

Understanding Site Flood Risk Factors Before You Buy

August 20, 2024
10:00-11:30





AFFORDABLE HOUSING CATALYST PROGRAM

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Florida Housing Finance Corporation



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Today's Presenters



CJ Reynolds

Director of Resiliency &
Disaster Recovery
Florida Housing Coalition
Reynolds@flhousing.org



Lauren Thornberg

Technical Advisor
Florida Housing Coalition
Thornberg@flhousing.org



Erin Deady, P.A.

President
Deady Law
Erin@deadylaw.com



Webinar Logistics

- Please mute yourself but we welcome you to be on camera
- Please post questions and comments into chat –
- We will share the PowerPoint at the end.
- The PPT and recording will be available on our website.



Today's Agenda

1. Welcome and Introductions
2. Long-term Affordability
3. Resilience Risk Factors
4. Stormwater and Low Impact Development
5. Desirable Location Factors
6. Tradeoffs and Decisions



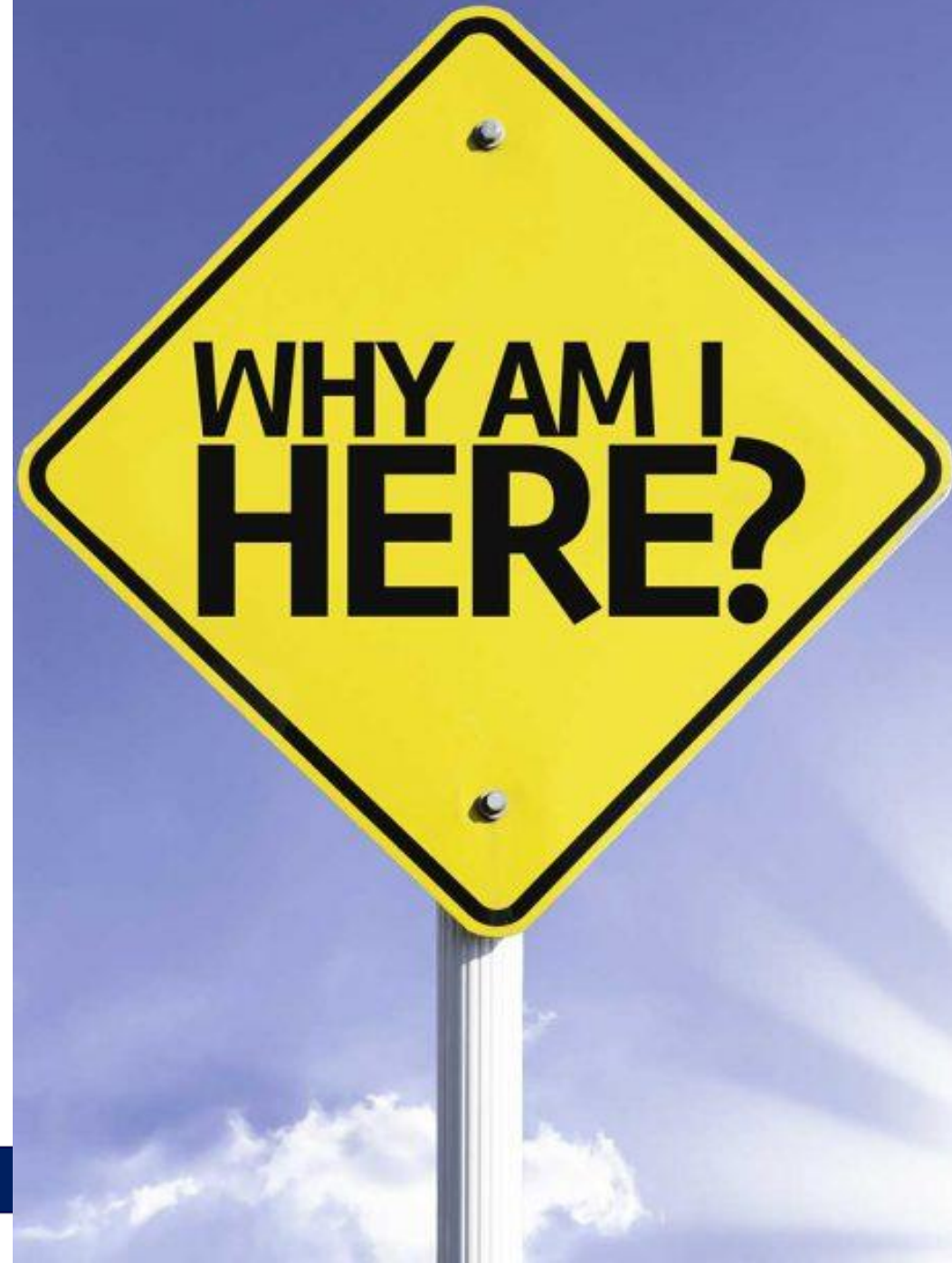
Poll Time....

- We have questions for you!
- Please pull out your phone to scan the QR code or click the Menti link in the chat
- There will be 3 questions



Poll Q1: What Motivated You To Attend?

- A. Want a general understanding of flood risk factors
- B. Have identified a site but have questions
- C. Want to find low risk sites for future developments
- D. Other



Poll 2: Does your organization/ company have property that experience major impacts from a hurricane since 2022?

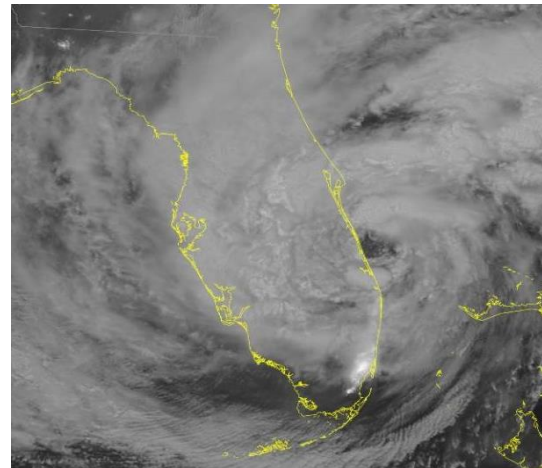
- A) No
- B) Yes, single-family homes
- C) Yes, multifamily
- D) Yes, other/multiple types of property



Hurricane Ian 2022



Hurricane Idalia 2023



Hurricane Nicole 2022



Hurricane Debby 2024

Poll #3

What three factors are most important in real estate?



Why Resilient Housing Matters

Increasing frequency and severity of extreme weather events — driven by climate change — damage millions of homes and exacerbate the housing crisis.

Due to climate change, rainfall intensity and extreme heat are expected to worsen.

- Design/construction standards and materials/technology continue to evolve.
- Affordable housing programs that integrate new standards and design will be more resilient to extreme weather and disasters – save money and better protect residents.
- Support more rapid recovery



NOAA NCEI Hurricane Ian was the costliest disaster in 2022: \$112.9B

Florida Policy: Citizens and Flood Insurance

Bill passed in Dec. 2022 requires Citizens' personal residential policyholders to carry flood insurance.

