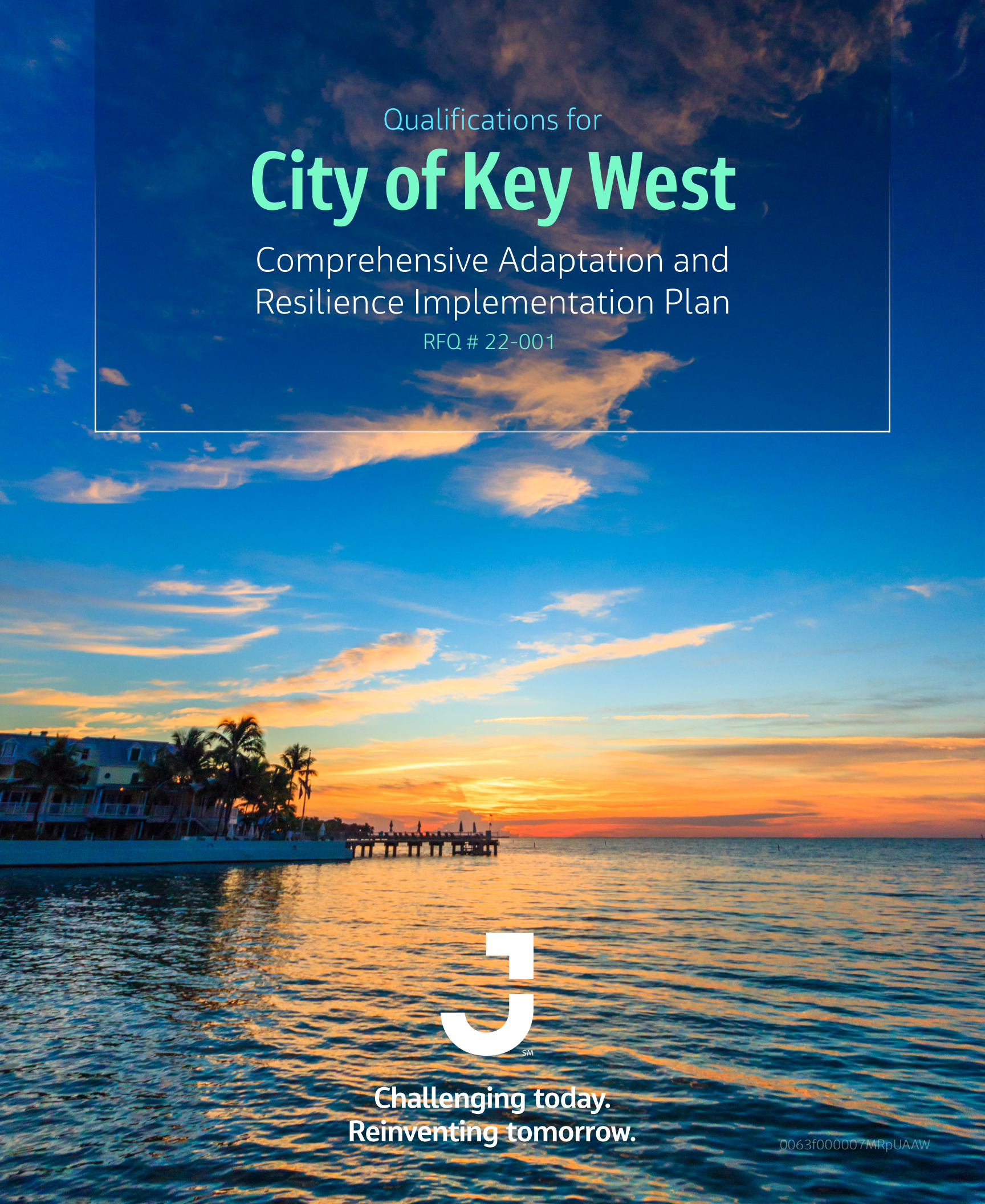
Qualifications for

City of Key West

Comprehensive Adaptation and Resilience Implementation Plan

RFQ # 22-001



Challenging today.
Reinventing tomorrow.

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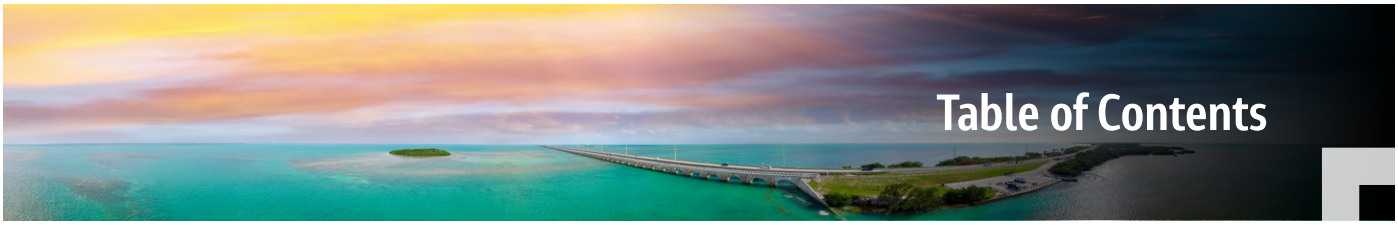

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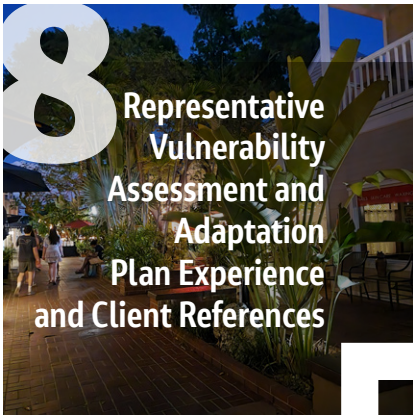
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1 Cover Letter

1. Cover Letter

January 11, 2023

City of Key West
1300 White Street
Key West, Florida 33040

Subject: RFQ #22-001, Key West Comprehensive Adaptation and Resilience Implementation Plan

Dear Selection Committee:

Congratulations on successfully securing two grants to begin this exciting and much anticipated vulnerability assessment and resilience planning process. We've been looking forward to this solicitation and sharing our qualifications and approach. We know the City of Key West (City) needs a strong, data-driven process to identify risk, organize a strategy, prioritize projects, inform policy, develop a funding plan, and implement a friendly, easy-to-use management tool. Robust stakeholder engagement and project management are the keys to the process. **We are excited to help you create an adaptation and resilience roadmap**.

Jason Bird, CFM, Jacobs' Florida resilience leader, will be your **main point of contact and our team leader**. He has a unique ability to approach projects from both a technical engineering perspective and a broader citywide resilience perspective. In the last decade, Jason has been personally involved in **more than 30 vulnerability assessments** of assets, facilities, organizations, and public places.

Developing a comprehensive adaptation and resilience strategy for the southernmost island city in the continental U.S., given its urban context and historic charm, is an admirable and daunting task. The water threatens the City from every direction. As your stormwater engineer and general engineering contractor, our team possesses a unique understanding of overall water resources management and how the related vulnerabilities affect the City. This provides a **quick start with no learning curve**. We also bring experts in land use policy, historic preservation, housing and economic development and social equity—all issues important to Key West. **We're not problem staters, we're problem solvers.** Here are a few highlights:

- **We know resilience in local government.** Our team includes two former Florida municipal **chief resilience officers**, with experience identifying risks, developing local policies, prioritizing needs, and creating and **implementing adaptation plans and public engagement strategies**.
- **We understand this challenge.** Shulman + Associates authored the **first-of-its-kind design guidelines for historic preservation in the face of climate change and sea level rise** (SLR) for a similar island community in southeast Florida. Lessons learned from this plan, ***Buoyant City***, can influence and inspire adaptation strategies in the Key West historic district to protect historic assets.
- **We wrote the book.** ***Adaptation Action Areas: A Planning Guidebook for Florida's Local Governments,*** was co-authored by team member and Jacobs' Global Lead for City Resilience, Susy Torriente, a former Fort Lauderdale assistant city manager. This guidebook details Fort Lauderdale's process as **one of the first governments in Florida to define Adaptation Action Areas (AAAs)** in the Comprehensive Plan and identify areas and subsequent projects in the capital budget plan. We will use this tool to identify AAAs in Key West.
- **We will leverage our current work** with **Naval Air Station Key West** (U.S. Army Corps of Engineers, *Engineering with Nature* program) and the **South Florida Military Installation Resilience Review** to inform the assessment and align projects with green infrastructure and nature-based solutions wherever possible and to complement traditional gray infrastructure projects for environmental and social benefits.
- **We bring leading industry experts.** ICF will support the Economic Redevelopment chapter. They **conducted a first-of-its-kind business case analysis of the Miami Beach** climate adaptation stormwater program, examining the effect of SLR and adaptation investments on **private property value, insurance premiums, property tax revenue to the city, and the cost of business disruption** with integration of state-of-the-art models—stormwater, catastrophic risk, and property value.

In many ways the City of Key West—a low-lying, densely developed island city, exposed to the sea on all sides, regularly in the path of devastating hurricanes—is ground zero for climate vulnerability and offers a unique adaptation opportunity. Climate change and SLR present an existential threat to the City, its unique environment, heritage, and communities. Jacobs brings experience from developing climate resilience strategies for global cities, including New York, San Francisco, Miami Beach, London, and Singapore. The unique challenges and opportunities of Key West truly excite our team. We recognize the significance of this Plan in defining a sustainable future for the City, where all can thrive. **We are ready to be bold in our approach, rigorous, visionary, and unafraid to challenge the status quo.** Our team brings local, national, and global expertise to support the City and we're proud to bring our strengths and proven methodology to assist you in defining the future for Key West. We are excited to begin work immediately! **Working together is success.**

Yours truly,

Alberto Lazaro, PE
Florida/Puerto Rico Geographic Sales Manager

Jason Bird, CFM
Florida Resilience Lead/Project Director

2 Information Page

2. Information Page

Project Name: Key West Comprehensive Adaptation and Resilience Implementation Plan | RFQ #22-001

Prime Firm: Jacobs Engineering Group Inc.

Address: 3150 SW 38th Ave., Ste. 700, Miami, FL 33146

Fax Number: 954 722 2621

Points of Contact:

Project Director: **Jason Bird, CFM**

Phone: 970 214 1495

Email: jason.bird@jacobs.com

5401 W. Kennedy Blvd. Suite 300,
Tampa, Florida 33609

"As Florida Resilience Lead, every day I think about our beautiful and fragile coastline. I know there are adaptation investments to address all the shocks and stresses of our changing world. Our team is ready to co-create island-suitable solutions based on our local and global expertise. The unique adaptation and resilience challenges, as well as opportunities in Key West make this a career defining project for me and I'm excited to start."

Project Manager: **Elaine Tolon, PE**

Phone: 954 684 3563

Email: elaine.tolon@jacobs.com

3150 SW 38th Ave., Ste. 700
Miami, FL 33146

"I just love Key West and it's been a pleasure working with the staff over the last few years on your projects. For this work, I will be your task master ensuring that all grant deliverables are on-time and on-budget. Using my familiarity of City systems and processes, I will build positive, productive, and collaborative relationships with you and the community—promoting continuous improvement with new technologies and innovation."

Designated Representative with Authority to Make Representations for the Firm: **Alberto M. Lazaro, PE** – Vice Present, FLPR Geographic Sales Manager

Phone: 786 406 9428

Email: alberto.lazaro@jacobs.com

3150 SW 38th Ave., Ste. 700
Miami, FL 33146

"This is a passion project for us and Key West is a premier client city. Over the years, we've shown you our expertise in engineering, water, and more recently around sea level rise and climate planning. As Jacobs evolves to a full global technology solutions organization, let's show you our passion for urban resilience and Florida coastal communities."

Throughout our proposal, we've incorporated your 11 selection criteria from Addendum #1 using the **green icons** below to visually link them to our team members, project understanding and approach, personnel, qualifications, and project experience.

Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9	Criteria 10	Criteria 11
Climate Vulnerability Assessment	Adaptation Plans	Traditional Hardscape Engineering	Nature-Based Adaptation/ GI/LID	Historic & Cultural Preservation	Economic Redevelopment	Community Adaptation (Housing/Health/ Social Wellness)	Policy Writing/ Guidance (LDRs & AAAs)	Public Facilitation/ Engagement	Interactive Maps	Women- and Minority-Owned Businesses

3 Organization Chart

3. Organization Chart

Exhibit 3-1. Our organization chart demonstrates how our project leadership team, work leads, support staff, and subconsultants work together; identifies clear lines of reporting; and includes location.

LEGEND
(1) Shulman + Associates
(2) Cummins Cederberg
(3) ICF
(4) Adept

Location

City of Key West

Project Director
Jason Bird, CFM
Tampa, FL

Principal-in-Charge
John Aleman
Miami, FL

QA/QC
Laurens Van der Tak, PE, D.WRE
Silver Springs, MD

Project Manager
Elaine Tolon, PE
Fort Lauderdale, FL

Climate Vulnerability
Kerstin Kenty, PhD, PE, PMP, ENV SP, CFM ***(Lead)***
Tampa, FL

Alec Rodriguez, PE
Miami, FL

Adaptation Plan
Susy Torriente ***(Lead)***
Orlando, FL

Public Engagement
Dana Pollit ***(Lead)*** **(4)**
Fort Lauderdale, FL

Tricia Schuler, ENV SP
Tampa, FL

Interactive GIS Maps
Shannon McElvaney ***(Lead)***
Greenwood Village, CO

Eduardo Rendon
Atlanta, GA

Infrastructure (Roads, Buildings, and Systems)
Daniel Rutland, PE ***(Lead)***
Miami, FL

Kevin Regalado, AIA, NCARB, LEED AP (Architecture)
Miami, FL

Alex Meitin, PE (Transportation & Mobility)
Miami, FL

Chad St. John, RLA, ASLA (Urban Design)
Tampa, FL

Rick Gorsira, ENV SP (Nature-based Solutions)
Tampa, FL

Historical & Cultural Preservation
Lori Price ***(Lead)***
Tampa, FL

Allan Shulman, FAIA, LEED AP **(1)**
Miami, FL

Kevin Regalado, AIA, NCARB, LEED AP (Building Architecture)
Miami, FL

Environmental Restoration
Jannek Cederberg, PE ***(Lead)*** **(2)**
Miami, FL

Jason Cummins, PE **(2)**
Miami, FL

Rick Gorsira, ENV SP
Tampa, FL

Economic Redevelopment
Elizabeth Stryjewski ***(Lead)***
Orlando, FL

Cassandra Bhat **(3)**
Miami, FL

Edward Fernadez, CFM **(3)**
Tampa, FL

Mike Matichich
Arlington, VA

Housing & Shelter
Megan Holder, LEED AP BD+C ***(Lead)***
Atlanta, GA

Leticia Solaun, PhD, ENV SP
Gainesville, FL

David Savarese, AICP
Melbourne, FL

Land Use and Code
Paul Culter, AICP ***(Lead)***
Cincinnati, OH

James Summerbell, AICP
Gainesville, FL

Allan Shulman, FAIA, LEED AP **(1)**
Miami, FL

Power and Water
Chris Sharek, PE, BCEE, PMP, ENV SP ***(Lead)***
Sarasota, FL

Jim Codling, PE
Fort Worth, TX

Chandra Mysore, PhD, PE, BCEE
Atlanta, GA

Jeff Benavides, LEED AP O+M, GGP, ISSP-SPC, NABCEP-PVA
Charlotte, NC

Patrick Eddy, PE
Gainesville, FL

Health, Equity & Social Wellness
Leticia Solaun, PhD, ENV SP ***(Lead)***
Gainesville, FL

Nino Kharaishvili, MD, MBA, PMP
Arlington, VA

Hiroshi Awata, PhD
Arlington, VA

All staff are Jacobs unless otherwise noted

At Jacobs, **we know that cities are facing more natural, societal, and economic risks** related to the impact of sea level rise (SLR) and other hazards. Key West is facing more extreme storm events, SLR, flooding, lack of affordable housing, rising costs of living, and water/energy redundancy needs at the Southernmost point. With this knowledge, **we've assembled a passionate team of strategists and technical professionals** to build consensus, plan and prioritize projects, and inform adaptive and innovative strategies to address current and future threats to the City of Key West.

Team Structure

We've carefully evaluated the City's scope of work and curated an exceptional group of professionals to encourage **creative ideas, inspire innovative thinking**, and replace routine "business as usual" with forward-thinking approaches successfully used in other coastal communities, as well as for inspiration to create Key West specific options. Our organization chart (Exhibit 3-1) and strategy are based on an uncomplicated management structure and an easily identifiable chain of command. We bring experts at the forefront of climate change adaptation, with a leaders at helm—**Jason Bird, CFM, Elaine Tolon, PE, and Susy Torriente**—teamed with passionate engineers, planners, historians, economist, public outreach specialists, and a strong supporting cast. **We are the team to deliver an innovative and successful Resilience Roadmap for Key West.**

Jacobs Resilience Leadership

Advanced Facilities	Buildings/ Cities	Cyber	Digital	Environmental	Resilience Leadership/Water	Healthcare	Power	Telecom	Transportation
David Krick	Susy Torriente	Cleophus Thomas	Forrest Gist, PE	Betsy Collins	Adam Hosking, VP Global Solutions Director	Nino Kharaishvili	Peter Rasmus	John Parham	Patrick King

Resilience Community of Practice (CoP)

Jacobs' Resilience CoP Leaders featured above are a group of **thinkers and visionaries that regularly share information, solve problems, and guide discussion/forums** on emerging issues to address global challenges from urbanization, climate change and digital proliferation to security, water scarcity, investment partnerships and the future of work. Our staff actively participates in the Resilience CoP and will have access to our Resilience Leaders to deliver **smart, connected solutions** that can strengthen the City's ability to anticipate, prepare for, respond to and recover from major stresses and shocks.

