TASK FORCE ON NEW ORLEANS SEWERAGE, WATER, AND DRAINAGE UTILITIES

Report of Findings and Recommendations

DRAFT

January 25, 2019

Members
Ramsey Green for Mayor LaToya Cantrell, Chair
District B Councilmember Jay H. Banks, Vice Chair

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David Gereighty, PE* | Louisiana Engineering Society
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Introduction

Functioning water, sewer, and drainage systems are a prerequisite to any thriving city. Though the City of New Orleans (the City) has survived many existential threats in its three-hundred-year history, the City currently stands at a crossroads with regard to the essential water-related infrastructure the Sewerage & Water Board of New Orleans (SWBNO) has stewarded for more than a century. We, as a community, now have an opportunity to address past shortcomings and establish the modern, well-functioning utility our citizens, businesses, institutions, and visitors require.

The Task Force on New Orleans Sewerage, Water, and Drainage Utilities (Task Force) was formed in accordance with 2018 Louisiana House Resolution 193 (the Resolution). The Task Force's primary objective was to develop findings and recommendations regarding the best management options for the sewerage, water, and drainage facilities and services in the City of New Orleans. In accordance with the Resolution, the Task Force submits this report to the Mayor of the City of New Orleans, the New Orleans City Council, and the members of the Orleans Parish Legislative Delegation[1].

As residents of the City and customers of the SWBNO, the Task Force members are well-aware of the ongoing and very public operational challenges the SWBNO faces (e.g. billing and collections, customer service, water loss, pump and power issues). The Task Force also acknowledges the acute lack of public trust in the SWBNO, and the need to rebuild customer support by addressing serious management issues, reinvesting in the workforce, and instituting transparency and accountability.

The Task Force's work coincided with new Executive Director Ghassan Korban joining the SWBNO after a series of interim directors. Mr. Korban came from a highly successful public works operation in Milwaukee, Wisconsin, and has moved quickly to diagnose and address the many complex and inter-related issues the SWBNO has been grappling with for decades. Therefore, rather than diving into day-to-day management issues beyond our scope, the Task Force thought it best to focus on structural management, governance, and funding issues that could enable a successful transformation of the SWBNO in the short, medium, and long terms.

[1] Members of the Task Force served in a volunteer capacity and were not compensated for their time.

History and Context[2]

Governance

In 1896, the New Orleans Drainage Commission was organized to carry out a master drainage plan that had been developed for the city. Three years later, SWBNO was authorized by the Louisiana Legislature to furnish, construct, operate, and maintain a water treatment and distribution system and a sanitary sewerage system for New Orleans. In 1903, the Drainage Commission was merged with SWBNO in order to consolidate drainage, water, and sewerage programs under one agency for more efficient operations. Today's SWBNO, as codified by La. R.S. 33:4071, is the local agency tasked with cleaning, distributing, and draining water.

Although SWBNO was created by state law, it is an independent city agency. In relation to city government, it is one of 10 "unattached" boards and commissions placed under the executive branch by New Orleans' Home Rule Charter, meaning it is not attached to a specific department of city government. Thus, both the city and the state have some amount of control over the agency's powers and governance.

SWBNO is governed by an eleven-member Board of Directors (Board) comprised of the Mayor, two representatives of the Board of Liquidation, one member of the City Council, and seven citizen members, including representation for all five Council districts and two consumer advocates. The full Board convenes monthly in a public meeting.

Although SWBNO originally was tasked with oversight of the entire drainage system, today it is responsible only for pipes 36 inches or larger in diameter, drainage canals and pumping stations. The City, through its Department of Public Works, is responsible for the rest of the local drainage system, including more than 72,000 catch basins and the nearly 1,200 miles of smaller drainage pipes underneath streets, sidewalks and other rights of way. The transfer of responsibility for "Minor" drainage from SWBNO to the City occurred in 1991, after voters refused to renew a 2-mill tax that supported the drainage system. No funding source came to the City with its new responsibilities.

Funding

Funding for SWBNO comes from three sources: user fees (sewer and water); millages (drainage); and bonds (all three). Dedicated funding for each division prevents financial intermingling, although a 2/3 Board vote can divert funds from one division to another in the case of a declared emergency. Water and sewer rates are set by SWBNO, with approval by the Board of Liquidation and City Council. Drainage millages are set by the City Council and approved by a vote of the people.

Of the three divisions, drainage is chronically underfunded. It has not gained a new revenue source since 1982, and in 1991 it lost a dedicated millage. Twice during the last 30 years, in 1985 and 1998, SWBNO unsuccessfully proposed supplementing its funding by implementing drainage fees. Existing millages generate approximately $54 million annually – about $50 million less than is necessary for adequate operations and maintenance. Without an additional revenue source, the drainage division likely will run out of cash in 2019.

[2] Information contained in this section is largely courtesy of Janet Howard, former CEO of BGR and was provided to the Task Force at the August 22, 2018 meeting. Additional background can be found at https://www.bgr.org/our-reports/?tag=sewerage-and-water-board&sort=

The full extent of SWBNO's operational and financial challenges was exposed in the aftermath of the August 2017 flood events. The majority of the agency's infrastructure and equipment was built in the early 1900s and suffers from old age and deferred maintenance due to lack of funding. These issues were compounded by myriad institutional issues, including inadequate billing and customer service programs, lack of coordination with other critical agencies, personnel shortfalls, and operational inefficiencies.[3]

Despite the significant challenges that remain, the City and SWBNO have made significant progress in strengthening the drainage system, attracting strong leadership, and improving customer service since August 2017. Some highlights that should be noted (and continued) are:

- Completion of approximately $85 million in repairs to the "Major" drainage and power systems to return system functionality;
- Completion of approximately $25 million in repairs and cleaning on the "Minor" drainage system, improving stormwater draining in flood-prone areas;
- Hiring the first permanent Executive Director and Chief Financial Officer since the fall of 2017;
- Billing and customer service improvements, including a billing system audit and community engagement events, such as making staff available at the Rosa Keller Library once a week for the month of January;
- Increased social media presence and participation in "Community Listening Sessions" with the Executive Director.

[3] For a full overview of the flood event and its root causes, see the ABS Group Root Cause Analysis.

Summary of Meetings and Process

The Task Force held its first meeting on July 30, 2018 and began by drafting a workplan to identify critical issues, seek expert opinions, and discuss a range of management options. The first five meetings were focused on historic and existing challenges, with a specific focus on drainage. The remaining meetings were dedicated to identifying and vetting management options, with the help of national experts and staff from "best practice" utilities elsewhere. Below is a summary of each meeting date, expert speakers, and the general topic of discussion:

Date	Topic	Expert Speaker[4]
July 30, 2018	Introduction, Workplan	
August 22, 2018	Workplan Adoption/ SWBNO History	Janet Howard
September 12, 2018	Urban Water Plan / Range of Utility Management Structures	Rami Diaz, Waggonner and Ball
September 18, 2018	August 5th Root Cause Analysis / Discussion of existing issues	Darrel Barker, ABS Group
October 3, 2018	SWBNO Finances and Management Overview	Keith Readling, Raftelis
October 17, 2018	Discussion of Vision and Desired Outcomes / Narrowing potential options	
October 31, 2018	Additional narrowing of options / outreach meetings	
November 14, 2018	Public Benefit Corporation Model	Dan Considine, Citizens Energy Group- Indianapolis, IN
November 30, 2018	Independent Rate Setting Board and Stormwater Utilities	Joanne Dahme, Philadelphia Water Department
December 12, 2018	Stormwater Utilities and Management Structures	Eric Rothstein, Galardi Rothstein Group and Andy Reese, Wood
January 9, 2019	Draft Recommendations	
January 16, 2019	Finalization of Recommendations	
January 28, 2019	Approval of Final Report	

The Task Force recognized the importance of community engagement and transparency in crafting its recommendations. As a result, it made all meeting agendas, materials, and presentations available via a dedicated web site[5], and live-streamed every meeting.

Importantly, the Task Force also hosted public meetings in each of the five Council districts to share its progress and receive citizen feedback on potential options:

District A | November 26, 2018 - Mid City Library, 4140 Canal St
District B | November 27, 2018 - Rosenwald Recreation Center, 1120 S Broad St
District C | November 28, 2018 - Algiers Regional Library, 3014 Holiday Dr
District D | December 6, 2018 - Milne Recreation Center, 5420 Franklin Ave
District E | December 11, 2018 - Joe Brown Recreation Center, 5601 Read Blvd.

[4] Presentations by the various expert speakers are included as an appendix to this report and provide additional details on lessons learned by the Task Force for consideration of the various issues and options.
[5] https://roadwork.nola.gov/swb-task-force/

Citizen feedback at the community meetings was robust and informed the Task Force's development of desired outcomes and ultimately recommendations. Feedback generally fell into three categories:

- **Issues with SWBNO management/customer service** - Many of the participants attended the meetings believing that it was an opportunity to air grievances about the Sewerage and Water Board in general or to issue complaints about billing issues or street repairs. Personal issues were referred to a SWBNO staff member on hand for resolution.
- **Need for Accountability and Strong Leadership** - regardless of the management structure.
- **Support for an Equitable Mechanism to Fund Stormwater Management** - Many attendees were particularly supportive of the idea of charging tax-exempt properties for their usage of the drainage system in conjunction with a well-funded stormwater program.

A more complete overview of the community meetings and feedback received from citizens can be found on the Task Force web site.

Management Options Considered

Many water utilities around the country are struggling with many of the same problems as the Sewerage and Water Board, including aging infrastructure, historic deferment of critical maintenance and capital improvements, politically challenging rate-setting processes, and attraction and retention of qualified and dedicated talent. In some cases, other utilities have determined that the best way to address these issues is through a governance change. The Task Force heard from several experts who have undertaken transitions to new models of utility structure, or reforms to more traditional models. Below is a summary of the considered options, as laid out in the workplan.

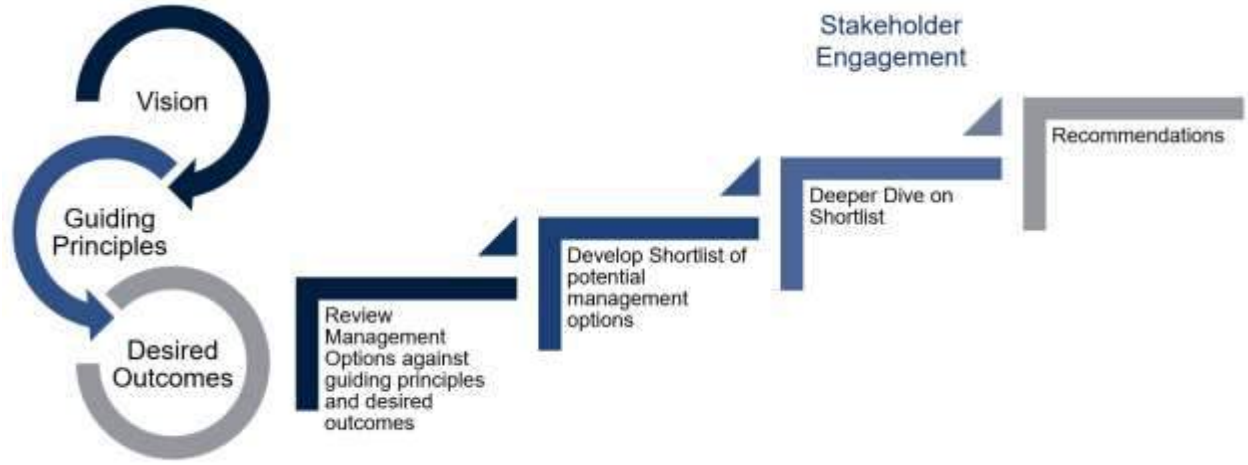
- **No Action** – The Task Force believed that there should always be a no action option, in the case that analysis of other options showed that a change would not dramatically improve the current situation. This option would preserve the existing governance and Board structure and maintain the existing split in the drainage system.
- **Combine Drainage under SWBNO** – Would allow for more consistent and coordinated service and was recommended by the Mayor's Transition Team Report; would require some way to transfer existing revenue from the City to SWBNO.
- **Consolidation under City of New Orleans** – Creation of a "municipal utility" which would be managed like any other administrative function of the City under the direction of the Mayor and City Council.
- **Privatization** – Sell the assets of the Sewerage and Water Board to a private company and allow for private operation.

- **Public-Private Partnership** – Expand contract operations beyond wastewater treatment and allow a private operator to take over daily management of the water and/or drainage system.
- **Public-Public Partnership** – Partner with some other public entity such as Southeast Louisiana Flood Protection Authority to managed daily operations of the drainage system.
- **Stormwater Utility** – Consolidate all drainage management under a new utility and move from millage to drainage fee; could be under SWBNO, under the City, or a new entity.
- **City-Owned Corporation** – Form a publicly chartered company with the City as the sole shareholder.
- **Regional Water Utility** – Leveraging existing excess capacity across the Region by combining operations to serve all or some portion of the Metropolitan area.

Desired Outcomes

In determining the best way to develop findings and recommendations, the Task Force worked through a deliberative process to weigh the issues and options against the needs of the system and citizens. Before analyzing each of these potential management options, the Task Force first reviewed the SWBNO's vision, mission, and guiding principles. Any recommendations should contribute to a more reliable, functional, responsive, accountable, equitable, and sustainable utility. Then it developed a list of "desired outcomes," and measured the universe of potential management options against those outcomes to determine which would be most effective and achievable. The Task Force also kept in mind industry best practices and attributes of a high-performing utility as aspirational goals for the SWBNO.

Figure 1: Overview of Process for Developing Recommendations



Below are the desired outcomes the Task Force identified and presented to the community for consideration.

- **Mitigation of Federal debt** – maximizing local revenue by looking for ways to avoid or reduce the amount of Federal repayment required going forward, specifically for the Southeast Louisiana Drainage Projects (SELA) and Permanent Canal Closure Pumps (PCCP).
- **Consolidation of Drainage O&M** – providing a "one-call" system where all drainage responsibilities are handled by a single agency to ensure better and more efficient service and maintenance.

- **Groundwater Management** – active monitoring and management of shallow groundwater to reduce subsidence and improve drainage.
- **Sustainable and Equitable Funding Source for Drainage** – new revenue is needed to fund the substantial capital and operations needs for the drainage system, particularly if consolidated.
- **Comprehensive Implementation of Green Infrastructure (Urban Water Plan)** – any new structure should be well suited to lead the way in implementing innovative and sustainable strategies for flood and subsidence reduction.
- **Workforce and Small Business Training Programs** – the utility should be a catalyst for economic growth in the community, particularly serving traditionally disadvantaged populations.
- **Holistic Approach to Water: regional MOUs with neighboring parishes and other agencies** – looking for new ways to become more efficient through shared resources and processes with our peers.

Based on feedback received at the community meetings, the Task Force added two additional desired outcomes:

- **Improve Efficiency and Accountability of Management** – citizens were clear in their feedback that the governance model matters much less than leadership that is accountable and provides excellent service. Any future model should reflect a strong sense of leadership in the community that is accountable to ratepayers.
- **Direct Engagement with Ratepayers** – citizens need to have more direct ways to engage with a utility as vital as the Sewerage and Water Board. New opportunities need to be created to allow for direct engagement and to let ratepayers vet and guide policy.

After measuring all the potential management options against these desired outcomes, the Task Force eliminated several options from further consideration because they were not the right fit to achieve the desired outcomes, overly complex to meet the current need, or simply infeasible. In particular, the Task Force ruled out the privatization options, because of the need for a public vote on any proposal, mismatch with many of the desired outcomes, and infeasibility in the near-term.

Then the Task Force presented the four remaining management options at the community meetings:

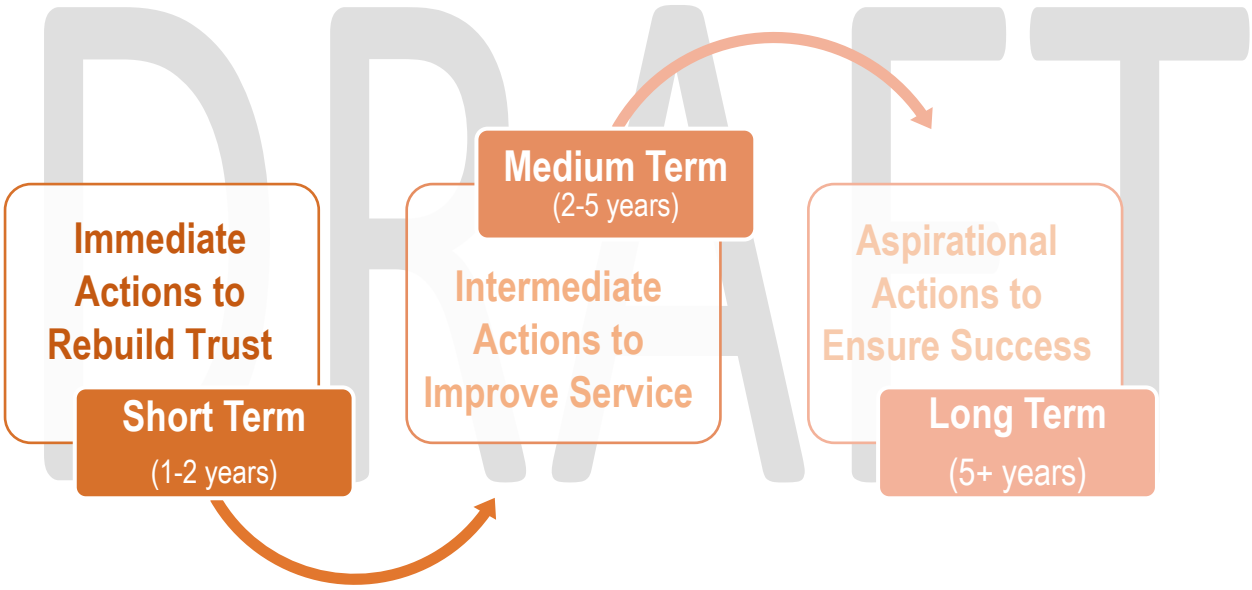
- No Action (with potential reform to the rate setting process)
- Consolidation of Drainage under a single entity
- Stormwater Utility (impervious area fee-based), and
- City-Owned Corporation.

Findings & Recommendations

After the community meetings, internal analysis, and expert testimony, the Task Force determined that a wholesale change in the governance structure of the Sewerage and Water Board is not likely to produce substantially better results than the current structure—particularly when weighed against the complexity of adopting some considered options. The Task Force determined that it would be best to make a set of phased recommendations under the existing governance structure which could address three tiers of issues facing the Board.

The Short Term phase will focus on immediate actions that will assist the organization in righting itself and increasing public trust. The Medium Term phase can proceed once the management has rebuilt credibility and delivered substantial results to the community so that the agency can focus on structural changes that would solidify the utility's ability to provide service for years to come. Finally, the Long Term phase is mainly about continuing to reevaluate the agency's structure to ensure success for the next century.

Figure 2: Overview of Recommendation Phases



The Task Force finds the following key issues and proposes recommendations to address each:

Finding #1. Customers are demanding improved efficiency and accountability. Citizens who weighed in during the public comment portions of Task Force meetings, and at the five public meetings, were clear in their feedback that the management structure matters less to them than having a well-functioning utility that is responsive and accountable to its customers. In addition, the SWBNO's longstanding workforce compensation, training, and demographic challenges have hampered progress.

Recommendations:

- **Undertake an Internal Strategic Planning Process (Short Term)** – Determine the actual needs of the organization and strategies for improvement of policies and processes to allow for strong leadership and accountability at all levels.

- **Reorganized Management Structure for Efficiency and Performance (Short Term)** – Allow the Strategic Plan to determine how to organize Executive leadership in order to structure responsibilities and staff for success.

- **Flexibility in Optimized Staffing and Hiring (Short Term)** – Complete an analysis of agency-wide personnel needs; review job classifications and requirements to ensure consistency. Look for ways to streamline the Civil Service hiring process for new employees and provide cross-training and promotional opportunities.

- **Continue Improvements in Billing and Customer Service (Short Term)** – Finish fixes to the billing and collection system and report on that progress to the public. Increase the availability of staff to meet with ratepayers through community outreach days and extended hours. Investigate Smart Water Meter technology and proven, compatible, billing software to eliminate human error from water bills and provide ratepayers with accurate sewer and water bills.

Finding #2. Inadequate opportunities for direct engagement between the SWBNO and its customers and other stakeholders. The SWBNO has begun to address this demand by meeting with neighborhood groups and making staff available at convenient times and places for customers to voice their concerns. The Task Force heard from representatives of other high-performing utilities around the country that provided models for how this could be done.

Recommendations:

- **Establish enhanced communications protocols (Short Term)** – Adopt new ways of communicating with citizens in advance of construction activity, boil-water advisories, and emergency shut-offs similar to other utilities using strategies like text messaging, social media, and door hangers.

- **Establish a Citizen Advisory Committee (Short Term) -** The Sewerage and Water Board should establish a committee of interested citizens from a broad and diverse group of ratepayers to advise on and vet planning processes, policy, and protocols. This group could also serve as a stakeholder in the strategic and master planning processes, future rate cases, capital planning, and other initiatives taken on by the Board.

Finding #3. Split responsibility for drainage is ineffective. The management of the drainage system is split into the Major system (pipes over 36 inches in diameter, canals, and pump stations), operated and maintained by SWBNO, and the Minor system (pipes under 36 inches in diameter and catch basins), operated and maintained by the City of New Orleans Department of Public Works. Despite each portion of the system being highly dependent on the other for success, the two entities coordinate very little in the way of operations, routine maintenance, or capital planning. The City completed a Drainage Master Plan in 2010, with the goal of upgrading the Minor system to achieve a 10-year 24-hour storm level of service. SWBNO, on the other hand, has no such master plan, and the Major system's level of service equates to a 1.5-year 24-hour storm level of service, which has proven an inadequate metric. This somewhat arbitrary division of responsibility means calls for service are often misdirected to the wrong agency and concerns are not addressed, further frustrating citizens and businesses. The Task Force's recommendations reflect the better practice of a single agency managing all drainage responsibilities to ensure better and more efficient service and maintenance.

Recommendation:

- **Consolidate management of drainage system (Medium Term)** – Institute a "one-call" system for drainage where operations, management, and customer service are handled by a single entity. The drainage system management and existing funding should be consolidated under SWBNO.

Finding #4. Chronically insufficient funding for drainage imperils the City. The Task Force heard from a number of sources including financial consultant Raftelis, the root cause analysis consultant ABS Group, and SWBNO Executive Director Ghassan Korban about the challenges the utility faces with revenue and funding. We also heard evidence of the historic disconnect between the SWBNO's obligation to provide service to ratepayers with limited authority over setting rates for service, which ultimately depends on the City Council. For drainage, funding is derived from two sources. For SWBNO, all funding for drainage comes from three dedicated millages that generate roughly $54 million per year, which barely meets the operational needs of the extensive and unique drainage system. For the City and the Minor system, funding is allocated through the City's general fund through the annual budgeting process. Both systems have historically been underfunded and funding can be unpredictable from year-to-year based on general fund revenue and administration priorities. This legacy of chronic underfunding and unpredictable revenue streams has crippled SWBNO's and the City's ability to invest in capital projects, forced deferment of regular infrastructure maintenance, and led to an almost wholly reactive, emergency-based maintenance protocol.

Finding #5. Current drainage funding formula is unfair. A functioning drainage system is an economic, social, and public health imperative—a prerequisite for living and working in the City of New Orleans. However, because the drainage system is funded exclusively by property taxes, there is not a strong nexus between the value of a property and its demand for drainage service. According to a 2011 Bureau of Governmental Research analysis, about 43% of the taxable value of properties in New Orleans are exempt either because they are owned by government or some non-profit organization, or the property's assessment is too low to pay the millages when accounting for the homestead exemption. As a result, many large generators of runoff, such as parking lots, churches, schools, and hospitals pay nothing for drainage service—inequitably placing a burden on the homeowners and businesses who pay for drainage through their real estate taxes. The Task Force heard from several other utilities and national experts about the many ways other cities have addressed similar challenges.

Recommendation:

- **Development and Implement an Equitable and Sustainable Drainage Funding Mechanism (Medium Term)** – Any new funding mechanism, including a stormwater fee, should follow national best practices and be charged on impervious surface area, with no exemptions. The mechanism should incorporate offsets, credits, and other affordability measures to ensure that it promotes a strict nexus between use of the system and cost of service delivery. Additional clarification is needed through a new Attorney General's opinion on the legal process for adopting any new stormwater funding mechanism.

Finding #6. SWBNO and the City must find additional, short-term revenue streams. Unless the SWBNO finds other sources of funds, or a way to avoid/reduce the debt soon coming due for the SELA and PCCP projects, funds for these obligations must be taken from the already woefully inadequate drainage fund, further restricting SWBNO's ability to make investments in the aging system. Improved collections and billing for water and sewer charges will not close the gap between existing funds and what is needed for 2019 and beyond, nor are those revenue streams legally

available to fund the drainage system. SWBNO has drawn down its reserves, borrowed money that it cannot repay, is nearly $40 million in arrears on contractor payments, and has imperiled its ability to issue further bonds. Additional funding is critical for continued operation.

Recommendation:

- **Support SWBNO through Stabilization Fund (Short Term)** – SWBNO missed the opportunity to issue a round of bonds for drainage capital improvements and has spent an unplanned $80 million to return the system to reliable functionality after the August 17 flooding. The agency needs an immediate infusion of cash to replace the spent reserves and to allow for new bonding opportunities to finance improvements in the short term.

Finding #7. No plan for how to repair and improve systems. At present, the Sewerage and Water Board does not have a comprehensive master plan to guide decision making and project development. There is also no single entity responsible for implementation of the Greater New Orleans Urban Water Plan and its green infrastructure and groundwater management strategies, which is sorely needed.

Recommendation:

- **Develop System Master Plans (Short Term) –** Begin work on project-based master plans for the sewerage, water, drainage, and power systems that will incorporate green infrastructure and the concepts noted in the Urban Water Plan. Pursue plans that will yield a 100-year vision for the agency, in the context of a robust, community-based engagement process to incorporate diverse interests and perspectives.

Finding #8. The rate-setting process is opaque. The historic underfunding of the Sewerage and Water Board appears to be the result of a reluctance on the part of past City Councils to grant requests for rate increases for water and sewer services. Under the existing process, there is no specified way for ratepayers to involve themselves in the process other than attending regular public hearings. Further, no part of the process is set up to provide City Councilmembers with the necessary information to make an accurate judgement call on whether a case is needed, nor are they allowed to alter a rate case—they can only approve or deny.

Recommendation:

- **Explore Reforms to the Rate-Setting Process (Medium Term) –** Additional study is needed to determine what changes could provide for a more equitable and transparent process to set rates. The Task Force heard many good ideas from other cities, including hiring a public advocate to analyze and advocate for ratepayers in the process.

Finding #9. New Orleans ultimately needs a more holistic approach to water management. At present, the delivery of the Sewerage and Water Board's core services is wrapped up in a complex web of State enabling legislation, City Charter requirements, and administrative rules. This complexity hampers the ability of groups like the Task Force to explore reforms that could significantly improve the utility's ability to perform. Further, sometime in the future, a well-functioning SWBNO could serve as the nucleus of a regional approach to managing water, garnering greater efficiency and effectiveness through shared resources with neighboring parishes. Many other jurisdictions throughout the country have already moved to such a regional cooperation model.

Recommendations:

- **Undertake a study of the existing governance and regulatory structure (Long Term) –** In general, the Task Force struggled with untangling the web of state and local statutes and codes that apply to the Sewerage and Water Board, its governance and its ability to make decisions. The Task Force recommends that the State Legislature undertake a special study of the issue of State control of the Sewerage and Water Board so that decisions can be better made by understanding all roles and responsibilities related to the agency's governance.

- **Once SWBNO has attained stable functionality, revisit governance structure (Long Term) –** Consider a broader range of options, including a regional utility and/or a public benefit corporation, which may best serve the long-term needs of the system. Undertake a study to determine the long-term effectiveness of state versus city control.

Conclusion

The Task Force, as organized, cannot act unilaterally on any of these recommendations to Mayor Cantrell, the City Council, and the Orleans Parish Legislative Delegation. Adoption and implementation of these recommendations, however, will require a true partnership among our elected leaders, public agencies, and the community.

The Task Force believes that the above recommendations will set the utility on solid footing and provide efficient and effective service to the community.

