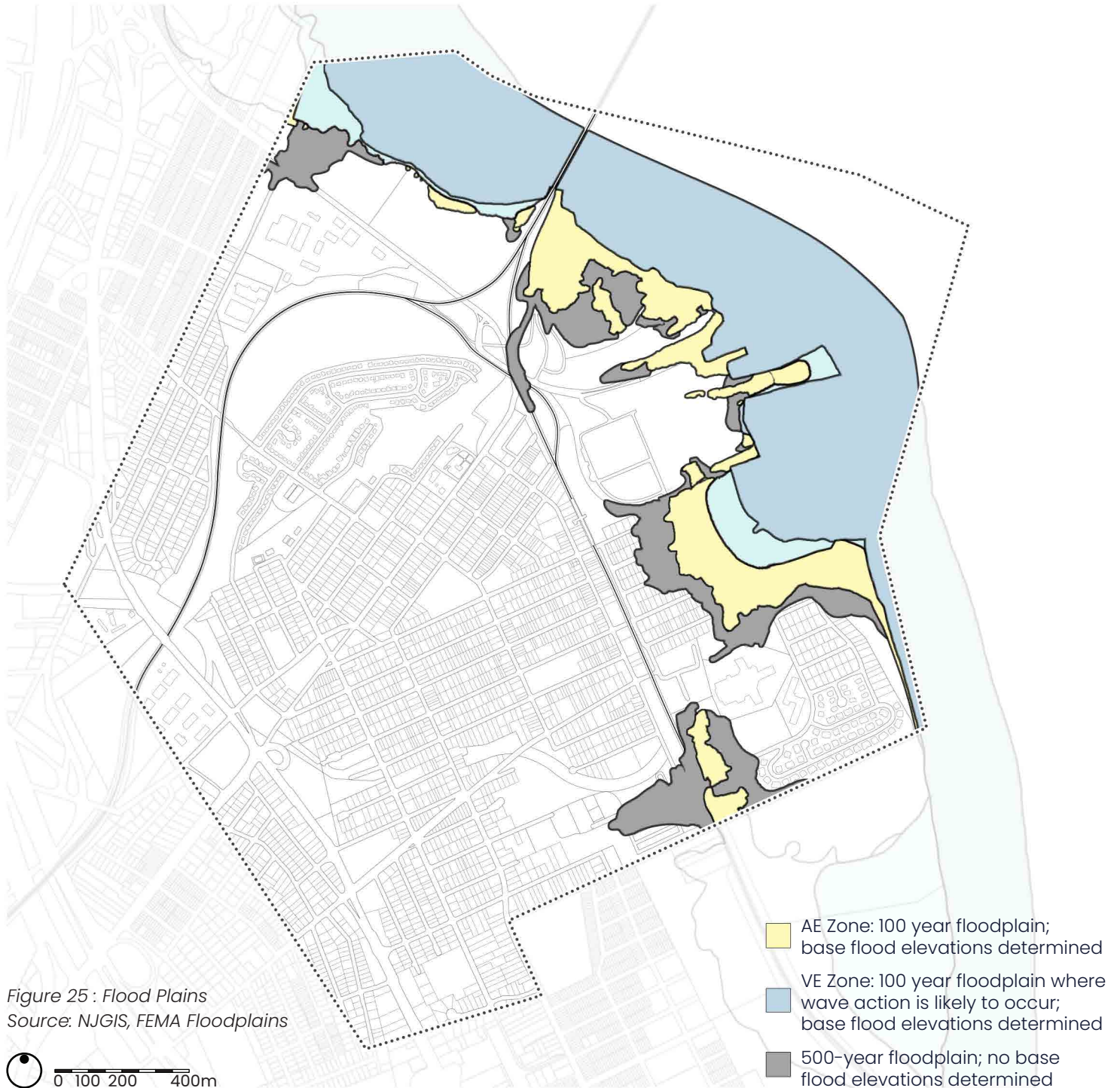


Figure 25 : Flood Plains  
 Source: NJGIS, FEMA Floodplains



The Federal Emergency Management Administration (FEMA) defines Flood Plains as 'any land area susceptible to being inundated by floodwaters from any source.'

Floodplains play a crucial role in the health of ecosystems by serving as filters for water and as habitats for wildlife. In addition, these areas are essential in preserving water quality, supplying freshwater to wetlands and backwaters, and reducing the concentration of salts and nutrients in the surrounding environment.

According to FEMA (accessed on 27th of March 2023)

- **AE Zone:** AE flood zones present a 1% annual chance of flooding and a 26% chance over 30 years.
- **VE Zone:** These coastal regions face a risk of flooding exceeding 1% and are also vulnerable to the added threat of storm waves. There is a 26% chance of flooding occurring in these areas during a 30-year mortgage. Therefore, the base flood elevations determined from comprehensive analyses are indicated at specific intervals within these zones.

## 3.3

### Flood Plains

#### Environmental Characteristics

South Amboy is characterized by a humid subtropical climate. Given the influence of South Amboy's humid subtropical climate on the environment and natural resources, it is imperative to consider these factors when developing a land use plan for the community. When formulating a land use plan for the community, it is crucial to consider the environmental limitations present in South Amboy. The specific location and nature of these constraints will play a significant role in determining the type, extent, and development placement in compliance with local, county, and state regulations. Given its proximity to Raritan Bay, South Amboy features environmental attributes that impact land use and development.



Figure 26 : Floodplain in South Amboy  
Source: southamboynj.gov

Source: FEMA, NJWEATHER



Figure 27 : Flood wall constructed along waterfront walkway  
Source: southamboynj.gov

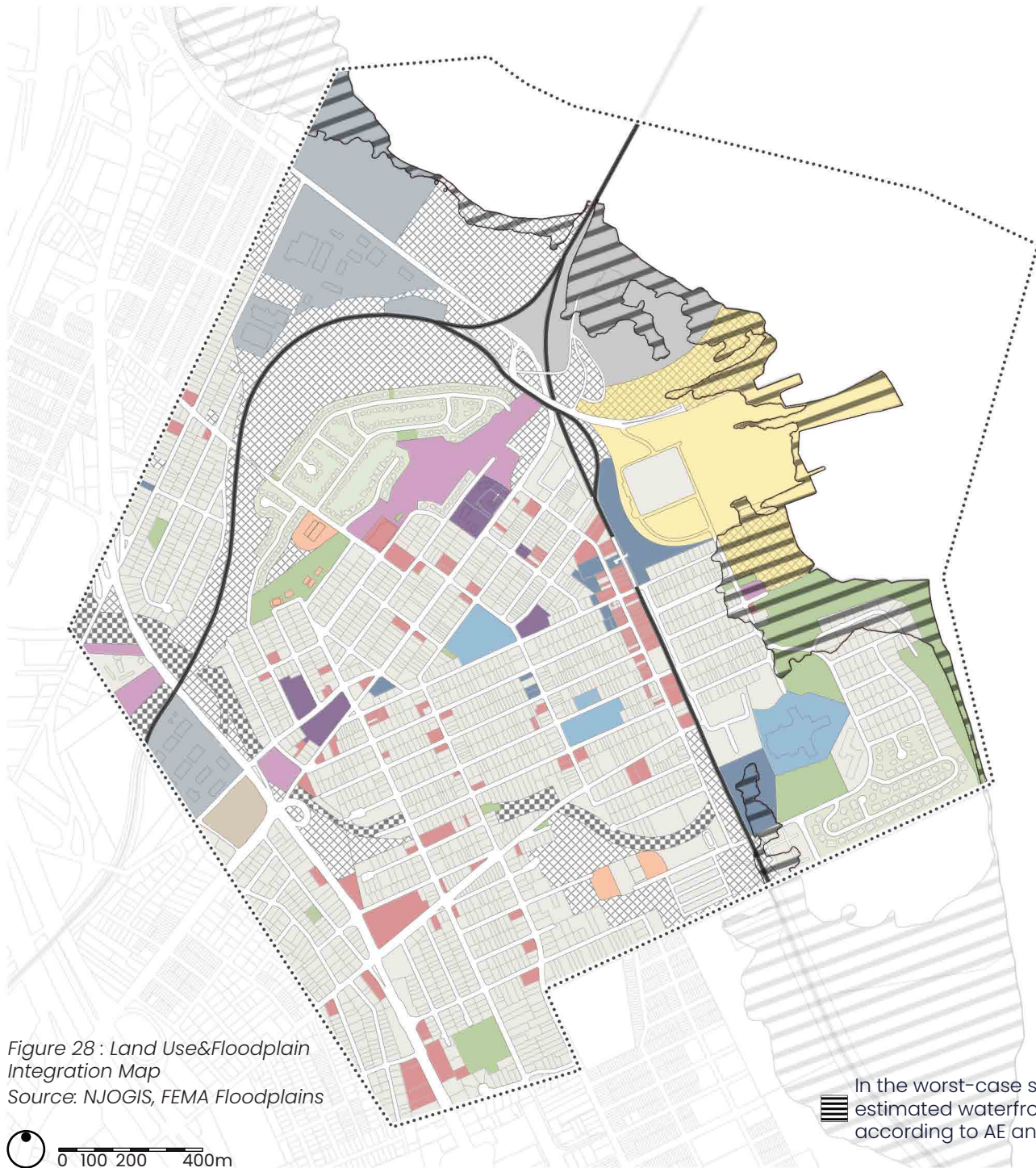


Figure 28 : Land Use & Floodplain Integration Map  
Source: NJOGIS, FEMA Floodplains

In the worst-case scenario, the estimated waterfront in 100 years according to AE and VE zones.

## 3.4

Land Use  
&  
Floodplain  
Integration Map

A synthesis map was created by combining two maps: Land use and Floodplains. By overlaying these maps, it was possible to identify areas where the two layers intersected, providing valuable insights into potential areas of risk or conflict.

The resulting synthesis map can be used as a tool for land-use planning, flood management, and risk mitigation strategies.

A significant number of homes in the South Amboy area will be affected, including not only single-family dwellings but also apartment buildings. In addition to residences, it has been observed that public property, public green spaces, industrial and logistic areas, as well as several commercial lots will be impacted.

The affected areas consist of several regions. On the north side, the left of the Raritan River Bridge, the logistics area waterfront, and the industrial area on the right side of the bridge have been impacted.

Approximately 30% of the designated project site has been impacted.

Moving to the south part, the majority of the waterfront walkway has been affected, as well as a portion of public green parks and several individual houses. In the inland area, there is damage to public property, a housing complex, and some vacant areas.

