SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

REGIONAL CLIMATE ACTION PLAN 2.0

Implementation Workshop

The Power of Procurement for Low-Carbon, Resilient Communities

May 10, 2019

BROWARD COUNTY FLORIDA

MIAMI-DADE COUNTY

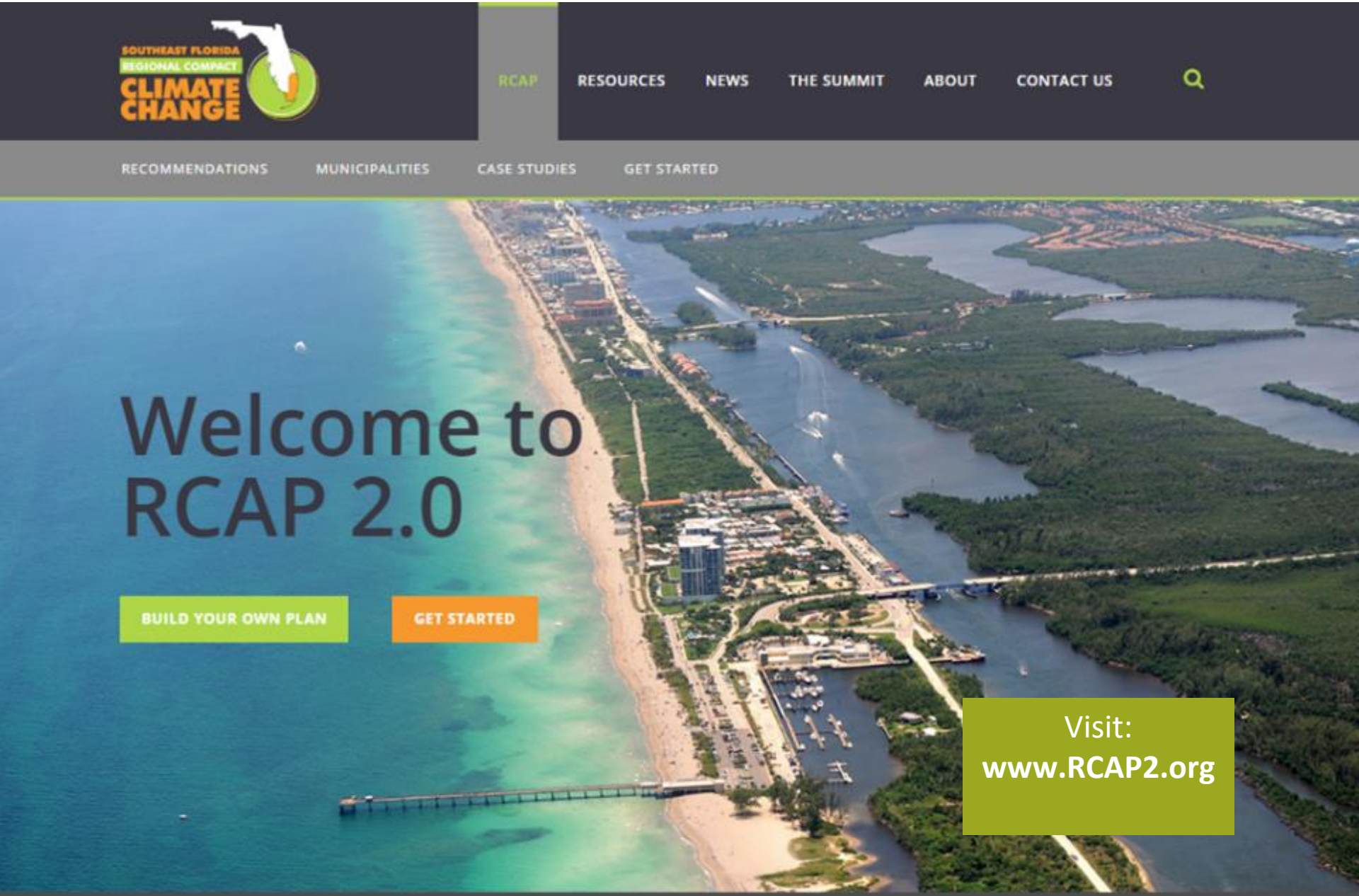
SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

PALM BEACH COUNTY FLORIDA

Implementation support provided by: INSTITUTE FOR Sustainable Communities

With funding support from: THE KRESGE FOUNDATION

Regional Climate Action Plan



The Power of Procurement

- Share lessons learned and best practices for innovative procurement strategies that support resilience objectives
- Increase dialogue between procurement and resilience/sustainability departments
- Review opportunities to evaluate bids using alternative evaluation methods to fully capture a wider suite of societal, environmental, and economic costs and benefits
- Deepen understanding on ways in which local governments may begin to track resilience investments and other metrics to monitor progress

Agenda

10:10 – 10:30 AM	**The Climate Compact 101 & what's procurement got to do with it?**
10:30 – 11:30	**Best practices & lessons learned for innovative procurement**
11:30 – 11:45	**Break**
11:45 – 12:30 PM	**Procuring for adaptation: Best practices for climate-smart infrastructure**
12:30 – 1:15	**Lunch**
1:15 – 2:15	**Procuring for a low-carbon future**
2:15 – 3:15	**Making the case: Metrics, life-cycle analysis, and tracking resiliency investment**
3:15 – 4:15	**Work Sessions:** *Track 1: Developing a Resilience Checklist* *Track 2: Procuring Resilience Toolkit*
4:15 – 4:30	**Adjourn**

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

The Climate Compact 101

What's procurement got to do with it?