Summary of Findings and Recommendations	Findings								
Recommendations	1. Customers are demanding improved efficiency and accountability.	2. Inadequate opportunities for direct engagement between the SWBNO and its customers and other stakeholders.	3. Split responsibility for drainage is ineffective	4. Chronically insufficient funding for drainage imperils the City.	5. Current drainage funding formula is unfair	6. SWBNO and the City must find additional, short-term revenue streams.	7. No plan for how to repair and improve systems.	8. The rate-setting process is opaque.	9. New Orleans ultimately needs a more holistic approach to water management.
Short Term (1-2 years)									
Undertake an Internal Strategic Planning Process	X								
Reorganized Management Structure for Efficiency and Performance	X								
Flexibility in optimized staffing and hiring	X								
Continue improvements in billing and customer service	X								
Establish enhanced communications protocols		X							
Establish a Citizen Advisory Committee		X							
Support SWBNO through stabilization fund						X			
Develop system master plans							X		
Medium Term (2-5 years)									
Consolidate management of drainage system			X						
Investigate development and implementation of an equitable and sustainable drainage funding mechanism				X	X				
Explore reforms to the rate-setting process								X	
Long Term (5+ years)									
Undertake a study of the existing governance and regulatory structure									X
Once SWBNO has attained stable functionality, revisit governance structure									X

Appendix

I. LA House Resolution 193, 2018

II. Janet Howard Testimony – August 22, 2018

III. Rami Diaz, Urban Water Plan - September 12, 2018

IV. Root Cause Analysis Presentation, ABS Group – September 18, 2018

V. Raftelis Presentation – October 3, 2018

VI. Citizens Energy Group, Dan Considine – November 14, 2018

VII. Philadelphia Water, Joanne Dahme – November 30, 2018

VIII. Stormwater Utilities, Eric Rothstein / Andy Reece – December 12, 2018

ENROLLED

2018 Regular Session

HOUSE RESOLUTION NO. 193

BY REPRESENTATIVE HILFERTY

A RESOLUTION

To create the Task Force on New Orleans Sewerage, Water, and Drainage Utilities to study issues related to the management of sewerage, water, and drainage facilities and services in the city of New Orleans and to provide a written report of findings and recommendations regarding the best strategies and procedures for the management of such facilities and services to the mayor of the city of New Orleans, the New Orleans City Council, and the members of the Orleans Parish legislative delegation not later than January 31, 2019.

WHEREAS, Act No. 6 of the 1899 Extraordinary Session of the Louisiana Legislature created the New Orleans Sewerage and Water Board to furnish, construct, operate, and maintain a water treatment and distribution system and a sanitary sewerage system for the city of New Orleans; and

WHEREAS, in 1903, the Drainage Commission of the city of New Orleans was merged with the Sewerage and Water Board in order to consolidate drainage, water, and sewerage programs under one agency for more efficient operations; and

WHEREAS, as the population of the city of New Orleans grew rapidly over the next one hundred years, the Sewerage and Water Board faced many new challenges in its attempt to provide efficient sewerage, water, and drainage services to the city's residents; and

WHEREAS, in 2005, Hurricane Katrina severely damaged the facilities of the Sewerage and Water Board, and the board has had to contend with rebuilding those facilities and making necessary infrastructure improvements; and

WHEREAS, costs associated with providing sewerage, water, and drainage services to the city's residents continue to escalate, and the city's population is again on the rise; and

WHEREAS, over the last several years, many residents, business owners, and local officials have questioned whether the Sewerage and Water Board is the best entity to manage sewerage, water, and drainage facilities and services in the city of New Orleans; and

WHEREAS, suggestions abound regarding the best management options for the city's sewerage, water, and drainage facilities and services, including but not limited to public-private partnerships, granting control to the city, or allowing the Sewerage and Water Board to retain control; and

WHEREAS, there is an urgent need for a comprehensive review of the management options for sewerage, water, and drainage facilities and services in the city of New Orleans, including a review of the state law governing the Sewerage and Water Board, as provided in R.S. 33:4071 et seq., so that the residents of the city can have confidence that such facilities and services are being managed as efficiently as possible.

THEREFORE, BE IT RESOLVED that the House of Representatives of the Legislature of Louisiana does hereby create the Task Force on New Orleans Sewerage, Water, and Drainage Utilities to study issues related to the management of sewerage, water, and drainage facilities and services in the city of New Orleans and to provide a written report of findings and recommendations regarding the best strategies and procedures for the management of such facilities and services to the mayor of the city of New Orleans, the New Orleans City Council, and the members of the Orleans Parish legislative delegation not later than January 31, 2019.

BE IT FURTHER RESOLVED that the task force shall be composed of the following members:

(1) The mayor of the city of New Orleans or his designee.

(2) The chairperson of the Public Works, Sanitation and Environment Committee of the New Orleans City Council or his designee.

(3) A representative of the New Orleans chapter of the Louisiana Engineering Society designated by the president of the chapter.

(4) The general superintendent of the New Orleans Sewerage and Water Board or his designee.

(5) A representative of the New Orleans Metropolitan Convention & Visitors Bureau designated by the president of the bureau.

(6) A representative of the Business Council of New Orleans and the River Region designated by the chair of the council.

(7) A representative of the New Orleans Office of Inspector General designated by the inspector general.

(8) A member of the New Orleans Board of Liquidation, City Debt designated by the board.

BE IT FURTHER RESOLVED that mayor or his designee shall serve as the chairman of the task force and the chairperson of the Public Works, Sanitation and Environment Committee of the New Orleans City Council or his designee shall serve as the vice chairman.

BE IT FURTHER RESOLVED that the chairman shall call the first meeting of the task force, and the meeting shall be held no later than August 1, 2018.

BE IT FURTHER RESOLVED that all representatives and designees shall be named no later than July 1, 2018.

BE IT FURTHER RESOLVED that a copy of this Resolution be transmitted to the mayor of the city of New Orleans, the New Orleans City Council, and the members of the Orleans Parish legislative delegation.

SPEAKER OF THE HOUSE OF REPRESENTATIVES

Presentation to the Task Force on New Orleans
Sewerage, Water and Drainage Utilities
By Janet Howard
Howard Policy Solutions LLC
August 22, 2018

First I'd like to thank the members of the Task Force for undertaking their work and for the opportunity to contribute background information to the discussions.

I've been asked to provide information on the Sewerage and Water Board's history, so I'll start at the beginning. In answer to the earlier question, the SWB was created by the state in 1899 at the request of voters to address the sewer and water infrastructure needs in New Orleans. Three years later, the City's Drainage Commission and its functions were merged into it.

Although the board is created in state law, it is an independent municipal agency. In relation to city government, it is one of 10 "unattached" boards and commissions placed under the executive branch by New Orleans' home rule charter, meaning it's not attached to a specific department of the city government. Thus, both the city and the state have a say in its powers and governance.

.

Currently, the board is responsible for the city's sewerage and water systems and part of the local drainage system. Its responsibility for the drainage system is limited to pipes 36 inches or larger in diameter, drainage canals and pumping stations. The City through its Department of Public Works is

responsible for the rest of the local drainage system, including more than 85,000 catch basins and the nearly 1,600 miles of smaller drainage pipes underneath streets, sidewalks and other rights of way." As a result of this split, DPW is responsible for more than 80% of all drainage lines (including canals) in New Orleans.

This was not always the case. The transfer of responsibility for the subsurface drainage from the SWB to the City occurred in 1991, after voters refused to renew a 2-mill tax that supported the drainage system. No funding source came to the City with its new responsibilities.

Currently the SWB is governed by a 10-member board consisting of the mayor, two members of the Board of Liquidation, and seven citizen members, who must meet various expertise and area-distribution requirements. The citizen members are nominated by a committee consisting of university presidents or their nominees. They serve four-year terms and are term-limited at two. This too was not always the case. Until 2013, the board had 13 members. It included four elected officials, the mayor and three councilmembers, two members of the Board of Liquidation and seven citizen members. There were no nominating process or expertise requirements for them. Terms were for nine years.

The finances of the water, sewerage and drainage systems were separated in 1967 and have been maintained separately since then. However, the S&WB operates the three systems on a consolidated basis.

The SWB has sole responsibility for and control over its management and operations. The city government cannot order the S&WB to take specific actions, nor can it impose specific financial burdens. However, it has significant control over its funding. The S&WB does not have taxing authority; taxes for its benefit are levied by the City Council. It must obtain the approval of both the City Council and the Board of Liquidation before issuing bonds or (with a limited exception) raising sewer and water rates. While the Board of Liquidation generally limits its review to the fiscal soundness of a proposed bond issue or rate increases, the City Council has no guidelines for its review. The Board of Liquidation and City Council cannot modify the rates proposed by the S&WB; they can only accept or reject them. The SWB can override the Council only if the rate increase is necessary to pay existing debt.

The City Council and Board of Liquidation were not always involved in rate setting. Until 1954, the S&WB set its own rates without even a public hearing. However, the rates were capped by law at a very low level, necessitating legislative approval of any rate increases. As a result of this impediment the SWB went for nearly 35 years – from 1913 to 1948 -- without an increase. Finally in 1954, as the SWB struggled to pay for infrastructure in the newly developing parts of the city along the Lakefront and New Orleans East, voters eliminated the cap. At the same time, they added requirements for public hearings and for the Board of Liquidation's approval of rate adjustments.

Four years later, when the SWB was first authorized to issue revenue bonds, voters added a requirement for City Council approval of rate increases.

The resulting arrangement created a misalignment of powers and responsibilities. Responsibility for the system is in the hands of the SWB, and the ultimate control over its revenues is in the hands an elected body with plenty of pressure to keep rates low. As is discussed below, the City Council has on multiple occasions delayed or killed rate increases, despite the S&WB's pressing needs.

The problems created by the misalignment were compounded by the presence of four elected officials on the board. The elected officials, leery of voters' ire, on multiple occasions objected to new rate and tax proposals at the board level. Their objections discouraged proposals from coming forward or foreshadowed the outcome of a Council vote, short-circuiting the process before it even began. Rarely did the other members act in concerted opposition to the elected ones. The latter problem was addressed tin 2013 through changes to state law and the city charter eliminating Council members from the board.

As a result of the governance arrangement that was in place for most of the last 50 years, rate increases were sporadic, with substantial increases following long periods with little or no adjustment. In the interim periods, the system continued to deteriorate, leading to poor services and increased infrastructure costs down the line.

For example, for a 20-year period from early 1987 to late 2007, water rates increased only twice. For a 14-year period running from early 1986 to early 2000, sewerage rates did not change at all, and customer charges declined relative to inflation. These long periods of inactivity were preceded and followed by multiple years of double-digit increases.

Sewer rates.

Sewer rates were first put into place in 1967. Four years later the SWB, facing intense pressure from inflation and more stringent federal regulations of sewerage discharge, sought a 72% increase. The Council responded with a 19% one, which was enough to cover bond obligations for a couple of years but not enough to access the federal funds needed for EPA-mandated sewer upgrades. Under intensifying federal pressure, the SWB came back for another hike, which the council refused to give. Finally, the SWB raised rates unilaterally (I'm not sure how), and the Council caved.

A period of five years with no increases followed. After that there were six years with increases needed to access federal funds and then a 14-year period with none. During that period, the EPA sued the SWB and City, forcing them into a consent decree to clean up the sewer problems. As a result of the consent decree, the SWB sought and obtained approval for annual increases over seven years, ending in 2006. The next set of increases, 10% over each of 8 years, went into effect in 2013 and continues through 2020. Due to compounding, it more than doubles customer bills over that time.

Water

On three occasions in the 1970s, the City Council shot down the water rate increases needed to avoid default on the S&WB's debt. The denials forced the S&WB to exercise its legal authority to raise rates unilaterally to meet its existing debt service obligations.

Two of the proposed increases that the Council denied included a component to support bonds that had already been approved by voters in 1975. Despite the voters' authorization, it took five years to cajole the Council into giving approval. The SWB sent it a dozen rate proposals, but it didn't approve any until 1978 when it allowed a 22% increase, enough to allow the issuance of $6 million of the $31 million of authorized bonds. The Council didn't approve the rest of the bonds until 1980, when it signed off on a 70% increase over five years. As the last of those increases went into effect in 1984, the Council approved another five-year series to meet rising costs and fund improvements. This time the SWB itself delayed implementation of two of those increases. The opposition to implementation was fomented by elected officials on the board. It wasn't until 1990 that the fourth of the rate increases was finally forced through by the board's appointed members in an acrimonious battle with the Council members. The fifth increase didn't go into effect until 2002, 18 years after the Council's original approval.

The next series of increases ran from 2007 to 2012. It was followed by the current series.

The S&WB's management coped with the stagnation in water and sewerage rates in the late 1980s and the 1990s– and their decline relative to inflation – by cutting operating costs, deferring system maintenance, funding some capital projects on a pay-as-you-go basis and deferring others. The deferred maintenance and capital investment increased the ultimate costs of repairing the systems and pushed the day of reckoning into the future.

Clearly, this fits-and-starts approach does not comport with best practices, which require increases to keep up with operating costs and fund needed investment. In that regard, BGR took a look in 2012 at how three peer utilities with aging infrastructure and similar revenue sources for water and sewer -- Cincinnati, Louisville and Charleston. It found that all three raised their rates in most years. During the period reviewed, those increases averaged 5% a year for water and 7.5% for sewer. Had New Orleans increased its rates each year on the basis of water/sewer CPI, bills would have been higher than the then-current one, but the system would have been better operated and maintained, and the costs would have been spread more fairly over generations of customers.

Drainage

Unlike the water and sewer systems, the drainage system is supported by tax revenue, which currently total 16.34 mills. That system too has faced funding obstacles. It has not gained a new revenue source since 1982, and in 1991 actually lost one.

The latter was a two-mill tax that had been in place for 100 years and used in its later years for drainage, including subsurface infrastructure. In 1991, voters twice refused to renew the tax. After that the City and the SWB entered into a CEA transferring responsibility for the subsurface drainage to the City.

The SWB also has in place a three-mill levy that was passed in 1967 and renewed in 2016. Prior to the passage of that tax, the city was obligated to support drainage if the SWB didn't have enough surplus from the water and sewer systems to do so. That requirement was lifted when the tax was imposed. The drainage system also receives revenue from taxes originally levied at six and nine mills.

In 2010, the millage rates were rolled back as a result of a major reassessment in the city. The SWB requested a roll forward but City Council blocked it, even as it rolled forward the City's own taxes.

Twice during the last 30 years – in 1985 and 1998 – the S&WB unsuccessfully proposed supplementing its funding by implementing drainage fees. Both fees would have used a property's size, land use and varying assigned rates to calculate the fee.

The first proposal, which would have generated $20 million per year for drainage, was rejected by voters. The second time that it sought a fee the S&WB took the

position that the City Council had the authority to impose the fee without a public vote. The proposal died when the Council failed to act on it.

The approval process is, as the above suggests, muddled. Under state law, the S&WB can fix and collect service charges from users of the drainage system, with the approval of the City Council, the Board of Liquidation and voters. Whether this law would be trumped by the City's home rule charter is a matter of debate. At the city level, a murky charter amendment requiring voter approval of certain fees was enacted after the City Council attempted to impose a "real property service charge" and a "road use charge" with flat rates. Whether the drainage fee falls into the realm of those fees is unclear.

The past is not necessarily prologue here. The use of drainage fees has grown dramatically around the country. In New Orleans, there is greater awareness of the limitations on tax capacity and the unfairness caused by massive tax exemptions. This makes fees that can each those properties a more palatable alternative to property taxes.

Privatization

In February of 2001, the SWB released without formally issuing an RFQ/RFP soliciting proposals to privatize either the management only or the management, operations and maintenance of the water and wastewater systems. The purpose of the privatization was to reduce costs and rate increases.

The solicitation was in the form of a managed competition, meaning that both private firms and the employees of the SWB were invited to submit proposals. The proposed procurement included the sewer collection system, the water distribution system, all treatment plants, billing, collection, meter reading and maintenance. It did not include the drainage system, the power plant or capital repairs and improvements for which the cost of materials exceeds $10,000. Had it been implemented, it would have been the largest water/wastewater privatization in the US, with an estimated value in excess of $1 billion.

The SWB started off on a bad foot by giving the public a mere ten days to review and comment on a set of legal and other documents about eight inches high. After pushback, the period was extended by four months. Because of the scope of the proposed privatization and its implications for all citizens, BGR hired experts to conduct an independent evaluation to determine (1) whether privatization was the best way to meet the SWB's financial challenges and improve services, and (2) whether the proposal on the table was structured in a way that would deliver maximum cost savings and other benefits.

The answer to the first question was a qualified yes; the answer to the second was a resounding no. The consultants found that privatization was more likely than internal engineering efforts to reduce costs and produce smaller rate increases. However, if the SWB's governance problems were not remedied, they would diminish the benefits of managed competition.

There were, unfortunately, serious procedural problems with the selection process and serious substantive problems with the terms of the proposed privatization and proposed contract. The procedural ones were of a magnitude that was likely to discourage bidders, and indeed there were only two besides the employee group. The problems included ambiguous selection criteria, lack of detail in the protocols for the selection process and the scoring system, a requirement for firm bids at an inappropriate time, and unusually complicated alternative scenarios (18 in all). In addition, there were other factors, such as the failure to establish an economic baseline for use in evaluating cost effectiveness.

Most of the contract provisions were reasonable. Some, however, undermined the goal of privatization by continuing the inefficient practices that privatization is supposed to avoid. For example, the draft contract gave the SWB the right to approve all subcontracts for professional services. In addition, there were ambiguities in the scope of work; inadequate treatment of major costs, such as electricity; and flawed pass-through provisions. There were also unusual termination provisions, such as the one for termination for uncontrollable circumstances, which placed an inordinate amount of financial risk on the SWB.

There were also legal clouds, including the Civil Service's claim to have a right of approval.

The process continued for more than a year and a half. During that time, BGR again hired consultants, Raftelis, first to review the process and the evolving draft service agreement, and then to analyze and score the final proposals. BGR

reviewed and submitted detailed comment letters on drafts of the agreement. Many of the problems identified at the outset were never addressed.

In the beginning of the process, the only parties showing up at the hearings were concerned employees and BGR. Over the course of the process interest and opposition grew, and not just at the local level. Public Citizens, an advocacy group in Washington opposed to water privatizations, came on the scene and began grassroots organizing.

In the fall of 2002, the privatization was defeated through a parliamentary maneuver. Mayor Nagin attempted to revive the effort, but it never went anywhere.

In the meanwhile, the City Council had proposed and voters approved a charter amendment that requires voter approval of SWB privatizations over $5 million. That charter amendment remains on the books.

I note that the operation of the sewerage treatment plant was outsourced before the managed competition and remains outsourced to this day. Veolia is the operator.

Management issues

As noted earlier, the SWB is responsible for the operations, maintenance and improvement of the systems. However, the City Council controls its access to

funding. There are two basic ways to a fully address this misalignment of powers and responsibilities. One is to consolidate the SWB into city government. The other is to make the SWB completely independent of city government by giving it independent funding authority.

In the U.S. most water and wastewater utilities are departments of city or county governments. A 2005 survey found that two-thirds of them were structured that way. Another 30% were stand-alone entities. The remainder took other forms, like cooperatives and privately owned utilities.

While departmental utilities were the most common, independent water agencies have been growing in popularity. There are advantages and disadvantages to both.

In 2011 BGR collected information on the governance of 37 independent utilities nationwide. It found that all but four of them had full control of their rates. Two of the four were regulated by the state public service commission, and the local governing body had the say in the other two.

Sixteen of the 33 utilities with full control of their rates had totally appointed boards. Another four had appointed boards with one ex officio member. In 11 other cases, the public elected all or a majority of the board members. The remaining two boards were comprised solely of elected officials.

While almost all of the stand-alone utilities had full control of their rates, only eight had taxing authority. None imposed taxes for drainage. Three funded it through their sewerage rates, while the other two imposed a separate fee.

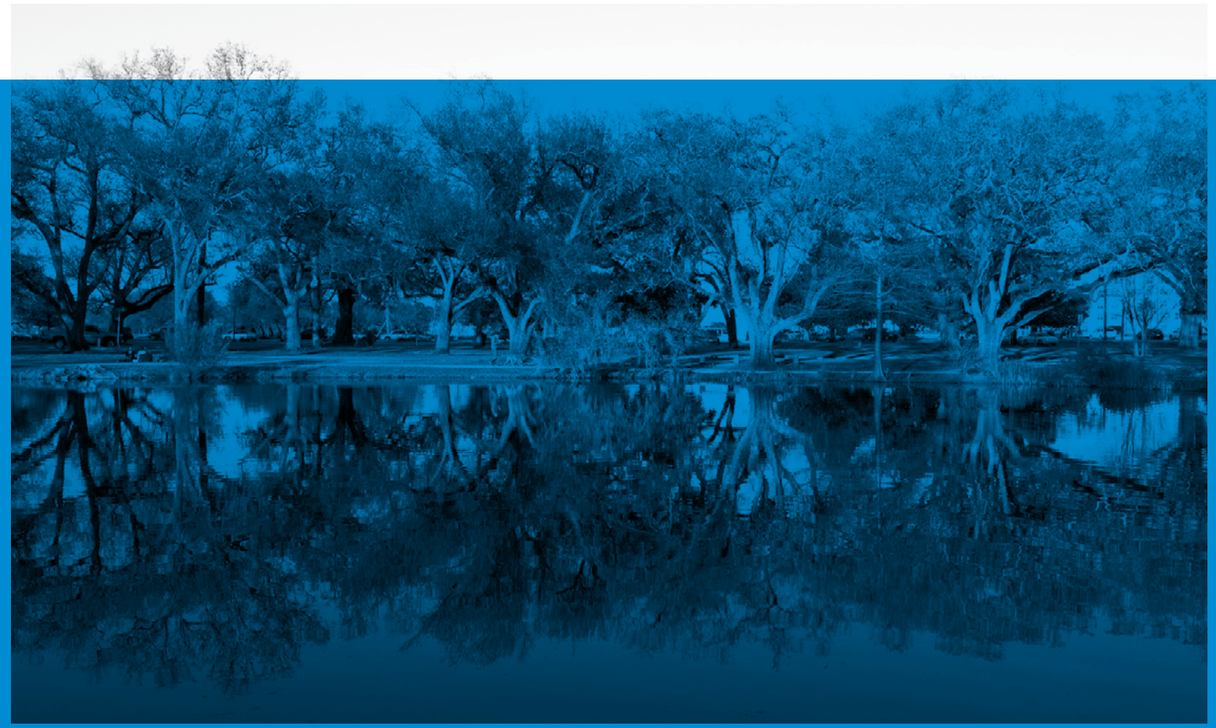
There are lesser measures that provide some, though not complete independence. They include giving the SWB limited ratemaking authority tied to an index of some sort, and amending the process by which the City Council considers requests for rate increases, including independent analysis and fixed timelines.

Earlier I flagged problems relating to having four elected officials on the board. This also is unusual. BGR took an in-depth look at the governance structure of 10 well regarded independent utilities. Seven of them were composed exclusively of appointees. Only three had an *ex officio* member, and in all three cases it was the mayor. No member of the local governing board sat on the committee. Appointments were made by the mayor, the city council, or most commonly by the mayor with council's approval.

Finally, there is another fracture in the system that should be addressed.: the division of responsibilities for drainage. Consolidating the SWB into the City is one way to address it. Should the SWB remains an independent entity, transferring the city's drainage to the SWB would also address the problem.

I'll wrap up here to make time for questions and discussion. In closing, I'd like to acknowledge that most of the history and other information contained in this

report comes from reports prepared by the Bureau of Governmental Research over the last two decades. For more detail, I refer you to those reports, which are contained on their website under reports in the subcategory Sewerage and Water Board.



12 SEPTEMBER 2018
S&WB TASK FORCE

JAIME RAMIRO DIAZ
ARCHITECTURAL/URBAN DESIGNER

Greater New Orleans Urban Water Plan

WAGGONNER & BALL

Living With Water New Orleans

Post-Katrina Catalytic Plans

2005 '06 '07 '08 '09 '10 '11 '12 '13 '14 '15 '16 '17 '18

Tulane University Stormwater Master Plan

FEMA Hazard Mitigation Grant Projects

St. Bernard Parish Water Plan

Foundation

Hurricane Katrina

Hurricane Rita

American Planning Association (APA) Plan

Urban Land Institute (ULI) Plan

Bring New Orleans Back Commission

St. Bernard Parish Recovery Plan

Dutch Dialogues I, II, & III

USA Delegation to Netherlands

Lambert Plan

Unified New Orleans Plan

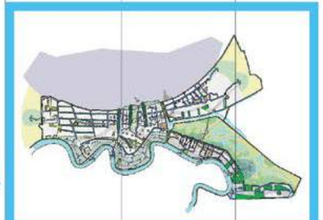
New Orleans Office of Recovery

New Orleans Master Plan

Lafitte Greenway Water Design

RFP for GNO UWP

Greater New Orleans Urban Water Plan



Phase 1
Project Definition & Data Collection
September 2011 - January 2012

Phase 2
Water System Analysis
November 2011 - September 2013

Phase 3
Water District Planning
December 2011 - September 2013

Phase 4
Implementation Strategy
July 2012 - September 2013

Phase 5
Pilot Project Development
January 2012 - September 2013

Resilience Projects

100 Resilient Cities: New Orleans

Gentilly Resilience District

NDRC Louisiana: LA SAFE

City of New Orleans Office of Resilience & Sustainability

City / Parish Policies

City of New Orleans Stormwater Management Code

New Orleans Master Plan Adoption of the Urban Water Plan

Mayoral Transition Water Plan Subcommittee

Water Economy

Sewerage & Water Board Increased Hiring for Water Management Positions

Greater New Orleans Foundation and Greater New Orleans, Inc. Focus on Water

Water Challenge

Education / Advocacy

Trust for Public Land Climate-Smart Cities Tool

Horizon Initiative

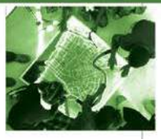
Greater New Orleans Water Collaborative

Groundwork New Orleans

Sewerage & Water Board Green Infrastructure Grants

Water Institute of the Gulf

Ripple Effect Water Literacy Curriculum

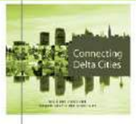


International Knowledge Sharing

Rockefeller Foundation Global Resilience Academy, Chennai

Rockefeller Foundation Global Resilience Academy, Bangkok

Connecting Delta Cities Network



100 Resilient Cities Chief Resilience Officer Grant

Living With Water: Houston, Charleston, Puerto Rico

Replication

MISI-ZIBI Workshop, St. Louis

Design Studios at Yale University, Washington University, Tulane University, and the University of Toronto

