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## Report of Breakout Session

Amina Rahill-Marier  
*Arcadis*

Katie Coleman  
*Arcadis*

John Millspaugh  
*Arcadis*

Kris Edelman  
*Arcadis*

Brian Joyner  
*Moffatt & Nichol*

*See next page for additional authors*

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**Authors**

Amina Rahill-Marier, Katie Coleman, John Millspaugh, Kris Edelman, Brian Joyner, and Scott Smith



# Resilience in Practice

AN INTERACTIVE PROBLEM-SOLVING SESSION

HAMPTON ROADS SEA LEVEL RISE/FLOODING ADAPTATION FORUM

JULY 20, 2018

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This report was authored by Amina Rahill-Marier; Arcadis

Those involved in the creation of the presentation and associated materials are

Amina Rahill-Marier; Arcadis

Katie Coleman; Arcadis

John Millspaugh; Arcadis

Kris Edelman; Arcadis

Brian Joyner; Moffatt & Nichol

Scott Smith; City of Norfolk

## Introduction

This report describes the outcomes of the Hampton Roads Sea Level Rise/Flooding Adaptation Forum that took place on July 20, 2018. Planned and hosted by Virginia Sea Grant (VASG), Old Dominion University (ODU), and the Hampton Roads Planning District Commission (HRPDC), these quarterly meetings foster knowledge sharing between municipal government staff, scientific experts, private sector engineers, state and federal agency staff, NGOs, members of the academic community, residents, and other stakeholders.

The forum has been meeting since 2012 and serves two main functions:

- (1) Present research regarding flooding and sea level rise to officials who make public policy decisions.
- (2) Promote dialogue and networking between those who provide information and those who use it.

This forum's theme for Summer 2018 was "Designing for Resilience", and the afternoon consisted of an interactive problem-solving session titled "Resilience in Practice" coordinated and led by a team from Arcadis, Moffitt & Nichol and the City of Norfolk. The session consisted of three [presentations](#) which were each followed by a breakout session related to the topic of the presentation. The three topics were

- (1) The Reality of Using an Interdisciplinary Approach
- (2) New Solutions to Old Problems
- (3) Construction Under Pressure.

The overall goals of this session were

- (1) communicate techniques used in the Norfolk Ohio Creek Nation Disaster Resilience Competition (NDRC) project
- (2) productively engage attendees in interdisciplinary discussion revolving around a case study of a fictitious town
- (3) facilitate knowledge sharing via report-outs and distribution of collected results in the weeks following the session.



### Hampton Roads Sea Level Rise/Flooding Adaptation Forum AGENDA

#### Designing for Resilience

July 20, 2018

TED Constant Center Multipurpose Room  
4320 Hampton Blvd, Norfolk, VA 23529

8:30 AM – 9:00 AM	Registration and coffee/continental breakfast
9:00 AM – 9:10 AM	Opening Remarks and Introductions <b>Larry Atkinson, Old Dominion University</b> <b>Michelle Covi, Old Dominion University and Virginia Sea Grant</b> <b>Ben McFarlane, Hampton Roads Planning District Commission</b>
9:10 AM – 9:45 AM	A Norfolk Neighborhood of the Future <b>Mason Andrews, Hampton University</b> <b>Mujde Erten-Unal, Old Dominion University</b>
9:45 AM – 10:15 AM	Rebuild by Design Meadowlands: Designing for Implementation <b>Garrett Avery, AECOM</b>
10:15 AM – 10:30 AM	Break
10:30 AM – 11:00 AM	Why don't we build above the minimum code? And what we can do about it. <b>Tripp Shealy, Virginia Tech</b>
11:00 AM- 11:30 AM	Partnering with the Army Corps of Engineers <b>Michelle Hamor, USACE</b>
11:30 AM- 11:50 AM	Making Designs Fit on the Ground <b>Skip Stiles, Wetland Watch</b>
11:50 PM – 12:30 PM	Lunch
12:30 PM – 3:00 PM	Resilience In Practice- an interactive problem solving session <b>John Millspaugh, Arcadis</b> The Reality of Using an Interdisciplinary Approach <b>Kris Edelman, Arcadis</b> New Solutions to Old Problems <b>Brian Joyner, Moffatt &amp; Nichol</b> Construction Under Pressure <b>Scott Smith, City of Norfolk</b>

Thank you to our 2018 Hampton Roads Sea Level Rise/Flooding Adaptation Forum sponsors.