Provision is being phased in over the next four years:

Jan. 1, 2024 — For policies insuring property valued at \$600,000 or more.

Jan. 1, 2025 — For policies insuring property valued at \$500,000 or more.

Jan. 1, 2026 — For policies insuring property valued at \$400,000 or more.

Jan. 1, 2027 — For all other policies...

Properties with lower value will be impacted.



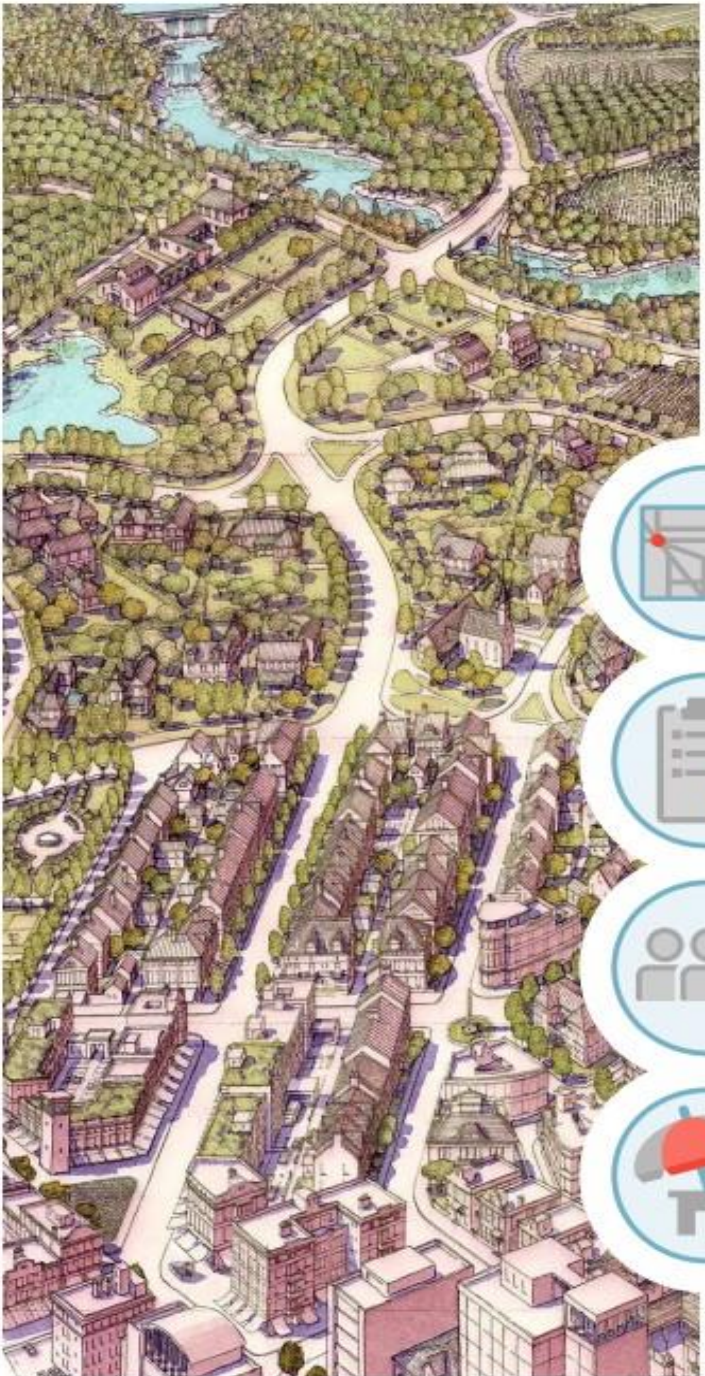
2024 Flood Disclosure Bill

- CS/CS/HB 1049: Flood Disclosure in the Sale of Real Property
- Effective October 1, 2024
- The bill "requires a seller of residential real property to complete and provide a form relating to flood disclosure to a purchaser of residential real property at or before the time the sales contract is executed"
- Enhance transparency about past flooding, especially for non-SFHA parcels that still have flood risk



The Fundamentals of Resilient & Climate Adaptive Design

Buildings and communities are subjected to destructive forces from natural and human-caused hazards. The forces affecting the built environment are evolving with climate change, environmental degradation, population growth, and migration. Apply these eight design principles to reduce harm and property damage, adapt to evolving conditions, and more readily, effectively, and efficiently recover from adverse events.



PLACE BASED

Understand and communicate the project's local hazard and climate risks as well as social, environmental and economic challenges and opportunities.



RISK PREPARED

Incorporate a project's hazard and climate risk, or building vulnerability assessment, when developing a strategy to avoid, mitigate, or reduce damage over the building's service life. Explore the potential for maladaptation that may unintentionally increase vulnerability.



EQUITABLE

Consider all populations to be serviced by the project. Remove barriers to access and service while promoting inclusive social, environmental, and economic benefits for the community.



PRECAUTIONARY

Select durable, low-maintenance building systems and materials that reduce negative consequences such as the release of toxics or wind/waterborne debris if the building or site is damaged.



SYSTEM CENTRIC

Recognize that buildings are part of a community system with inherent interdependencies, opportunities, and potential for unintended consequences. Explore the impacts of the project at the building and community scale and harmonize solutions.



READY

Plan for disruptions. Support the operation and occupants of the building, including its role in the community during an emergency, outage, or other disruption. Consider emergency preparations, safe shelter, physical protection, and mental well-being.



SERVICE-LIFE FOCUSED

Ensure design choices support building performance throughout the project's intended lifecycle; balancing first costs and long-term value.



ADAPTIVE

Design the project to accommodate and adapt to changing social, economic, and environmental conditions throughout its anticipated service life.

Permanent Affordability and Livability: Today

Same criteria.....

1. proximity to necessities
2. proximity to amenities
3. distance from hazards
4. designed for flooding and heat





Flood Risk Affects Affordability

Insurance premiums are increasing.

Many cannot obtain insurance

Homeowners cannot afford insurances in higher risk locations

Repair for damages

Flood insurance policies range \$500 to \$8,000 per year, depending on location.

Quick look up: <https://www.valuepenguin.com/flood-insurance/florida>



Future Flood Risks Will Affect Lending and Sales Value

Projections of future events may lower asset value as risk becomes more salient.

NY Federal Reserve study May 2024

“...our results are indicative that mortgage lenders are aware of flood risk outside FEMA’s identified flood zones.”

https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1101.pdf

Commercial developers have departments and consultants to identify ideal locations and define current and future risks.

FHC is supporting smaller nonprofit developers and local governments to do the same.



Heat and Increased Flood Risks

It's getting hotter...

As the atmosphere warms, it holds 7% more moisture for every degree Celsius

More moisture is available to fall as rain, potentially raising the risk of inland flooding.