Dutch Dialogues Virginia

NDRC Virginia

RBD Bridgeport

NDRC Connecticut

Rebuild By Design (RBD) Framework

Resilient By Design: Bay Area

Hurricane Sandy

Hurricane Isaac

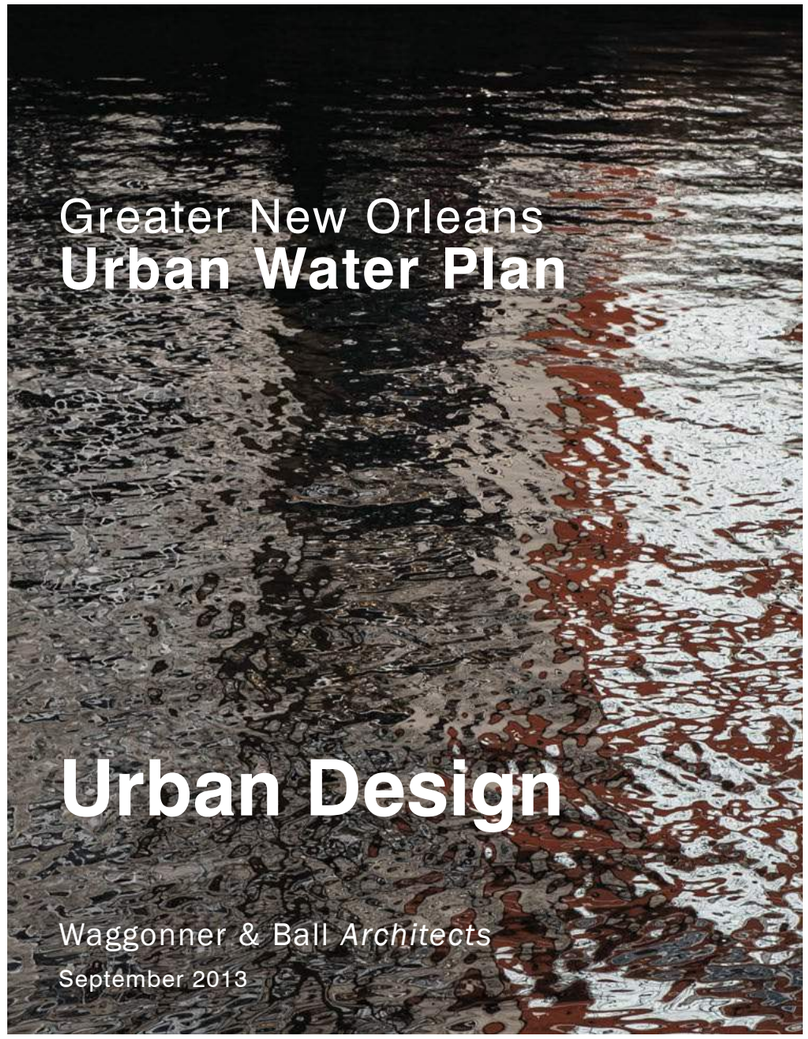
Hurricane Harvey

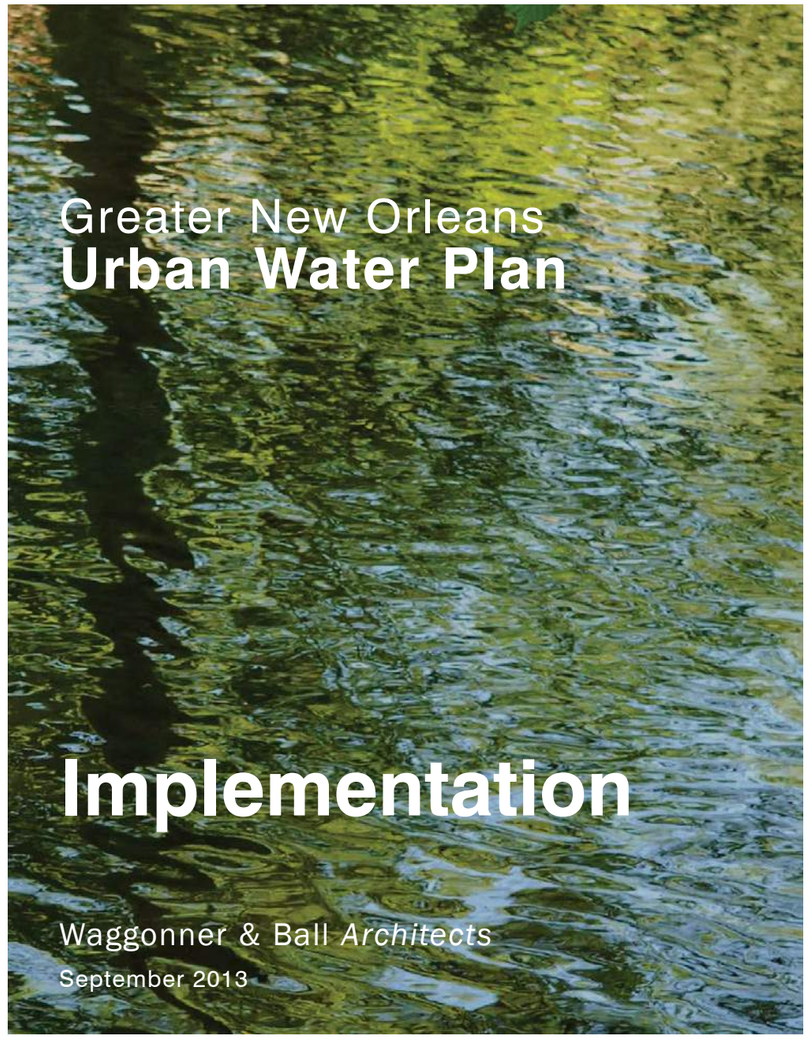
Hurricane Irma

Hurricane Maria

Documents

Greater New Orleans Urban Water Plan





+ System Design, District Plans, Demonstration Projects, and Resources

www.livingwithwater.com

Team & Partners

Greater New Orleans Urban Water Plan

Waggonner & Ball

Manning Architects

Dana Brown Landscape Architects

FutureProof

CDM Smith

Nelson Engineers

Dewberry

GCR

Eustis Engineering

Sherwood Design Engineers

Tulane University

LSU Coastal Sustainability Studio

Bright Moments

Arcadis

Deltares

Royal Haskoning

City of Rotterdam

City of Amsterdam

H+N+S Landscape Architects

Bosch Slabbers Landscape Architects

Robbert de Koning Landscape Architect

Palmbout Urban Landscapes

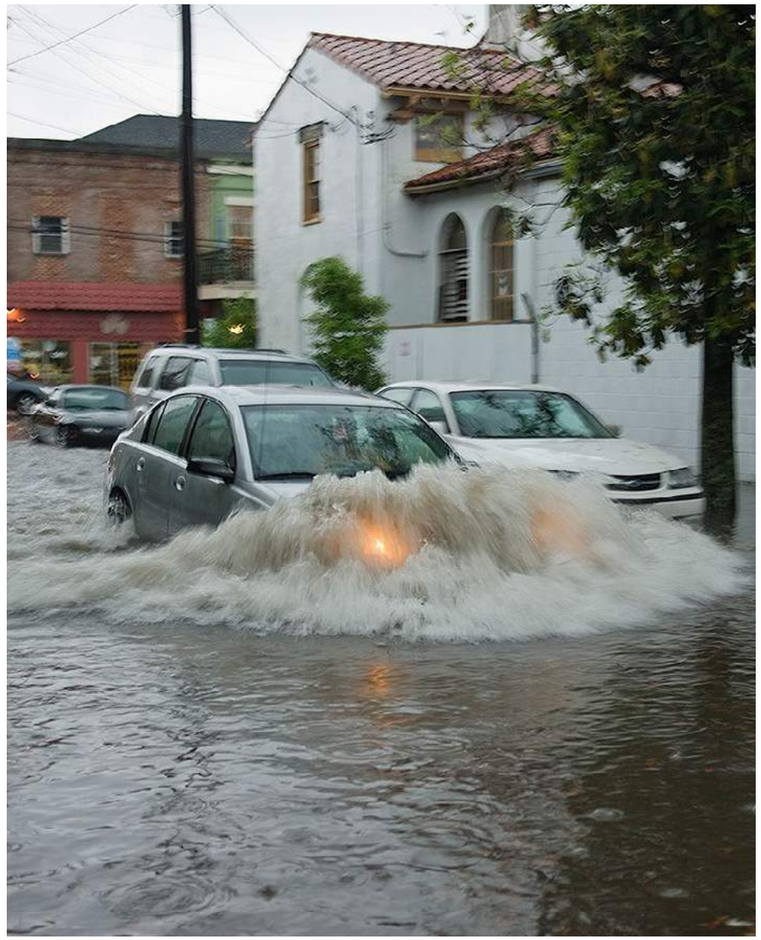
Technical University Delft

WAGGONNER & BALL

greater new orleans inc
regional economic alliance

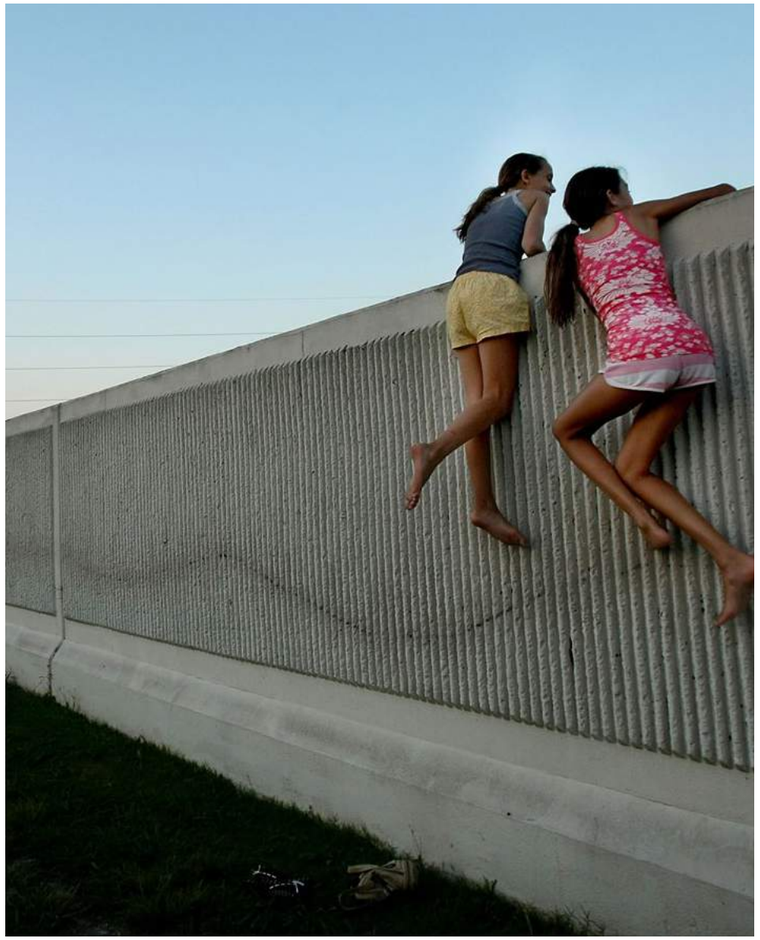
Problems Identified

Greater New Orleans Urban Water Plan



1 Drainage systems are regularly overwhelmed by too much runoff, causing flooding.

2 Excessive pumping causes the land to sink by lowering groundwater levels.



3 Critical water assets are wasted, hidden behind walls, buried underground, or pumped out of sight.

Pluvial Flooding

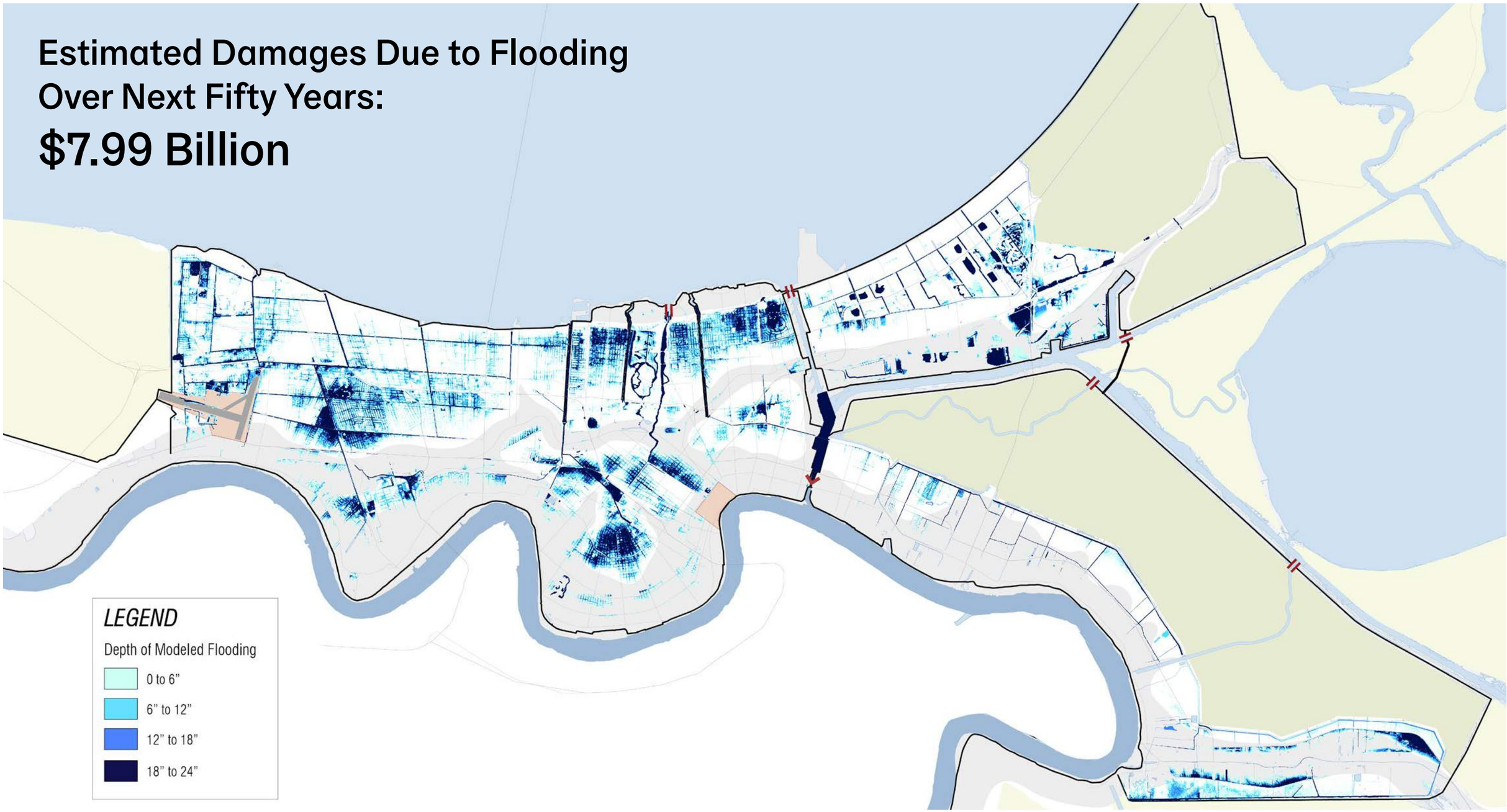
Greater New Orleans Urban Water Plan

Pluvial Flooding

Greater New Orleans Urban Water Plan

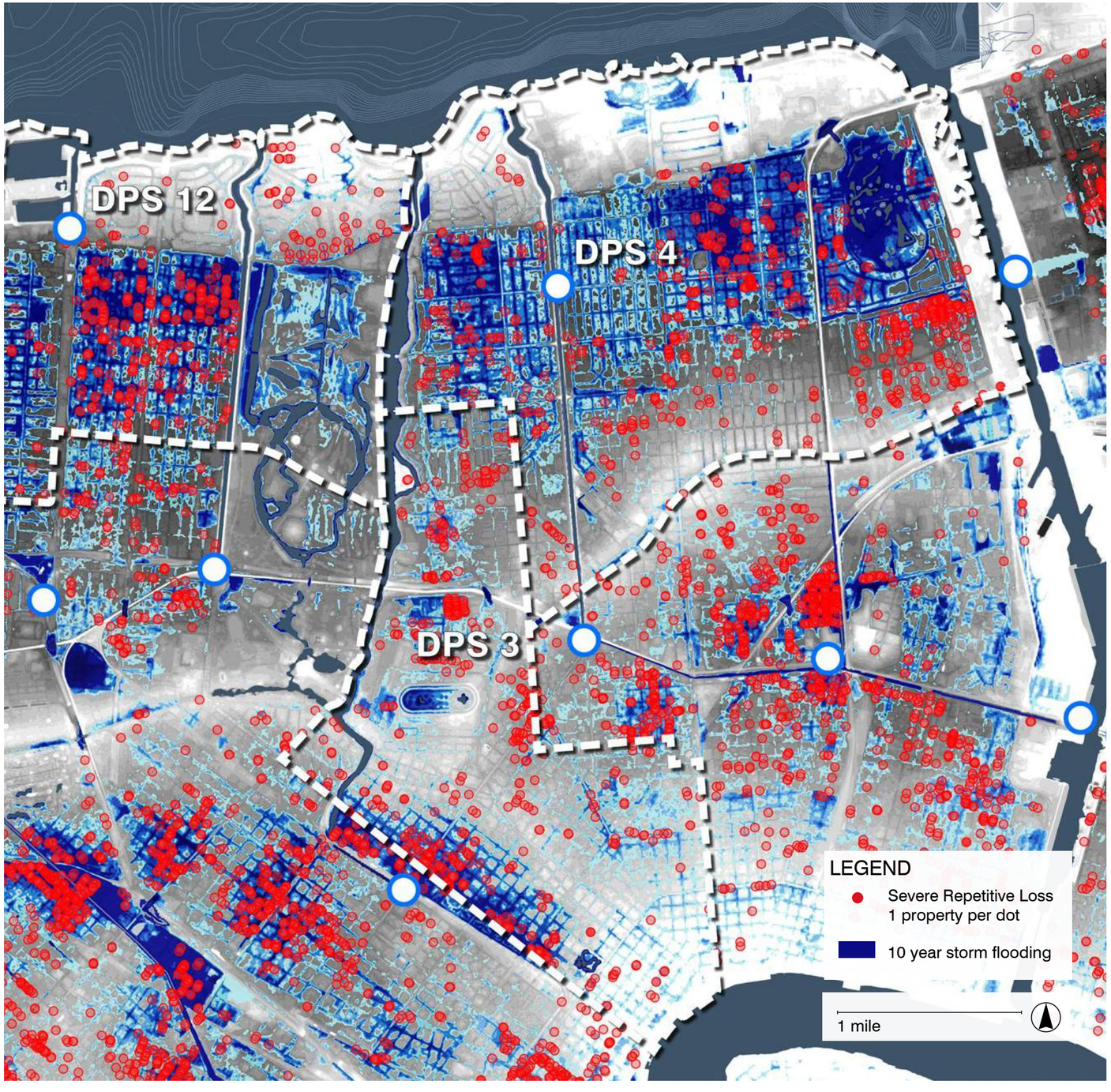
Estimated Damages Due to Flooding Over Next Fifty Years:

$7.99 Billion



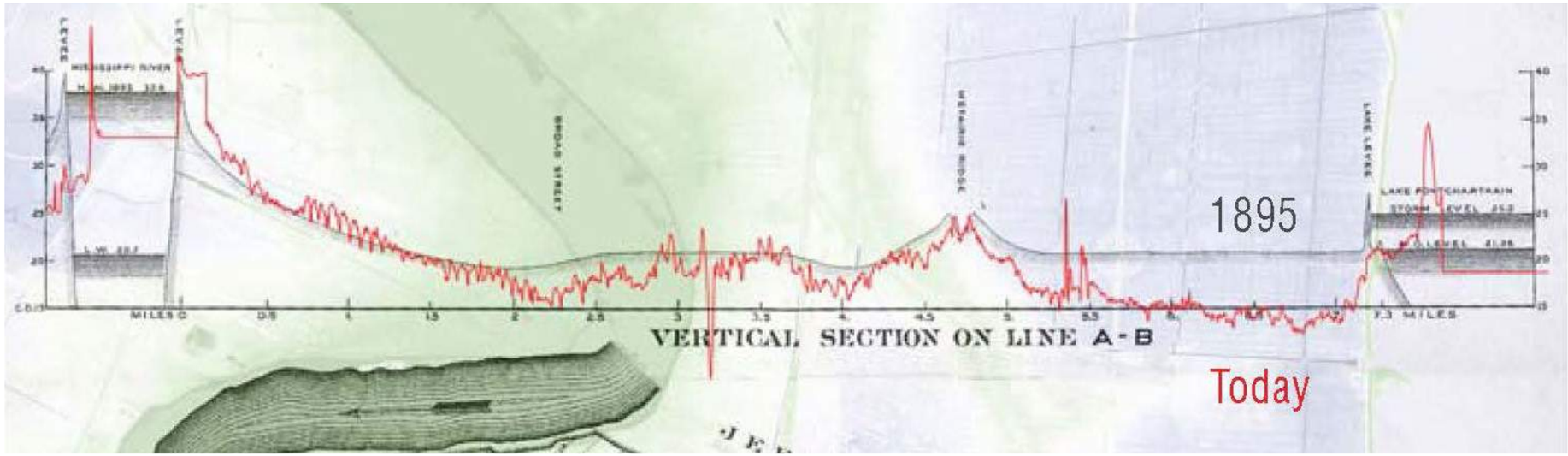
Repetitive Flood Loss

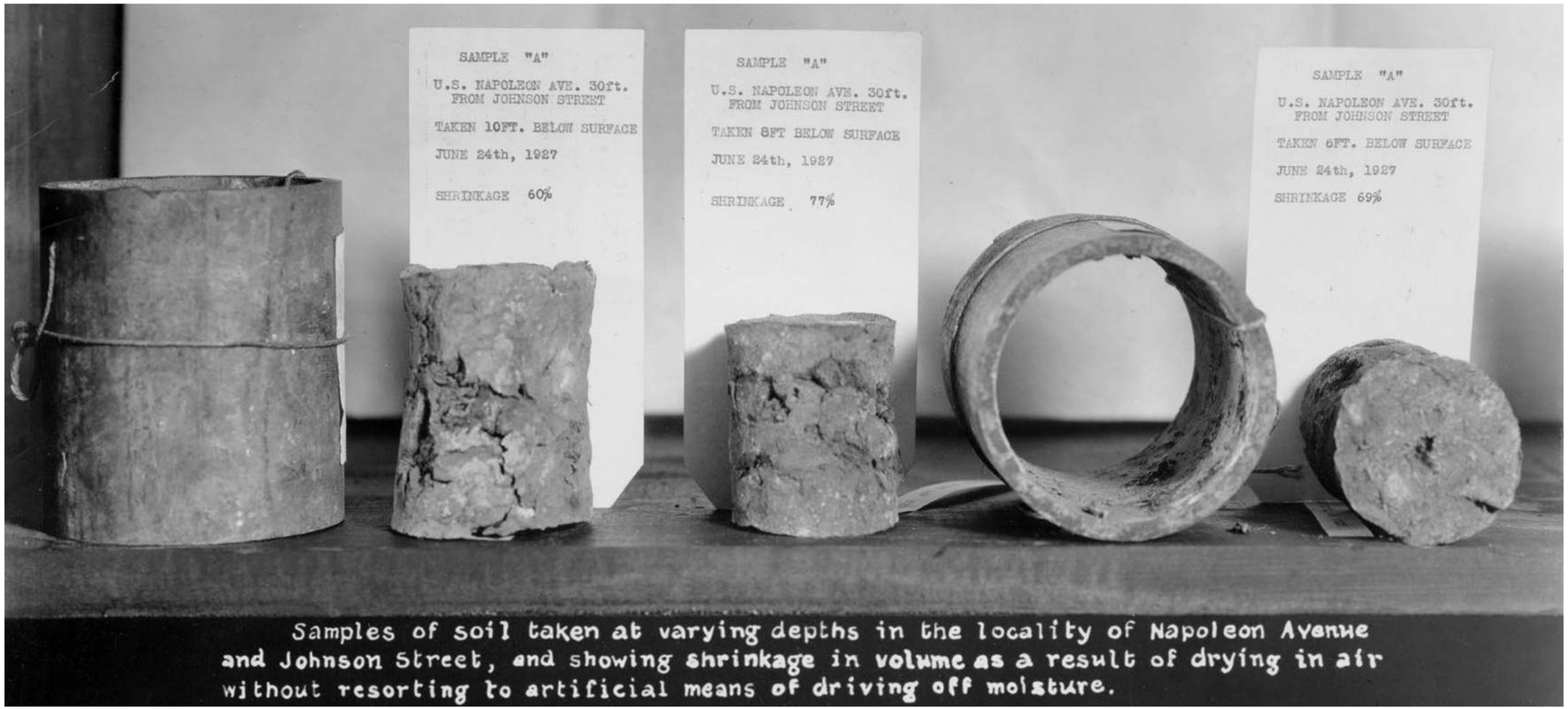
Greater New Orleans Urban Water Plan



Subsidence

Greater New Orleans Urban Water Plan

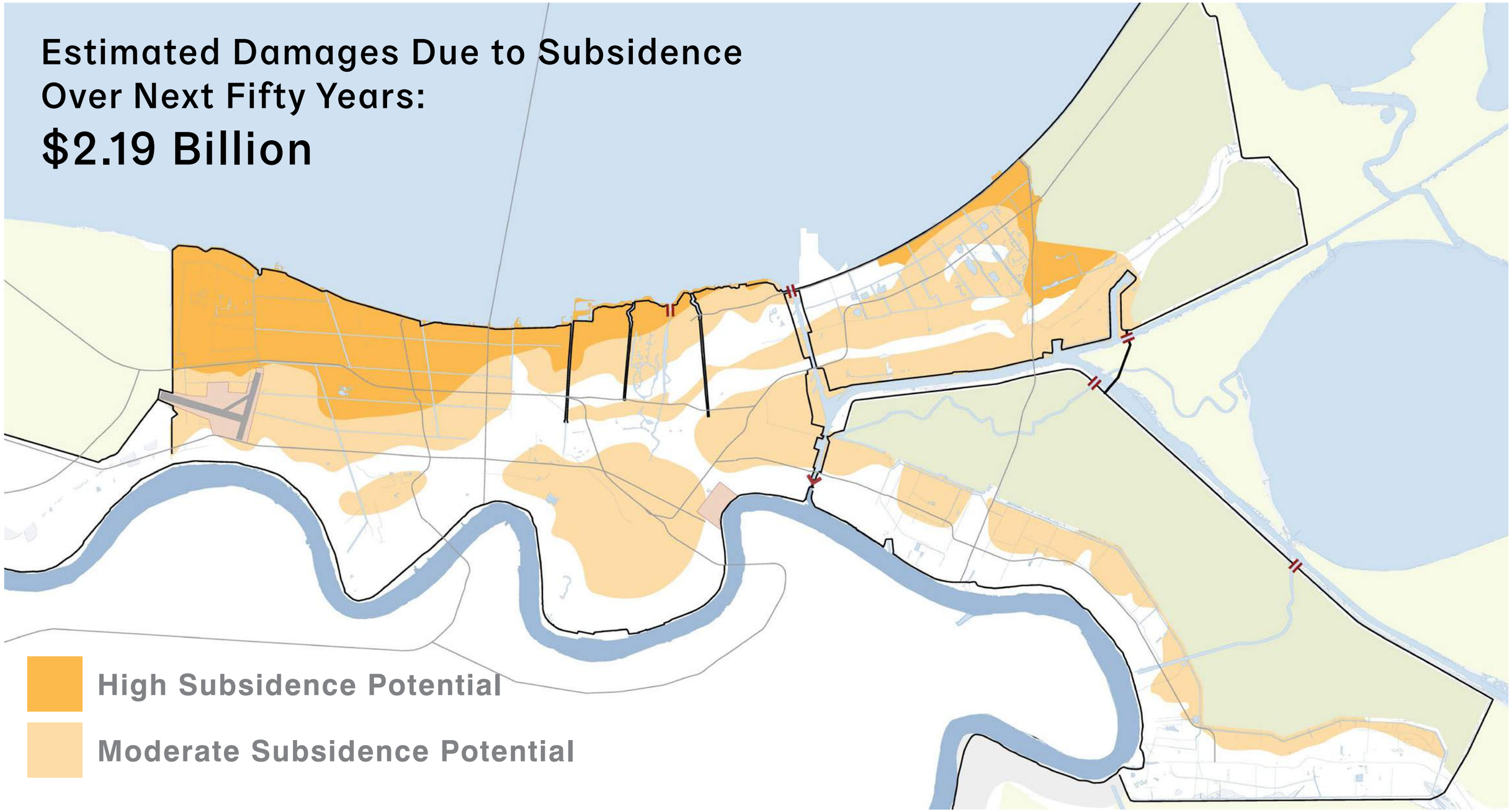




Samples of soil taken at varying depths in the locality of Napoleon Avenue and Johnson Street, and showing shrinkage in volume as a result of drying in air without resorting to artificial means of driving off moisture.