## Resilience in Practice

The session began with an introduction to the topic and an explanation of the format. After the first presentation, the fictitious municipality of “Floodtown” was introduced to the participants, including maps and explanations of the problems facing the town.

With this introduction complete, participants were asked to stand and switch tables to mimic the reality of working in an interdisciplinary fashion: it created a completely different working environment in which people think very differently, which can often be destabilizing. Twenty minutes were allotted for them to tackle the first breakout session, in which a brief narrative was provided, and guiding questions served as potential topics to be addressed. Feedback was collected via Google Forms to facilitate the distribution of information after the fact and the creation of this report. Each breakout session functioned in the same manner.

After the three presentations and breakout sessions, each table reported back to the larger group to encourage sharing new ideas. It also established open communication between participants and organizers. The feedback included many new ideas as well as suggestions regarding further improvements if a session like this is conducted again in the future. Below you will find a summary of results synthesized from the comments submitted via Google Forms, quotes from answers to a few of the specific questions, and lessons learned.

### *Participants*

The participants included primarily professionals in sea level rise and flood adaptation from engineering and consulting firms, local governments, academia, and others who voluntarily chose to attend.

Approximately 100 stakeholders participated in the Forum. These participants sat down at any table they chose when they first arrived, often choosing to sit with people they already knew. However, before the breakout sessions, the tables were shuffled to encourage a more randomized and diverse group of people would be present at each table.

Each table chose one person to be the designated note taker. Some first chose to write notes on paper, but in the end each table filled out and submitted the Google Forms. The completed Forms were projected during the report out and used to create this report.

## Results

The following paragraphs in each of three sections are a synthesis of comments reported from the discussion at the tables. Questions posed, and representative quotes are included below the summary paragraphs in each section.

### The Reality of Using an Interdisciplinary Approach

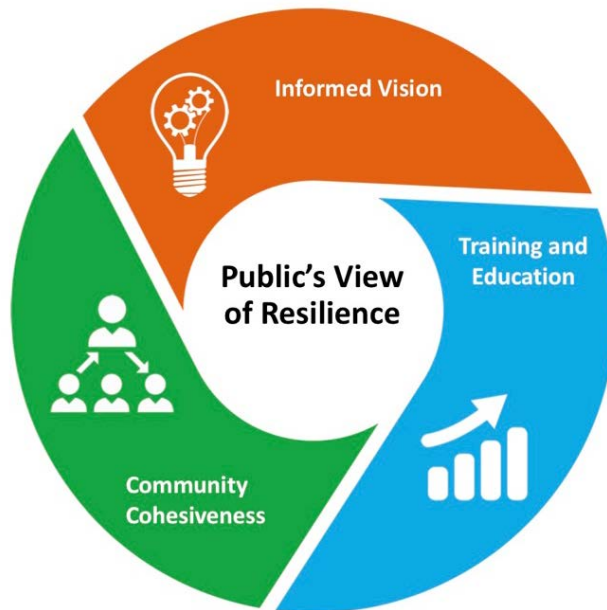
As flooding worsens due to the more frequent and intense storms in tandem with sea level rise, communities must adapt on a scale and at a rate that has not been seen before. A **siload approach to problem solving will not work** to address these issues; rather, an interdisciplinary approach must be wholeheartedly embraced. Teams comprised of engineers, social scientists, economists, environmental specialists, community members, and more will be able to tackle problem solving in a more comprehensive way. Some may see the multitude of disciplines and ideas that this method will bring to the table as a barrier to efficiency. However, by changing one's mindset so the **diverse perspectives are the strength of the approach** rather than a possible weakness, a more resilient solution will emerge from this approach by encompassing multiple viewpoints early in the planning process and throughout the design process.