Identifying Suitable and Desirable Sites

1. Lot size, shape, existing zoning, and other characteristics
2. Availability of existing infrastructure
3. Proximity to jobs, schools, and other desirable amenities
4. Current and future hazards and environmental considerations

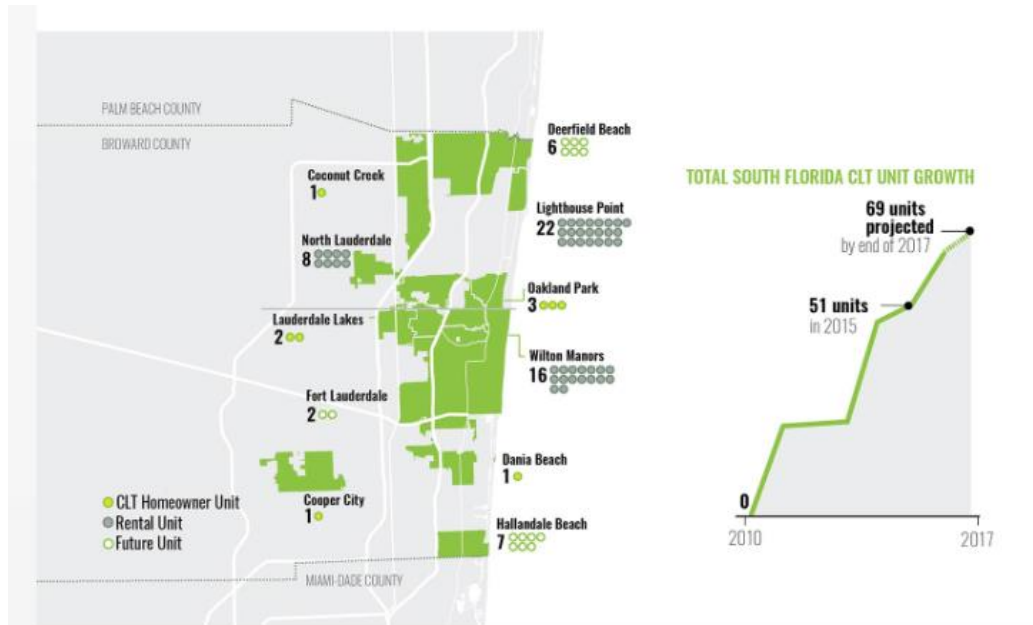
Strongly influence what form of affordable housing is feasible and desirable -- multifamily, mixed-use or single-family