Subsidence

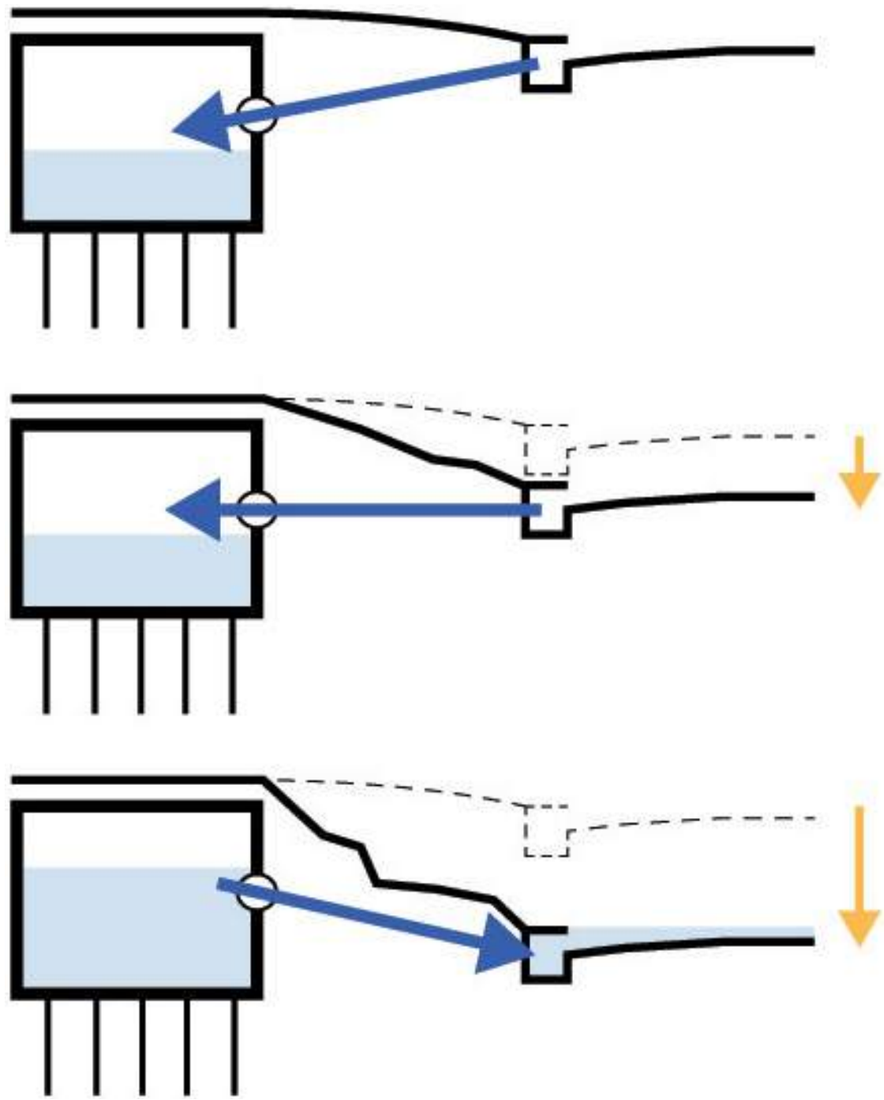
Greater New Orleans Urban Water Plan



Subsidence

Greater New Orleans Urban Water Plan

Broad Street Canal Construction, 1930's



Pile Supported Drainage + Subsidence =
Reduced Capacity + Flood Risk

Subsidence

Greater New Orleans Urban Water Plan

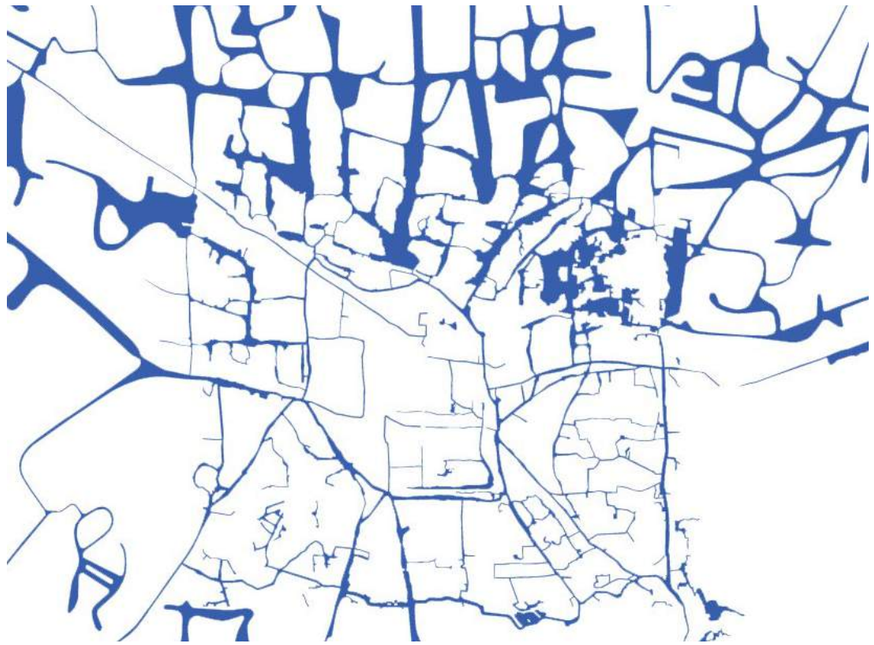
Subsidence

Greater New Orleans Urban Water Plan

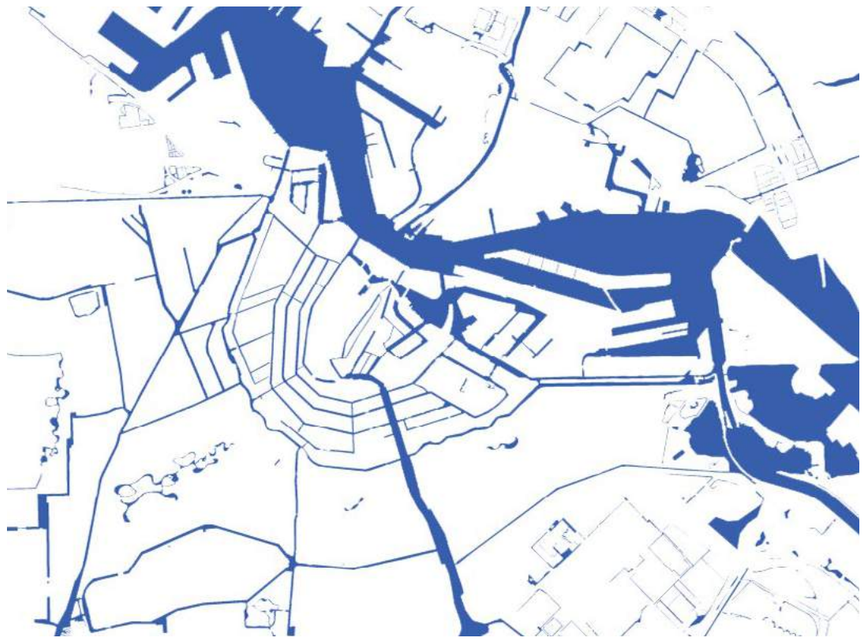
International Water Cities

Water Figure-Ground

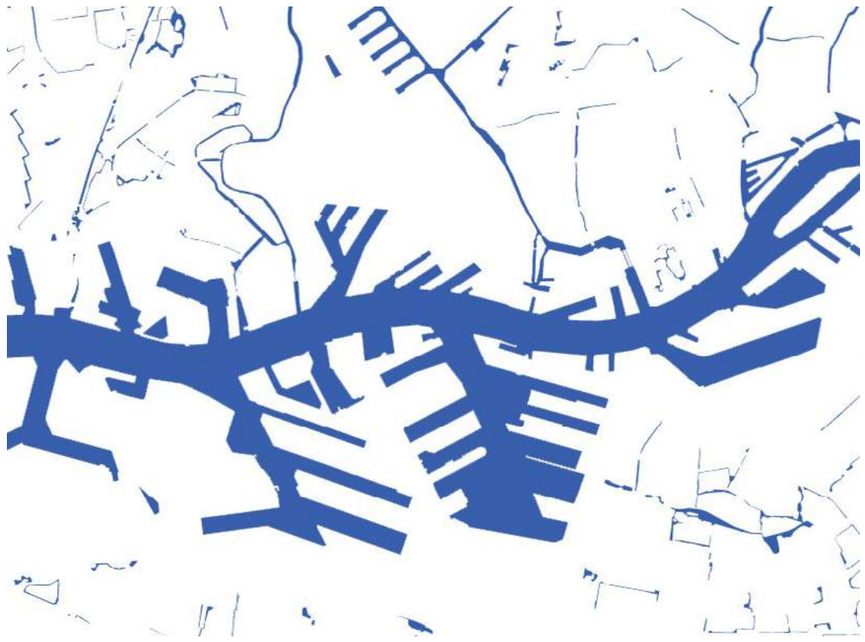
New Orleans, Louisiana



Shaoxing, China



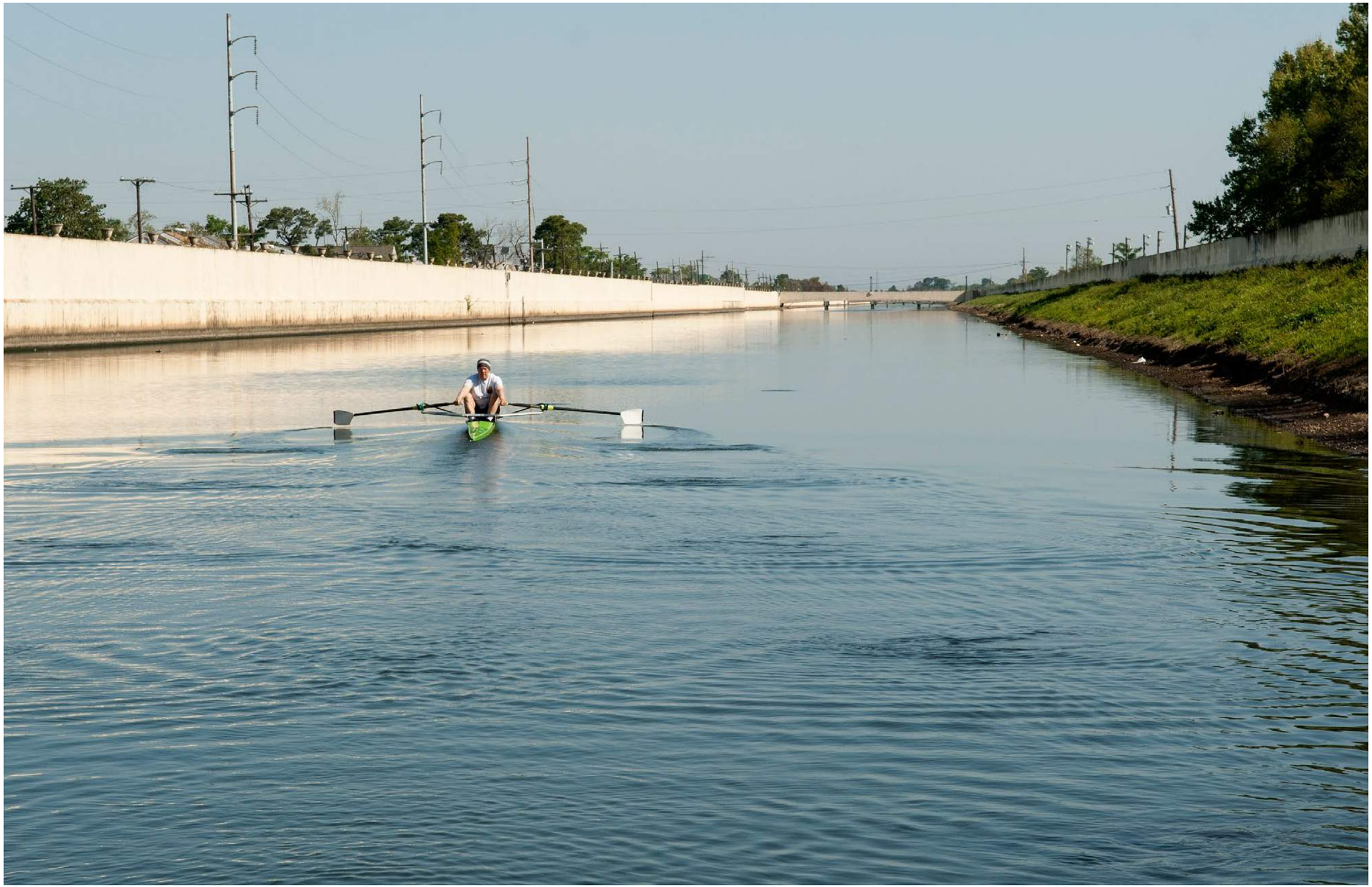
Amsterdam, Netherlands



Rotterdam, Netherlands

Value of Water: Hidden Assets

Orleans Canal, New Orleans



Value of Water: Integrated Flood Protection

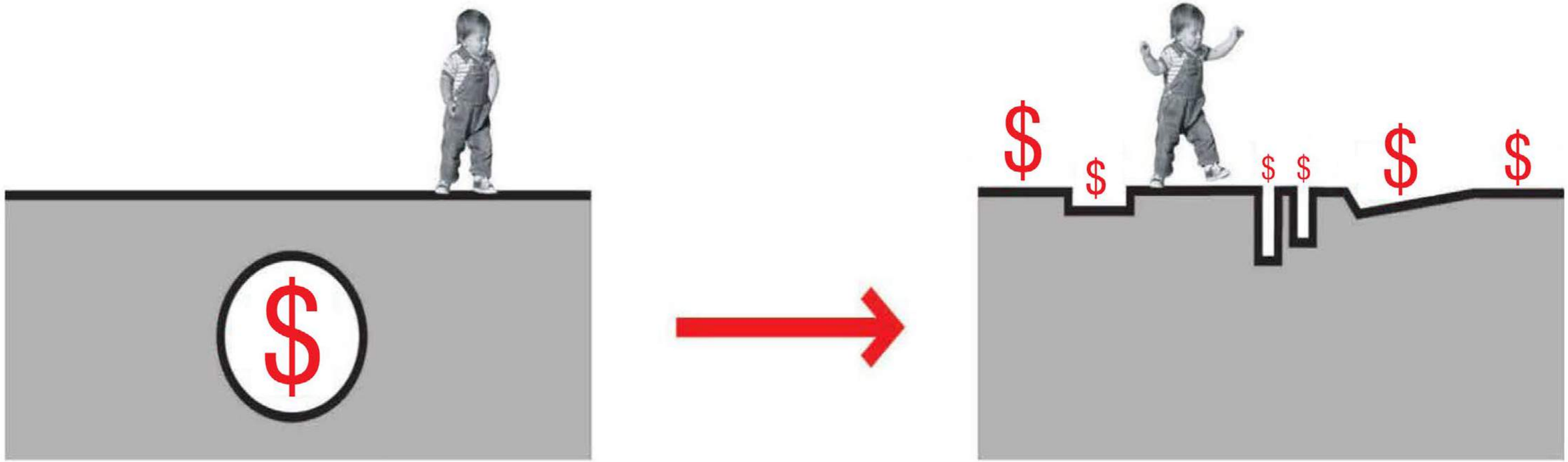
Westersingel, Rotterdam

Infrastructure = Investment

Amsterdam

Infrastructure Investment + Amenity

Greater New Orleans Urban Water Plan

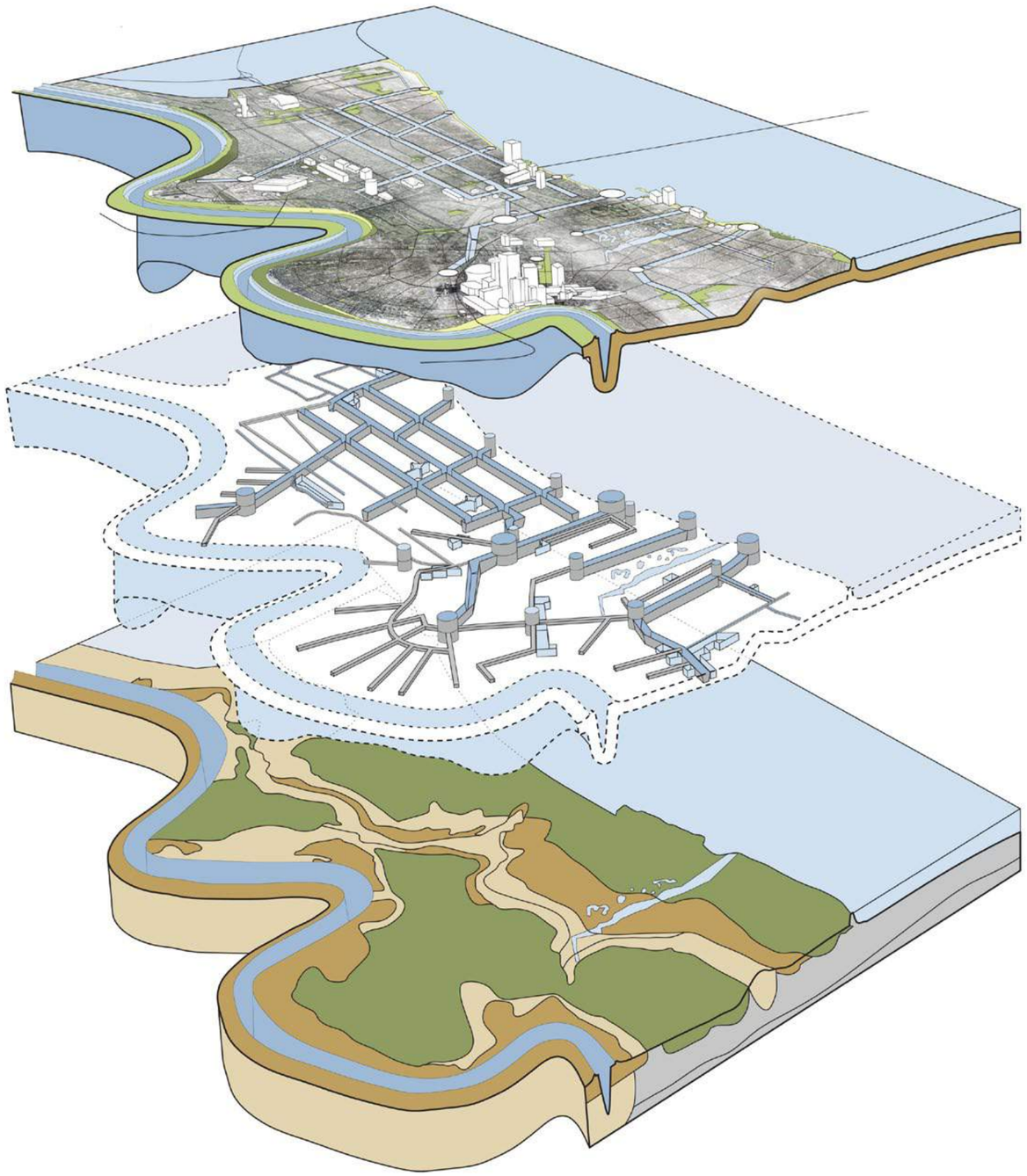


Living with Water Principles

Greater New Orleans Urban Water Plan

Planning Approach

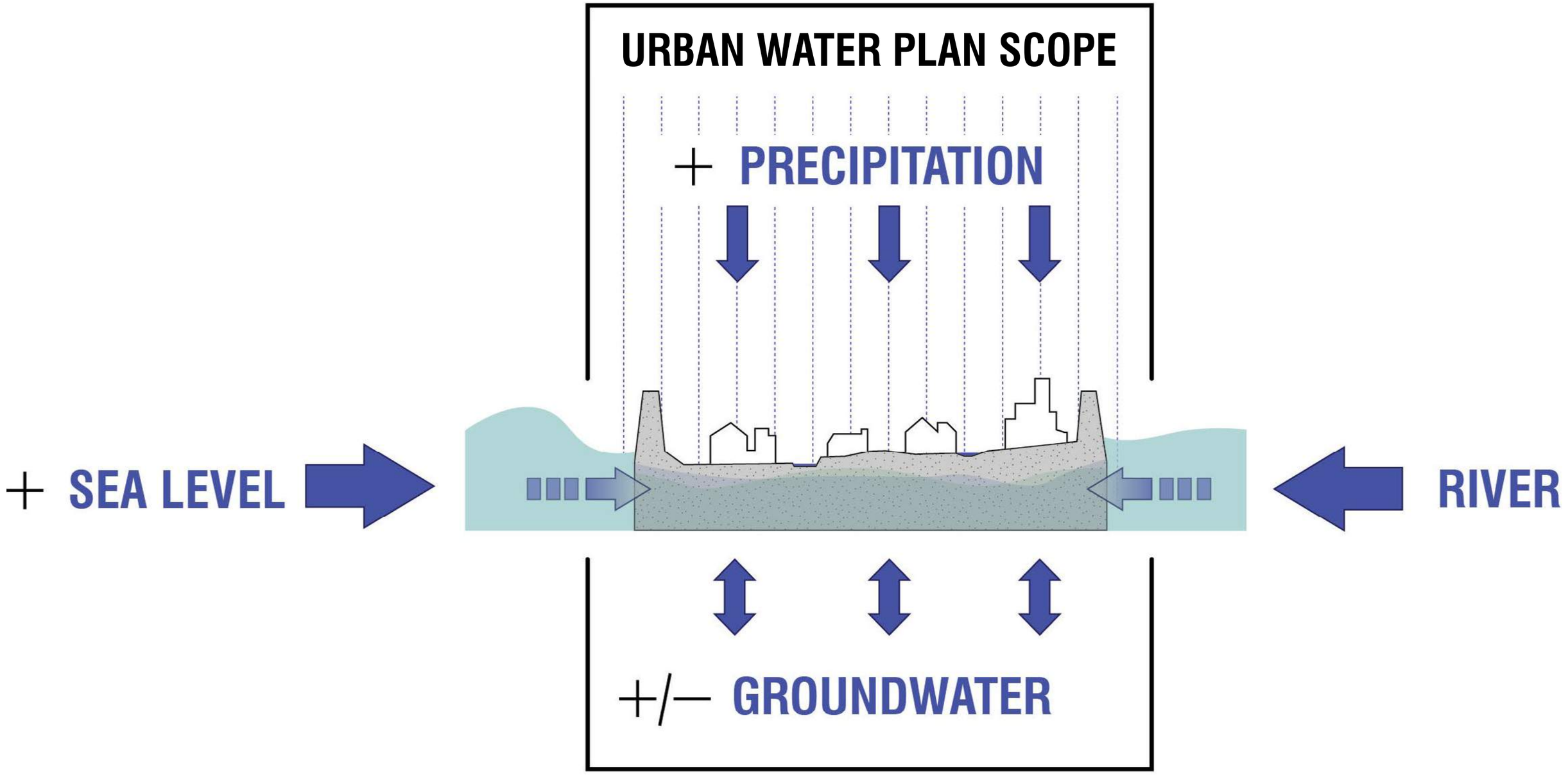
