



CITY OF
ST AUGUSTINE
EST. 1565

Lincolnville Neighborhood Association

“Stormwater and Resiliency Program Update”

February 25, 2021

Jessica L. Beach, P.E.
Chief Resilience Officer
Stormwater Engineer





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Presentation Outline

- ❖ Background and Overview of the Stormwater Program
- ❖ Resiliency Planning
- ❖ Understanding Flooding and Flood Risks
- ❖ Project Implementation

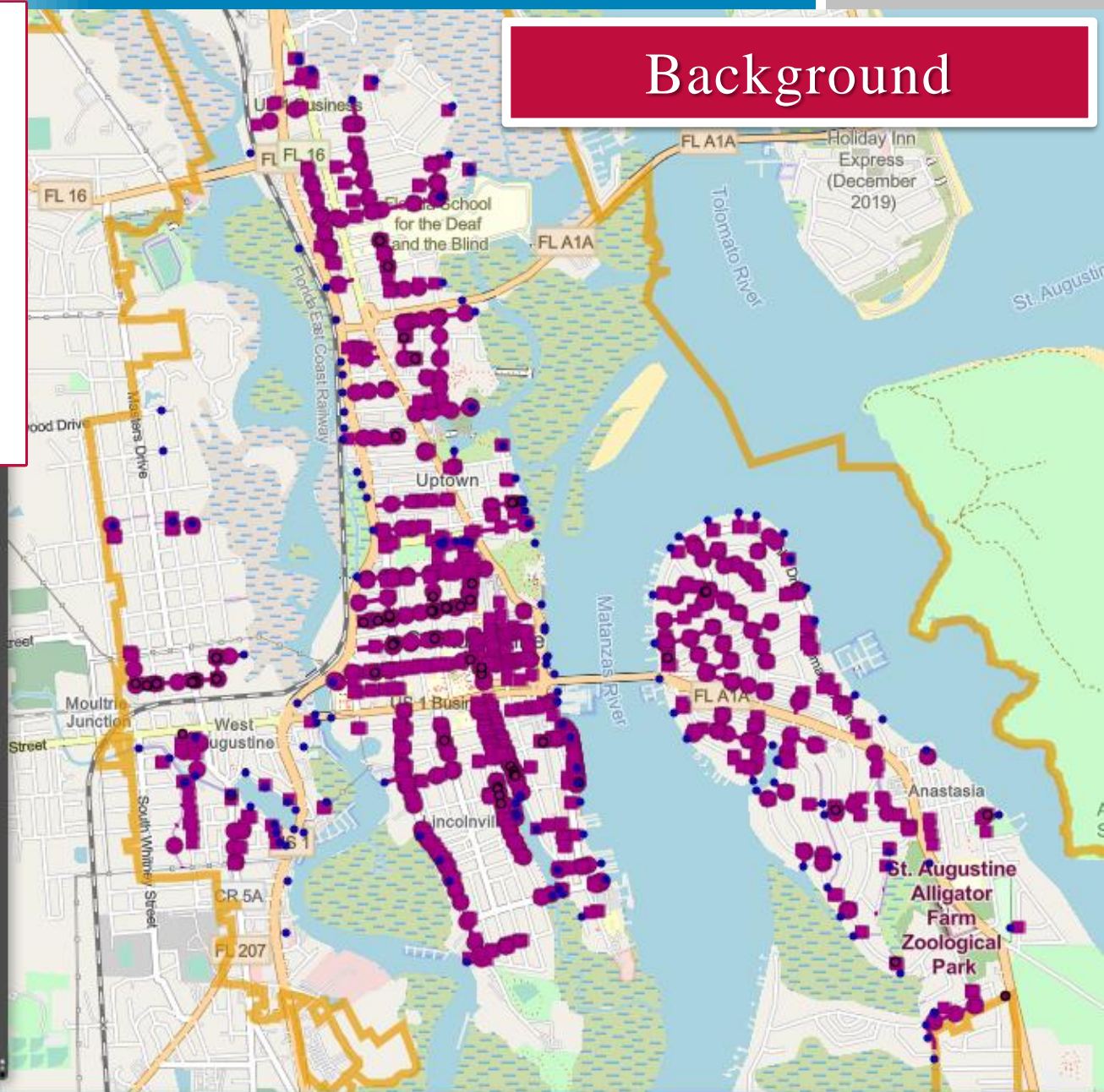


Stormwater Infrastructure:

- 163 Outfalls Tidally Influenced (not including FDOT)
- 949 Storm Inlets
- 20 miles of pipe

Background

- ☒ PublicWorks - swDischargePoint
- ☒ PublicWorks - swCulvert
- ☒ PublicWorks - swFitting
- ☒ PublicWorks - swInlet
- ☒ PublicWorks - swGravityMain
- ☒ PublicWorks - swManhole