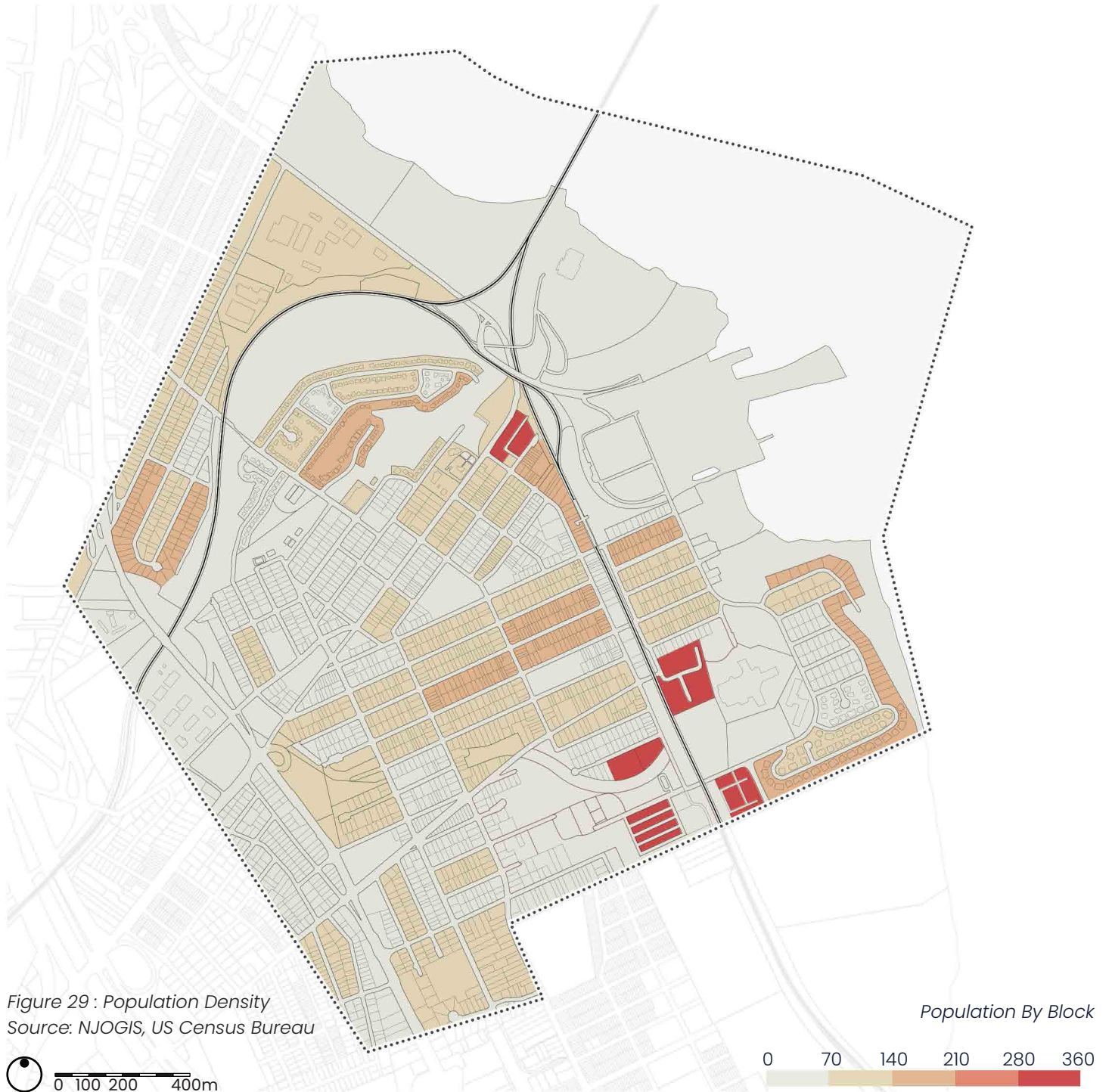
Furthermore, the infrastructure has also been impacted. A section of the country road and railway road have also been damaged.

As a result, the South Amboy Middle High School and many dwellings will be surrounded by water, and the only entrance to the dwellings will be from the school area.

According to FEMA, the Federal Emergency Management Agency, the 100-year floodplain is the minimum safe zone for determining floodplains, as it represents the area with a 1% annual probability of flooding. However, given the potential impacts of climate change and sea level rise, it may be advisable to consider a more precautionary approach, such as using a 500-year or even a 1000-year floodplain as the safe zone.

One hundred ten standalone houses will be directly affected, while the adjacent lots will also experience some degree of impact. Considering this, the total number of affected properties comes to X. It is imperative that these houses, as well as the utility, industrial, and logistics areas, be replaced before the onset of flooding.

*Source: FEMA*





South Amboy, New Jersey, exhibits a moderate population density. As of the available information provided by NJ Government (2021), the city has a land area of approximately 4 square kilometers and a population of around 9,327 people. Therefore, by calculating the population density, we can determine South Amboy has an average density is about 2,331 residents per square kilometer. This figure shows the distribution of individuals within the city that allows for a sense of community while maintaining a considerable level of personal space.

### Comparison of Population Density between South Amboy and Perth Amboy

Perth Amboy is located north of South Amboy above the Raritan River. The result shows relative differences when comparing the population densities of the two cities. Perth Amboy has a population of 55,291 and a land of 12,07 square kilometers. South Amboy showcases a slightly lower population density compared to Perth Amboy. While South Amboy's population density stands at around 2,331 residents per square kilometer, Perth Amboy, on the other hand, exhibits a higher density of approximately 4,580 residents per square kilometer. These figures suggest that Perth Amboy has a higher concentration of individuals within a given area compared to South Amboy. This difference in population density may lead to varying social dynamics and resource allocation in the two cities. Understanding the population density provides valuable insights into the demographic characteristics of these communities, enabling further analysis and exploration of their unique features.

There are two significant differences between South Amboy and Perth Amboy. First, in the means of household type, in South Amboy, the married percentage is 53, while in Perth Amboy is 38%. This may suggest in South Amboy, there is a greater emphasis on traditional family structures within the community. The higher married percentage could also imply a higher number of households with families. The second point that has importance in this comparison is the poverty rate. The percentage in South Amboy is 8, while in Perth Amboy, it is 20%. This may suggest relatively better economic conditions, higher incomes, and potentially more opportunities for employment and financial stability within that community. The lower poverty rate may indicate a stronger social safety net, higher educational attainment, or a healthier local economy.

## 3.5

### Population Density

**CASE STUDIES**

04

Chapter 04 presents case studies to showcase examples of urban design interventions in similar contexts. The High Line in New York City, the BIG U and The Green Loop project are discussed as prominent case studies. These examples offer insights into innovative approaches to repurposing underused spaces, enhancing public spaces, and mitigating the impact of climate change. The case studies provide valuable lessons and inspiration for the development of strategies and interventions in South Amboy.

The High Line in New York City is built on an abandoned railway line as an elevated park. The project began in 1999 when a group of residents formed the Friends of the High Line organization to advocate for its preservation. In 2002, the city announced that it would convert the railway line into a park. The design of the High Line was a collaborative effort between architects, landscape architects, and urban designers.

One of the key strategies employed in designing the High Line was using native plants and materials. The park's designers chose plants indigenous to the region, promoting biodiversity in the area.

From an urban design perspective, the High Line has significantly impacted the surrounding neighborhood.

The High Line in New York City is a case study of how architecture and urban design can be used to transform a city and has demonstrated its resilience to climate change and flooding. As the sea levels rise and storms become more frequent and intense, cities worldwide struggle with how to adapt to the new reality of climate change. The High Line provides a model for how cities can incorporate resilient design strategies into their infrastructure to mitigate the impacts of climate change.

The High Line's elevated design allows it to serve as a barrier to floodwaters, protecting the surrounding community from potential damage. In addition, the park's planting strategy incorporates plants that are able to withstand flooding, such as salt-tolerant species, which can help to absorb floodwaters and reduce the risk of erosion.

The park's infrastructure also includes sustainable drainage systems, which help to manage stormwater runoff and reduce the risk of flooding. These systems include green roofs, which absorb rainwater and help mitigate the urban heat island effect, and rain gardens and bioswales, which help filter and absorb stormwater.

## 4.1

### High Line in New York City



Figure 30 : Highline view  
between the buildings  
Source: Timothy Schenck



Figure 31 : Highline view  
Source: Timothy Schenck



Figure 32 : Highline city view  
Source: Timothy Schenck

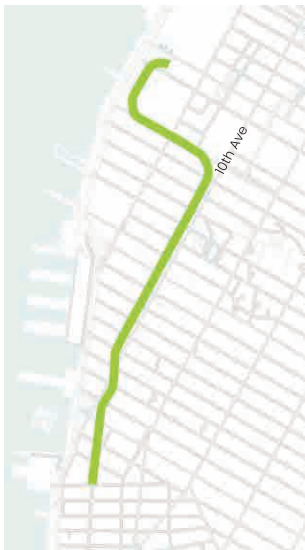


Figure 33 : Highline plan  
on the map

The High Line's design addresses the challenges of climate change and flooding as well as recognizes the significance of creating new public spaces. By repurposing an elevated railway into a vibrant park, the High Line offers an innovative approach to urban design beyond flood risk mitigation. In addition, the park's sustainable transportation features, such as bike lanes and pedestrian pathways, encourage alternative modes of transportation, reducing the reliance on cars and thereby minimizing carbon emissions. By creating new public spaces like the High Line, cities can address multiple urban challenges simultaneously. The park serves as a testament to the transformative power of urban design, offering a model for how cities can adapt to climate change's impacts while simultaneously enhancing their residents' quality of life. In addition to flood resilience measures, the High Line demonstrates the importance of integrating public spaces within the urban fabric, providing gathering places, recreational opportunities, and cultural experiences for both residents and visitors.

This thesis on the challenges of urban development and climate change in South Amboy is similar to the renowned High Line project in New York City, particularly in creating new public spaces. While South Amboy faces the threat of water rise induced by climate change, the High Line project offers valuable insights into the transformative potential of repurposing underused areas to address urban challenges. Both highlight the significance of repurposing underused spaces, creating new public spaces, and enhancing connectivity to build more resilient and livable communities.

Source: [thehighline.org](http://thehighline.org)



Figure 34 : The Big U perspective view  
Source: Big Team

## 4.2

The BIG U



Figure 35 : The Big U plan  
Source: Big Team

Source: [archdaily.com](http://archdaily.com)

In the face of climate change, flooding has become an increasingly pressing issue in urban contexts. Cities are particularly vulnerable to flooding due to their concentration of people, infrastructure, and resources in low-lying areas near waterways. The Big U project, an initiative in New York City, aims to address this issue by creating a system of protective measures along the city's waterfront.

The Big U is a multi-phase project that seeks to create a "bridging strategy" for the Lower Manhattan area, which is particularly susceptible to coastal flooding. The project includes a series of flood protection measures, such as raised platforms, deployable walls, and other infrastructure that can withstand the impact of storm surges and rising sea levels.

The project also emphasizes community engagement and social resilience, recognizing that flooding not only causes physical damage but can also have social and economic impacts on communities. The Big U includes the development of green spaces and public amenities, such as parks and community centers that can serve as gathering places and emergency shelters during flooding events.

In addition to its goals, The Big U is also a model for how cities can respond to the challenges of climate change. The project recognizes that urban areas are not static entities but are constantly evolving in response to social, economic, and environmental factors. By integrating flood protection measures into the city's urban fabric, The Big U demonstrates that cities can adapt and become more resilient in the face of climate change.

The 'Big U' project includes various technological innovations to enhance urban resilience and address the challenges posed by climate change which can be used as a guide in this thesis. Some of the key technological innovations employed in the project include; Flood protection systems, Sensor networks and monitoring systems, Green infrastructure and nature-based solutions, Smart city technologies, and Resilient building materials and design.