A **sustainable model of resilience requires interdisciplinary work**. The three main aspects of resilience line up with the three pillars of sustainability. All three aspects are required to provide a completely resilient and sustainable solution.



To the public, resilience is not generally a topic that is front and center; the public’s view of resilience is a topic that needs to be addressed. **Training and education** of the risks associated with development not centered around resilience will lead to an **informed vision** of the project. If the public is aware of the risk, they are more likely to become involved in a planning process that, because of an interdisciplinary approach, seeks to engage them earlier and more thoroughly. This informed vision will allow the developed project to **foster community cohesiveness through open dialogue**.



The ASCE Code of Ethics provides guidance for engineer’s personal and professional conduct. Canon 8 states: Engineers shall, in all matters related to their profession, treat all persons fairly and encourage equitable participation without regard to gender or gender identity, race, national origin, ethnicity, religion, age, sexual orientation, disability, political affiliation, or family, marital, or economic status. The interdisciplinary approach allows for greater focus on the principles of this canon.

Extensive **public outreach** is far more prominent in the interdisciplinary approach. This leads to increased **diversity** by involving voices that represent more diverse perspectives. During and after project implementation and construction, there is a more established system of **checks and balances**.





How would using the adapted approach method mentioned in the presentation to address problems in Floodtown differ from the typical approach? What are the pros and cons?

*“future thinking versus past thinking”*

*“adaptive approach combines both green and grey”*

*“use a more holistic approach by utilizing a multidisciplinary team to pull together innovative ideas that would likely not be proposed by a single discipline or program”*

*“adapted approach may help ease the transition of the community after the flooding is addressed”*

*“address concerns and viewpoints earlier in the process”*

*“longer planning phase”*

*“multiple disciplines working together instead of siloed”*

How can an interdisciplinary approach to solving Floodtown's problems ensure that Canon 8 of the ASCE Code of Ethics is upheld?

[Canon 8: Engineers shall, in all matters related to their profession, treat all persons fairly and encourage equitable participation without regard to gender or gender identity, race, national origin, ethnicity, religion, age, sexual orientation, disability, political affiliation, or family, marital, or economic status]

*“understand community priorities”*

*“train locals people to disseminate the information”*

*“checks and balances”*

*“diversity of interested stakeholders ensures all thoughts are vocalized”*

*“bringing all stakeholders to discussion early enhances equal involvement and representation”*

*“by involving voices and perspectives, diversity is more likely to be valued”*

How will your suggestions for environmental and economic aspects of resilience contribute to social aspects of resilience? Keep in mind that the work we do as engineers is always with a purpose greater than ourselves.

*“three pillars of sustainability – people, planet, profit”*

*“better quality of life for residents”*

*“re-connect neighborhoods”*

*“providing open space for the public encourages community cohesiveness”*

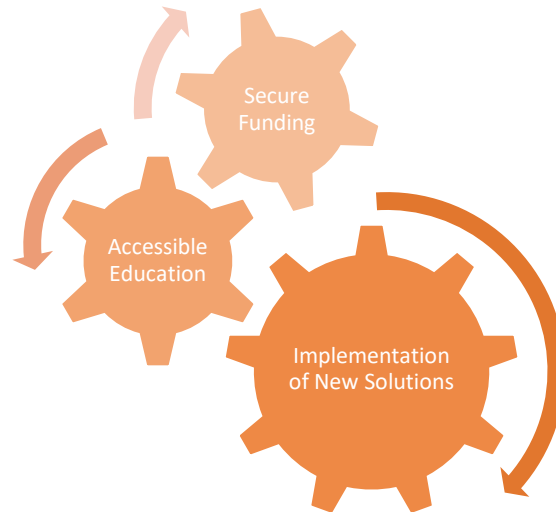
*“starting with a vision informed by actual community feedback”*

*“leadership and creating a community vision are key to a successful project”*

## New Solutions to Old Problems

Technology's presence and power has revolutionized how people work. The infrastructure sector, however, remains traditional. In creating resilient solutions, new technologies such as permeable pavers, water retention below roadways, using green spaces as water storage during storms, and creative landscaping **must be implemented more frequently** to reach the necessary capacity of storm systems.