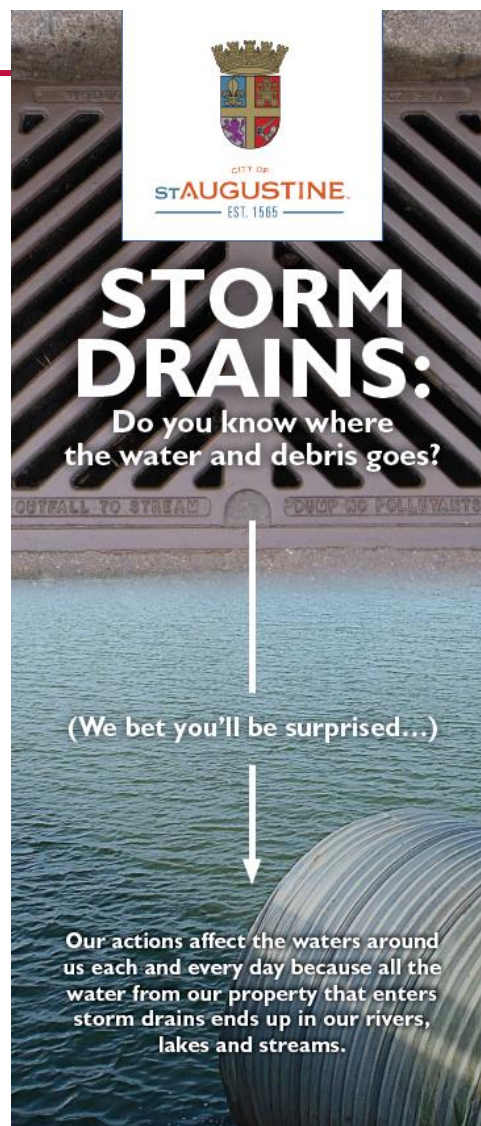
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Stormwater Infrastructure:

- Regulated by the Florida Department of Environmental Protection (FDEP)
- City operates and maintains a "Phase 2, MS4 NPDES" permit from FDEP
- Governs the stormwater program
 - Education and Outreach
 - Public Involvement and Participation
 - Illicit Discharge Detection/Elimination
 - Construction Site Stormwater Runoff Control
 - Pollution Prevention/Good Housekeeping

<https://www.citystaug.com/431/Stormwater>

Background



Here are tips on how to keep our storm drains and community clean:



- Wash vehicles at the carwash, not on a street or driveway.

- Use fertilizer sparingly

- Set sprinklers to water lawn and garden areas only, not pavement to prevent loss and erosion.



- Pick up pet waste and dispose of properly.

- Keep trash out of storm drains, if you see it, pick it up.



- Dispose of yard debris and grass properly. Sweep into piles for collection. Do not hose them down the drain.

- Direct downspouts and rain gutters away from paved surfaces.



- Recycle Motor Oil, antifreeze and other fluids.

REPORT ANY ILLEGAL DISCHARGE OR SPILLS.

Call the City of St. Augustine at 904-825-1040.

www.citystaug.com

**ONLY RAIN
DOWN THE DRAIN...**



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Stormwater Infrastructure -

Operation and Maintenance:

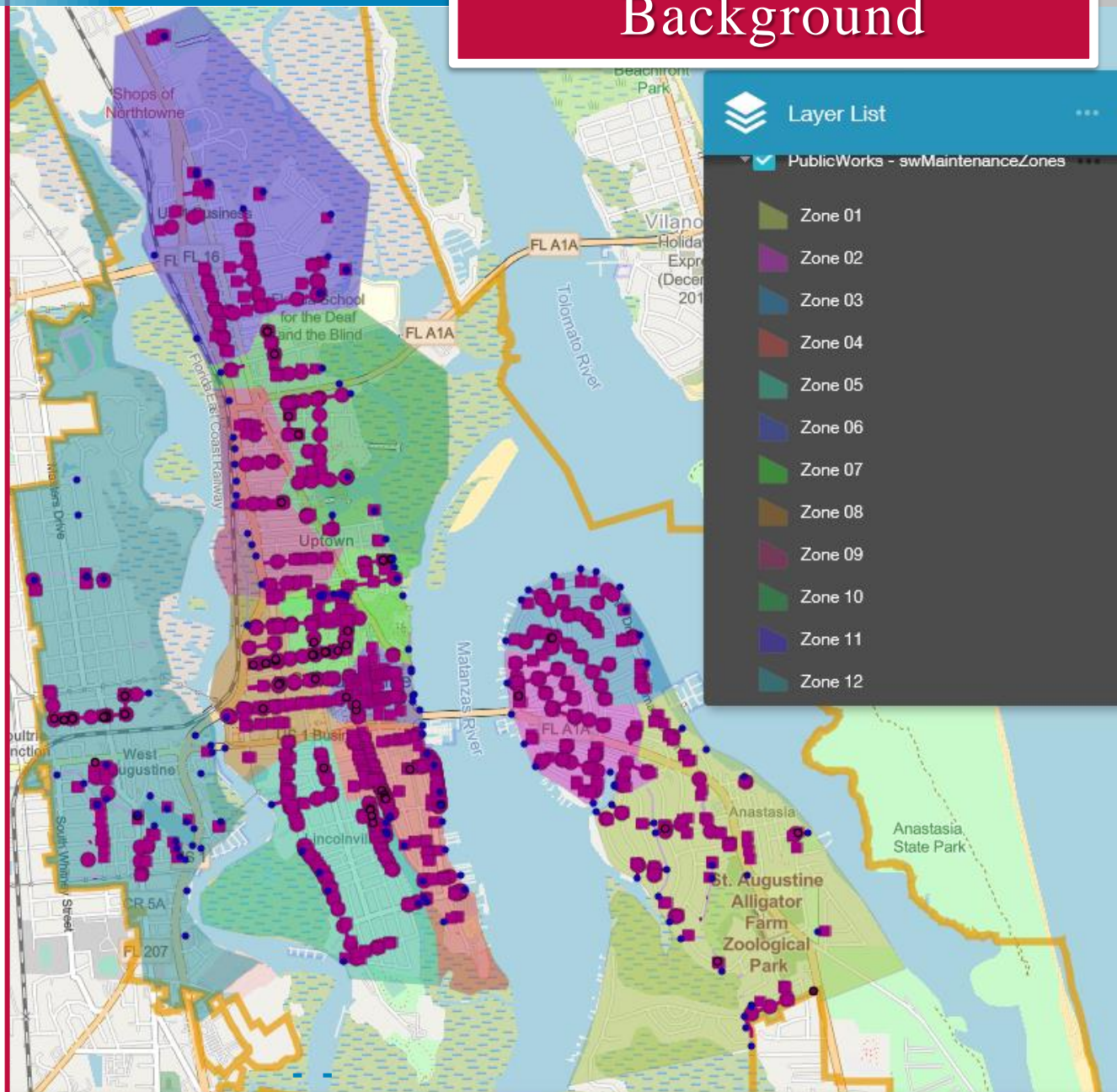
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- 12 zones
- All infrastructure inspected at least once each year
- Increased frequency during Hurricane Season (pre and post storm cleaning)
- Vacuum truck to remove sediment and debris
- Street sweeping
- Inspections of tide check valves
- 4 dedicated crew
- Report flooding or service requests at:

Public Works (904) 825-1040
stormwater@citystaug.com

<https://www.citystaug.com/431/Stormwater>

Background

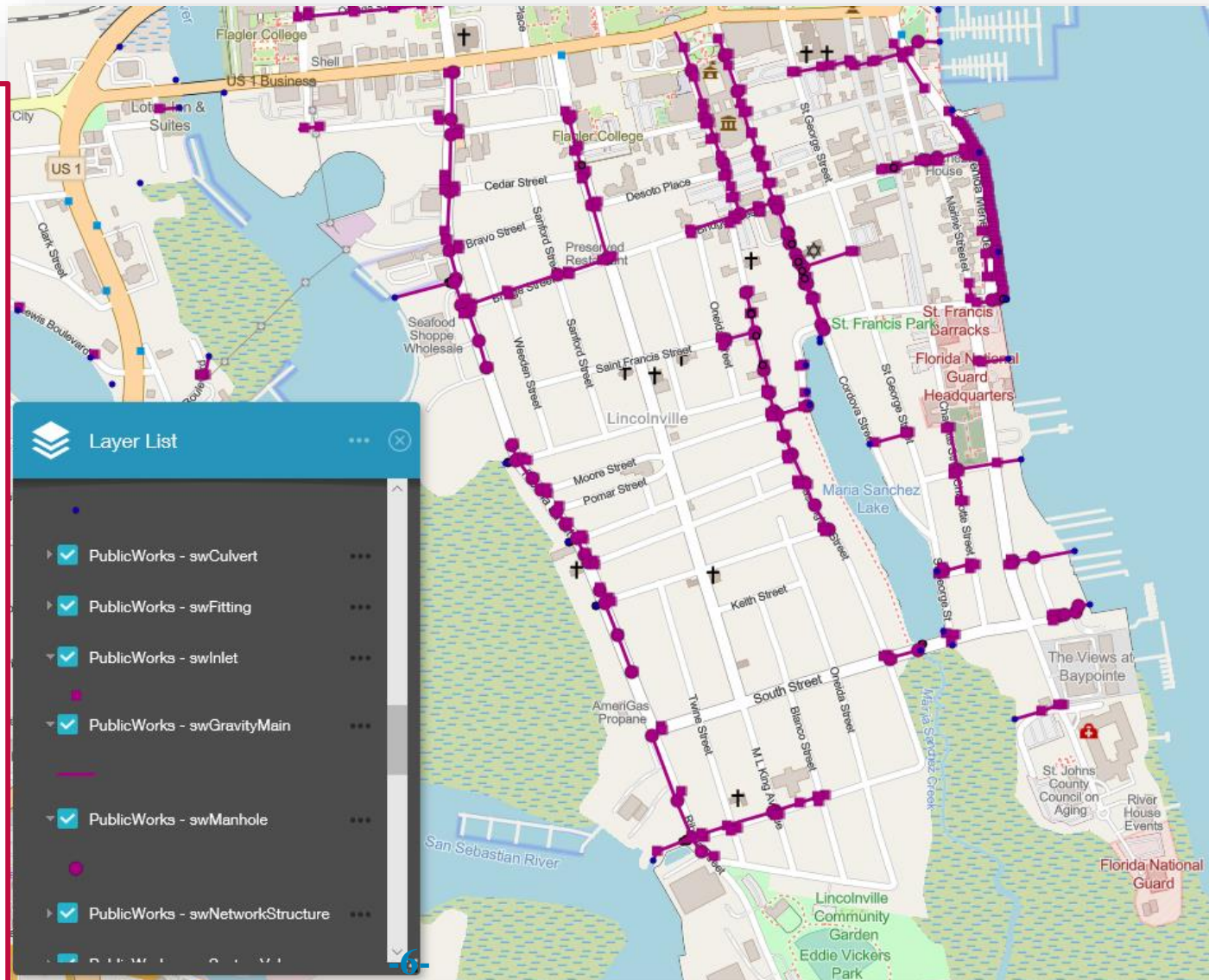


Public Works Infrastructure



Stormwater Infrastructure: Lincolnville Area

- 5 - Sediment Collection Vaults along Riberia (water quality benefit)
- Tide check valves in the vaults
- Storm inlets, pipes and outfalls





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Background



Installation During Construction



After Construction

Sediment Collection Vaults (5 Total) along Riberia Street
(Provides water quality benefit)



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Background



Operation and Maintenance of Vaults:

- Vacuum Truck used to remove sediment build up in the Vault Boxes
- Filters removed and cleaned . .
- Each vault is serviced at least once per year



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Background



Current City Challenges (stormwater):

- Aging infrastructure
- Undersized collection system
- Low-lying and coastal location (within a flood zone)
- Highly developed (high impervious area)
- **Subject to flooding – both from rainfall and tidal influence**





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Planning Efforts

➤ Stormwater Master Plan Update – February 2013

- ❑ Developed Watershed Models to Evaluate Options
- ❑ Defined Level of Service
- ❑ Stormwater Utility Evaluation and Recommendations
- ❑ Updated Stormwater Utility Fee (effective March, 2014) – New fee structure based on actual impervious area; Discount for permitted stormwater treatment facilities
- ❑ 3 Pilot Projects Featured:
 - ✓ Lake Maria Sanchez Stormwater Management
 - ✓ South Dixie Highway
 - ✓ Sidney Street (completed 2016)

STORMWATER MASTER PLAN UPDATE
PHASE 1

FINAL REPORT

STORMWATER UTILITY FEE UPDATE

NEW STORMWATER RATES ON UTILITY BILLS

Stormwater rates will be changing starting on your April 2014 utility bill. Some rates will be lower, some higher, depending on the size of your home or developed property.