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

Best Practices & lessons learned for innovative procurement

SLR IN BROWARD PROCUREMENT

Broward County Environmental Planning and Community Resilience Division

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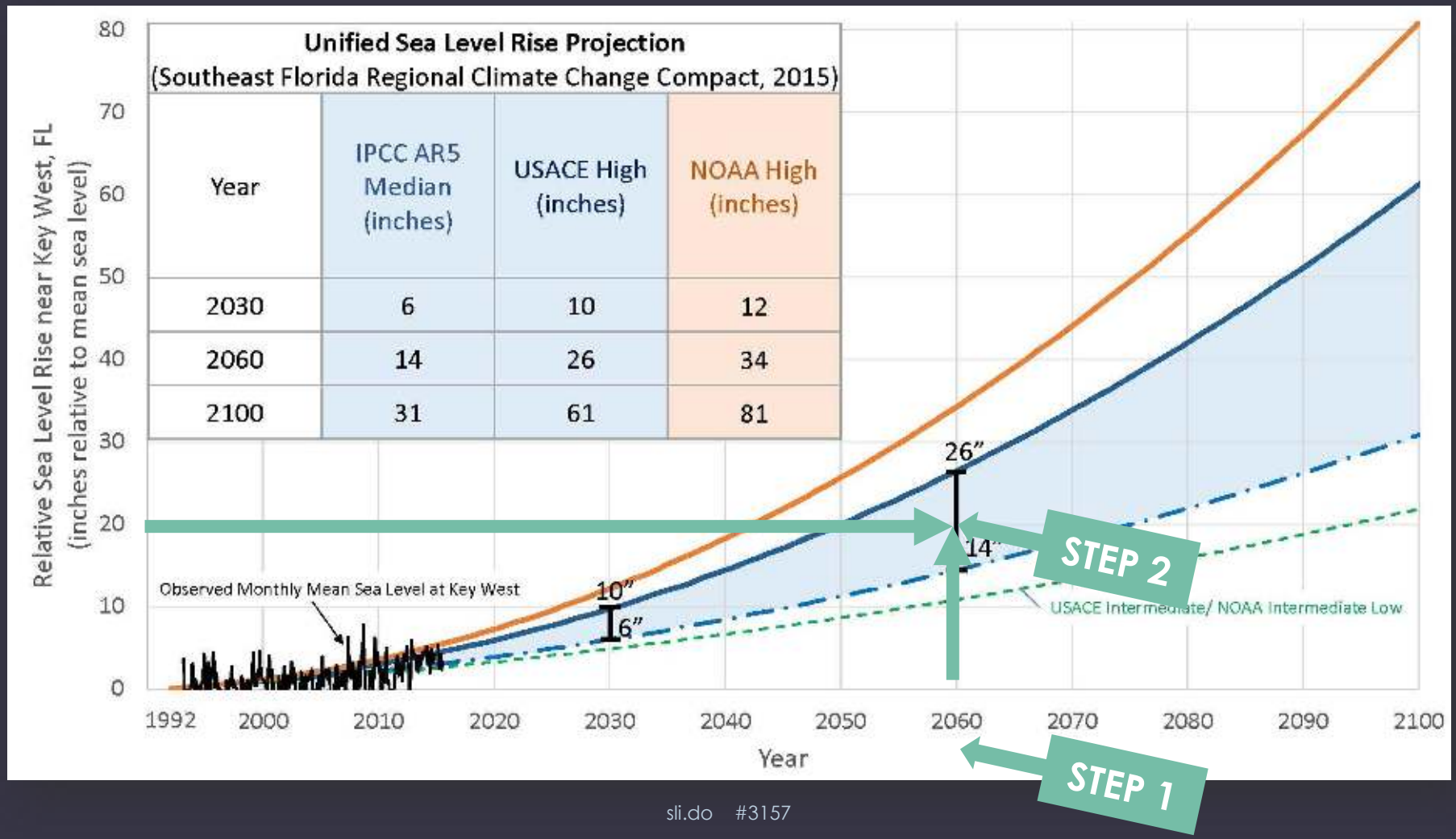
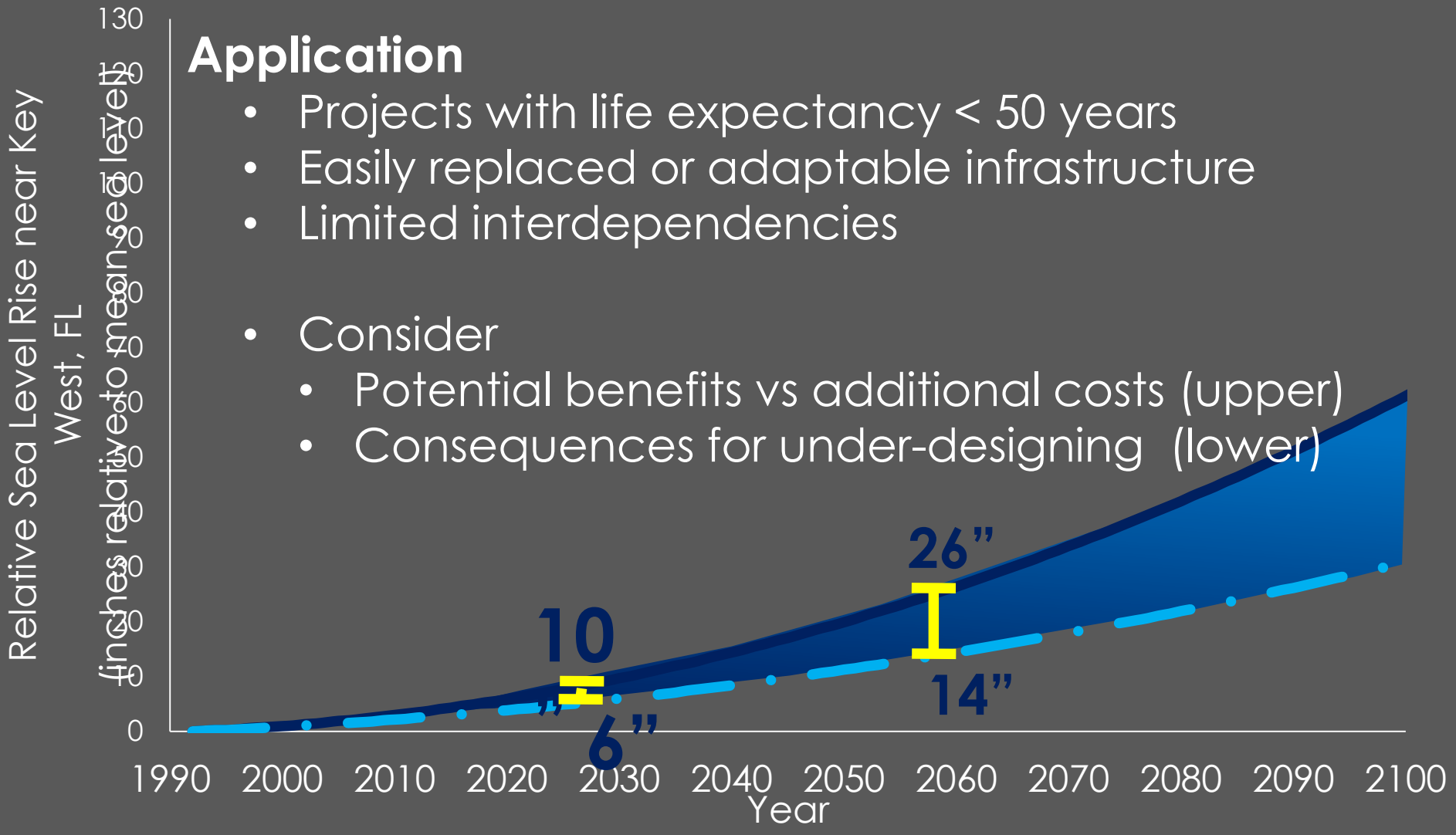
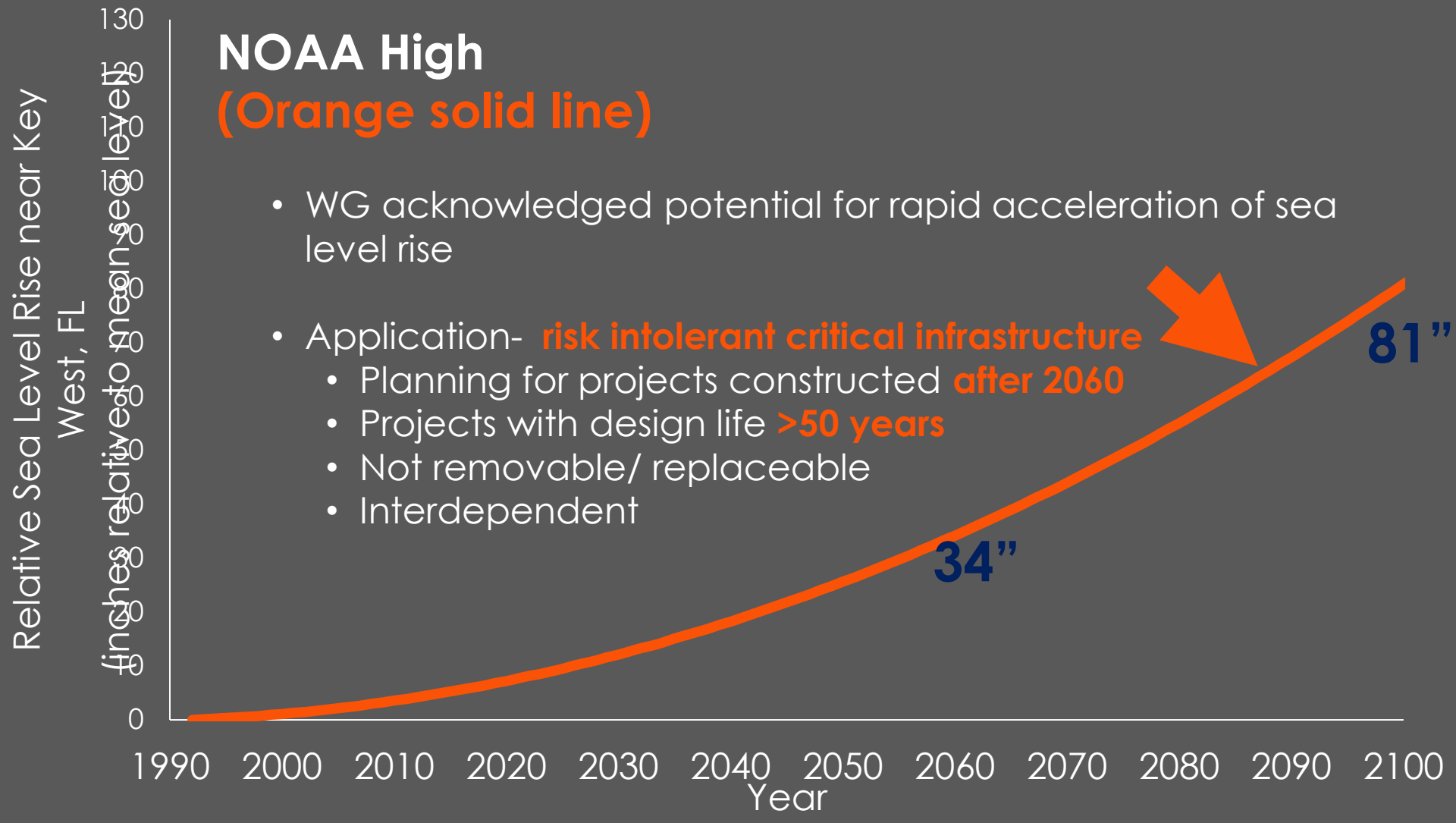

Unified Sea Level Rise Projection
(Southeast Florida Regional Climate Change Compact, 2015)
Year
IPCC AR5 Median (inches)
USACE High (inches)
NOAA High (inches)
2030
6
10
12
2060
14
26
34
2100
31
61
81
Relative Sea Level Rise near Key West, FL (inches relative to mean sea level)
Observed Monthly Mean Sea Level at Key West
10"
6"
26"
14"
USACE Intermediate/ NOAA Intermediate Low
STEP 2
STEP 1
Year

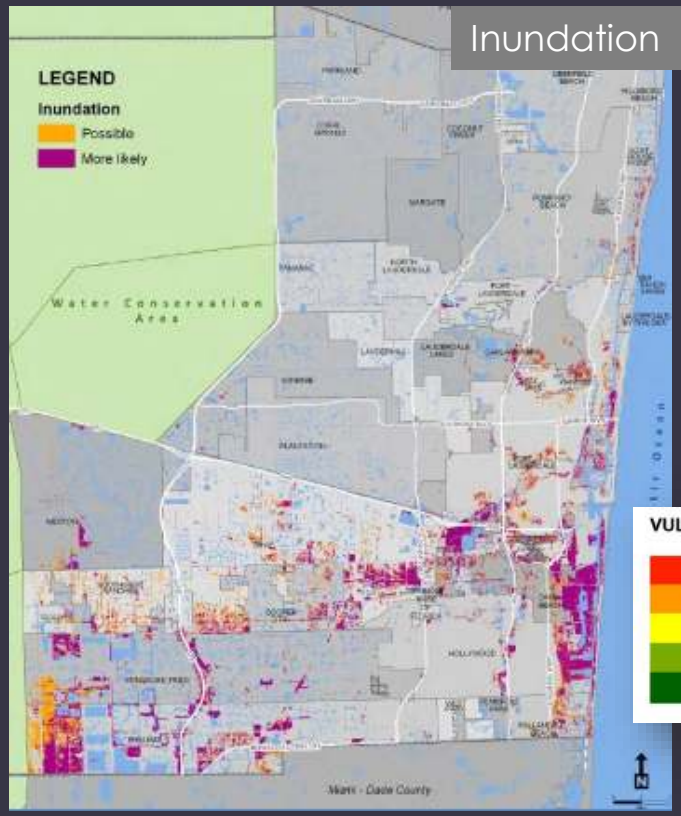
Application

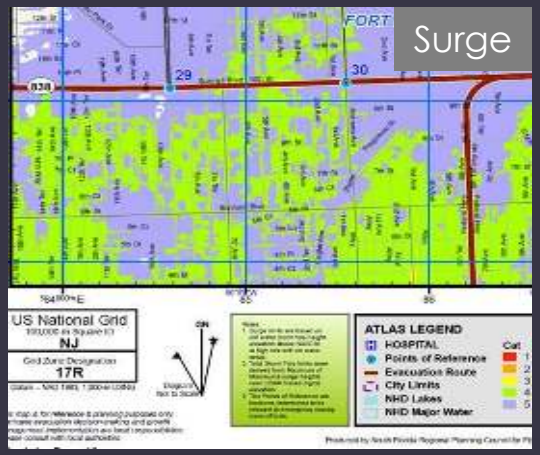
- Projects with life expectancy < 50 years
- Easily replaced or adaptable infrastructure
- Limited interdependencies

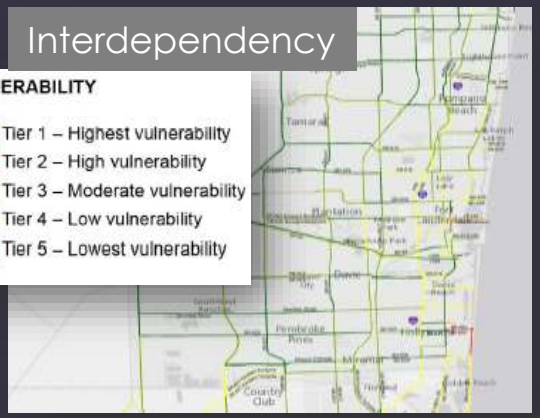
- Consider
  - Potential benefits vs additional costs (upper)
  - Consequences for under-designing (lower)




NOAA High
(Orange solid line)
• WG acknowledged potential for rapid acceleration of sea level rise
• Application- risk intolerant critical infrastructure
• Planning for projects constructed after 2060
• Projects with design life >50 years
• Not removable/ replaceable
• Interdependent
34”
81”
Relative Sea Level Rise near Key West, FL
(inches relative to mean sea level)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
Year







Project Evaluation Examples

- Risk to equipment
- Accessibility of roads and sites
- Critical infrastructure assessment
- Land Use