Overall, The Big U project is a comprehensive and innovative approach to addressing the challenges of flooding and climate change in an urban context. The project provides a model for how cities can adapt and thrive in a changing climate by combining physical infrastructure, community engagement, and social resilience.

The Green Loop project in Portland is an innovative urban initiative that aims to transform the city's urban landscape into a sustainable and pedestrian-friendly environment. The Green Loop envisions a 6-mile pedestrian and cycling pathway to encircle the central city, connecting neighborhoods, parks, cultural hubs, and commercial districts.

This project seeks to create a seamless network of green spaces, recreational areas, and transportation corridors, fostering active and sustainable modes of transportation while promoting community engagement and social interaction. The Green Loop will provide a safe and accessible pathway for pedestrians and cyclists, encouraging healthier lifestyles and reducing carbon emissions by promoting non-motorized transportation options.

Furthermore, the Green Loop project will integrate ecological elements, such as sustainable stormwater management, native plantings, and urban biodiversity enhancements. These features will contribute to improved air quality, water conservation, and the overall resilience of the city's urban ecosystem.

## 4.3

### The Green Loop



Figure 36 : The Green Loop render  
Source: [portland.gov](http://portland.gov)

Source: [portlandmaps.com](http://portlandmaps.com)



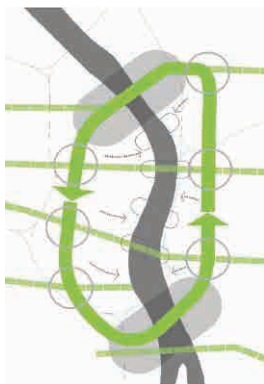


Figure 37: The Green Loop initial connections



Figure 38: The Green Loop sections



Figure 39: The Green Loop diagram

In exploring the challenges of urban development and climate change in South Amboy, this thesis draws inspiration from transformative projects like the Green Loop in Portland. The Green Loop serves as a valuable guide for enhancing urban resilience, which is central to the concerns of South Amboy.

By studying the Green Loop project, this thesis finds valuable insights into repurposing underused areas and creating new public spaces. The success of revitalizing abandoned properties, vacant lots, and brownfields in Portland can inform similar efforts in South Amboy, contributing to the city's overall livability and resilience. Additionally, the integration of sustainable infrastructure, such as green spaces, aligns with the objective of mitigating the impact of water rise in coastal communities like South Amboy.

Furthermore, the emphasis on enhancing connectivity within the city, as seen in the Green Loop, can guide the approach taken in South Amboy. By improving pedestrian access and promoting mixed-use development, the city can foster a more cohesive and vibrant community, reducing reliance on cars and promoting sustainable transportation options.

In conclusion, by drawing inspiration from the Green Loop project, this thesis provides practical insights and recommendations for South Amboy to address the challenges of urban development and climate change. By repurposing underused areas, enhancing connectivity, and prioritizing sustainability and resilience, South Amboy can navigate the threats posed by water rise and create a more equitable and livable community. The Green Loop serves as a testament to the transformative power of urban design, offering valuable lessons for cities like South Amboy to embrace a comprehensive approach towards a more sustainable future.

Source: portland.gov

**CIRCULATION & BORDERS**

05

Chapter 05 focuses on circulation and borders within South Amboy. It explores the concept of the green system, which emphasizes the importance of creating interconnected green spaces throughout the city. The chapter also addresses the roadway network's role in promoting connectivity and accessibility. Additionally, the public transportation system is examined to identify opportunities for improvement and expansion.



## 5.1

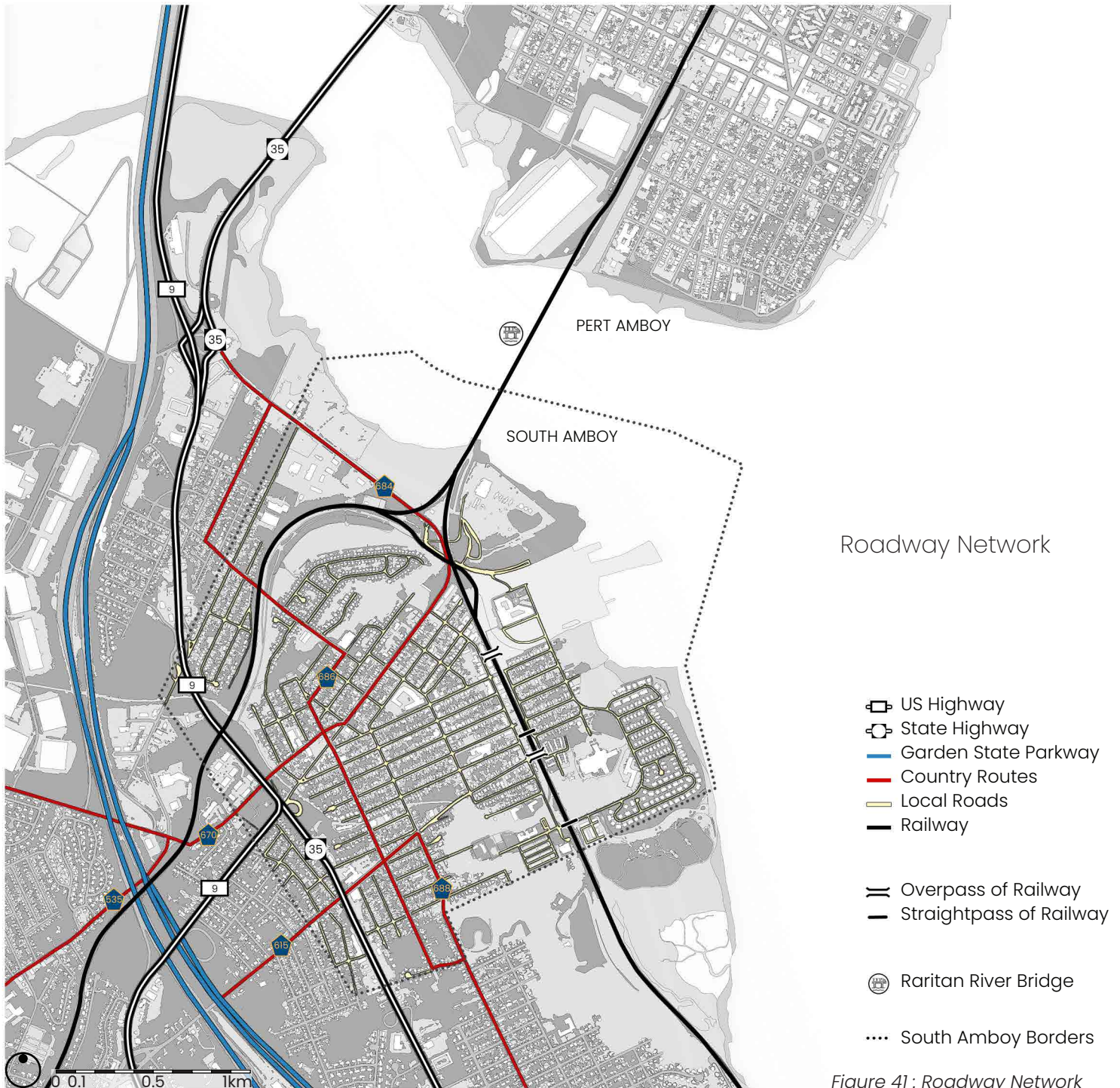
### Park & Open Space

South Amboy is a coastal community that struggles with urban spaces and their development. Currently, South Amboy has 15 park-open spaces, although it is essential to note that most of these areas are relatively small, with the majority measuring less than 1 acre. This limited size poses a challenge in providing substantial green areas within the city center.

Within the city center of South Amboy, the availability of green open spaces is notably few and far between. Only a few smaller parks exist, which emphasizes the need for creating quality green spaces that can enhance the well-being of residents and contribute to a sense of community. Recognizing the importance of accessible and well-designed green spaces, this thesis aims to address this deficiency and develop opportunities for residents to connect with the city and nature and engage in recreational activities.

To address this gap and promote a more sustainable and resilient community, this thesis explores strategies to improve the quality and distribution of green open spaces. By repurposing underused areas, such as abandoned properties, vacant lots, and brownfields, the city can revitalize these spaces and transform them into vibrant green spaces that offer numerous benefits to both residents and the environment.

Moreover, the thesis recognizes the importance of connectivity and accessibility in fostering a vibrant and cohesive community. Efforts are underway to enhance pedestrian access, improve public transportation, and promote mixed-use development that supports various activities and services. By connecting different parts of the city and creating walkable neighborhoods, South Amboy aims to reduce dependence on cars, promote active lifestyles, and encourage a lifestyle that is both healthy and sustainable.



## Roadway Network











-  US Highway
-  State Highway
-  Garden State Parkway
-  Country Routes
-  Local Roads
-  Railway
-  Overpass of Railway
-  Straightpass of Railway
-  Raritan River Bridge
-  South Amboy Borders

