

Observations and Recommendations for The Delaware and Raritan Canal Master Plan Update

Prepared for the Delaware and Raritan Canal Commission
By the Spring 2021 Graduate Planning Studio
Edward J. Bloustein School of Planning and Public Policy, Rutgers University

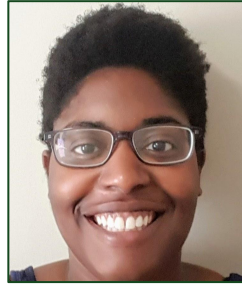
April 27, 2021

Introduction

Our Team



**Morgan
Astorino
(she/her)**
MCRP, 2021
Based in:
Mount Holly,
NJ



**Mercy
Iyere (she/her)**
MCRP, 2021
Based in:
New
Brunswick,
NJ



**Ananya
Kashyap
(she/her)**
MCRP, 2021
Based in:
New
Brunswick,
NJ



**Jesse
Lindenberg
(he/they)**
MCRP, 2021
Based in:
Highland Park,
NJ



**Haleigh
Schmidhamer
(she/her)**
MCRP, 2021
Based in:
Albany,
NY



**Natalie
Tse
(she/her)**
MCRP, 2021
Based in:
Marlboro,
NJ



**Ryan
Wolf
(he/him)**
MCRP, 2021
Based in:
Long Island,
NY



**Jeanne
Herb
(she/her)**
Professor
Based in:
Frenchtown,
NJ

Special Thanks

Delaware and Raritan Canal Commission

John Hutchison | Executive Director
Colleen Maloney | Review Zone Officer
Bruce D. Stout, PhD | Vice Chairman
John Loos | Commissioner
Phillip Lubitz | Commissioner
Douglas H. Palmer | Commissioner
Mayor Caryl “Chris” Shoffner | Commissioner
John J. Reiser | Commissioner

New Jersey Department of Environmental Protection

Robin Madden | Acting Director, Division of Parks and Forestry
Vicki Chirco | Resource Interpretive Specialist, Historic Resources
Stephanie Fox | Resource Interpretive Specialist, Natural Resources
Judeth Yeany | Bureau Chief, Green Acres Program
Kate Marcopul | Administrator, State Historic Preservation Office
Jesse West-Rosenthal | Historic Preservation Specialist, State Historic Preservation Office

New Jersey Water Supply Authority

Marc Brooks | Executive Director
Julie Shelley | Property & Permit Administrator
Michael Sellar | Facility Manager
Kenneth H. Klipstein | Director, Watershed Protection Programs

New Jersey Department of Transportation

Tina Shutz | Section Chief

D&R Canal Watch

Linda Barth | President, Board of Trustees
Robert Barth | Trustee

D&R Greenway Land Trust

Linda J. Mead | Executive Director

Millstone Valley Preservation Coalition

Robert von Zumbusch | Vice President

Abbott Marshlands

Patricia Coleman | Executive Committee Member
Mary Leck | Executive Committee Member

City of New Brunswick

Daniel Dominguez | Director, Department of Planning, Community & Economic Development

City of Trenton

Jeffrey Wilkerson | Acting Planning Director
Michael Kolber | Senior Planner

Isles, Inc.

Michael Nordquist | Managing Director of Community Planning & Development

Introduction

The 70-mile corridor of the Delaware and Raritan Canal offers not only an aesthetic and **recreational benefit** to multiple New Jersey communities, but also steady and reliable **supply of drinking water** for over one million people per day.

The Delaware and Raritan Canal faces new threats and new circumstances, exacerbated by **COVID-19**, that require renewed planning efforts in the form of an updated master plan.

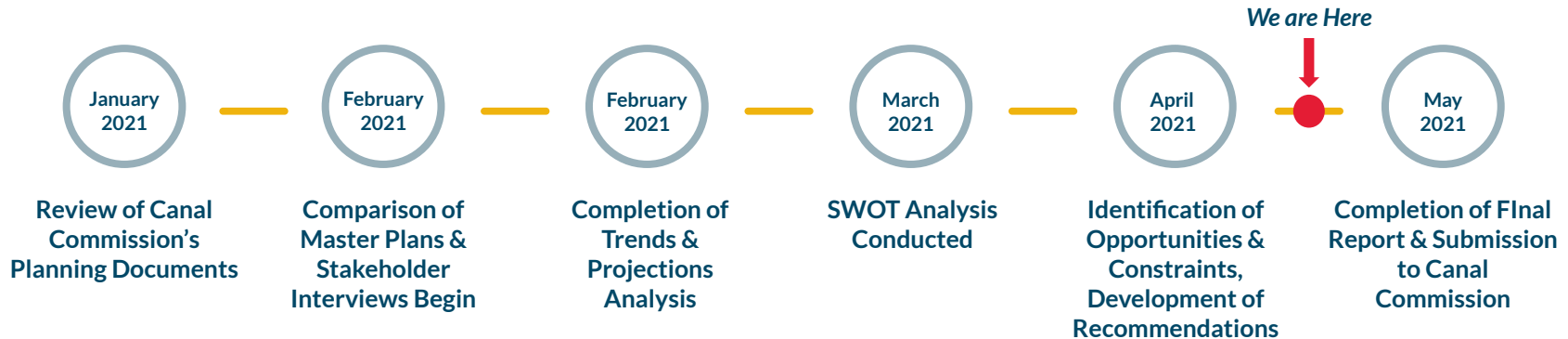
As 2024 marks the **50th anniversary** of the D&R Canal State Park, it is an opportune time to look at the next ten years and beyond of the canal and plan accordingly.

Our Process

Background & Process

The following research is the culmination of a semester-long project (January through May 2021) completed by seven graduate students as part of the Bloustein School's MCRP program.

Constrained by the limitations of working remotely due to the COVID-19 pandemic and the four month timeline, the studio team sought to provide information and context needed for Canal Commission to *successfully* begin its master planning process.



Comparison of Master Plans

Over the months of January and February, the studio team explored comparable master plan efforts from other local and regional government entities that were recently accomplished.

This research helped to shed light on current best practices and innovations in master planning efforts that could be similarly employed by the Canal Commission.

