Getting Ahead of the "Curve" Opportunities and Challenges in Preparing for Sea Level Rise///

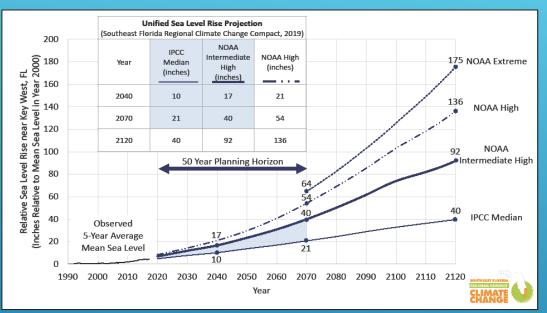
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December 17, 2020

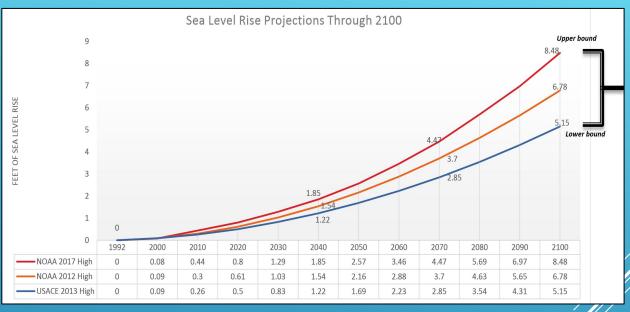


Outline - Resiliency Planning and SLR

- Regional SLR Projections
- Key State Statutes:
 - Adaptation Action Areas (with examples)
 - Peril of Flood Planning Legislation
 - Sea Level Impact Projection (SLIP) studies
- Funding Options for Adaptation
- Tort v. Takings
- Sovereign immunity
- Lessons for Local Governments & Policy Responses
- Adaptation Case Study: Monroe County

Regional Sea Level Rise Projections, aka "The Curves"





SE Florida

East Central Florida

Year	NOAA Int-Low (feet)	NOAA Intermediate (feet)	NOAA High (feet)	
2000³	0	0	0	
2030	0.56	0.79	1.25	
2040	0.72	1.08	1.77	
2050	0.95	1.44	2.56	
2060	1.15	1.87	3.48	
2070	1.35	2.33	4.56	
2080	1.54	2.82	5.71	
2090	1.71	3.38	7.05	
2100	1.90	3.90	8.50	

Table 1. Sea Level Change Relative to the Year 2000 for St. Petersburg, Florida in Feet above Local Mean Sea Level (LMSL)

Adaptation Action Areas (AAAs) Defined

- "Adaptation action area" is a designation in the coastal management element of a local government's comprehensive plan which identifies one or more areas that experience coastal flooding due to extreme high tides and storm surge, and that are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning. S. 163.3164(1), F.S.
- Section 163.3177(6)(g)(10), F.S.: "....At the option of the local government, develop an adaptation action area designation..."
- Local governments utilizing AAAs should consider policies within the coastal management element to improve resilience.

AAAs - Criteria and Types

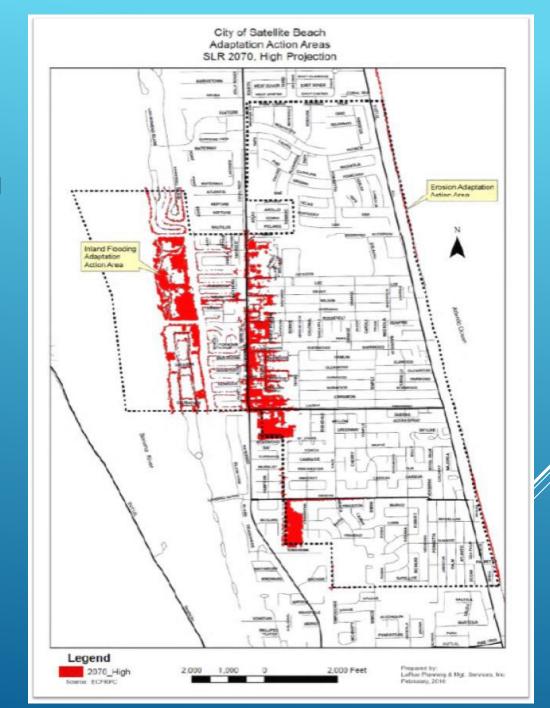
- Criteria for the adaptation action area may include, but aren't limited to, areas for which the land elevations are below, at, or near mean higher high water, which have a hydrologic connection to coastal waters, or which are designated as evacuation zones for storm surge. S. 163.3177(6)(g)(10), F.S.
- Different types of AAAs:
 - Infrastructure and assets (public sector and critical assets ranging from roads/flood mitigation to hospitals and schools)
 - Natural systems adaptation (parks, open space and natural shorelines)
 - Neighborhood adaptation (private property adaptations and policies)
- Subzones approach (RCAP 2.0)
 - Adaptation Areas
 - Restoration Areas
 - Growth Areas