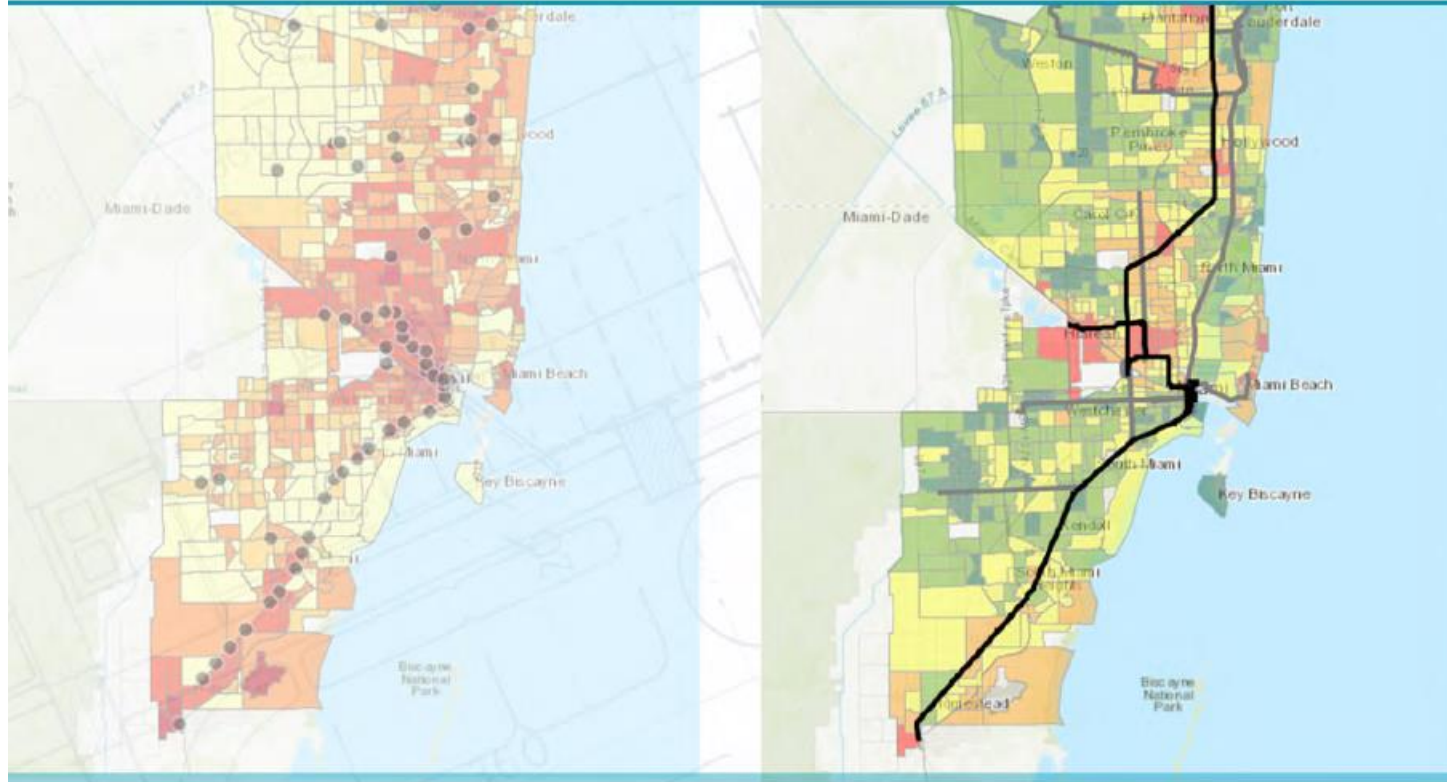
Learning From the South Florida CLT



<https://southfloridactl.org/>



DEFICIT-based → OPPORTUNITY-based



- Demographics

Transit

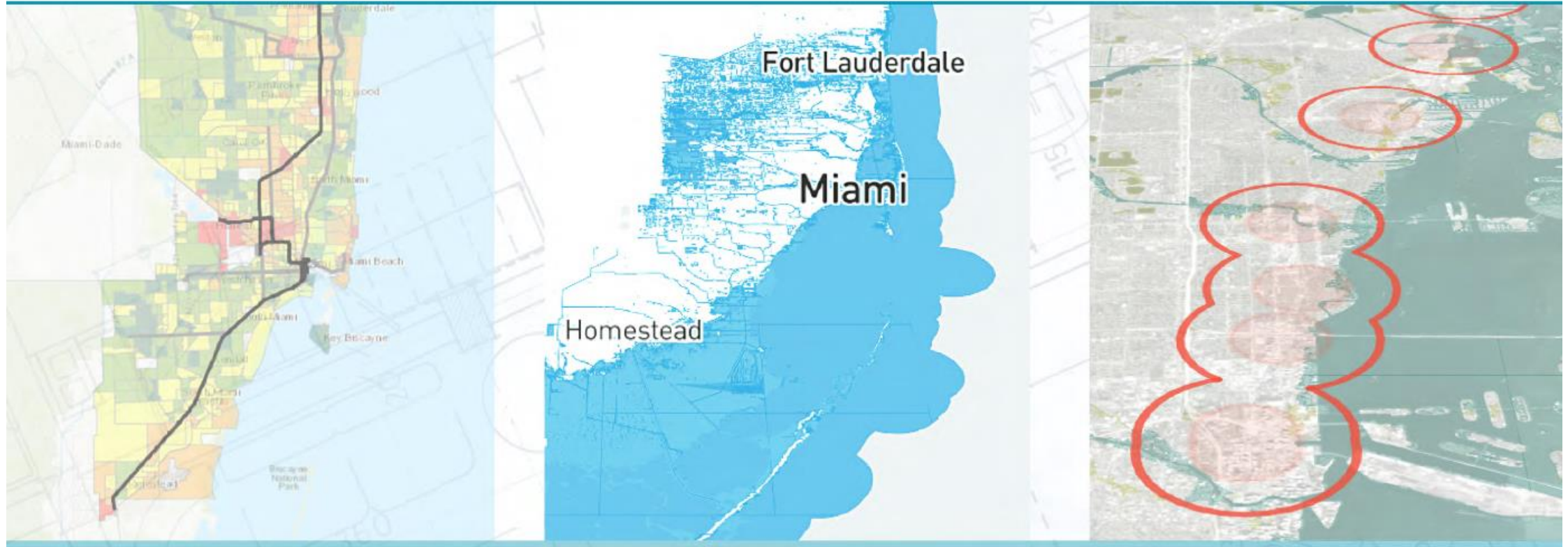
Jobs

Education

Health

Safety

OPPORTUNITY-based → RESILIENT-based



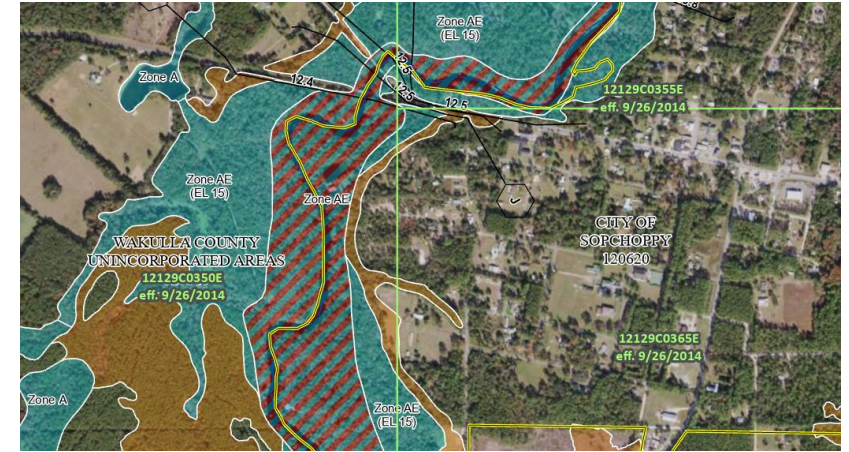


Resilience & Affordability Factors are Interconnected

- 1. **Where** you build
- 2. **What type** of housing you build
- 3. **How well** you build it

Resilience Location Factors

- Infrastructure
- Wetlands
 - Environmentally sensitive areas & species
- Flood/Special Flood Hazard Areas
 - Sea level rise
 - Riverine and pluvial flooding
- Hurricanes
 - Evacuation zones
 - Storm surge
- Environmental Hazards
 - Heat, brownfields, pollution



Know Your Flood Zone

FEMA flood zones are categorized according to the estimated flood risk **due to heavy rain** (influenced by waterbodies such as ponds or rivers.)

It is **NOT** related to storm surge and hurricanes.

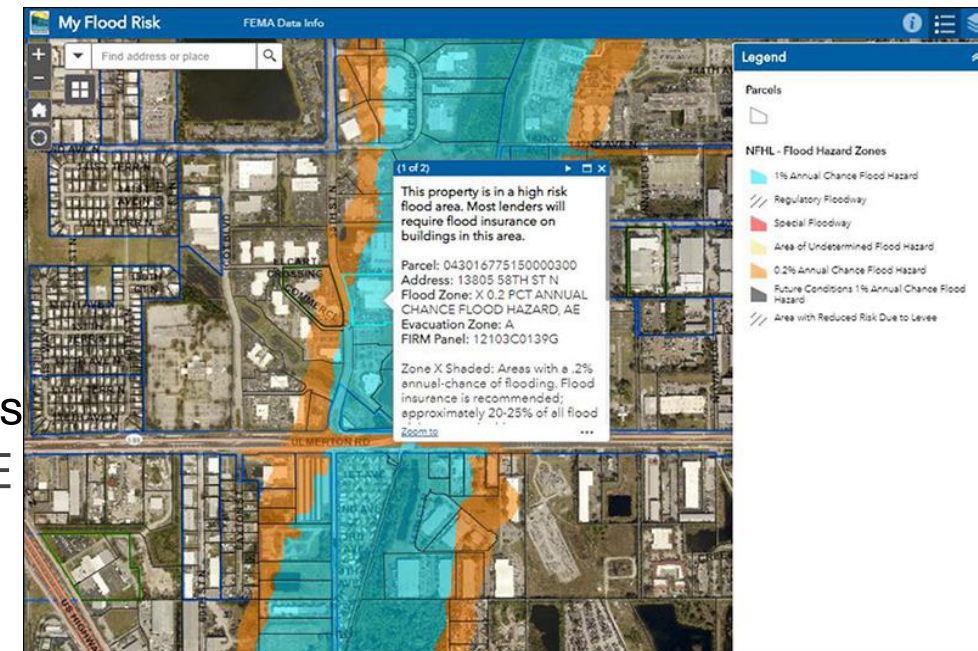
Special Flood Hazard Areas (SFHA)

- Flood insurance is required with federally backed mortgages
- **SFHA categories begin with A or V:** Zone A, AE, AO, AH, V, VE

Non-SFHA / Moderate Risk

- Flood insurance recommended

Non-SFHA / Low Risk



Know Your Zone

Go To The FEMA Flood Map Service Center

- Insert the address
- Look at the interactive map
- Download the map and mini-report

This map shows two types of Zones: A and AE. Zone AE is the Regulatory Floodway. (BMP is to avoid this for all construction.)