Figure 41: Roadway Network

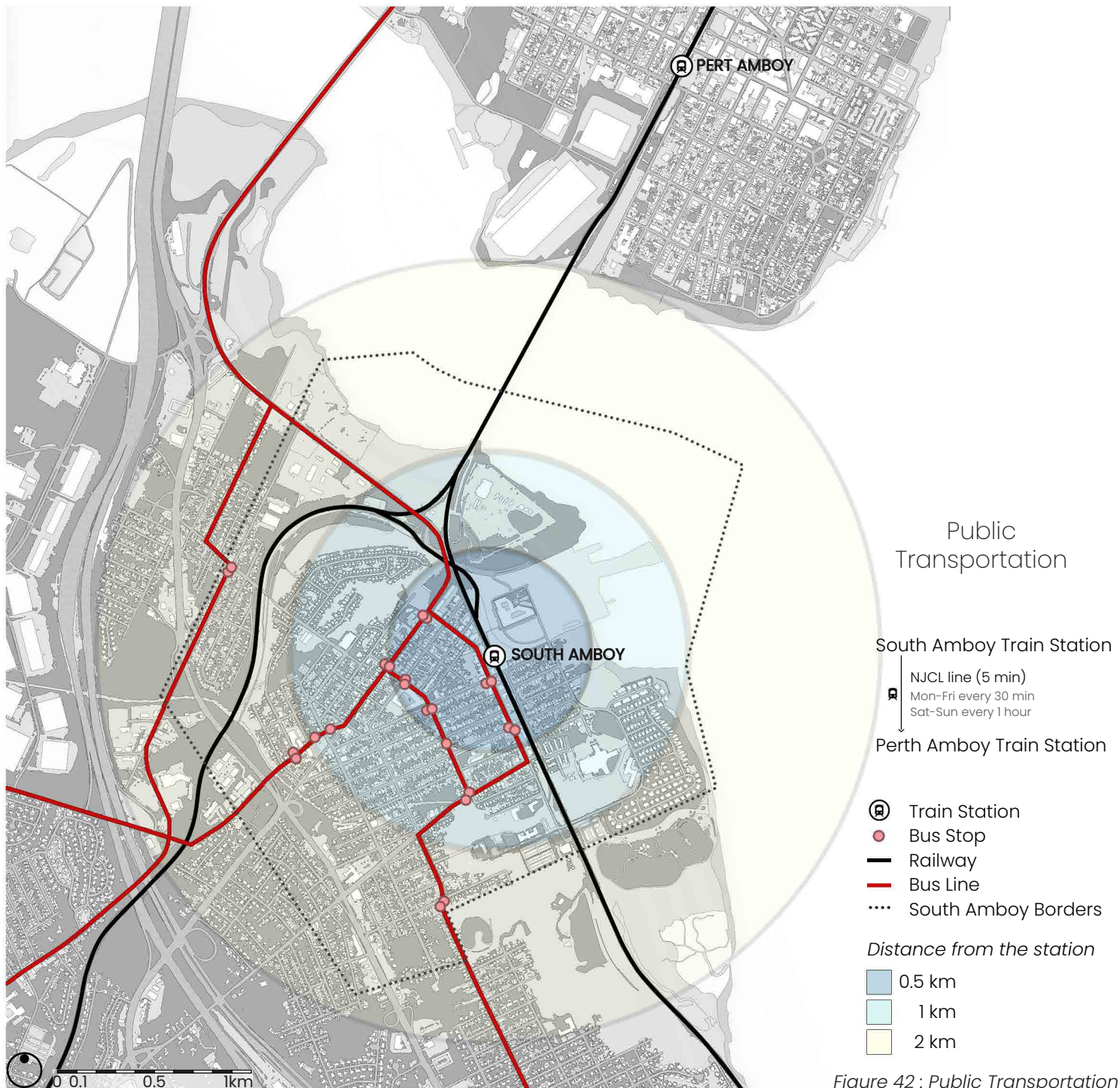


Figure 42 : Public Transportation

The roadway network is vital in connecting the city to neighboring areas and facilitating transportation within its borders. Situated within the city limits are key transportation routes, including US Highway, State Highway, County Routes, and local roads, which serve as essential arteries for vehicular traffic.

US Highway, State Highway, and County Routes traverse through South Amboy, ensuring access to and from the city. These roadways provide crucial connections to other regions and facilitate transportation.

Within the city, the local road network is designed to accommodate the primarily low-density development characteristic of a typical American suburb. These roads are arranged in a grid-like pattern, providing access to residential areas, commercial districts, and essential amenities.

Enhancing pedestrian access is an essential approach to urban design in South Amboy. By prioritizing pedestrian-friendly infrastructure, such as sidewalks and crosswalks, the city aims to promote walkability and create a safer environment for pedestrians.

Although there are bike lanes in South Amboy, they are limited in number and poorly connected to one another. Therefore it is not a preferred way of transportation.

The railway network also plays a significant role in South Amboy's transportation infrastructure. The city is traversed by railway tracks, providing additional transportation options for passengers. Along the eastern wing of the railway, there are four passes, two of which are overpasses, and two are straight passes.

Notably, the Raritan River bridge is a vital railway link connecting South Amboy and Perth Amboy. This bridge solely caters to the passage of trains, allowing railway connections between the two cities and different states on a bigger scale.

In conclusion, the roadway network in South Amboy, comprising US Highway, State Highway, County Routes, and local roads, plays a pivotal role in connecting the city to its surroundings and facilitating internal transportation. By prioritizing connectivity and accessibility, the thesis aims to create a more connected community, less reliant on private vehicles, fostering a sustainable and accessible transportation system to benefit its residents and visitors.

*Source: NJOGIS, NJGIN, NJDEP, NJDOT, NJTRANSIT*

## 5.2

### Roadway Network



## 5.3

### Public Transportation

South Amboy's public transportation network consists of railways and bus lines.

Railway transportation plays a significant role in South Amboy's public transportation system. The city is served by a train stop located in the old harbor area, providing access for commuters and travelers. This train stop is an important connection point for people traveling to neighboring cities, such as Perth Amboy, located across the Raritan Bay. Traveling between South Amboy and Perth Amboy is a 5-minute journey across the bay.

Regarding bus transportation, South Amboy has bus stops in the city center, enabling access to public transportation for residents in that area. However, the availability of bus stops decreases in other parts of the city, which can pose challenges for those residing in those areas who rely on public transportation.

Improving public transportation in South Amboy is essential for enhancing connectivity and ensuring mobility options for all residents. Expanding the bus stop network to cover more areas within the city would provide better accessibility and convenience.

By addressing public transportation gaps and providing more accessible options, South Amboy can foster a more connected and sustainable community. It would reduce dependence on private vehicles, promote a greener environment, and enhance the overall livability of the city.

In conclusion, while South Amboy benefits from a train stop and bus stops in the city center, there is a need for further investment in public transportation infrastructure to ensure equitable access and connectivity throughout the entire city. By doing so, South Amboy can enhance its public transportation system and provide its residents with efficient, convenient, and sustainable mobility options.

PROJECT 06

Chapter 06 focuses on urban development and climate change challenges in South Amboy. The thesis proposes a comprehensive approach to urban design that repurposes underused areas and enhances connectivity within the city. By revitalizing abandoned properties, vacant lots, and brownfields into green spaces and sustainable infrastructure, South Amboy can reduce the impact of water rise and promote a more resilient and livable community. Improving pedestrian access and encouraging mixed-use development will also create a cohesive and sustainable city. The chapter concludes by offering practical recommendations for implementing these strategies and encouraging other cities to prioritize sustainability and resilience in their urban design.



Figure 43 : Urban Fabric



- Public Building
- Commercial
- Dwelling

## Urban Fabric

The urban fabric of South Amboy exemplifies the characteristics of an American suburb, predominantly composed of single-family houses and stand-alone buildings. These single-family homes are typically accompanied by private gardens and driveways, contributing to the city's overall green appearance. However, it is essential to note that most of these green spaces are not accessible to the public, limiting their contribution to the city's public life and sense of community.

Historically, South Amboy's development was influenced by the presence of a harbor that facilitated coal transportation, establishing the city as an industrial hub. Over time, these industrial areas have transformed, with a predominant shift towards residential development. Former industrial sites are gradually being repurposed for housing purposes, reflecting the changing economic landscape and the community's evolving needs.

The railway network that traverses South Amboy acts as a physical division and barrier within the urban fabric. The presence of two railway lines further emphasizes this division, impacting the city's spatial connectivity and potentially affecting the overall coherence and integration of different neighborhoods.

Understanding the characteristics of South Amboy's urban fabric, including its predominant single-family housing, limited public green spaces, industrial-to-residential transformations, and the division created by the railway, provides valuable insights. By addressing these aspects, the city can foster community engagement, enhance public green spaces, promote sustainable development, and improve connectivity within its urban fabric.

## Urban Patterning

South Amboy comprises stand-alone buildings. As a result, there are hardly any mixed-use buildings.

## Green Infrastructure

The distribution of the defined green area is mainly on the edges of the city, making it harder to access for people.

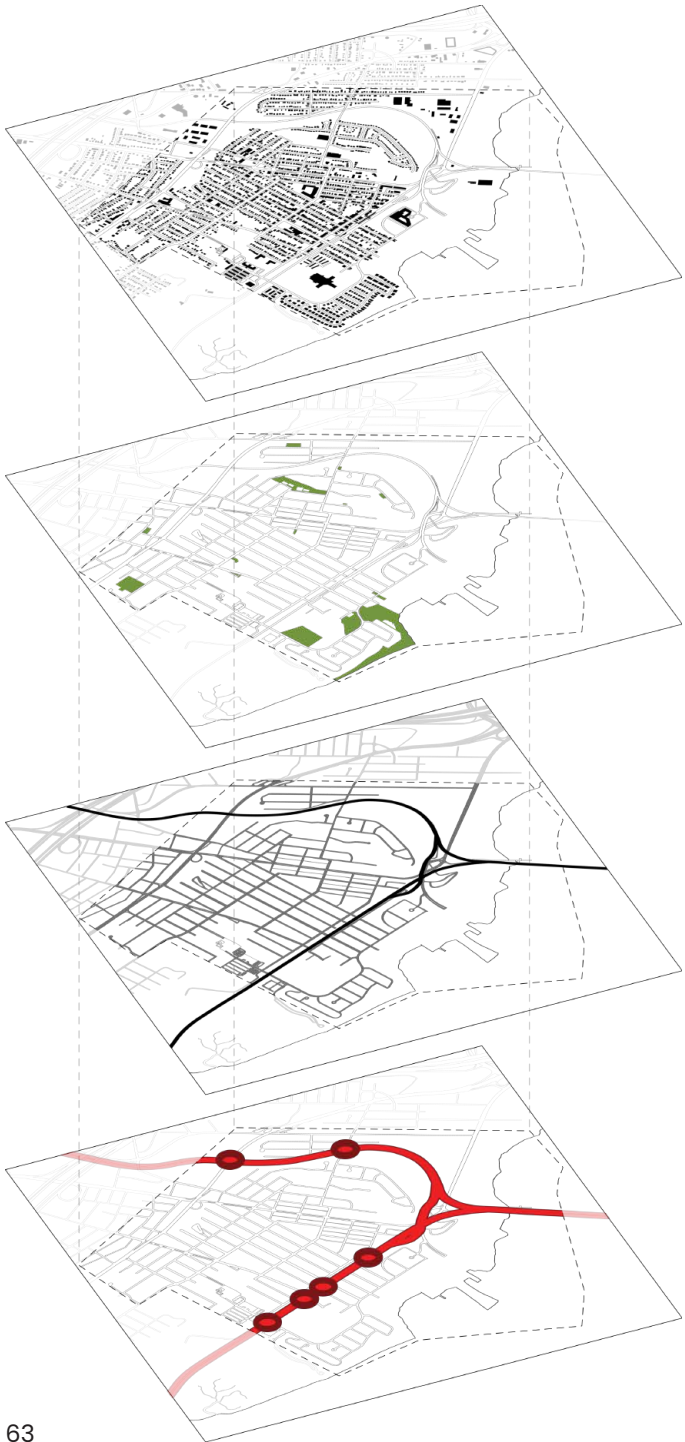
## Existing Infrastructure

The railways are still operative and bus lines are present in the city (see Public Transportation Map, p.56); however, South Amboy, as a suburban, is a car dependent city.

## Infrastructure Barrier

Train lines separate the city's both regional and local movements, leaving the city's edges fragmented. There are only a few connection points on the railway line.

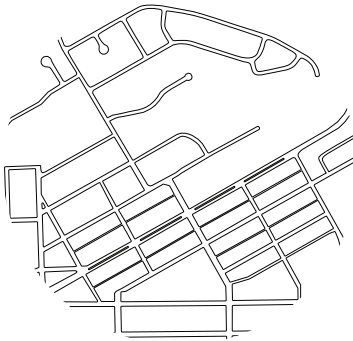
Figure 44 : Blow-up Maps





Built Area Pattern

South Amboy features a typical suburban layout characterized by stand-alone buildings with no adjacent structures throughout the area. This architectural arrangement in South Amboy showcases a sense of individuality, as each building stands independently, maintaining its own distinct presence.



Street Composition

The street configuration in South Amboy is characterized by a notable presence of dead-end streets, a feature less frequently encountered in urban settings. However, within a suburban context such as South Amboy, this layout contributes to the sense of privacy and isolation.



Figure - Ground Diagram

According to the Figure-ground diagram, South Amboy illustrates a situation where the majority of lots are occupied while a noticeable number of vacant lots are vacant, which should not be regarded as insignificant.