Residential customers will pay a flat rate, while non-residential properties are computed based on developed, impervious area.

Small home (35,000 sq-ft or less)	\$3.66/month
Single home (35,000 sq-ft to 45,000 sq-ft)	\$7.00/month
Large home (45,000 sq-ft to 60,000 sq-ft)	\$10.20/month
Multi-family unit (condo or townhouse)	\$2.66/month
Mobile home	\$1.91/month
Non-residential customers	\$7.00/1,000 sq-ft/month

Why does the city need a stormwater fee? The fee goes to cover the cost of maintaining and improving the City's stormwater collection and treatment system.

What is an impervious area?

Impervious is any surface that does not allow for infiltration of rainwater to occur and includes roofs, driveways, patios, sidewalks, and other paved areas. In St. Augustine a single family unit (SFU) is defined as 7,500 square feet and it is the basis for assessing non-residential rates.



NON-RESIDENTIAL RATE EXAMPLE

$$\begin{aligned} &9,000 \text{ sq-ft} + 10,000 \text{ sq-ft} \\ &2,752 \text{ sq-ft} \\ &6.90 \text{ SFUs} \times \$7.00/\text{month} = \$48.32/\text{month} \end{aligned}$$



MARCH 2014



Our Mission

The Department of Public Works is responsible for operating and maintaining our stormwater infrastructure to meet the criteria of the permit administered by the Florida Department of Environmental Protection. Your fees pay for repairs of roadway drainage, new projects, maintenance, and administration of the program.



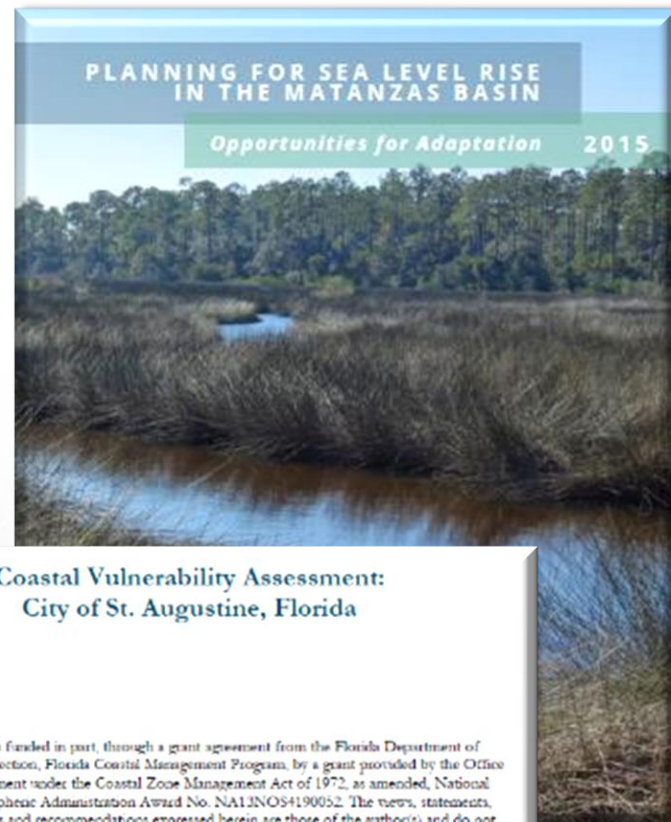
For more information on stormwater and other water resource services, please visit www.StAugSW.com or contact us at 904-825-1049.



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Planning Efforts

- **Planning for Sea Level Rise in the Matanzas Basin (2015)¹**
- **Community Resilience Initiative – Pilot Project (2016 – 2017)**
 - ❑ Coastal Vulnerability Assessment ²
 - ❑ Strategic Adaptation Plan ³



Coastal Vulnerability Assessment: City of St. Augustine, Florida

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June 24, 2016

Florida Community Resiliency Initiative Pilot Project

Adaptation Plan for St. Augustine, Florida

May 2017



UF UNIVERSITY of
FLORIDA



NATIONAL ESTUARINE
RESEARCH RESERVE SYSTEM
SCIENCE COLLABORATIVE



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Planning Efforts



Coastal Vulnerability Assessment

- Evaluated total area flooded, roads, bridges, buildings, 2,550 historic and archeological resources, water and wastewater plants, groundwater supply
- **3 Scenarios:**
 - Mean Higher High Water – daily inundation about 2' NAVD88
 - Nuisance Flooding – 12-17 times per year, 3.75' NAVD88
 - 1% annual chance flood event – 26% chance in 30 years, 6-10' NAVD88

