



A Holistic Approach to Flood Mitigation

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FLOODACTION

ALEXANDRIA

Energy and Climate Change Action Plan, Workshop #2

March 1, 2022



Outline

- What's an ultra urban environment?
- Causes of flooding
- Alexandria's holistic approach

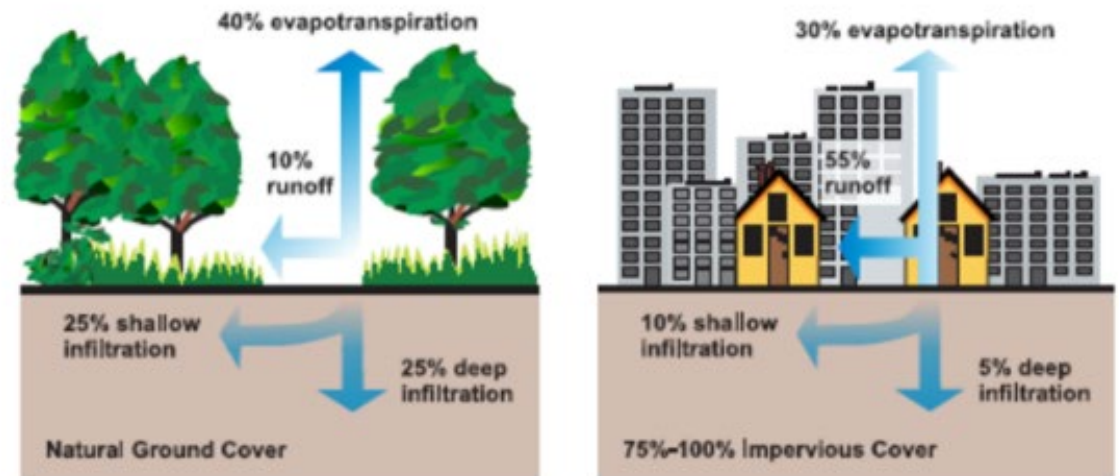
What's an ultra urban environment?

- Urban areas more than 85% impervious:
 - Rooftops
 - Roads and streets
 - Parking lots
 - Compacted soils
- Areas where streams have been piped
- Areas with combined sewers



Causes of Flooding

- Existing impervious areas
- Future imperviousness
 - New development
 - Re-development
- Inadequate drainage
- Encroachment in flow paths
- Soil compaction
- Lawns



Causes of Flooding

- High tides
- Sea level rise



Old Town Alexandria, 10/29/2021

Climate change is an amplifier



Warmer air holds more moisture



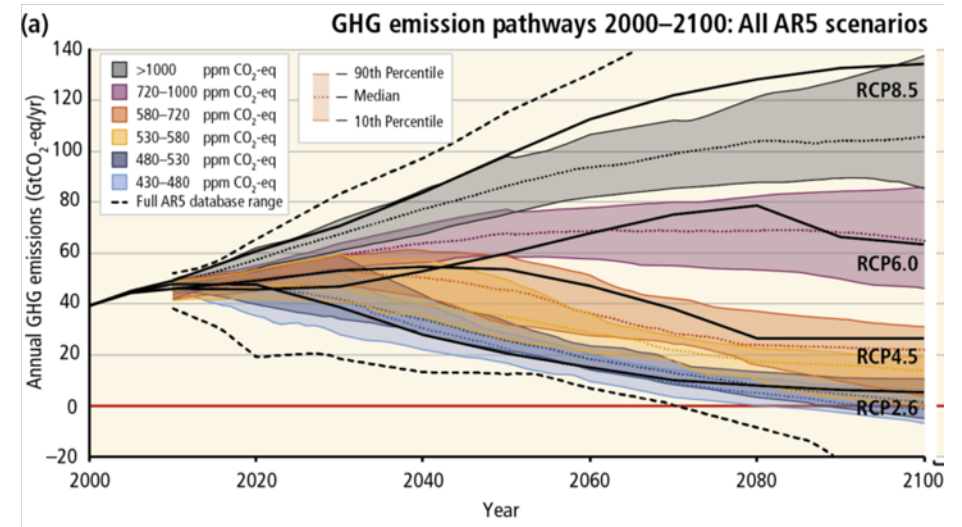
More solar heat causes greater evaporation