However, the implementation of these new solutions will not happen without **education** and the ability to **secure resources**. The first key to success is educating the public about green infrastructure, pumping systems, cisterns, and landscaping methods to ensure **community buy-in**. The methods of education need to be **accessible** to whichever community the work is being conducted in, which is evidently project specific. Additionally, there must be a secure funding source for these more unconventional approaches.



This shift to new solutions presents an opportunity to involve young professionals and students. **Fellowship and internship programs** provide a low-cost opportunity for companies to recruit top talent. These students bring energy into a workplace and are eager to learn from and be trained by the professionals in the office.

Additionally, students are approachable, allowing them to conduct efficient **community outreach**, provided someone well versed in the process guides them. Private industry could develop **partnerships with universities** to maximize this opportunity.

Technology also facilitates **crowdsourced data collection**. Students of all ages could help with data collection by participating in **outdoor labs** and visiting newly formed natural areas. **Mobile applications** could be developed, possibly as games, to encourage people to interact with the new green spaces and provide instantaneous feedback.

Creating resilience to street and property flooding can contribute to economic and social aspects of resilience within the community at large by creating stability. Improvements to infrastructure and transportation guarantees that **access and egress is maintained**, allowing people to travel to work and appointments. Overall, the result will be an **improved everyday quality of life**.

What potential challenges do you foresee that could come with implementing these types of new solutions?

*“public education”*

*“funding”*

*“making sure the public is on board”*

*“this town cannot do it by themselves”*

*“expertise within the community”*

*“community buy-in”*

*“financial constraints”*

*“community support”*

How can industry experience of more seasoned professionals be combined with out of the box ideas from younger professionals?

*“mentorships and internships”*

*“pair up old fart with new kid to maximize talent”*

*“fellowship and internship programs”*

*“promote competitions for out of the box ideas”*

*“younger people tend to be better with tech/more efficient solutions”*

*“smart city sensor networks and crowdsourcing may go over better with the younger population”*

How can local high school, universities, and start-ups be incorporated into a project?

*“schools can lead outdoor labs/data collection”*

*“take kids to newly formed wetlands”*

*“students are more approachable”*

*“cheap labor, better educational experiences, more energy with better ideas, out of the box thinkers”*

*“they can google anything!”*

## Construction Under Pressure

Interdisciplinary methods and new technologies implemented over a short time frame require different project delivery methods. The Construction Management At-Risk (CMAR) method has been used successfully in these more iterative projects.

In this method, the owner has **more control** over the design. This allows for **multiple groups to engage**, a key aspect of the interdisciplinary method. It can take a long time to select and initiate a CMAR relationship; for large projects, the time investment is worth it, but for smaller projects Design-Build or Design-Bid-Build may be a simpler choice. However, stakeholders in the neighborhood will have less input with these methods.



When it comes to maintaining a high degree of resilience in the project, the lowest bidder may not always be well versed in the intricacies required by resilient, interdisciplinary work. CMAR affords **greater opportunity for involvement and value engineering**. The additional flexibility combined with a comprehensive management approach ensures **overall goals are met**.

CMAR	DBB
<ul style="list-style-type: none"><li>• QBS of designer</li><li>• Selection CM on qualifications and cost</li><li>• CMAR bids out work</li><li>• GC input during design</li><li>• GMP established collaboratively with contractor</li></ul>	<ul style="list-style-type: none"><li>• QBS of designer; cost-based selection of constructor</li><li>• Well-known method</li><li>• Owner-controlled</li><li>• Well-defined project (low risk premium)</li></ul>

Which project delivery method would you choose to implement the changes you have brainstormed for Floodtown in the previous sessions? What benefits or problems could choosing a CMAR have when implementing your ideas?