Asset Category SMEs / Other Support Services:

Roads
Alex Meitin, PE

Bridges
Randy Mock, PE

Seawalls
Max Mozo, PE

Stormwater
Mitch Griffin, PE

Urban Planning
Sarah Marrs, PLA, ASLA, LEED

Landscape Architect
Matt Friesen , PLA, AICP, CNUa, LEED AP

Ecological Systems
Rick Gorsira , ENV SP

Airports
John Jackson RA, LEED AP

Building Structural
Velvet Bridges, PE

Affordable Housing
Jonathan Bartlett, CRE

Renewable Energy
Erin Morrison, MSCEE

Potable Water Supply/ Distribution
Jennifer Baldwin, PhD, PE

Food Availability
Vincent Testa, PE, CCM

CIP development
Jaason Englesmith

Website Development & Graphics Design
Jim Kessler

WWTP & Natural Treatment Systems
Rafael Vasquez Burney, PE

One Water solutions
Susan Butler

We interviewed Jason to share some of his thoughts on your project, resilience, and his past experiences.

Spotlight on our Project Director

Jason Bird, CFM is a **native Florida resident** with a background well-suited to serve the City. His expertise in **developing climate and natural hazard adaptation plans, policies, and design standards in support of community resilience,** along with his involvement in previous City projects, including the Stormwater Masterplan update, the Sea Level Rise Policy, the Post Disaster Response and Recovery Plan, and the Southeast Florida Regional Climate Change Compact's Resilient Redesign project, will provide an important linkage to the work completed to date and help the team achieve the City's resilience goals. **Jason provides a clear picture of project success and brings the skills to deliver**. With his methodical nature and deep domain expertise in resilience, he will align the team on planning, policy and design objectives in support of successful Plan delivery to guide the City on its resilience journey.

Jason's strong history leading projects with a focus on sustainability and resilience within Florida and for other coastal communities, along with his vast experience of infrastructure and detailed knowledge of sustainability and adaptation strategies, **ties to 10 of your selection criteria —making him ideal to steer your project** and provide the most thorough assessment to best prepare the City for an uncertain climate future.

Q1 What interests you the most about this project? Or What about this project do you find most compelling?

A What most interests me about this project is the magnitude of the challenge associated with **protecting the lifestyle and culture in Key West**—a unique and special place, at the forefront in the fight against climate change. Key West is at a crossroads where the **right decisions must be made to support long-term viability of** the City. The country and world are watching as the City charts a new path forward and lays the groundwork for many other coastal communities to follow. The legacy of this project and the fate of the City will be determined by our actions today, requiring **an unwavering commitment to finding solutions using industry leading innovation** brought to the City by the world's largest, industry leading planning and design team.

Our team is driven by these resilience projects that allow us to showcase our innovation and broad reaching capabilities, where we are truly able to live our motto of **"challenging today, reinventing tomorrow"** to the benefit of our communities and environment.

Q2 What prepared you for this role? How can your past work experience be transferred to this contract?

A From my 22 years of experience, I've learned what works and what doesn't. Starting a project with a **collaborative team to establish clear goals and objectives** is paramount to success. My involvement with **dozens of community-focused resilience adaptation plans** and other Key West projects has focused on design management, technical integration and coordinating work products produced by multiple technical teams. These efforts involved working with external parties, including consultants, contractors, City officials and technical staff, stakeholders, and community members to support various design interfaces to address cross-disciplinary issues. **I know how to integrate other consultants into the program** as they come on board and how they support the broader project objectives.

Q3 How can we transform severe weather challenges into resilience and climate adaptation action?

A There is an urgent need to act on the ever-changing and increasing threats of climate change to protect assets, people, communities and the environment. For action and implementation to be successful, we need to **completely understand the risks and how they evolve over time, support innovation and a proactive stance, grow partnerships and increase funding collaboration, and have a clear roadmap** to achieve project and community goals.

Q4 What is your philosophy on managing teams?

A **Communication and collaboration**. The whole is greater than the sum of its parts. We want to make sure people are not working in silos but **collaboratively with full knowledge** of other perspectives and toward a common goal. I also bring a unique perspective to the role with my diverse professional background and **big picture thinking** that supports multi-disciplinary team collaboration and visioning to meet or exceed project objectives for long-term value for our communities.

4 Company Information

4. Company Information

Becoming resilient means minimizing the impacts of climate change, addressing aging infrastructure, rethinking supply chain and regulations, addressing all aspects of health, and more. It also means increasing the capacity of individuals, communities, institutions, businesses, and systems to adapt and grow—no matter what difficulties arise.

About our Company: The Evolution of Jacobs

You may know us for our decades of leadership in engineering and design. Let's share a bit about our evolution. Jacobs acquired engineering firm CH2M to expand its environmental solutions and water footprint in 2017, and sold its oil and gas, mining, and chemicals business. Earlier this year, Jacobs Engineering transitioned to **Jacobs Solutions**, **to better align with our intelligence, infrastructure, cybersecurity, space portfolio, resilience, and sustainability.** This move is the latest part of a deeper strategy change at our company. CEO Steve Demetriou is committed to global infrastructure modernization, climate response, and the digitization of the industry as three multi-decade growth opportunities for the firm.

Jacobs will channel its expansive capabilities in **water, power, transportation, and environmental markets, and tap resiliency experts to bring forward bold solutions** (Exhibit 4-1). Our team also includes public engagement, social equity, economic, and historical preservation experts so that those solutions honor the history and beauty of Key West and reflect its residents and culture.

Our 55,000 multidisciplinary professionals in 400 communities around the globe are excited about these developments focused on the future. With more than 4,000 employees that call the Sunshine State home, the Jacobs Resilience Center of Excellence is located in Florida—supported by our firmwide top resilience leaders: **Jason Bird, CFM,** and **Susy Torriente**. We're bringing our **top resilience leaders to this project** and we will share best practices and lessons learned to date from other coastal and island communities. We are at the forefront of water and climate resilience, with over 3,000 specialists who work worldwide to help our clients' infrastructure and communities stay safe, resilient, and adaptable to change. We are committed to providing you with a long-term trusted partner that can help you get this important resilience implementation plan ready for future generations. Exhibit 4-2 features some of our key recognitions and awards for our exemplary work.

Exhibit 4-1. Our 3 Focus Areas Underpin our Markets and Transform the World

Exhibit 4-2. Jacobs does not use the phrase "Industry Leader" lightly, we're recognized by our employees and peers

Industry Leadership and Commitment to Inclusion & Diversity

ENR RANKINGS — ***Ranked #1*** *ENR's Top Design Firms List for the* ***5th*** *consecutive year*

Received **100%** score on the **Best Places to Work** for LGBTQ Equality by Human Rights Campaign Foundation's Corporate Equality Index for **3 years** running

Recognized Leader in Climate Change Resilience by *Environmental Business International (EBI)*

In April 2022, Jacobs received **6** business achievement awards for leadership and outstanding performance in:

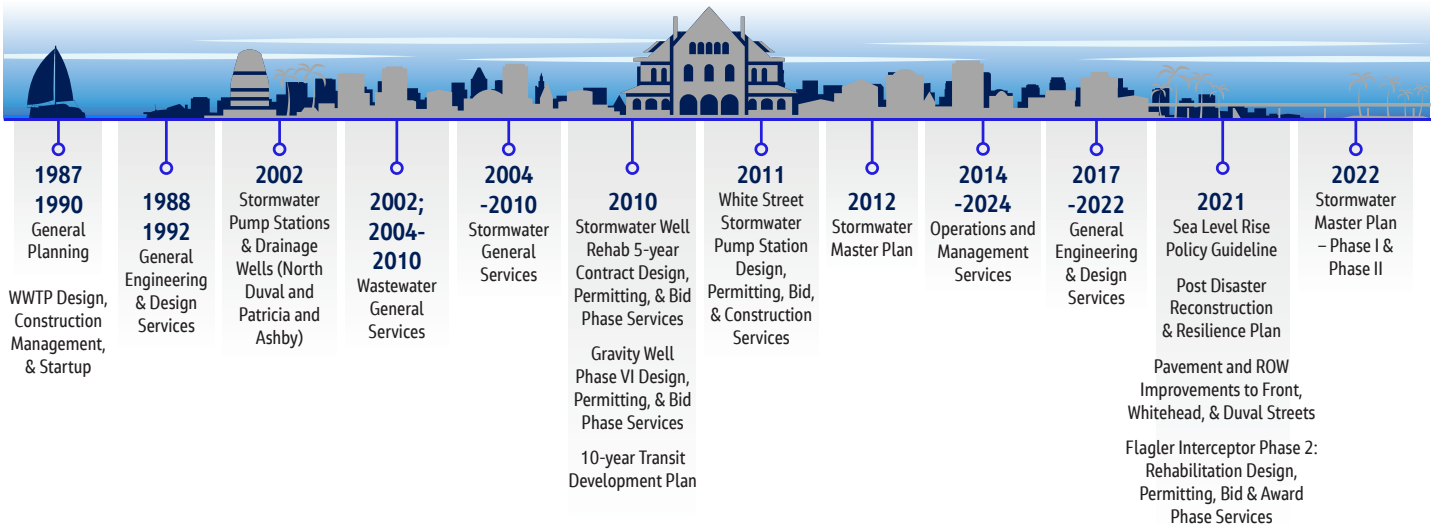
- ☑ **Climate Change Adaptation and Resilience**
- ☑ **Climate Response and Sustainability Consulting**
- ☑ **Sustainable Business Practices**
- ☑ **Greenhouse Gas (GHG) Mitigation**
- ☑ **Climate Technology**
- ☑ **Jacobs' STEAM Education Program**

For the last **10 years**, Jacobs has been the recipient of these annual awards, administered by two leading business intelligence sources in the environmental industry: *Environmental Business Journal* and *Climate Change Business Journal.*

Vested in Key West

This project requires a team with longevity and familiarity working with you—a team that understands the unique culture and history of Key West. Having worked with the City since 1987, **we bring extensive insight into Key West's goals and a comprehensive understanding of your underground utilities, unique challenges, and need to protect the City from SLR and storm surge** (Exhibit 4-3). In fact, since 2018, hundreds of Jacobs' staff have worked on Key West projects in one capacity or another across project types, including stormwater master planning and design, roadway and drainage engineering, wastewater plant improvements, solid waste and coastal facilities, post-disaster recovery planning, and SLR policy development. With this experience, **we've built trust with you** and we're sensitive to this project's unique historic, cultural, and environmental needs. Also, as an industry leader in developing place-based responses, optimizing environmental quality, social equity, and economic vitality, we bring a **long-standing commitment to environmental stewardship** and our resulting **reputation for responsible, savvy solutions** to develop climate change resilience and sustainable urban infrastructure.

Exhibit 4-3. Our history working with the City.



Our Teaming Partners

Jacobs often partners with small business enterprises (SBEs) in meaningful project participation roles to help grow their capabilities and footprint, and to make certain that we can meet our clients' project needs. We embrace the City's inclusion of **women and minority owned businesses (W/MBEs)** and we agree that **building a diverse and sustainable workforce is good for everyone**. Given the aggressive schedule due to the federal funding requirements, we've engaged four subconsultants (Exhibit 4-4), including a W/MBE—**ADEPT Strategy & Public Relations**—to complement our in-house resources. Most of our teaming partners maintain a presence in South Florida—enabling us to effectively and responsively complete this project and affirm our personal commitment to Key West and the local community.

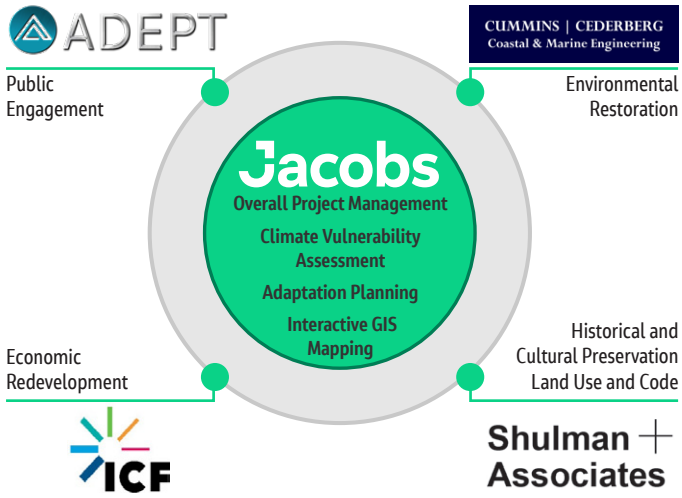
Criteria

11

Women- and Minority-Owned Businesses

On the following page, several **green selection criteria icons** appear by each teaming partner's company profile—indicating their experience with the project scope of services and adaptation chapters.

Exhibit 4-4. The Jacobs team promotes a "one team" philosophy that supports collaboration, communication, and synergy between all firms.



Our subconsultants are integral partners to the success of this project

Shulman + Associates

Historical and Cultural Preservation / Land Use and Code

Selection Criteria Experience: 1 2 3 4 5 6 7 8 9 10 11

Rationale for Selection: Founded in 1996, S+A is a nimble, innovative studio deeply rooted in South Florida— with six architects and designers and led by principals' Allan Shulman and Rebecca Stanier-Shulman. This award-winning **design, planning and preservation** firm has been on the forefront of resilience planning and design in historic districts, recently **partnering with municipalities** to reconcile competing priorities **(assessing 200,000 historic buildings for Miami-Dade County)**. S+A has served as principal investigator for multiple national register districts; has **written over 100 historic resources reports**; and has been honored with **95 design and preservation awards**.

Relevant Project Experience:

- City of Miami Beach, Buoyant City: Historic District Resiliency and Adaptation Guidelines
- Miami Dade County, Resilient Rehab: A Guide to Historic Buildings in Miami-Dade County

ADEPT

Public Engagement

Selection Criteria Experience: 1 2 3 4 5 6 7 8 9 10 11

Rationale for Selection: Headquartered in **South Florida**, ADEPT is a **certified SBE and W/MBE** firm with nearly a **decade** of branding, marketing, advertising, and communication experience with local governments and agencies. ADEPT offers expertise in **public outreach/involvement**, economic development, government and public affairs, social media and digital marketing. This broad range of experience allows ADEPT to provide a better outlook on economic, political and social dynamics that influences the constituencies. Specifically, ADEPT has been your **marketing partner and collaborator** for the past six years on two successful contracts—soliciting feedback from the City and gaining **first-hand-knowledge of Key West's people**, visitors, traditions and nuances.

Relevant Project Experience:

- City of Key West, Key West Historic Seaport & Garrison Bight Tourism Impact Study
- Broward County 100-Year Flood Map Project & Covid-19 Vaccine Outreach
- City of Marathon Quay Tourism Impact

CUMMINS | CEDERBERG Coastal & Marine Engineering

Environmental Restoration

Selection Criteria Experience: 1 2 3 4 5 6 7 8 9 10 11

Rationale for Selection: Since its founding in 2010, Cummins Cederberg—a **certified SBE**—has successfully grown into a leading engineering firm with involvement in more than **500 complex coastal environments and marine engineering projects** throughout Florida, including Monroe County, and the Caribbean. Their marine biologists and regulatory experts provide **unparalleled experience in local, state, and federal coastal permitting, mitigation design** and monitoring, NEPA documentation, and Endangered Species Act Section 7 consultation—providing a thorough understanding of the multiple facets of a project and interdependency of decisions made along the way.

Relevant Project Experience:

- Apalachee Regional Planning Council, Vulnerability Assessment
- FDOT D1, Roadmap to Resilience
- Miami-Dade County-wide Waterfront Park Vulnerability Assessment

ICF

Economic Redevelopment

Selection Criteria Experience: 1 2 3 4 5 6 7 8 9 10 11

Rationale for Selection: Founded in 1969 with over **9,000 professionals**, ICF is one of the world's largest climate consultancies with unmatched climate vulnerability and resilience expertise with **cutting-edge economic analysis** capabilities to help clients navigate change and shape their future. ICF has **50+ years of experience** estimating the economic impacts of business and tourism disruptions based on damage from coastal flooding, sea level rise, and hurricanes. This firm has led numerous projects ranging from the Fourth National Climate Assessment to an analysis of the business case for the City of Miami Beach stormwater resilience program. **We've also worked with ICF on the 1st phase Port of San Francisco's Waterfront Resilience Program**—a 10-year program to improve safety, reduce damage, and enhance the environment along 7.5 miles of historic waterfront.

Relevant Project Experience:

- Business Case Analysis for the City of Miami Beach Stormwater Resilience Program
- Port of San Francisco Waterfront Resilience Program Flood
- Multi-Basin Stormwater Assessments for the City of Naples

5 Methodology, Approach, and Timeline

5. Methodology, Approach, and Timeline

Building on previous work, the Jacobs team will **quickly develop an organized, prioritized, and actionable comprehensive adaptation plan** that will guide planning and investment to protect your historic community, critical infrastructure, and residents. The plan will rely on a robust public engagement process and a data-driven approach to analyze threats and provide strategies, projects, and policies at both the regional and community level.

This is a **transformational project** for the City. It must go beyond delivering a Comprehensive Climate Adaptation and Resilience Implementation Plan to support institutionalizing resilience into the City's fabric. We will leverage our leadership position in climate adaptation including contributions from our **QA/QC Lead, Laurens van der Tak,** to the EPA's Resilience Guidebook.

Project Methodology and Program Approach

The most successful climate adaptation plans start with a clear and unified vision that is institutionalized into the City's fabric through robust public engagement. The visioning process begins with establishing a comprehensive public engagement plan to develop trusted relationships with all stakeholders. This process also includes presenting stakeholders (City, Steering Committee, Working Groups, and other community members) with a thorough understanding of climate science, data, and potential infrastructure impacts. We have already started this process through recent projects that have shown how science-based data, combined with stakeholder insight, effectively guide the analysis of hazard exposure, sensitivity, adaptive capacity, and risk, including development of effective and equitable solutions. Our approach doesn't stop there; our goal is to build on the data we have already developed to help you advance the City's resilience to the next level. This process includes training staff, updating procurement rules, updating standard operating procedures, and aligning annual budget activities and capital improvement plans focusing first on the objectives in your *Key West Forward 2024 Strategic Plan* while also looking at scenarios for 2100 and beyond so early decisions don't preclude long-term solutions.