Greater New Orleans Urban Water Plan



Inhabitation
Land Cover

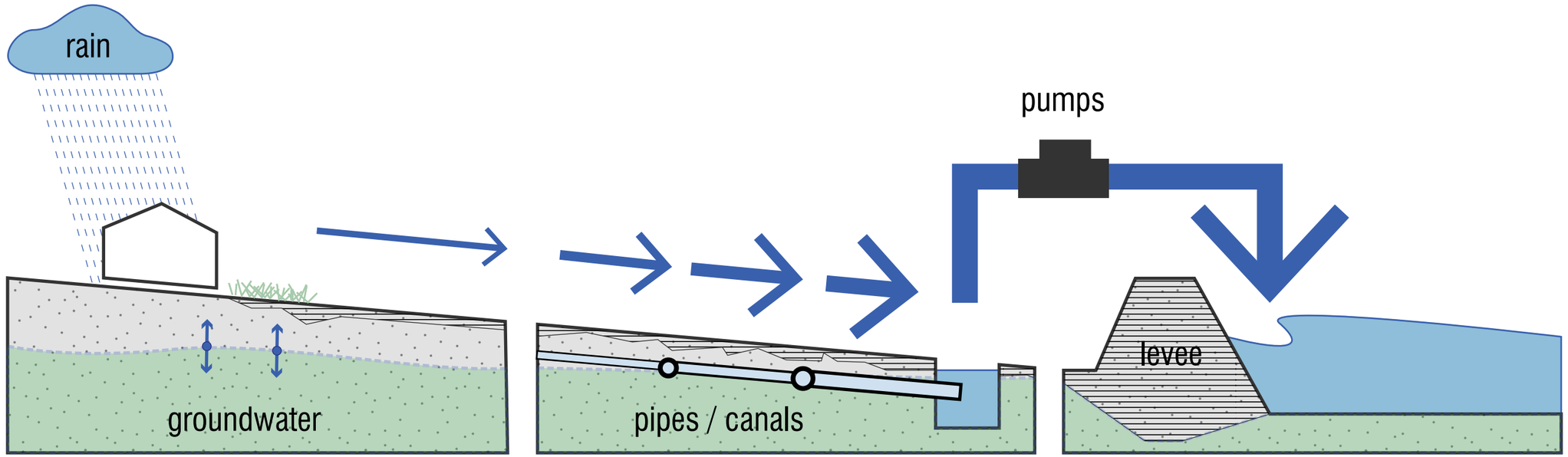
Infrastructure
Networks

Soils
Water
Biodiversity

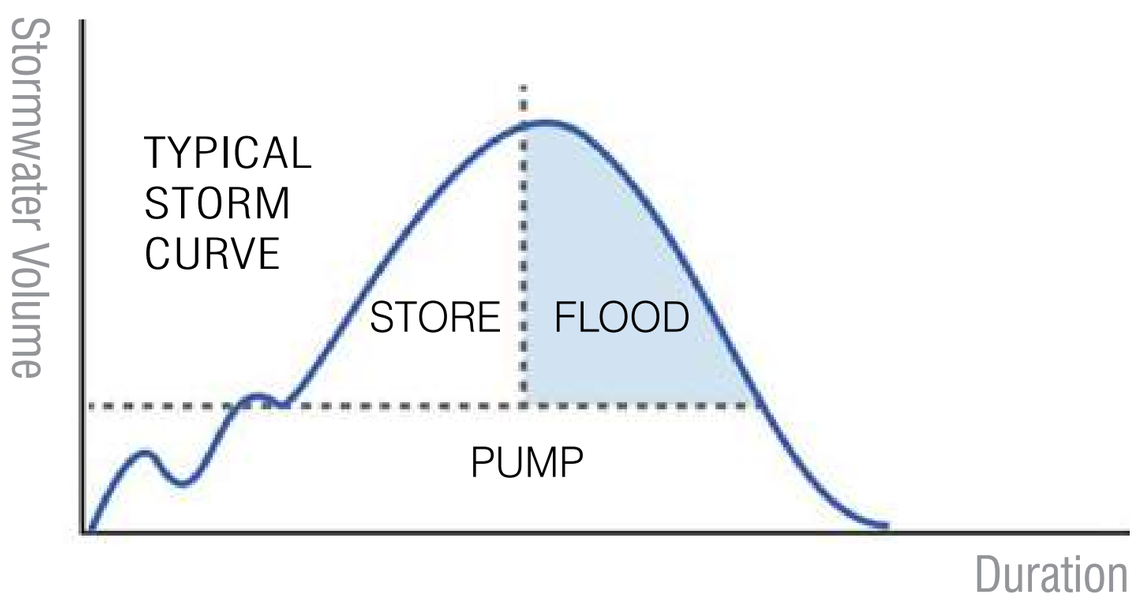

URBAN WATER PLAN SCOPE
+ PRECIPITATION
+ SEA LEVEL
RIVER
+/– GROUNDWATER

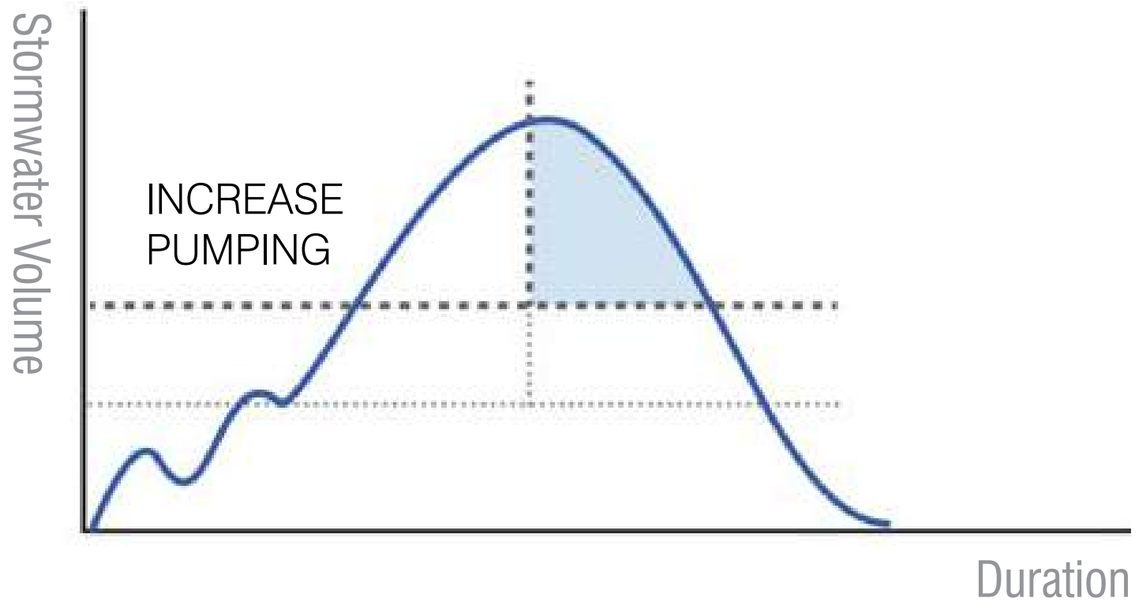
Existing Approach

Greater New Orleans Urban Water Plan



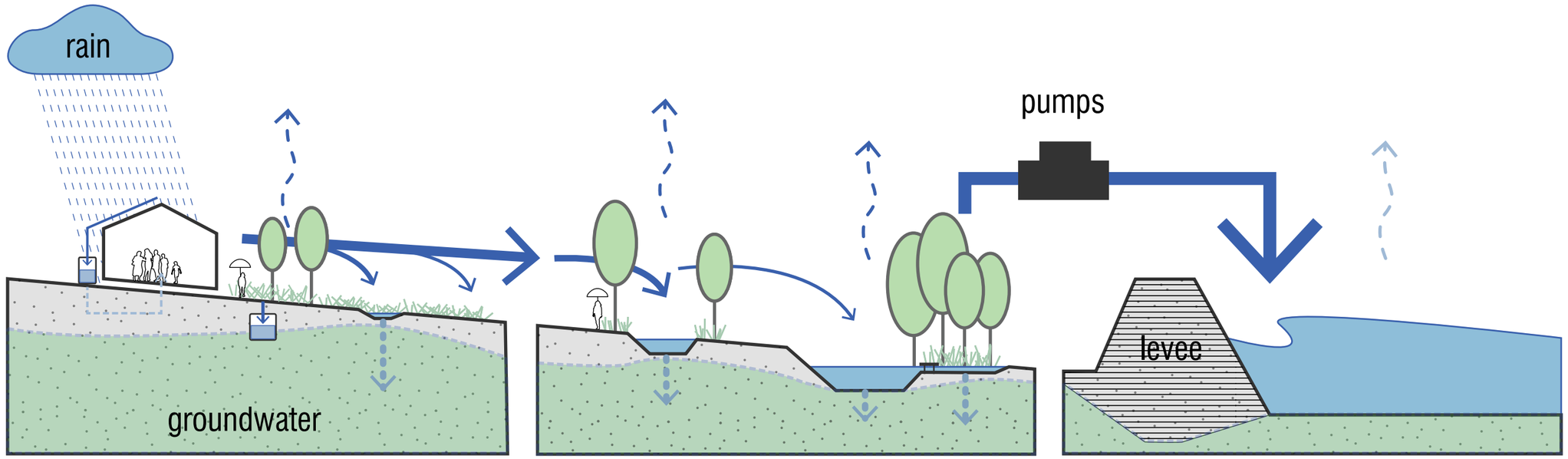
Pave + Pipe **Pump** **Drain**



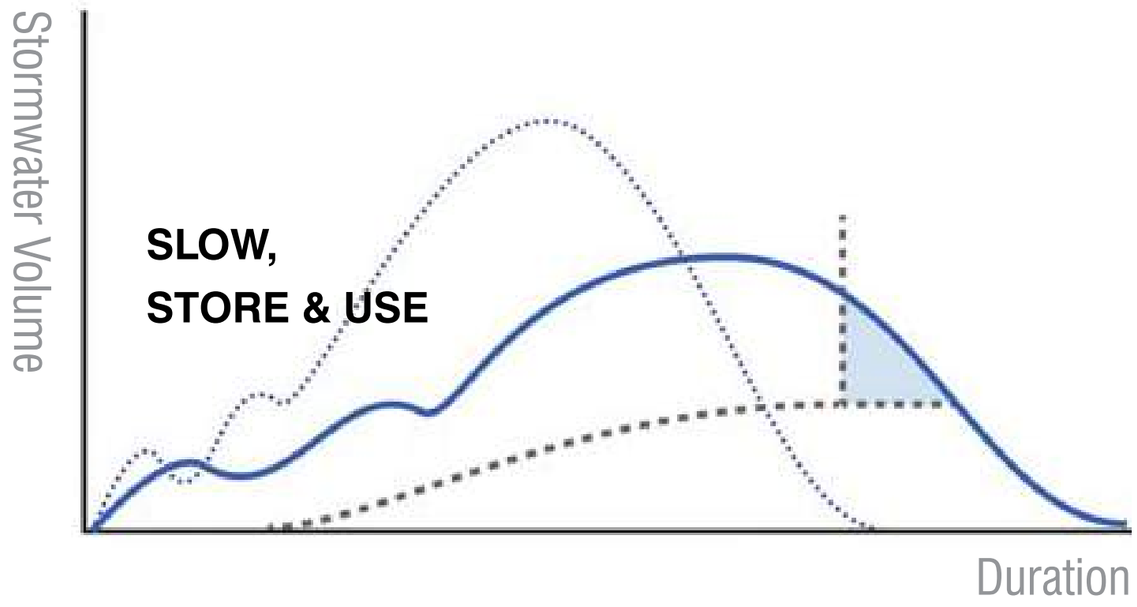


Paradigm Shift

Greater New Orleans Urban Water Plan

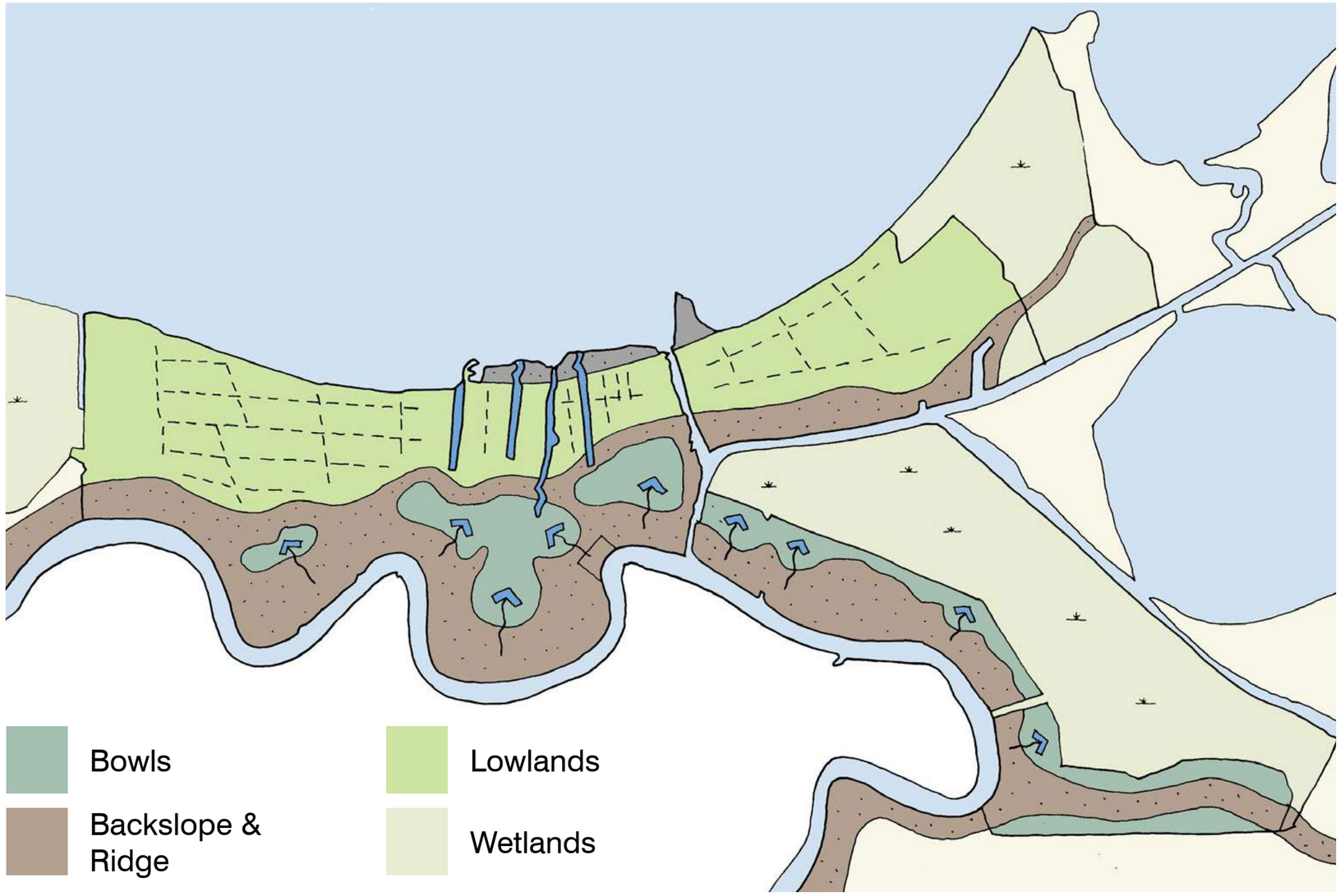


Slow | **Store & Use** | **Drain** (when necessary)



Landscape Typologies

Greater New Orleans Urban Water Plan



Wetlands

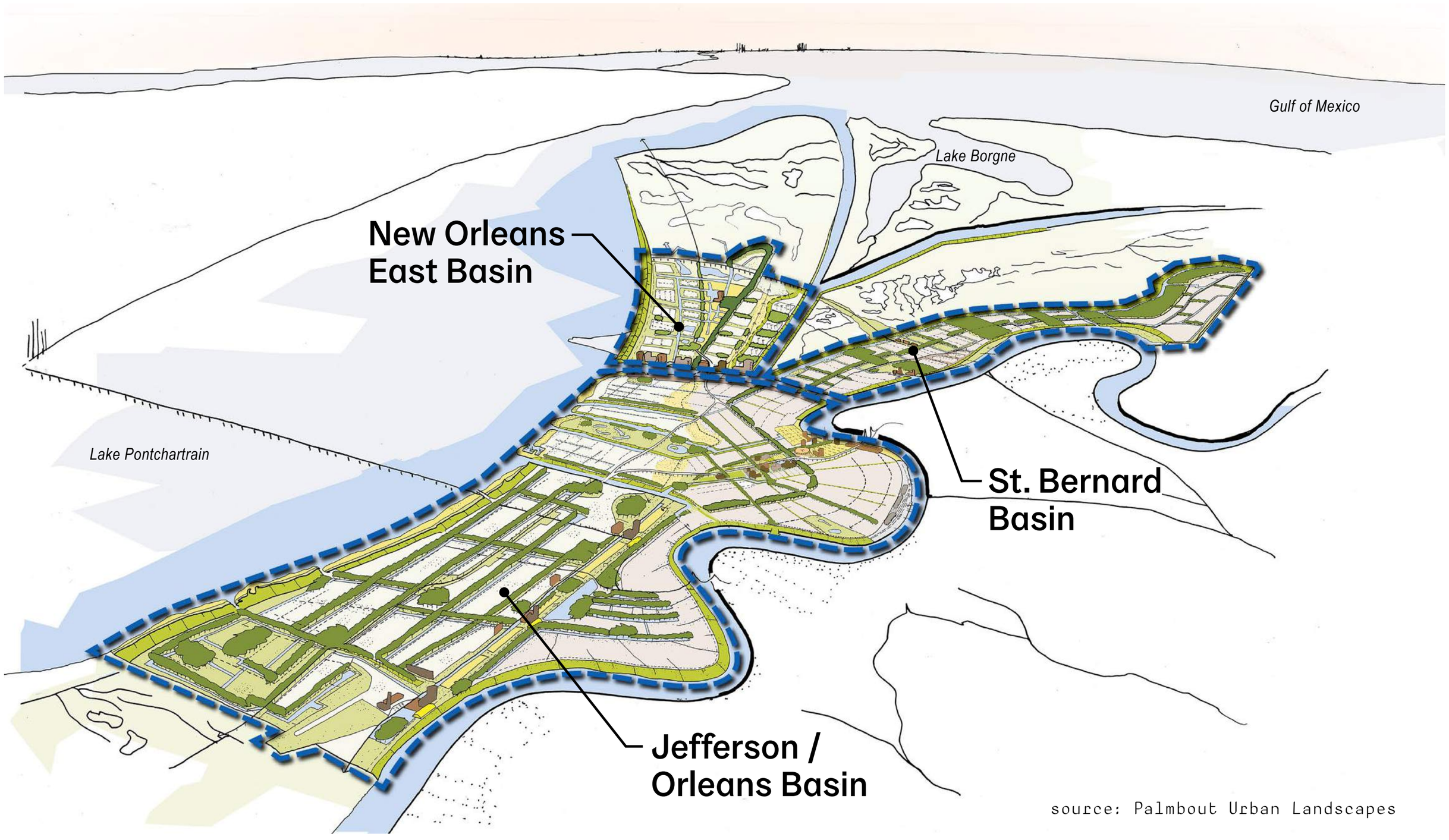
Lowlands

Bowls

Backslope & Ridge

Regional Plan

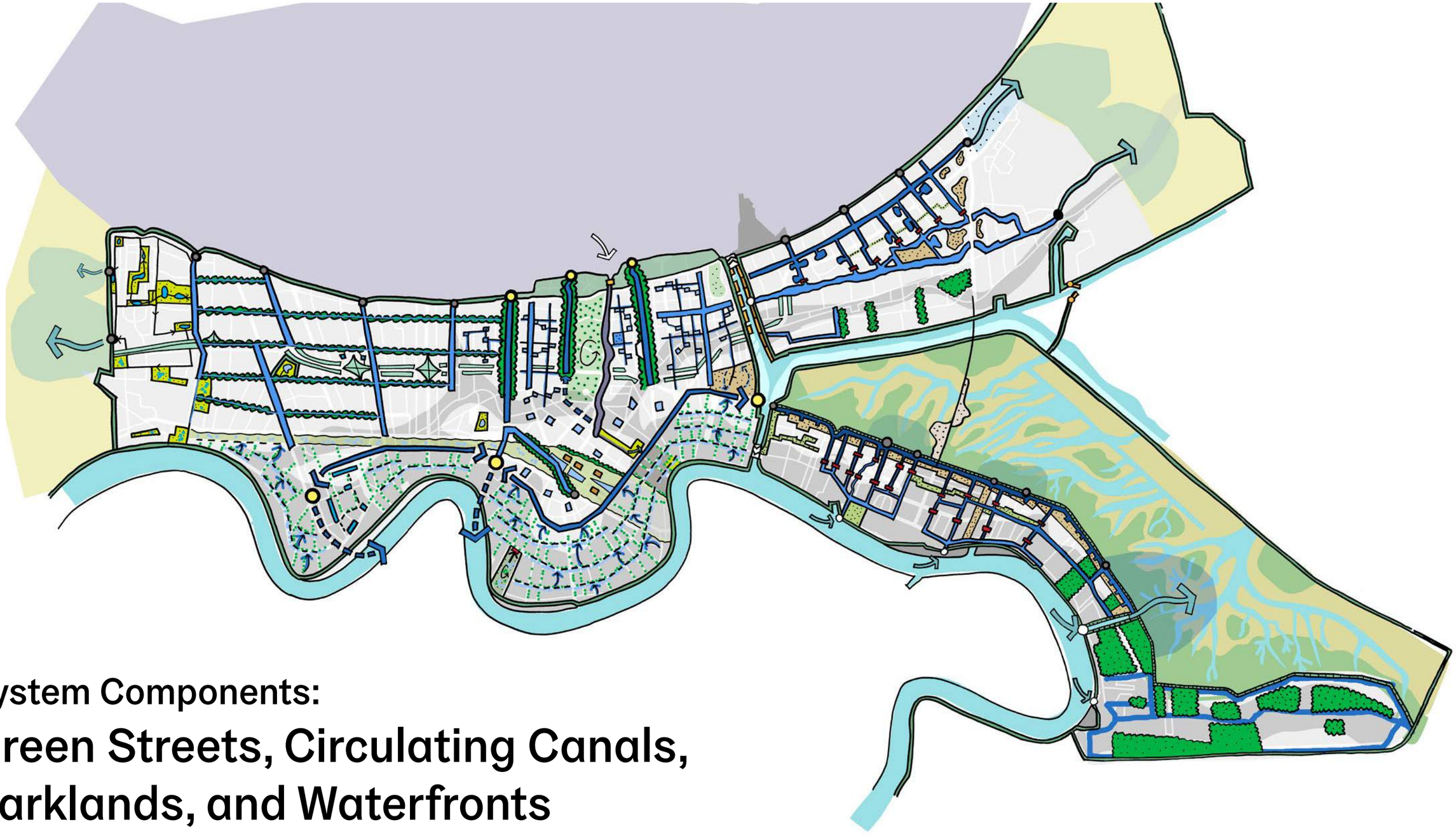
Greater New Orleans Urban Water Plan



source: Palmbout Urban Landscapes

Living Water System

Greater New Orleans Urban Water Plan



System Components:

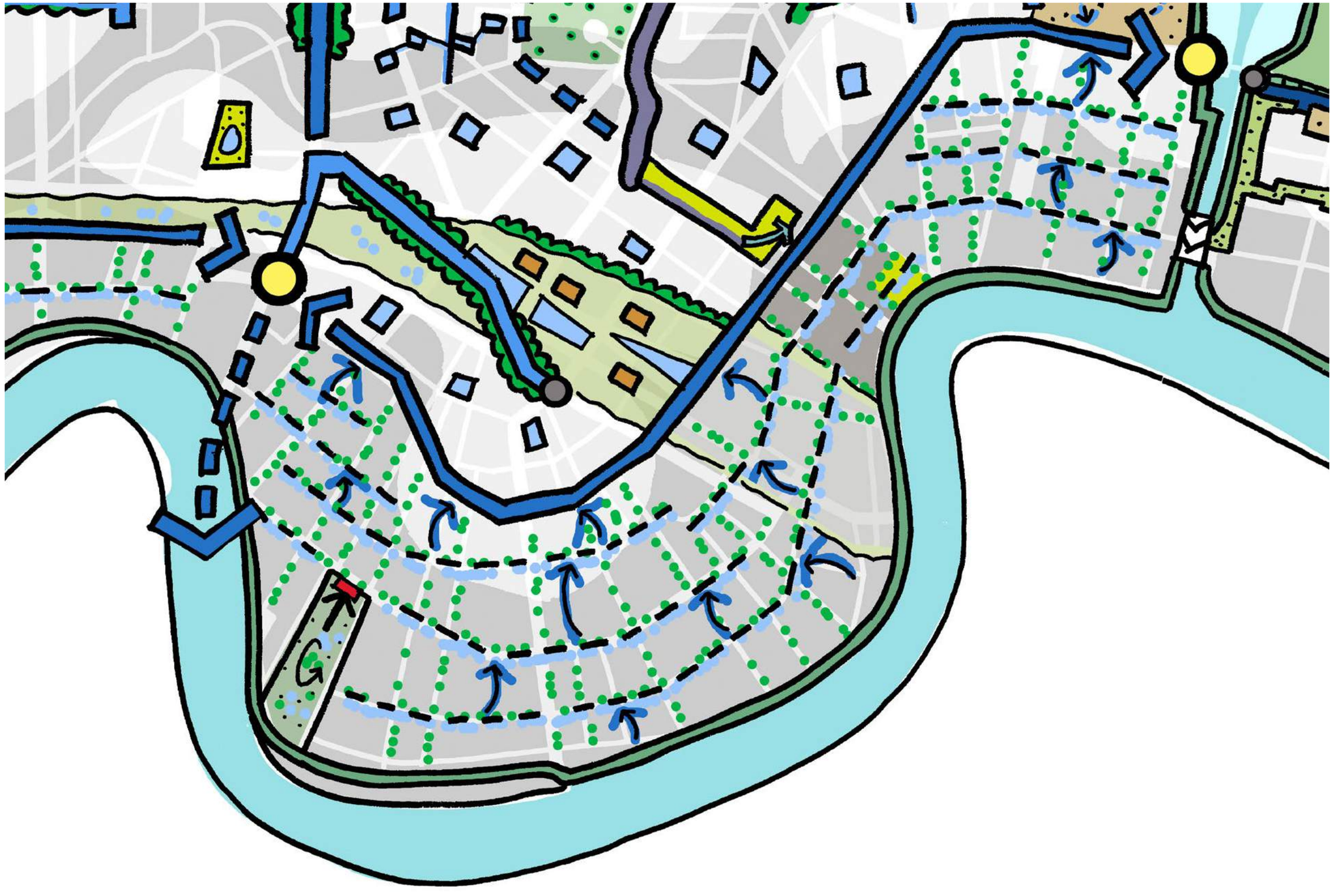
Green Streets, Circulating Canals, Parklands, and Waterfronts

