

A Holistic Approach to Flood Mitigation

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Outline

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



What's an ultra urban environment?

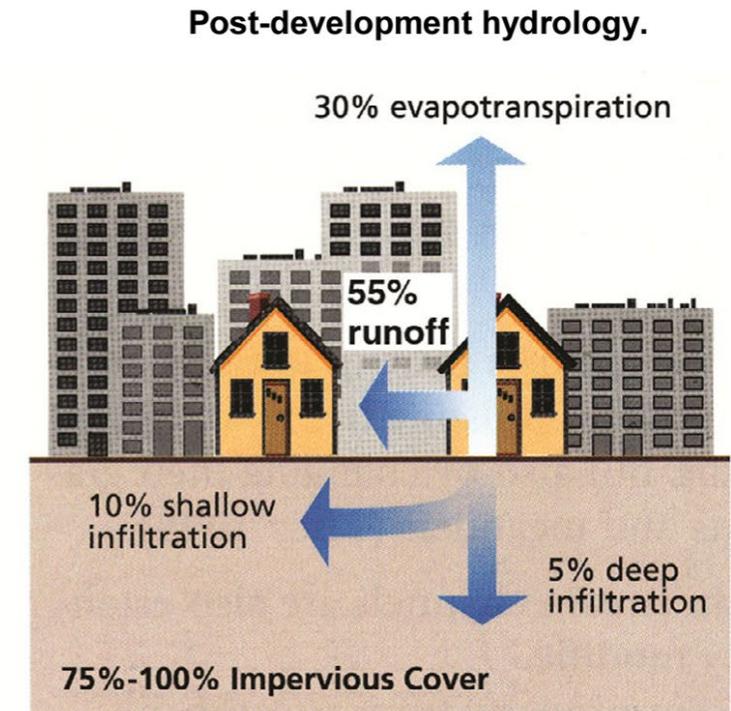
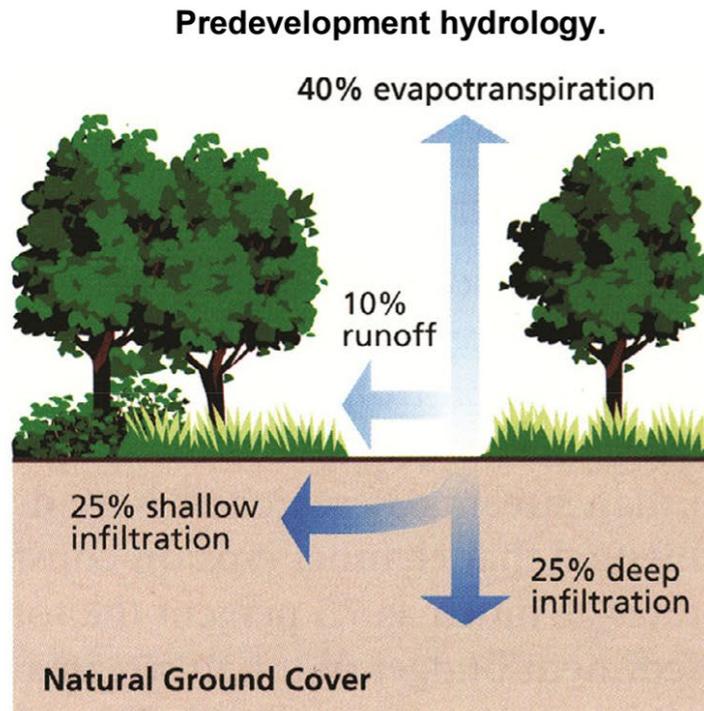
- Urban areas more than 85% impervious:
 - Rooftops
 - Roads and streets
 - Parking lots
 - Compacted soils
- Areas where streams have been piped
- Areas with combined sewers