Our **approach leverages a human-centered process to co-create and co-design solutions** that are data driven to provide multi-benefit solutions that meet long-term program goals **(Exhibit 5-1).** Our approach is organized in five main phases:

1) **ALIGN** to a vision through early engagement where we **listen** and **learn** from stakeholders who provide valuable insight that will help identify project needs and confirm project elements.

2-3) **DISCOVER** and **DEFINE** the threats and risks during data collection and review during the climate vulnerability assessment (CVA).

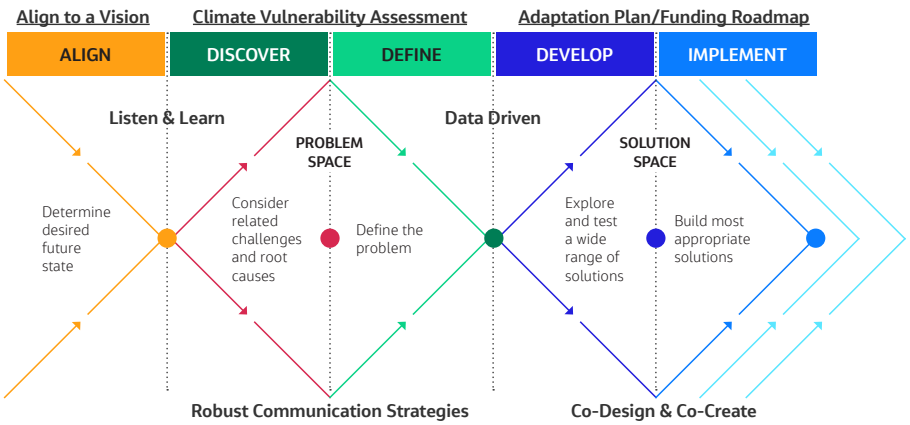
4) **DEVELOP** the Adaptation Plan chapters through robust communication with the City and stakeholders and with the effective use of tools to co-design and co-create the strategies, projects, and funding.

5) **IMPLEMENT** to help you monitor, measure, adjust, and repeat the process as needed via interactive mapping platform to make informed decisions based on real-time data.

Our implementation pathway philosophy allows us to strengthen, adapt, and envision the future of Key West so that early decisions will not preclude future solutions. Throughout this process the team must be **curious and unafraid** to explore innovation and all viable options and rely on a **data-driven** process to inform strategies, projects, and policies using science and best engineering practices.

Exhibit 5-1. Human-Centered Design Process to Develop Effective, Collaborative Solutions

Our approach is **grounded in human-centered design,** a problem-solving technique that puts people at the center of the development process for outcomes tailored to community needs.



We will leverage our **proven project management processes** and recent delivery of the SLR Policy Guideline and Post-Disaster Recovery and Reconstruction Plan (PDRRP) projects to avoid learning curves and begin work immediately. **Project Director, Jason Bird, CFM, and Project Manager, Elaine Tolon, PE,** will work closely together to deliver this project on time and within budget. Elaine will confirm that we comply with the reporting requirements for the Florida Department of Economic Opportunity (FDEO) and Florida Department of Environmental Protection (FDEP) grants. This process aligns us with the City team and project team expectations, defines project objectives and successful outcomes, and identifies public and external stakeholders as part of the engagement plan—including roles and responsibilities of the Steering Committee and Chapter Work Groups. The process also establishes project focus areas and hazards and planning horizons to be evaluated, above and beyond the minimum state requirements to support ongoing and planned City initiatives, capital plans, and policies.

Elaine Tolon, PE - Project Manager

Ingredients for successful project management

- Knows that an effective visioning process and frequent communication provides the path to success.
- Will quickly mobilize all team members and operational resources to review the scope of work, schedule (including key milestones), and project team and communication protocols, and deliverables schedule.
- Confirm project goals and commit to schedule and budget—creating the schedule and routines for deliverables and invoicing.

Public Engagement Plan

Criteria

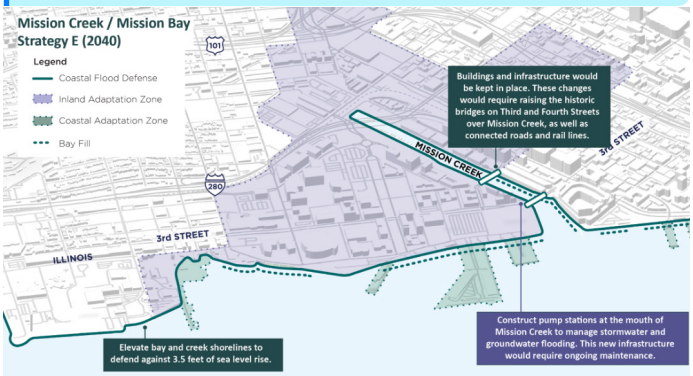
9 Public Facilitation/ Engagement

11 Women- and Minority-Owned Businesses

To be successful the visioning framework must be carried throughout the project and be based on a robust public engagement plan. The Jacobs team, through **local M/WBE, ADEPT,** will lead the public engagement process, a critical component in our human-centered design process. **Dana Pollitt** and his team have 20 years of experience in the Keys and have supported the City on two key projects for over 6 years. We will leverage their local knowledge, experience, connections, and current work to optimize feedback. Our engagement strategies are both methodical and practical – based on science and community needs and meeting people where they live, work, and play. The stakeholder details will be mapped during our visioning sessions. Together, we will identify individuals and groups, establish goals, determine tactics, and commit to a timeline to meet grant requirements and maximize input. We have found that continuous stakeholder engagement and community participation will enhance preparedness, trust, and resilience. With extensive experience in grants and public engagement on recent similar resilience projects such as Miami Beach, Tampa, Los Angeles, and New York City, we will meet or exceed all the requirements of the RFQ. Highlights of our approach include:

- Plan for the early engagement of resident and business owners where we **LISTEN and LEARN** to help inform the vision and adaptation plan based on their lived experience and rich island history. Continued engagement during the data collection and analysis phase allows the team to **DISCOVER and DEFINE** the **risks** and **validate findings** and observations to **complement strategy** and project development for each chapter.
- Establish working groups of internal and external stakeholders paired with subject matter experts from the Jacobs' team to help identify appropriate adaptation strategies, refine and prioritize projects, and develop the companion funding roadmap for implementation.
- Use a **digital approach**, in addition to the suggested number of meetings in the RFQ, to attain greater engagement (e.g., **newsletter/email, social media, and digital marketing/online survey/direct mailers**). It will promote involvement from Key West seasonal residents, business owners, adjacent communities, and other members of the community who may not be able to regularly participate in person.
- Develop and publish an interactive tool that uses story maps across a variety of threats and timelines to provide easy to understand data that better engages and informs stakeholders.
- Use our **well-defined engagement plan** with internal stakeholders (City staff) from the Sea Level Rise Policy, PDRRP, and Naval Air Station Key West (NASKW) Military Installation Resilience Review (MIRR) project to support strategy and project development.

Example story map from our San Francisco Waterfront Resiliency Program that uses layers to clearly summarize multiple threats under different scenarios. *https://storymaps.arcgis.com/stories/1ed3561c936244f2979ad68cda6a681a*



Robust public engagement will help **crystallize the community's vision** for the future and ensure **transparency and build trust**.

Exhibit 5-2. Climate Vulnerability Assessment Key Elements

Discover	
Vulnerability Assessment	Risk Analysis
• Asset criticality • Exposure • Sensitivity • Adaptive Capacity • Map outputs	• Likelihood and consequence • Qualified in dollar terms • Consequence matrix • Map outputs

Our CVA process has been successfully used to **guide dozens of vulnerability assessments** to identify risks from climate and natural hazards for other coastal communities including the recent **NASKW MIRR project.** A key output will be a user friendly, public facing, interactive map illustrating vulnerabilities, risks, including focus areas, and adaptation strategies.

Key vulnerabilities facing Key West include:

- Shoreline erosion
- Road flooding with rainfall and high tide
- Single entrance access points
- Encroachment along canals
- Traffic and blocked access on highway during accidents
- Damage to potable water distribution
- Aging electric infrastructure
- Risk to electrical lines or bridge
- Peaker plant insufficient to power hospital
- Heat affects personnel
- Staff retention due to housing costs
- Water supply source
- Supply chain disruption
- Iguanas burrowing

Climate Vulnerability Assessment (CVA)

Criteria 1

Climate Vulnerability Assessment

Our assessments include a robust, action-oriented framework that meets state funding requirements and capital project prioritization, while supporting enterprise operational and community resilience. Exhibit 5-2 summarizes the key elements of the CVA, at a glance. The JacobsWe value the first visioning and goal setting step that aligns with the Florida Adaptation Planning Guidebook and the State Standardized Vulnerability Assessment Scope of Work Guidance. **Kerstin Kenty, PhD, PE, PMP, ENV SP, CFM**, our experienced vulnerability analysis lead, will guide the team to define the threats to be addressed. She will take the results of the CVA and quantify risks in dollar terms based on likelihood and consequence of impacts associated with the identified vulnerabilities. This analysis will define costs associated with infrastructure system impacts, with qualitative considerations for indirect impacts such as loss of business revenue. This analysis will support capital project prioritization and provide the economic framework to support future grant applications. The quantified risk values will be used as the benefits, or avoided costs associated with the implementation of adaptation actions, for the benefit/cost analysis.

Comprehensive Data Collection and Analysis to Identify Threats and Vulnerabilities

The City's strategic plan and the eight plan chapters identified in the grant and RFQ thoughtfully define the important asset/societal categories and infrastructure systems and state guidance provides the framework. The assessment will benefit from the latest available climate science, asset management, capital plans, policies, and City operations to better inform the analysis and resulting Adaptation Plan. We will also leverage the data from our recently completed South Florida MIRR assessment at NASKW to expedite identification of threats as well as data available from review of previous City, county, and state data. Our team is experienced in applying the state required climate projections for sea level rise and future conditions (2040 and 2070), at a minimum, and 2100 for county alignment. We understand current flood vulnerabilities and how they will evolve over time to support the right investment at the right time to mitigate risk and support the future of Key West. We will evaluate **exposure, sensitivity, and adaptive capacity** of current and future threats (shocks and stressors) to identify immediate needs, near term actions, and longer terms strategies. A gap analysis will be performed of the existing available data and information and a plan to address any identified data gaps to support this vulnerability assessment and adaptation plan. Using this data, we will consider a range of design/operational guidelines, nature-based strategies, code modification, adaptation action area development, and educational approaches.

Data-Driven Approach Using Proven Tools

The Jacobs team will collaborate with City staff during the CVA to identify the appropriate scale and functional needs of a software platform. We will provide a platform that provides multiple levels of output for both public and internal use. Public facing data will be more educational and informative and a secure set of project management data will also be available for the City that may contain sensitive information such as utility data, priority neighborhoods, and project prioritization. We will advise and integrate data into an existing off-the-shelf software platform or develop a custom designed solution to best meet the City's needs. Our unique Kaleidoscope *(https://www.jacobs.com/technology/kaleidoscope)* platform uses spatial analytics to assess vulnerabilities in various types of infrastructure, including energy, transportation, water, sanitation, stormwater, and communication. The tool is able to identify areas that are most vulnerable to failure and who/what will be impacted from failure. This provides a big-picture view of the city's infrastructure and supports informed decisions to efficiently and equitably allocate resources. Kaleidoscope is an easy-to-use web app, ideal for non-technical users, providing actionable information on the location, condition, and vulnerability of assets. An example menu of tools we will consider for both analysis and implementation is discussed in Section 5.5 Interactive Mapping, along with additional data on our Kaleidoscope software.

Hazard mitigation, adaptation strategies, solutions data, tools, models, and analysis, coupled with real-life examples, tell the story of current conditions, future threats and adaptation solutions. Based on the identified vulnerabilities and quantified risk for each sector, we will focus on those strategies that align with a 10-year Capital Improvement Program (CIP) planning horizon and develop a series of hazard mitigation and adaptation strategies focused on those most suitable to achieve project objectives and specific community goals. For each chapter we'll consider how the strategies may be integrated with those from other chapters to support place-based holistic solutions with multiple benefits. Each strategy will be evaluated against a series of performance metrics developed to meet City objectives and challenges with funding and implementation.

We will evaluate and prioritize hazard mitigation and adaptation actions within each sector. We will conduct an economic analysis for recommended projects to verify they provide a positive benefit cost ratio to garner City leadership support and grant funding eligibility. These adaptation actions will be prioritized by implementation timeframe to support state grant funding application cycles to expedite critical project implementation. Applicable design standards, local and state policies, and related operational guidance, including the Local Mitigation Strategy, Emergency Response Plans, Disaster Recovery Plans, and Comprehensive Plan, will be included to support future capital investment.

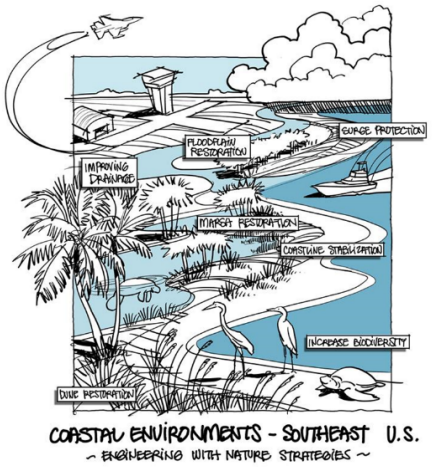
Exhibit 5-3 provides some example ideas that convert some of the City's biggest challenges into opportunities including traditional engineering and nature-based solutions that protect historical assets, environment, and community health. We will work closely with you throughout the process to develop solutions like these to protect and preserve your community today and for the future.

Exhibit 5-3. Converting Challenges to Opportunities

1. DoD & WWTP Access
2. Intersection Flooding
3. Solid Waste Management
4. Traffic Congestion
5. Neighborhood Flooding
6. Affordable Housing & Social Equity
7. Water & Electric Supply via Mainland
8. Vector Management
9. Sea Walls & Surge Protection
10. Airport Flooding
11. FDOT Coordination
12. Shoreline Erosion A1A
13. High Repetitive Loss Neighborhood
14. Tourism Impacts
15. Historic Property Preservation
16. Mobility & Pedestrian Safety
17. Historic District Flooding
18. Stormwater Pump Station Outfalls & Water Quality
19. Business District Impacts

Exhibit 5-4. Adaptation Plan Key Elements

Define & Develop	Implement
Strategy Development & Prioritization	**Adaption Action Plan Implementation Roadmap**
• By asset type • Aligned with 8 chapters • ROM cost est • BCA • Green & gray infrastructure	• Action oriented • Funding strategy • Policy enhancements • 10-yr CIP • Plan maintenance & updates



We will apply a strong focus on nature-based solutions as we develop the top priority projects

As part of our Tyndall project, we developed a living master plan that is web-based with integrated and interactive mapping to facilitate engagement and implementation. (*www.tyndallifs.com*)

Creating a Comprehensive Integrated Adaptation Plan

Criteria 2 — Adaptation Plans

Approach to Plan Development – Collaborate and Communicate to Develop Integrated Solutions. An accessible, Final Adaptation Plan will be prepared (as noted in RFQ Goal 11) that fully integrates each chapter and aligns them with City objectives to guide the climate and natural hazard adaptation efforts. Exhibit 5-4 summarizes the key elements of the adaptation plan, at a glance. The plan will include steps to define and develop the prioritization of projects and create a roadmap for implementation and funding. This plan will be developed under the direction of a single **Adaptation Plan Lead, Susy Torriente.** She's been there, done that and will coordinate this task like an ACM and chief resilience officer. Susy will leverage and build on her experience as assistant city manager to develop a clear vison for the community.

Susy Torriente - Adaptation Plan Lead

- Spent 17 years as a South Florida assistant county/city manager overseeing large departments focusing on operationalizing resilience and climate adaptation in local government policies, plans, projects, and budgets in similar coastal communities.
- 10-years of practical experience with developing adaptation plans, including the *Miami Dade GreenPrint, Resilient 305, Fast Forward Fort Lauderdale*, and the first two south east Florida Regional Climate Action Plans.
- Will lead our multi-disciplinary team of SMEs and dedicated working groups to enhance information sharing and leverage project opportunities between chapters.

Chapter leads will not work in silos; teams will collaborate on best practices and share information. Additionally, as priority projects are developed for each chapter, they will be evaluated against City-wide needs to develop the master list of capital projects combining elements of all eight chapters to inform funding and financing over a 10-year budget cycle (RFQ task 11.2); see project timeline for more information. Our team will co-create a prioritization formula with you so that capital projects can be bundled to save time and money and reduce neighborhood disruption.

Approach to Chapter Development – Provide Expert and Local Knowledge to Create Community-Centric Solutions. Recognizing that each neighborhood will benefit from elements of all eight chapters, a system- thinking approach to project development and prioritization will identify and address interactions and dependencies that meet community needs for years to come. Cross-sector and neighborhood level adaptation actions will meet multiple City objectives, are aligned with all chapters, and promote broader community and environmental benefits while reducing project capital and operation and maintenance (O&M) costs. This place-based approach will inform actions to best integrate with the City-wide prioritized capital projects list and policy recommendations. We will review the various City plans using strikethrough and underline for ease of review and consideration. This will provide the City with a proactive stance to manage its infrastructure and community needs while reducing current and future risk that will drive down life-cycle costs and better position the City for economic prosperity. Our approach to developing each chapter is provided on the following pages.

Leveraging the interactions and dependency between chapters provides a **cost-effective roadmap** for high priority and multi-benefit projects

Chapter 1. Infrastructure Adaptation

Criteria **3**

Traditional Hardscape Engineering

Because Key West is at sea level, your critical horizontal and vertical assets including roads, bridges, buildings, sea barriers, water, wastewater, stormwater, electric power distribution, and communication systems face increasing threats from flooding, SLR, and extreme weather events. Our goal is to efficiently evaluate conditions, threat exposure, vulnerability, and risk to identify and prioritize corrective and adaptation actions to build resilience.