AAA Example – Miami Beach

- Established entire City as an AAA.
- Policy 13.4: "The City will include areas, which experience tidal flooding, storm surge, or both as the first priority for the development and implementation of adaption strategies."
- Policy 13.5: Adaptation strategies may apply to the following:
 - Public infrastructure;
 - Emergency management;
 - Stormwater management;
 - Land development regulations;
 - Building codes;
 - Comprehensive planning; and
 - Other functions.

AAA Example – Satellite Beach

- Erosion Adaptation Action Area (EAAA)
 - ocean-front side of barrier island
- Inland Flooding Adaptation Action Area (IFAAA)
 - side of island on Indian River Lagoon



AAA Example - Yankeetown

- Bases AAAs primarily on natural area preservation (beach and dune protection)
- Policy 5.2.3.2: Ecosystem Migration. "Based on the science plan, the Town shall identify priority areas ... for fee simple, and less than fee simple, acquisition based on their strategic capacity to support coastal ecosystem migration."
- Objective 5.3.1: Adaptive Structures. "The Town shall discourage new structures within the NR-AAA Overlay District that are vulnerable to sea level rise unless designed to allow for coastal ecosystem migration (for example, floating, elevated or moveable structures)."

Peril of Flood Legislation

Section 163.3178(2)(f), F.S.: "...A redevelopment component that outlines the principles that must be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise." The component must:

- Include development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk which results from high-tide events, storm surge, flash floods, stormwater runoff, and the related impacts of sea-level rise.
- Encourage the use of best practices, principles, strategies, and engineering solutions that will result in the removal of coastal real property from FEMA flood zones.
- Identify site development techniques and best practices that may reduce losses due
 to flooding and claims made under state flood insurance policies.
- Be consistent with, or more stringent than, the flood-resistant construction requirements in the Fla Building Code and applicable flood plain management regulations in 44 C.F.R.
- Require that any construction activities seaward of the coastal construction control lines established pursuant to s. 161.053 be consistent with Chapter 161.
- Encourage local governments to participate in the NFIP Community Kating System to achieve flood insurance premium discounts for their residents.

Sea Level Impact Projection ("SLIP") Studies Section 161.551, F.S.

- Calls for agency rulemaking, to require a SLIP study for state-financed construction projects in the coastal building zone.
- The standard developed must assess the flooding, inundation, and wave action relating to a coastal structure over its expected life or 50 years, whichever is less.
- The standard must factor in, among other enumerated things, reliable scientific research about the local risks and generally-accepted industry practices for mitigating risks.



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SLIP Studies (con't)

- Beginning 1 year after the rule is promulgated, a state-financed constructor may not commence construction without:
 - Conducting a SLIP study;
 - Submitting the study to DEP; and
 - Receiving notification from DEP that the study has been published on the Department's website for at least 30 days.
- If construction starts without compliance, the Department may institute a civil action to:
 - Seek injunctive relief to cease further construction or enforce compliance.
 - If the coastal structure has been completed (or substantially completed), seek recovery of all or a portion of state funds expended.
- Notice of Development of Rulemaking (Nov. 4, 2020)

Funding Strategies For Resiliency

Taxes

Direct taxes (i.e., property taxes) and indirect taxes (i.e., sales taxes and use taxes) levied for lawful public purpose. Local discretionary sales surtaxes (i.e., infrastructure + resiliency?).

Assessments/Special Districts

Charge against property 1) receiving special benefit and 2) fairly apportioned. Authorized by specific statutes or home rule authority.