Key Takeaways:

- Public Engagement
- Implementation and Governance
- Supportive studies
- Environmental Sustainability
- Funding and economic impact

Master Plans Considered:

Gowanus Canal Draft Master Plan (2019)
 City of Asbury Park Comprehensive Plan (2017)
 Seaside State Park Master Plan (2016)
 Burlington Parks, Recreation and Waterfront Master Plan (2015)
 Master Plan for the Central Delaware River (2012)
 New Jersey Highlands Master Plan (2008)
 Bronx River Greenway Master Plan (2006)
 Greenpoint-Williamsburg Waterfront Open Space Master Plan (2005)
 Bordentown Master Plan - Open Space Element (2005)
 Reclaiming the High Line (2002)
 Buffalo Bayou Park (2002)
 New York State Canal Recreationway Plan (1995)

Stakeholder Interviews

Our process not only consisted of research and critical analysis among the members of the studio team, but detailed interviews - both inside and outside the classroom - with knowledgeable and invested stakeholders.

Key Takeaways:

- The Canal Commission is facing challenges, pressures, and issues that the 1989 Master Plan does not take into consideration and, therefore, the current master plan no longer provides adequate guidance for commission decision making processes.
- With the development of a new Master Plan, the Commission will be better positioned to proactively address the challenges presented by multi-jurisdictional governance and coordination between state agencies, local governments, and other planning documents.
- An updated Master Plan will better reflect the current conditions of the Canal System and address the needs and desires of constituents, including local governments, users, and friends groups.

Reexamination of Goals and Objectives of the 1989 Master Plan

Introduction

The **1974 legislation** which created the D&R Canal State Park established initial goals for the park's existence:

- The function of the canal as a major water supply facility in the State
- The necessity to provide recreational activities to the citizens of the State
- Existing historical sites and potential restorations or compatible development
- The range of uses and potential uses of the canal in the urban environment of the older, intensively development communities through which it passes
- Designated wilderness areas to be kept as undeveloped, limited-access areas restricted to canoeing and hiking

These goals were later translated into the 1989 Master Plan and have been found to **still hold true today**, based upon an analysis of recent trends and future projections.

Goals of the 1989 Master Plan

<p>01</p>	<p>The Canal is a Water Supply System</p>	<ul style="list-style-type: none"> • The integrity of canal as water system must be protected • The water that enters the canal must be suitable for drinking water • Development must be compatible with water supply system
<p>02</p>	<p>The Canal is a Site of Recreational Activities</p>	<ul style="list-style-type: none"> • Widest compatible range of recreation should be encouraged • Recreational activities should depend on the “Canal Environment” • Recreation and access should be allocated to all parts of park • Adjacent recreational resources should be connected to park
<p>03</p>	<p>The Canal is a Historic Resource</p>	<ul style="list-style-type: none"> • All maintenance and development should respect historic character • The area of the Canal and towpath should be preserved • Canal’s history should be interpreted for public • Park should provide context for nearby historic sites
<p>04</p>	<p>The Canal is an Area that Should be Maintained in a Natural State</p>	<ul style="list-style-type: none"> • The Canal should be maintained to preserve natural habitats & vegetation • The Canal should be a means of connecting other natural areas • Rare and endangered species should be preserved • The Canal should be a migratory route for plants and animals
<p>05</p>	<p>The Canal is a Means of Enhancing Urban Areas</p>	<ul style="list-style-type: none"> • The Canal’s natural conservation objectives is applicable to urban areas • Park should serve as a transportation route • Park should be a boundary and connector for urban neighborhoods • Park should connect urban areas with recreation and natural sites

Compendium of Trends

Over the past **thirty years**, the outlined goals of the 1989 Master Plan have been impacted by emerging trends and conditions that were unpredictable or not considered at the time of the original master planning effort.

1. **Demographics**
2. **The Economy**
3. **Land Use, Development, and Urbanization**
4. **The Environment**
5. **Sense of Place**

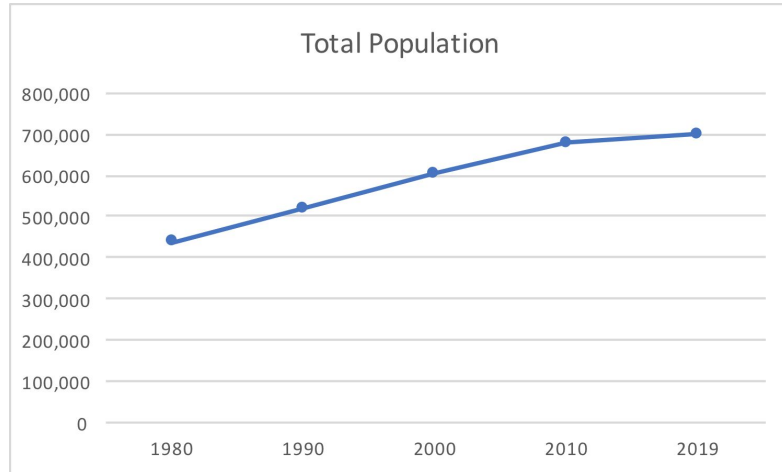
To understand the major trends identified above, the team collected and analyzed **data from the time the Master Plan was last reviewed to present-day**.

Due to the nature of historical and current data available, the time frames and geographies studied for each analysis vary.

1. Demographics

The region's population has increased over time, though its growth rate has slowed down.

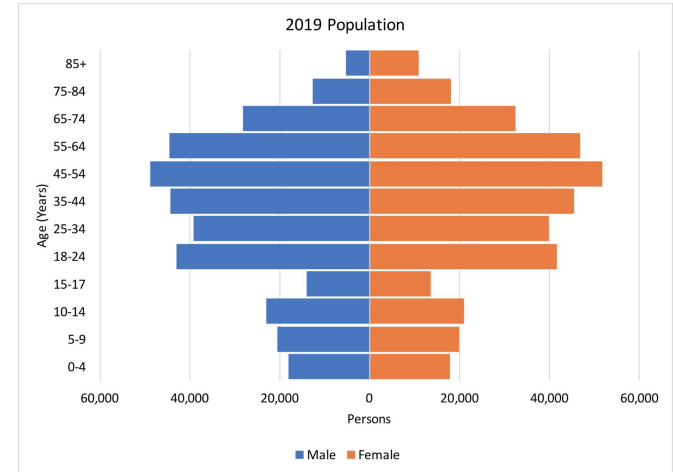
- 1980 population: 438,338
- 2019 population: 700,414



Total population from 1980 to 2019.

The population is aging, with most entering middle to senior age.