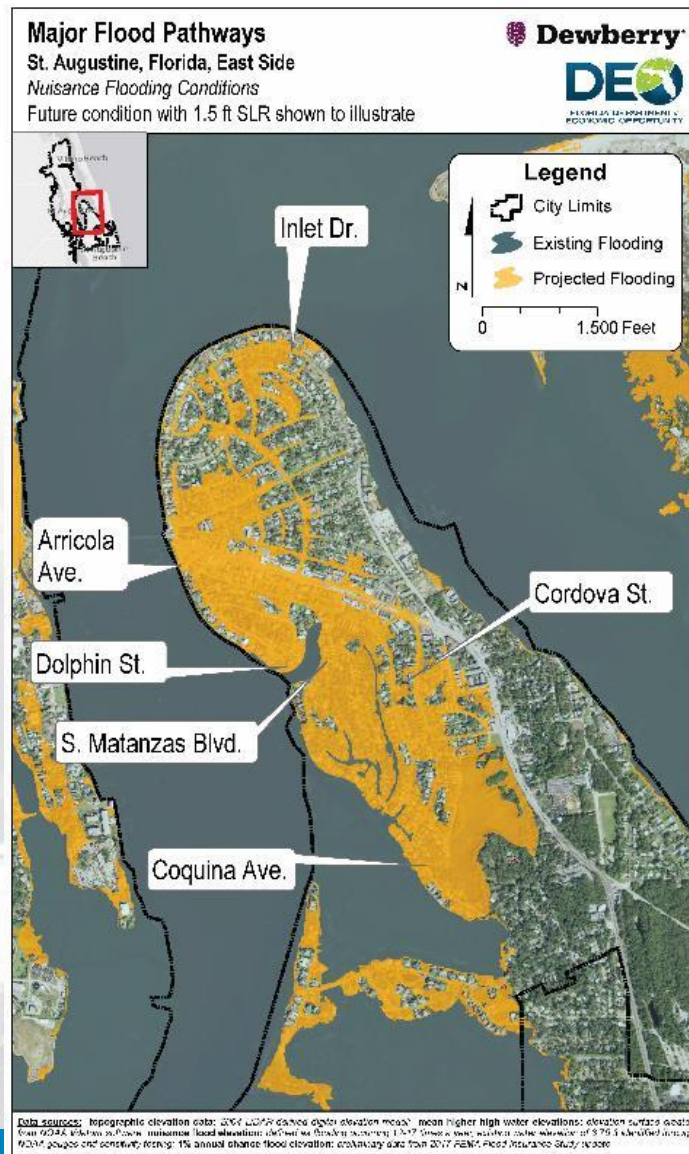


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Planning Efforts

Strategic Adaptation Plan:

- ✓ Educate the public about SLR & policy responses
- ✓ Develop baseline budgets
- ✓ Adopt policies that limit spending in areas where retreat or re-design are more effective
- ✓ Base decisions on FEMA's updated FIRMs
- ✓ Install LID/Green infrastructure
- ✓ **Targeted upgrades to City's stormwater system**
- ✓ WWTP options
- ✓ FDOT roadway improvements for resiliency
- ✓ Historic Preservation Comprehensive Plan





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Understanding Flooding and Flood Risk

September 2020 Flooding Events

"King Tides"



Nor'easter
> 20 mph (3 days)
10-15 mph (1 day)



Rainfall
2-3
inches



Multiple
Flood
Advisories
Issued



= CITY WIDE FLOODING



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Understanding Flooding and Flood Risk

❖ Rainfall Driven Flood Event

❖ Sunday, 9-27-2020

- ❑ Flood warnings were issued for St. Johns County and St. Augustine
 - ❑ Citywide Flooding
 - ❑ **3.61 inches in 1 ½ hours > 100-year storm event**
 - ❑ Total of 5.12 inches in 4 hours > 100-year storm event
 - ❑ City design standard:
 - 10-year, 1-hour = 3.1 inches
- ❖ Riberia Street design = 25-year, 24-hour storm event (\approx 2.7 inches in 1 ½ hours) design was exceeded - road was flooded





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Understanding Flooding and Flood Risk