More moisture forms clouds



Heavier rainfall



More Frequent, Intense (“Heavy”) Rainfall Events

- **2018:** Virginia’s wettest year on record, 20”+ over normal
- **July 8, 2019:** Regional Flood
- **July 23, 2020:** Local Flash Flood
 - 60-80% of monthly avg in 30 minutes
- **Sept. 10, 2020:** Local Flash Flood
 - 2.5-4” with rates up to 3”/hr in 10 mins
 - Daily rainfall record at National Airport
- **August 21, 2021:** Very Local Flash Flood in single local watershed



Radar, September 10, 2020

Alexandria's holistic approach

- Large capacity projects
- Spot improvements
- Maintenance and Operation of the Stormwater and Sanitary Systems
- Stream and channel maintenance
- Community involvement (Alex311)
- Waterfront initiative
- Flood mitigation grant program
- Stormwater utility fee



Neighborhood Spot Improvements



A crew pours concrete to form the catch basins for the new, wider inlets on Hume Avenue.



Engineer Brian Rahal, of the Stormwater Management Division, monitors progress on larger inlet installation on Hume Avenue on Jan. 24, 2022

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Operations & Maintenance

- ✓ Inspecting and cleaning storm lines every 3-5 yrs.
- ✓ Inspecting and clearing before storms
- ✓ Repairing stormwater infrastructure as needed
- ✓ Maintaining streams and channels
- ✓ Maintaining large infrastructure components, such as Hooffs Run Culvert
- ✓ Inspecting interior of sewers via CCTV
- ✓ Street sweeping & leaf removal
- ✓ Additional maintenance in response to service requests received via Alex311



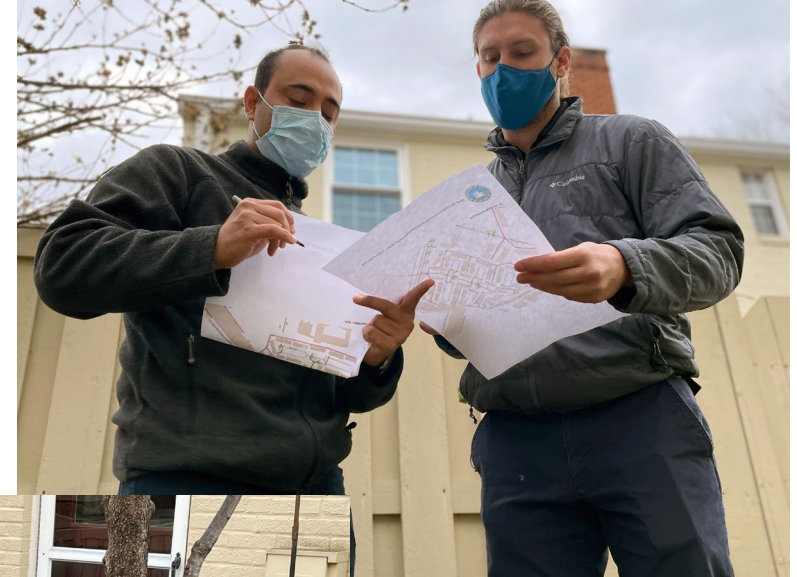
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Communications

FLOOD ACTION NEWSLETTER

Project updates, news and messages directly from senior leaders.

VIDEO STORYTELLING

Informative and educational video messaging from the staff.

SOCIAL MEDIA

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T&ES Alexandria, VA

The official account for the City of Alexandria VA Department of Transportation & Environmental Services.

alexandriava.gov/TES

301 King St, Rm 4100, Alexandria, Virginia



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ALEXANDRIA

FEBRUARY 2022 Issue 5

ABOUT US ADVISORY GROUP ENEWS

Manager's Message
A message from the Stormwater Management Division Chief.

When future generations of Alexandria residents trace back flood-resilient improvements in the City, they'll see the journey started with all of us.

While there is still much work to be done, the City has made steady progress in building resiliency to the impacts of flooding. We started the year off strong with construction beginning on multiple neighborhood spot improvement projects and putting out a request for qualifications on two large capacity projects, both of which you'll read about below.

Alexandria is a great historic city and a great place to live and work. But this history also means the sewer systems are older, and some of these systems carry live streams. While these systems were advanced when they were first installed, I don't think they were designed to contain runoff from these intense storms that we used to call 50- or 100-year storms that we now experience once or twice a year. With a warmer atmosphere holding more moisture, precipitation drops all at once and can overwhelm our systems, so we need to build more capacity and measures to protect us from flooding.