- 1980 most prevalent age group: 25-34
- 2019 most prevalent age group: 45-54

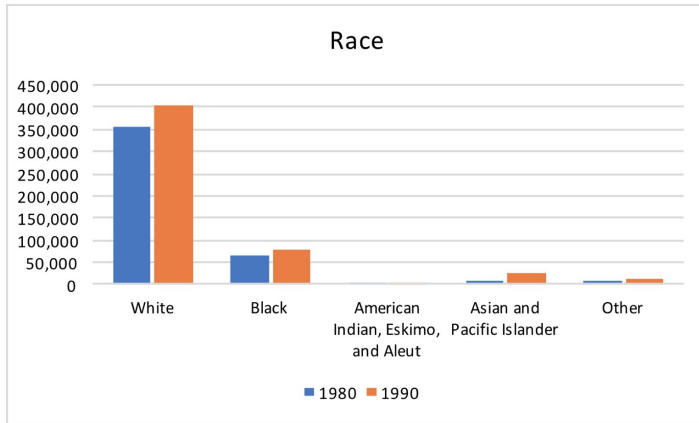


Age-sex pyramid of population in 2019.

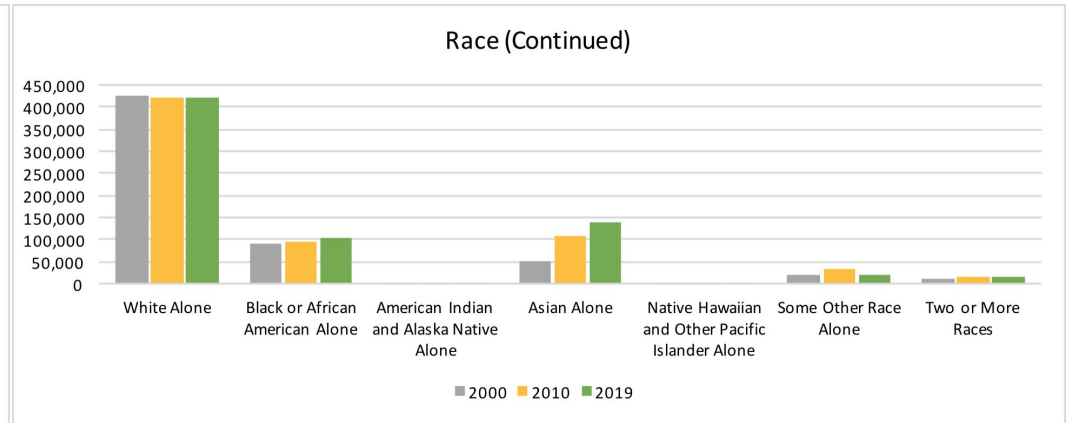
1. Demographics (cont.)

The region's population has become more racially and ethnically diverse.

- 1980 population:
 - 81% White, 15% Black, 4% other races
 - 3% Hispanic
- 2019 population:
 - 60% White, 15% Black, 25% other races
 - 14% Hispanic



Population by race in 1980 and 1990.



Population by race in 2000, 2010, and 2019.

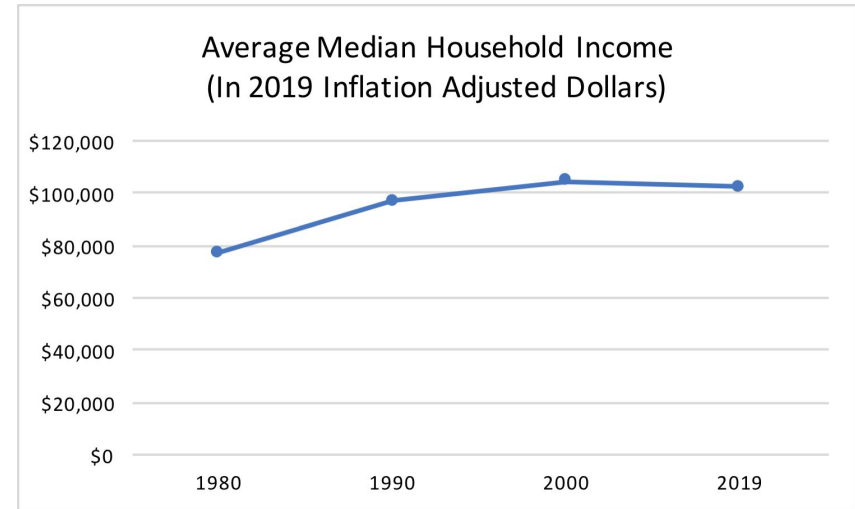
1. Demographics (cont.)

Median household income has risen over time, but some municipalities are more burdened than others.

- 1980 median income: \$77,182
- 2019 median income: \$102,247

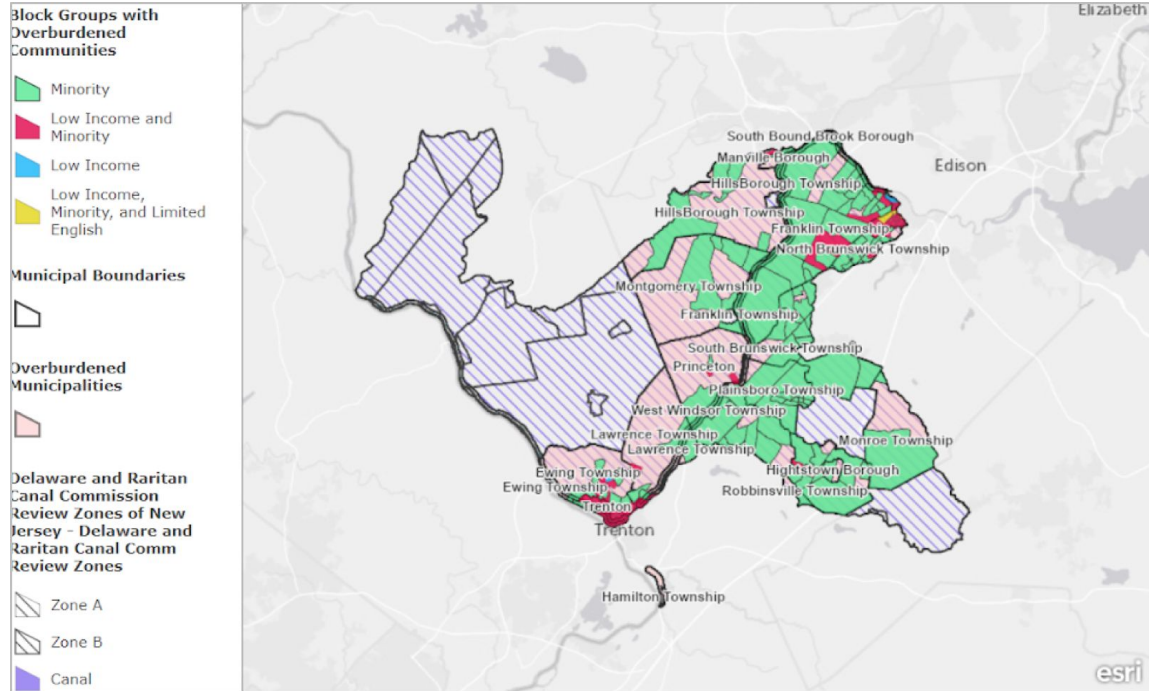
As per New Jersey Environmental Justice Law, an “overburdened community” is defined as any census block group in which:

1. At least 35% of the households qualify as low-income households;
2. At least 40% of the residents identify as minority or as members of a State recognized tribal community; or
3. At least 40% of the households have limited English proficiency.



Average median household income for population in 1980, 1990, 2000, and 2019.

1. Demographics (cont.)



Municipalities with overburdened communities.

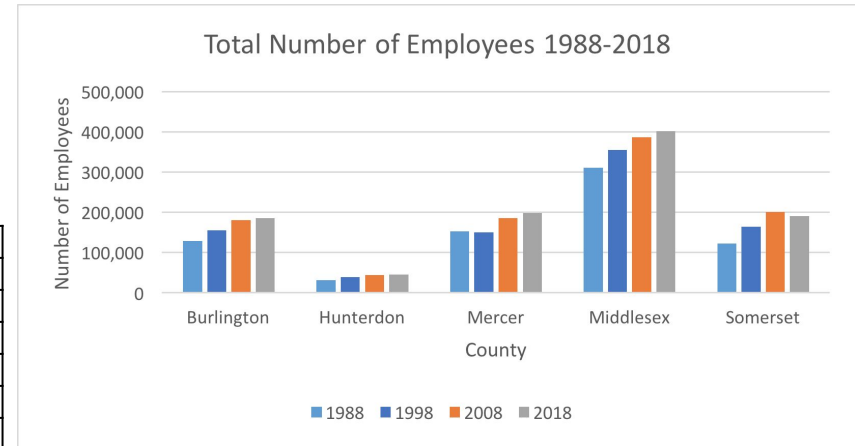
2. The Economy

Economic growth has continued in the region while development pressures will persist.

- Dominant sectors:
 - Wholesale Trade
 - Transportation and Warehousing
- Emerging sectors:
 - Arts, Entertainment, and Recreation
 - Forestry, Fishing, Hunting, and Agriculture Support

Projected Total Employment by County 2016-2026			
County	2016	Projected 2026	Percent Change
Burlington	226,170	238,370	5.4%
Hunterdon	52,070	54,150	4.0%
Mercer	270,990	289,750	6.9%
Middlesex	474,010	518,240	9.3%
Somerset	208,610	224,550	7.6%

Projected total employment by county between 2016 to 2026.

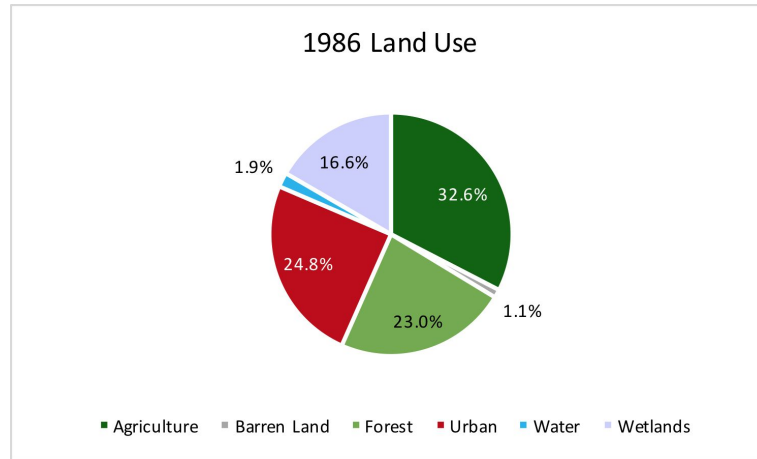


Total number of employees from 1988 to 2018.

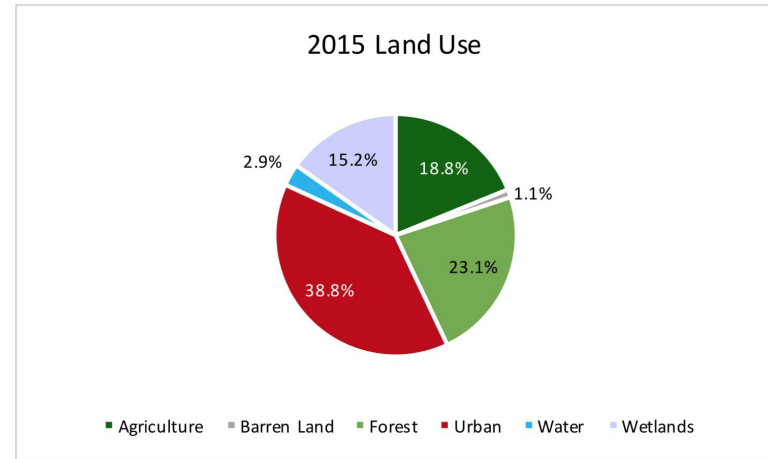
3. Land Use, Development, and Urbanization

Urban land use has become the most prominent land use in the region.

- Agricultural land use has declined 14% while urban land use has risen 14%
- Residential, industrial, and commercial land uses have also increased



Land use by generalized category in 1986.



Land use by generalized category in 2015.