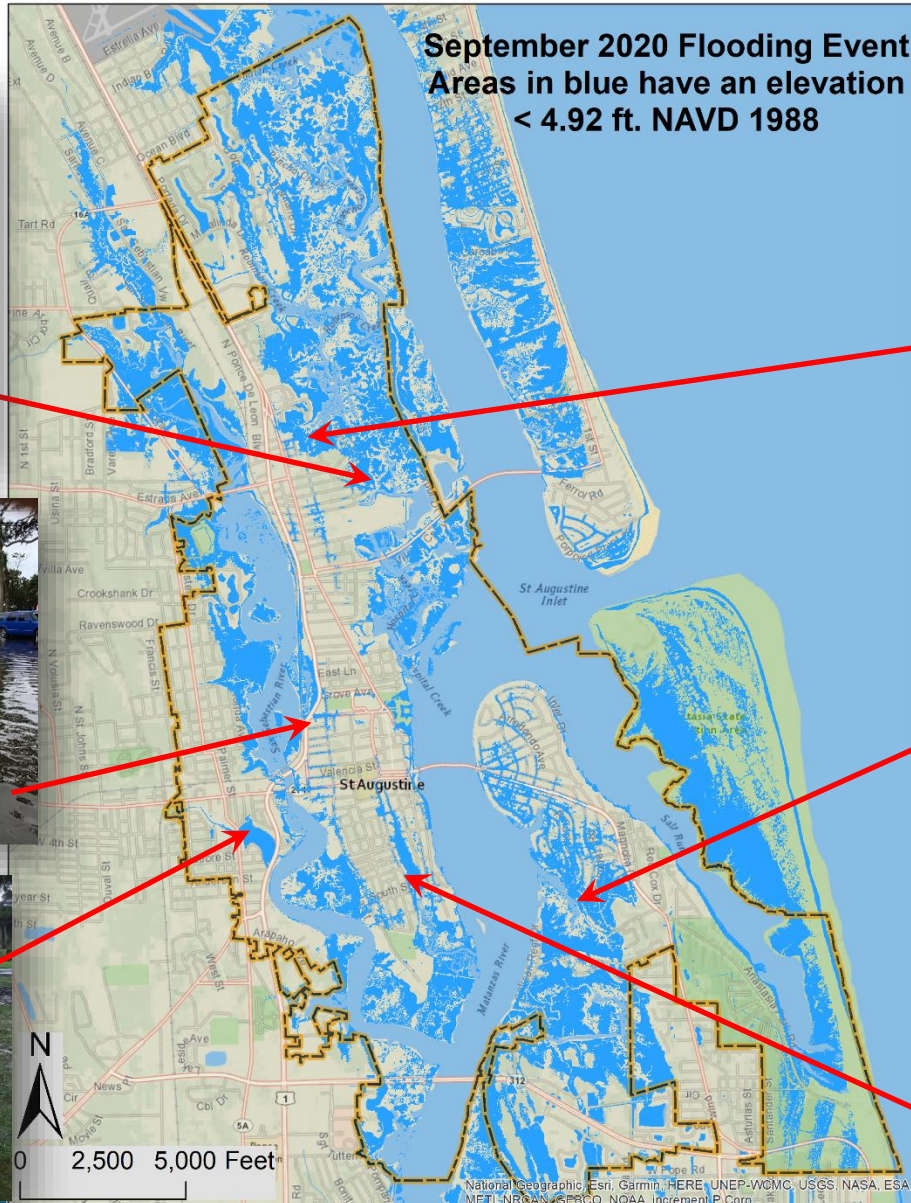
E Park Ave



Orange St & Riberia St



Lewis Blvd



Court Theophelia



Coquina Avenue



Washington St



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Understanding Flooding and Flood Risk



❖ Lincolnville – Flooding photos from September event



❖ Lincolnville – Digital Elevation Map (DEM)





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Understanding Flooding and Flood Risk

- ❑ Base Flood Elevation (BFE) – Flood Insurance Rate Maps (FIRM)
- ❑ Know your finish floor elevation (FFE)
- ❑ St. Johns County Flood Viewer to search for any properties and determine which flood zone they are located in. You can access the link here:
<https://www.gis.sjcfl.us/floodviewer/>
- ❑ Northeast Florida Regional Council's Regional Resilience Exposure Tool (R2ET). Resource for citizens, businesses and government to engage the community in discussions on sea level rise and emergency preparedness to build a more resilient future:
<http://buildcommunityresilience.com/northeastflorida/>
- ❑ There is also a flood factor tool to find your home's flood factor such as past floods, current risks, and future projects: <https://floodfactor.com/>



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Understanding Flooding and Flood Risk

- ❑ Private and public participation
- ❑ City is offering individual flood mitigation site visits:
 - Email Stormwater@citystaug.com or jbeach@citystaug.com or call 825-1040 to request a site visit
- ❑ Flood mitigation tools available to private property owners – see also Flood Factor online tool for more details and examples
 - Flood barriers, walls, door dams etc.
 - Flood proofing your home
 - Elevating structures where possible, Flood Mitigation Assistance (FMA) program for potential funding through FEMA
- ❑ Policy – Building Code Task Force Committee –
 1. Protecting older homes from the flooding impacts of new homes that are required to be constructed at higher elevations
 2. Provide incentives for property owners to use building techniques which do not require land filling for new home construction
 3. Limit the amount of impervious surface that is allowed on residential lots. There is currently no limit to the amount of paving a homeowner can do on their property



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Lincolnville Utility Rehab and Drainage Improvement Project

❖ Lincolnville Utility Rehabilitation Project is Completed !



City of St. Augustine

PUBLIC WORKS DEPARTMENT

P.O. Box 210, St. Augustine, FL 32085 Phone: (904) 825-1065

Lincolnville Region - Utility Rehabilitation
Proposed Project Map

SHEET
1 of 1





Lake Maria Sanchez Flood Mitigation and Drainage Improvement Project

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- ❖ Lake Maria Sanchez Flood Mitigation and Drainage Improvement Project is under design





Lake Maria Sanchez Flood Mitigation and Drainage Improvement Project

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❖ Flood Protection (Structures)

- ✓ Estimated 200 Acre Benefit Area
- ✓ 25-Year Storm Event + 2050 Sea Level Rise (6.4 Feet Storm Surge)
- ✓ Protect 186 Structures (Currently at Risk)



❖ Flood Protection (Roadways)

- ✓ 10-Year, 24-Hour Rainfall Event Level of Service (7.6 inches)
- ✓ Protected from Coastal Flooding
- ✓ Reduces both Depth and Duration of flooding