Approach Highlights

- Build on our team's extensive knowledge of City infrastructure to identify and evaluate vulnerable structures for hardening/elevation
- Conduct gap analysis/identify detailed assessments needed
- Use GIS and build on information from the City's asset management and capital programs
- Focus on critical infrastructure and system dependencies
- Leverage recent policy development and stakeholder engagement experience with the City to build on good work and relationships from recent collaboration and develop a vision for the PDRRP and traditional hard Infrastructure

Leveraging Our Team's Expertise including Policy and Resilient Redesign

- **SLR, Policy Development, and Resilient Redesign for the City:** We developed your SLR **policy and design guidance for roads, buildings, seawalls**, and other types of infrastructure and supported the City's resilient redesign of the airport and development of the PDRRP. Also leverage our work updating your Stormwater Masterplan as the City's stormwater engineer.
- **Traditional Engineering for City Improvements:** Design of roadway improvements at United and South Streets and drainage projects at Green/Elizabeth/Caroline Streets
- **Resilient Designs and Policies:** Tyndall AFB, Base of the Future

Project Showcase: Miami Beach Road Adaptation/Elevation, Miami Beach, FL. This adaptive traditional engineering and policy design project involves incorporating a complete street approach, including enhancements to pedestrian, bicycle and vehicular access, blue-green infrastructure for managing stormwater quantity and quality, streetscape aesthetics, traffic calming, urban forestation, and dry and wet utility replacement, while improving the road surface durability, elevation, and resilience to flooding.

Sunset Harbor Area, Pub Belly Restaurant (Credit: Amanda Ruggeri)

Chapter 2. Environmental Adaptation

Criteria **4**

Nature-Based Adaptation/ GI/LID

Corals, mangroves, and tropical hammocks currently offer resilience to severe weather impacts and SLR but may struggle to keep pace with rapidly advancing changes and experience spatial contraction. Our goal is to consider a range of currently used adaptation practices and emerging technologies that are environmentally beneficial to minimize impacts on sensitive aquatic and native habitats.

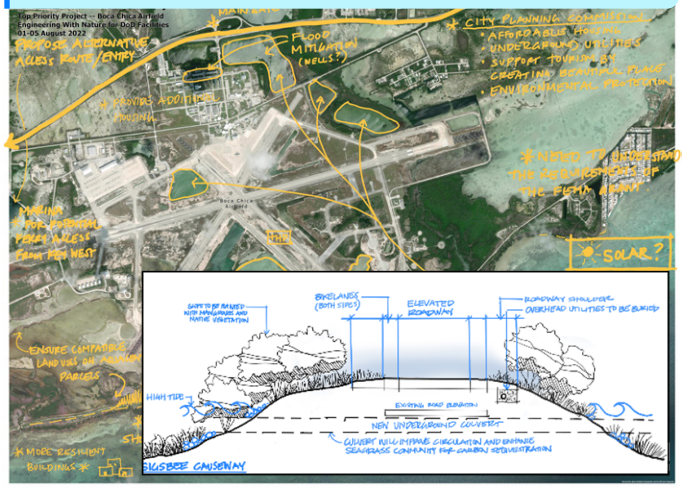
Approach Highlights

- Identify optimum locations for nature-based solutions
- Perform cost/ benefit analysis (i.e., eco-system services)
- Expand natural infrastructure strategies—intensive use of green space, beach nourishment, wider mangrove buffers, and coral reef enhancement to withstand stronger hurricanes
- Consider policies—marine zoning and regulations that target changing conditions, use patterns and emerging threats (such as conservation of sea grass bed communities, wetlands)
- Hardening to reduce erosion and partially attenuate waves
- Consider high adaptation measures/large-scale projects of significant scale such as beach dune systems, hard coastal protection, ecosystem-based adaptation, and relocation

Leveraging Our Team's Expertise, including Nature-Based Solutions

- **Innovative green infrastructure**—coral reefs and mangroves creation with The Nature Conservancy
- Partnering on **USACE's Engineering with Nature®** program
- Leveraging South Florida MIRR work at the NASKW

Project Showcase: South Florida Engineering with Nature (EWN) Pilot and MIRR Program, FL. Our team is currently providing nature-based pilot project development at the NASKW through the USACE Engineering with Nature program and in concert with regional stakeholders as part of the MIRR program, to enhance community and supporting infrastructure resilience for the military installation mission. This collaborative approach strengthens the public service reliability and community resilience.



Chapter 3. Land Use and Code Adaptation

Criteria
8

Policy Writing/ Guidance (LDRs & AAAs)

Resilience is not achieved just one project at time. It takes vision, leadership, and policy to institutionalize resilience in the fabric of government operations to develop resilient projects. Land use and planning are traditional tools to shape the built environment. Together with governance tools and community support, these policies will shape the Keys for generations. Our goal is to leverage these policies to guide community action and modernize policy to institutionalize resilience in design, construction, and renovation of the built environment.

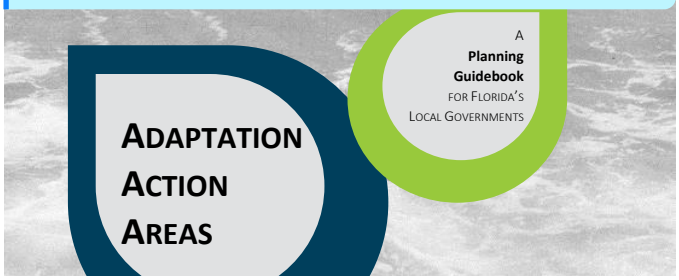
Approach Highlights

- Research best practices in resilient land use and future land use maps in coastal island communities, as well as areas such as New York City adapting to climate change
- Identify and understand barriers to resilience in the planning, permitting, and building process
- Collaborate with other chapter leads to identify opportunities in the comprehensive plan and land use regulations
- Align the City's vision and operational requirements to make this a priority for future actions
- Interview stakeholders and staff experienced in the development process to identify opportunities to modernize and streamline
- Develop resilience standards for stakeholder input

Leveraging Our Expertise

- Miami Beach Land Development Regulations Resilience Amendments – green building, freeboard, seawall, urban heat island and more
- Fort Lauderdale - Comprehensive Plan, Coastal Element Development
- Fairfield Forward Comprehensive Plan and Future Land Use Map, Fairfield, OH
- Norcross Unified Development Code, Norcross, GA
- Smithsonian Marine Station Climate Adaptation Planning, Ft. Pierce, FL
- Hurricane Maria and Irma Recovery, St. Juan, Puerto Rico; St. Croix, U.S. Virgin Islands

Project Showcase: State of Florida Adaptation Action Areas Guidebook, Fort Lauderdale Case Study – developing AAA's in the Comp Plan and Capital Improvement Program budget. Susy was assistant city manager at Fort Lauderdale when she secured a state grant with Broward County and the regional planning council to pilot AAAs in the city Comprehensive Plan and capital budget. This was an early case study and model for other Florida cities.



Chapter 4. Historical and Cultural Adaptation

Criteria
5

Historic & Cultural Preservation

Historic preservation recognizes and enhances architecture and culture, streetscape, and setting allowing for necessary adaptations to climate change. We will consider a wide range of vulnerabilities, financial capabilities, cultural expressions, property uses, and building types. We will also recommend climate change and resilience solutions that retain the unmistakable character of historic Key West.

Approach Highlights

- Develop a robust public engagement plan to learn what the community values most in the culture and historic built environment
- Study building types/construction technology/building forms
- Understand water/sea level rise in the local context and explore equation of water versus building type
- Create a current conditions study through photographs/analytical drawings/urban framework/distribution of building types
- Study integration of streetscape/landscape/architecture
- Study best practices and feasibility of adaptation of historic buildings and districts, living with water, elevating historic buildings and districts, and landscape/green infrastructure
- Develop resilience approaches and strategies for adaptation: general, mid- and long-term, landscape (with others), and streetscape
- Create a new Historic Preservation and Resilience Framework
- Develop recommendations for the intersection between historic preservation and resilience
- Create Historic Preservation and Resilience Guidelines organized by building type and adaptation strategy

Leveraging Our Team's Expertise (S+A)

- *Resilient Rehab: A Guide to Historic Buildings in Miami-Dade County,* a grant-funded project for the Office of Historic Preservation completed and implemented in 2021
- *Heritage Survey*, documenting historic buildings and sites (1941-1981), a County-funded project for Miami-Dade County OHP

Project Showcase: Buoyant City: Historic District Resilience and Adaptation Guidelines, Miami Beach, FL. This first-of-its-kind, award-winning, grant-funded project argues that Miami Beach's historic districts should be preserved, must evolve to survive, and that preservation can be redeployed as a powerful adaptive tool. Immediate, mid-, and Long-term strategies were explored over 60 years. Using a typological approach, we ultimately recommended two strategies and a series of general recommendations, as well as specific guidelines including cost estimates for each building type.

Chapter 5. Power and Water Adaptation

Criteria 3

Traditional Hardscape Engineering

Power and water utilities serving the community have addressed many current high-priority threats and have award-winning reliability. We will use this strong baseline of system reliability to focus on long-term risk reduction, local generation feasibility, enabling policies, future design standards, resilience, 100% renewable energy, and sustainable local water sources.

Approach Highlights

- Identify key projects that provide essential public safety services beyond a target number of days of utility outages
- Develop a One Water approach to water resources management to build on existing conservation and policy efforts and focus projects that achieve multiple benefits
- Identify actions to alleviate energy and water burden for vulnerable residents and business; align adaptation strategies to meet 100% renewable energy goals
- Implement a staff training program to build understanding, technical capacity, and clarity of project responsibility of energy and water resilience coordination to achieve clean energy transition goals
- Build off existing risk and resilience assessments and 10-year site plans. Enhance the SAIDI and SAIFI reliability indices and cyber security protocols with SCADA, and other monitoring and control systems
- Conduct a funding workshop to focus priorities with FMPA, KEYS, FDEP, FEMA, SFWMD, FKAA, DOE, and the FL Public Service Commission where appropriate

Leveraging Our Expertise

- **Engineering and O&M Support to the City for over 30 years.** We are your operations and engineering partner for the WWTP and provided engineering and planning under multiple GEC contracts providing an unparalleled understanding of your infrastructure.
- **Policy and Planning Guidance:** SLR Policy and Design Guidance Document, PDRRP, and City's Stormwater Master Plan Update
- **CVAs:** Enhanced engineering design standards, and construction project execution for power and water utilities such as Miami Dade County, Fort Lauderdale, PG& E, Sonoma County, and New York City providing similar support for the City's power division

Project Showcase: **Wastewater/Water System Resilience Assessment Plan and Program, Jacksonville, FL.** Jacobs provided a comprehensive Resilience Plan for long-term reliability and resilience for potable water, wastewater, chilled water, and reclaimed water systems through identification of flood risk, development and prioritization of mitigation strategies, and the incorporation of aggressive design standards for future capital projects. JEA was so pleased that we are now providing similar support for the City's power division.

Chapter 6. Economic Adaptation

Criteria 6

Economic Redevelopment

Strengthening the City's resilience to natural disasters will help mitigate impacts to the local and regional economy, so that the livelihoods and way of life of local residents are able to bounce back after a disaster and that the local economy continues to thrive. We will evaluate the potential economic impacts from coastal flooding, sea level rise, and hurricanes, with particular attention to critical sectors of the local economy: small businesses, tourism, and utilities. We will develop a targeted adaptation strategy that provides a foundation for federal grant applications so that the City is well positioned to pursue federal funding for key initiatives and projects.

Approach Highlights

- Apply federal benefit-cost analysis methods to assess natural disaster impacts to the local economy, including physical damage, disruption time, and direct losses to economic output
- Employ economic modeling software such as HAZUS, IMPLAN, REMI, and RIMS to estimate how direct impacts to the Key West economy can impact related industries, wages, and other relevant factors among dependent industries throughout the regional economy
- Assess level of threat to critical industries (small businesses, tourism, and utilities) to inform strategy and prioritization

Leveraging Our Expertise

- Port of San Francisco Waterfront Resilience Program
- Critical Infrastructure Outages in the Economic Assessment of Adaptation Strategies for Coastal Flood Resilience Under Climate Change in South Florida, National Oceanic and Atmospheric Administration (NOAA) Climate Program Office FY2019
- EPA Office of Brownfield and Land Revitalization: Technical Assistance and Implementation Support for Area-Wide Planning (AWP) Communities
- Multi-Basin Stormwater Assessments for the City of Naples, FL

Project Showcase: **Business Case Analysis for the City of Miami Beach Stormwater Resilience Program, Miami Beach, FL.** A first-of-its-kind detailed analysis of the effectiveness of different flood-reduction scenarios (e.g., public investments of street raising, increased drainage, increased pump capacity and private investments) and their effects on property values, insurance premiums, city operational costs, and more. The goal is to highlight the cost-effectiveness—in terms of impacts on property damages, taxes, insurance payments, and tourism—of various mitigation strategies against the costs of inaction.

Chapter 7. Housing and Shelter Adaptation

Criteria
7
Community Adaptation (Housing/Health/ Social Wellness)

Affordable housing and sea level rise were identified as the community's top concerns in the *Key West Forward* Strategic Plan. The rise in popularity of Air BnB and VRBO has also impacted the availability and affordability of the housing for year-round, island residents. HUD and the state legislature are increasing the availability of funds, due in part to full funding of the Sadowski Trust Fund. Likewise, the state passed several pieces of legislation in support of home hardening and to address the current property insurance crisis. We will identify adaptation measures to develop resilient and affordable housing and shelter-in-place building standards that protect residents.

Approach Highlights

- Assess quality, type, and needs of individuals and families; distribution of and access to housing; and policies – such as shelter in place building standards
- A base case for current affordable housing and shelter and anticipated future demand
- Recommendations for resilience renovations
- Funding mechanisms to address shortages, potential property acquisitions, and renovations
- Policy recommendations that integrate resilience and sustainability standards and shelter in place building standards; construction options that meet floodproof and wind hardening standards
- Recommendations related to organizational need to develop safe and resilient housing, including partnerships and funding mechanism(s)
- Engage and educate community

Leveraging Our Expertise

- **NASKW MIRR** and **USACE EWN** projects included a task to identify affordable housing opportunities for military families.
- **Meridian Water, Multi-Use Development Project, North London**. We are helping create the data visualization platform and key performance indicator (KPI)-driven geodesign processes to support decision-making that will bring homes and jobs including affordable housing.
- Other cities and communities have introduced progressive policies, identified creative financing mechanisms, and leveraged federal and state programs to achieve their affordable housing objectives.

Project Showcase: **Former Hunters Point Naval Shipyard, San Francisco, CA.** This is a large redevelopment project in south San Francisco that provides affordable housing in a densely populated coastal area. Jacobs has been supporting preparing the properties for transfer and development, engaging with numerous local, state, and federal agencies and community groups. There is ongoing extensive community engagement in four languages.

Chapter 8. Health and Equity Adaptation

Criteria
7
Community Adaptation (Housing/Health/ Social Wellness)

Equity underpins every aspect of the plan, serving as a key variable integrated into assessment and planning. This chapter will address current and future vulnerabilities related to physical, behavioral, and social health and social equity. We will address and mitigate the potential for disproportionate impacts and maximize plan benefits.

Approach Highlights

- Assess vulnerability of residents and availability and access to public health, healthcare, and social services related to climate health-related impacts, including heat, mold, disease vectors, and stress
- Apply social vulnerability mapping tools and assess key social equity and wellness
- Leverage Simetrica, a subsidiary of Jacobs, with tools and processes that rank health, equity, and social value in CIP prioritization

Leveraging Our Expertise

- Jacobs is an industry leader in social, economic, and health equity and has successfully addressed and **helped clients with these initiatives for more than 35 years**. We've trained public and private sector organizations and multi-lateral international financial organizations in designing and implementing equitable infrastructure.
- **Gowanus Repowering Project, New York City.** We assessed environmental and social stressors and links to environmental health disparities, integrating climate change indicators and variables (heat vulnerability, access to air conditioning, and independent living indicators), and climate risks (risk from rising sea levels, an expanding floodplain and urban flooding, and higher temperatures) and social vulnerability criteria, including vulnerabilities to heat risk (energy cost burden).
- Key staff have completed assessments and plans in more than 40 countries, including collaborating closely with state departments of health to develop criteria to provide for social and health equity.

Project Showcase: **Joe's Creek Greenway Restoration and Trails Project, Pinellas County, FL.** Jacobs planned and designed a 4.1-mile corridor to provide connectivity, flood mitigation, and improved health and safety for a previously isolated and marginalized community that had been cut off to pedestrian access—blocking residents' ability to reach essential public transportation.

Interactive Mapping and Tools for CVA

Tools for Analysis and Implementation

Criteria
10

Interactive Maps

We know data is just data, and without context it can be difficult to make sense of it or use it effectively. Our goal will be to deliver a relevant and valuable mapping platform with a set of digital data that City staff can access, view, and interact with perpetually. **Shannon McElvaney** will lead this task with more than 28 years of experience in the use of geospatial technology and interactive mapping. If the City is looking for a single platform, it will be important to consider how to integrate data from multiple sources that allows it to be managed and accessed effectively. We will use the Esri-based platform to build on existing City data and mapping, with robust data management and user interfaces/dashboards to streamline and enhance user ability to review and analyze scenarios to inform decision making. Most of the suggested public GIS data and tools have been developed on the same platform making data integration, analysis, and publication easy, scalable, and cost effective. The GIS platform provides a range of tools for data management, analysis, and visualization, and can be configured to meet the specific needs of the City.

Shannon McElvaney - Interactive GIS Maps

- For the last 12 years, focused on applying geodesign to urban and regional planning efforts to help clients plan and design more sustainable, resilient built, and natural environments.
- Instrumental in the Tyndall Air Force Base project, where he led the spatial analytics and data visualization tasks including the use of our Kaleidoscope software to develop interactive maps and website content for decision making and communication.
- Believes in storing the data once and using it many times, as well as integrating imagery, datasets, and GIS layers into day-to-day City operations is critical.