Flood Hazard Map Considerations

- New report from First Street Foundation recreated modelling Hurricane Debby --
- Flood hazard maps change
- FEMA updates every 5 years
- Modelling considers past storms
- Need to err on the side of caution



Flood Zones and Development Considerations

The National Flood Insurance Program (NFIP) has regulations with planning factors, including:

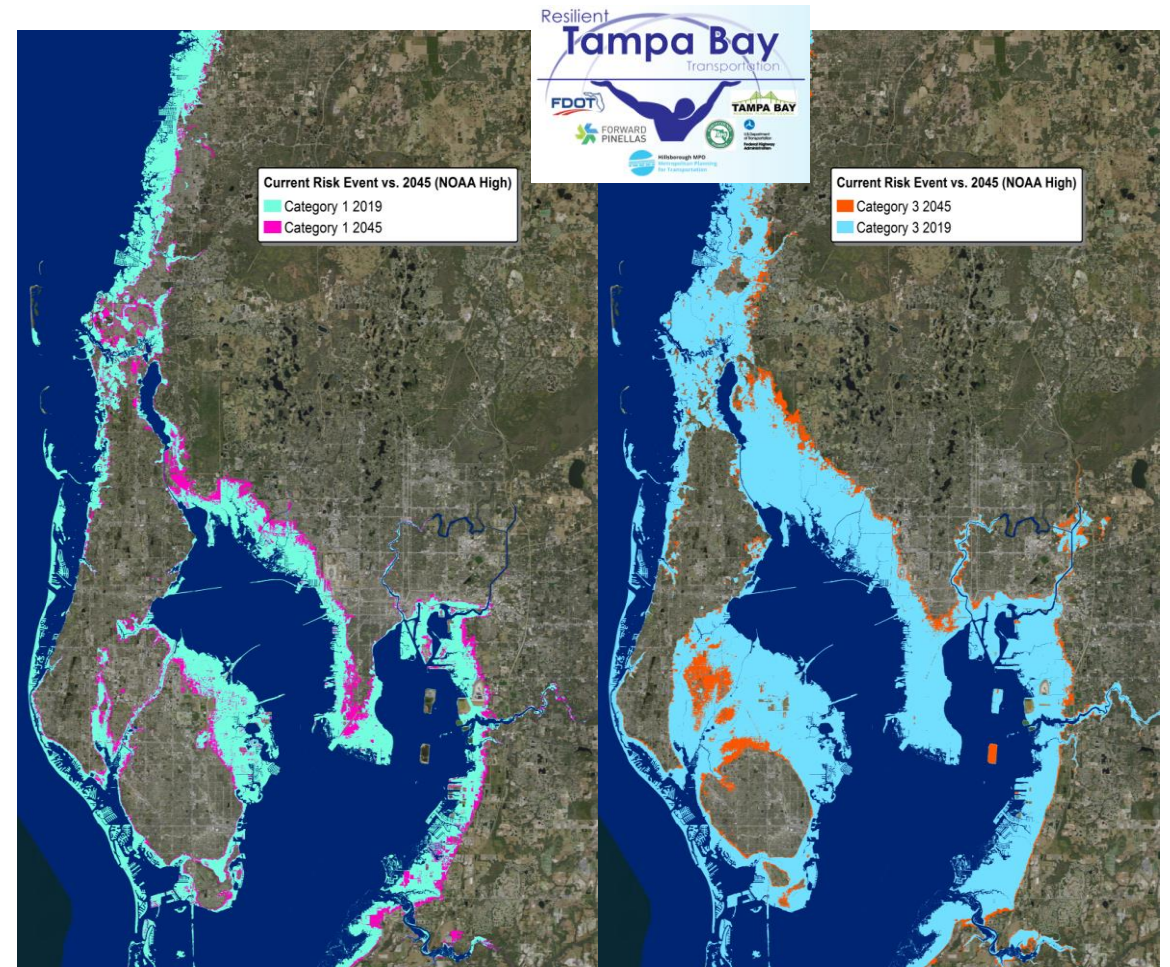
- Diverting development to areas outside the SFHA to reduce flood damage
- Full public disclosure to potential buyers of properties in the SFHA
- Acknowledge that SFHA development may increase flood risk of existing development
- Improve local drainage to reduce runoff and the probability of flooding on other properties
- Require additional elevation above the Florida Building Code (1-foot freeboard or more above Base Flood Elevation (BFE))
- Require elevation methods such as pilings or columns to rather than fill -- to protect homes, maintain the water storage capacity of the floodplain, and minimize environmental impacts
- Require evacuation plans for manufactured home parks and subdivisions



Flood Risks Are Projected to Increase

75-year building lifespan = 2100

- Heavier rainfall will create more inland flooding
 - Warmer Atlantic Ocean and Gulf = larger, slower hurricanes with more rain
 - Hurricane Debby: unprecedented levels of rain with a category 1 storm led to unexpected inland flooding... what's next?
- Increased frequency of chronic tidal flooding
- Storm surge will reach further inland
- Sea level rise