Figure 45 : Solid-Void Diagrams



Figure 46 : Vacant Area in South Amboy  
Source: NJGOV, GoogleEarth



- Railway
- == Highway
- ▒ Vacant Area
- ▒ Estimated Waterfront\*



## Vacant Area in South Amboy

In the context of South Amboy, the presence of railways has caused the division of the city, creating distinct borders. Furthermore, the city has experienced a history of industrial sites, which have since been disassembled, leaving behind a significant number of vacant spaces. These vacant areas are notable in terms of land coverage, as can be observed on the map. While some of these spaces have been repurposed over time and transformed into sports facilities, both in the northern and southern parts of South Amboy, a considerable number of empty lots still remain.

Presently, the majority of these vacant spaces predominantly consist of either green or brownfields, which are rarely, if ever, used by the city's residents. The existence of these unused areas raises questions about the potential for their revitalization and integration into the urban fabric. The presence of these underutilized spaces provides an opportunity for urban planning and development efforts to explore strategies for their adaptive reuse, potentially addressing the need for public space or engaging the connection in the city. By considering the optimal utilization of these vacant areas, the city can enhance its urban landscape and use its available land resources.

\*In the worst-case scenario, the estimated waterfront in 100 years according to AE and VE zones.

*Source: NJGOV, GoogleEarth*



Figure 47: Strategy



- Existing Infrastructure
- Vacant area
  - Train line
  - Highway
  - Estimated Waterfront\*
- Proposed Infrastructure
- Green loop

# The Green Loop

## Strategy

This strategy aims to outline a comprehensive plan for establishing a green loop in South Amboy, utilizing the city's vacant spaces as connectors. By integrating sustainable design principles, green infrastructure, and community engagement, this initiative aims to transform South Amboy into a more vibrant and environmentally friendly city.

To begin, an assessment of the vacant spaces within South Amboy was conducted. This evaluation identifies suitable locations for creating green connections, considering accessibility, size, proximity to existing infrastructure, and potential environmental impact.

With the vacant spaces identified, the next step is to design and develop green spaces that will form the foundation of the green loop. The design includes sustainable principles. Emphasis will be placed on creating spaces that encourage recreational activities and provide opportunities for social interaction.

Integrating green infrastructure elements is essential to maximize the sustainability of the green loop. This includes the installation of permeable pavement, bioswales and green roofs, which can help manage stormwater runoff, improve air quality and mitigate the urban heat island effect.

A critical aspect of the green loop strategy is ensuring connectivity and accessibility throughout the city. This involves establishing pedestrian and cycling paths and providing adequate signage and wayfinding systems.

Additionally, partnerships with local community organizations, volunteer groups, and educational institutions can help engage residents in the stewardship of green spaces.

In conclusion, by implementing this comprehensive strategy, South Amboy can transform its vacant spaces into green connections that unite the city and promote sustainable living. This green loop initiative will enhance residents' quality of life, attract visitors, boost economic development, and position South Amboy as a sustainable urban planned city.



Figure 48: The Loop



- Big Loop
- Small Loop
- Pedestrian Connection

## The Loop

The Loop spans a distance of approx. 5 km, with a smaller loop branching off towards its northern section.

Based on an average walking speed, individuals are able to cover a distance of approximately 400 meters within a 5-minute timeframe. In the context of the specific route in question, which measures 5.1 kilometers, it is feasible to walk a distance of approximately 5 kilometers within a time range of 45 to 60 minutes on foot. Alternatively, when utilizing a bicycle and traveling at a speed of 19 km/h, the same 5-km distance can be covered in approx. 15 minutes.

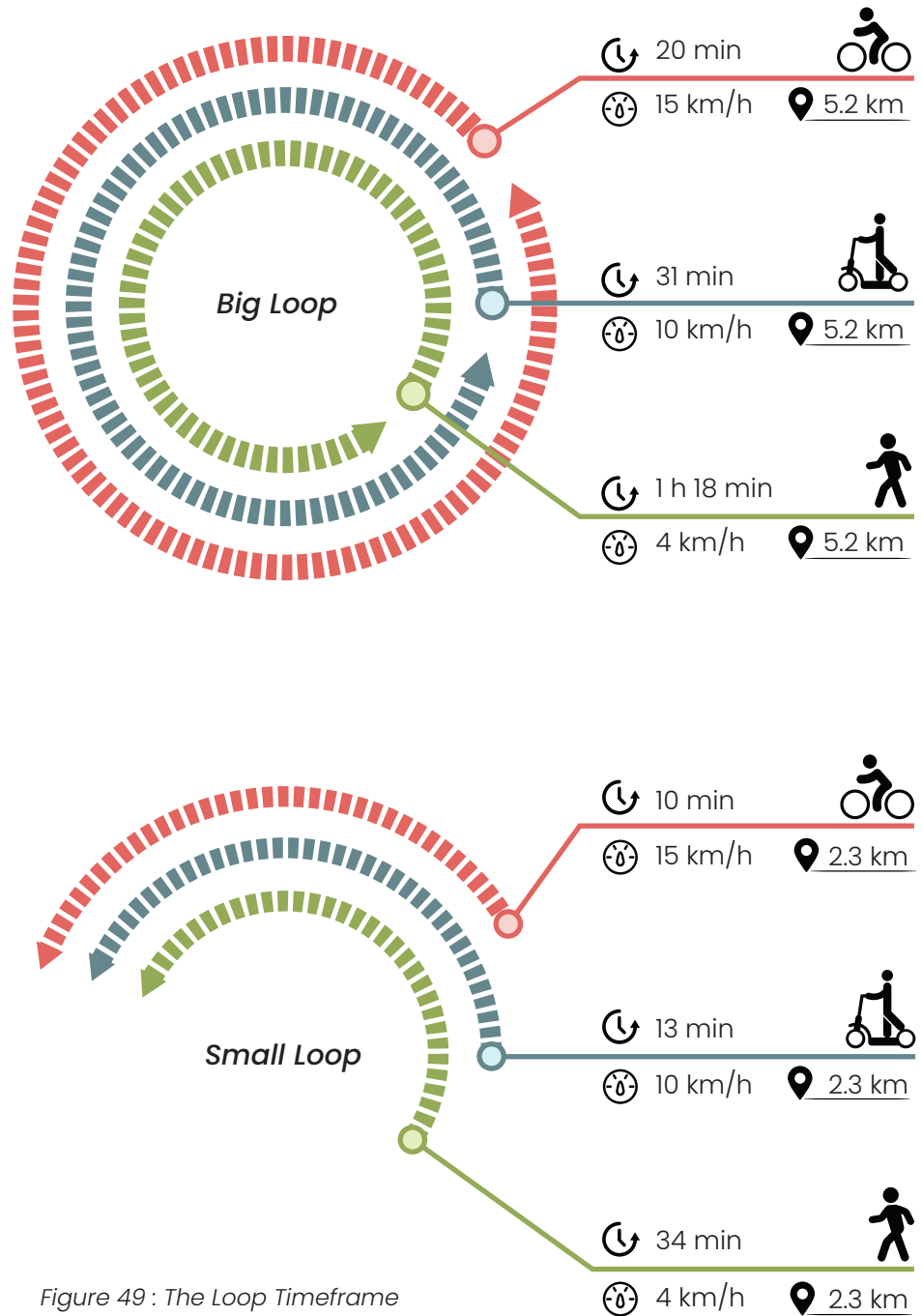
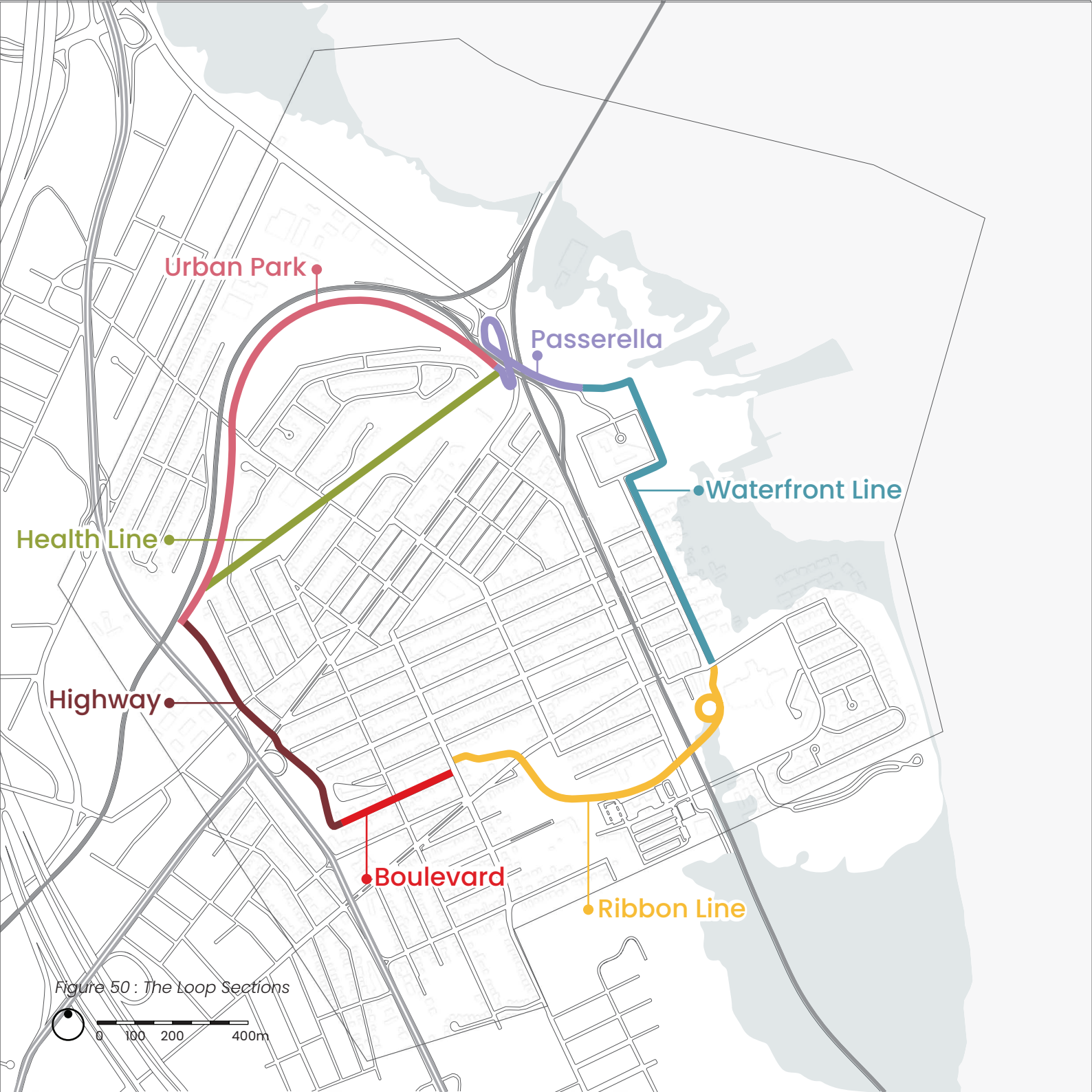


Figure 49: The Loop Timeframe



Urban Park

Passerella

Waterfront Line

Health Line

Highway

Boulevard

Ribbon Line

Figure 50 : The Loop Sections



*The Loop comprises a continuous pathway primarily designed for pedestrians and cyclists, consisting of seven distinct sections. While the Loop as a whole contains main characteristics, each individual part illustrates unique adjustments tailored to the specific attributes of the pathway.*

### **Urban Park**

Urban Park is located next to the railway, and the path is designed by the line of desire.