We will use the best available data and analytical tools from both public and private sources to reveal vulnerabilities and propose design options. Our team members are well-versed with high security data from working with energy utility and Department of Defense clients. We will use the City's current procedures, procedures we know well to set any new requirements, metadata standards, access hierarchy, permissions, and restrictions early in the project planning phase. A **menu of example tools** is provided below using assets categories that mirror the eight chapters listed in the RFQ **(Exhibit 5-5)** as shown on the next page. This is just an example list of tools that could be used. The asset categories will be further refined within each chapter.

Our team's experience will ensure the **right tool** is used for each asset category/infrastructure system, to **expedite the analysis process** and **meet the aggressive project and grant deliverables schedule.**

Capabilities and Platforms Unique to Jacobs

We recognize that no one tool will meet all the needs for this project, but Kaleidoscope comes close. We propose to use our Kaleidoscope software *(https://www.jacobs.com/technology/kaleidoscope)* during both the analysis and implementation phases. **Kaleidoscope** was developed to **identify cross-sector vulnerabilities and interdependencies and develop a more accurate resilience score.** The tool's analytical engine is Esri-based and capable of incorporating data from a variety of formats from the listed sources to meet the specific needs and requirements of each task. The tool is also secure using Esri's username authentication. Kaleidoscope uses spatial analytics to calculate a resilience score with outputs in any format required. Once Kaleidoscope is launched, the geodatabase continues to keep track of the assets' original installation dates, thereby "aging" the assets naturally over time. You can also view the impact on existing infrastructure from various climate impacts such as SLR at an interval of your choosing (e.g., 2040, 2070, 2100). Any new capital projects can be incorporated, and the data updated on a frequency that best suits your needs. Typically, these updates are done bi-annually after the construction season, but they can be done as frequently as required, keeping your staff informed and on track as they progress toward a more resilient future. Any changes to natural hazard models can also be updated as they become available. Users can view multiple data layers and data sets, as well as aggregate and disaggregate vulnerabilities by asset type, threat type, time horizon and/or climate change model. It allows the user to zoom in and out to different geographic levels to examine vulnerabilities at different scales. It also has capability to assign permission levels to restrict access to sensitive data and protect the integrity of data sets. In short, it already has a majority of the features you desire (RFQ Section B.4 Interactive Mapping). Additional customizations can be built in this tool, or we can develop interactive mapping on any GIS platform the City desires including options with no additional licensing cost via City existing platform. **If the City determines that the Kaleidoscope platform would be beneficial for this project, the cost for licensing and usage is $15-20K per year depending on quantity of updates required, with an annual subscription.**

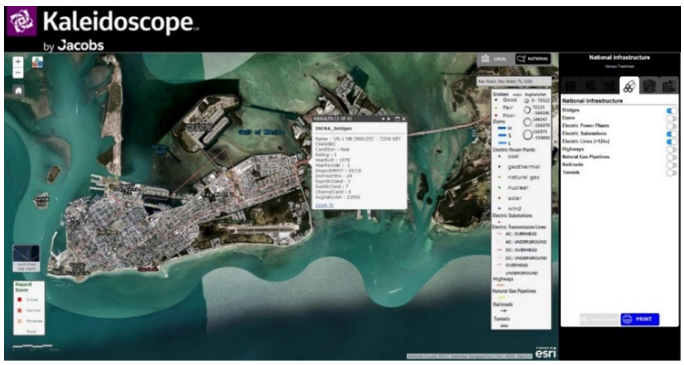


Exhibit 5-5 Menu of Example Tools for Analysis and Implementation

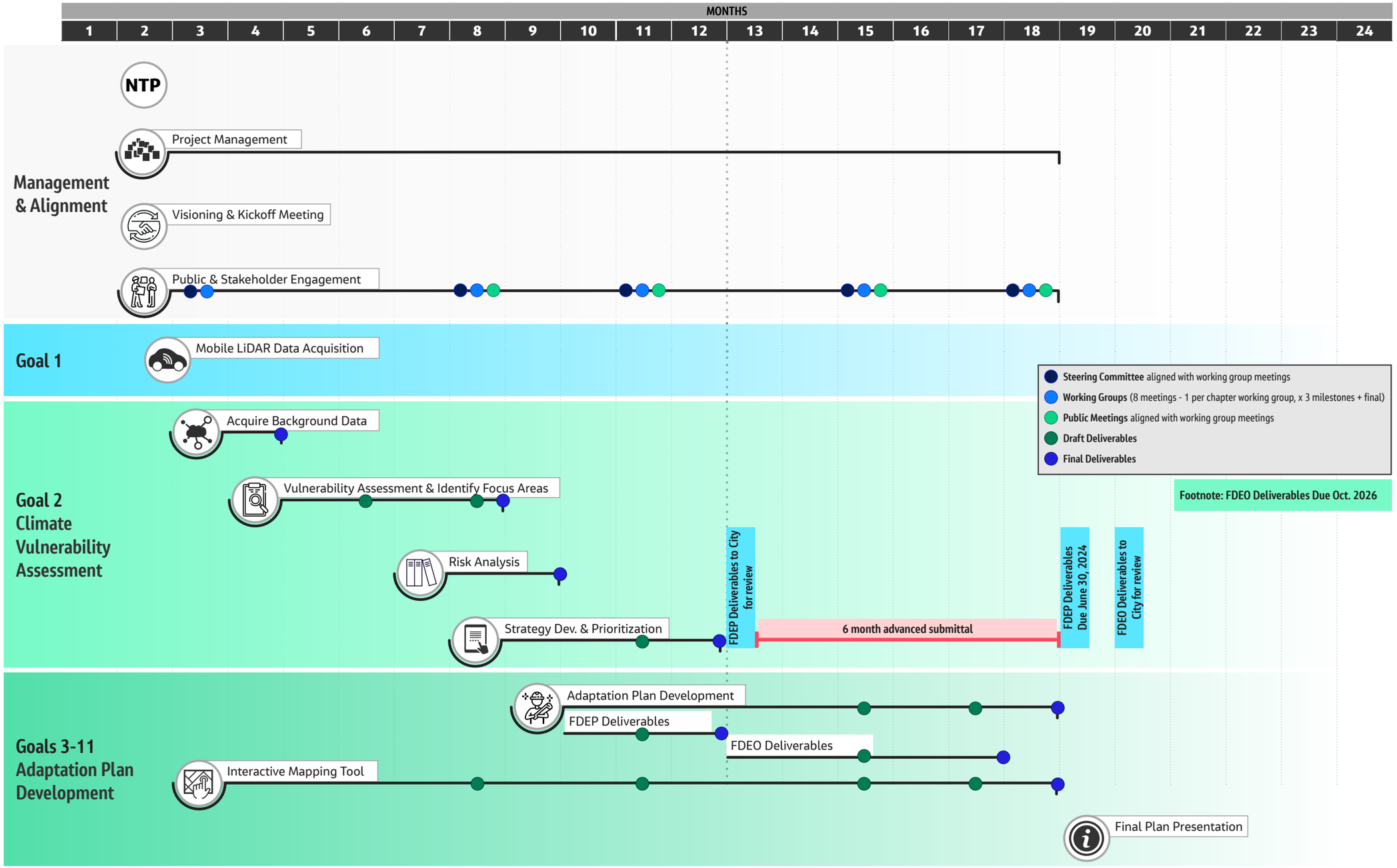
Asset Categories	Tools/Datasets	Analysis	Justification for Approach/Use
Chapter 1 Infrastructure Adaptation (Infrastructure Layer)			
Roads, bridges, seawalls, critical facilities, City-owned buildings, stormwater, wastewater infrastructure	Kaleidoscope, Esri GIS platform with dashboard as user interface for scenario analysis, FEMA STAPLEE method, FEMA National Risk Index, County public records, SE FL Compact SLR Projections, NOAA Flood Mapper	Exposure, sensitivity, vulnerability, risk, adaptation strategy development	These tools will enable development of road and bridge PCI or sufficiency ratings; stormwater and wastewater existing condition assessment; collocation impact assessment; and flood mitigation concepts across all roads and buildings, with basic costs for each treatment.
Chapter 2: Environmental Adaptation /Restoration (Environmental Layer)			
Sea walls, coastline, greenways, drainage features, brownfields, fueling stations, protected species, marine habitat	US Resilience Toolkit & TNC Coastal Resilience Mapping Tool, NWI layer, condition, ownership, coastline type, habitat type, greenways/drainage features, alleys, 600' mean high water zone, brownfields, fueling stations, protected species, Esri GIS platform	Conservation sensitivity and vulnerability, prioritization, contamination, stormwater storage and treatment opportunities, application of nature-based solutions	These tools will help identify conservation and remediation interdependencies and priorities as well as cost and co-benefits of various design scenarios. Also, to promote one-water solutions with multiple community and environmental benefits.
Chapter 3: Land Use and Code Adaptation			
Land use codes, City ordinances/ zoning and policy, referendums, habitat, Comprehensive Plan, social equity, drainage, density, residential and commercial properties, federal, state and county lands	Zoning classification, use table type, PDRRP, Stormwater masterplan, EPA's Smart Growth Fixes for Climate Adaptation and Resilience, Esri GIS platform	Location of assets and attributes with each asset category	These tools will help visualize the impact of land use policy "on the ground" to set a baseline from which to explore land use and zoning code changes that would move the needle towards more resilient communities.
Chapter 4: Historic and Cultural Adaptation Preservation			
Historic buildings, shorelines, monuments, cultural resources, land use, SHPO, US DoI registered buildings	CDC Environmental Justice Index and our team's Miami Beach's "Buoyant City: Historic District Resiliency & Adaptation Guidelines (S+A) First floor elevation, significance type, characteristics, condition, land use, historic shorelines, flood zone and past storm damage, Kaleidoscope	Condition assessment, structural, architecture, urban design, exposure, vulnerability, risk	These tools will help inventory, catalog, and calculate both social value and potential loss of places of historic/cultural significance. The tools also account for issues related to social and environmental justice.
Chapter 5: Power and Water Systems Adaptation			
Potable water supply/distribution (FKAA), electric power distribution (FPL), renewable energy, EV charging stations	Kaleidoscope, FEMA National Risk Index, J-100-10 and UN ARISE Resilient Scorecard	Exposure, vulnerability, risk, sensitivity, weighting, scoring, and prioritization	Kaleidoscope will identify infrastructure at risk of failure and provides colocation analysis to show interdependencies across systems, where failing infrastructure becomes a hazard, and shows social impact as well.
Chapter 6: Economic Adaptation			
Business market, tax generation, tourism, hotels, airports, ports, marinas, military, census data, employment, rentals, and sub-standard buildings	CDC Social Vulnerability Index & Environmental Justice Index, EJ40, Esri GIS platform	Trend, Exposure, sensitivity, vulnerability, risk, and grant and finance strategy development	These tools will help inventory and analyze the true costs of redevelopment both in terms of tax generation and operational expenditures to help balance risk and social justice, while improving economic resilience.
Chapter 7: Housing and Shelter Adaptation			
Affordable/subsidized housing, demographics, (retirees, working class), sub-standard housing, hurricane shelters, refuges of last resort, LMI, mobility and transit stops/stations	CDC Social Vulnerability Index & Environmental Justice Index, Esri GIS platform, digital twin models , County real property records, City, County and State transportation /mobility data	Model impacts on private commercial real-estate and housing. Digital twin of real estate properties across similar regions combined with Resilient Infrastructure Analysis Tool	Digital Twin models provide an interactive scenario planning platform and data-driven analysis of upgrade options and risk mitigation activities to future-proof the assets and investments.
Chapter 8: Health and Social Wellness (Equity) Adaptation			
LMI, demographics, socioeconomics, food availability, health care access, lead paint, toxic hazards, and other vulnerabilities.	CDC Social Vulnerability Index & Environmental Justice Index LMI, food availability, health care access, lead paint, energy burden, access to healthcare, homebound, susceptibility to health impacts, crosswalk with the geographic data from the CDC/ATSDR	Social vulnerability, accessibility to good food, healthcare, etc., heat island, shade, heat stress, mobility, ADA compliance, safety	These tools will help identify neighborhoods that may require additional services, improvements, or policy changes to improve the health and well-being of citizens and visitors alike.

Timeline

This proposed timeline benefits from our ability to get started on your project immediately upon notice to proceed, using the groundwork of our long partnership with the City to shorten the research and discovery task. The resulting savings in time and effort enable us to provide you a post-delivery briefings task.

The proposed project timeline to meet City and grant funding deadlines is presented here. Given our in-depth knowledge of your recent resilience efforts, we can reduce the overall schedule for chapter and plan development and complete this project within 18 months. Starting with a robust visioning and public engagement process, we will listen and learn and further define community threats and vulnerabilities and the process to co-create and co-design solutions. The resulting options reflect qualitative and quantitative data, enabling us to continue engaging the entire community as you weigh trade-offs and make decisions and help visualize the big picture of feedback we have received. Once all parties acknowledge and align on the results, we can then establish the action-oriented adaptation plan.

The plan development and project prioritization (Phase 1) includes an initial evaluation of funding and financing strategies to support project implementation feasibility and timelines; with more detailed funding and financing refinements occurring in collaboration with City during Phase 2 to support future implementation.



LOOKING AHEAD:

The timeline doesn't end. Next Steps: 2024+ Establish & Commit to an Implementation Model

- Monthly staff meetings for progress monitoring
- Quarterly leadership reports for decisions
- Annual update to Commission & Community support and awareness
- Annual budget alignment & integration with a robust funding strategy and aggressive grant pursuit approach
- Annual interactive tool update to keep the information fresh
- Create and execute a Community Resilience Information Campaign (information, events, workshops, townhalls, social media, website, ground breakings, ribbon cutting, and adaptation celebrations!)
- Schedule periodic and routine staff training (conferences, workshops, and webinars)
- 2024 consider merging Strategic Plan Update into the Resilience Plan = One Vision
- Repeat !
- Five-year update of the Resilience Plan

HOP ON HOP OFF - TOUR ALL DAY
Key West's Best Tour
OLD TOWN TROLLEY TOURS
Truman Little White House
EZ-GO

6 Personnel

6. Personnel

At Jacobs, we believe in the power of collaboration. We understand that harnessing the collective experience, talent, creativity, and ingenuity of all team members creates maximum value for our clients. Bringing the best minds to the table, we'll **explore all opportunities, bring best practices** and **lessons learned** from various vulnerability evaluations, and **collaborate with you to develop and prioritize adaptation strategies** that work for Key West.

Focused Leadership and Accountability

Our intimate understanding of the City, together with our regional, national, and international experience will enable us to prioritize projects which will seize the opportunities for change in the short term and provide a positive legacy in the long term. **Project Director Jason Bird, CFM and Project Manager Elaine Tolon, PE are committed to collaborating seamlessly** enabling productive relationships to form— **built on trust**. Pairing our Florida Resilience Practice Leader with a seasoned engineer lead—epitomizes the national resources and deep local knowledge that define our team and bring the City benefits through their interdisciplinary, holistic approach to resilience, and adaptation. Throughout this section, we've included **abbreviated resumes and a qualification table** for our project leadership and key personnel. We've also included **green icons,** at a glance, to clearly showcase **how our staff's expertise complements each other and aligns with your selection criteria.**

Project Delivery Leaders

Project Director
Jason Bird, CFM

Education: *AA, with coursework in Civil Engineering and Construction Management, towards BS*

Selection Criteria Experience:

1 2 3 4 5 6 7 8 9 10

Rationale for Selection: Jason brings **more than two decades of experience** of national and international experience in sustainability and resilience for municipal, master planned communities, and federal facilities. His focus is on **holistic, integrated resilience planning and delivery** to help communities reduce risk and improve their resilience to severe weather and climate threats. Jason's experience ranges from evaluating vulnerabilities and identifying adaptation strategies for coastal and inland communities. Specifically, **his work for Key West includes analysis to help develop minimum design criteria for critical infrastructure.** Jason has been instrumental in **Southeast Florida Change Compact** and the **Resilient Redesign Initiative for Key West** to mitigate flood risk. He helped City develop actions to guide investment and rebuilding of infrastructure like roads, sea barriers, and utilities from major storm events.

Representative Experience:

- **Resilience Lead**, Post-Disaster Recovery and Reconstruction Plan (PDRRP)/Sea Level Rise (SLR) Policy, Key West, FL.
- **Resilience Lead**, Planning Level Study/Concept Design, Category 5 Storm Shelter and Advanced Control Center, Miami-Dade WASD, FL.
- **Resilience Task Lead**, Tyndall Air Force Base (AFB), Rebuild and Coastal Resilience, Panama City, FL.

Project Manager
Elaine Tolon, PE

Education: *ME, Environmental Engineering Sciences* | *BS, Environmental Engineering*

Selection Criteria Experience:

1 2 3 4 5 6 7 8 9 10

Rationale for Selection: Elaine is **strong collaborator and facilitator with trusted relationships at the City** and our project team. She has extensive experience managing projects under the City's General Engineering Services contracts. Elaine has worked with the City on strategic planning documents involving resilience and stormwater management as well as the rehabilitation and retrofit of drainage systems. **She has managed multi-discipline teams from planning and design through bidding and construction support for the City and other local clients.** Her recent Key West experience includes **key strategic planning documents** such as the Stormwater Master Plan Update and Sea Level Rise (SLR) Policy and other stormwater drainage projects—providing an in-depth understanding of your infrastructure and goals and objectives.

Representative Experience:

- **Project Manager**, PDRRP Vulnerability Assessment for Resilience Planning, Key West, FL.
- **Project Manager**, Stormwater Master Plan Update, Key West, FL.
- **Project Manager**, SLR Policy Study, Key West, FL.

QA/QC

Laurens van der Tak, PE, D.WRE

Education: *Civil Engineer Degree | MS, Agricultural Engineering | BA, Biology | BS, Agricultural Engineering*

Selection Criteria Experience:

1 2 3 4 5 6 7 8 9 10

Rationale for Selection: Laurens is Jacobs' Water Resilience Director for the Americas and brings 32 years of experience addressing water-related issues, including **climate vulnerability assessments and adaptation, green infrastructure (GI), and GIS applications**. He is widely **recognized technical expert** in the U.S. and abroad. Laurens translates the latest climate science into climate vulnerability assessments and adaptation strategies that balance stakeholders risk tolerance and resource constraints. He is also **Chair of American Water Works Association's (AWWA's) Water Resources Sustainability Division**. He will apply his lessons learned and expertise to support Jason and Elaine through effective QA/QC program implementation.