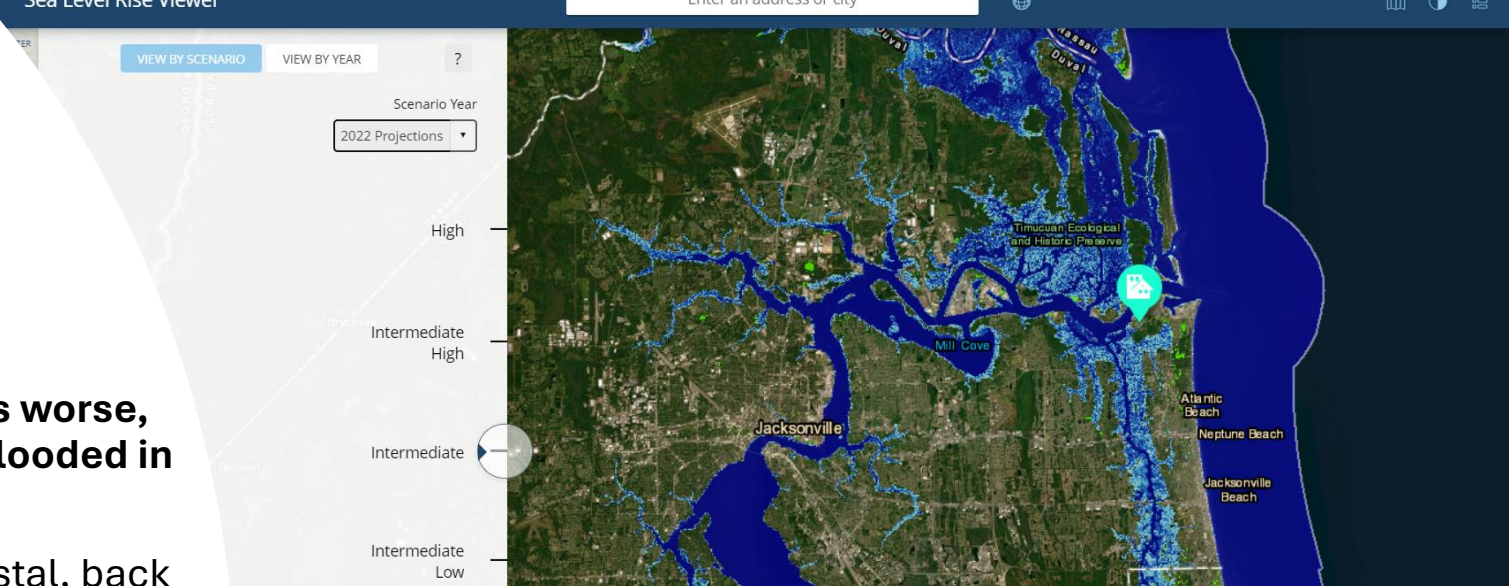


Federal Highway Administration vulnerability assessment project led by Hillsborough TPO with TBRPC, Pinellas 2045 Long Range Transportation Plan. NOAA (2017) High SLR in 2045 = 2.16 feet

Assess Future Flood Risks

Rule of thumb: sea level rise (SLR) will make things worse, and some areas are projected to be permanently flooded in 40-50 years.

- Not just a beachfront problem -- impacts intercoastal, back bay, inlets, estuaries, rivers, and drainage
- Ask City/County for local SLR projections and vulnerability assessment maps
- Hire a consultant or use public tools, until local data and maps are available
- Firststreet.org scores are based on depth and likelihood of floodwater reaching the physical structure of a home, derived from location's history and geographic info such as elevation, climate, changes in the environment, proximity to water, and adaptation measures.
- Look at neighborhoods or property-specific risk assessments.



2015

This year

In 30 years

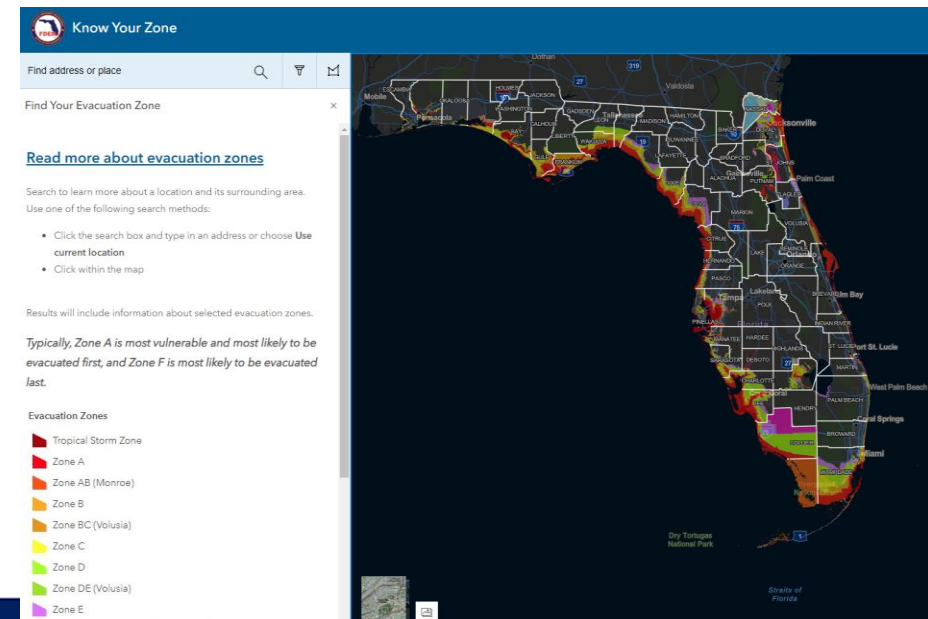
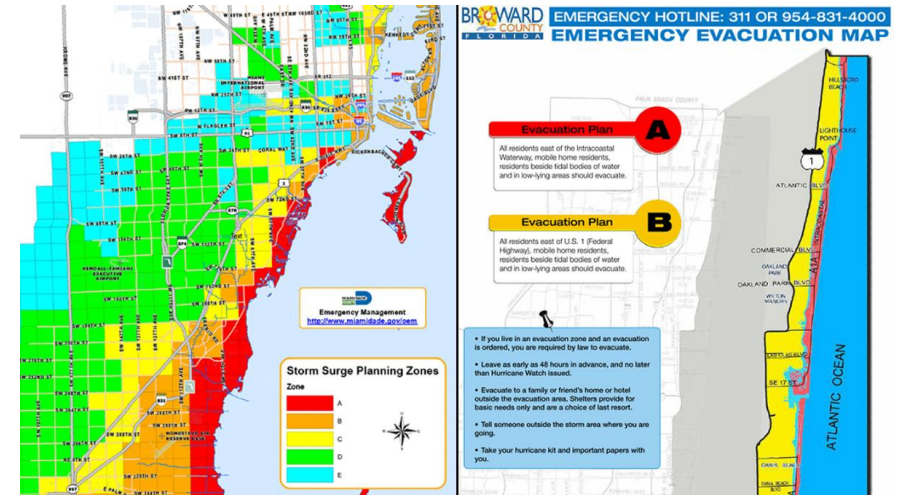
Know Your Evacuation Zone

A and B Zones are most vulnerable.