Bonding

General Obligation (full faith and credit of an issuer with taxing power) or Revenue (payable with specific sources of revenue i.e.; utilities).

Impact Fees or TIF

Fees for the impact of new development (link between additional facilities and growth).
"Tax increment": the difference between the assessed value of the property before and after the redevelopment project.

User and Utility Fees

Payments for voluntarily purchased services which benefit the specific individual to the exclusion of non-feepayers such as stormwater utility.

Grants

Ex: Disaster recovery funds for resiliency and infrastructures. To address stormwater, septic, and water quality issues.





Eliminating a Property Owner's Access to a Road: Issues and Distinctions

Authority to Abandon Does Not Eliminate Potential Takings Claims

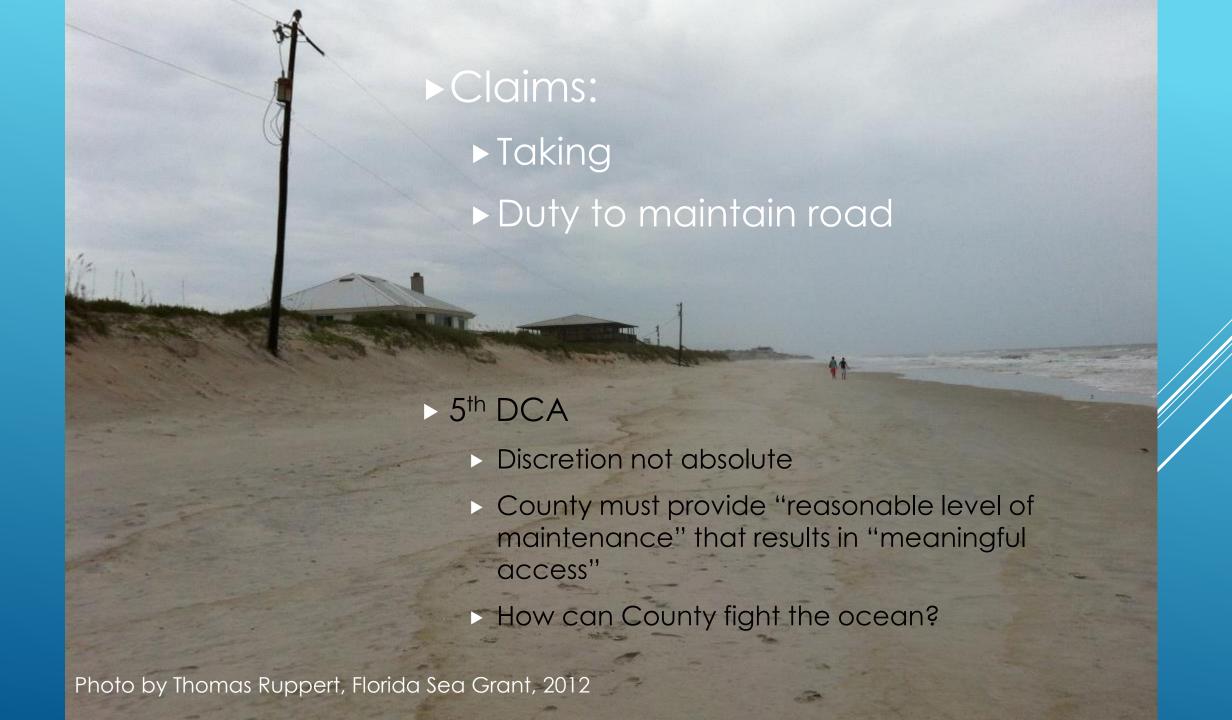
Eliminating or interfering with the right to access constitutes a taking if the property owner's right of access was substantially diminished.

Fact-intensive inquiry in each case:

- How was the road easement established?
- By who? To whom does the property revert? With or without a private easement?







THESIS: JUDICIAL
INTERPRETATION OF
"MAINTENANCE"
RESPONSIBILITIES FOR
INFRASTRUCTURE MAY
DETERMINE EXTENT OF LOCAL
GOVERNMENT DISCRETION IN
HOW LOCAL GOVERNMENTS
ADDRESS SEA-LEVEL RISE.