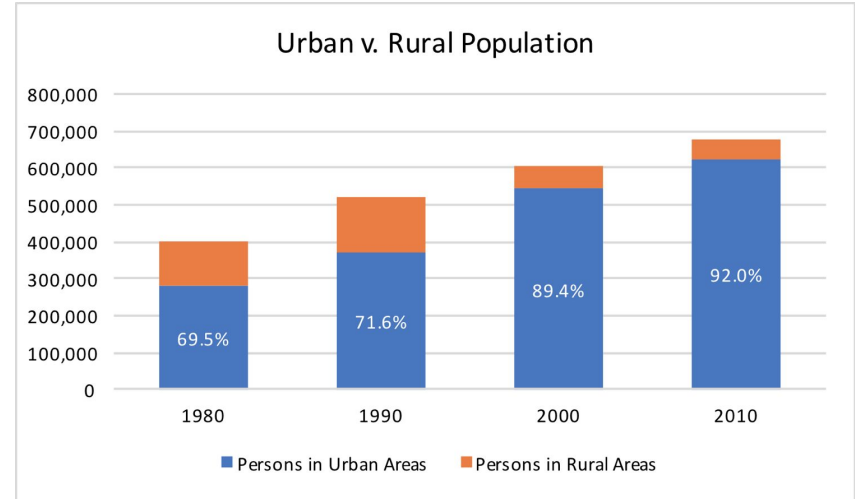
3. Land Use, Development, and Urbanization (cont.)

The Canal Park serves a population that is increasingly living in urban areas.

- 1980 percentage urban population: 70%
- 2010 percentage urban population: 92%

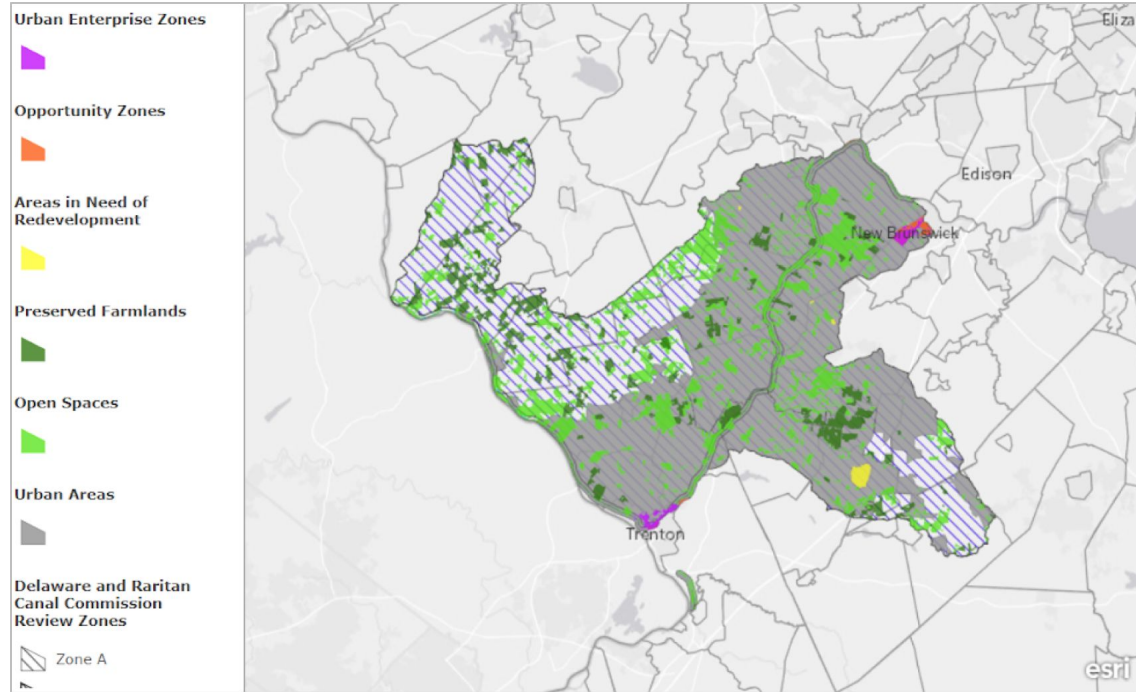
Development is expected to continue in the region.

- Opportunity Zone: New Brunswick
- Area in Need of Redevelopment: Hightstown



Population by urban and rural areas from 1980 to 2010.

3. Land Use, Development, and Urbanization (cont.)



Opportunity Zones, Areas in Need of Redevelopment, etc.

4. The Environment

Climate change, invasive species, and areas of contamination are critical areas of examination that have newfound importance since 1989.

Open Space Preservation

- Open space in the Canal Park nearly doubled between 1989 and the present from around 3,550 acres to more than 6,500 acres.

Climate Change

- Observed annual temperatures have increased from 51.96 degrees Fahrenheit in the 1980s to 54.26 degrees Fahrenheit in the 2010s, causing increases in extreme weather events, most notably Hurricane Sandy and Irene. With this changing climate, precipitation (and flooding) has simultaneously increased on a yearly basis.