*“CMAR. Owner has more control over design, may be costlier in the long run, but it puts risks on the contractor not owner”*

*“CMAR - so we can maintain our independence at the design then and the construction manager can do their piece and we don't have to manage them”*

*“CMAR would allow for multiple groups to engage; however, it still doesn't prevent the bid to come in over budget...you still may have to reduce the scope if that happens”*

*“If all improvements are to be accomplished under one project umbrella, CMAR is a good option. If smaller, discrete projects are identified DB or DBB are good options. CMAR can take a long time to select and initiate”*

How can the choice of project delivery method complicate or simplify the execution of an interdisciplinary approach to problem solving in Floodtown? What opportunities for mutual education exist?

*“Based on the approach the number of contacts could be easier for community members to see and understand who is doing the projects. There could be limitations for collaboration with some approaches. CMAR would potentially be able to participate in the full process”*

*“Need to not value engineering out co-benefits as other methods might do”*

*“Challenge of maintenance costs over the long term”*

*“In a DBB approach the interdisciplinary approach can be applied during the design phase but will be difficult to implement during construction. In DB approach it would be very difficult to bring in outside stakeholders, but the procurement can be structured to address, incorporate those views. CMAR must also be structured to consider and address interdisciplinary approach.”*

How does the choice in project delivery method impact the degree of resilience that can be implemented throughout the project? How do different delivery methods help or hinder social, economic, and environmental aspects of resilience?

*“lowest bidder not well versed in green infrastructure”*

*“CMAR affords greater opportunity for involvement/leadership participation”*

*“can ensure level of resiliency stays high”*

*“more flexibility can increase resilience”*

*“CMAR can provide a comprehensive management approach to a broad project that ensures overall goals are met”*

## Lessons Learned

This interactive session served as a learning experience for all those involved, including the organizers; a session of this style had not been conducted at the Forum before. Therefore, establishing a means of communication to receive positive feedback and constructive criticism about the session was very important. The participants were presented with a first opportunity to provide feedback during the report-outs. Additionally, a post-forum survey was created. The links to this survey were placed in the middle of the discussion tables and were also sent out via email the following week.



If a session like this were to be done again, below are a few of the recommendations that could be adopted to result in an even more successful event:

- (1) if a case study is going to be used, ensure it contains all potentially necessary information (i.e. economic distribution, availability of funds, etc.)
- (2) allow for additional time during the first session so that team members may introduce themselves and get to know each other more thoroughly
- (3) limit the number of guiding questions provided to a number that can be adequately addressed during the allotted time
- (4) when planning, keep in mind that this is a great opportunity both to teach those present about a topic but also to learn from all the diverse perspectives in the room, and adopt a structure that allows all perspectives to shine

## Next Steps

After a productive afternoon of learning and discussing, the question “What next?” beckons. Luckily, the quarterly Adaptation Forum provides the perfect opportunity to continue the conversation started during this session.

Some possible questions and topics that could be interesting to explore are:

- As the world shift towards a digitally based working style, how can digital technologies be employed in our quest for more resilient communities?
- How can lessons learned at these forums be compiled and distributed on a large scale, aligning with the goal to promote open communication and information sharing?

Another interesting idea would be to dedicate a future forum solely to hearing from members of civic leagues from communities in the area. Attendees spend lots of valuable time sharing research regarding innovations in the industry, but in order to maximize the positive impact of those innovations, listening to the surrounding community is key. During this forum, one member who was present spoke up about needing more moderated discussions between governments and professionals in the industry and the communities the work is impacting, and this forum could serve as a vehicle for those discussions.

## Appendices

Appendix A: Breakout Session Handouts

Appendix B: Factsheet and Maps

Appendix C: Additional Maps

## BREAKOUT SESSION #1

## The Reality of Using an Interdisciplinary Approach

## PROBLEM NARRATIVE

Floodtown, our fictitious municipality, suffers from serious flooding during rain events, and its coastal location makes it susceptible to worsening conditions such as sea level rise and more frequent and severe storms. Floodtown is uniquely susceptible to various environmental, economic, and social issues, as outlined on the factsheet. The team assembled today represents a group of diverse specialists. Together, you must propose an *interdisciplinary solution* to Floodtown's problems. How will you put your skills to work to address resilience of the following three asset types: environment, economic, and social? Focus especially on how interdisciplinary work will directly impact quality of life of those in Floodtown. Address some initial action items as well as ways to maintain the plan over time.