Working with the City is particularly special to me as I get to serve the community where I live. This makes it not just a job, but a way to contribute to the community to make people and their property safer.

Like many people in the City, my family's house has experienced flooding from these more recent storms. Yes, we do have some significant challenges. However, I truly believe we can meet the challenges we face by working together.

With the support of the community and City Council, we've hired more experts, pursued more grant opportunities and devoted more time to examining problems in pursuit of solutions.

I'm proud of the team we've been building across the Department of Transportation and Environmental Services in the Stormwater Management Division, Sanitary Sewer Division and Department of Project Implementation in the past year. I'm energized about the work we've done with the community and the work that lies before us to squarely focus on infrastructure solutions that will alleviate flooding.

We've got the experts, strategy and your support. I'm looking forward to working alongside the community over the next year as we continue designing a City that future generations will be proud to call home.

Jesse Maines
Division Chief, Stormwater Management, T&ES, City of Alexandria



THUMBNAIL 1: HAVE YOU HEARD? The City's updated noise ordinance is effective. Here's what you need to know.

THUMBNAIL 2: VAMS advocates on behalf of Virginia localities to continue working toward the shared goal of clean water and more resilient communities. **JESSE MAINES**, Division Chief, Stormwater Management, T&ES, City of Alexandria.

THUMBNAIL 3: The City will **REDUCE** your fee if you take steps to manage stormwater on your property.

THUMBNAIL 4: **DEREK CLAYTOR**, T&ES, City of Alexandria. My name is Derek Claytor, I am one of several T&ES Commanders assigned to the City of Alexandria.