AVAILABLE AT:

HTTPS://WWW.FLSEAGRANT.ORG/WP-CONTENT/UPLOADS/CASTLES-AND-ROADS-IN-THE-SAND_2018_48_ELR_10914.PDF



NEWS & ANALYSIS

THE BEST LEGAL RESOURCE ON EARTH"

October 2018

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In the Agencies

EPA proposes replacement rule for Clean Power Plan

In the Congress

President signs extension of National Flood Insurance Program

In the Courts

D.C. Circuit vacates EPA delay of Chemical Disaster Rule

In the States

California moves to preserve current federal tailpipe standards



Articles

John C. Dernbach, Legal Pathways to Deep Decarbonization: Postscript Daniel R. Mandelker, Practicable Alternatives for Wetlands Development Under the Clean Water Act

Thomas Ruppert, Castles—and Roads—in the Sand: Do All Roads Lead to a "Taking"?

Dialogue

John C. Cruden, John Elwood, and Richard Lazarus, The Impact of Justice Kennedy and the Effect of His Retirement



Maintenance vs. Upgrade

- Immunity through "planning" vs. "operational" distinction
 - Immunity for planning as this is legislative
 - No immunity for "operations;" always a duty to act with reasonable care to avoid harm to others





Example home along Old A1A in St. Johns County 2012

Photo by Thomas Ruppert, Florida Sea Grant, 2012

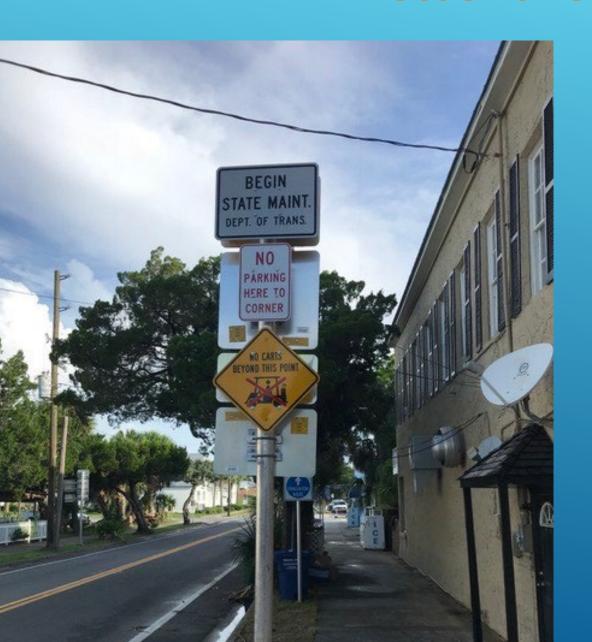




- Eventual takings liability can be as bad or worse from permitting building in inappropriate places as from not allowing
- Different view of "inaction" and takings between Florida state courts and Court of Federal Claims/Federal Circuit
 - ► Florida: "Inaction" possible basis for takings
 - ▶ Fed. Cl.: "Inaction" sounds in tort, not takings

- Generally no duty to build or upgrade infrastructure, BUT duty to maintain
 - ▶ What is "maintenance" under changing conditions?
 - ► I.e.—for drainage, liability if not changed to match new conditions? Probably not; answer depends on "discretionary planning" vs. "non-discretionary operations/maintenance"
- Once you create or accept infrastructure, you own the potential liability

- Local governments have both the authority and RESPONSIBILITY to act and plan proactively for a changing future. Failure to do so risks significant liability.
- Case law views local efforts to protect health and safety from flooding favorably.
- Not all local governments will respond the same. Some have more ability to raise capital and more in-house expertise available.
 - Lots of examples of sophisticated technical analysis (e.g. Monroe County)
 - Examples of large-scale protective infrastructure projects (e.g. Miami Beach, New Orleans, etc.)



- Small- to medium-sized local governments
 - Will confront financial limits of infrastructure creation and upgrades sooner
 - Need for policy innovation sooner
- Technical analysis always useful, but not necessarily enough.
 - Ultimately, not everything can be protected everywhere from all the impacts we will see.
 - The difficult question: What do we spend lots of money to protect?
 - The truly agonizing question: What do we NOT do?

Eventually policy decisions will not be just about avoiding any potential liability. Once there is not enough money to protect and satisfy everyone, the lawsuits start. The law will change and evolve in response to the impacts of climate change and sea-level rise. Local government should work with the community to use their values and input to design policies that provide the best possible legal argument to push the law in the directions that best serve the long-term interests of local governments and the broadest interests of their communities.