Lake Maria Sanchez Flood Mitigation and Drainage Improvement Project





Lake Maria Sanchez Flood Mitigation and Drainage Improvement Project

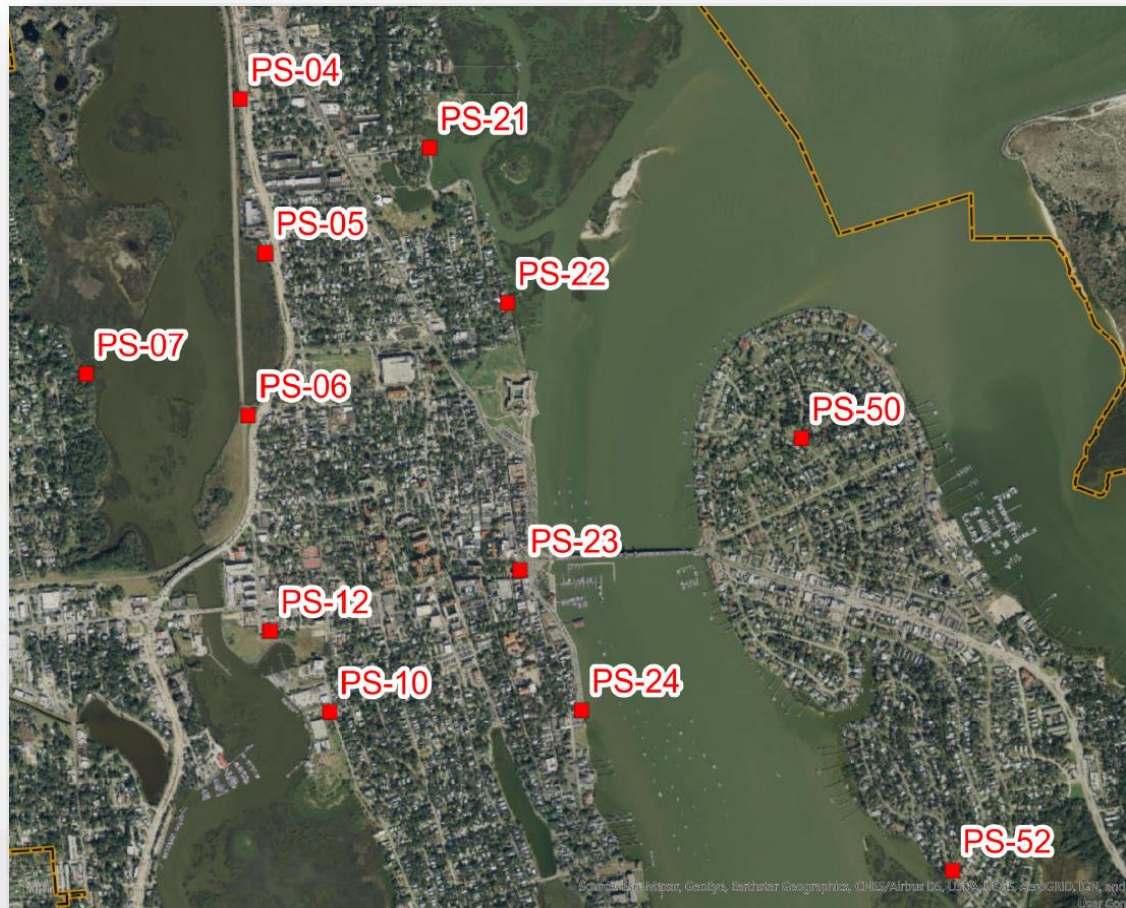




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FEMA 13 LIFT STATIONS REHABILITATION

- ❖ Bidding Complete
 - ✓ First 10 of 13 Stations
- ❖ Guaranteed maximum price for entire project \$13.8 M
- ❖ Notice to Proceed issued January 4, 2021
- ❖ Construction duration \approx 2 years
- ❖ List of 13 Lift Stations to be Rehabilitated or Replaced:
 - ❖ LS-4, 5, 6, 7, 10, 11, 12, 21, 22, 23, 24, 50, and 52
- ❖ Arricola Ave. Force Main





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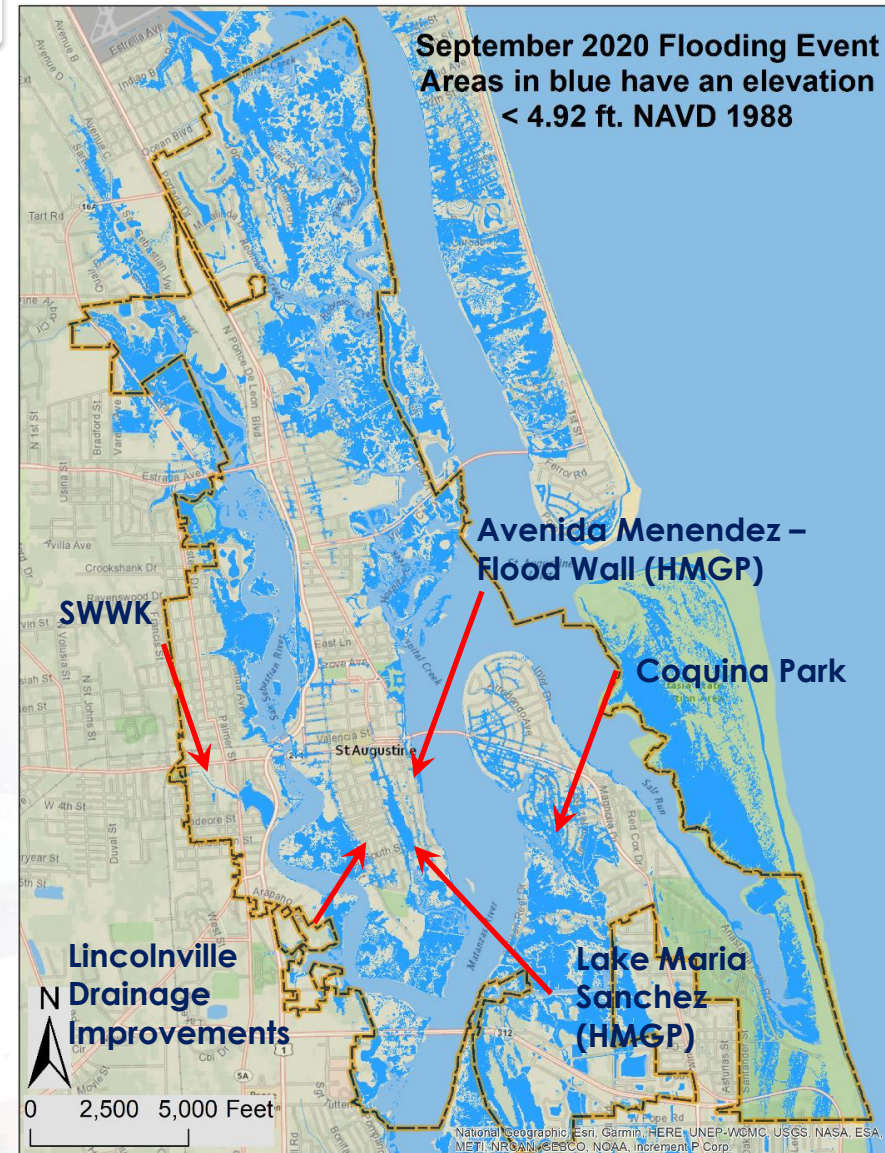
Moving Forward