### **Highway**

Highway has the purpose of serving the vehicles, and the path also continues here.

### **Ribbon Line**

Ribbon Line is an elevated path that goes through the grove and turns into a bridge.

### **Passerella**

Passerella is first an overpass that turns into an underpass.

### **Health Line**

Health Line also uses the line of desire to shape the path and is provided with activities.

### **Boulevard**

Boulevard is created by pedestrianization of the large vehicle way.

### **Waterfront Line**

Waterfront Line is designed to fit into the new coastline.



Figure 51: Masterplan





## The Green Loop Section



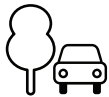
Urban Park



Health Line



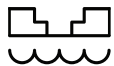
Highway



Boulevard



Ribbon Line



Waterfront Line



Passerella

## Elements on the Path



Open Park Space



New Dwellings



Sport Courts



Playground



Wellness



Picnic Area



Service & Rest Area



Pedestrianization



Elevated Path



Bridge



View Area



Cafe



Open Park Space



Picnic Area



Passage



Crosswalk



Underpass



Overpass

## Existing Infrastructure



South Amboy Train Station



South Amboy Middle High School



Church



Existing Park

- 1 - Charles Brown Jr Memorial Park
- 2 - South Pine Avenue Park
- 3 - Magnanimity Memorial Park



Train Line



Highway

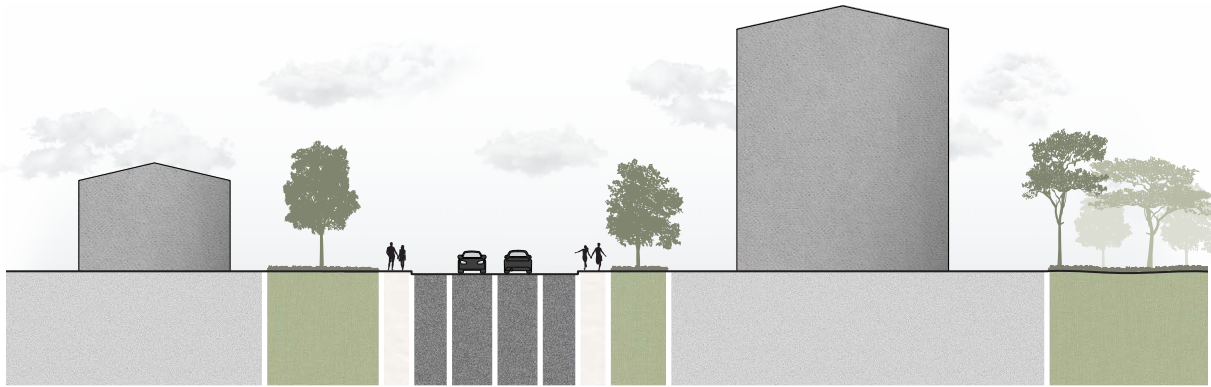
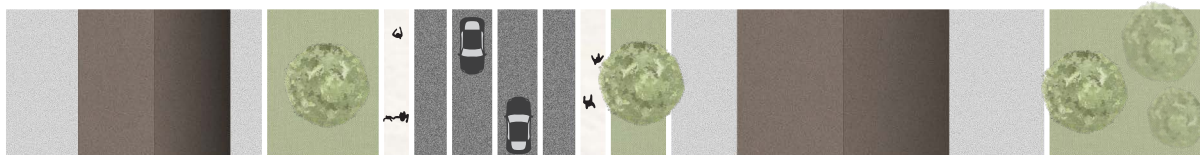


Figure 52 : Urban Park New Settlement Section

Scale 1/500



The Urban Park, previously a vast untouched green space, was designated a key area for city growth. Due to future elevation changes along the sea, houses needed to be relocated, leading to the decision to allocate this area for that purpose. Alongside the residential structures, an urban park was established, preserving the remaining green space for the leisure activities of city residents.

## Urban Park

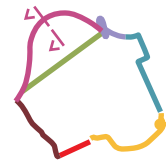
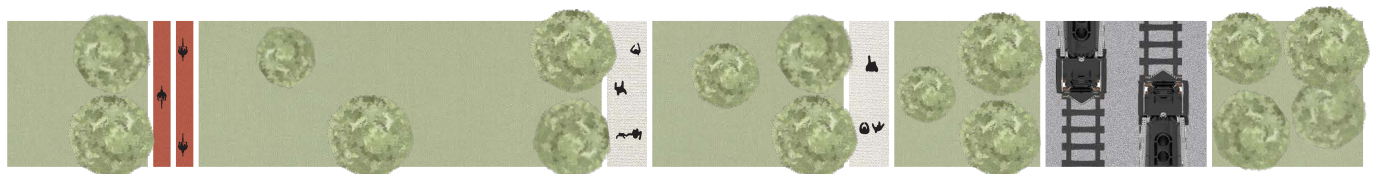


Figure 53 : Urban Park Railway Section

Scale 1/500





Urban Park  
Mood Board

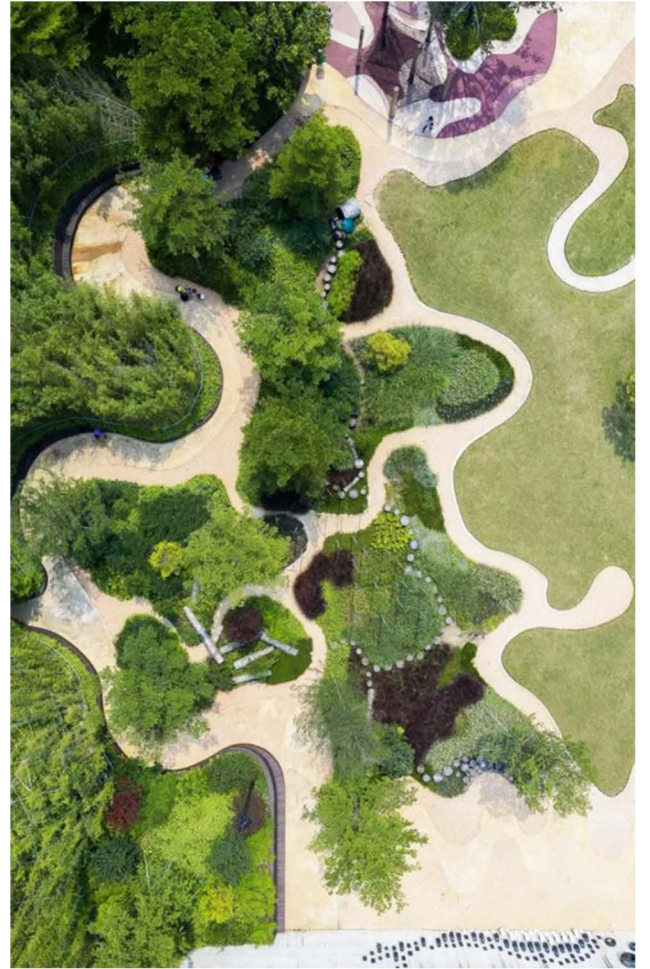


Figure 54 : Urban Park Collage

Healthline is a green corridor spanning 1 kilometer in length and 50 meters in width, which has been preserved as a natural green space due to the presence of power lines passing through the area. Through comprehensive analysis, it was discovered that this corridor possessed the potential for sports-related activities. Thus, a designated area called Healthline was designed. The existing sports fields were preserved and supplemented with new ones, while the green corridor was divided into three main zones: sports complexes, children's areas, and youth areas. Careful attention was given to creating sports facilities tailored to the specific groups residing in each zone, ultimately resulting in a green corridor that can fulfill the sporting needs of the entire city, encompassing a capacity that caters to various segments of the population.

## Health Line

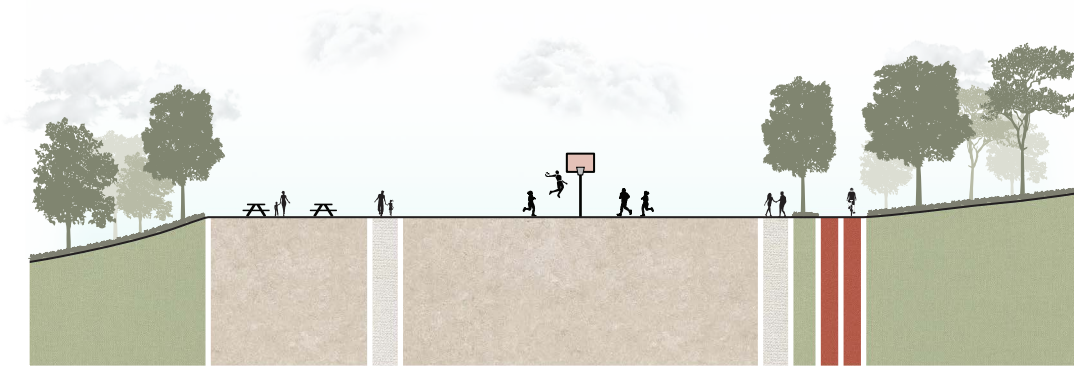
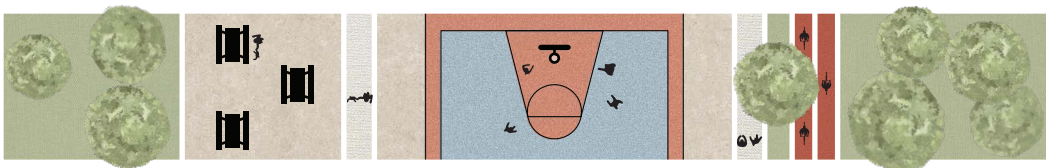


Figure 55 : Health Line Section

Scale 1/500





Health Line  
Mood Board



Figure 56 : Health Line Collage

Highway, one of the main arteries connecting South Amboy to other cities, holds significant importance. Despite its bustling nature, making substantial changes to the road itself may be challenging. However, through analysis, it was evident that certain vacant spaces and green areas along the Highway drew attention. To address the needs of travelers on the Highway, the concept of incorporating structures within these green spaces to enhance their functionality was considered. As a result, the abandoned vacant areas were transformed into service areas, including facilities such as cafeterias and gas stations, allowing individuals to take breaks and cater to their needs during their journey. This redesign aimed to provide functional spaces for highway travelers while optimizing the utilization of these previously underutilized areas.