- Tools
  - Risk maps
  - FDOT SLR Sketch
  - NOAA

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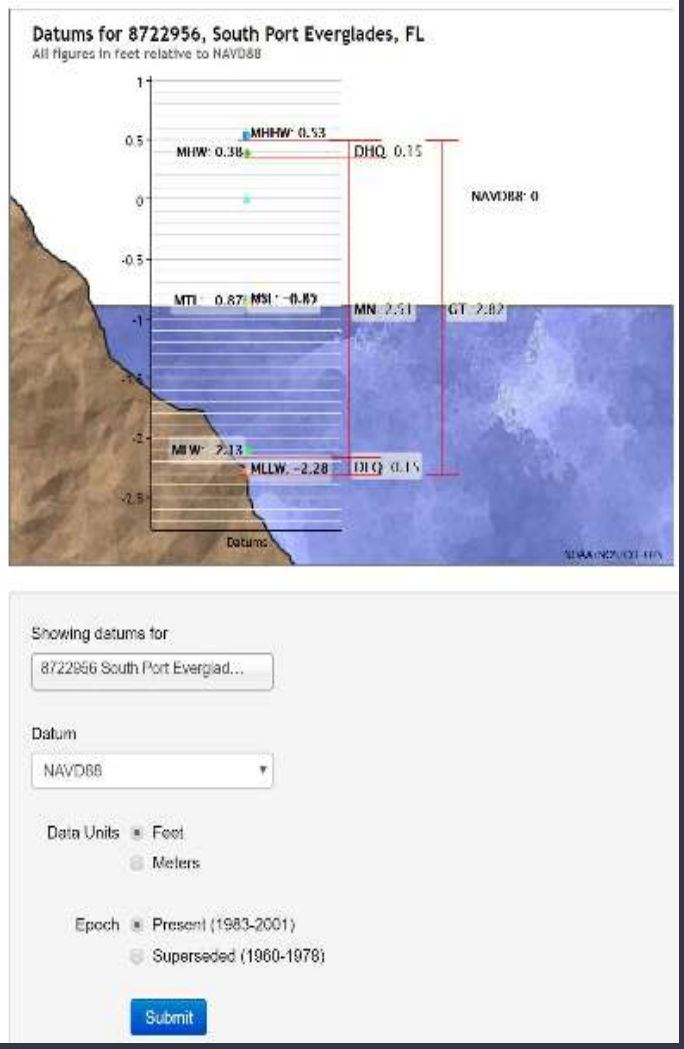
Elevations on NAVD88

Station: 8722956, South Port Everglades, FL
Status: Accepted (May 7 2018)
Units: Feet
Control Station: 8722670 Lake Worth Pier, Atlantic Ocean, FL

T.M.: 0
Epoch: 1983-2001
Datum: NAVD88

Datum	Value	Description
MHHW	0.53	Mean Higher-High Water
MHW	0.38	Mean High Water
MTL	-0.87	Mean Tide Level
MSL	-0.85	Mean Sea Level
DTL	-0.87	Mean Diurnal Tide Level
MLW	-2.13	Mean Low Water
MLLW	-2.28	Mean Lower-Low Water
NAVD88	0.00	North American Vertical Datum of 1988
STND	-28.35	Station Datum
GT	2.82	Great Diurnal Range
MN	2.51	Mean Range of Tide
DHQ	0.15	Mean Diurnal High Water Inequality
DLQ	0.15	Mean Diurnal Low Water Inequality
HWI	0.84	Greenwich High Water Interval (in hours)
LWI	6.91	Greenwich Low Water Interval (in hours)
Max Tide		Highest Observed Tide
Max Tide Date & Time		Highest Observed Tide Date & Time
Min Tide		Lowest Observed Tide
Min Tide Date & Time		Lowest Observed Tide Date & Time
HAT	1.63	Highest Astronomical Tide
HAT Date & Time	10/16/1993 13:24	HAT Date and Time
LAT	-3.18	Lowest Astronomical Tide
LAT Date & Time	02/08/1997 07:12	LAT Date and Time



Datums

Consistency!!

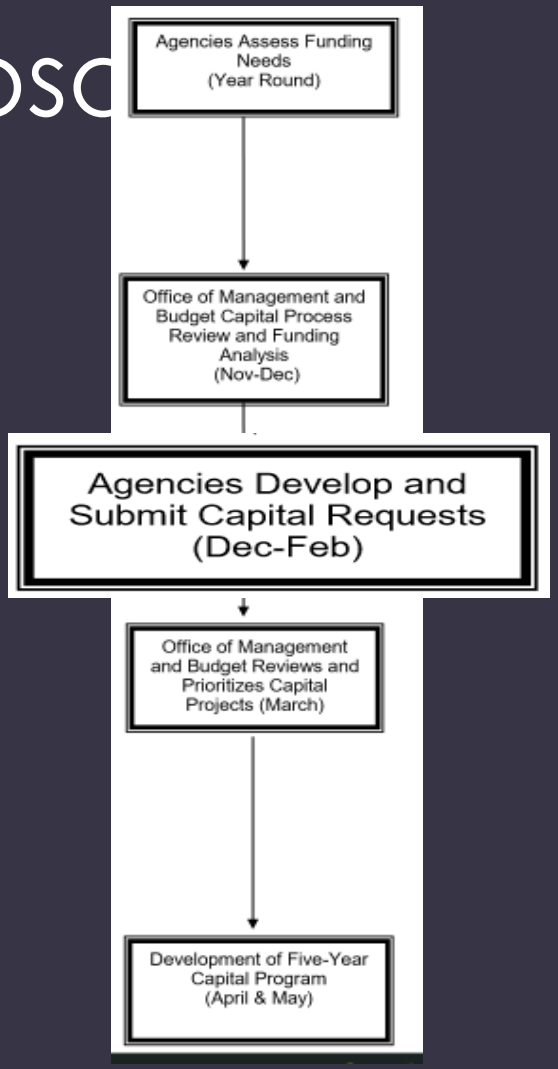
- North American Vertical Datum
- Scope, data, conversion error

NOAA Benchmarks

- Lake Worth Pier
- Port Everglades South
- Miami Beach
- Virginia Key
- Key West

Capital Budget Proposa

- Explain how resilient to sea level rise
- Link to interactive maps
- Line item in expense spreadsheet for adaptation **contingency**



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Procurement Process

- Procurement Checklist
  - All required steps and documents including sea level rise pre-analysis
- Tech specs from agency
- Board review (bidders and contract)
- Permit conditions
- Request for Services or Qualifications
  - Highly qualified and recognizes professional with experience with climate adaptation
  - Refer to future conditions ordinance and unified sea level rise projection

Selection Committee Meeting

- Questions to ask
  - Describe how you have you applied the unified sea level rise projection in other projects
  - What factor of safety would you apply in design to account for updates in projection?
  - What other sea level rise impacts would this project be subject to?
  - How would you expect sea level rise to compound effects of surge or flooding on this project?
  - What materials or methods may be considered to counteract effects of sea level rise?
  - What are the credentials of the team member that will be converting datums and interpreting projections?

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Procurement Policy

Deforestation-Free Procurement Act (AB-572)

- **Require state contractors to have policies** ensuring that the beef, soy, palm oil and other commodities they import to California aren't contributing to tropical deforestation.
- Tropical deforestation is an urgent problem that affects all Californians by accelerating climate change, which causes fires, drought, sea-level rise, and a melting snowpack. So the California legislature is to be commended for recognizing this global issue.

Life Cycle

California Executive Order B-30-15

- State agencies shall take climate change into account in their planning and investment decisions, and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives. The state's Five-Year Infrastructure Plan will take current and future climate change impacts into account in all infrastructure projects

Federal Flood Risk Standard

- ensure that agencies address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended.

Federal Project Example

- Project co-op agreements require eligibility for flood insurance program
- SLR protection criteria results in higher appropriation ranking
- Fed funding prohibits using locally preferred (SLR) expert
  - Contract separately
- Beach project life cycle ~10 yrs
  - Redesign in 5th year
  - procurement in 6th year
  - Consider contingencies, horizon

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1. At what other procurement steps should sea level rise be referenced?
2. What % of staff involved in procurement process would feel comfortable incorporating sea level rise? Why not?
3. Who would you consult with to verify sea level rise information?

MIAMI BEACH BUSINESS CASE ANALYSIS OF THE STORMWATER PROGRAM

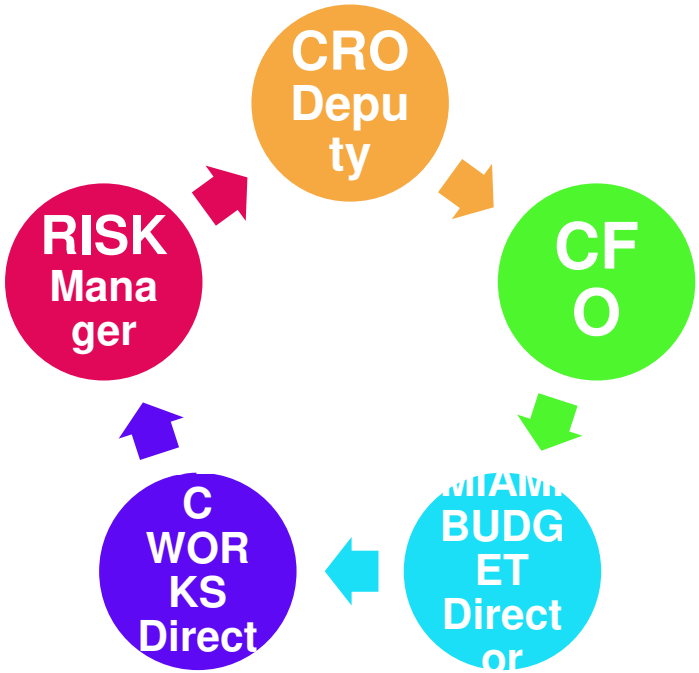
Key Questions to Answer

- What is the effectiveness of the City's planned infrastructure improvements (e.g., raising roads, increasing drainage capacity) at reducing flood risk?
- How much would additional private sector investments in flood mitigation reduce flood risk overall?
- What is the effect of these investments on property values?
- What are the other benefits of reduced flooding?
- Overall, what is the business case for public and private sector stormwater resilience investments?