Living Water Scales + Project Types

Greater New Orleans Urban Water Plan

Backslope Streets

Greater New Orleans Urban Water Plan



Interceptor Streets: Existing

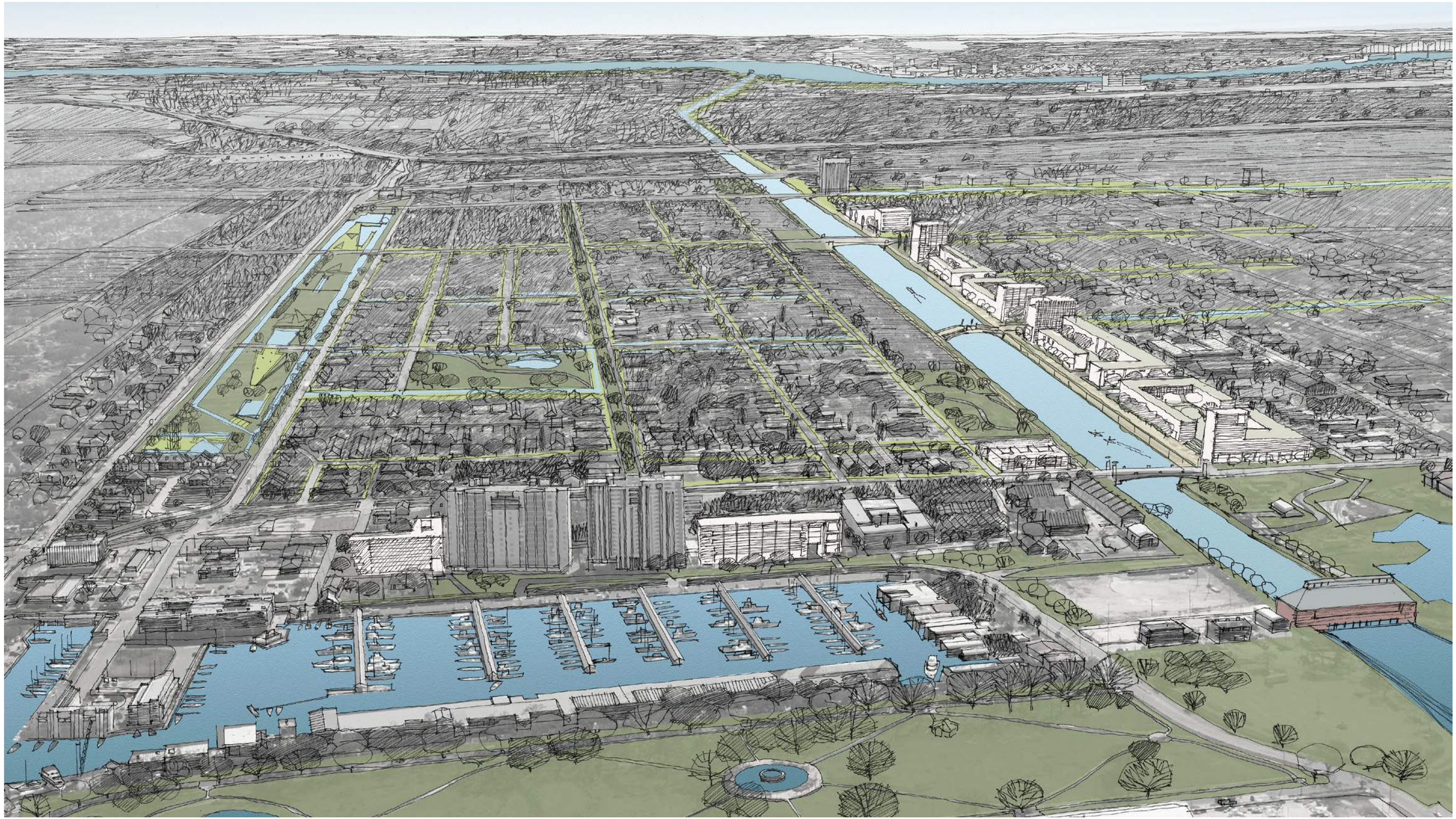
Greater New Orleans Urban Water Plan

Interceptor Street: Potential

Greater New Orleans Urban Water Plan

Lakeview and Bucktown

Greater New Orleans Urban Water Plan



Floating Streets: Dry

Greater New Orleans Urban Water Plan

source: Bosch Slabbers

Floating Streets: Wet

Greater New Orleans Urban Water Plan

source: Bosch Slabbers

Underutilized Right of Ways

Greater New Orleans Urban Water Plan

Lowland Canals: Existing

Greater New Orleans Urban Water Plan

Lowland Canals: Potential

Greater New Orleans Urban Water Plan

Hoey's Basin / Monticello Canal

Greater New Orleans Urban Water Plan

Hoey's Basin / Monticello Canal

Greater New Orleans Urban Water Plan

source: Bosch Slabbers, Waggonner & Ball

Hoey's Basin / Monticello Canal

Greater New Orleans Urban Water Plan

source: Bosch Slabbers, Waggonner & Ball

Lafitte Blueway: Dry

Greater New Orleans Urban Water Plan

source: Bosch Slabbers

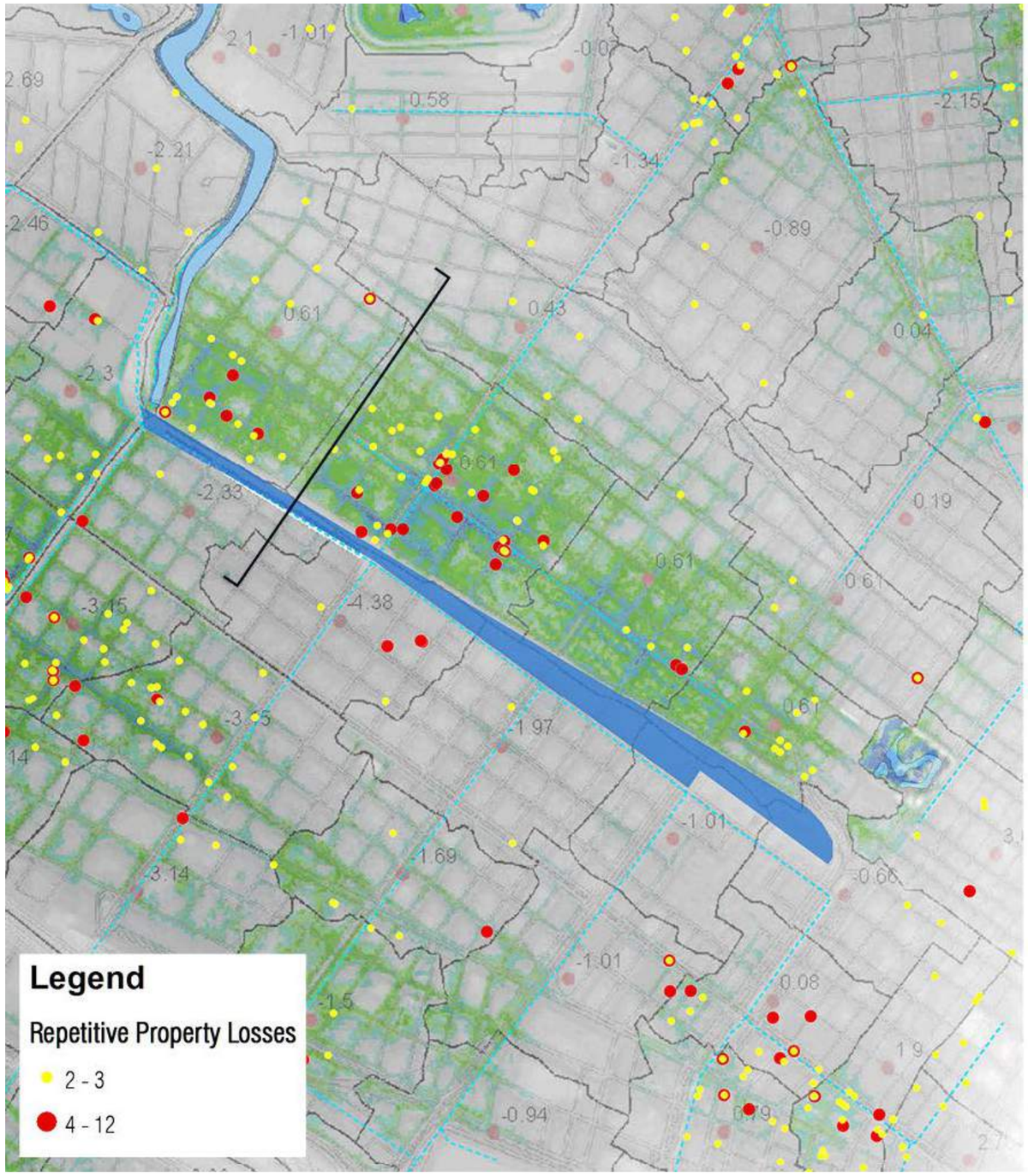
Lafitte Blueway: Wet

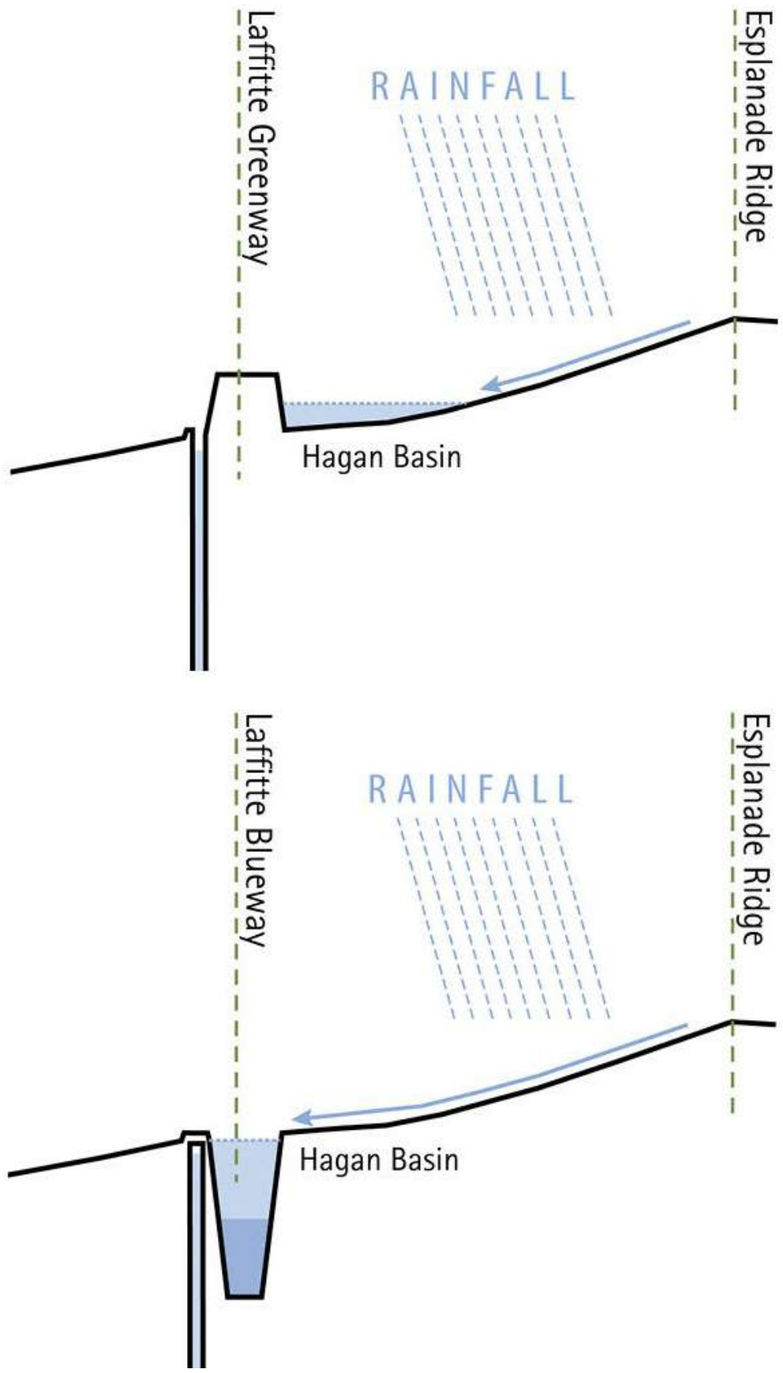
Greater New Orleans Urban Water Plan

source: Bosch Slabbers

Lafitte Blueway: Drainage Impact

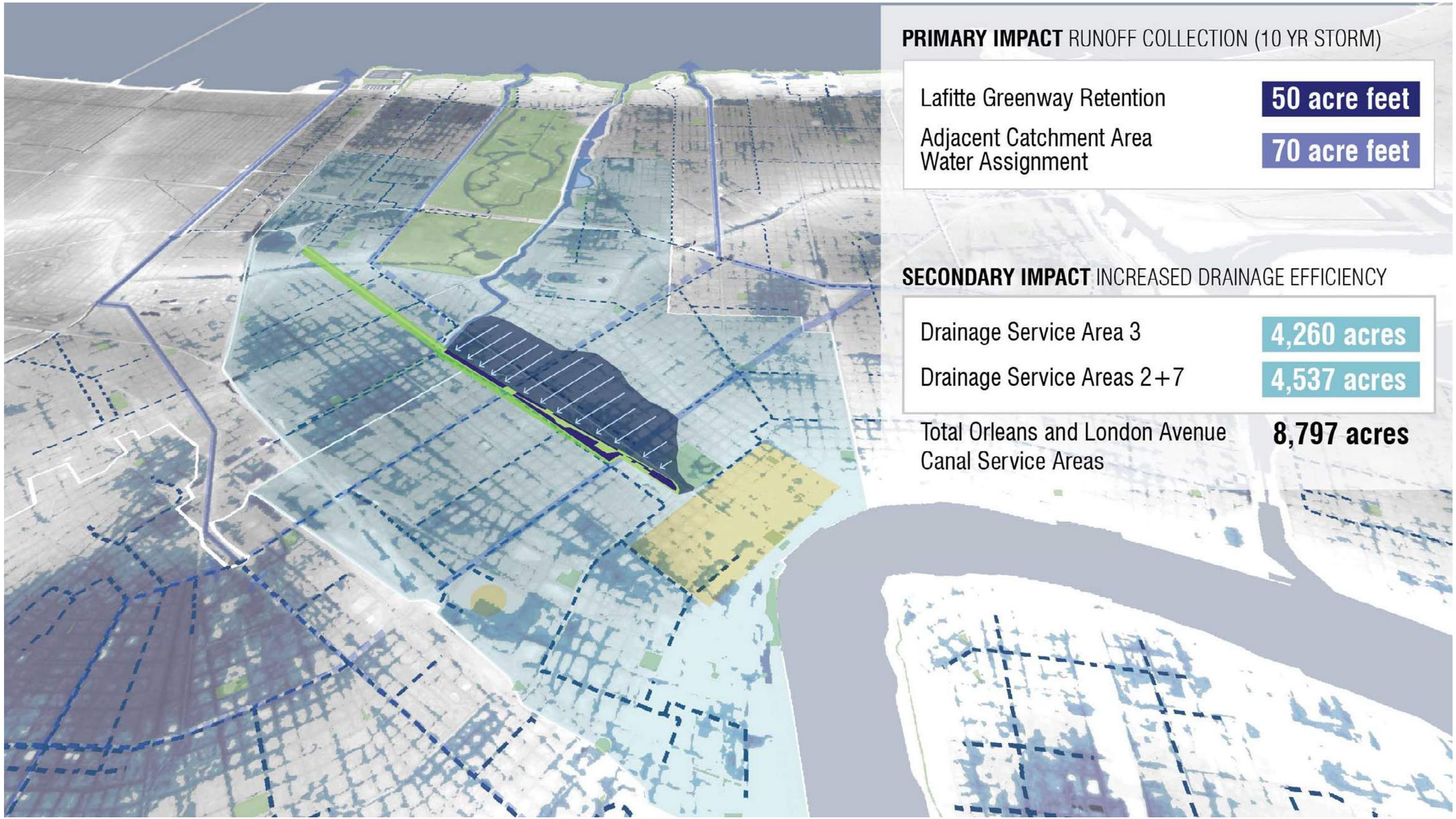
Greater New Orleans Urban Water Plan





Lafitte Blueway: Drainage Impact

Greater New Orleans Urban Water Plan



PRIMARY IMPACT RUNOFF COLLECTION (10 YR STORM)

Lafitte Greenway Retention	50 acre feet
Adjacent Catchment Area Water Assignment	70 acre feet

SECONDARY IMPACT INCREASED DRAINAGE EFFICIENCY

Drainage Service Area 3	4,260 acres
Drainage Service Areas 2+7	4,537 acres
Total Orleans and London Avenue Canal Service Areas	**8,797 acres**

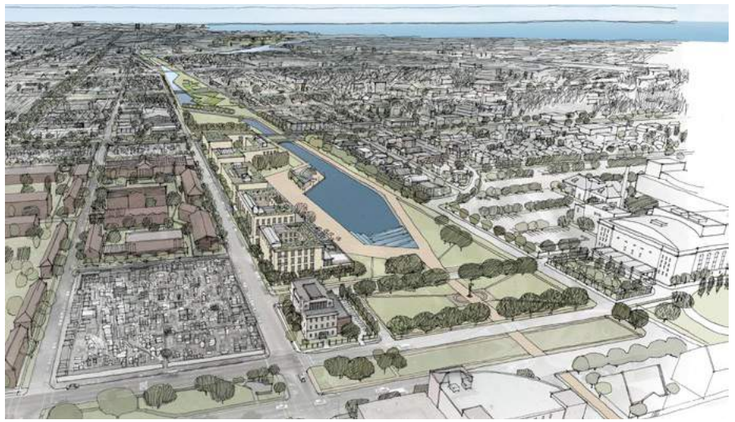
Lafitte Blueway: Urban Identities

Greater New Orleans Urban Water Plan

ZONE 3
Claiborne to Broad
$17 to 20 Million

ZONE 2
Claiborne to Broad
$23 to 28 Million

ZONE 1
Basin to Claiborne
$10 to15 Million



Program Diagram

Design Option 1 (of 2)

ZONE 2
$17-20M

ZONE 2
$23-28M

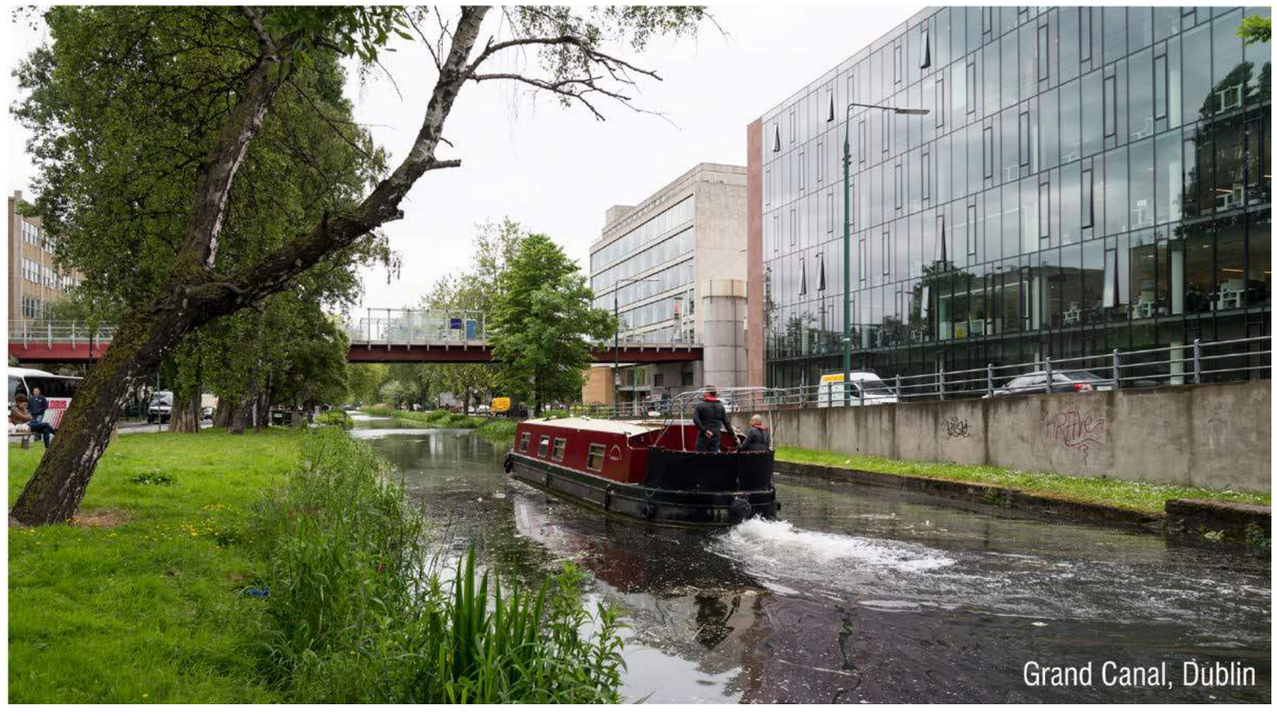
ZONE 1
$10-15M

Lafitte Blueway: Scale Comparisons

Greater New Orleans Urban Water Plan

Lafitte Blueway: Scale Comparisons

Greater New Orleans Urban Water Plan



Lafitte Blueway: Scale Comparisons

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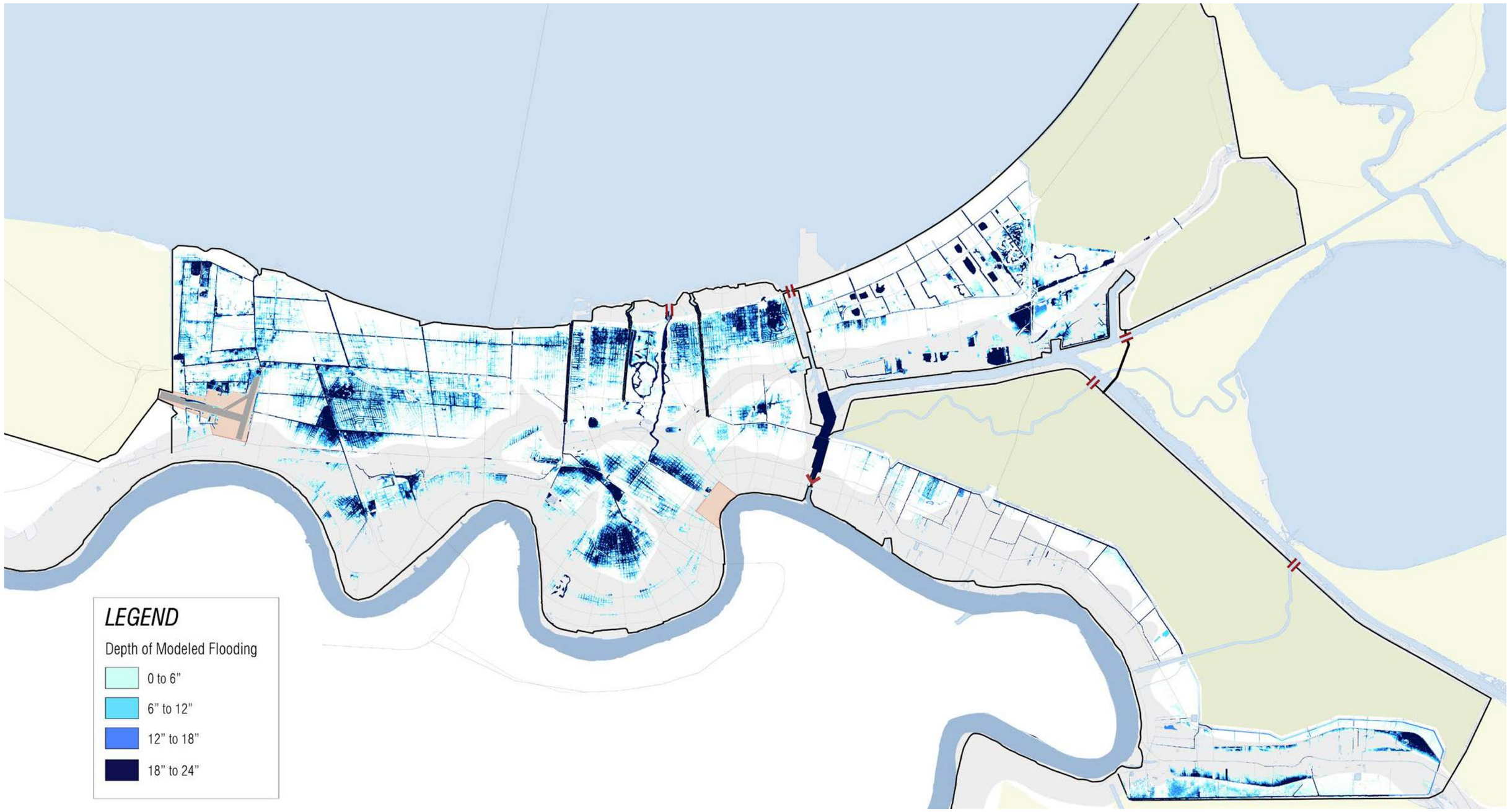
The costs come before the benefits.

Inscription at the Amsterdam Stock Exchange

10 Year Storm: Existing Flooding

Greater New Orleans Urban Water Plan

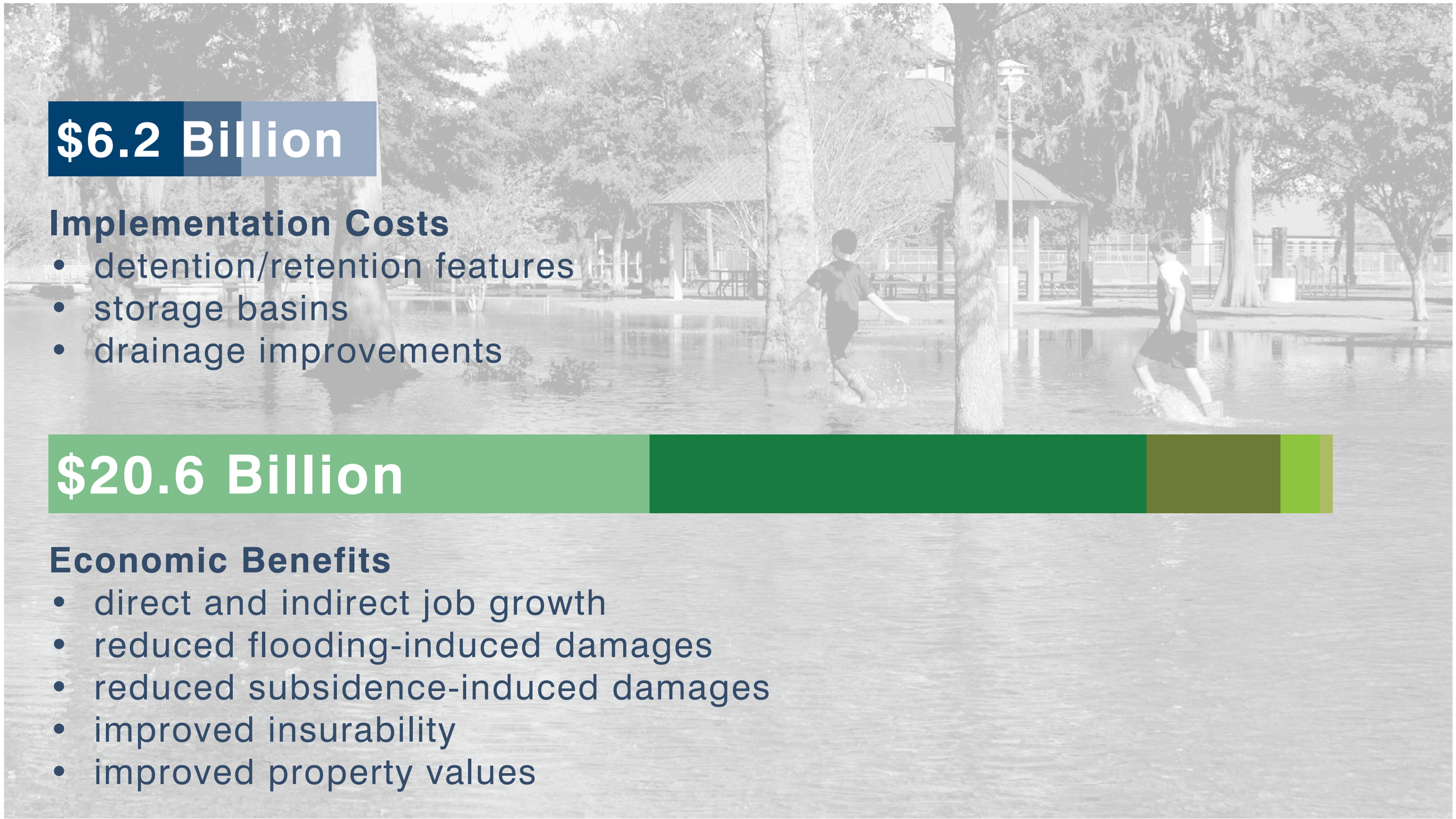


10 Year Storm: Full Implementation

Greater New Orleans Urban Water Plan

Regional Costs vs. Benefits

Greater New Orleans Urban Water Plan



$6.2 Billion

Implementation Costs

- detention/retention features
- storage basins
- drainage improvements

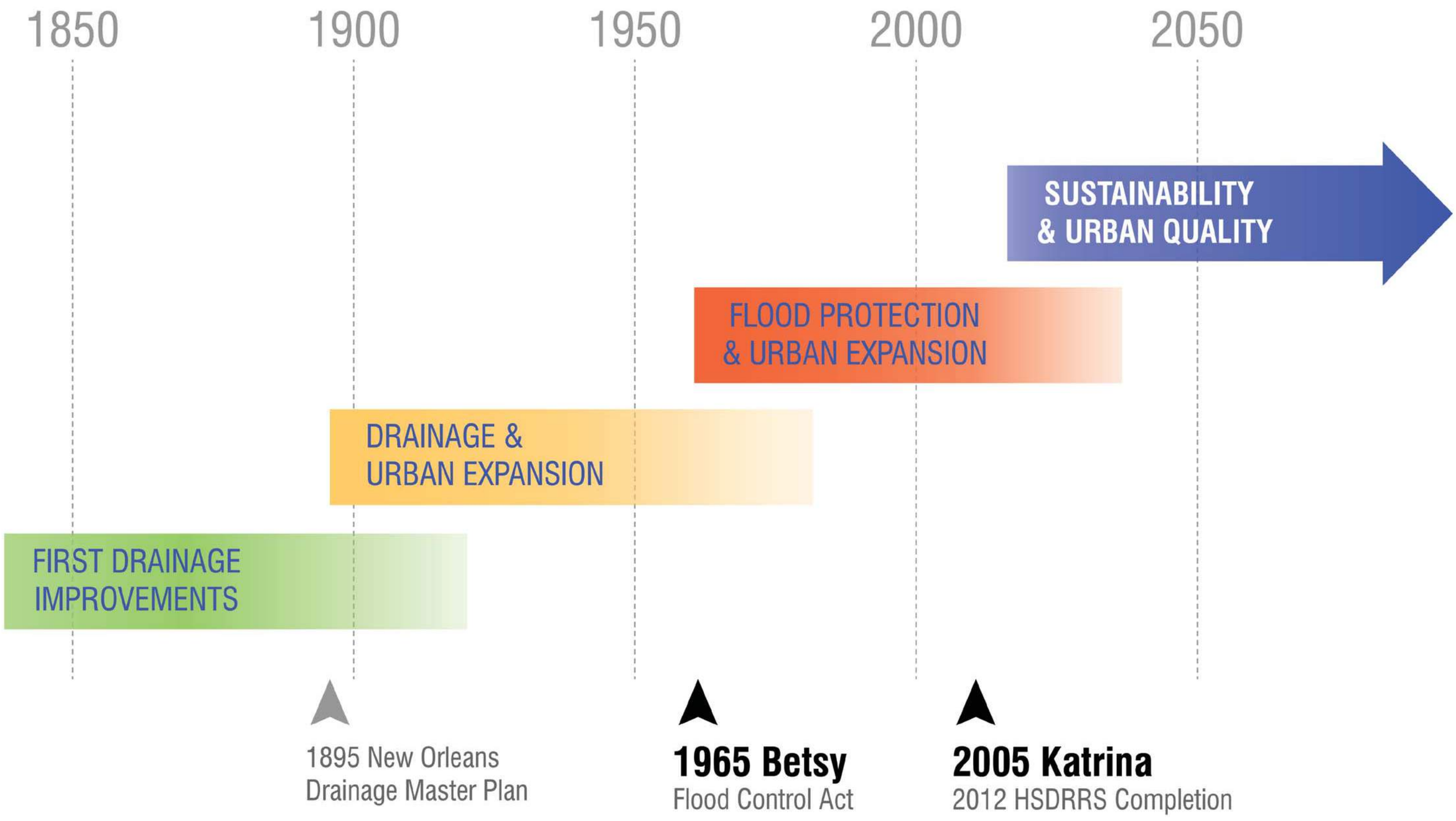
$20.6 Billion

Economic Benefits

- direct and indirect job growth
- reduced flooding-induced damages
- reduced subsidence-induced damages
- improved insurability
- improved property values

Planning + Implementation Eras

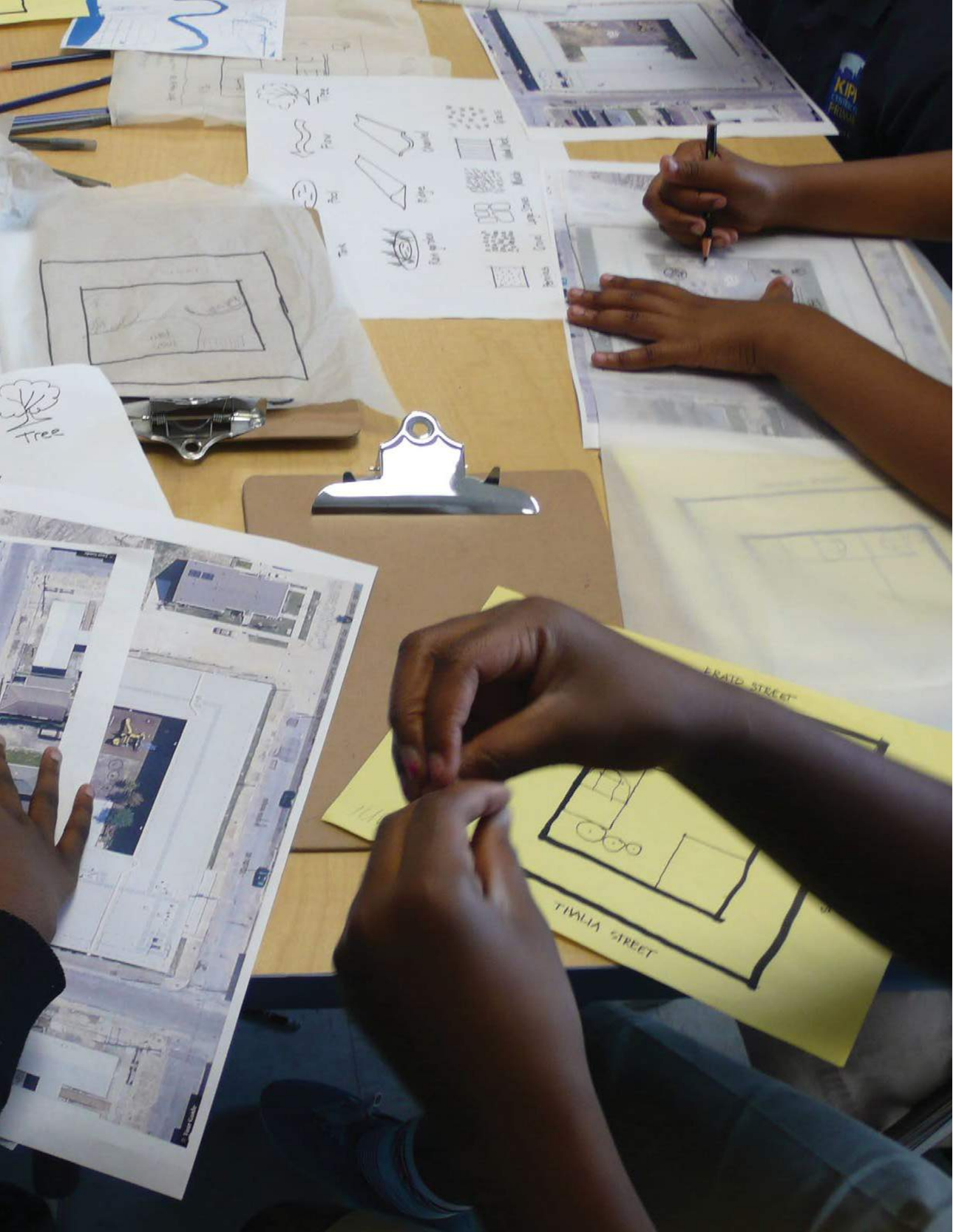
Greater New Orleans Urban Water Plan



WATER COLLABORATIVE

ADVOCACY · COMMUNITY EDUCATION · K-12 EDUCATION
BUILDERS & DESIGNERS · RESEARCH & POLICY

APA Louisiana · Bayou Land RC&D · Blue Crab Labs · CDM Smith · City of New Orleans DPW · City Park · City Porch Realty Committee for a Better New Orleans · Common Ground Relief · Concordia · Cry You One · CSED · Dana Brown and Associates DisasterMap.net · EcoUrban · Energy Wise Alliance · Evans + Lighter · Feldmeier Galyean · Friends of Lafitte Corridor · Future Proof · Global Green USA · GNO Inc. · Greater New Orleans Foundation · Green Light New Orleans · Groundwork New Orleans Gulf Restoration Network · Hike for Katreena · Hollygrove Greenline · Historic Treme Faubourg Treme · Horizon Initiative · Imago Collective · KIPP Central City School · KSI Environmental Consultants · Lake Pontchartrain Basin Foundation · Land Trust for Louisiana · LEAAF · Levees.org · Life City · Longue Vue House and Gardens · Louisiana Economic Development · LSU Coastal Sustainability Studio · National Wildlife Foundation · Neighborhood Partnership Network · NEWCITY · New Orleans Food & Farm Network · Nola Bamboo · NOMAR Green Comittee · Nunez Community College · WWNO NPR · Parkway Bakery & Tavern Parkway Partners · RIDE New Orleans · Regional Planning Commision · Sankofa · Sewerage & Water Board · Sierra Club Spackman Mossop Michaels · Thomas Strategies LLC · Tulane City Center · Tulane Institute on Water Resources Law and Policy UNO Pontchartrain Institute of Environmental Sciences · UNO Transportation Institute · Urban Conservancy · Urban Institute US Green Building Council Louisiana · Waggonner & Ball · Waldemar S. Nelson · Water Works · Villavaso & Associates



Ripple Effect

At the core of our project is a three-part collaboration between teachers, design experts and water experts.