## Highway

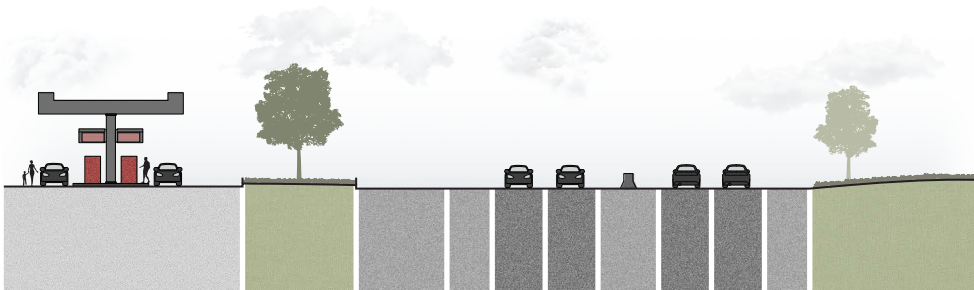
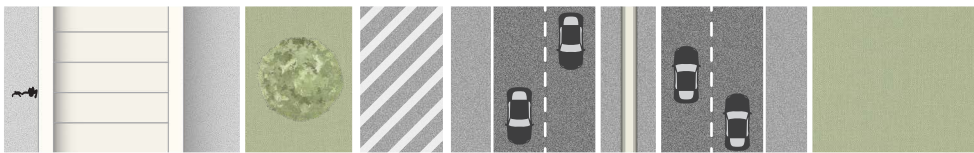


Figure 57 : Highway Section

Scale 1/500





Highway  
Mood Board

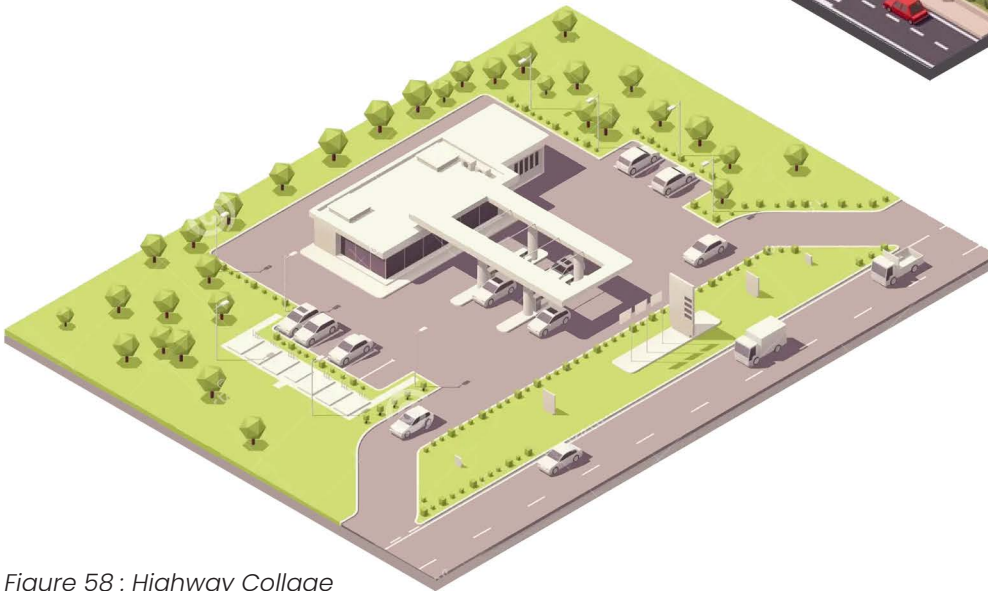
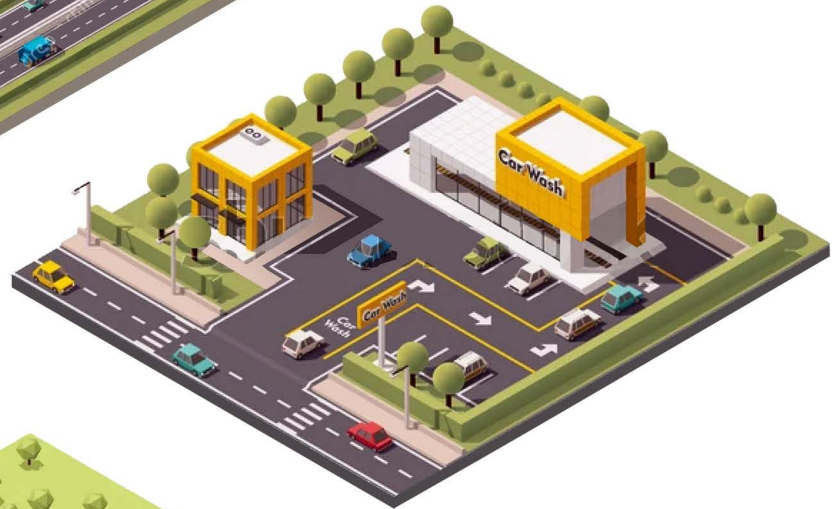


Figure 58 : Highway Collage

The Boulevard was one of the wide, vehicle-accessible roads within the loop. Therefore, it was decided to utilize it in order to complete the loop. A section of this road was partially pedestrianized to ensure the continuous completion of the designed loop and to provide a seamless transition for pedestrians and cyclists to access the adjacent green area without any inconvenience. This facilitated the uninterrupted flow of the loop, free from any disruptions or interruptions. The Boulevard was designed with trees to maintain a sense of greenery, creating a sense of continuity between the two green areas. This integration of pedestrian-friendly elements and green landscaping ensures a harmonious connection between the loop and the surrounding natural spaces, providing an enhanced experience for both pedestrians and drivers.

## Boulevard

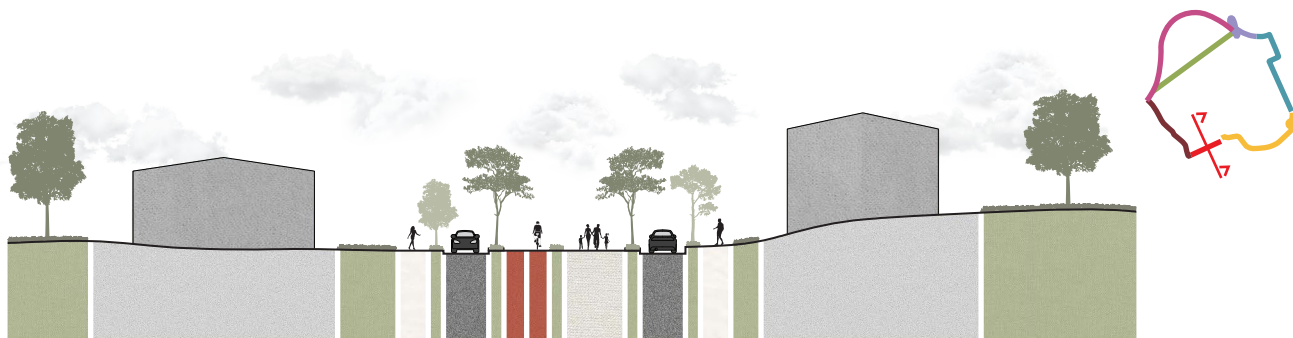
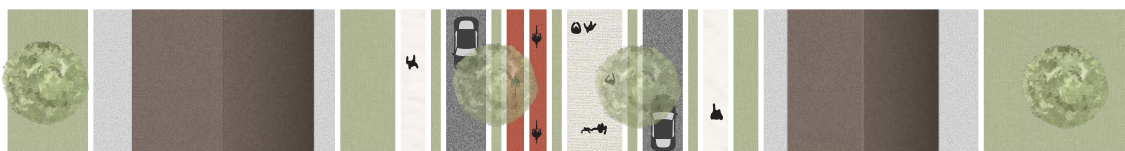


Figure 59 : Boulevard Section

Scale 1/500







Boulevard  
Mood Board

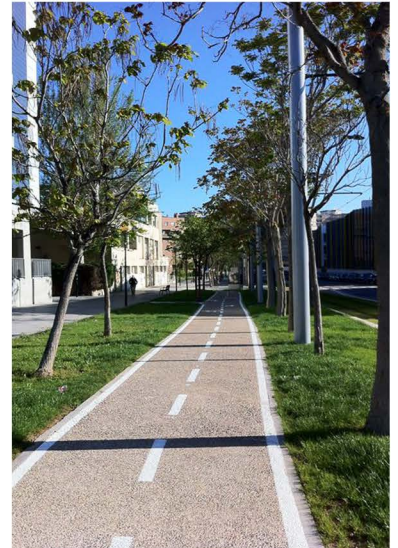


Figure 60 : Boulevard Collage

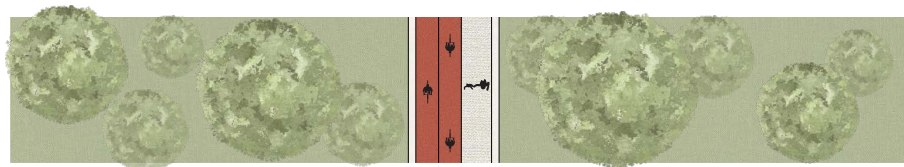
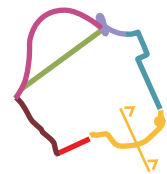
Ribbon Line consists of two distinct sections within the loop, separated by a railway line. The first section is a natural forest area nestled among residential buildings surrounded by numerous trees. However, this section faces a challenge with the interruption of roads and the creation of dead-end streets due to variations in the levels. The second section encompasses green spaces with high school baseball fields, which will eventually transform into a natural lake, partially submerged underwater. To establish a connection between these two areas and resolve the connectivity issues between the roads, the concept of designing an elevated path was introduced. The elevated path was designed to link the roads within the first section and culminate in a vantage point overlooking the future lake, seamlessly traversing the railway line.

## Ribbon Line



Figure 61: Ribbon Line Section

Scale 1/500

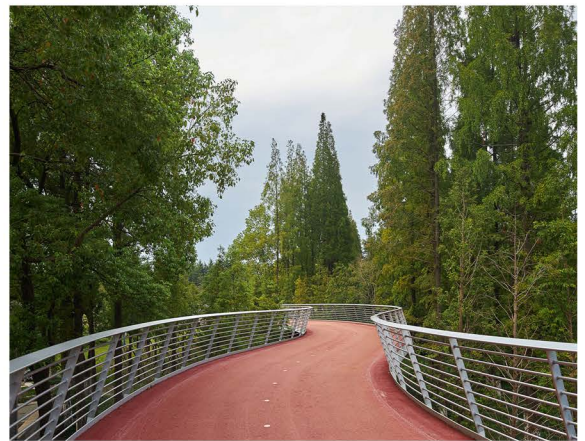




Ribbon Line  
Mood Board



Figure 62 : Ribbon Line Collage



Waterfront Line is one of the largest and most significant areas within the loop project. Being the city's sole waterfront stretch, it holds the potential for people to engage with the water and partake in various activities. However, due to the lack of any waterfront development, it is currently not a facilitative space for public use. To address this issue, a waterfront park is envisioned to transform this neglected area into a vibrant destination where people of all ages can interact with the water. The park will feature observation platforms, recreational and sports areas, and green spaces and cater to the diverse needs and preferences of the community.

The primary challenge is that a substantial portion of this area will eventually submerge underwater. In the design process, careful consideration was given to creating a sustainable and adaptable design that serves both the present and the future. The structures were designed to accommodate potential submersion, with the flexibility to transform their shape and function while remaining usable in the future. Simultaneously, the houses located south of the waterfront, which would eventually be submerged, were relocated to new residential areas within the urban park.