Business case components:

- Expected losses/property damage
- Changes in property values
- Insurance premiums
- Property tax revenues
- Tourism revenues
- Operational/response costs
- Traffic disruptions
- Business closures
- Resilience construction

INTERDISCIPLINARY EVALUATION COMMITTEE



Team Roles

ICF	Overall project management, vision, oversight Property value analysis Economic analysis
AIR	Citywide risk modeling Expected damages Flood risk effects on insurance premiums
Kimley»Horn	Integrated flood modeling
BRIZAGA ASSESS. COMMUNICATE. ADAPT	Communications Adaptation strategies for individual property owners
FAU	Support property value analysis Qualitative analysis Advisory support

FUNDING

POOL OF QUALIFIED CONSULTANTS

-Top ranked

WOOD
AECOM
BALMORAL GROUP
HAZEN AND SAWYER
CH2M HILL (JACOBS)
ARUP

Stage 1

Stage 2

Stage 3

Stage 4

Scope of Work

T1 – User Engagement and Data Collection

- Documentation of user needs
- Data inventory

T2 – Citywide SLR and Storm Surge Risk Model

- Expected annual coastal flood losses w/ and without SLR
- Extent and depth of surge under various scenarios

T3 – Integrated Flood Modeling (First Street neighborhood)

- Inundation extents/depths under baseline, public investment, and private investment scenarios

T4 – Determine Property Value Impacts

- Hedonic pricing model linking property values to flood risk to property and nearby roads

T5 – Individual Property Business Case

- Calculate costs and benefits of different homeowner resilience investment options

T6 – Neighborhood-level Business Case

- Calculate costs and benefits of public and private resilience investment options

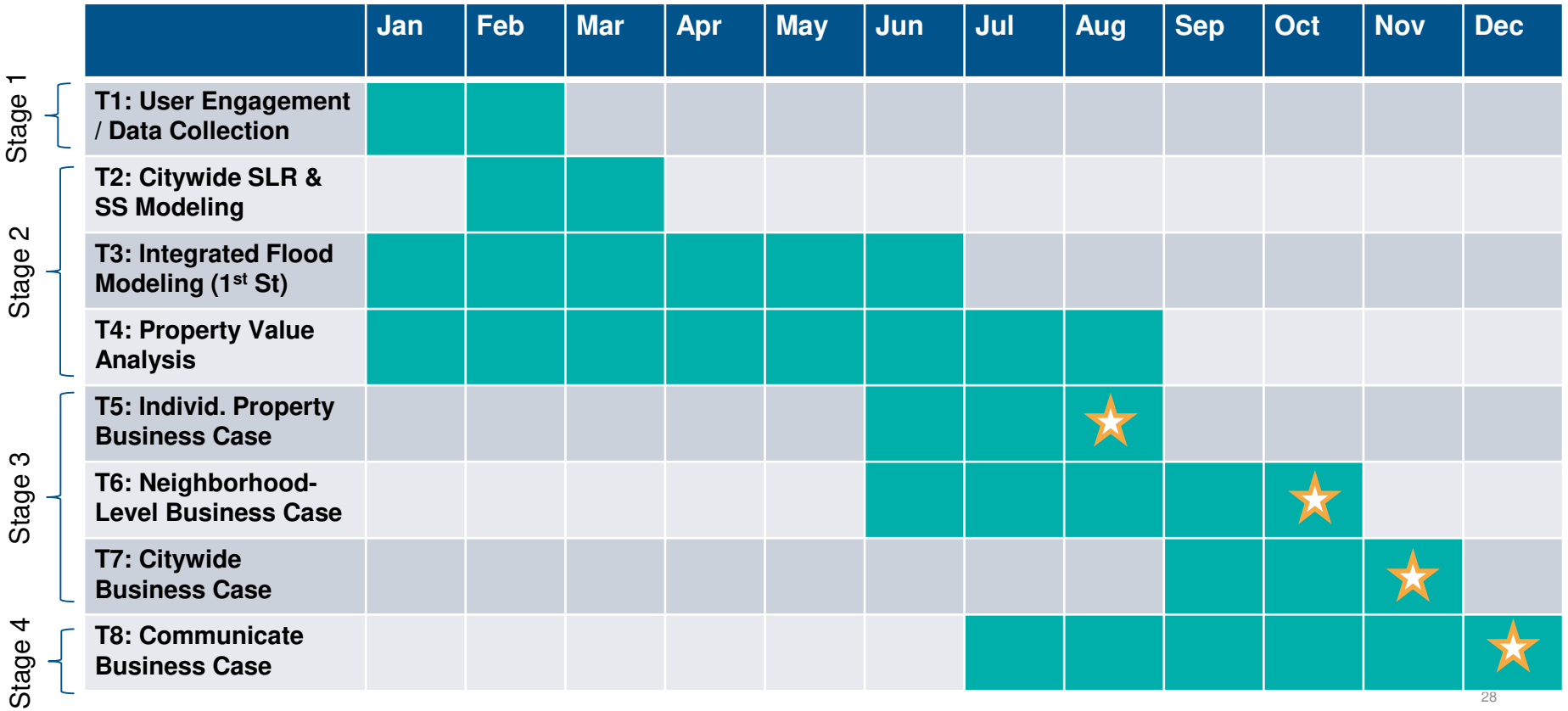
T7 – Citywide Business Case

- Estimate Citywide cost of inaction; appropriate level of investment in resilience

T8 – Communicate Business Case

- Communication products (2-pager, presentation)

Schedule



MIAMIBEACH
RISING
ABOVE

THANK YOU!

Eric Carpenter, PE
Assistant City Manager
EricCarpenter@miamibeachfl.gov

SOUTHEAST FLORIDA
REGIONAL COMPACT
CLIMATE
CHANGE

Break

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

Procuring for adaptation

Best practices for climate-smart infrastructure

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Lunch Break

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Procuring for a low-carbon future

PROCURING FOR A LOW CARBON FUTURE: INVESTING IN SOLAR AND ENERGY EFFICIENCY

Dr. Jennifer Jurado | Broward County

Compact Procurement Workshop

May 10, 2019

Overarching Obstacles

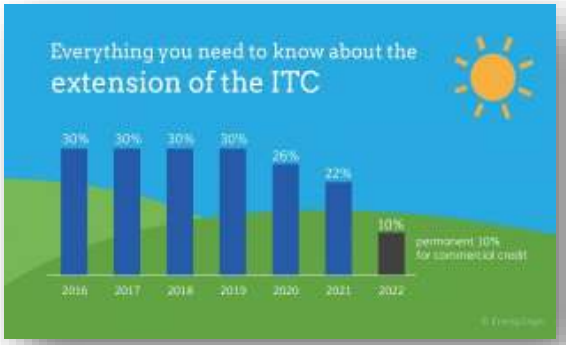
- Limited access to upfront capital funds
- Inability to sell long-term ROI
- Lacks of financial incentives for local governments
- County vs. community projects and investments
- Internal coordination
- Perceptions of risk and liability

Strategies

- Seek opportunities to transfer risk
- Pursue public-private partnerships
  - Ease procurement challenges
  - Take advantage of tax incentives
- Recent examples
  - 179D tax credit
  - Qualified energy conservation bonds
  - Federal investment tax credit
- Issue: Program expiration requires timely action

U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY



Tools for Expediency

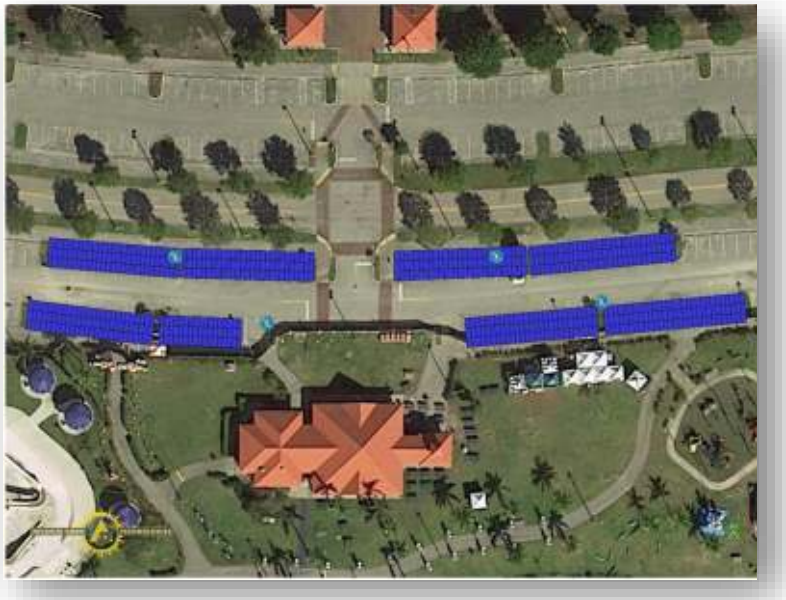
- Utilize procurement by others as basis for “sole” or “most reasonable source” justification, noting:
  - Need to evaluate alternative models
- Piggy-back on agency agreements negotiated through competitive procurement, noting:
  - Need to adhere to initial scope
  - Little flexibility for additional contract terms

Current Effort

- Obtain energy services through state negotiated agreement
- Financial model relies upon expiring federal tax credit
- Avoids upfront capital costs associated with site-specific installations
- Facilitates prominent promotion of renewable energy investments at agency facilities
- Target capacity for financial ROI ca. 2 MW

Status

Broward County Central Regional Park



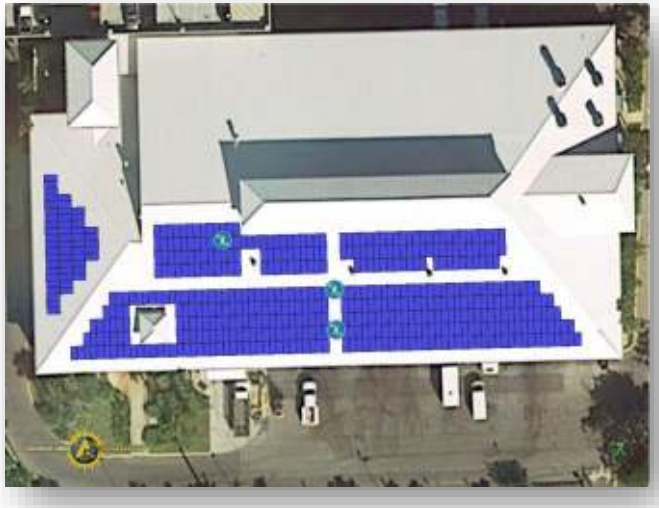
- 8 select county sites
  - 6 roof top
  - 2 parking canopies
- Sites selection based on:
  - Age and condition of roof
  - Ownership and use
  - Planned sites improvements
- Projects sized in accordance with average monthly energy consumption, and minimums
- 2 MW to offset ca. 60% energy consumption

Challenges

- Coordination – facilities, construction management, building managers, agency directors, legal, real property, budget, purchasing, county administration
- Concerns – implication for existing warrantees, compatible with hardened facilities, planned improvements (roof/AC), access, conduit, racking systems, penetrations, wind rating
- Hiccups – need for site-specific lease agreements, ownership, newly identified roof replacement

Broward County
Animal Care

Broward County Transit



Lessons

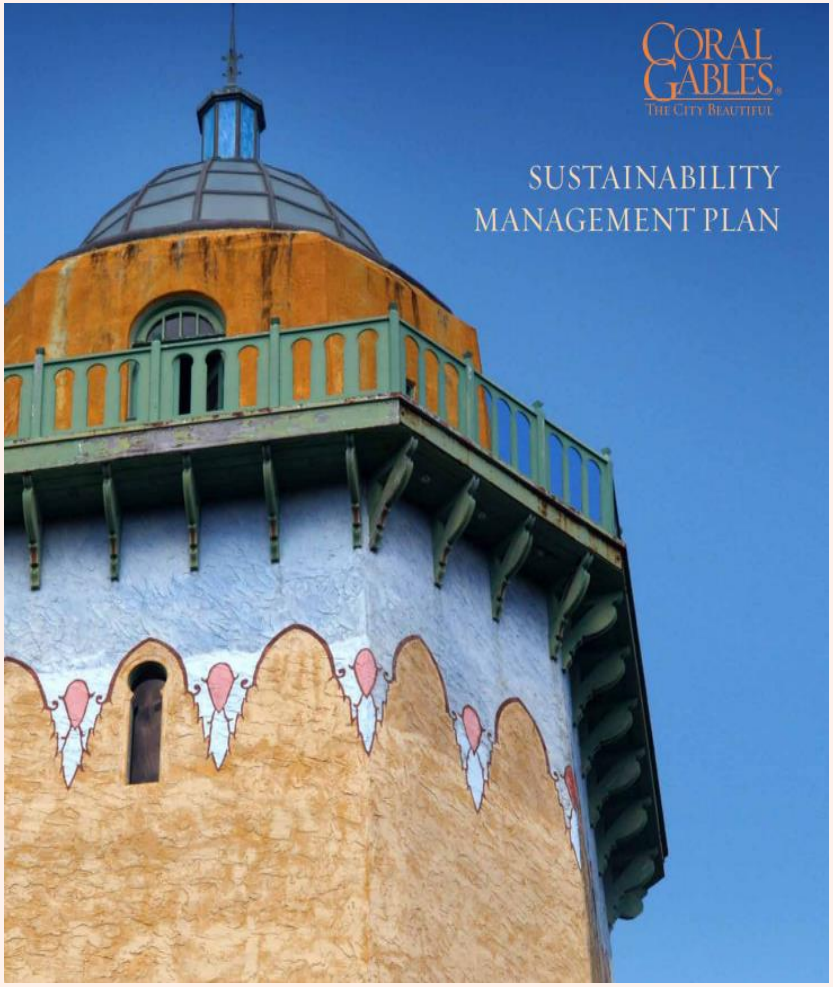
- Seek strong endorsement and directive from senior administrator
- Longer the process, the more time for conditions to change. Something always comes up.
- Listen to all arguments, they will need to be responded to, and there might be some valid points
- Employ exhaustive coordination and expertise of colleagues
- Be persistent, and don’t take “no” for an answer