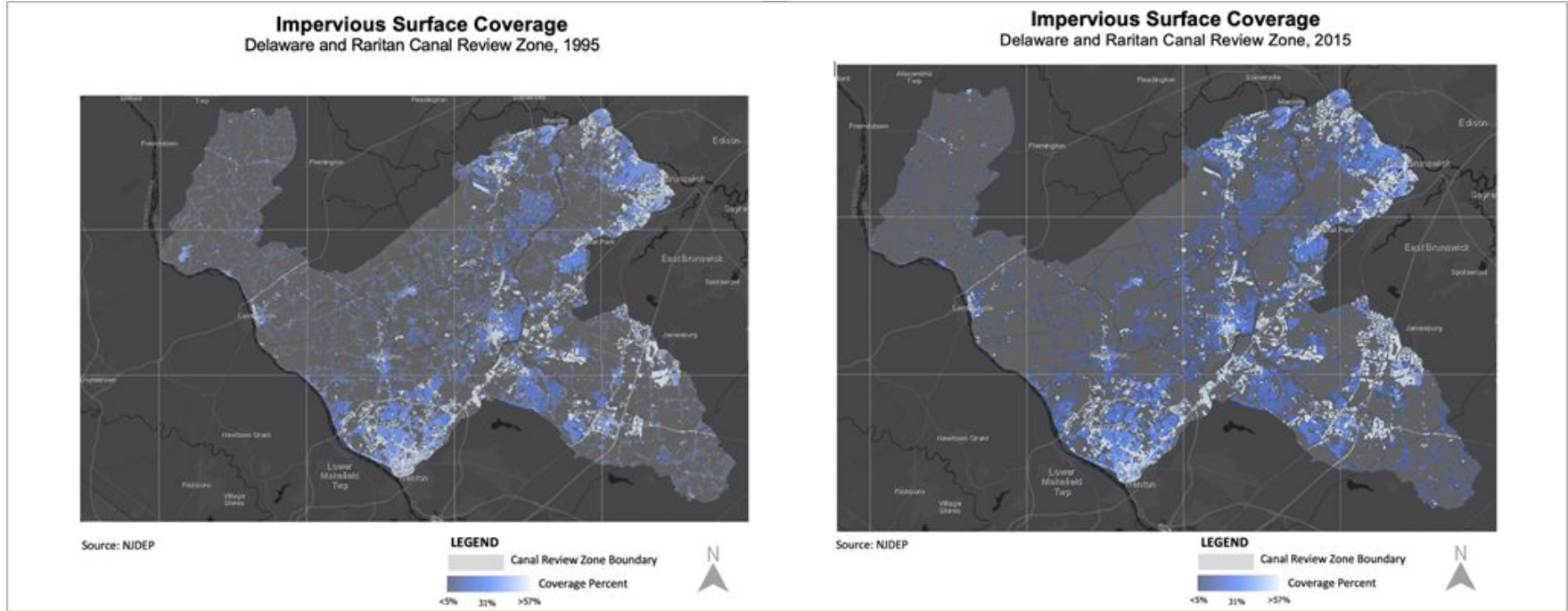
Invasive Species

- The invasive species of Hydrilla and Emerald Ash Borer have emerged in the canal over the past ten years due to a warming climate and will be a permanent threat to control. The ash trees of the canal are under threat of being wiped out.

Impervious Coverage

- There has been a notable increase in the impervious coverage within the review zone of the commission, especially in urban areas like the City of New Brunswick as well as the eastern portion of the commission's review zone.

4. The Environment (cont.)



Impervious surface coverage in 1995 and 2015.

4. The Environment (cont.)

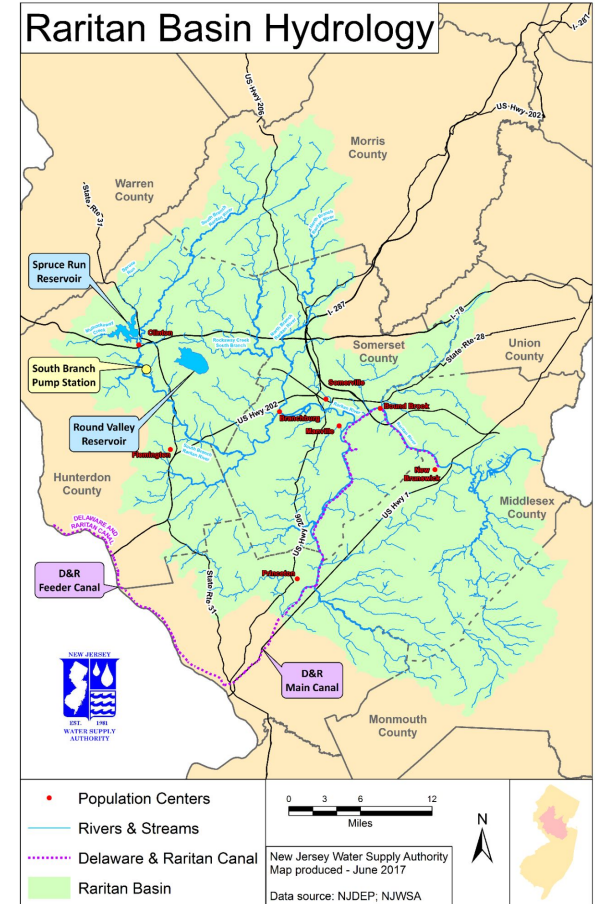
As the Canal System provides drinking water to one million people, the maintained quality of the canal's waterbody and 400 square mile watershed is paramount.

Water Quality

- The flow of the Canal has remained fairly consistent (between ~ 84-97 MGD) and within the required flow level of up to 100 MGD.
- Climate change may pose threats to the Canal's water quality and the Commission may wish to work with other agencies and organizations to study the current conditions and future projection.

Contamination

- Immediate Environmental Concern sites (IECs), in the form of potable well contamination and vapor intrusion, exist in 10 municipalities.
- 5 municipalities contain sites of groundwater contamination.



5. Sense of Place

The beauty and vibrancy of the Canal Park stem from its role as a natural resource and site for recreational activity that is full of rich history.

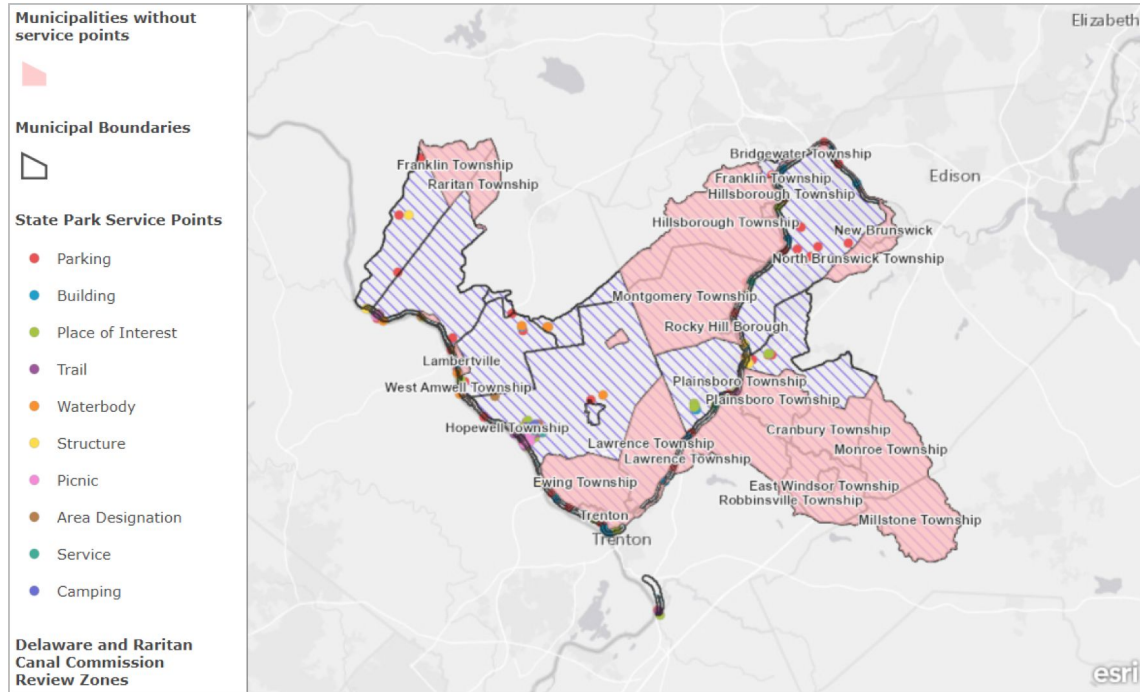
Recreation

- The Canal's recreational trail reached a milestone in 2010 when the final 1.5 mile tract of trail near Trenton was completed, thereby providing a continuous 70 mile link between Trenton and New Brunswick.