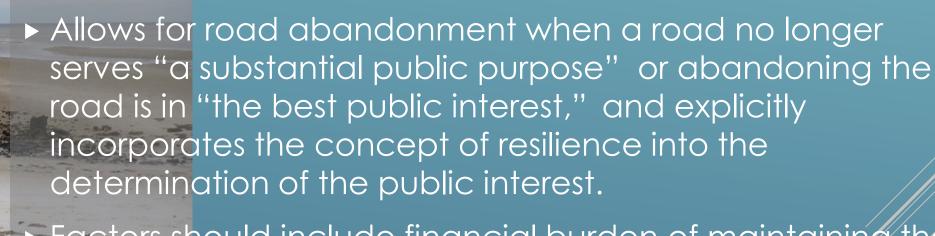
Policy Responses: A Resilience Policy Standard

A resilience standard would evaluate government action in light of whether it is likely to promote or compromise community resilience and whether the community's adaptation goals, targets, and timelines are reasonable under the circumstances.

- Management practices such as incorporating best available science into decision-making; assessing vulnerabilities; using adaptive planning that sets targets or thresholds for action; and evaluating the effectiveness of actions taken in order to adjust practices as needed.
- Should factor environmental, social, cultural, and economic conditions.
- At some point, however, a system's resilience can degrade or even collapse. If this occurs, a reasonable resilience standard would allow for the system limit to be acknowledged, setting the stage for actions such as road closures or abandonment.



olicy Responses: Adaptive Management in Abandonment



Factors should include financial burden of maintaining the road, the public's dependence on the road, and what caused a decrease in the public's use of the road.

Additional factors should be evaluated to determine the impact of the decision on community resilience and the long-term resilience of the road network as a whole.

Policy Responses: Sovereign Immunity

- If we want to encourage local leaders and staff to take the time, make the financial investment, and adequately assess their communities' risks and vulnerabilities, local governments planning for and making discretionary decisions that are inherently uncertain need sovereign immunity protection.
- > Sovereign immunity should apply with exceptions for gross negligence.
- Sovereign immunity should not turn on whether a government's action is a "repair" or "upgrade." An adaptive duty to maintain would include both repairs and upgrades as long as the reasonable resilience standard is met.
- "Adaptive management" concept focuses more on the community's needs and financial means, and limitations rather than impacts to individual properties.

Why the Urgency?





Agenda for Today (11/18/20)

- 1. Background on County's Resiliency and Climate Program
- 2. Introduction to Sea Level Rise (SLR) Roads Vulnerability Project
 - a. Project approach and status
 - b. Vulnerability and Criticality approach used to identify the initial 25% of roadway segments
 - c. Engineering concept design evaluation
- 3. Roads Program and Resiliency Policy Relationships



Kristen Key Szpak, 10/19/20

Background Efforts on SLR-Related Planning to Date

- 1. County's sea level rise planning launched in 2016: GreenKeys
 - 5-year work plan, 165 recommendations
 - Recommendations included:
 - Pilot Roads Projects
 - Improve elevation data
 - Engineering level analysis of transportation impacts countywide (this Roads Adaptation Project)
 - Numerous other vulnerability recommendations, including updates when significant new data available
- 2. Energy and Climate Element of Comprehensive Plan (2016)
- 3. Pilot Road Elevation Projects (Big Pine and Twin Lakes) initiated in 2016 and design/permits completed 2020
- 4. New Roads Mobile LiDAR elevation data (2019 completed)
- 5. Grants for SLR planning and projects (3 awarded and completed)
 - Harry Harris Park, Bayshore Manor, National Oceanic and Atmospheric Administration



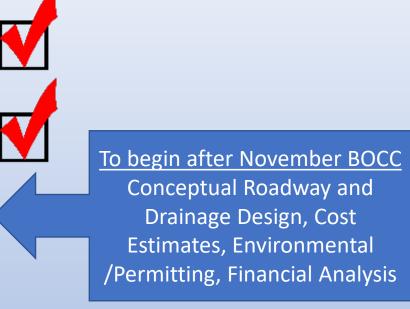
SLR-Related Planning Efforts *In Process or Coming Up*