Journey into Electric Vehicles and EV Charging Infrastructure

CORAL GABLES®
THE CITY BEAUTIFUL

Sustainability Management Plan

- 10-year Plan
  - City Operations (23 projects)
    - Focus areas: (Energy, Fleet, Water, Waste, Land Use & Transportation, Outreach, Finance
    - Reduce Fuel, Energy, Water and GHG Emissions by 20% by 2025.
    - 24% ROI over 10 years (over $4 million)
  - 2013 & 2017 Greenhouse Gas Emission Inventory (City Operations & Community-Wide)



Electric Vehicle Fleet

- 51 Electric Vehicles (16 Extended Range Chevy Bolts)
- FY 2021 goal: 78 Electric Vehicles (60% of Administrative Fleet).
- Departments with EV's: Public Works, Code Enforcement/Development Services, Parking, Procurement/Finance, Automotive, Historical Resources, Fire Dept.
- EV's replaced vehicles that were not Emergency/Rescue-Recon
- 12 GEM Electric Vehicles (Neighborhood Safety Aide & Special Activities Service Vehicle)

www.coralgables.com/electricvehicles

Current Electric Vehicle Charging Infrastructure

- Currently: (16 Stations): (12) Level II & (4) Level III (Total: 22 charging ports)
- Public: (5) level II Dual Port Stations: (2) Parking Garage #2, (1) Garage #4 and (2) Garage #6 , (2) Level III stations at City Hall (405 Biltmore Way)
- 10,700 Charging Sessions; Saved 12,000 gallons of fuel; Avoided 28,000 lbs of GHG
- Private: (1) Private Level III and (6) Level II at Public Works Department; (1) Level III Youth Center; (1) Level II Trolley/Admin Office
- Future Implementation: 11 Charging Stations; 21 Charging Ports
- Zoning Code Update (March 2019): (20 or more off-street spaces): Requires 2%: EV parking with charging stations. 3%: “EV Ready” (infrastructure installed except EV Station. 15%: “EV Capable” conduit run with capacity in electrical panels.

PROCUREMENT

- Nissan Leafs (2016) were priced at $32K on the State Contract.
- Used MEARS lease program to help take advantage of additional tax incentives to bring the cost lower.
- Additional dealer incentives from Nissan lowered the cost to $18K.
- Nissan also provided two FREE fast charging stations.
- Chevy Bolts purchased off the State Contract and leased for one year to receive $3,000 of tax incentive.
- Purchased through vehicle replacement program. ($3.2 million)
- Charging Stations: purchased through operations funds.
- EVGO Level III Stations: Provided space and they operate and maintain.
- EV's will be rotated every 6 yrs. to retain maximum value with battery warranty.

Best Practices

Charging Stations

- Placement of charging stations and their type, Level 2 or 3, is critical to the success of your EV fleet.
- Consider inexpensive “standard” level 2 chargers for secure government parking areas that are not available to the general public.
- Consider purchasing dual port level 2 charging stations that can charge 2 cars simultaneously. Place them between two parking spaces where cars park overnight
- Level 3 chargers should be used in outlying areas furthest away from the home base.
- Survey areas to ensure that the chargers are not placed in flood areas.
- Consult with cities/county in your area before developing your infrastructure plan!

EV Fleet

- How many average daily miles are driven? Min of 20% range available at the end of the route/workday. Is the vehicle used for multiple shifts?
- Is the vehicle deemed mission essential after a hurricane?
- Estimate a 30% reduction in battery capacity over the battery’s warranty.
- Constant fast charging will accelerate the reduction of battery capacity.
- Ancillary devices that must be installed on the car that would require battery power?

ALTERNATIVE TRANSPORTATION

- Multimodal transportation plan
- Free Trolley Service (Over 1.2 million riders per year).
- Bicycle/Pedestrian Master Plan
  - Expanding bike infrastructure (10 to 34 miles)
- Provide free bike racks to businesses
- Freebie Service (Year 1: 60,000 riders)
- Spin and Bird Scooters (1st in Florida)
- Since FY16: 1.2 miles of sidewalk extensions. 232 crosswalks.

www.coralgables.com/bike

Thank you

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Senior Sustainability Analyst
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305-460-5008

Climate Mayors

Electric Vehicle Purchasing Collaborative

Electrification Coalition

Jared Walker
Technical Lead – Fleet Transition

RCAP Resilient Procurement
May 10th 2019

The Electrification Coalition

About Us

The Electrification Coalition is a nonpartisan, not-for-profit group of business leaders committed to promoting policies and actions that facilitate the deployment of electric vehicles on a mass scale.

Electrification Coalition

How to Maximize Fleet Electrification Benefits

Total Cost of Ownership Approach	• Fleet managers rank TCO as the most significant factor in acquisition decisions
Route Predictability	• Lower infrastructure investment; known impact of transition to new technology
High Utilization Rates	• High VMT/vehicle increases ROI and lowers cost per mile
Use of Central Parking Facilities	• Lower infrastructure investment; economies of scale in installation
Maintenance Costs	• Lower maintenance costs of new technology = substantial cost savings
Lower Fuel Prices	• Electricity is domestic, diverse, and cleaner
Return on Investment	• In the right applications, EVs will generate an ROI during their useful life
Sustainability Initiatives	• EVs contribute to sustainability initiatives around reduced GHG emissions and/or petroleum use

Driving EV Fleet Transition

Reducing barriers to transition for ALL public fleets (not just cities that are part of Climate Mayors)

- Increasing procurement choice – including innovating leasing options
- Reducing administrative time
- Aggregating national demand to lower costs
- Helping with pre/post-deployment planning and training
- Offering cooperative purchasing/bundling purchasing

Cities with commitments to EV fleets

MI Ann Arbor	AR Fayetteville	NY Rochester
CO Aspen	MD Greenbelt	CA San Diego
TX Austin	NY Highland Park	CA Sacramento
CA Berkeley	NJ Hoboken	CA Santa Monica
CA Beverly Hills	TX Houston	FL Satellite Beach
NY Binghamton	NJ Jersey City	WA Seattle
VT Burlington	CA Long Beach	MA Somerville
FL Cape Canaveral	CA Los Angeles	NJ Verona
NJ Cape May Point	KY Louisville	DC Washington
CA Chula Vista	WI Madison	FL West Palm Beach
OH Cincinnati	WA Olympia	NY Yonkers
NC Charlotte	FL Orlando	CA Alameda County
OH Cleveland	AZ Phoenix	OH Cuyahoga County
OH Columbus	PA Pittsburgh	MN Hennepin County
CO Denver	NJ Plainsboro	CA Los Angeles County
IA Des Moines	OR Portland	AZ Pima County
	CA Redwood City	

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

Making the case

Metrics, life cycle analysis, and tracking resiliency investment

Cross-Departmental Strategic Priority Teams Drive Metrics

Dr. Keith A. Clinkscale, Lean Six Sigma Black Belt

Director, Strategic Planning and Performance Management Division

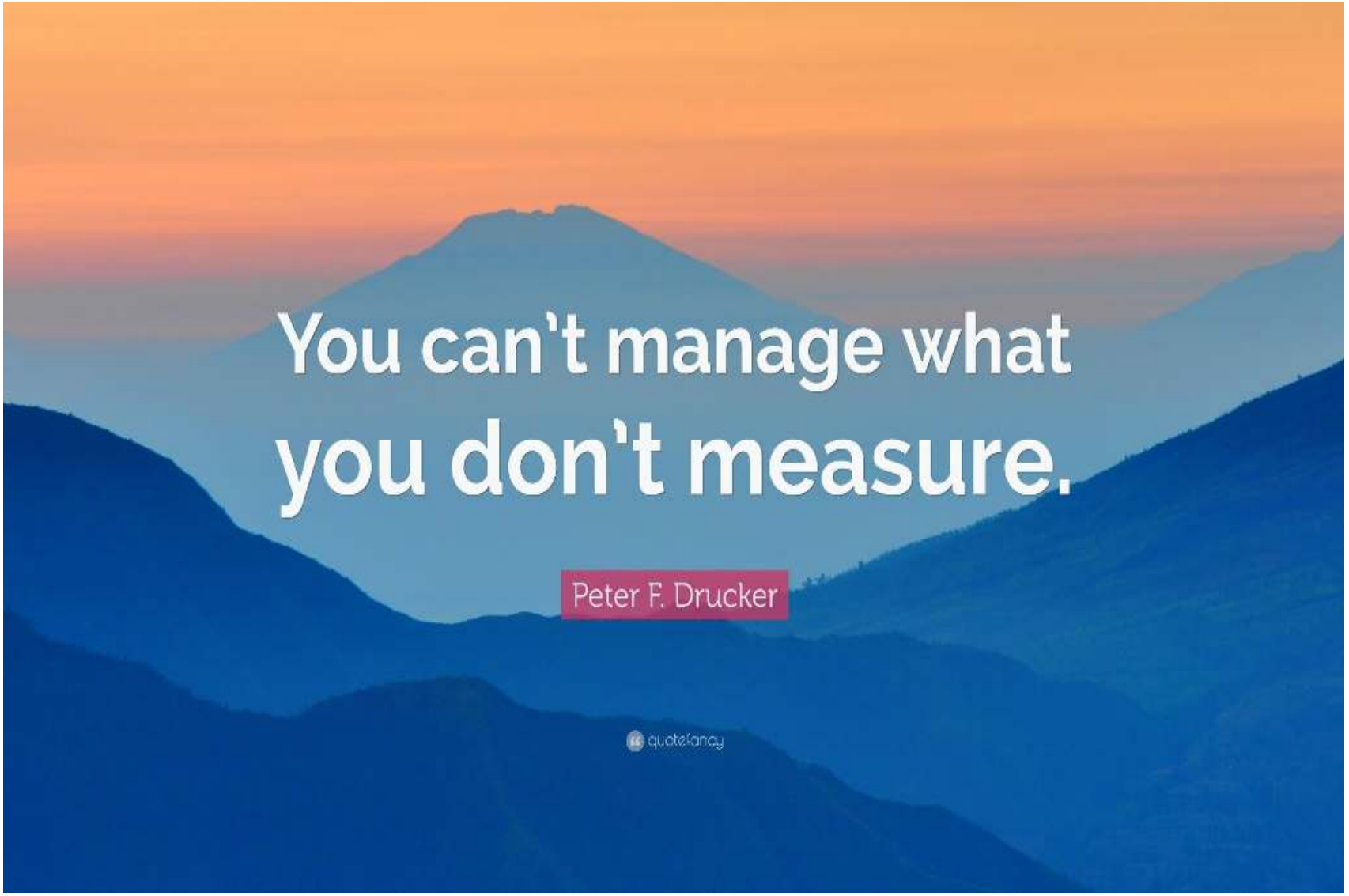
Office of Financial Management & Budget Department , Strategic Planning & Performance Management Division