Representative Experience:

- **Task Order Manager**, Climate Change Vulnerability Assessment, Adaptation, and Mitigation Plan, Washington Suburban Sanitary Commission, MD.
- **Task Order Manager**, Ocean Outfall Legislation (OOL) Program, Miami-Dade County, FL.
- **Task Manager**, Miami Beach Integrated Water Management Plan, Miami Beach, FL.

Climate Vulnerability (Lead)

Kerstin Kenty, PhD, PE, PMP, ENV SP, CFM

Education: *PhD, Chemical Engineering | MS, Environmental & Resource Engineering*

Selection Criteria Experience:

1 2 3 4 5 6 7 8 9 10

Rationale for Selection: Dr. Kerstin Kenty brings nearly **three decades of expertise** supporting public agency clients to provide solutions to the unique challenges faced by utilities in Florida. She has in-depth knowledge of the permitting/regulatory process, system capacity assurance planning, **assessing vulnerability and risk to improve resilience**, and a pulse on state and local grant funding opportunities. She is a **recognized industry expert**, having authored numerous papers and presentations on Florida climate and environmental issues. Kerstin's passion and drive brings the perfect mix of technical expertise and practicality to deliver this project.

Representative Experience:

- **Project Manager/Subject Matter Expert (SME)**, Flood Mitigation Plan, Miami Beach, FL.
- **Project Manager**, Pasco County Utilities Srvcs. Branch Strategic & Business Planning, Pasco County, FL.
- **Project Manager/SME**, BRIC Application, Buckman WRF Outfall, Flood Mitigation and Wastewater Reliability Enhancement Project, Jacksonville, FL.

Adaptation Plan (Lead)

Susy Torriente

Education:
MPA, Public Administration | BA, English

Selection Criteria Experience:

1 2 3 4 5 6 7 8 9 10

Rationale for Selection: Susy is our Global Lead for City Resilience. She brings more than **29 years of practical experience** in South Florida as assistant city/county manager, sustainability director and chief resilience officer. Susy breaks down complex issues into manageable solutions, **fostering collaboration and integrating resilience and climate adaptation** into her projects. She also brings specific experience in **operationalizing resilience** in plans *(Resilient 305, Fast Forward Fort Lauderdale, Miami Dade Green Print*, Compact regional climate action plans and strategic plans) and policies (resilient land use regulation amendments, Adaptation Action Areas, comprehensive plans and multi-year capital budget plans).

Representative Experience:

- **Resilience Advisor/Strategic Resilience Planning**, PDRRP and SLR Policy Development, Key West, FL.
- **Project Manager**, South Florida Military Installation Resilience Review (MIRR), FL.
- **Project Director**, Miami-Dade County-wide Resilience Hubs Network Strategy, FL.

Jacobs is a partner, not a vendor. Curiosity drives us; we're never shy to ask questions, and apply our imagination to create what has not been created. Our teams complement your staff, and augment where you need deep expertise. We provide tools and knowledge on how to use those tools with the aspiration of teaching and building your capacity. This allows us to continue providing what you need, no matter how complex.

Public Engagement (Lead)
Dana Pollitt | ADEPT

Education:
Masters' Degree in Management

Selection Criteria Experience:
1 2 3 4 5 6 7 8 9 10

Rationale for Selection: With **more than 20 years of industry experience**, Dana possesses an excellent understanding of **Key West marketing and advertising, media markets and public relations**, and the tools needed to create and maintain successful partnerships. Since 2015, he has overseen ADEPT's marketing services contract for the Key West Historic Seaport—promoting initiatives, events, and programs, producing advertising and communication materials, recommending & implementing media strategies.

Representative Experience:
- **Project Manager**, Advertising & Marketing Services Contract, Key West, FL.
- **Project Manager**, Garrison Bight Tourism Impact Study, City, Key West, FL.
- **Project Manager**, City of Marathon Quay Tourism Impact Study, FL.

Interactive GIS Maps (Lead)
Shannon McElvaney

Education:
MPS, Geodesign | BA, Geography

Selection Criteria Experience:
1 2 3 4 5 6 7 8 9 10

Rationale for Selection: Shannon is the **Global Geodesign Director** for Jacobs' Advance Planning Group. He has **27 years of experience** applying the use of geospatial technology across numerous industries including **planning, utilities, transportation, conservation, agriculture, and renewable energy**. For the last 12 years, Shannon has focused on using geodesign to help clients plan and design more **sustainable, resilient built and natural environments**. He is also the **author** of *Geodesign, Case Studies in Urban and Regional Planning* and numerous other publications.

Representative Experience:
- **Geodesign Lead**, Tyndall Air Force Base, Rebuild and Coastal Resilience, Panama City Beach, FL.
- **Geodesign Lead**, Civil Engineering-led Multidisciplinary Services for Design and Planning Services, London, UK.
- **Geodesign Lead/Co-Author**, Manitou Springs Creek Walk Master Plan, Manitou Springs, CO.

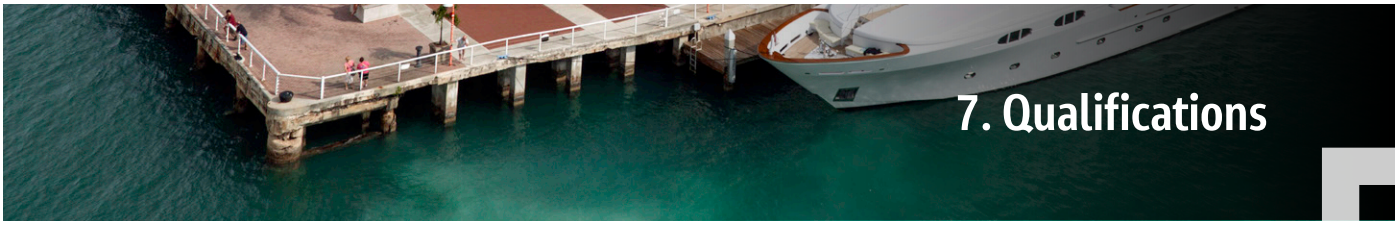
Additional Staff Qualifications

Exhibit 6-1.Summarizes the qualifications and experience of our staff identified—demonstrating the careful planning of our team that will make this project a resounding success.

Role | Staff | Highest Academic Degree	Rationale for Selection and Relevant Project Experience
Principal-in-Charge **John Elizabeth Aleman** *BSBA, Finance* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• As **former City of Miami Beach Commissioner**, John sponsored numerous strategic response initiatives to **address resiliency goals**, including legislation and capital projects for critical infrastructure projects. Served on **Land Use and Development Committee (Chair), Sustainability and Resiliency Committee (Vice Chair), Neighborhoods and Community Affairs Committee, Finance and Citywide Projects Committee**. • **Principal-in-Charge**, Integrated Water Management Program and Ocean Terrace Park and Streetscape Projects, Miami Beach, FL. • **Miami Beach Chamber of Commerce**, Board of Governors and Executive Committee.
Infrastructure **Daniel Rutland, PE** *MS, Agricultural & Biological Eng., Land & Water Resources* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• With **15 years of experience**, Daniel offers innovative solutions to complicated **infrastructure improvement needs** for small and large watersheds in restrictive permitting environments. Recipient of the **Distinguished Achievement Award** and **Outstanding Service Award** from the Florida Section, American Society of Agricultural and Biological Engineers (ASABE). • **Project Manager**, Palm Beach Renewable Energy Park Industrial Supply Well Master Plan, Phase II - Solid Waste Authority of Palm Beach County, FL. • **Project Engineer**, Reservoir Design and Construction, Osceola, County, FL. • **Project Engineer**, General Engineering Consulting Services, FDOT District Five, FL.
Urban Design **Chad St. John, RLA, ASLA** *BLA, Landscape Architect* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• **Senior Lead for Urban Design and Planning** with **23 years of experience** managing large-scape transportation projects, streetscape design, bridge and highway aesthetics, and community parks. Chad designs sustainable concepts with **GI design technology and practices** to reduce infrastructure costs. • Facilitates **community design workshops** to bring consensus to project goals and objectives. • **Landscape Architect**, Redevelopment Strategy for Central Riyadh, Saudi Arabia. • **Design, Master Planning, and Program Support** for multiple infrastructure and resiliency projects at military installations - CA, CO, FL, GA, NM, OK, SD, TX, VA, WY.

Role | Staff | Highest Academic Degree	Rationale for Selection and Relevant Project Experience
Historical & Cultural Preservation **Lori Price** *MFA, Historic Preservation* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• **National Cultural Resources Community of Practice Lead** with more than **30 years of experience** managing **environmental reviews; developing mitigation strategies** and drafting Memorandum of Agreements (MOAs)/Programmatic Agreements (PAs); and performing **cultural resources field surveys**. • **Senior Architectural Historian**, Section 106 Consultation and Finding of Effect for Federal Emergency Management Agency (FEMA) Public Assistance Disaster Operations, Franklin County, FL. • **Senior Architectural Historian**, Environmental & Historic Compliance Support for Environmental Assessment for a Public Assistance Grant Project, Franklin County, FL. • **Cultural Resources Senior Staff**, Union Pacific Railroad & BNSF Railway, IL, MO, ND.
Environmental Restoration **Jannek Cederberg, PE** *MS, Coastal Engineering* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• **Principal and Leader** *(Cummins Cederberg)* with **20 years of experience** in coastal engineering and **master planning of coastal developments, shoreline management, and strategic planning**. Jannek has worked with cities, participating in stakeholder presentation, as well as prepared **adaptive redesigns** for parks to mitigate flooding from rainfall, king tides, and SLR. • **Senior Project Manager**, Waterfront Parks SLR & Flood Mitigation Roadmap, Miami-Dade County, FL. • **Principal**, Living Shoreline Assessment, Miami Beach, FL. • **Project Manager**, FDOT A1A Vulnerability Study and Roadway Stabilization Design, Indian River County, FL.
Economic Redevelopment **Elizabeth Stryjewski** *MS, Agricultural & Resource Economics* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• **Senior Economist** with**15 years of experience** in environmental science, coastal restoration, and flood protection projects, including Delta Climate Change Vulnerability Assessments. Elizabeth's areas of expertise include **economic analysis, cost benefit analysis, regional economic impact analysis, infrastructure investment strategy, business case analysis, and funding strategy**. • **Technical Lead**, Freeman Diversion Habitat Conservation Plan Costs & Economic Impacts, Ventura County, CA. • **Technical Lead**, Carpinteria Water Infrastructure Resilience Program Funding, FEMA Benefit Cost Analysis, Santa Barbara County, CA. • **Co-Author**, *Managing California's Water Resources* (2011). Public Policy Institute of California.
Housing and Shelter **Megan Holder, LEED AP BD+C** *BLA, Landscape Architecture* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• **Senior Consultant** with Jacobs' Advanced Planning Group, bringing **17 years of experience** in the pre-design, planning, and design of projects including thousand-acre master plans for new cities. Megan's ability to **listen, analyze complex data, organize tasks and communicate** effectively results in successful project outcomes that reflect the client's vision and objectives. • **Project Manager**, Housing Accommodation Detailed Master Plan, Sultanate of Oman. • **Project Manager**, Integrated Accommodation Master Plan, Sultanate of Oman. • **Project Manager**, Accommodation Master Plan, Confidential Client, Lake Charles, LA.
Land Use & Code **Paul Culter, AICP** *BA, Urban Planning* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• **Over 29 years of experience** in **land use planning, site development strategies, and public participation.** Paul's expertise in land use controls ranges from the traditionally accepted to the cutting edge—giving him a **broad view of the tools available to communities**, and how those tools may be best adapted to the situation. He has **written or revised zoning** development controls, for **200+ clients** in the U.S. and overseas. • **Project Manager**, Fairfield Comprehensive Plan, Fairfield, OH. • **Senior Planner**, Citywide Visioning, Dunedin, FL. • **Planner**, Dubai 2040 Spatial Structure Plan, Government of Dubai.
Power and Water **Chris Sharek, PE, BCEE, PMP, ENV SP** *MS, Water Resource Eng.* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• As **former Assistant City Engineer and Utilities Manager** for the City of Venice, FL, Chris brings **24 years of experience** in planning, technical design, permitting, and construction observation for public infrastructure improvement projects. • Design consultant for **50+ electric vehicle supply equipment**; **oversaw dozens of capital improvement projects** and serves as the **Chair of the Water and Sewer Advisory Committee** for Sarasota County. • **Project Manager,** Climate Resilience Study and Action Plan, Sarasota, FL. • **Quality Advisor,** North Windmill and Sun N Fun Private System Infiltration/Inflow (I/I) Evaluation, Ordinance, and Smart Sewer Platform, Sarasota, FL.
Health and Equity/Housing & Shelter (Support) **Leticia Solaun, PhD, ENV SP** *PhD, Mass Communication* **Selection Criteria:** 1 2 3 4 5 6 7 8 9 10	• **Over 26 years of experience** leading high-profile **stakeholder engagement and social impact projects,** including implementing **more than 30 social equity projects**. Dr. Solaun specializes in technically complex, geographically complicated, and politically sensitive national programs. She is a **native Spanish speaker** and has dedicated her career to promoting inclusion and equity, related to engagement and access. • **Environmental Justice (Social Impact) Specialist**, Gowanus Repowering Project, NY. • **Climate Change Communication**, Tyndall Air Force Base Phase II: Strategic Communications and Pilot Study Analysis - Rebuild and Coastal Resilience, Panama City, FL. • **Communication Specialist**, Tribal Community Development, Hollywood, FL.

7 Qualifications



7. Qualifications

Jacobs has been Key West's long-time trusted resilience advisor and leads the industry in climate response capabilities, tools, and solutions. We'll work closely with City staff, stakeholders, and the public to create a robust roadmap to adaptation and resilience—**one that honors your past and prepares all aspects of your community for the future. Ours is the strategic, creative, and passionate team you seek!**

Recent Experience Delivering Resilience Projects for the City of Key West

As the City's planning and engineering consultant since 1987, Jacobs is very proud of the diverse projects we've helped you implement over the years. In particular, our recent post-disaster recovery planning, sea level rise (SLR) policy, and resilient infrastructure planning and design work—for stormwater, roadway, coastal, and wastewater projects—**enables us to hit the ground running with virtually no learning curve**. Like the City, we are deeply committed to creating inclusive, resilient communities and transformative solutions that advance livability, mobility, prosperity, and long-term sustainability. For us, that makes *every project* a climate response opportunity—bringing you the ideal blend of **global best practices and local expertise in all facets of this project**.

Sea Level Rise Policy Guideline:
Our team partnered with you to develop a new SLR policy, supporting your ongoing efforts to efficiently and equitably enhance its resilience to flooding. As a fundamental component in building community resilience, this guidance includes an overview of historical weather, water levels, and climate projections used to establish public infrastructure design criteria. We partnered with you to explore the potential implications of various future scenarios related to the City Infrastructure policy, enabling us to establish the project focus in terms of planning horizons and risk tolerance. We built this consensus through regular meetings with you throughout the project and through a virtual goal-setting and visioning meeting we hosted, including key City staff, utility representatives and other stakeholders, and your engineering, planning, and sustainability and resilience departments.

Team Members Involved: Elaine Tolon, Jason Bird, Susy Torriente, Mitch Griffin, Mike Matichich

Stormwater Master Plan Update, Phase I and II:
Our team has intimate knowledge of Key West stormwater infrastructure and drainage needs. We prepared your stormwater master plan in 2012 and are currently helping you update it, using the latest modeling software to identify new projects for reducing flooding generated by increased rainfall intensity and increased tidal boundary conditions resulting from sea level rise. In Phase I of this task, completed in 2021, we focused on improving the Interconnected Channel and Pond Routing (ICPR) model used to simulate conditions and how they were affected by four design storms. Based on the results of this model update and on previously recommended projects, current conditions, depth of flooding, and engineering judgment, the City is now preparing your list of recommended projects for Phase II, which is ongoing.

Team Members Involved: Elaine Tolon, Jason Bird, Mitch Griffin, Mike Matichich, Rick Gorsira

Post Disaster Recovery and Reconstruction Plan (PDRRP):
We collaborated with you to develop a comprehensive PDRRP addressing city vulnerabilities and helping you develop a process for efficient, equitable, and resilient post-disaster recovery and rebuilding. As a foundation for your resilience planning, this plan is intended to be a living document able to evolve with your needs. The PDRRP also considers community capacity, economics, health and social services, housing, infrastructure, and natural and cultural resources—to increase the city's overall resilience. Our collaborative efforts included a visioning webinar to solicit feedback from post-disaster recovery and reconstruction professionals, City staff, and Monroe County staff engaged in emergency management and adaptation, resilience, and sustainability activities.

Team Members Involved: Elaine Tolon, Jason Bird, Susy Torriente,

Expertise and Experience with RFQ Criteria

In the following sections, we demonstrate our qualifications and experience in delivering this forward-looking, multifaceted project. We've used **green icons** and headings to visually link the scope of services and your 11 selection criteria. We've also used *italic blue (➲)* to identify team member **collaboration** on various projects mentioned in the following pages.

Criteria

1 Climate Vulnerability Assessment

2 Adaptation Plans

Jacobs' work has used to develop guidance documents on how to do climate vulnerability assessments, including two manuals that we contributed to for the USEPA. We work through a practical process towards a vision and bring adaptations in dense cities such as in Miami, San Francisco, and New York. This means we know what works and what doesn't and will bring a practical approach and solutions to Key West.

Climate Vulnerability Assessment (CVA) and Adaptation Planning

Climate-related resilience is more than suggesting sea walls, higher levees, bigger tunnels, and more reservoirs. The City requires a multi-pronged approach to tackle a host of challenges, while preserving its historic charm. Our climate scientists, infrastructure designers, and public engagement experts collaborate on a vision, perform detailed risk assessments, and implement adaptations that bring the most protection and value to each community.