❖ Current Flood Mitigation Investments ≈ \$36,133,000 (\$27,611,932 grant funded):

- ❑ Lake Maria Sanchez (HMGP)
- ❑ Avenida Menendez Flood Wall (HMGP)
- ❑ Installed tide check valves (43 Citywide)
- ❑ Coquina Park
- ❑ South Whitney/West King (SWWK) Flood Mitigation (HMGP)
- ❑ South Dixie Highway (SDH) Culvert Replacement
- ❑ Lincolnville Utility and Drainage Improvements
- ❑ FEMA 13 Lift Station Hardening and Flood Proofing

❖ Additional Flood Mitigation Projects planned &/or being developed:

- ❑ South Davis Shores Resiliency Master Plan
- ❑ Oyster Creek Flood Mitigation project
- ❑ Other Neighborhood Resiliency projects





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Additional Questions and Discussion



1. Are there funds for Black & Brown lifelong homeowners whose dirt driveways are now flooding to be raised & paved?

A: The Fix It Program is available for any qualifying resident. Funds from this program can be used to pay for the restoration or installation of a driveway or other home repairs. Residents should reach out to the St, Johns Housing Partnership at 904.824.0902 to complete the application and qualification process.

2. What plans are in place/future plans to keep storm drains free from debris?

A: See previous slides covering the operation and maintenance of existing stormwater infrastructure.

3. What grants has the city acquired to provide funds specific to raising older homes?

A: FEMA Flood Mitigation Assistance (FMA) – is the current federally funded program available for qualifying properties to apply for funding to elevate homes that are below the base flood elevation.



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4. What environmental steps is the city taking to mitigate flooding i.e. Are there city funds to buy & maintain green spaces and specifically prevent development here in Lincolnville of the small amount of green space we have left?

A: CRA funds can be used to acquire land. Pocket Parks is the significant focus right now for vacant, green spaces.

5. Are there funds for planting Cyprus trees to absorb access water?

A: Funds are available for tree planting. The Tree Planting Masterplan allows us to plant trees in the ROW. We recently completed the inventory of trees in Lincolnville which will help us accurately analyze where trees need to be planted. We are also developing a comprehensive plan to plant trees on private property if residents desire to have a tree planted. Cypress trees have not been discussed specifically, but there is guide regarding tree planting on the COSA website. Right Tree, Right Place helps us to better understand the tree that would best benefit the area where a tree is needed.

6. Can the city stop the removal of future healthy trees, such as the 6 palms our neighbor removed because he 'didn't like them,' Lightner Museum tree and palm removal, etc.

Tree removals on private property are mandated by our Code Enforcement Department. There are many variables that go into place with the approval of tree removals on private property. Some of the variables that our Code Enforcement Department considers is dependent upon the tree type, size, health, etc. Aside from obtaining a permit from the City, residents can also solicit the expertise of an Arborist. If a resident has a report from a certified arborist suggesting a tree meets the qualification for removal, this supersedes the inspection of the City. Trees that are removed must be replaced with another shade tree (Cedar trees must be replaced with 2 shade trees). Permits are \$30.00 and fines are up to \$5000.00 for removal of a tree(s) without approval or an arborist report. Each situation is looked at on a case-by-case basis and there is no cookie cutter scenario.

The City is implementing the Tree Planting Masterplan to create a productive tree canopy or urban forest. The tree that the Lightner removed was planted down at Freedom Park. Residents can find more information regarding tree planting and removal on the COSA website.



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7. How do the residents find out about the City's Climate change plan, if there is one?

A: The City was one of three communities to participate in a pilot project that evaluated the effects of sea level rise on our infrastructure and historic resources. You will find the Coastal Vulnerability Assessment and Strategic Adaptation Plan located on our website here: <https://www.citystaug.com/570/Coastal-Vulnerability> those documents are guiding the City as we move forward on our resiliency efforts.

8. In a future with sea level rise and sea walls, how will our stormwater system function? Lots of pumps?

A. The Lake Maria Sanchez Flood Mitigation and Drainage Improvement project will be the first major stormwater project that will incorporate a flood wall and pump system, in addition to other strategies to combat both rainfall flooding and tidal flooding. That could be the future model for how we management our stormwater within our City. There are many different resiliency tools, such as policy, infrastructure/hardening and natural based solutions. We will be evaluating all of those to determine the best appropriate application of those tools on future projects.

9. It seems as though a number of City efforts directly conflict with our ability to improve resiliency. Planning continues to approve concrete foundations for new construction and to spend money on studies that call for additional sidewalks throughout Lincolnville and other neighborhoods. The PZB continues to approve projects and developments without regard for the impact of increased traffic or the City's aging infrastructure. Does your office have the ability to influence and mandate that resiliency is consistently addressed as part of the City's review and approval process?

A. Current policy that is in place is what governs the decision-making process, so if there are changes that are desired to that process that would require changes to the current policy. Those types of changes take time. Part of my new role as Chief Resilience Officer will be to work between departments to look at opportunities to improve resilience of our City. This will include projects and policy. We have currently focused on projects and getting those implemented, but we also need to evaluate our policy to determine where we may want to improve, add and/or amend current policies. A good example of this process at work is the current Building Code Task Force that has recently completed and making recommendations to go before the Commission.