301 N. Olive Ave., 7th Floor, West Palm Beach, FL 33401

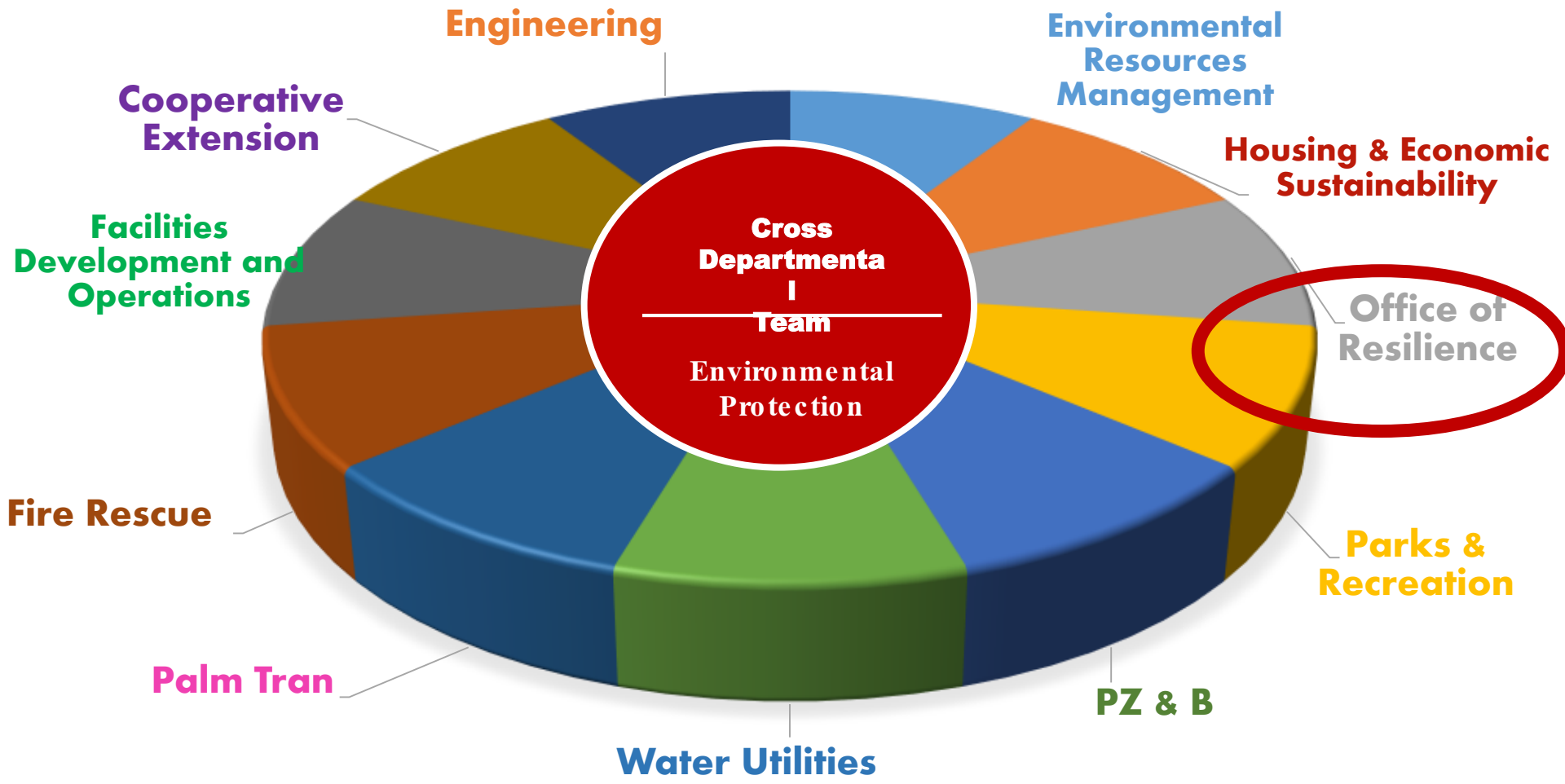
KCLINKSCALE@pbcgov.org

Board Approved Strategic Priorities 2019/2020

- **Economic Development**
- **Housing/Homelessness**
- **Environmental Protection**
- **Infrastructure**
- **Public Safety**
- **Substance use and Behavior Disorder**


You can't manage what
you don't measure.
Peter F. Drucker
quotefancy

Strategic Priority: Environmental Protection



STRATEGIC PRIORITY: ENVIRONMENTAL PROTECTION

"To promote programs and activities that protect, preserve, and enhance natural resources while providing sustainable living and developing a climate of resilience."

Environmental Protection Goals:

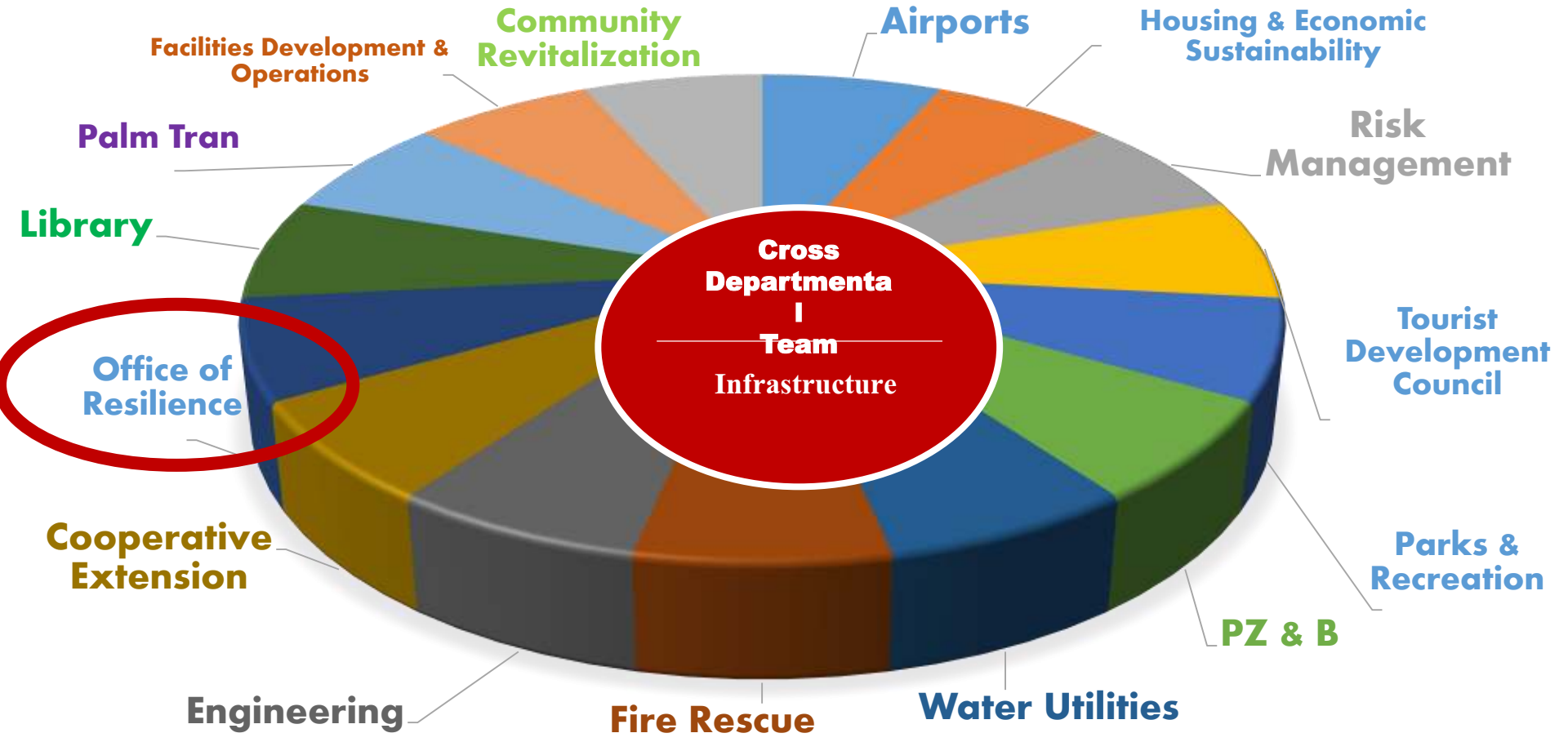
- Provide support four our Farmers and Agriculture
- Enhance and restore conservation lands and coastal habitats
- Reduce mosquito populations
- Protect drinking water quality
- Ensure environmental protection in site plan approvals
- Protect beaches
- Increase sustainability awareness
- Continue to provide/develop energy efficient facilities
- Encourage public transportation use and ride sharing
- Increase alternative fuel and clean energy sources
- **Create more resilient communities**
- Mitigate climate change impacts
- Promote clean energy job creation
- Design and construct 4 artificial reefs
- Storm water management and compliance
- Address algae and water quality of local bodies of water

STRATEGIC PRIORITY: ENVIRONMENTAL PROTECTION

METRICS

- Maintain the County's inventory of 31,628 acres of natural area lands for invasive/ exotic vegetation at less than 1% coverage
- Maintain 166 miles of publically accessible trails in County natural areas
- Increase acreage of estuarine and freshwater habitats
- Maintain an 11-year moving average of greater than 1 million cubic yards of sand placed on beaches County-wide
- Inspect coastal facilities to achieve at least 90% compliance with sea turtle lighting ordinance
- Achieve at least 90% completion of mosquito control service requests within 5 days
- Achieve at least 95% compliance with storage tank regulations
- Annual community/government renewable energy usage
- Decrease per capita vehicle miles traveled
- **Increase percent compliance with Resiliency and Sustainability in County Capital Projects**
- Reduce per capita water demand
- Percent increase in restored habitat
- Increase number of activities and programs that support Farming and Agriculture

Strategic Priority: Infrastructure



STRATEGIC PRIORITY: INFRASTRUCTURE

"To provide the needed structures, systems and services that establish the foundation required to enhance the quality of life of every resident."