Access

- Access of the canal has been a continual concern, not only from a need for more parking spaces and lavatories, but on the basis of equitable access.
- Since 1989, a major main challenges for access have been disruptions of recreational opportunities due to public safety concerns. In 2012, for instance, a visitor died at Bull's Island Recreation Area when a weakened tree fell while he was camping.

5. Sense of Place (cont.)



Locations of state park service points.

5. Sense of Place (cont.)

The beauty and vibrancy of the Canal Park stem from its role as a natural resource and site for recreational activity that is full of rich history.

Crime

- For all five counties within the Canal Commission's review jurisdiction, crime has significantly decreased since 1989.
- Despite decreasing trends, the perception or fear of crime has been a noted factor that prevents residents and visitors from visiting the State Park.

Cultural & Historical Resources

- Culturally significant sites nearly doubled in every county since the 1989 Master Plan was developed.
- The preferences of elected historic sites have changed since 1989 in each county. Most sites being of educational significance are now of architectural significance.
- New sites get added to the list regularly, including some from 2020. Therefore, it is important to review these sites when updating the Master Plan.

Key Takeaways

1. **Demographics:** The **population has gradually increased** and has become more racially and ethnically **diverse** with time. Median income has shown dips and rises in the last three decades but some municipalities are more burdened than others.
2. **The Economy:** **Continued economic growth** within the surrounding five counties is key to contextualize and guide economic development strategies for the Canal Park, while recognizing that **development pressures will persist** in the region.
3. **Land Use, Development, and Urbanization:** **Increasing urbanization and development** in nearby communities pose both threats and opportunities to the vitality of the Canal Park.
4. **The Environment:** **Climate change, invasive species, and areas of contamination** are critical areas of examination that have newfound importance since 1989.
5. **Sense of Place:** The **beauty and vibrancy** of the Canal Park stem from its role as a natural resource and site for recreational activity that is full of rich history.

Opportunities & Constraints for Future Master Planning Efforts

SWOT Analysis

Guiding Questions:

1. Strengths:

What does the Commission do well?
What are the positive features of the canal?

2. Weaknesses:

What parts of the Canal need improvement?
What aspects of the Commission's work need improvement?

3. Opportunities:

What external factors can help the Commission in its objective?
What are the favorable trends that impact the Commission and Canal?

4. Threats:

What are the negative external factors beyond control of the Commission?
In what ways, is the integrity of the Canal system in danger?
What should the Commission create a contingency plan for?

SWOT Analysis (cont.)

Strengths

1. A strong sense of commitment to the preservation of the Canal
2. The continued relevance of the Five Goals
3. A good financial situation
4. Continuous open space
5. A good relationship with strong allies

Weaknesses

1. Insufficient access points and missing signage
2. Insufficient funding and staff
3. Incomplete inventory of resources
4. Overlapping jurisdictions and regulations
5. Shortage of public engagement
6. Difficulty in balancing uses of the Canal
7. Too many websites create confusion

Opportunities

1. 50th Anniversary
2. Increased awareness of inclusivity
3. Access to better technology
4. Increased park patronage due to COVID-19
5. Increased development

Threats

1. Overlapping/unclear regulations
2. Changing development patterns
3. Climate change
4. Inconsistent sense of place
5. Management structure
6. Litigation
7. Post-COVID-19 uncertainty
8. Safety

Opportunities and Constraints

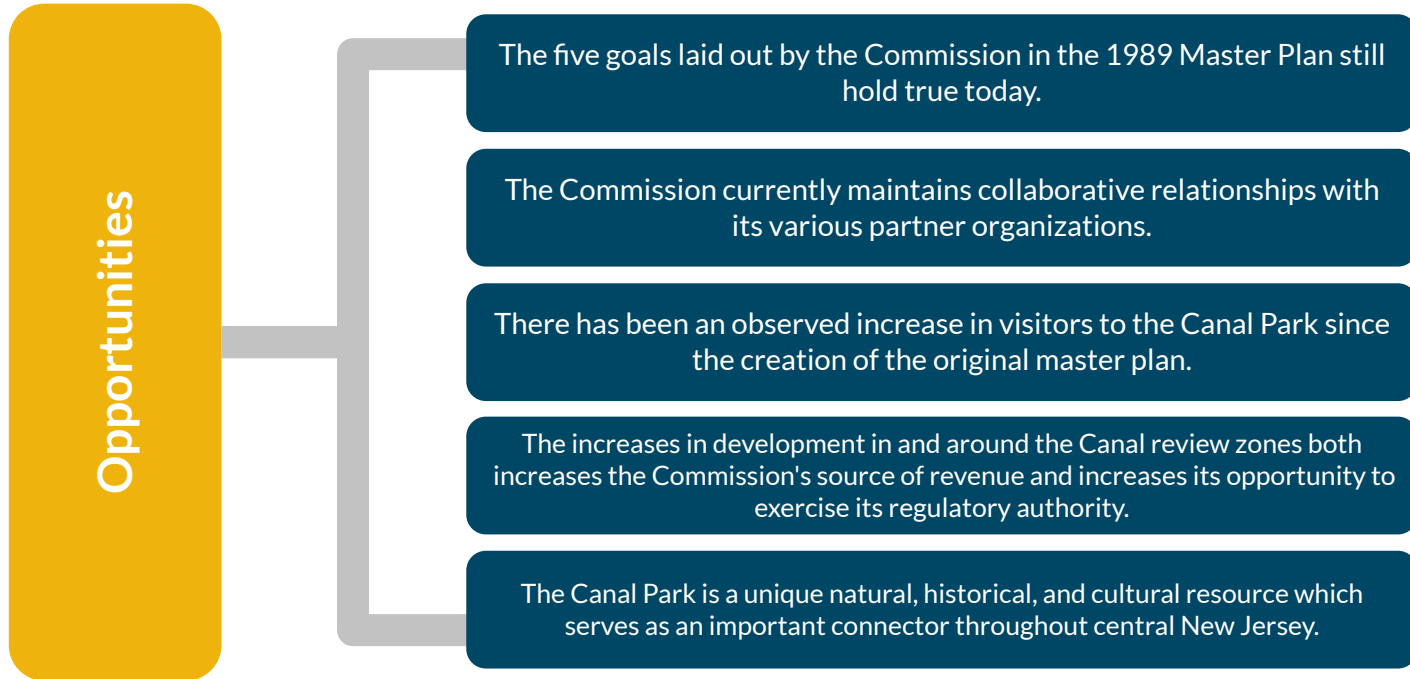
Intended to identify:

1. The **current challenges** facing the Commission as it positions itself to initiate a master plan update
2. The **potential benefits** that the Commission may be able to take advantage of within an updated master plan and/or as part of the process to update the master plan

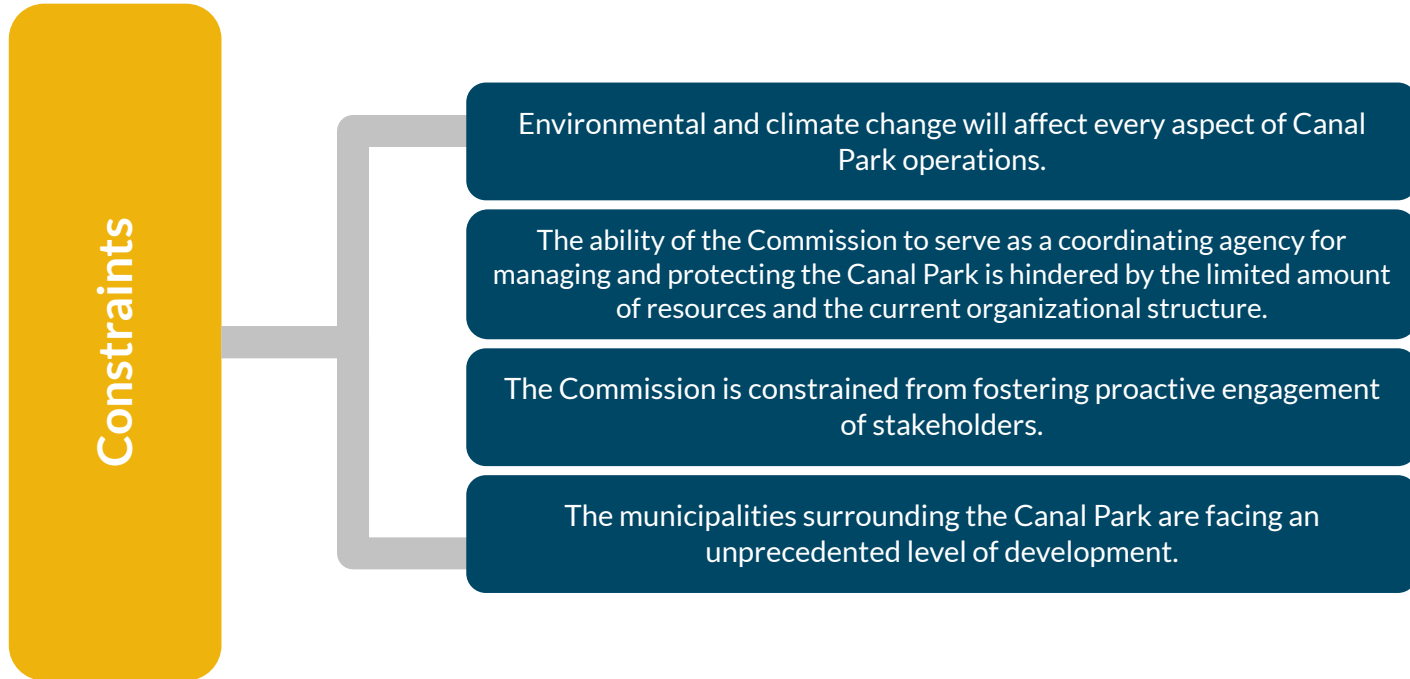
Guiding Definitions:

- **Opportunities** are elements in the Commission's external environment that allow it to formulate and implement strategies to meet its goals.
- **Constraints** are weaknesses which prevent you from taking advantage of an opportunity.

Opportunities and Constraints (cont.)



Opportunities and Constraints (cont.)



Next Steps & Conclusion

Recommended Guiding Goals for the Master Plan

Guiding Goal #1

A new master plan will be drafted with the primary concurrent goals of serving the health of the communities within the boundaries of the Commission's jurisdiction and protecting the health of the Canal's natural environments for the next ten years and beyond.

Guiding Goal #2

A new master plan will recognize the continued relevance of the goals set forth in the 1989 Master Plan and retain them, all the while accommodating the new trends and conditions that have emerged over three decades.

Guiding Goal #3

A new master plan will reflect the essential function that the Canal Commission serves as a coordinating entity.

Further Recommendations

In proceeding with the master planning process, it is recommended that the Commission consider the following:

1. Incorporate the Canal's Milestone 50th Anniversary into the Framing for an Updated Master Plan
2. Improve the Commission's ability to measure the levels of visitation to the State Park in order to help guide access and recreational capacity considerations
3. Quantify the economic and health benefits that the D&R Canal State Park generates in order to provide measurable evidence of the positive regional influence that the Canal represents
4. Create a formal public outreach plan prior to the start of the master planning process for the purposes of identifying relevant stakeholders and assessing the best practices for creating an equitable process for public involvement
5. Utilize digital and other technological advancements to aid both the master planning process and the Commission's day-to-day functions

Conclusion

A review of **emerging trends and future projections** reveals that the Delaware and Raritan Canal faces new threats and circumstances (affected by COVID-19) that cannot be addressed from the current form of its Master Plan.

Knowledgeable **stakeholders and peer master plans** have shown the likely priorities and opportunities that should be incorporated into the Commission's master planning approach.

External forces such as climate change and increasing development represent possible **constraints** that must be considered in a future master plan of the Commission.

As the **50th anniversary** of the Delaware and Raritan Canal State Park approaches, it is an opportune time to begin the master planning process - a process that the studio team hopes is informed by our provided recommendations and data.

Thank You

Please feel free to ask any questions!