Jacobs has completed hundreds of climate change mitigation and adaptation projects for national governments, state municipalities, and private clients globally. We've developed, and regularly use a number of industry leading analytical vulnerability assessment tools and models including the EPA Climate Ready Guide and the United Nations ARISE Buildings Resilience Scorecard. Our assessments identify and rank high-risk critical infrastructure, including human health risks (such as from power, water, and wastewater facility failures) to economic risks such as business continuity or supply chain issues.

Example CVAs and adaptations include:

- **JEA Wastewater/Water System Resilience Assessment Plan and Program, FL.** Jacobs was program manager for a $1.4M Comprehensive Resilience Plan, an action-oriented guide for long-term reliability and resilience of JEA utilities. We identified flood risks, developed and prioritized adaptation and mitigation strategies for 176 high-risk facilities. We're now performing a **vulnerability assessment and adaption plan for JEA's power facilities** (See Project Reference in Section 8). ➲ *Jason Bird, Laurens van der Tak, Kerstin Kenty, Erin Morrison, Susan Butler, and Jennifer Baldwin*
- **South Florida Military Installation Resilience Review (MIRR)** included CVAs for the communities that surround the installations in Monroe, Miami-Dade, and Broward Counties. ➲ *Jason Bird, Susy Torriente, Chad St. John, Eduardo Rendon, Rick Gorsira, Mike Matichich, Mitch Griffin, and Sarah Marrs*
- **Miami-Dade County Water and Sewer Department (WASD), Ocean Outfall Legislation Program, FL.** As delivery partner, Jacobs initiated this long-term, $2.6B program by modeling the extent of flood inundation due to sea level rise, storm surge and extreme rainfall, evaluating risk to WASD facilities, and developing design criteria for flood control elevations and capital projects for facility hardening. We're now managing more than **26 major utility improvement projects** with the updated design standards. ➲ *Jason Bird, Laurens van der Tak; Leticia Solaun, Rick Gorsira, Mike Matichich, Kevin Regalado, Mitch Griffin, and Jaason Englesmith*
- We're also completing **vulnerability assessments for Port Canaveral** and the **Historic Greynold's Park Sea Level Rise Flood Mitigation Strategy.** ➲ *Jason Bird, Kerstin Kenty, Susy Torriente, and Rick Gorsira*

Criteria

3 Traditional Hardscape Engineering

4 Nature-Based Adaptation/ GI/LID

Traditional Hardscape Engineering and Nature Based Adaptations

Key West's low lying, island community is home to 26,000 residents, Naval Air Station Key West (NASKW), U.S. Army Training Facilities, U.S. Coast Guard, and other critical U.S. DoD facilities that elevate its strategic importance for national security and underscores the need to maintain critical infrastructure. We bring a holistic approach to resilience planning, leveraging our expertise in both coastal and inland flooding to tackle sea level rise and flooding risks on multiple fronts. Our extensive experience includes traditional and nature-based adaptions in some the world's most compact and vulnerable regions, including Key West, Miami Beach, Puerto Rico, New York, New Orleans, San Francisco, and London.

Our **hardscape engineering** climate resilience portfolio includes stormwater improvements; water, wastewater, and power utility resilience and protection; transportation, mobility, and transit projects; and shoreline protection, including seawalls, revetments, and embankments for coastal defense.

Tyndall AFB Coastal Rebuild
After being virtually destroyed by Hurricane Michael in 2018, Tyndall AFB hired Jacobs to help transform the base into a smart, resilient installation of the future.

- Establishing high performance buildings, resilient and redundant energy systems, high wind load structural solutions, resilient utility systems, and cybersecurity.
- Developed pilot projects that use nature-based solutions to reduce coastal flood risks while creating social and environmental benefits
- Interactive mapping to inform designs

Because coastal protection for SLR requires ecosystem considerations, we're experts at **nature-based solutions** such as restoring coastal wetlands, mangroves, beaches, and barrier islands. **Green infrastructure and low impact designs** are essential for mitigating inland flooding and we've led the charge with dozens of award-winning projects.

Example projects include:

- Currently developing **nature-based solutions for NASKW** (U.S. Army Corps of Engineers [USACE] Engineering with Nature [EWN] program) and we'll coordinate work with the City and stakeholders to benefit the adjacent community and environment. ➲ *Susy Torriente, Jason Bird, Rick Gorsira, Mike Matichich, Mitch Griffin, and Jim Kessler*
- **$4B resilient rebuild of Tyndall AFB, FL.** (See inset and reference project in Section 8) ➲ *Jason Bird, Susy Torriente, Paul Culter, Jim Summerbell, Megan Holder, Lori Price, Rick Gorsira, Shannon McElvaney, Eduardo Rendon, Leticia Solaun, Matt Friesen, Jennifer Baldwin, and Jim Kessler*
- **The City of Miami Beach (CMB) Integrated Water Management Plan** included a **road elevation policy** and private property harmonization; capital project prioritization; **Blue Green Infrastructure** and a **significant public engagement campaign. Current work includes multidisciplinary neighborhood design.** See reference project in Section 8. ➲ *Jason Bird, John Aleman, Laurens van der Tak, Kerstin Kenty, Leticia Solaun, Susy Torriente, Rick Gorsira, Mike Matichich, Kevin Regalado, Alex Meitin, Matt Friesen, Jennifer Baldwin, Jaason Englesmith, Susan Butler, and Jim Kessler*
- **San Francisco Waterfront Resilience Program, CA.** We're managing the first phase of a 10-year program from **risk assessment, planning, public engagement, design and construction to protect San Francisco's historic waterfront.** ➲ *Elizabeth Stryjewski, Jaason Englesmith, Jim Kessler, and Eduardo Fernandez (ICF)*
- **Built living shorelines and nature-based coastal defenses in Miami area** and along Gulf Coast with The Nature Conservancy. ➲ *Jason Bird and Rick Gorsira*
- $225M **Superstorm Sandy, Howard Beach Front Renovation and Restoration of 30 sites** for NYC Department of Design and Construction.

Historic and Cultural Preservation

Criteria 5

Historic & Cultural Preservation

Jacobs brings broad background and experience in historic and cultural preservation, most notably on the **CMB's Integrated Water Management Program** and the **Port of San Francisco's Waterfront Resilience Program**. Phase 1 of San Francisco's program, valued at $1B, includes development of an **adaptation plan focused on a range of assets, including historic resources, transportation, utilities, the public realm, and environmental resources**, to improve the waterfront's resilience to seismic events and flood risks. Teaming partner, Schulman and Associates (S+A), augments our team with extensive local experience developing resilience guidelines for South Florida historic buildings. They worked with **Miami-Dade County Office of Historic Preservation on its "Resilient Rehab: A Guide to Historic Buildings"** in Miami-Dade County, which was sponsored in part by the Department of State, Division of Historical Resources and the State of Florida. Created through a lens of resilience, these guidelines enhance and support the County's preservation efforts and serve as a resource to the owners and stewards of historic properties, supporting them in the care of built and cultural heritage. They also include a series of recommendations for private property owners. S+A also developed the City of Miami Beach's Historic District resilience and adaption guidelines (see inset).

City of Miami Beach | Buoyant City: Historic District Resiliency and Adaptation Guidelines
S+A led an international team in the development of these, working closely with the CRO and Planning Department. Over the next 60 years, most buildings in the historic districts will need to be substantially rehabilitated/reconstructed to provide resilience to rising waters. BUOYANT CITY argues that Miami Beach's historic districts should be preserved, must evolve to survive, and that preservation can be redeployed as a powerful adaptive tool. An example shown here is the **Flamingo Park Study Area** where incentivization for owners of the historic homes and low-scale commercial buildings could include an allowance for vertical growth, solar panels, small windmills, and water storage.

Climate Change Based Economic Redevelopment and Community Based Adaptations

Criteria

6 Economic Redevelopment

7 Community Adaptation (Housing/Health/ Social Wellness)

The East Side Coastal Resiliency design integrates flood protection into the community fabric, improving waterfront open spaces and access, rather than walling off the neighborhood. Construction began in 2020 and will end in 2026.

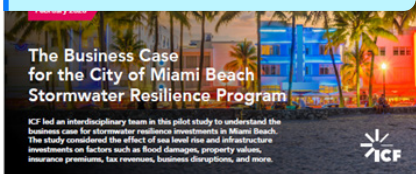
The Jacobs team also brings specialty experience to identify creative ways to tackle the top two issues identified in your strategic plan—**housing, and SLR.** Providing adequate availability of affordable housing is one of Key West's greatest challenges. To address these challenges, we will leverage our expertise creating partnerships and affordable housing strategies on our **MIRR, USACE EWN, Tyndall AFB projects**. For Tyndall AFB, we estimated that a 1,500-bed accommodation village was needed to support the rebuild, but the projected number of workers available in the local market would not meet these workforce demands, especially when combined with the region's other rebuilding efforts. To overcome this challenge, we developed a Construction Worker Logistics Accommodation Strategy to **provide housing that achieves worker welfare goals, elevates workforce productivity, and is a "good neighbor"** to Tyndall AFB and the surrounding community. To enable Tyndall AFB to attract and retain the best workforce, **affordable housing accommodations** had to be a key differentiator. Transportation, parking, access/circulation, site security, recreation, catering services, laundry and community facilities were among the many aspects addressed in our accommodation strategies. Resilient housing is also about providing the ability to shelter in place through hardening guidelines for residential buildings. We've performed or supported post disaster planning for Key West, Jacksonville, and Miami Beach. Our Florida-based team brings expertise in integrating housing and shelter criteria into resilience planning and design, and we are members or affiliates of professional housing associations, including the Florida Housing Coalition.

Economic Redevelopment and Community Based Adaptations. With Jacobs, you get the benefit of coastal resilience experts; transportation, wastewater, and power engineers; and economists and urban planners—all in one firm. That means we not only design resilient infrastructure, but we tap specialists who improve business districts and neighborhoods with community amenities alongside infrastructure construction.

Examples include:

- We are currently working developing a **Resilience Hub Network Strategy in Miami-Dade County** for the Atlantic Council's Adrienne Arsht-Rockefeller Foundation Resilience Center (AARFRC). This includes a **CVA and a socio-economic vulnerability assessment** that will be used to create a framework for improving social wellness for vulnerable and underserved populations across the County, state, and beyond. ➲ *Jason Bird, Susy Torriente, Laurens Van der Tak, John Aleman, Shannon McElvaney, Kerstin Kenty, Kevin Regalado, Leticia Solaun, Matt Friesen, and Sarah Marrs*
- We led the **Southbank Riverwalk Replacement Resilient Design-Build** in Jacksonville, FL. We provided urban development to address climate hazards, including coastal flood scenario modeling and analysis; resilient surfaces timber walkway; design over topped by flood waters; permeable surfaces allowing water to recede; and submersible mechanical and electrical systems. ➲ *Max Mozo*
- We are currently working to develop a **Resilience Hub Network Strategy in Miami Dade County.** This includes a **CVA** and a **socio-economic vulnerability assessment** of vulnerable communities. ➲ *Jason Bird, Susy Torriente, Sarah Marrs, Leticia Solaun, and Jeff Benavides*
- Jacobs was one of two design leads and engineers-of-record for the **East Side Coastal Resiliency project** in Manhattan for the New York City Department of Design and Construction. The project received $338M in Community Development Block Grant Disaster Recovery funding to fund the construction of the flood protection. Our solutions included flood protection structures and foundations, raising the East River Park esplanade, flood-resistant utility tunnels, sewer outfall retrofits to prevent stormwater backflow, sustainable design features, habitat enhancements, park amenities, and pedestrian and bike access paths and bridges. ➲ *Max Mozo*

ICF led an effort to communicate the business case for flood resilience investments in the **City of Miami Beach**. This project included detailed analysis of the effectiveness of different flood-reduction scenarios (e.g., public investments of street raising, increased drainage, increased pump capacity and private investments) and their effects on property values, insurance premiums, city operational costs, and more. They created **citywide sea level rise and storm surge inundation maps, detailed interconnected pond routing models, a hedonic pricing model, and a citywide business case analysis.** The goal was to highlight the cost-effectiveness—in terms of impacts on property damages, taxes, insurance payments, and tourism—of various mitigation strategies against the costs of inaction.



Teaming partner **ICF brings climate resilience expertise with cutting-edge economic analysis** capabilities to projects in Florida and other communities where tourism-based economies are threatened by natural hazards and a changing climate. They apply economic impact analysis, financial modeling, statistical analysis, and database management for public and private sector clients to provide actionable insight that supports decision-making.

Social Wellness. The ultimate climate adaptation plan for Key West will be a plan for people, neighborhoods, and communities; solutions must be developed through that lens. Our team brings in-depth experience and tools that enable us to assess the social, economic, and environmental impacts of projects, quantify the value of their changes in dollar terms, and then compare the costs of investment amongst a range of project alternatives. By putting the spotlight on what matters to the community, this approach yields a comprehensive and credible analysis for both decision-making and communication. We can also evaluate the societal impacts of projects based on datasets such as the four themes of the Center for Disease Control (CDC) Social Vulnerability Index (SVI), FEMA NRI SVI, Economic Justice Screening Tool (CEJST), and EPA's Environmental Justice Screening Tool (EPA EJ Screen). For the **AARFRC's Resilient Hub Network Strategy**, our team is developing a process to identify community vulnerabilities and other public service needs, as well as a prototype hub to address community needs, strengthen community ties, and build resilience. The prototype hub will be tailored to meet those needs before, during, and after-shocks and stressors and serve their communities year-round.

Criteria

8

Policy Writing/ Guidance (LDRs & AAAs)

In addition to Key West's first sea level rise policy, as a Miami Beach assistant city manager and chief resilience officer *Susy Torriente* oversaw the Planning Department and worked with the **Mayor's Sea Level Rise Blue Ribbon Panel** and **City Land Use Committee** and the **City Commission** to amend the land use code more than a dozen times to—the City's strategic response to sea level rise from the policy and planning perspective.

Criteria

9 Public Facilitation/ Engagement

11 Women- and Minority-Owned Businesses

ADEPT has successfully implemented the entire advertising marketing and communications program for the **Key West Historic Seaport and Bight Marina.**

Policy Writing, Plans, and Land Development Regulations

Our leadership team includes public sector experts who **understand the policy development process.** With two former Florida Chief Resilience Officers **(Susy Torriente and Jeff Benavides)** experienced in developing similar local government policies, adaptation plans and land development policies, **we have no learning curve**. Additional staff, including **Paul Cutler and Jim Summerbell,** specialize in land use policy and planning and can draft /mark up code language correctly and comprehensively. This experience is critical for **moving resilience projects forward with community input.**

Project examples:

- We developed **Installation Facility Standards (IFS)** for US DoD facilities that serve as the development code for new capital projects for the **Tyndall AFB** effort. **This first-of-its-kind development policy exceeded current federal and state regulations to adapt to future climate conditions.** ➲ *Jason Bird, Susy Torriente, Paul Culter, Jim Summerbell, Megan Holder, and Lori Price*
- **City of Brookhaven 2034 Comprehensive Plan**. Jacobs developed **land use and housing recommendations** and implementation strategies. Goals centered around nine subject areas: Land Use and Transportation Coordination, Diversity, Unique Brookhaven, Parks, Buford Highway Gateway, Transit-Oriented Design, Neighborhoods, Sustainability, and Economic Prosperity. ➲ *Paul Cutler*

Public Engagement

People-Centric Planning and Implementation to Build Consensus and Sustain Support. A resilience plan starts with getting the public and stakeholders to align to a vision and on implementation pathways. That doesn't come without challenges; consider our lessons learned in San Francisco. The Embarcadero Seawall that protects the city and its historic waterfront has deteriorated over the past 100 years and is at risk of failure due to sea level rise/flooding and earthquakes. Jacobs is leading the **Waterfront Resilience and Embarcadero Seawall Program to protect over $100B in assets and annual economic activity**. We helped them move forward with a concept to organize planning around three major fronts: *Strengthen* – for critical, immediate projects needed; *Adapt* – projects to meet resilience needs through 2050; and *Envision* – consider the needs of future generations and lay groundwork for year 2100 needs. Our Draft Waterfront Adaptation Strategies is a reflection of over 5 years of citywide community engagement that has connected with tens of thousands of San Franciscans on what a resilient, sustainable, equitable waterfront means to them. **We have done this—and continue to do so**—through a host of public meetings with creative games, videos, and a public-facing program website built using ArcGIS Story Maps *(https://storymaps.arcgis.com/stories/1ed3561c936244f2979ad68cda6a681a)*. The interactive and engaging story maps show San Franciscans what they are facing and when, based on modeling projections of future sea level rise (estimated at 1.5 feet in 2050 and 3-7 feet in 2100). They succinctly present the challenges and risks visually accompanied by easily understood language: *"to defend San Francisco from current and future flood risk, there is a need to adapt by raising the shoreline to address up to 7 feet of sea level rise expected by 2100. There are many ways we can do this, but whatever we do will need to not only defend against rising tides, but manage water inland as well."*

From Pensacola to the Keys, we have led similar public engagement efforts in Florida, such as resident, business, and neighborhood outreach for the **Miami Water and Sewer Department Ocean Outfall Legislation program** and **CMB Integrated Water Program**. On projects throughout the state, we have conducted outreach designed to elicit community input related to convenience and use of mass transit and roadways, pedestrian use and impacts, and social and community needs, such as through numerous FDOT project development and environment studies and public forums to discuss environmental impacts from Navy operations.