Examining evacuation zones is important for understanding

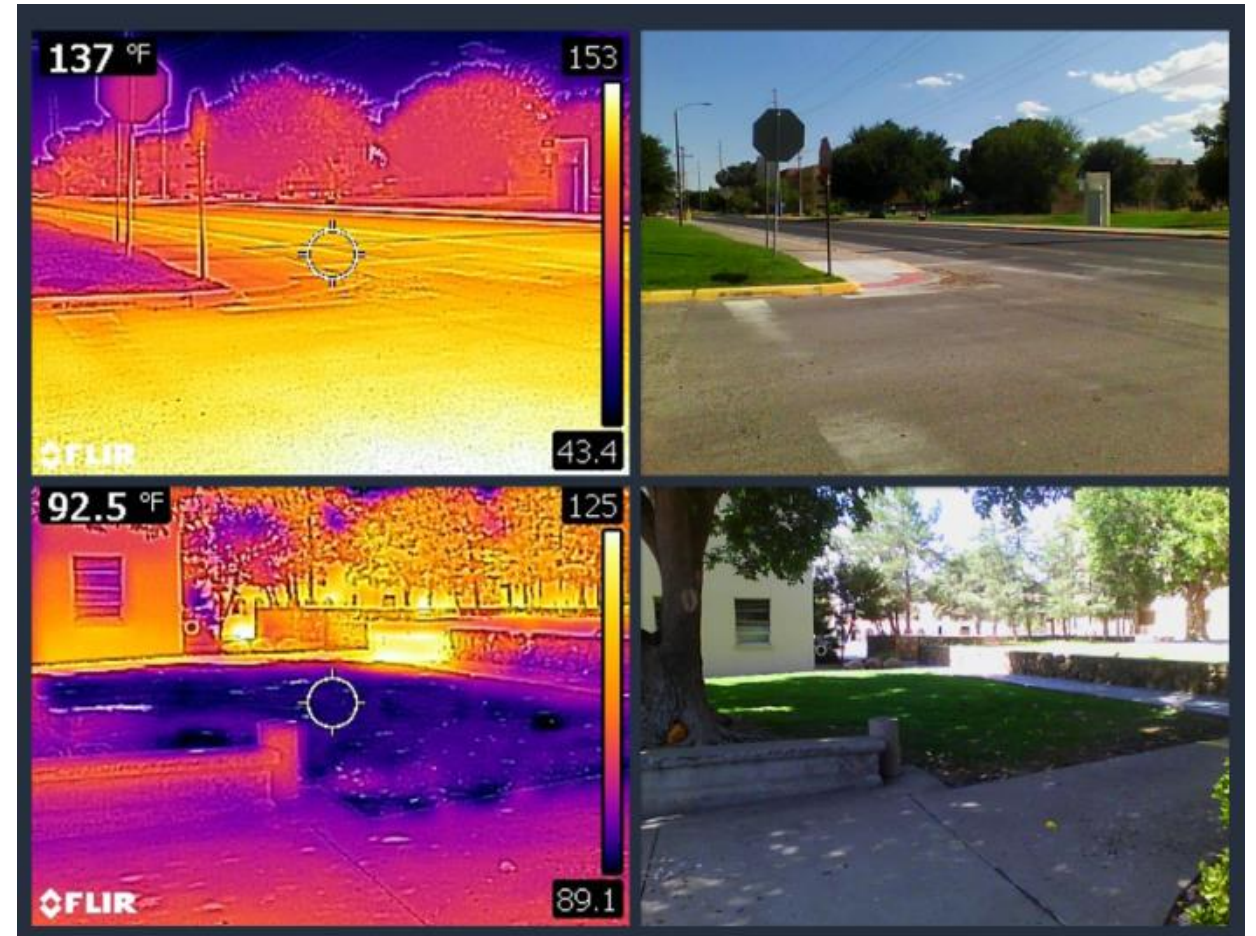
- Construction requirements
- Homeowner hazard insurance costs
- Higher potential for storm damage, requiring repairs
- Evacuation creates additional expenses and can have a disproportionate effect on lower-income residents, the elderly, and people with disabilities.

FDEM Know your Zone Mapper or County Maps to identify the evacuation zone



Heat Islands and Affordable Housing

- Heat Islands - areas with a lot of concrete, buildings, parking lots, roads, and other infrastructure **absorb and re-emit the sun's heat**, more than natural landscape.
- Housing in/near "heat islands" will need green building and site design to reduce heat.
- These can be at risk for flooding due to extreme rainfall (drainage issues – more later...)



Public Infrastructure Necessary for Housing

Affordable housing finance programs at the state and federal level require some form of verification of local public infrastructure, such as confirming access to:

- Water
- Stormwater
- Sewer
- Electricity
- Roads
- Drainage
- Broadband*

*Minimum thresholds of broadband connectivity for a given location may not be universally required for affordable housing funding resources, but it helps to assure that future residents will have access to internet for modern quality of life aspects such as virtual schooling, telehealth, and working from home.



Age of the Area and Infrastructure

- The age of an area can provide an indication of the functionality of the infrastructure.
- Newer areas are built to modern design levels: stormwater regulations have generally improved over time.
- Older areas may have minimal, or antiquated, infrastructure that cannot keep up with extreme weather.
- Understand Capital Improvement Projects and planned investments



City of Tampa photos

Changing Water to Manage: Upstream and Downstream

- Most urban drainage systems were constructed decades ago and are primarily in urban areas
- Current climate models indicate that rising temperatures will intensify the Earth's water cycle, increasing evaporation.
- Increased evaporation will result in more frequent and intense storms but will also contribute to drying over some land areas.
- The extremes are getting more extreme



April 14, 2023, WREX, FLL Airport, 1 in 1000-year rainfall event

Adequate Drainage?

- Most urban drainage systems are designed to handle rainfall events of a certain magnitude (“design storm events” such as 3-day / 25-year storm)
- Water management districts generally permit to this standard too
- These systems will be under capacity considering changing precipitation patterns (*USGS predicts a 1.2 factor of rainfall volume by 2070 for South Florida*)
- Upstream water management will be complicated by increasing sea level rise downstream



Miami Herald, 2022, Stillwright Point, Key Largo

Other Water Management Trends

Regulations are increasing:

- Clean Waterways Act (2020) and Chapter 62-330, F.A.C.

Specifically increasing treatment for water quality improvement which means:

- More onsite management (minimal or no discharge offsite) means more open land or onsite technologies to treat water
- More land lessens developable space
- More technologies increase cost of drainage system
- More intensive onsite water management means more cost longer term for operations and maintenance of systems

DEP concluded that the revised rules will likely increase stormwater treatment costs by \$1.21 billion (or \$2,600 per acre developed) in the aggregate within five years after the rules' implementation



Sarasota Herald Tribune, 2020

Navigating Stormwater Management

- Space constrained sites are going to be more complicated to manage water on
- Determine local design storm event and level of service requirements for stormwater management
 - *Some local governments are increasing these regulations: Example Broward County requires management of future groundwater conditions to 2070*
- Determine if they are the same or additional to water management district regulations for that type of development or infrastructure (homes vs. roads)
- Design systems to account for future conditions and whether or not site will be tidally influenced now or in future
- Design systems to be adequate for future rainfall trends, this probably exceeds a 3-day, 25-year event
- Maximize open space and passive onsite treatment over more expensive technical treatment



www.constructionspecifier.com



Low Impact Development (LID)

- Low impact development (LID) uses land planning, design and construction practices to conserve and protect natural resource systems while reducing infrastructure costs.
 - Emphasis on cost-effective strategies at the lot/site level
- Seeks to work with nature to manage stormwater runoff and onsite flooding
- Financial, aesthetic, and environmental benefits
- **What are your area's rules and incentives? (You may need to ask your jurisdiction!)**



Low Impact Development (LID)

Techniques include:

- Vegetated swales, buffers and strips;
- Rain gardens, bioretention, rain barrels;
- Narrower streets without curbs and gutters;
- Parking with permeable surfaces and materials;
- Natural area preservation (concentrations);
- In-ground infiltration and storage;
- Green building programs, such as [Florida Water Star](#) or [Florida Green Building Coalition](#)



What Makes a Site Desirable?