- 1. Roads Adaptation Plan (this project launched 2019)
 - Identify sea level rise impacts to roads and drainage comprehensively
 - Identify policy and funding options
 - Develop engineering alternatives and Implementation Plan
- 2. Vulnerability Assessment for other County non-road assets being updated separately for habitat, buildings, and infrastructure (funded by Resilience Planning Grant 2020)
- 3. Comprehensive Plan (2021 initiate update)
 - Peril of Flood amendments to address State requirements (drafted, RPG 2019)
 - Adaptation Action Areas (in process RPG 2020)
 - Other amendments as necessary
- 4. Pending Grants and Projects in application review
 - Twin Lakes x 2 (State & Fed)
 - Sands Subdivision x 2 (State & Fed)
 - Regional Roads Adaptation Planning with Municipalities and 6 County Neighborhood evaluations (State)
 - Natural Areas Adaptation Plan (State)
 - Stillwright Point (State)



Vulnerability and
Criticality Evaluation
to determine Initial
25% of road
segments to be
further evaluated
(remaining 75%
addressed later)





....IN PROGRESS

Increasing Projected Water Levels Throughout County... SLR Condition: NOAA 2017 Intermediate-High + King Tides







Increasing Projected Water Levels Throughout County...

SLR Condition: NOAA 2017 Intermediate-High + King Tides

\$1.8 Billion*

Projected SLR + King Tides will affect the following:	2045	Unincorporated Countywide %	2060	Unincorporated Countywide %	2100	Unincorporated Countywide %
Miles of Vulnerable and Critical County Maintained Roadways	152 MI	49%	206 MI	66%	252 MI	81%
# of Residential Units along County Maintained Roadways	12,585 Res. Units	71%	14,501 Res. Units	82%	16,370 Res. Units	92%

311 Total Road Miles Countywide

[★] Cost estimate is conceptual and assumes reconstruction of the roadway and use of an injection well system. Cost estimates do not include design, right-of-way acquisition, harmonization/cost to cure, and legal fees. Cost estimates are preliminary and subject to change.

Monroe County Roadway Vulnerability Study

Recommended Weight Factors to obtain Weighted Averages

STEP 1 STEP 2

Vulnerability Evaluation Factors	Weighting Percentages	
Roadway Surface Inundation Depth	60%	

Criticality Evaluation Factors	Weighting Percentages
Vulnerability Score	50%

Monroe County Roadway Vulnerability Study

Initial 25% of Road Segments Based on Preliminary Scoring to proceed to Engineering Concept Design Evaluation

	No. of	Rdwy	Sub-	Length	Residential
	Keys	Segments	Divisions	(Miles)	Units
Initial 25%	17	709	240	78.01	8303
All Unincorporated County (100%)	24	2383	260	311.00	17703
Percentage of Total	71%	30%	92%	25%	47%

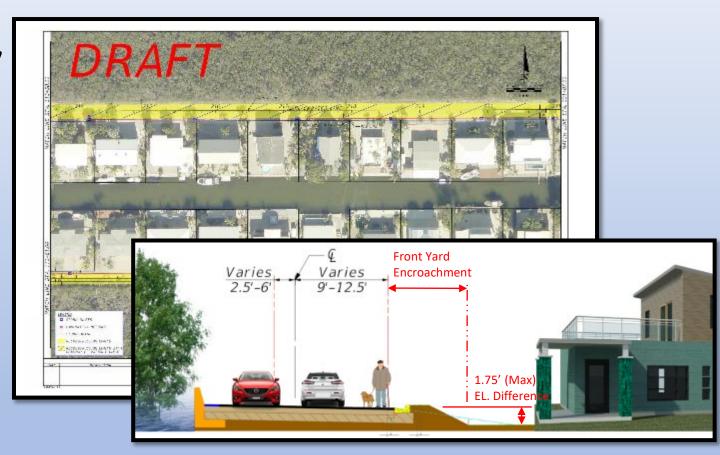


NOAA 2017 Intermediate-High SLR Projection + King Tide Prediction for 2045

Monroe County Roadway Vulnerability Study

What Road Design will work and where?