Our team's **multilingual, diverse staff** are subject-matter experts and expert communicators with experience designing and implementing inclusive and impactful outreach, resulting in community input, feedback, and participation. Our M/WBE teaming partner, **ADEPT** has worked with the City for the past 6 years and understands the importance of staying informed on your priorities, which were most recently laid out in its Six-Point Strategic Plan released in September 2021 and includes feedback and recommendations from the City, Key West Historic Seaport Tenants, the Bight Marina, the Bight Preservation Association, and the Bight Management District Board. ➲ *Dana Pollitt (ADEPT)*

Criteria

10

Interactive Maps

Interactive Maps

Why are we doing this? That is often the first question asked when looking at capital spending projects, and hard to answer without data. Our data scientists and geospatial specialists are detectives and storytellers. We employ more than **800 geospatial technologists nationwide**, including GIS analysts, surveyors, drone and mobile LiDAR experts, software developers, and information solutions specialists. This group has supported over **10,000 GIS-related contracts at scales from National mapping of flood risks for the UK, to statewide resilience mapping in California, to municipal and individual asset level.** We routinely use ArcGIS and Esri to understand and address important challenges such as climate change, supply chain resilience, public health, and social equity. Our interactive models empower real-time understanding, transform decision-making, and provide for more fluid collaboration.

Aggregating maps/data for planning decisions and capital project expenditures. We can use any tool the City desires to produce interactive maps, and our Kaleidoscope software solution was designed to manage and mitigate the risks associated with multiple assets and infrastructure vulnerabilities. With Kaleidoscope, you can easily visualize, analyze, and track the health and potential vulnerabilities of your assets, including roads, bridges, seawalls, pipelines, and socio-demographic information. The tool uses data to co-locate and cross analyze vulnerabilities among different types of infrastructure. For example, a bridge itself may have a lifespan of 100 years and ranked resilient on its own. However if the watermain beneath it is close to failure, it means the bridge is at risk failure too and should be ranked higher. And if the bridge fails, nearby power and roads are at risk. Kaleidoscope allows us to identify the most vulnerable areas across all types of infrastructure.

Example Projects:

- **Tyndall AFB**. We used existing GIS data, LiDAR and aerial photography to characterize existing conditions and present vulnerability analysis to support planning activities to support planning activities. Tasks included map development and site characterization for 1391 funding and design package submittals and National Environmental Policy Act (NEPA) review. Our Kaleidoscope geodesign platform and host of spatial analytics and data visualization techniques from interactive maps to high-quality photorealistic visualizations were instrumental in gaining acceptance of proposed designs. ➲ *Shannon McElvaney and Eduardo Rendon*
- **South Florida MIRR.** We oversaw the development of **several maps** such as combined hazard exposure, SLR and tidal flooding, and storm surge exposure. We can include these maps as underlying data for interactive mapping done on the citywide resilience plan.
- **For the City of Manitou Springs, CO—similar in size and historical importance to Key West**— Kaleidoscope solution **helped the City better understand the interdependencies between their aging infrastructure and their vulnerability to natural hazards** such as flood, fire, and landslides. Kaleidoscope showed city leaders exactly where their assets were most vulnerable and ranked them in terms of likelihood of failure. Four out of the top five predicted locations had infrastructure fail within 18 months! The **collaborative process helped to break down data silos** and provided leaders with a more comprehensive view of the infrastructure issues facing the city. As a result, the City was able to prioritize capital expenditure (CapEx) projects for their 5-year plan and begin monthly coordination meetings between utilities. ➲ *Shannon McElvaney*
- **Infrastructure Los Angeles**—a multi-agency effort to maximize Infrastructure Bill grant success. All organizations worked together in the planning of large projects, examining the location and proximity of transportation, sanitation, water, power, and stormwater projects in relation to each other and the community. We are helping leaders identify potential project synergies and expose system vulnerabilities that will save money, inspire innovation, protect the environment, and maximize benefits to disadvantaged communities, and ultimately improve the vibrancy and viability of the region. Kaleidoscope's analytics is providing the ILA Executive Leadership Team with objective, data-driven information to move single sector projects into place-based community development initiatives. ➲ *Leticia Solaun, Shannon McElvaney, Jaason Englesmith, and Kerstin Kenty*
- The **Meridian Water redevelopment project is a major $7.8B, 20-year London regeneration program bringing 10,000 homes to north London**. We are creating the **data visualization platform** and data driven geodesign processes required to synthesize data coming from multiple sources into a common data environment to support decision making. The result is a set of live, interactive 2D and 3D visualizations and dashboards to help urban planners optimize the master planning process, so we meet sustainability and resilience goals, and to present results to a wide variety of stakeholders in an engaging way. ➲ *Shannon McElvaney and Eduardo Rendon*

This **Meridian Water interactive 3D web map** improved communication to council regarding infrastructure vulnerabilities from flooding as well as proposed solutions, from preventive pylon strategies to the contouring of greenbelts that could remove stormwater.

8 Representative Vulnerability Assessment and Adaptation Plan Experience and Client References

8. Representative Vulnerability Assessment and Adaptation Plan Experience and Client References

100+
Resiliency-focused technical experts in Florida

50+
Years of integrated resilience solutions across markets

1,000+
Resilience related projects in our portfolio

200+
Clients worldwide focused on planning and response in full range of climate hazards

We firmly believe past performance is a key indicator of future success. As with other projects we've completed for the City, we promise to continue earning your trust and providing the same Jacobs hallmark industry-leading technical competence, strategic collaboration, and innovative thinking to prioritize actions items that increase resilience.

As mentioned in our cover letter, **we're problem solvers, not just problem staters**. We bring technically sound solutions to the table to then co-create and co-design solutions and policies with City staff and the community that fit the City's vision for the future and honor its past as well. **We understand your challenges and see them as opportunities**. By closely listening to and understanding the City's needs, we deliver customized solutions in a flexible and responsive manner. Throughout Florida, we've continued to foster cooperative and positive relationships with our communities, which is reflected in our track-record of repeat clients and long-term services agreements, and built on our commitment to providing quality work and timely delivery while meeting our clients' budgets.

Vulnerability Assessments and Adaptation Plan Experience

With an extensive portfolio of projects focused on building infrastructure and community resilience against the adverse effects of extreme weather events and climate change, **Jacobs is at the forefront of developing and implementing long-term, adaptive solutions**. Exhibit 8-1 shows our projects that include scope items similar to those shown in your RFQ. This experience will allow our team to provide **valuable insight, lessons learned, and innovative solutions** on every assignment. We encourage the City to contact any of our clients (listed within each featured project description) and would be happy to provide additional references on request.

Exhibit 8-1. Our Team's Project Experience Meets – and Exceeds – the City's Criteria for this Project

Featured Project Experience										
Projects	Selection Criteria									
	1	2	3	4	5	6	7	8	9	10
South Florida Military Installation Resilience Review (MIRR) South Florida	✓	✓	✓	✓		✓	✓	✓	✓	✓
Wastewater/Water System Resilience Assessment Program Jacksonville, FL	✓	✓	✓	✓				✓		✓
Integrated Water Management Consultant Miami Beach	✓	✓	✓	✓	✓		✓	✓	✓	✓
Tyndall Air Force Base Rebuild and Coastal Resilience Panama City, FL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Historic Greynold's Park Seal Level Rise Flood Mitigation Strategy Miami, FL	✓	✓	✓	✓	✓		✓		✓	✓

Additional Project Experience										
Projects	Selection Criteria									
	1	2	3	4	5	6	7	8	9	10
Water Agency Climate Vulnerability Assessment and Adaptation Plan Sonoma County, CA	✓	✓	✓	✓		✓		✓	✓	✓
Electrical Resilience Plan Jacksonville, FL	✓	✓	✓			✓		✓		✓
Climate Change Vulnerability Assessment, Adaptation, and Mitigation Plan Prince George and Montgomery Counties, MD	✓	✓	✓	✓	✓	✓			✓	✓
Miami-Dade Ocean Outfall Legislation (OOL) Program Miami, FL	✓	✓	✓	✓				✓		✓
San Francisco Waterfront Resilience Program San Francisco, CA	✓	✓	✓	✓	✓	✓		✓	✓	✓
Hurricane Irma & Maria Response San Juan, PR; St. Croix, USVI	✓		✓		✓		✓	✓		
Smithsonian Climate Change Adaptation Plan Fort Pierce, FL; Washington DC; New York, NY	✓	✓		✓	✓			✓	✓	
Confronting Climate Change and Population Growth Effects on Sewer and Wastewater Systems New York, NY	✓	✓	✓	✓					✓	✓
Facilities, Storm Drainage, Wastewater, and Climate Plan Boston, MA	✓	✓	✓	✓	✓					✓
USEPA Drought Guide, Adaptation Planning, and Climate Resilience Evaluation and Awareness Tool (CREAT) Toolbox Nationwide	✓	✓	✓	✓				✓	✓	✓
East Side Coastal Resiliency "Rebuild the Design" New York, NY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

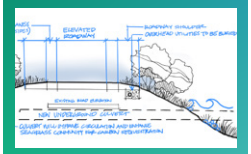
South Florida Regional Planning Council
South Florida Military Installation Resilience Review (MIRR)

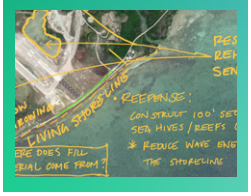
Client Reference: Isabel Cosio Carballo, MPA - Executive Director | **Phone:** 954.924.3653 | **Email:** Isabelc@sfrpc.com

Team Members Working Together: Jason Bird, Susy Torriente, Chad St. John, Eduardo Rendon, Rick Gorsira, Mike Matichich, Mitch Griffin, and Sarah Marrs

Selection Criteria Experience:

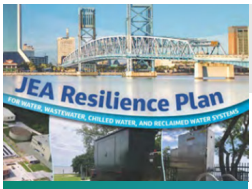
1 2 3 4 5 6 7 8 9 10





The South Florida MIRR spans three counties and four key installations, including U.S. Naval Air Station Key West (NASKW). The purpose of the MIRR is to **identify the risks, hazards, and vulnerabilities** of concern related to the ability of the military to carry out its missions on the installation that could be mitigated through investments and **solutions outside the fence line in the community.** We use the planning horizons of 2040 and 2070 for projections and forecasted vulnerabilities and shocks in addition to everyday stresses the installation faces.

The project kickoff and **visioning session** took place in May at the U.S. Southern Command Headquarters. Over the summer, our team conducted four site visits with tours and work group meetings with installation planners, municipal leaders, and utility providers for fact finding and data collection. Key West staff members were valuable contributors during our site visit. While NASKW assets are indeed vulnerable to climate change and sea level rise, they are also highly valuable and unique installations for homeland security and their regional economies. The **vulnerability assessment is now complete** and we enter 2023 gearing up for **strategy development and project definition** with a completion target date by summer 2023.

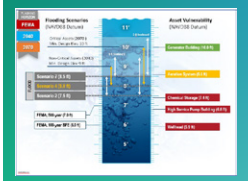


JEA
Wastewater/Water System Resilience Assessment Plan and Program

Client Reference: Oliver C. Domingo, Project Manager | **Phone:** 904.665.6325 | **Email:** domioc@jea.com

Team Members Working Together: Jason Bird, Laurens van der Tak, Kerstin Kenty, Erin Morrison, Susan Butler, and Jennifer Baldwin

Selection Criteria Experience: 1 2 3 4 5 6 7 8 9 10



Jacobs developed a comprehensive Resilience Plan to serve as an **action-oriented guide** to position JEA for long-term reliability and resilience for potable water, wastewater, chilled water, and reclaimed water systems through identification of flood risk, **development and prioritization of mitigation strategies**, and the incorporation of aggressive design standards for future capital projects. We also provided program management, engineering, and design services to improve system reliability and resilience during extreme weather events.

We initially **reviewed and prioritized JEA facilities** based on highest vulnerability and criticality. We then determined the benefits of resilience investments for each facility based on monetized risk, calculated as the product of consequences of flooding times the probability of flooding. The probability of flooding was determined for each asset based on the flood modeling scenarios. We then developed applicable strategies that provide varying levels of protection based on asset criticality and anticipated service life. The adaptation strategies developed fall into three categories: elevation, hardening, and flood barriers. We used the risk and strategy cost data to drive a cost/benefit analysis and prioritize facility investments based on return on investment. **The plan was so well received by the water side of JEA that the power side of the house currently has us engaged for a similar and complementary energy resilience plan!**

City of Miami Beach
Integrated Water Management Consultant

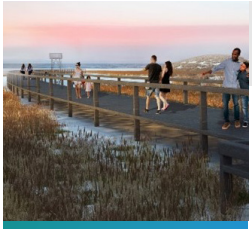
Client Reference: Eric Carpenter, Deputy City Manager | **Phone:** 305.673.7000 ext. 7080 | **Email:** ericcarpenter@miamibeachfl.gov

Team Members Working Together: Jason Bird, John Aleman, Laurens van der Tak, Kerstin Kenty, Leticia Solaun, Susy Torriente, Rick Gorsira, Mike Matichich, Kevin Regalado, Alex Meitin, Matt Friesen, Jennifer Baldwin, Jaason Englesmith, Susan Butler, and Jim Kessler

Selection Criteria Experience: 1 2 3 4 5 6 7 8 9 10

This multi-disciplinary flood mitigation program focuses on reducing flood risk through a comprehensive and integrated approach to managing water resources. It is a community-based flood mitigation and SLR adaptation plan to **guide capital investment and project prioritization** for immediate needs, near-term activities, and longer-term strategies to enhance the resilience of the City. This program will set the industry standard for integrated approaches to mitigate current flood risk and adapt to future flood risk in coastal communities. Work to date includes **road elevation/adaptation policy, capital budget reprioritization, and neighborhood design improvements.**

Each project incorporates a **complete street approach,** including enhancements to pedestrian, bicycle, and vehicular access, streetscape aesthetics, traffic calming, and dry and wet utility replacement while improving the road surface durability elevation and resilience to flooding. The city's **blue/green infrastructure plan** includes best practices, implementation strategies, concept plans and "Living with Water" renderings for not only the many challenging conditions across the city, but also incorporating blue/green strategies that blend road-raising efforts within their site-specific contexts around Miami Beach. Aside from the highly urbanized and dense context of Miami Beach, other constraints included **historic building stock across the city**, shallow groundwater levels with limited soil and storage capacity, **rising sea levels**, low topographic elevations, along with extreme and intensifying storm events.



U.S. Air Force Program Management Office (PMO)

Tyndall Air Force Base Rebuild and Coastal Resilience

Client Reference: Traycee Verdun-Chapman, Community Planner and Partner Liaison | **Phone:** 314.737.3088 | **Email:** traycee.chapman@us.af.mil

Team Members Working Together: Jason Bird, Susy Torriente, Paul Culter, Jim Summerbell, Megan Holder, Lori Price, Rick Gorsira, Shannon McElvaney, Eduardo Rendon, Leticia Solaun, Matt Friesen, Jennifer Baldwin, and Jim Kessler

Selection Criteria Experience:

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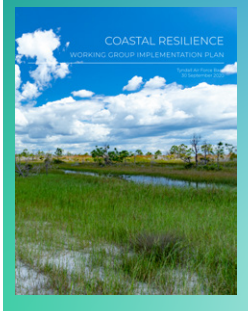


After Hurricane Michael devastated the Tyndall AFB base in October 2018, Jacobs developed governance documents and a Program Management Plan to guide the Rebuild Program. The program incorporates **planning and design strategies** supporting operational readiness and efficiency; creating a **secure, resilient environment; addressing flood and storm surge risks**; and consolidating development to use land efficiently. Guiding principles included cost-saving resource efficiencies, **improved environmental performance**, personnel safety, and augmentation of severe weather and climate resilience performance through the pillars of sustainability, resilience, and smart technologies.

We evaluated **coastal flood risk and other natural hazards to identify vulnerabilities** to infrastructure, base operations, and mission readiness and to inform the development design guidelines for reconstruction. We used GIS to perform asset vulnerability assessments and we provided map support and site characterization for USAF 1391 design package submittals and NEPA review. **Robust stakeholder engagement** played a critical role in project development and support. Our **Kaleidoscope platform hosts interactive maps, and the viewing portal fostered alignment on a vision** for the future and streamlined decision-making. Jacobs developed **42 capital infrastructure project descriptions and cost estimates** focused sustaining the critical DoD mission at the base, with high priority projects including water, wastewater, stormwater, buildings, and roadways to maintain operational continuity of the base. Our work continued through 2022 focused on developing **four nature based coastal projects,** including **securing $15M** for design and construction. We just finalized and submitted a companion **Coastal Resilience Implementation Plan** for the installation.

Miami-Dade County Parks, Recreation and Open Spaces

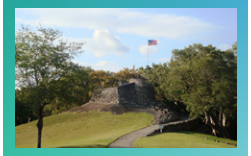
Historic Greynold's Park Sea Level Rise Flood Mitigation Strategy

Client Reference: Roberto Rodriquez, Project Manager | **Phone:** 305.755.7955 | **Email:** roberto.rodriguez3@miamidade.gov

Team Members Working Together: Jason Bird, Susy Torriente, Kerstin Kenty

Selection Criteria Experience:

1 2 3 4 5 6 7 8 9 10



We performed a **vulnerability assessment** within the broader context of Miami-Dade County's **resilience philosophy and strategy**. The county manages more than 13,500 acres and more than 280 parks, facilities, and greenways with numerous recreational assets vulnerable to flooding and SLR. We studied the park infrastructure and operational vulnerabilities and developed flood mitigation strategies and a project implementation roadmap to inform future planning and budgeting over time, to reduce flood risk in a targeted manner. We **evaluated 23 park facilities against several current and future flood scenarios** to determine facility flood vulnerability and to inform flood mitigation strategies and project ranking. After assessing vulnerability risks, we conducted a flood risk analysis to calculate park facility flood risk in dollars. With this information in hand, we developed flood mitigation strategies and evaluated estimated construction costs against the flood risk to select the appropriate flood mitigation measures for each facility. We recommended the client design and build improvements with community benefits and values in mind, including improving accessibility for all residents and enhancing aesthetics and environmental stewardship. Our **outreach, information, and programming** effort communicated the park project's value to community stakeholders to elevate awareness of climate change, SLR, South Florida vulnerabilities, and management and adaptation solutions.

Project Director: Jason Bird, CFM

Phone: 970.214.1495

Email: jason.bird@jacobs.com

5401 W. Kennedy Blvd. Suite 300
Tampa, Florida 33609