Infrastructure Goals:

- Increase sustainability of infrastructure
- **Plan and design for sea level rise and extreme weather events**
- Continue to develop infrastructure services
- Safe, healthy and attractive neighborhoods and communities
- Access to opportunities safely, efficiently and courteously through stellar transportation services
- Increase connectivity and safety through complete streets (i.e. bicycle lanes, proper signage, pedestrian lanes and cross-walks)

STRATEGIC PRIORITY: INFRASTRUCTURE

METRICS

- Average annual traffic delay (during peak hours) due to traffic congestion
- Reduce peak period travel time on certain major corridors
- Increase travel time reliability on certain corridors
- Increase bus on-time performance
- Decrease traffic crashes, bicycle collisions and pedestrian incidents
- Maintain 100 percent compliance with drinking water standards
- **Increase number of resilient public facilities available**
- **Increase resiliency of public shelters (including self-sufficiency)**
- **Use of unified sea level rise projections on applicable projects**
- Increase Library attendance/usage

TRACKING RESILIENCY IMPROVEMENTS

Seth Platt

LSN PARTNERS
Local • State • National

MOODY'S
INVESTORS SERVICE

"The growing effects of climate change, including climbing global temperatures, and rising sea levels, are forecast to have an increasing economic impact on US state and local issuers. This will be a growing negative credit factor for issuers without sufficient adaptation and mitigation strategies."

Union of Concerned Scientists

- 1 million Florida homes worth $351 Billion will be at risk for tidal flooding and about $5 billion in annual property tax revenue will also be in jeopardy.

- 2017 Extreme weather costs exceeded $312 billion.
- 2018 Extreme weather costs exceeded $91 billion

National Institute of
BUILDING SCIENCES

Natural Hazard Mitigation Saves: 2017 Interim Report

- Mitigation funding **can save the nation $6 in future disaster costs, for every $1 spent** on hazard mitigation.
- *The* Report demonstrates that investing in hazard mitigation measures to exceed select Building code requirements can **save the nation $4 for every $1 spent**.

BENEFITS OF TRACKING RESILIENCY SPENDING

- Motivates mitigation and resiliency components to be included.
- Mitigates future credit downgrades associated with climate change risk.
- Mitigates increases to insurance for the private and public sector.
- Justifies requests for State and Federal matching dollars or grants.
- Leverages Infrastructure Life Cycles in Bonding.
- Increases public awareness of real costs associated with climate change.
- Helps to fulfill defined goals of implementing strong resiliency programs.
- Saves taxpayers' dollars by extending lifecycle through hardening infrastructure.
- Demonstrates leadership in climate change mitigation.

HOW DO WE INCENTIVIZE RESILIENCY AND SUSTAINABILITY IN PUBLIC PROCUREMENT?

Conflict: Resiliency/Sustainability vs Traditional Procurement

- Procurements Often Seeks Cost Benefit vs Sustainability.
- Can pricing be weighted against resiliency?
- How do different methods of procurement address this conflict?
- Does State Law allow resiliency as a consideration in procurement?
- How do we create a resiliency procurement method which cities and Counties may incorporate?
- Types or procurements to target
  - Products or services
  - Infrastructure projects

RESILIENCY TRACKING
PUBLIC SECTOR VS PRIVATE SECTOR

- Public Sector
  - Requires staff review of infrastructure projects
  - Requires tallying of all resiliency improvements
  - Adoption of standards like LEED
- Private sector
  - Include resiliency improvements review in CCNA
    - Identify tangible improvements for bid process
    - Include Life Cycle Costing
  - Require private sector quantitative cost measurement reporting similar to small business program reporting.
- Hybrid

CCNA

Florida State Statute 287.055(4)(b)

- *In determining whether a firm is qualified, the agency shall consider such factors as the ability of professional personnel; whether a firm is a certified minority business enterprise; past performance; willingness to meet time and budget requirements; location; recent, current, and projected workloads of the firms; and the volume of work previously awarded to each firm by the agency.*
- CCNA does not allow for sustainability to be considered as an evaluation criteria in a firm's proposal.

EMPOWER YOUR CONSULTANT

- Communicate desire for resiliency inclusion.
- Establish benchmarks.
- CCNA Initial Design Review can identify potential resiliency opportunities.
- Request Life Cycle Cost Analysis justifications.
  - GSA mandates Life Cycle Costing in *(CFR), Title 10, Part 436, Subpart A: Program Rules of the Federal Energy Management Program* when applied to building design energy conservation measures.
  - Request tangible life cycle cost analysis on procurement items, i.e. Chillers, fleet vehicles.
  - Compare building materials.
- Establish baselines for methods and materials.

CALIFORNIA EXECUTIVE ORDER B-30-15

- *State agencies shall take climate change into account in their planning and investment decisions and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives.*
- *State agencies' planning and investment shall be guided by the following principles*
  - *Priority should be given to actions that both build climate preparedness and reduce greenhouse gas emissions;*
  - *Where possible, flexible and adaptive approaches should be taken to prepare for uncertain climate impacts;*
  - *Natural infrastructure solutions should be prioritized.*
- *The state's Five-Year Infrastructure Plan will take current and future climate change impacts into account in all infrastructure projects*
- *The Governor's Office of Planning and Research will establish a technical, advisory group to help state agencies incorporate climate change impacts into planning and investment decisions.*

DESIGN BUILD

Per *FL SS. 287.055 9(c) 3:*

- *The criteria, procedures, and standards for the evaluation of design-build contract proposals or bids, based on price,* ***technical****, and* ***design aspects*** *of the public construction project, weighted for the project.*
- Sliding scale for pricing weighted against provable life cycle costs savings.

DESIGN COMPETITIONS & CHALLENGES

- Encourage innovation
- Challenge.gov
- HUD -Rebuild by Design & National Disaster Resilience Competition
- White House Budget Proposal
  - $100 Billion in Incentive Grants
  - $20 Billion in Transformative Projects
- White House & Congress $2 Trillion Infrastructure

PUBLIC PRIVATE PARTNERSHIPS

- Performance Contracts
  - Energy Savings Performance Contracts
  - Are there other procurements which can leverage this method?
- Infrastructure
  - Resilient inclusion is incentivized
    - Collaborative Project Delivery
    - Operations
    - Maintenance
    - Increased Life Cycles Benefit Financing

THANK YOU.

How Triple Bottom Line Economic Analysis Supports Best Value Procurement, Project Selection, and Stakeholder Outreach

Autocase
Impact Infrastructure

Eric Bill, M.Econ, MBA – VP Economics, Autocase
eric@autocase.com

Building resilience requires not just integrating the changing climate into planning, but also adjusting how we invest using resilience principles.

How can local governments require meaningful climate-smart criteria and deliverables for all infrastructure-related capital projects and capital improvement plans, contracts and other procurement vehicles, grants and bond funding, and asset management plans?

What evaluation methodologies are available to help capture the broader range of climate impacts in the project design and bids evaluation process that include the cost of externalities?

What are potential ways to track resilience investments within local governments?

Total Value = Financial + Social + Environmental

Identify best-value: measure impacts, prioritize projects, and communicate public and community benefits

Autocase

ECONOMIC ANALYSIS TO INFORM PROJECT AND POLICY DECISION MAKING

CBA is a tool to aid organizations in project design, prioritization, and outreach:

- It considers the gains and losses to all members of the society on whose behalf the CBA is being undertaken

  It values impacts in terms of a single, familiar measurement scale – money

  The money values used to weight the relative importance of the different impacts
- Determine whether the benefits of a proposed action justify its costs

Data-Driven Decision Making

Autocase

CONSIDERATIONS TOWARDS ECONOMIC ANALYSIS

- CBA is an industry standard decision-support tool used to inform and improve public policy, programmes and projects
- Increasing project competition for scarce resources
- Regulatory and legislative drivers
- Broader public and stakeholder interest in community benefits and sustainability, alongside greater project scrutiny
- Challenges incorporating sustainability and resiliency into investment and operating decisions via traditional capital planning
- Used extensively in resiliency assessment to value of both structural and non-structural investments relating to hazard mitigation or operational redundancy/reliability
- PPP market further driving importance on identifying explicit value proposition and benefits to different stakeholder groups (owner, government, community)
- Private capital, alternative funding, and bond ratings looking to quantify impacts & risks
- Compare disparate investments using a common lens
- Greater importance of quantitative decision making and project due diligence

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INTEGRATING TBL ECONOMICS – BROADER MARKET

J.P.Morgan Asset Management

"We will not invest in any infrastructure project that does not include long-term **triple-bottom-line** analysis from early planning into operations."
-CEO, JP Morgan Infrastructure Investments, 2014

PGH2O

"Evaluate … if design locations are maximizing their fullest stormwater capture. The Consultant shall provide … a benefits valuation performed by the PWSA, which will be based in Autocase software, to evaluate: [financial, social and environmental costs and benefits]."
– *Pittsburgh Water and Sewer Authority*, 2018

DGS

"The state is interested in aligning sustainable design decisions in the most cost beneficial manner, taking into account life cycle financial, social, and environmental factors…..have identified a software program called Autocase as the tool they will use in analyzing sustainable project enhancements." - DGS O Street RFP 2017

NYCEDC

"NYC Capital Planning now requires a **triple bottom line** analysis, and we need tools to do it."
-NYC Director of Capital Planning, 2015