- **<u>Teachers</u> contribute knowledge of curriculum design and implementation.**

- **<u>Design professionals and educators</u> contribute knowledge of visual, hands-on, and experiential learning.**

- **<u>Water experts</u> contribute content expertise in international and local water issues.**

GROUNDWORK
New Orleans

Changing Places
Changing Lives

City of New Orleans Stormwater Drainage System Root Cause Analysis of July-August 2017 Flooding

ABS Group
Cara Stone, LLP
Gaea Consultants

September 2018

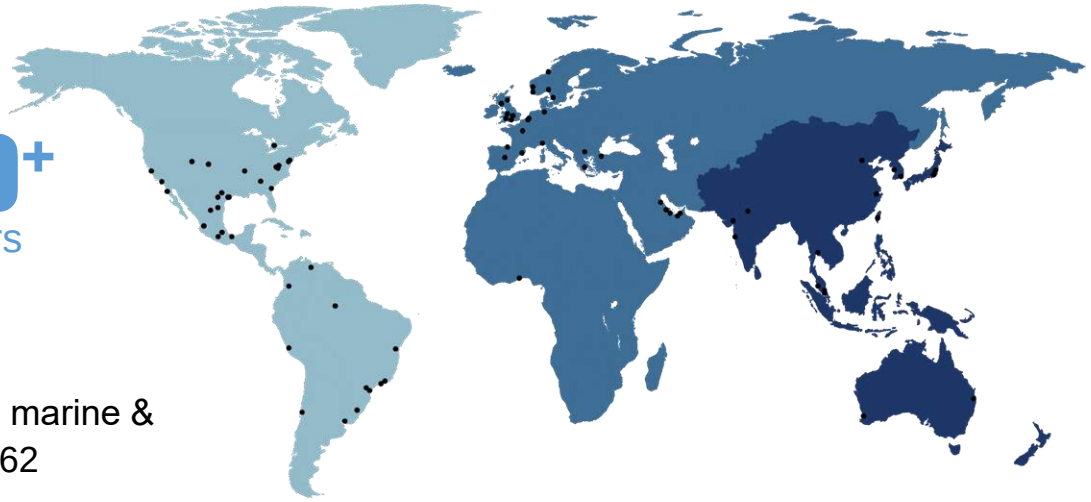
Company History & Mission

Our mission is to be a leading global provider of technical services that better enables our clients to operate safely, reliably, efficiently & in compliance with applicable regulations & standards; we are focused on adding value to the industries we serve.

1800+
Employees

30+
Countries

40+
Years



Parent company, ABS, is the world's leading marine & offshore classification society, founded in 1862

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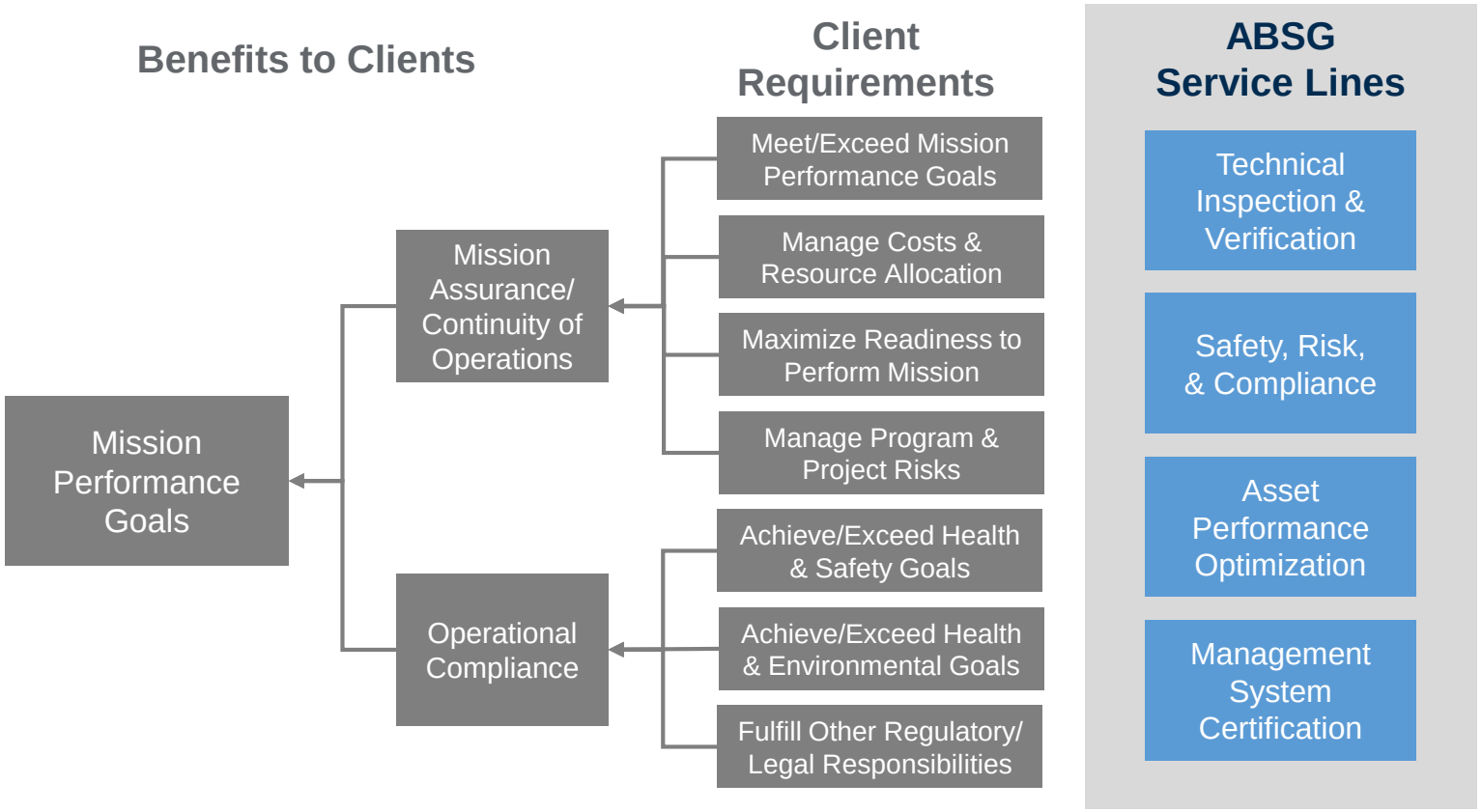
Our Value Proposition



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Scope of Analysis

A Root Cause Analysis with recommendations for addressing identified causal Factors and root causes was conducted for the following “Loss Events”:

- Flooding
  - July 22, 2017
  - August 5, 2017
  - August 8, 2017
- Turbine Generator #1 Electrical Fault
  - August 9, 2017

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Root Cause Analysis Process

- Causal Factors
  - Front-line personnel performance gaps
  - Equipment performance gaps
- Intermediate Causes
  - Contributing factors to existence of Causal Factors
- Root Causes
  - Governance, policy, and management deficiencies allowing Causal Factors to occur or exist
- Recommendations
  - Suggested development, modification or enhancement of governance, policy, management, or operational systems

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Assessment of Combined Stormwater Drainage System

(S&WB & City Controlled Assets)

NOLA Stormwater Drainage System - Combined

- Responsibility for stormwater drainage is divided between separate governmental entities:
  - City
    - Catch basins
    - Piping less than 36-in. diameter
  - S&WB
    - Piping 36-in. diameter or greater
    - Pumping system
    - Power System
    - Underground Culverts & Outfall Canals

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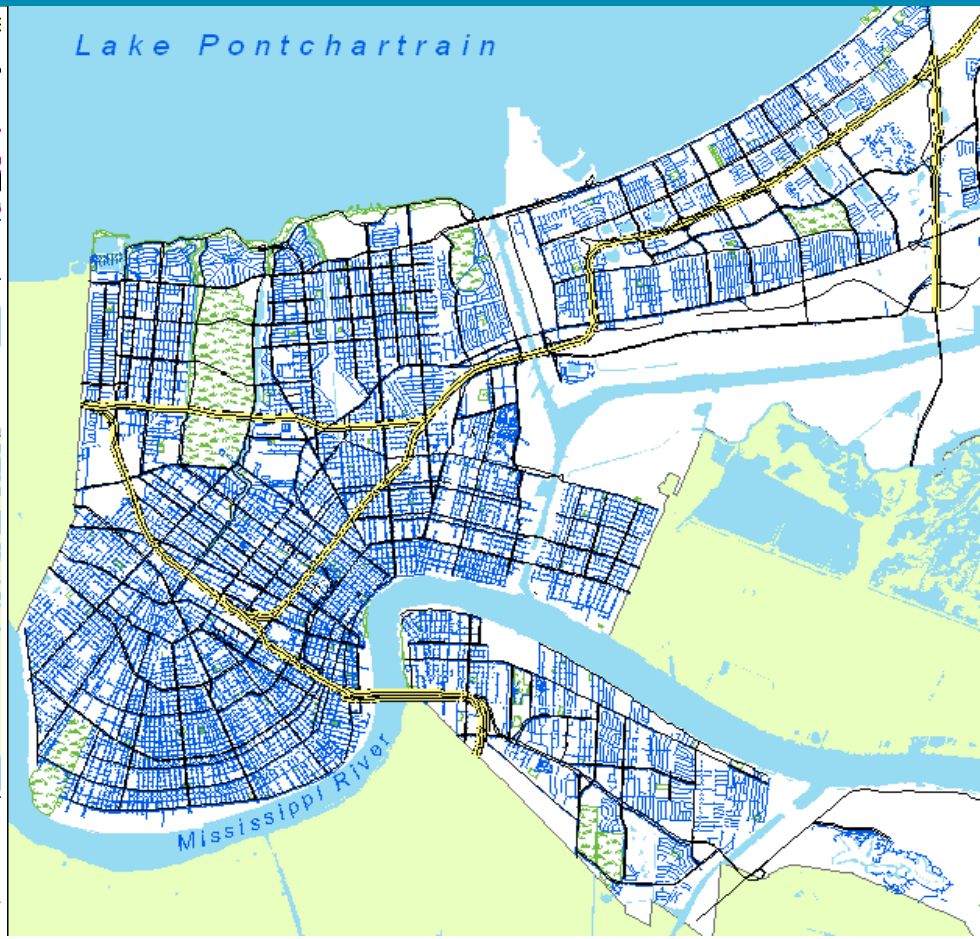
By the Numbers: S&WB and City Portions & Budgets for Combined NOLA Drainage System



S&WB: 235 miles of Pipe, Canals & Culverts; 23 Pump Stations; Power Plant

2017 O&M Budget: $66,994,749

City: 1,288 Miles of Drainage Pipe & Over 68,000 catch basins, ditches, and inlets

2017 O&M Budget: Portion of $6,496,623

NOLA Stormwater Drainage System - Combined

- Causal Factors and Root Causes of the flood related Loss Events involved both portions of the city's drainage system
- Consequences of divided responsibility:
  - No single point of responsibility
  - Inconsistencies between S&WB and City performance standards and management

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Relevant Inconsistencies between S&WB & City Controlled Portions of NOLA Drainage System

- S&WB & City use different performance standards by which to establish service goals and measure success.
- S&WB pumping system capacity is not designed for full output from City drain lines.
- S&WB and City use separate governance, funding sources, budgeting processes, and maintenance programs to manage their portions of single system

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Assessment of S&WB Controlled Portion of Stormwater Drainage System

Root Causes

S&WB/City Leadership Deficiencies as Root Causes

- **Insufficient Oversight:** Neither Board of Directors, Mayor, or City Council had controls in place to regularly assess and monitor power and pump system condition, performance issues, and related emergency measures

- **Lack of Situational & Risk Awareness:** S&WB Board and Executives failed to recognize impact that offline pumps and turbines would have in draining city and did not pursue adequate measures to mitigate performance risks

- **Failure to Adequately Fund:** City Leadership did not address known funding shortfalls related to drainage operations and capital improvements

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S&WB Funding Deficiencies as Root Causes

- **Insufficient Funding Relative to Need:** Funding levels in years leading to Loss Events were insufficient to meet unmet maintenance needs and priority capital asset repairs.

- **Reduced Maintenance/Capital Spending:** One of S&WB's three drainage millages set to expire in Dec. 2016 w/out certainty of renewal, compelled 2015/2016 reduction in maintenance and capital spending to reserve funding.

- **Insufficient Monitoring of Needs:** Board's budgeting process lacked ongoing analysis of changing operational and capital needs during fiscal year.

- **Hesitancy to Enact Drainage Service Fee:** City Leadership choice to not pursue drainage service fee upon commissioning a proposed rate structure prevented pursuit of bond financing for major turbine and pump asset related improvements.

S&WB Funding Deficiencies as Root Causes

- Funding deficiencies identified 2015 Report on Operations
  - Insufficient funding available for capital improvements
    - $13.3 million available
    - $24.9 million required for anticipated capital improvements in 2016
    - 2016-2020 – S&WB does not have the capacity to issue additional bonds or fund the major capital improvement program
  - Future costs associated with SELA projects
    - Repayment of S&WB portion to begin 2019, payment rises to $8.8 million/year in 2022
    - Additional $1.2 million in annual costs will be incurred for operations and maintenance
  - Additional costs
    - $4 million for deferred maintenance
    - $2 million for groundwater management and green infrastructure
  - ***"The analysis indicates that the current revenue sources are not adequate to meet operation and maintenance expenses and total debt service on existing bond issues beginning in 2020"***

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Assessment of City Controlled Portion of Stormwater Drainage System

City Controlled Portion of NOLA Drainage: Operational Deficiencies as Root Causes of Loss Events

Significantly Compromised Pre-Flood System: 38% of 68,092 catch basins; unknown amount of drain lines compromised.

Failure to Implement 2011 Stormwater Plan Maintenance Goal: Annually clean and inspect 8% of City drainage assets**,** including 15% of problem assets (103 mi pipes inspected; 7-8K catch basins cleaned). Clean system in 9 years.

Actual Operations (2011-2017): Average 4,751 catch basins cleaned annually – citizen complaint based; no camera inspections.

Failure to Remedy Known Pre-Flood Compromised Catch Basins: Post-Hurricane Isaac (2012), City aware of thousands of blocked catch basins and pipes. Received FEMA funding to address. Action not meaningfully begun until after August flood.

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City Controlled Portion of NOLA Drainage: Governance Deficiencies as Root Causes of Loss Events

Incompatible Standard Relative to Need: Complaint based annual target number of catch basin/drain line cleanings does not assure sufficient performance baseline relative to known risks.

Insufficient Funding Relative to Need: Between 2011-2017, City drainage maintenance used portion of $4.2 average annual budget for “roadway maintenance.” Post-Loss Event, City spent and acknowledged more than $20MM is needed annually to achieve sufficient performance baseline.

Lack of Dedicated Funding & Overreliance on Regulated One-time Funds: Absent drainage service fee or other regular source, City over relies on one-time and federal funding with use limits delay due to regulatory compliance inefficiencies.

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Root Causes of Loss Events

Root Cause Summary

Flooding

Entity	Description
S&WB	Inconsistent leadership oversight of power and pumping operations
S&WB	Failure to establish and maintain minimum conditions of operations
S&WB	Insufficient planning and risk awareness of assets conditions
S&WB	Inadequate pump asset maintenance planning
S&WB, City	Inadequate budgeted funding for inspection and repairs
S&WB, City	Inadequate long-term capital improvement planning
City	Bureaucratic inefficiencies and limitations
S&WB, City	Precipitation greater than design level of service

Electrical Fault

Entity	Description
S&WB	Detailed procedures for repair of critical equipment were not developed
S&WB	Configuration management for brushes and springs was not maintained

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Improvement Recommendations
City Leadership and City Council

Recommendations – City Leadership and City Council

- Maintain more consistent and probing situational awareness of the readiness of the city's drainage assets
- Prepare and implement strategies to ensure adequate, sustainable, and coordinated funding for operations, maintenance, and capital improvements within the entire city drainage system
- Require a monthly status update on any emergency repairs projects involving S&WB power and pumps assets
- Advance S&WB's ongoing studies of alternative power sourcing options that would provide more reliable commercially rated electrical service for drainage operations
- Institute a more proactive approach to maintaining City controlled drainage system assets

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Recommendations – City Leadership and City Council

- Develop a proactive approach to replacing deteriorated and undersized drainage assets within city control, while investing in increased storm water storage and detention on both public and private property
- Establish drainage asset replacement measures
- Develop capital investment funding and incentives
- Consider implementing incentives to reduce stormwater runoff and promote retention
- Determine and communicate the risk of flooding with the city's various drainage basins that will remain within that design capacity goal; determine additional investments and restructuring that would be needed to further reduce such risk; and prepare contingency plans for reducing the risk

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Improvement Recommendations
S&WB

Recommendations –S&WB

- Develop and implement a *Power Resiliency Plan*
- Establish minimum design configuration and operational performance requirements should be established for drainage-dependent pumping and power assets
- Significantly improve the frequency and effectiveness of its oversight activity
- Require more stringent follow-up project status reporting requirements for emergency authorizations
- Require a project status update for any work involving turbines at monthly general board meetings
- Monitor and evaluate the impact of maintaining increased reliance on internally generated power
- Complete inspection of all system electrical feeders and prioritize replacements and repairs

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Recommendations – City Leadership, City Council, S&WB

- Redirect available capital and maintenance funds to resolve prioritized repair needs and establish a proactive timeline and budget strategy
- Institute a more proactive inspection and maintenance program
- Establish a critical systems maintenance prioritization and tracking system
- Develop an integrated (S&WB/City) drainage asset capital improvement strategy to assure that catch basins, minor and major lines, pumps, related power assets, and planned storm water retention projects are designed, scaled in capacity, coordinated in operation and repair, and sustainably funded
- Enact policies and procedures that trigger coordination and communication measures whenever a “rain load” events has been designated

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Detailed Corrective Action Recommendations

Corrective Action Recommendations

S&WB management team should develop a ***Power Resiliency Plan*** that establishes minimum performance requirements and operational plans to ensure backup power is provided for all drainage operations.

Causal Factors & Root Causes Addressed:

Causal Factor: There was insufficient 25 Hz power to supply all required pumps due to Turbines 1, 3, 4, and 5 being out of service for restoration or maintenance.

Root Causes: Insufficient Planning & Risk Awareness of Power Generation Systems; Increased Reliance & Demand on Aging Turbines for Daily Non-Drainage Related Systems

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Corrective Action Recommendations

New Orleans City Leadership (City, S&WB, City Council) should ***maintain more consistent and probing situational awareness*** of the readiness of the city's drainage-dependent turbines and pump system assets.

- Monthly S&WB reports to Board, Mayor, Council, and public summarizing power/pump system readiness; status of offline assets; and contingency plans.
- Protocols for assessing and reporting risks and alternative solutions if major repairs are not begun or completed within three months of scheduled timelines.

Causal Factors & Root Causes Addressed:

Causal Factors: Insufficient 25 Hz power to pumps; Pumps not moving water efficiently and ran backwards for long durations due to mechanical integrity issues.

Root Causes: Insufficient risk awareness and planning to address Power System problems; Inconsistent oversight of Pump System repairs and capacity limits.

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Corrective Action Recommendations

City Leadership (Mayor, S&WB, City Council) should ***enact strategies to ensure adequate, sustainable, and coordinated funding*** for operations, maintenance, and capital improvements within the entire city drainage system.

- Jointly create a single long-term funding source for entire city drainage system.
- Enact a joint drainage system capital planning and maintenance process
- Employ service delivery focused “budgeting for outcomes” process to establish annual joint budgets, maintenance goals, and performance metrics.

Causal Factors & Root Causes Addressed:

Causal Factors: Insufficient 25 Hz power; Continuous power from redundant sources not available; Insufficient pumps due to maintenance; Pumps not moving water efficiently and ran backwards for long durations; City pipes and catch basins blocked; City portion of drainage system lacked sufficient design drainage capacity.

Root Causes: Inadequate SWB/City long-term funding strategies, sources, policy support, and planning for inspections, repairs, and capital improvements.

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Corrective Action Recommendations

City Leadership (Mayor, S&WB, City Council) should ***maintain more effective situational awareness of the impact that daily use of onsite turbines for non-drainage system needs has on readiness and functionality*** in meeting drainage system needs. This heightened awareness should include regular monitoring, analysis, and reporting to City Leadership.

Causal Factors & Root Causes Addressed:

Causal Factor: Insufficient 25 Hz power to pumps due to Turbines 1, 3, 4, 5 out of service for restoration/ maintenance.

Root Cause: Steady increase since at least 2011 in the use of S&WB turbines for non-drainage related system needs.

ABS Group

Corrective Action Recommendations

City Leadership should ***improve oversight of drainage power/pump matters***:

- S&WB Board should require monthly reports by staff on operating, offline, and repair status of critical drainage systems (turbines, pumps, frequency converters)
- Pump/power performance gauged using single drainage rate benchmark.
- Amend state law authorizing S&WB emergency repairs (La R.S. 33.4084) to require more stringent status reporting requirements to City Council and Board.
- Amend S&WB Board procedures to require a project status update for any work involving turbines at monthly general board meetings.
- Include updates on turbine related repairs and readiness as part of information reports to City Council and regular Mayoral briefings.

Causal Factors & Root Causes Addressed:

Causal Factors: Insufficient 25 Hz power to pumps due to known offline turbines and insufficient number of operable pumps due to maintenance issues.

Root Causes: Inconsistent oversight of turbine and pump repairs; Inadequate awareness of consequence of known offline turbines during severe rain events.

Corrective Action Recommendations

S&WB Leadership should establish ***proactive protocols to maintain critical threshold of functioning drainage system electrical feeders***.

- Institute proactive inspection and maintenance program to assure feeders deliver sufficient power to meet demands based on modeled\rain storm scenarios.
- Complete inspection of all system electrical feeders and prioritize replacements and repairs based on confirmed degrees of deterioration or malfunction.
- Redirect funds if needed to resolve prioritized repair needs and set forth a proactive timeline and budget strategy to assure all system feeders are functioning.
- Institute a proactive inspection and maintenance program using benchmarks for gauging asset performance health (e.g., functional, problematic, eminent failure, failure) to better communicate system criticality within S&WB and to the public.

Causal Factors & Root Causes Addressed:

Causal Factors: Insufficient 25 Hz power to pumps due to lack of electrical feeders; Continuous power from non-turbine sources not adequately relayed to online pumps.

Root Causes: Inadequate budget and planning to assure inspections and repairs of feeders; and alternative power sourcing/conveyance options.

Corrective Action Recommendations

City Leadership (Mayor, S&WB, City Council) should ***collaborate jointly to negotiate a long-term power generation solution that involves reliable onsite power sourcing*** (e.g., the long-proposed power utility substation based at S&WB's East Bank Water Plant); and reduces or eliminates reliance on unreliable overhead distribution lines to convey power to critical water systems.

Causal Factors & Root Causes Addressed:

Causal Factor: Continuous power from redundant sources was not reliably conveyed to online pumps causing them to trip offline and cease functioning.

Root Cause: The use of distribution lines which are not commercially rated to convey Entergy power to S&WB is highly prone to disruption.

Corrective Action Recommendations

S&WB should consider the following to ***improve project prioritization and tracking***:

- Uniform analysis to establish feasible performance goals and asset needs for each drainage pumping station based on modeled rain storm scenarios.
- Centralize the assessment of the system's pump stations.
- Institute a fast-track project delivery system and unit to procure, perform, and monitoring repair and maintenance projects.
- Train personnel to use computerized maintenance management system to integrate job creation, prioritizing, procurement, and performance monitoring.
- Uniform procedures across all pump stations related to operations, inspections, "rain load" event checks, communications, repairs, and project tracking.

Causal Factors & Root Causes Addressed:

Causal Factors: Insufficient operable pumps due to maintenance issues; Pumps were not moving water efficiently due to mechanical integrity issues.

Root Causes: Inadequate pump asset maintenance planning; reactive maintenance.

Corrective Action Recommendations

S&WB and City Leadership should consider establishing ***minimum design and performance requirements for drainage-dependent pumping and power assets based on realistic goals for minimizing standing water during 5, 10, and 25-year rain events,*** considering the combined S&WB/City drainage system as presently designed and configured. Specific examples include:

- Baseline for minimum 25 Hz power that must be able to be self-generated at any time to achieve the pumping capacity needed to meet those minimized standing water depth aims.
- Minimum pump station flow rates required to prevent flooding during rain event scenarios and baseline self-generated power needs to achieve those rates.

Causal Factors & Root Causes Addressed:

Causal Factor: Pump system had inadequate design capacity to remove water from drainage basins.

Root Causes: Pumping performance standards for modeled rain events are not used nor did S&WB establish and maintain minimum conditions of operations.

Corrective Action Recommendations

S&WB and City Leadership should ***implement an integrated drainage asset improvement plan*** to assure that catch basins, minor and major lines, culverts, pumps, power assets, and storm water retention projects are designed, coordinated in operation, and sustainably funded to assure that the city's combined drainage system limit standing water to 6 inches or less amid a 10-year rain event (approximately 8.5 inches over 24 hours).

Causal Factors & Root Causes Addressed:

Causal Factor: The drainage pumping system had inadequate design capacity to remove water from drainage basins.

Root Cause: Inadequate drainage related capital improvement assessment and implementation strategy.

Corrective Action Recommendations

City Leadership (Mayor, CAO/DPW, City Council) should ***maintain City controlled drainage assets based on rain event modeling and inspection data*** in lieu of a complaint-driven strategy.

- Establish a maximum standing water depth goal in each of the City's drainage basins for 5, 10, and 25-year rain events.
- Establish an adequate catch basin/drain line performance baseline by inspecting and cleaning all assets within 3-5 years and 8% of the system annually thereafter.
- Increase training along with performance incentives among contracted entities performing inspection and maintenance.
- Avoid use of one-time, highly regulated fund sources to the extent feasible.
- Implement cost-sharing or asset-sharing cooperatives between City and S&WB and neighboring Parishes to better meet maintenance goals.

Causal Factors & Root Causes Addressed:

Causal Factors: City drainage assets in flooded basins were clogged or broken.

Root Causes: Inadequate funding, planning, maintenance, and capital improvements relative to need and risk.

Corrective Action Recommendations

City Leadership (Mayor, CAO/DPW, City Council) should consider the following to improve the design and function of its portion of the drainage system:

- Institute capital improvement plan to replace compromised catch basins and undersize minor drain lines over 10-15 year period.
- Modify existing contracting and procurement rules to allow for “Design-Build-Finance-Maintain” contracting to better enable public-private funding options.
- Enact developer fees for major storm water infrastructure improvements servicing their project and/or based on runoff to already constructed finite drainage systems.
- Link zoning incentives to storm water control features above existing mandates.
- Enact ordinances and/or executive orders establishing target percentages for storm water investment among capital projects; and pervious surface area among planned street, roadway, and curb improvements between 2018-2028.

Causal Factors & Root Causes Addressed:

Causal Factors: City drainage assets in flooded basins were clogged or broken.

Root Causes: Inadequate funding, planning, maintenance, and capital improvements relative to need and risk.

Corrective Action Recommendations

S&WB and City Leadership should ***ascertain and communicate the risk of flooding with the city's various drainage basins based on a various modeled rain event scenarios***; what additional investments and restructuring would be needed to reduce such risk; and prepare contingency plans for reducing the risk of human endangerment, property damage, business interruption, and compromised transportation mobility during rainfall exceeding the present drainage system design capacity.

Root Causes Addressed:

Rainfall in three drainage basins during the Loss Events exceeded the "design storm" capacity of City's controlled portion of the drainage system; and four drainage basins based on the "design storm" capacity of the S&WB controlled portion of the overall drainage system.

Corrective Action Recommendations

City Leadership (S&WB, City, City Council) should ***enact policies and procedures that trigger coordination and communication measures whenever a "rain load" events is declared*** by S&WB based on the severity of an anticipated storm. This designation should activate underpass flood alert signals and multi-media public communications on safeguards to minimize property damage. City should also streamline protocols for issuing public flood advisories.

Causal Factors & Items of Note Addressed:

Causal Factor: The public was not warned in a timely manner about street flooding causing traffic to enter flooded streets.

Items of Note: City Office of Communications procedures prevented City Emergency Operations personnel from issuing flood advisories to the public without prior approval.

Observations about

Drainage Service Delivery in New Orleans

Keith Readling

RAFTELIS

October 3, 2018

Outline

- Readling background, Raftelis services
- SWBNO current state of affairs regarding drainage program and key observations
- Selected high performing drainage programs and notable characteristics
- Conclusions and advice

Keith Readling

- Executive VP – Raftelis
- Civil Engineer
- For Raftelis -- responsible for stormwater management, data services, management consulting
- Since 1991 -- personal focus on developing stormwater programs and funding

Keith Readling

- Worked with > 40 stormwater programs; many large and complex:

SWBNO	**Charlotte**	**NEORSD**	**Dallas**
St Louis	**PWSA**	**BWSC**	**Fort Worth**
Nashville	**Baltimore**	**Philadelphia**	

- Organizational and funding focus

Local Services

- SWBNO / New Orleans Services:
  - 2016: Drainage fee feasibility study
  - 2017: Fee in lieu study

- Raftelis (not Readling): Financial planning and ratemaking for water / wastewater

Five SWBNO / New Orleans Observations

- Service delivery model: drainage program obligations split (major / minor system)
- Funding: severe underfunding at City and SWBNO, and no fee component
- Authorities: obligations and authorities disconnected
- Processes: billing, collections, customer service and data maintenance and management are a struggle
- Operations: system operations compound some problems

High Performing Systems

- Charlotte-Mecklenburg Stormwater Services
- Northeast Ohio Regional Sewer District

Service Delivery Model

Funding

Authority

Processes

Operations

Conclusions

- Service delivery model: there's more than one way to skin the cat but tight coordination is required if responsibilities are shared; implications for streets
- Funding: more money is needed – a lot more money, and expectations will grow with spending
- Authority: authority should come with responsibility
- Processes: drainage fees come with complicated processes that must be well run to retain customer support
- Operations: system operations should be integrated and coordinated

Citizens Energy Acquisition of Indianapolis Water & Wastewater Utilities

Presented to New Orleans Water Task Force

Dan Considine, Manager, Corporate Communications
Citizens Energy Group

citizens energy group™
We're all citizens.