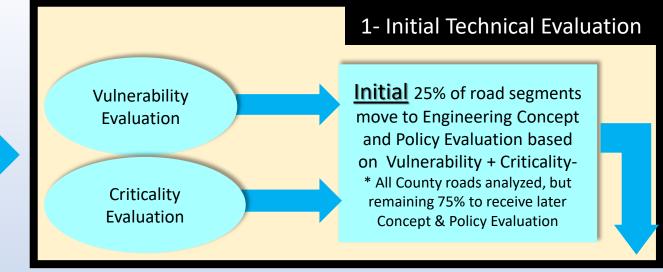
- Develop preliminary conceptual design of roadway and flood mitigation improvements
 - Future water levels
 - Existing ground elevations
 - Safety
 - Accessibility
 - Utility Impacts
 - R/W Impacts
 - Collection, conveyance, treatment, and disposal of water on the roadways
- Deliverable: Roadway Plan Sheets and Typical Sections for each neighborhood.



Process for Roads Adaptation

Data collection

Review Compact's 25 year SLR (useful life) projections & King Tide predictions for future impacts



Process for Roads Adaptation

Data collection

Review Compact's 25 year SLR (useful life) projections & King Tide predictions for future impacts



Vulnerability Evaluation Initial 25% of road segments move to Engineering Concept and Policy Evaluation based on Vulnerability + Criticality* All County roads analyzed, but remaining 75% to receive later

Further Evaluation

Considerations <u>could</u> include: Level of Service, cost effectiveness, affordable housing issues, access, staging efficiency + other factors depending on road project



Engineering Concept

Evaluation

Evaluation =
Preliminary Design &
Conceptual \$\$\$



Concept & Policy Evaluation

Board
Presentation
November 2020

1- Initial Technical Evaluation

Process for Roads Adaptation

Data collection

Review Compact's 25 year SLR (useful life) projections & King Tide predictions for future impacts



1- Initial Technical Evaluation

<u>Initial</u> 25% of road segments move to Engineering Concept and Policy Evaluation based on Vulnerability + Criticality-

* All County roads analyzed, but remaining 75% to receive later Concept & Policy Evaluation



Considerations <u>could</u> include: Level of Service, cost effectiveness, affordable housing issues, access, staging efficiency + other factors depending on road project



Engineering Concept

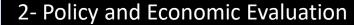
Vulnerability

Evaluation

Criticality

Evaluation

Evaluation =
Preliminary Design &
Conceptual \$\$\$



Board
Presentation
November 2020

3- Plan & Implementation

Board Review and Public Engagement

Review results of full roads evaluation process and results



<u>Draft Roads Adaptation Plan</u> & Implementation Strategy

* New projects in remaining 75% added as reviews completed

Board Approval (Fall 2021)

Roads Adaptation Plan and Implementation Strategy

After Fall 2021 = Implementation
Detailed design, project permitting/implementation and funding

Work to Develop Roads and Flood Mitigation Implementation Strategy

- Decision Framework of Adaptation Approaches
 - Analysis of Future Growth
 - Where is the remaining growth (and demand for services) going to go?
 - Level of Service issues
 - Differing levels of service across neighborhoods
 - Case studies related to "natural hazards" and government providing services (ie; flooding, snow plowing, fire management, etc.)
 - "Road Maintenance"
 - County obligations to maintain roads and authority to upgrade
- Regulatory requirements
 - Feds, State & County related to sea level rise
- Funding
 - Case studies in resiliency funding
- Implementation strategies:
 - Comprehensive Plan, Ordinances, Design/Code, Special Districts/MSBU, etc.



Twin Lake

County Adaptation + Parcel Adaptation

Projected SLR impacts to private properties (due to low elevation) will continue to increase along vacant lots, shorelines and property lines



202520352045

County Adaptation + Parcel Adaptation

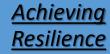
<u>Countywide</u> <u>Adaptation</u>

- Roads
- Habitat/Resources
- Elevate or mitigate County buildings
 - Infrastructure