## GUIDING QUESTIONS

- What are Floodtown's assets (think from an engineering, environmental, economic, and social standpoint)? Given your understanding of the risks and the community, what would you prioritize?
- How would using the *adapted approach method* mentioned in the presentation to address problems in Floodtown differ from the typical approach? What are the pros and cons?
- What specific skills does your group possess that would be beneficial to Floodtown? How do your group's skills complement each other to solve the community's problems? Where could you turn to find other necessary skills?
- How can an interdisciplinary approach to solving Floodtown's problems ensure that *Canon 8* of the ASCE Code of Ethics is upheld?  
*Canon 8: Engineers shall, in all matters related to their profession, treat all persons fairly and encourage equitable participation without regard to gender or gender identity, race, national origin, ethnicity, religion, age, sexual orientation, disability, political affiliation, or family, marital, or economic status.*
- How will your suggestions for environmental and economic aspects of resilience contribute to social aspects of resilience? Keep in mind that the work we do as engineers is always with a purpose greater than ourselves.

## BREAKOUT SESSION #2

## New Solutions to Old Problems

## PROBLEM NARRATIVE

The 21st century has already brought innumerable technological improvements to our world, ranging from having self-driving cars hit the roads to making huge strides forward in artificial intelligence applications. The infrastructure sector, however, has remained more traditional. As technical specialists in the industry, we are in the position to push for increased implementation of new technologies. On the neighborhood scale of Floodtown, where do you see room for improvements like those presented (green infrastructure, cisterns, landscaping, pumping systems)? Do you have any ideas for other new solutions? For example, how can growing industries such as big data and AI be woven in to infrastructure over the coming years? Or, how can local high schools, universities, or start-ups contribute to projects? Think outside the box, be creative.

## GUIDING QUESTIONS

- Where do you see room for improvements like those presented (green infrastructure, cisterns, landscaping, pumping systems)?
- What potential challenges do you foresee that could come with implementing these types of new solutions?
- How can industry experience of more seasoned professionals be combined with out of the box ideas from younger professionals?
- How can local high school, universities, and start-ups be incorporated into a project? How can young talent bring unusual ideas to the table to create these new solutions to old problems?
- How does creating resilience to street and property flooding contribute to economic and social aspects of resilience within the community at large?



# BREAKOUT SESSION #3

## Construction Under Pressure

### PROBLEM NARRATIVE

Construction can often prove to be the riskiest part of a project when it comes to timelines and budget. Using a Construction Manager at Risk (CMAR) can help mitigate these risks by shortening the timeline and setting a cap on potential costs. Discuss whether Floodtown should use a CMAR to implement the changes discussed in your previous sessions. What are the anticipated benefits and possible challenges to your choice? How will the goal of maximizing resilience be supported by your choice?

Towards the end of this session, take some time to discuss what you will be reporting back to the group and who will be speaking. Results from Google Forms will be projected for the room.

### GUIDING QUESTIONS

- Which project delivery method would you choose to implement the changes you have brainstormed for Floodtown in the previous sessions? What benefits, or problems could choosing a CMAR have when implementing your ideas?
- How can the choice of project delivery method complicate or simplify the execution of an interdisciplinary approach to problem solving in Floodtown? What opportunities for mutual education exist?
- How does the choice in project delivery method impact the degree of resilience that can be implemented throughout the project? How do different delivery methods help or hinder social, economic, and environmental aspects of resilience?