Citizens Energy Group Overview

- Founded in 1887 Utilities held in Public Trust
  - Vision of the founders
  - Dedicated to community service
  - Efficiency & innovation of private sector
  - Free of partisan politics and private interests
  - Promise of the Trust

Citizens Today

- Natural gas utility serving Indianapolis
- Nation's second largest steam & chilled water utility serving downtown Indy
- Largest water and wastewater utilities in Indiana
- Other utility related businesses

City Utility Challenges

- Inefficient, short-term management under political control
- Water & wastewater infrastructure failing
- Rising utility rates
- High levels of debt (75-80% of costs)
- Difficulty retaining qualified staff, high levels of outsourcing
- City underfunding other infrastructure – streets, bridges, abandoned homes

Utility Transfer Rationale

- Better Utilities for a Better City
  - Utilities kept under public ownership
  - Non-profit business model
  - Non-partisan governance
  - Operational savings
  - Smaller rate increases
  - Excellent customer service
  - $425 million in proceeds to City to fund other hard infrastructure

Transaction at a Glance

Total Value of Assets:

- Value of water system $916 million
- Value of wastewater system $789 million
- Total value of assets $1.7 billion

Existing Debt Assumed by Citizens:

- Water system debt $916 million
- Wastewater system debt $527 million

Total existing debt to Citizens $1.44 billion

Net value of systems after debt: $262.6 million

Transaction Proceeds

Total Proceeds to City of Indianapolis

- Cash to City $262.6 million*
- PILOT bond issue $140 million
- Wastewater general fund $50 million

Maximum proceeds to City $452.6 million*

*Equals value of assets less existing debt. Paid in two installments -- $170.6 million at closing and $92 million on Oct. 1, 2011.

*Contingencies prior to closing could reduce amount to $425 million.

Utility Transaction Approval Process

- Three Keys to approval
  - Customer/Public Support
  - Political/Regulatory Approval
  - Financing Approval
- 75 public meetings
- Meetings with ratings agencies
- Full City Council – July 26, 2010
- Citizens Board of Directors – Aug. 2, 2010
- IURC – July 13, 2011
- Citizens assumed operations Aug. 26, 2011

Utility Integration Process

- Veolia contract terminated, employees absorbed – 2011
- United Contract terminated, operations employees absorbed – 2016
- Cross functional integration planning involving new employees
- Creation of shared field services

Benefits of Utility Transfer

- Operational savings exceed $80M per year
- Capital project savings $400M since 2011
- Rates now fund 75-100% of costs
- Sound debt coverage ratios
- Consent decree projects ahead of schedule and below budget
- Both systems more operationally sound
- Solid customer satisfaction despite rate increases

citizens energy group
We're all citizens.

Questions

citizens energy group™
We're all citizens.

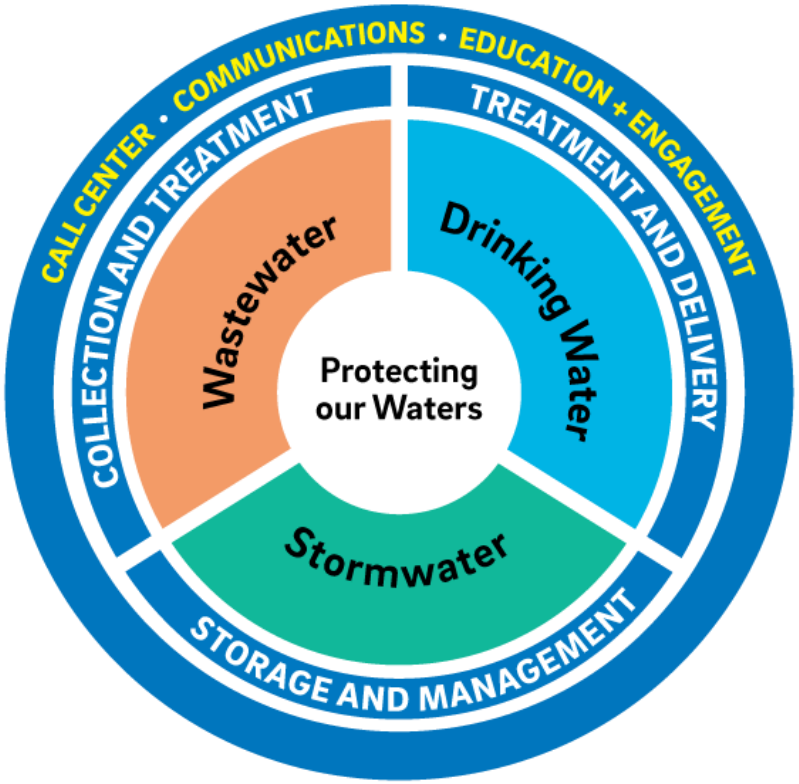
PHILADELPHIA WATER DEPARTMENT

Water, Sewer & Stormwater Rate Board

November 30, 2018

We provide the City with integrated water, wastewater, and stormwater services

PWD does not profit from rate increases.



Why do we need a rate increase?

Pipes & Plants

Increase in water main replacement

Increase in sewer replacement

Increase in facilities investment for pollution prevention and drinking water investment

Challenging Winter '17-'18

Increase in water main breaks

Increase in costs

People

Increasing work force costs for about 2,000 employees

Emergency crews, 2017

Reduced consumption

Annual decrease in consumption

Environmental Regulations

Full compliance with stringent water quality regulations

Consent Order & Agreement for Combined Sewer Overflow Reduction

New rates process:
Every customer can participate.

In 2012, voters approved the creation of the Philadelphia Water, Sewer and Stormwater Rate Board. This independent rate-making board is responsible for setting and regulating water, sewer and stormwater rates. As of January 2014, the Rate Board oversees rate changes requested by Philadelphia Water.

A summary of how the process works now:

Rate request

We calculate the costs of services, and if current rates aren't enough to cover those costs, we present the Rate Board with a request to change rates.

Fact-Based

Philadelphia Water must prove the rate change is necessary and reasonable, and provide supporting documentation.

Clear, Timely Decisions

Within 120 days of our request, the Board reaches its decision to approve, modify or reject the proposed rate change, based on financial records, public testimony, and a formal report.

Who's on the Rate Board?

The Rate Board consists of five members appointed by the Mayor and approved by City Council. For more information on the Rate Board and its members, visit www.Phila.gov/water/rateboard.

The Rate Board is responsible for setting rates

What is the Rate Board?

The water, sewer, and storm water rate board is a local agency authorized to approve rate changes for the water department.

Who's on the Rate Board?

The Rate Board consists of five members appointed by the Mayor and approved by City Council. For more information on the Rate Board and its members, visit www.Phila.gov/water/rateboard.

Rate Board Regulations

1. **Purpose: the Board shall evaluate and determine proposed changes to the rates and charges fixed for supplying water, sewer and storm water service for accounts and properties located in the City of Philadelphia**
2. **Department Filings: The Department shall file its Advance Notice with City Council and the Board.**

The documents that the Department files with its Advance Notice and Formal Notice shall include, but not be limited to, the following:

- clear estimates of the effects of the proposed rate changes on customer bills, including, but not limited to, the estimated average percentage Small User bill increase;
- all financial, engineering and other data upon which the proposed rates and charges are based;
- evidence demonstrating that such rates and charges (A) were developed in accordance with sound utility rate making practices, (B) are consistent with current industry standards for such rates and charges, and (C) are consistent with the Department's bond covenants and other legal requirements; and
- a summary fact sheet, designed for the layperson, that explains the proposed rates and charges, the need for such rates and charges, and the information relied upon by the Department to develop and support such proposed rates and charges.

Rate Board Regulations

3. Hearing Officer: A Hearing Officer shall be appointed by the Board, which appointment shall take effect, pursuant to a formal City contract with the Board, on or after the date of the Advance Notice.

The Hearing Officer shall have the power and authority to:

- Schedule conferences that the Hearing Officer deems appropriate;
- In consultation with the Board, schedule all public hearings and technical review hearings, including time and locations of such hearings;
- Conduct and preside over all public hearings and technical review hearings;
- Make all procedural rulings necessary to conduct a fair, impartial and expeditious hearing process, including the exclusion of irrelevant or redundant testimony or evidence.
- Make rulings on any requests for information submitted by a Participant in conjunction with the Rate Change Proceeding;
- In conjunction with Department staff, post on the Board's website all written information submitted during the Rate Change Proceeding and any other documents the Board believes are relevant; and
- Prepare and submit the Hearing Officer Report to the Board and all Participants.

Rate Board Regulations

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- In conjunction with Department staff, post on the Board's website all written information submitted during the Rate Change Proceeding and any other documents the Board believes are relevant; and
- Prepare and submit the Hearing Officer Report to the Board and all Participants.

Rate Board Regulations

4. Public Advocate: A Public Advocate may be appointed by the Board, which appointment shall take effect, pursuant to a formal City contract with the Board or the Public Advocate's employment with the City, on or after the date of the Advance Notice. If appointed, the Public Advocate shall be a Participant to the Rate Change Proceeding and shall have the responsibility of ensuring that the Board understands the interests of all Small User Customers in the Rate Change Proceeding.

5. Technical Expert: The Board may hire or appoint a Technical Expert to advise the Board on the Department's proposed rates and charges and directly related issues. Unless the Technical Expert is a City employee, the terms shall be set forth in a formal City contract with the Board.

Rate Board Regulations

6. Public Hearings

7. Technical Hearings

8. Hearing Record

9. Decision on Rates and Charges: The Board, in making the Rate Determination on the proposed changes in rates and charges, shall fully consider and give substantial weight to the Hearing Officer Report and the Hearing Record. The Rate Determination shall make reference to sections of the Hearing Record supporting the conclusions contained in the Rate Determination.

The Rate Determination of the Board shall include instructions to the Department to prepare a new tariff incorporating the new rates and charges and any changes in rate structure or terms of service and other issues included in the Rate Determination. The new tariff shall conform to the Rate Determination.

The Rate Determination of the Board shall be filed with the Department of Records, shall be posted on the Board's website and shall be sent to all Participants.

The effective date of the changes in the rates and charges shall be the date set in the Rate Determination, but shall not be sooner than ten (10) days after the Department files the new rates and charges with the Department of Records.

Evolution & Adaptation

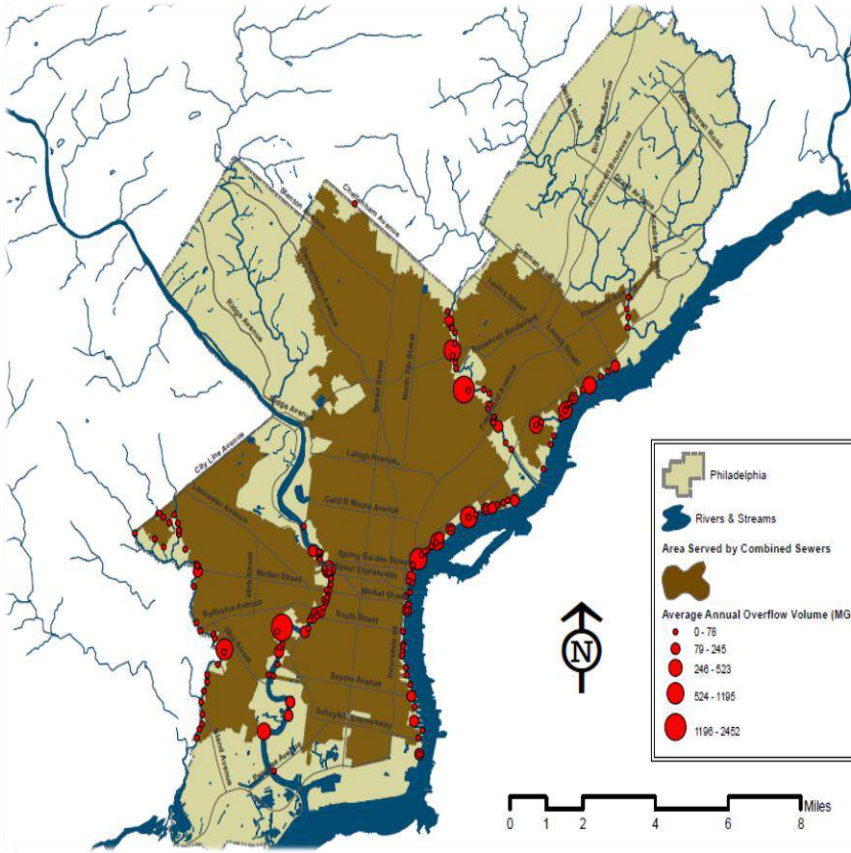
Changes in Philadelphia's Stormwater Billing Program

November 30, 2018

PHILADELPHIA WATER DEPARTMENT

Background

- Philadelphia Water Department is a water/wastewater utility that also provides and charges for stormwater services
- Serving 2 million customers
- Over 500,000 accounts billable for stormwater service
- Customers receive consolidated monthly bill containing usage/service/stormwater fees



How PWD Charges for Stormwater

THEN

- PWD separately recognized stormwater costs starting in 1967 and included costs in service charge
- Billed customers for stormwater based on size of water meter
- Owners of properties without water meters were not charged for stormwater

NOW

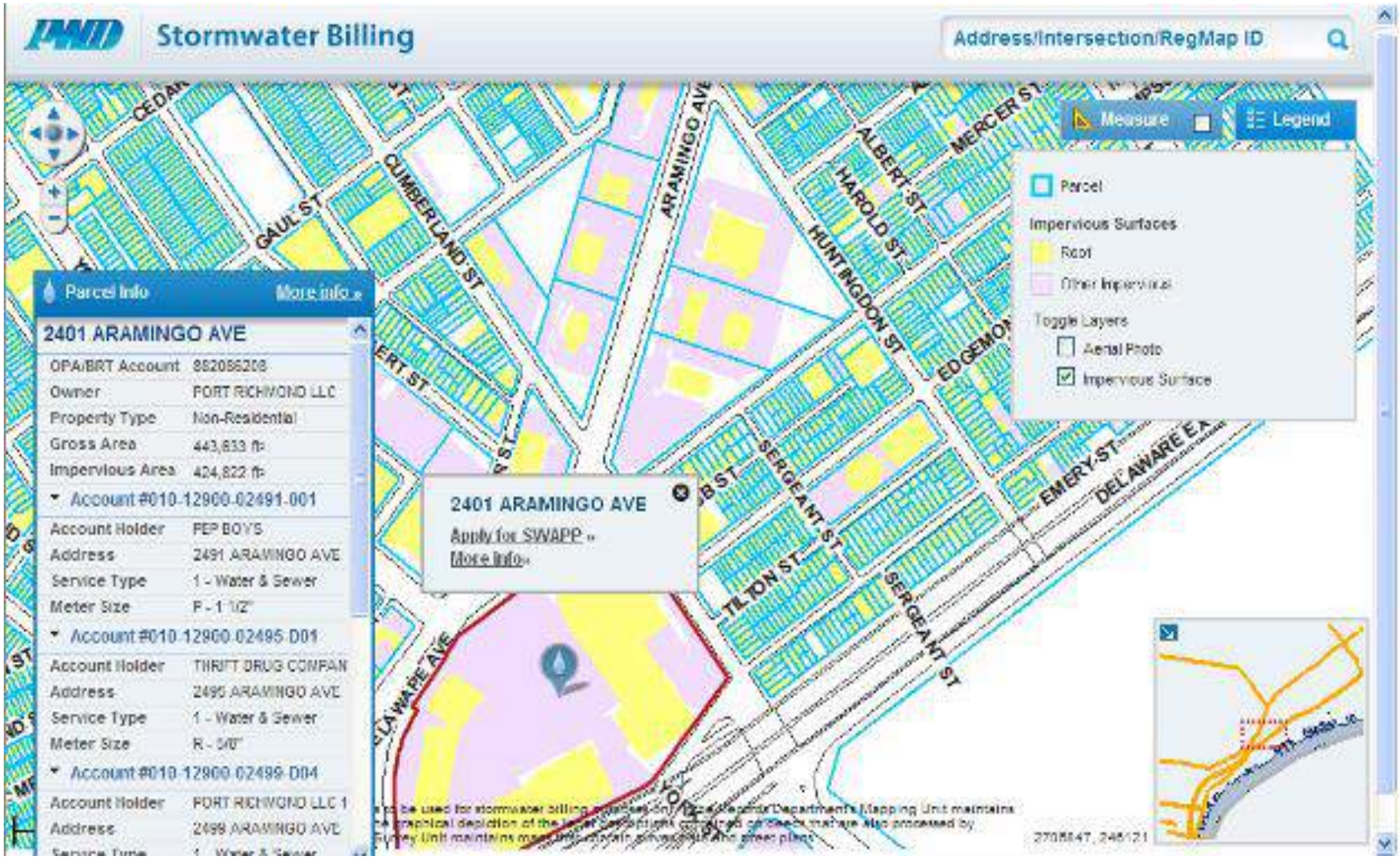
- Moved to parcel-based system starting 2010
- Stormwater charge for a parcel is based on:
  - Gross area (GA)
  - Impervious area (IA)
- All properties are billed
- PWD must recover in excess of $150 million of stormwater costs

How parcel-based fees are calculated

- Non-residential properties receive a GA/IA specific fee
- Residential properties receive a flat fee based on average GA/IA
- Parcel-based fees phased in over 4 years to graduate impact

	Rate
Gross Area	$0.70 / 500 sq.ft.
Impervious Area	$5.30 / 500 sq.ft.

Online Tools: Stormwater Parcel Viewer



Initial Program Design

- Basic Appeals Program to account for inaccurate property impervious area, gross area and charge distributions
- Basic Credits Program to recognize management of the 1” of runoff and large grassy areas on properties
- And a few exemptions…
  - City-owned vacant lots per existing ordinance
  - Related city agency-owned vacant lots

Where we are Today

new programs, changed policies, constantly evolving

- New appeals for residential sideyards in 2011 and cemeteries in 2013 – if eligible both property types receive full exemption from stormwater charge
- Modified credit regulations in 2013 to account for direct dischargers, reduce credit max % and tighten up open space requirements
- Established the Stormwater Customer Assistance Program in 2011 (just one year after we launched!) to address highly impacted customers

Stormwater Customer Assistance Program (CAP)

- Subsidy program introduced in June 2011 during phase-in
- “Caps” a customer’s monthly stormwater charge increase at rate periods at 10%
- Direct response to pressure from Philadelphia City Council

Stats:

- 2,000 customers originally eligible
- 250 enrollees today and decreasing
- $20M in reduced stormwater charges administered total to date

Where we are Today

new programs, changed policies, constantly evolving

- Community Gardens Stormwater Discount introduced in January 2017 in response to approved City ordinance
- Currently addressing approved ordinance and regulations requiring the exemption of all water/sewer/stormwater charges for properties owned by the Philadelphia Land Bank
- Stormwater grants program launched in 2012 with a $5 million budget, now at $25 million

Takeaways

1. **Communication and messaging is key**
2. **Be as flexible and adaptable as possible**
3. **Align incentives with environmental mandates (NPDES Permits, Consent Orders, etc.)**

Thank you!

Joanne Dahme

Philadelphia Water Department

Joanne.dahme@phila.gov

Stormwater Services Governance and Management

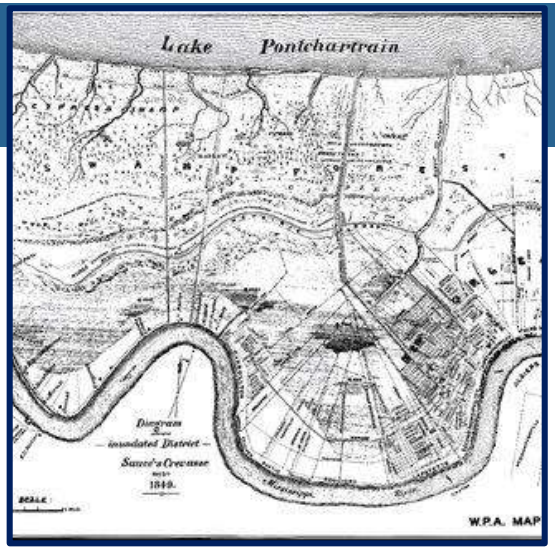
Sewerage & Water Board of New Orleans
Management Options Task Force
December 12, 2018

Introductions

- Andrew Reese
  - 30+ years in stormwater technical, financial, organizational
  - Expertise in design, green infrastructure, planning
  - Over 100 cities: Philadelphia, Charlotte, Nashville, Portland, Halifax, Cleveland, Atlanta, Birmingham, Dallas/Ft. Worth, Australia
- Eric Rothstein
  - 30+ years in water, wastewater, stormwater finance
  - Municipal Advisor, CPA, EFAB Board
  - Institutional structuring / regionalization: Atlanta, Detroit, Egypt, Flint, Houston, Toledo

Where You Are Going

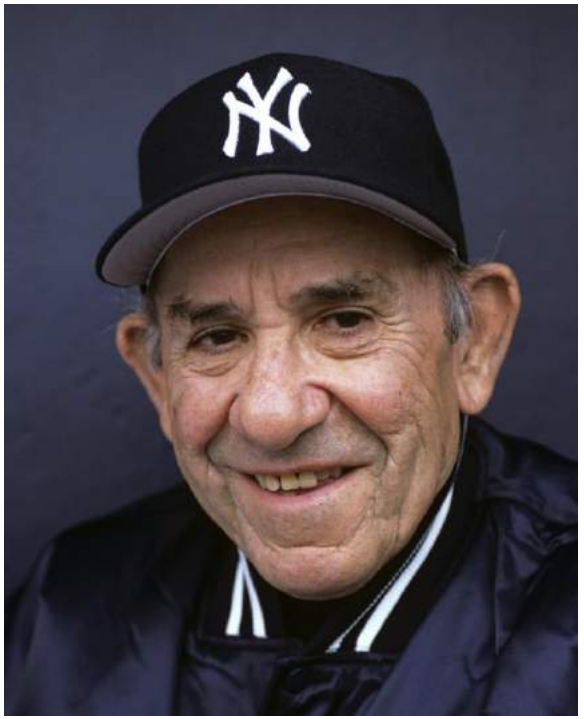
- Repair and manage the pumps and canal systems
- Rapidly clean, repair, and transform the collection system
- *Imperatives:*
  - *Achieve efficiency, excellence, transparency, accountability, and equity*
  - *Leverage existing organizational, and administrative capacity and authority*
- Build in flexibility for regional cooperation



Institutional Structuring Options

- ~~City of New Orleans Department~~
- ~~Privatization~~
- Separate independent utility
  - City of New Orleans
  - Multi-jurisdictional / regional
- Sewerage and Water Board
  - Adjunct to status quo
  - Evolution to alternative
- Public benefit corporation

Project and Service Delivery Partnerships
- Traditional
- Community-Based

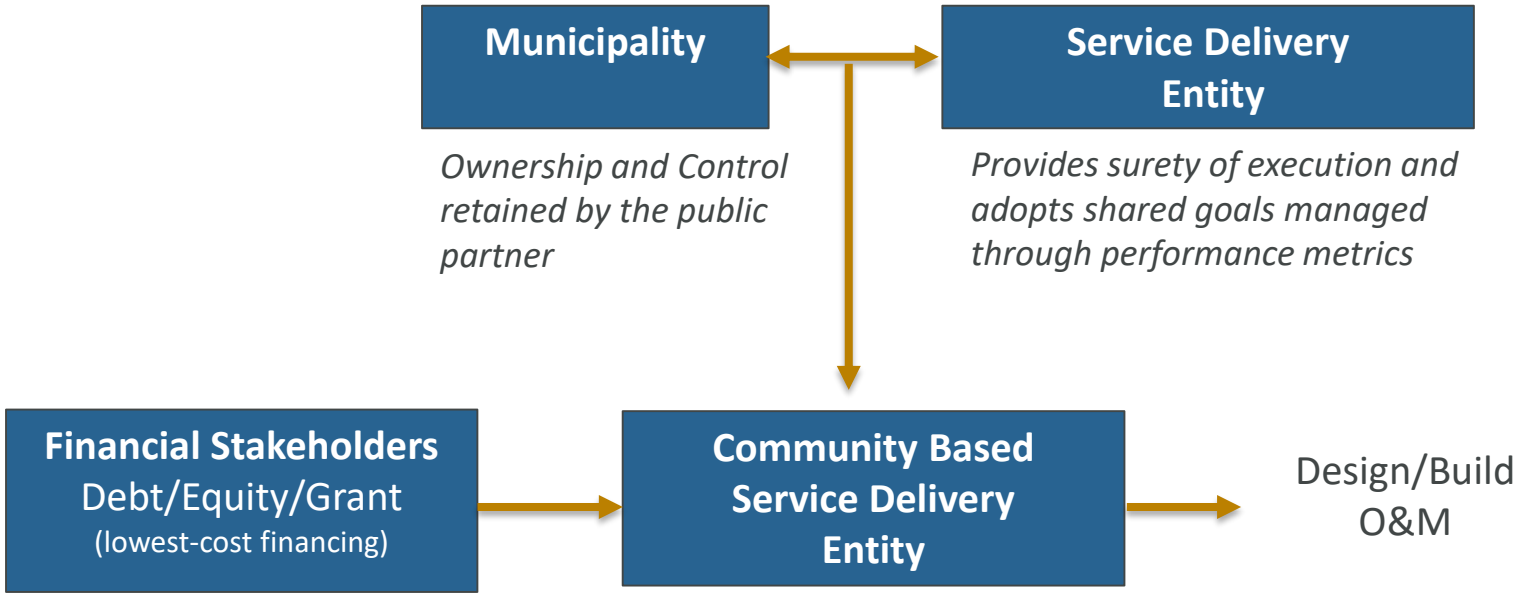


"If you don't know where you are going, you'll end up some place else."

Benchmark Stormwater Utilities

- Charlotte – Mecklenburg County
- Nashville
- Halifax
- CSO communities
  - Philadelphia
  - DC Water
  - NEORSD
  - Louisville

Community-Based Model Structure



1. One contract awarded to a design, construction, O&M consortium to operate for a specified time (enabling rapid resource deployment)
2. Private sector may assume more risk in both the short and long term
3. Local hiring and workforce development focus and performance measures
4. Community members involved in entity management / decision-making

Separate Stormwater Utility

An institutional entity, typically enabled through state authorization, with utility powers including the ability to impose rates and charges, sometimes taxes, issue debt, invoke eminent domain, etc. – with responsibility for stormwater management, flood control.

Benefits

- Focus of utility enterprise
  - Absence of distractions
  - Absence of legacy issues
- Billing and collection (w/o revenue sharing)
- Focused coordination with potential funding / project delivery providers
- Prioritization of O&M procedures based flooding, SW assets

Challenges

- Creation of new Institutional infrastructure – all admin and O&M functions
- Establishing efficient billing and collection processes
- Coordination with other water resource utility functions
  - One water management
  - Transportation infrastructure

SWU Impacts on Financing

- Advantages
  - New, dedicated revenue stream
  - Focused grantsmanship
- Disadvantages
  - Risks associated with difficult to collect rates and charges
  - Dilution (actual or perceived) of support for water and wastewater reinvestment needs

Equity and Affordability Considerations

- Opportunity to focus investment / reinvestments in previously under-served, flooding sections of City
  - Address environmental justice / restorative justice options
- SWU impervious area (+) charges arguably more equitable mechanism to recover stormwater management / flood protection costs
  - Flexible rate and credit options
- Low Income affordability implications:
  - Cost recovery aligned to home / parcel sizes
  - Opportunity to tailor credit mechanisms

Lessons Learned

- Structure governing board for sound, efficient decision-making
  - Independent, < 10 members, voting structures designed for compromise/consensus
  - Qualified, responsive leadership matters
  - Accountability requires transparency
  - Institutionalize community engagement (facilitated outside of governance structure)
- Build in financial integrity to help ensure resiliency
  - Private capital requires competitive, market-based returns
  - Restructuring payments (e.g., acquisition, concessions, franchise fees) typically require same customer base to pay twice for asset base
  - Favorable financing secured by sound financial policies and risk management
  - Equitable, stable funding structures (e.g., impervious area charges)
  - Recognize affordability, historical inequities / EJ issues
- Pursue integrated, holistic water management
- Evolve institutional structures in response to community needs

Logical Steps Forward

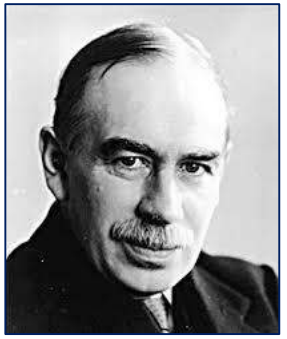
Major Network System

1. Create excellence within S&WB to fix or transform large systems
2. Modify board & governance to meet oversight & performance goals
3. Rapidly plan & execute overhaul or change in pumping systems

Collection & Conveyance System

1. Create focused & lean organization as “twin” to S&WB
2. Develop utility fee funding
3. Use alternative / innovative options for rapid design/construct/maintain
4. Work out efficient way to work with Public Works
5. Use S&WB administrative support

Short-term → Long-run



Questions and Answers