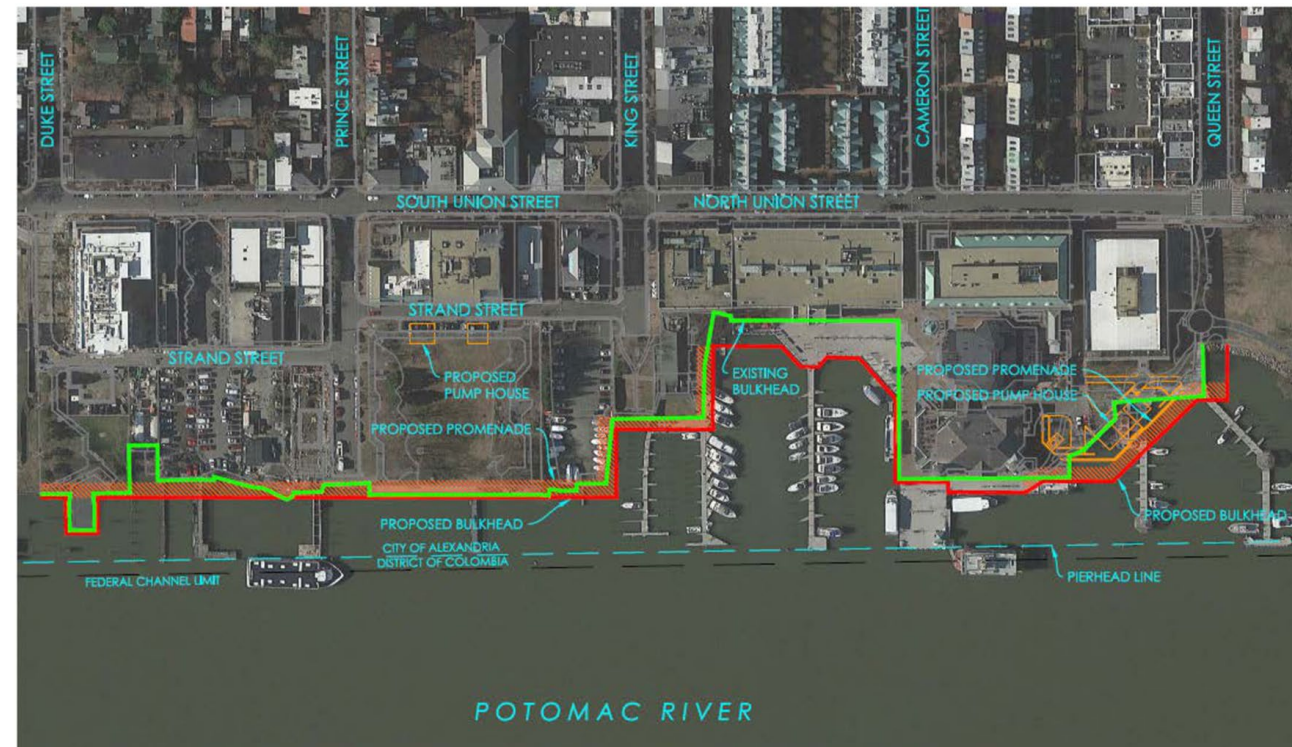
THUMBNAIL 5: RAIN DOWN THE



ART: FREEPIK

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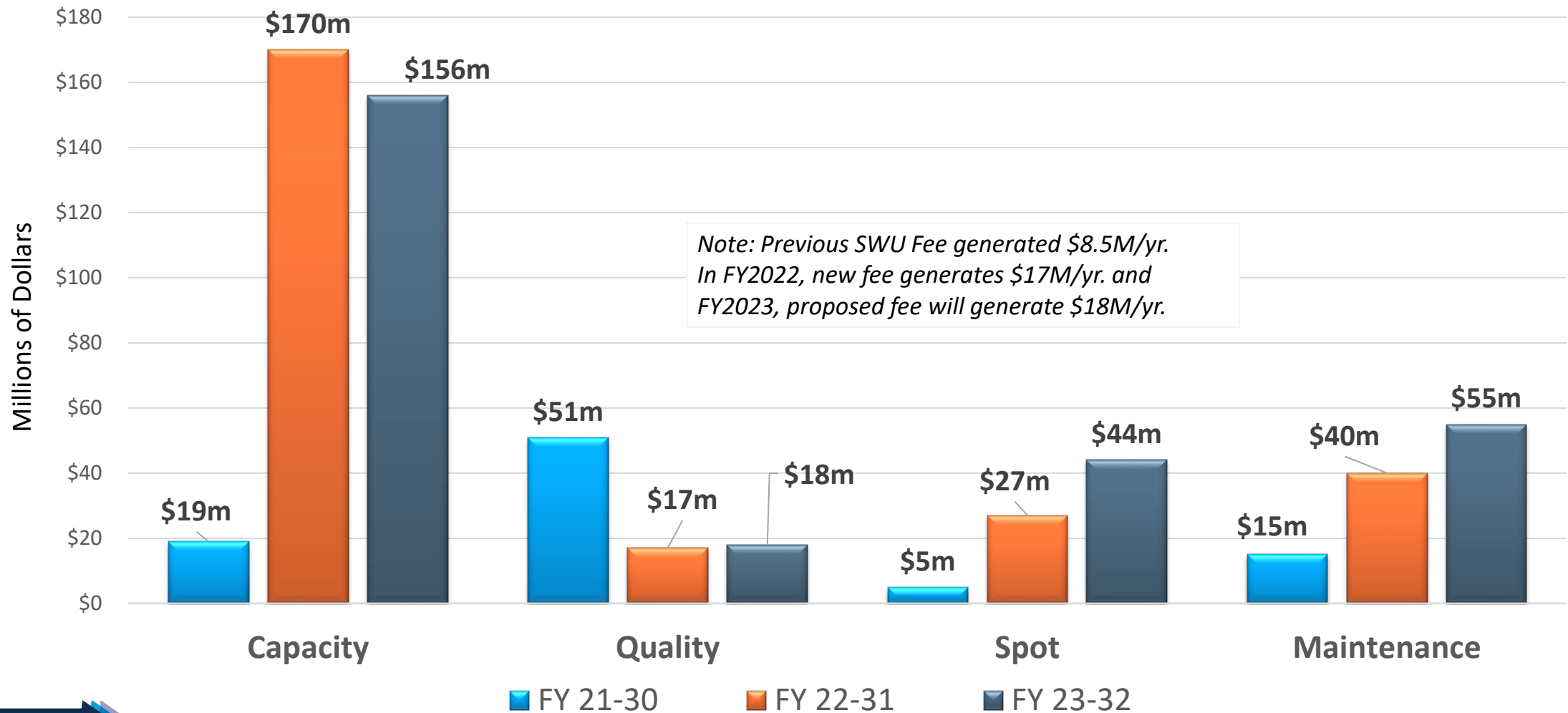