### Economic

- Quality of Life
- Mobility
- Leadership
- Planning
- Economy
- Resource Allocation
- Materials
- Energy
- Natural World
- Siting



### Social

- Quality of Life
- Wellbeing
- Mobility
- Community
- Leadership
- Collaboration



### Environmental

- Resource Allocation
- Materials
- Energy
- Water
- Natural World
- Siting
- Conservation
- Ecology
- Climate and Resilience
- Emissions

**EXISTING CONDITIONS**

Floodtown, a municipality located in a coastal region of the mid-atlantic United States, faces economic, environmental, and social vulnerability to the effects of climate change. The area’s current problems center around five core pillars: quality of life, leadership, resource allocation, natural world, and climate and resilience. Floodtown only has a future as a healthy city if concepts of resilience can be successfully applied to each pillar.

Quality of life in Floodtown currently suffers due to economic inequality, inadequate public transportation systems, and lack of green spaces. The municipality has a large disparity in incomes, resulting in inequality in opportunities for those who live there. This inequality is accentuated by inadequate public transportation systems, creating a reliance on cars that is unaffordable for those with lower incomes and makes traveling to jobs, grocery stores, and amenities challenging. Left unable to easily access their workplaces, portions of the population must devote more time to commuting which could otherwise be spent on activities that would enrich their quality of life. Additionally, during the scant leisure time that is available, there is a complete lack of green spaces and opportunities for recreation. Subsequently, little time is spent outdoors, foregoing all the potential physical and mental health benefits of outdoor time.

The leadership opportunities within the community are being stifled by lack of investment and unemployment. Those within the community with higher incomes do not make significant investments within the community, but rather spend their money elsewhere. Overall, businesses are not drawn to the area due the multitude of problems it currently faces. In general, economic and social investment must be increased. Additionally, personal leadership skills stand to be further developed if the unemployment rate is to be reduced.

Floodtown also has problems with resource allocation. The infrastructure within the neighborhood, ranging from roads to bridges to utilities, is aging. The primary concern is power outages caused by storms that cut off electricity to key assets during critical times. However, with limited material, human, and financial resources, Floodtown must think holistically, prioritize, and be realistic when addressing these issues.

Additionally, uncertainty shrouds Floodtown’s environmental future. General environmental degradation is accentuated by poor water quality and replacement of natural wetlands with impervious surfaces. The area is already prone to flooding from rainfall but predicted sea level rise will result in tidal flooding, further aggravating the problem. Sea level rise will also cause coastal erosion, and storm surges will worsen. These climate change issues must be addressed in a timely manner to secure Floodtown’s future as a healthy city.

**GENERAL BREAKDOWN OF EXISTING CONDITIONS, VIA 100 RESILIENT CITIES FRAMEWORK AND ENVISION CREDIT SYSTEM FRAMEWORK**

Quality of Life	Leadership	Resource Allocation	Natural World	Climate and Resilience
<ul style="list-style-type: none"> <li>•Economic Inequality</li> <li>•Inadequate Public Transportation Systems</li> <li>•Lack of Green Spaces</li> </ul>	<ul style="list-style-type: none"> <li>•Lack of Investment</li> <li>•Unemployment</li> </ul>	<ul style="list-style-type: none"> <li>•Aging Infrastructure</li> <li>•Power Outage</li> </ul>	<ul style="list-style-type: none"> <li>•Environmental Degradation</li> <li>•Poor Water Quality</li> <li>•Destruction of Natural Wetlands</li> </ul>	<ul style="list-style-type: none"> <li>•Tidal Flooding</li> <li>•Rainfall Flooding</li> <li>•Sea Level Rise</li> <li>•Coastal Erosion</li> <li>•Storm Surge</li> </ul>