<u>Private Property</u> <u>Response</u>

- Elevate or mitigate private structures
- Lot fill and driveways
 - Shorelines



- County
- People
- Habitat
- Economy

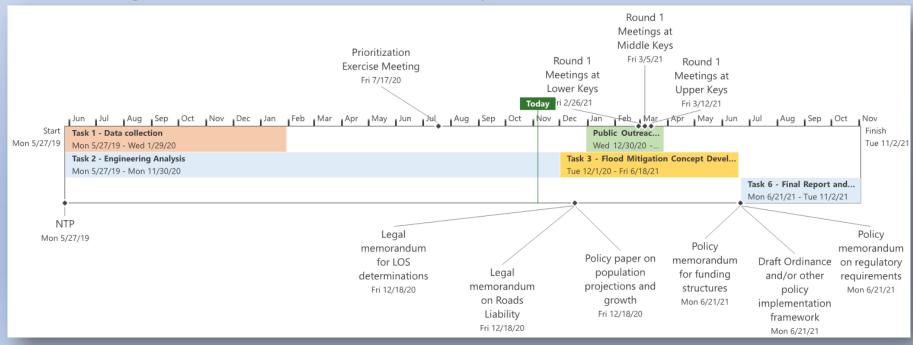






Keys Countywide Project...What's next?

Completion of the Monroe County Roadways Vulnerability Study will enable a complete understanding of the areas of concern, overall improvements needed and the costs for road and drainage infrastructure adaptation







King Ave

King Ave

The Law: Where Does Climate Change Show Up?

1308 Cases as of 12/2020- Columbia Law School Tracking Database





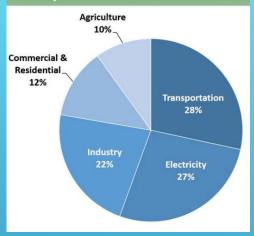
Public Trust Doctrine

THE PRINCIPLE THAT CERTAIN NATURAL AND CULTURAL RESOURCES ARE PRESERVED FOR PUBLIC USE, AND THAT THE GOVERNMENT OWNS AND MUST PROTECT AND MAINTAIN THESE RESOURCES FOR THE PUBLIC'S USE.

Reynolds v. FL (18-CA-000819)

- Parties: State of Florida (Rick Scott), DEP, DACS, Board of TIITF and PSC (Filed 4/16/18, 2d Circuit, 8 youth plaintiffs aged 10-19)
- Claims: Constitutional and common law public trust obligations to protect Plaintiffs' inalienable and fundamental rights secured by Florida common law and Article I, Sections 1, 2 and 9; Article II, Sections 5, 7(a), and 8; and Article X, Sections 11 and 16 of the Florida Constitution
- Public trust resources: Atmosphere and State's energy policies (FFs & GHGs) violate public trust doctrine. Amended complaint has 36 references to climate impacts to health or importance of public health-
- Remedies sought: GHG Inventory & Prepare and implement an enforceable comprehensive statewide remedial plan to stabilize climate system and protect natural resources
- Motion to Dismiss: Filed by all Defendants 7/6/18 (political question, etc.). 1st Amended Complaint filed 12/26/19 & Defendants filed Motions to Dismiss
 - MTD Granted: "Having reviewed the extensive materials submitted and heard argument of counsel, the Court finds that the motions to dismiss should be, and hereby are, GRANTED. Simply put, this Court finds that it lacks the authority to grant the relief requested due to the Separation of Powers Clause of the Florida Constitution. This Court finds that the Plaintiff's claims are inherently political questions that must be resolved by the political branches of government."
 - ► Appeal filed to 1st DCA: 7/9/20 & Opening Brief 9/9/20
 - Answer Brief filed 11/9/20: "The Plaintiffs' claims "would entangle courts in the details and execution of [energy] policies . . . , involving millions of [Floridians] and billions of dollars, in an arena in which the courts possess no special competence or specific constitutional authority."
 - ➤ Appellant's Reply filed 12/9/20: standing, viability of claims, political question, etc.

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2018





What's to Come?

- Legislative Committees:
 - Environment, Agriculture & Flooding (Under House State Affairs)
- Resiliency/sea level rise:
 - SLIP Rulemaking- Will it have other implications for local governments beyond projects funded with state dollars?
 - Organizational legislation for DEP's Office of Resilience
- Property Assessed Clean Energy (residential consumer protections and flood mitigation qualifying improvements)
- Climate "related":
 - Sales of electricity / power purchase agreements (overturning PW Ventures case for the umpteenth time)
 - ➤ Solar schools x 2
 - Energy 2040 Task Force
 - Electric Vehicle fees





THANK YOU

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