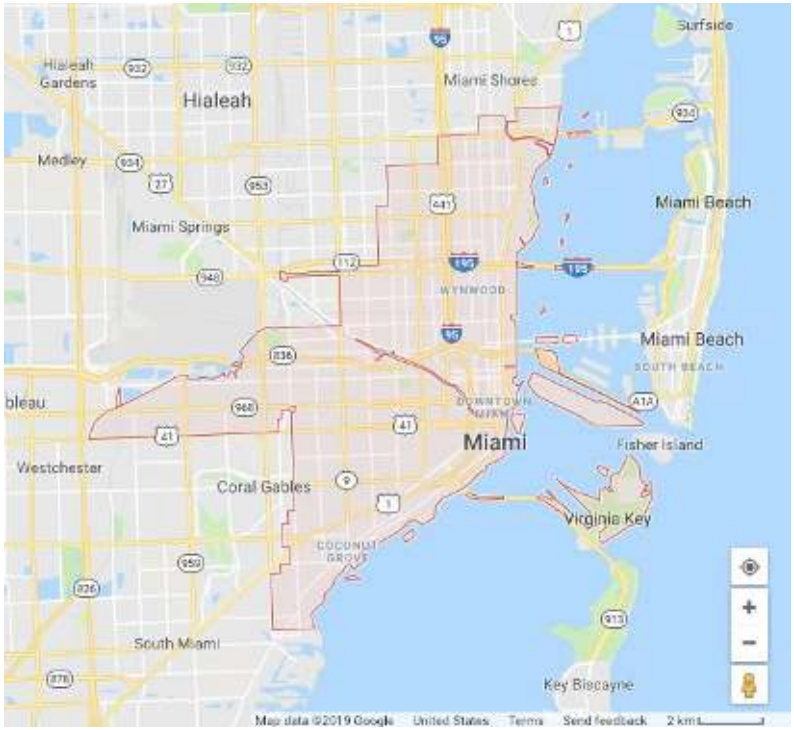
City of Phoenix

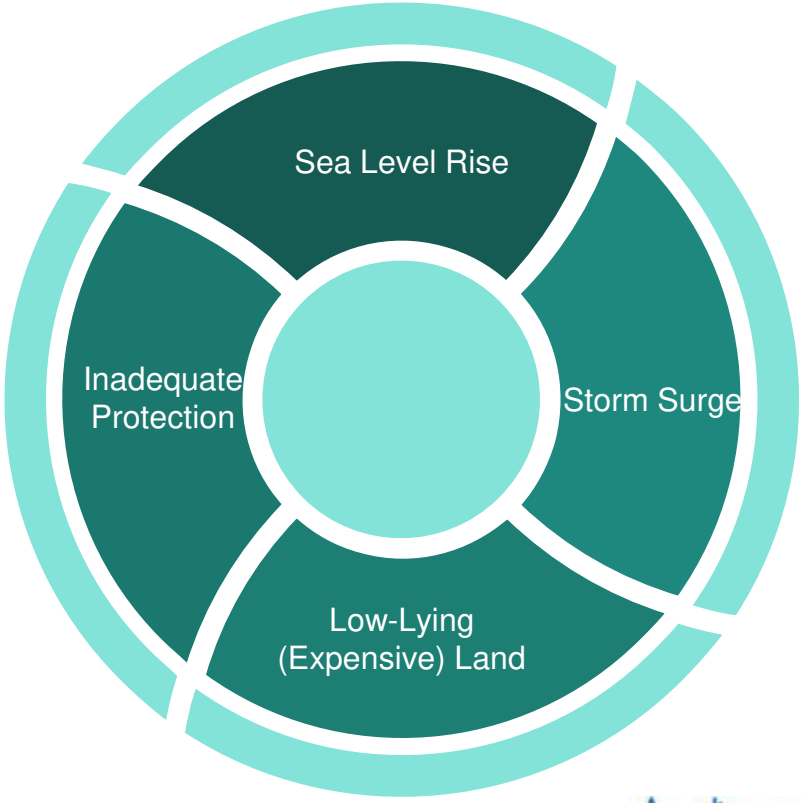
"The City is looking for a firm with experience in…**cost-benefit analyses (looking at both direct and indirect costs and benefits**). Please specify the method/program you would propose to undertake this study (i.e., **Autocase**, etc.)." – City of Phoenix Request for Firm Information, 2017

SFO

"Contractor shall develop a comprehensive business case analysis that includes data on external **economic, social, and environmental costs…(e.g. Autocase)**"
- San Francisco International Airport Terminal 1 BID Spec Document, 2015

City of Miami - Flood Mitigation Urban Resilience Planning





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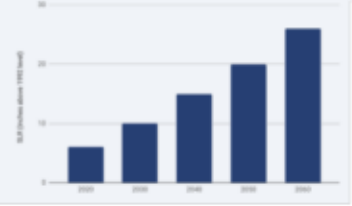
Rethinking Resilience: Valuing Sea Wall Designs in Downtown Miami

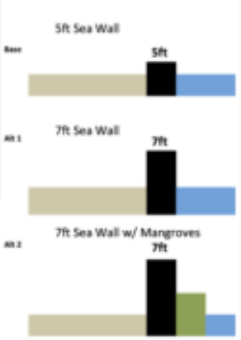
Autocase

Impact Infrastructure

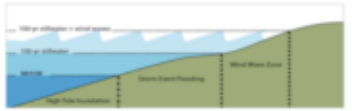
The City of Miami faces various natural hazards, including **sea level rise (SLR)** and storm surges.

Miami Downtown Development Authority (Miami DDA) engaged Impact Infrastructure to conduct a **Triple Bottom Line Cost Benefit Analysis (TBL-CBA)** to estimate the incremental costs and co-benefits over a 40-year time period into a **net present value (TBL-NPV)** of 7ft sea wall and 7 ft sea wall+living shoreline (mangroves+seagrasses) compared against current shoreline protections of the 5ft sea wall.





Ten-year storm event



7ft sea wall
reduce coastal flooding risk

Investing in 8.3 miles of 7ft sea wall along Downtown Miami shoreline costs -$66M but yields $404M in avoided coastal flood risk resulting in

$338M TBL-NPV
Annual avoided flood risk of $10M
$6.10 for every $1 invested
830 jobs

7ft sea wall+living shoreline
reduce coastal flooding risk and create ecosystem services

Investing in 8.3 miles of 7ft sea wall+living shoreline along Downtown Miami shoreline costs -$108M but yields $552M in avoided coastal flood risk and $11M in ecosystem service benefits resulting in

$454M TBL-NPV
Annual avoided flood risk of $14M
$5.20 for every $1 invested
1,300 jobs

SFO Terminal 1 Redevelopment

Infrastructure owner SFO makes the case for sustainability investments and design elements in SFO's $2.4B 1.18 M sq ft Terminal 1 re-development

"Contractor shall develop a comprehensive business case analysis that includes data on external **economic, social, and environmental costs…(e.g. Autocase)**"

Autocase

SFO Terminal 1 Redevelopment - Boarding Area B (BAB)

	Green Roof	Electrochromic Glazing	Motorized Window Shades	Interior Landscaping	Radiant Heating and Cooling	Ground Source Heat Pump
Lifecycle Financial NPV	-$1.05	-$3.29	-$7.59	-$8.48	-$2.84	-$5.82
Social & Environmental NPV	$6.34	$6.26	$6.26	$11.39	$0.44	$0.59
Triple Bottom Line NPV	$5.29	$2.97	-$1.34	$2.91	-$2.41	-$5.23

*In Millions

BAB & T1 Highlights:

- TBL CBA supported SFO sustainability design decisions
- Owner requirement to support design-build teams for value-based design
- Used outputs as part of broader MCDA decision approach

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Miami Dade County - Office of Resilience - Building 305 Program

City Energy Project partnered with 20 cities and counties across the U.S. to create and implement customized, impactful energy efficiency policies and programs

Autocase

Building Efficiency 305 Ordinance Components

BE305 Program is a building performance policy that was developed through local stakeholder engagement. This policy has three main components:

- **Benchmarking and Transparency** - tracking a building's energy and water use
- **Retuning** - basic systems are tuned with no-cost or low-cost minor repairs and adjustments so that buildings operate and function as designed.
- **Auditing** – a whole-building performance evaluation to identify and prioritize improvements.

- 3 years of implementation, 40 years of operation
- **10,778 buildings covering 1,080,000 square feet of floor space**

Autocase

Building Efficiency 305 Ordinance Components

Triple Bottom Line of the Building Performance Ordinance and Components					
Impact Type	Cost/Benefit	Benchmarking	Retro-commissioning	Auditing	Total
		Value	Value	Value	Value
Owner/Occupant	Operation & Maintenance	-$46,829,000	-$1,079,000	-$351,900	-$48,612,000
Owner/Occupant	Financial Savings from Electricity	$1,626,560,000	$2,008,459,000	$523,591,000	$4,158,610,000
Owner/Occupant	Financial Savings from Natural Gas	$119,101,000	$214,356,000	$40,034,000	$373,492,000
Community	Social Value of Air Pollution	$515,604,000	$672,099,000	$166,866,000	$1,354,569,000
Community	Social Value of Carbon Emissions	$715,245,000	$979,879,000	$232,674,000	$1,927,798,000
Community	Social Value of Water	$2,122,000	$2,230,000	$673,500	$5,026,000
Total Owner/Occupant NPV		$1,698,832,000	$2,221,736,000	$563,273,100	$4,483,490,000
Community NPV		$1,232,971,000	$1,654,208,000	$400,213,500	$3,287,393,000
Triple Bottom Line NPV		$2,931,803,000	$3,875,944,000	$963,486,600	$7,770,883,000

- >44 million tons CO2e reduced
- ~52 thousand tons of Criteria Air Pollutants reduced

Autocase

City of Pittsburgh - Green First Program

Phase I: City-wide Green Infrastructure (GI) Assessment: Evaluate GI benefits in targeted areas across the **30 combined sewersheds** with TBL-CBA tool

'Green First' Program: implementing GI first to capture stormwater at its source:

- Chronic surface flooding (CSO & SSO)
- Poor water quality and recreation opportunity enhancements
- Meet EPA consent decree obligations

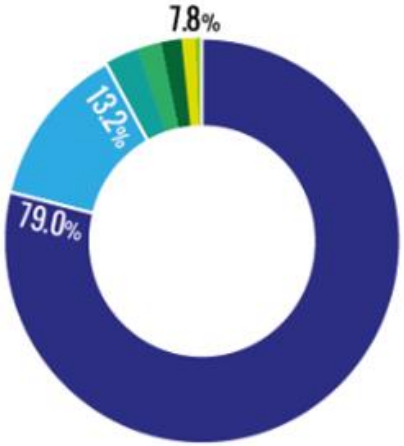
GI Investment Scenarios

- 1,286 acres of impervious area managed by GI in 13 sewersheds
- 1,835 acres of impervious area managed by GI in 18 sewersheds

City of Pittsburgh - Green First Program

Benefits

- Local Flood Mitigation
- Property Value Increase
- Recreational Value Added
- Economic Water Quality
- Air Pollution Reduction
- Heat Island Effect Reduction
- Carbon Reduction



	LOW	HIGH
TBL TOTAL BENEFIT	$428M	$850M
BENEFIT PER RETROFITTED IMPERVIOUS ACRE	$233,000	$462,000

Evaluated benefits of a city-wide GI investment to reduce CS and SS overflows, remove/detain stream inflows, reduce flood hazards, and reduce basement sewage backups

Developed a stormwater overlay lens for use as a comprehensive planning tool for future development & redevelopment

Autocase required in subsequent design/construct project planning

Autocase

City of Pittsburgh - Green First Program, Phase II

Phase II: Individual priority sewersheds and sites identified in Phase I

Professional engineering, landscape architecture, ecological, and hydrology services

Four Mile Run Project: 3rd largest CSO contributor, 400 million gallons flow sewershed

2. **PURPOSE:** The proposed design requires a combination of both green and gray solutions to be evaluated to ensure cost-effectiveness for the PWSA rate payers. The Consultant should be collaborative and inclusive in its design approach as this project has significant stakeholders from both in public and private entities as well as multiple community based organizations. The overarching goal of this design is to address CSO overflows, reduce localized flooding, spur further park improvements, and align with mobility corridors where appropriate.

3. **SCOPE OF WORK:** The Consultant shall do all the work and furnish all supervision, labor, materials, equipment, tools and appurtenances necessary or proper for the performance and completion of the following:

A. Task 1: Preliminary Design Assessment and Expansion

1. Development and Validation of Alternatives

b. Evaluate the Preliminary Design Report and critically assess if each of the key design locations are maximizing their fullest stormwater capture and suggest alternatives where appropriate. The analysis shall include, but is not limited to:

4) Financial, social, and environmental costs and benefits. The cost analysis performed shall determine the cost per impervious acre captured. The Consultant shall provide inputs to a benefits valuation performed by the PWSA, which will be based in Autocase software, to evaluate: financial costs and benefits, combined sewer overflow reduction, surface and basement flooding risk, and other inputs of interest. Inputs shall be updated for each subsequent design milestone (e.g. 60%, 90% and final). The Consultant shall incorporate material options that minimize carbon footprint and negative environmental implications.

SOUTHEAST FLORIDA
REGIONAL COMPACT
CLIMATE CHANGE

Work Sessions