- Once a site is deemed sufficiently low-risk for housing, analyze the community amenities/resources
- For builders: lower development costs, possibility of increased access to funding mechanisms
- For residents: enhanced quality of life, lower transportation costs, improved mental and physical health



Proximity to Community Resources

Multifamily developments seeking to utilize competitive affordable housing financing resources (i.e., Low-Income Housing Tax Credits, SAIL, Multifamily Mortgage Revenue Bonds, HOME, NHTF) will need to evaluate a site's proximity to:

- Public bus or rail transit services
- Grocery stores
- Medical facilities, pharmacies
- Public/charter schools
- Other community-based services*

*If a site is being used to develop a Community Residential Home or Supportive Living Units, additional proximity measures may be considered, such as retail stores, recreational areas, green space and employment opportunities.



Why Job Proximity Matters

- Large employers and staff readiness: military, first responders, nurses and EMS
- Insufficient transit
- Reduces vehicle operating and insurance costs
- Time for activities other than commuting
- Reduced traffic congestion and road improvements
- Shorter commute can enhance employee retention and business costs – lower wage jobs
- Can reduce pollution

---> Contact your Community Development Director for information on local plans and Employment Clusters



Resilience Site Considerations: Risk and Options



Site Factors and Options

Q: My site is very desirable, but FEMA map shows it's a few homes outside of the V Zone boundary. What should I do?

A: Science is not precise. Flood maps and risk can change over time. The site would not be ideal for single family homes for low- to moderate-income households because of potentially higher homeowner insurance premiums, mandated flood insurance and high prospect for future flood risk/damages.

- Contact your County Floodplain Manager to discuss
- Call an insurance broker to get quotes
- Review elevation, BFE and other construction requirements
- Depending on zoning, does it have potential for a multi-family property, that *is appropriately elevated and designed to be flood resistant.*



Site Factors and Options

Q. We received 8 donated contiguous parcels and would like to build single family homes, but we saw standing water on some of the property. What should we do?

- A. Check the Flood Zone. If it is not in an SFHA, get a technical engineering assessment to review parcel elevation, infrastructure and land factors and determine how much of the land would be buildable, or need to be set aside for stormwater drainage.
- B. If the area is a SFHA and zoned for single family, can it be upzoned for "gentle density" multi-family and allow elevated first floors? If not, consider selling it, or give it back to the donor.

Site Factors and Options

Q: The affordable lower risk land is in an unincorporated area which doesn't have much infrastructure and amenities. What should I do?

- A. What infrastructure is there and what is planned? Talk to your County/City Planner to understand Future Land Use plans, planned capital infrastructure improvements, and future service areas; explore criteria considered for land use amendments and rezonings, if needed.
- B. Address the amenities/resource gap
 - Single-family housing -- additional building leased for commercial.
 - Mixed-income and mixed-use properties -- lease the first floor.

Getting Started....

Schedule a meeting to discuss your program status, timeline and support needs

- Questions about specific parcels?
- Questions about pulling a team together to DIY?
- Questions about conducting comprehensive site screening to support land acquisition plan?

Links to Resources



Coming This Fall

Identifying Suitable and Resilient Sites for Affordable Housing Development: A Guide and Worksheet to Support Rapid Analysis

The development of the Guide was supported by Fannie Mae.



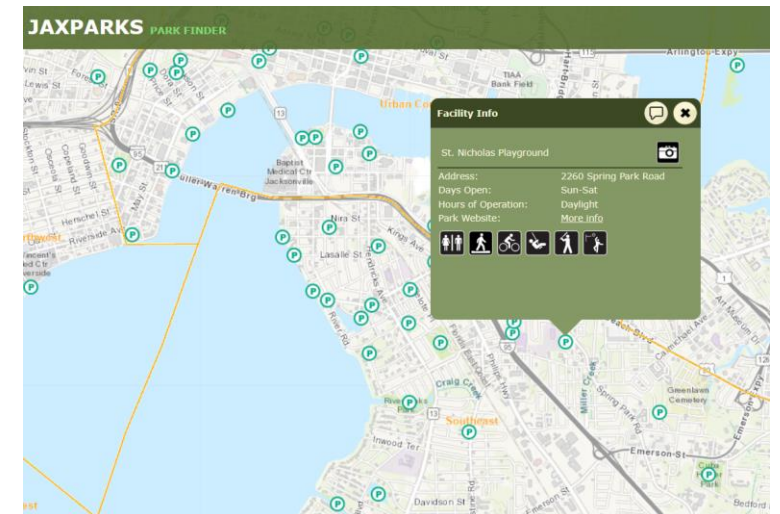
Assessing Resilience and Environmental Hazards

1. Flood Zones: [FEMA Flood Map Service Center](#)
2. Evacuation Zones: [FDEM Mapper](#) and county websites
3. Sea level rise risks: [NOAA Sea Level Rise Viewer](#) and [First Street](#)
4. Riverine Flooding: [USGS](#) & Local Flood Zone Maps
5. Wetlands: [Fish and Wildlife Service National Wetlands Inventory](#)
6. Environmentally sensitive areas: [NOAA Environmental Sensitivity Index](#)
7. Extreme heat risks: [Heat Risk Assessment](#) and <https://geoxc-apps2.bd.esri.com/Climate/HeatVulnerability/index.html>
8. Brownfields: [EPA EnviroAtlas and Brownfields](#)
9. Air pollution: [EPA Air Compare](#)
10. Sinkholes: [FDEP Subsidence Incident Map](#)



Assessing Community Resources

1. **Food and Grocery Stores:** [USDA Food Access Research Atlas](#)
2. **Schools/Childcare:** [Florida Department of Education](#), [Childcare.gov](#)
3. **Medical and Dental Services:** [Florida Department of Health Maps](#)
4. **Emergency/Community Services:** [Local Maps](#)
5. **Transit:** [Florida Department of Transportation Official Transportation Map](#), [Local Maps](#)
6. **Green Space:** [Local Maps](#), [State Park System](#), [National Park System “Find Your Park”](#)



City of Jacksonville Public Parks Map

Resources



ASTM New Guide for Property Resilience Assessment – in development

- Provide overview of generalized, systematic approach for conducting a Property Resilience Assessment (PRA)
- Starts with identifying natural hazards likely to affect a property
- Evaluate risks posed by hazards along with capacity of the property to prepare for, adapt to, withstand and recover from those hazards;
- Identify resilience measures to enhance property-level performance and recovery.
- Includes a baseline assessment of safety, damage, functional recovery time, and a limited consideration of community resilience or other material dependencies, such as the ability of utilities to deliver service to a property following a hazard event.



Technical Assistance for Site Selection is Available!

- **Email CJ Reynolds (reynolds@flhousing.org) to discuss site assessments**
- Options for assistance include:
 - ✓ Phone and Email Consultation
 - ✓ In-person meetings
- Register at www.flhousing.org for:
 - ✓ Workshops, Webinars
 - ✓ Find Previous trainings and publications