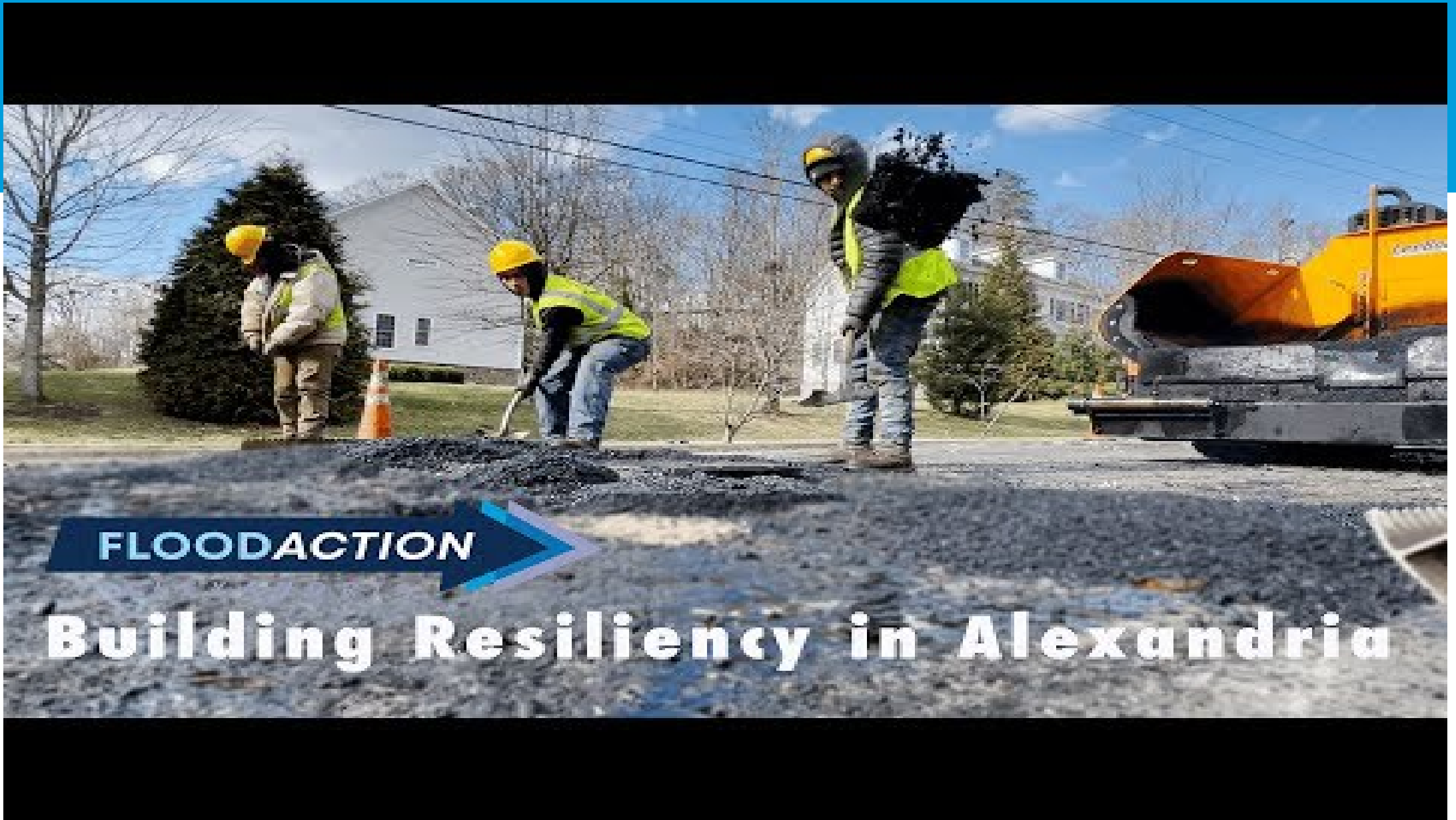
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Stormwater Management Funding Changes from FY22 – FY23 Proposed





FLOODACTION

Building Resiliency in Alexandria

The Flood Action Alexandria initiative is the comprehensive response to address flooding in all corners of the City. Here's a look at what our team does to mitigate flooding.

Thank you!



www.alexandriava.gov/FloodAction

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