# FLOODTOWN, USA

## SOCIAL AND ECONOMIC INFORMATION

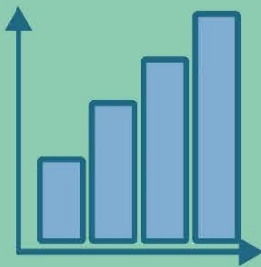


**5,000**

TOTAL TOWN  
POPULATION

**30,000**

TOTAL MUNICIPALITY  
POPULATION

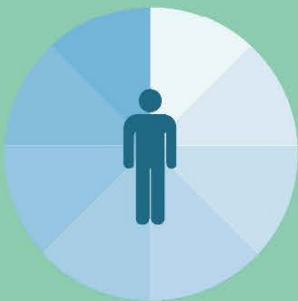


**\$45,000**

MEDIAN INCOME

**20%**

INDIVIDUALS LIVING  
BELOW POVERTY LEVEL



**32**

MEDIAN AGE

**15%**

POPULATION  
UNDER 18

**10%**

POPULATION  
OVER 65



**45%** **40%**

WHITE

BLACK

**10%**

HISPANIC

**5%**

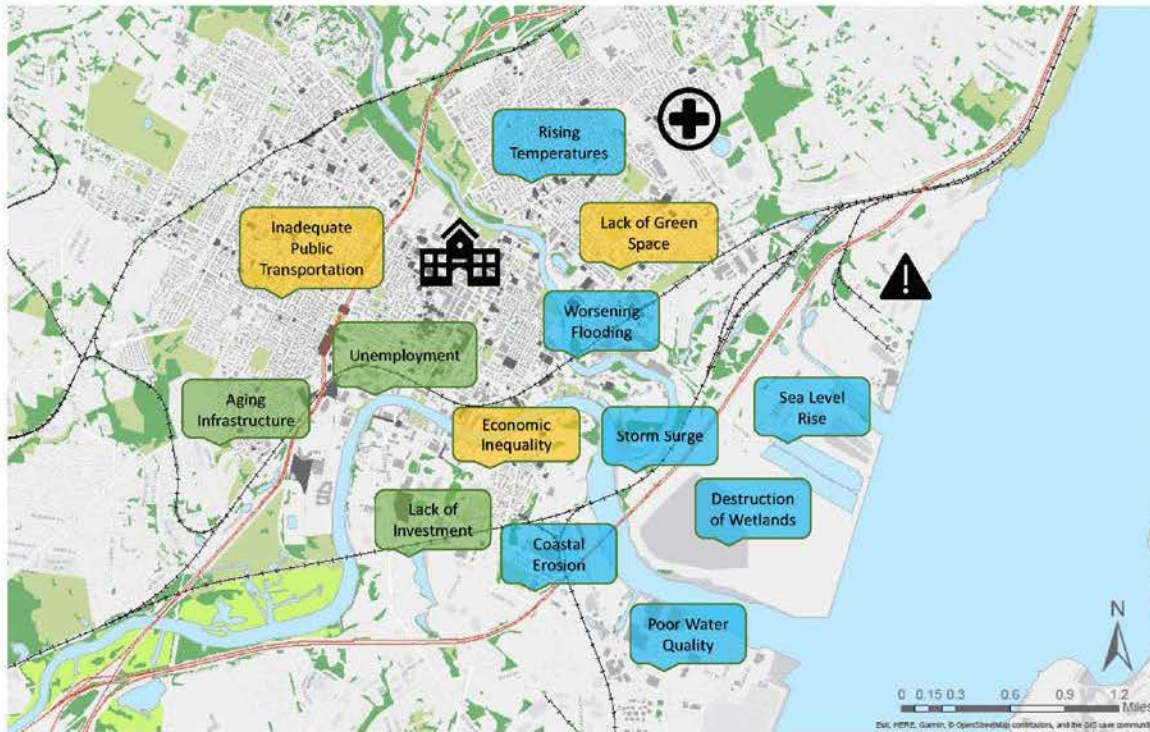
ASIAN



### Floodtown Community Assets

- Swimming Area
- Recreation Spot
- Public Park
- Port
- Electrical Substation
- Train Station
- Elementary School
- City Hall
- Court House
- Health Clinic





### Floodtown, USA

- Quality of Life
- Climate & Resilience
- Leadership & Resource Allocation
- + Health Clinic
- ! Electrical Substation
- 🏠 Elementary School



### Floodtown, USA

#### Flooding Scenario

- Quality of Life
- Climate & Resilience
- Leadership & Resource Allocation
- + Health Clinic
- ! Electrical Substation
- 🏠 Elementary School



# View 1



# View 2





# View 3



# View 4