## Waterfront

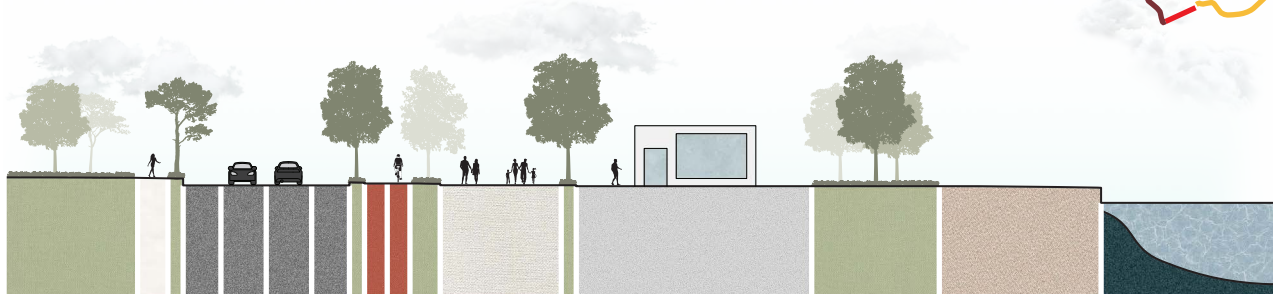
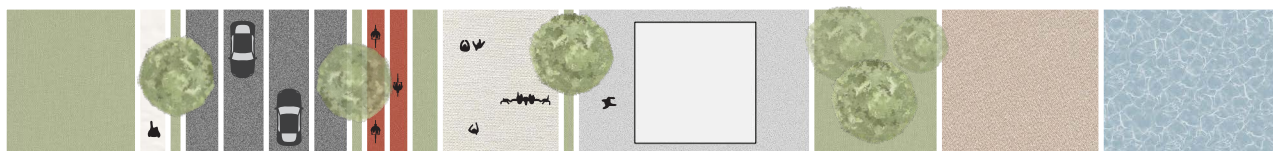


Figure 63 : Waterfront Section

Scale 1/500





Waterfront  
Mood Board

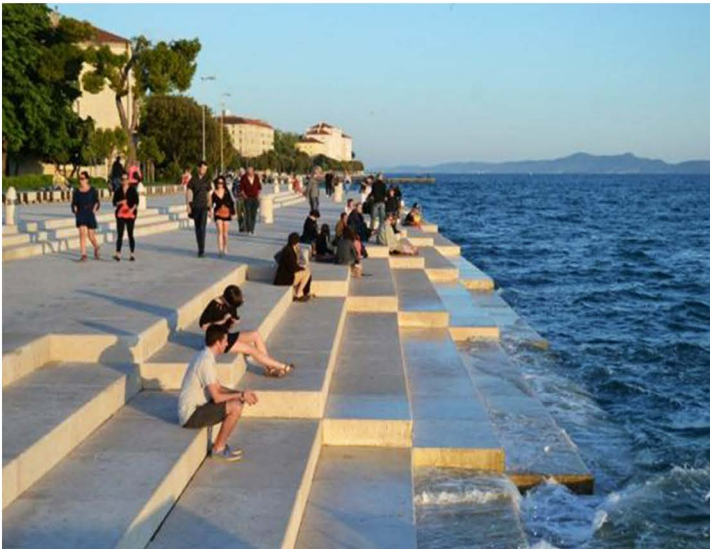
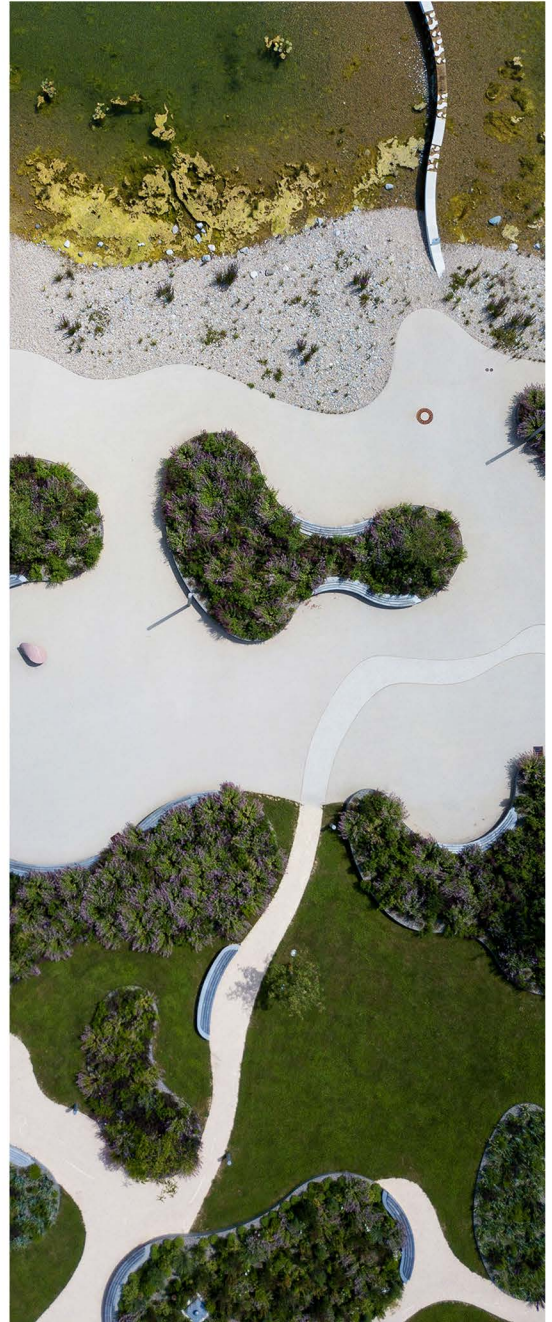


Figure 64 : Waterfront Collage



Passerella serves as a square connecting Urban Park, Healthline, and Waterfront Line. Previously, there was a noticeable lack of connectivity between these areas, making it difficult to cross, especially for pedestrians from one side to the other. To address this issue, a solution was implemented by establishing pedestrian and bicycle paths along this route, effectively resolving the connectivity problem among these three significant urban parks. When starting from the waterfront Line to the Urban Park or Health Line, the passage starts as an overpass, then curls in and turns into an underpass. This design intervention not only improves accessibility but also fosters a seamless connection, allowing visitors to traverse between these parks with ease, promoting a cohesive and integrated urban experience.

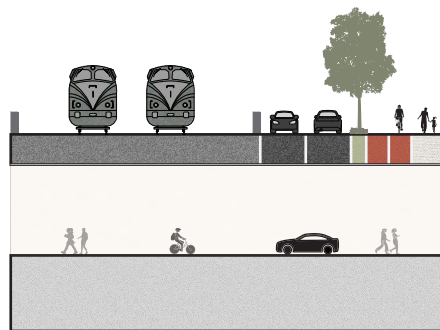


Figure 65 : Passerella Section  
Scale 1/500

## Passerella





Passerella  
Mood Board

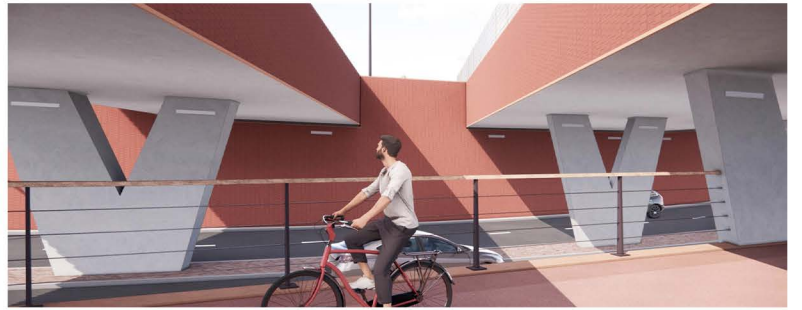


Figure 66 : Passerella Collage

CONCLUSION 07



Chapter 07 encompasses the source, bibliography, and figure lists. These lists serve as essential references, providing a comprehensive record of consulted sources, cited materials, and visual aids used in this work.

United States Census Bureau  
[census.gov/](http://census.gov/)

NJGOV (Official Site of the State of New Jersey)  
[nj.gov/](http://nj.gov/)

NJMAP2 (Interactive Atlas of New Jersey)  
[njmap2.com/](http://njmap2.com/)

NJDEP (New Jersey Department of Environmental Protection)  
[dep.nj.gov](http://dep.nj.gov)

NJGIS (New Jersey Bureau of Geographic Information Systems)  
[nj.gov/dep/gis/](http://nj.gov/dep/gis/)

NJGIN (New Jersey Geographic Information Network)  
[njgin.nj.gov/](http://njgin.nj.gov/)

NJOGIS (NJGIN Open Data)  
[njogis-newjersey.opendata.arcgis.com](http://njogis-newjersey.opendata.arcgis.com)

Sources

NJDOT (New Jersey Department of Transportation)  
[state.nj.us/transportation/](http://state.nj.us/transportation/)

NJWEATHER (New Jersey Weather)  
[nj.com/weather/](http://nj.com/weather/)

NJTRANSIT (New Jersey Transit Corporation)  
[njtransit.com](http://njtransit.com)

NJTPA (North Jersey Transportation Planning Authority)  
[njtpa.org](http://njtpa.org)

GoogleEarth  
[earth.google.com/web/](http://earth.google.com/web/)

FEMA (Federal Emergency Management Agency)  
[fema.gov/](http://fema.gov/)

FEMA Flood Map Service Center  
[msc.fema.gov/](http://msc.fema.gov/)

FEMA's National Flood Hazard Layer (NFHL) Viewer  
[hazards-fema.maps.arcgis.com/](http://hazards-fema.maps.arcgis.com/)

FEMA Flood Maps  
[fema.gov/flood-maps](http://fema.gov/flood-maps)

High Line New York  
[thehighline.org](http://thehighline.org)

Arch Daily  
[archdaily.com](http://archdaily.com)

Rebuild by Design  
[rebuildbydesign.org/](http://rebuildbydesign.org/)

Portland Government  
[portland.gov](http://portland.gov)

The Green Loop  
[portlandmaps.com](http://portlandmaps.com)

Code Publishing Company (CPC)  
[codepublishing.com](http://codepublishing.com)

Mapbox Studio  
[studio.mapbox.com](http://studio.mapbox.com)

## Sources

- Postmetropolis: Critical Studies of Cities and Regions by Edward W. Soja (2000)
- Drosscape: Wasting Land in Urban America by Alan Berger (2006)
- A Better Place to Live: Reshaping American Suburbs by Philip Langdon (1994)
- The Rise and Fall of Suburbia by Robert Fishman (1991)
- A flood vulnerability index for coastal cities and its use in assessing climate change impacts, Balica, S. F., Wright, N. G., & van der Meulen, F. (2012)
- Designing the Reclaimed Landscape by Alan Berger (2008)
- The Land as Palimpsest by Andre Corboz (1983)
- Garden Cities of To-morrow by Ebenezer Howard (1898)
- Social Exclusion and Space: Social Exclusion in European Cities: Processes, Experiences, and Responses by Ali Madanipour, Goran Cars, Judith Allen (1998)
- Urban Colossus: Why is New York America's Largest City? by Edward L. Glaeser (2005)

## Bibliography