Causes of Flooding

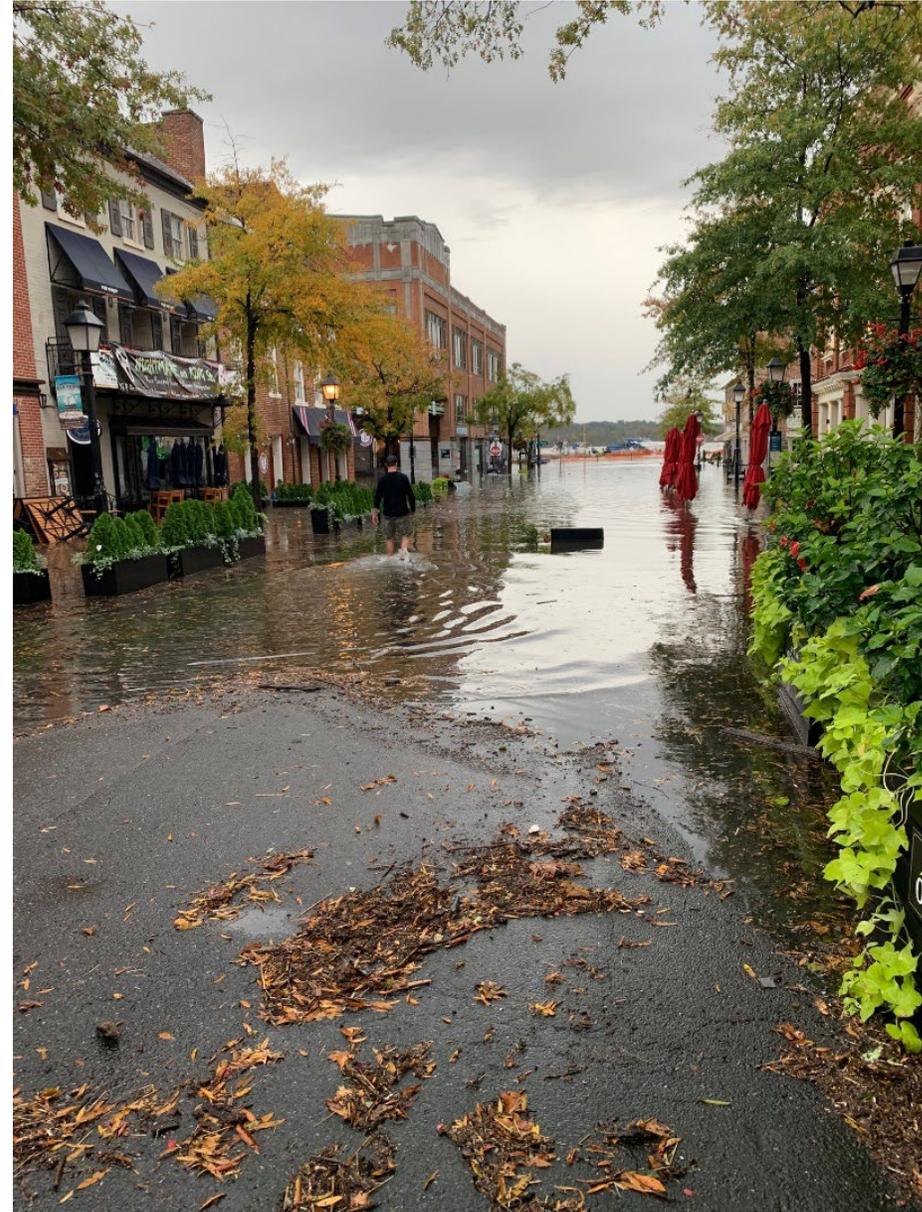
- Existing impervious areas
- Future imperviousness
 - New development
 - Re-development
- Inadequate drainage
- Encroachment in flow paths
- Soil compaction
- Lawns





Causes of Flooding

- High tides
- Sea level rise



Old Town Alexandria, 10/29/2021



Climate change is an amplifier



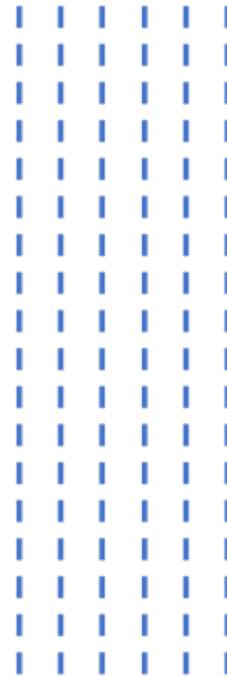
Warmer air holds more moisture



More moisture forms clouds



More solar heat causes greater evaporation



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



Operations & Maintenance

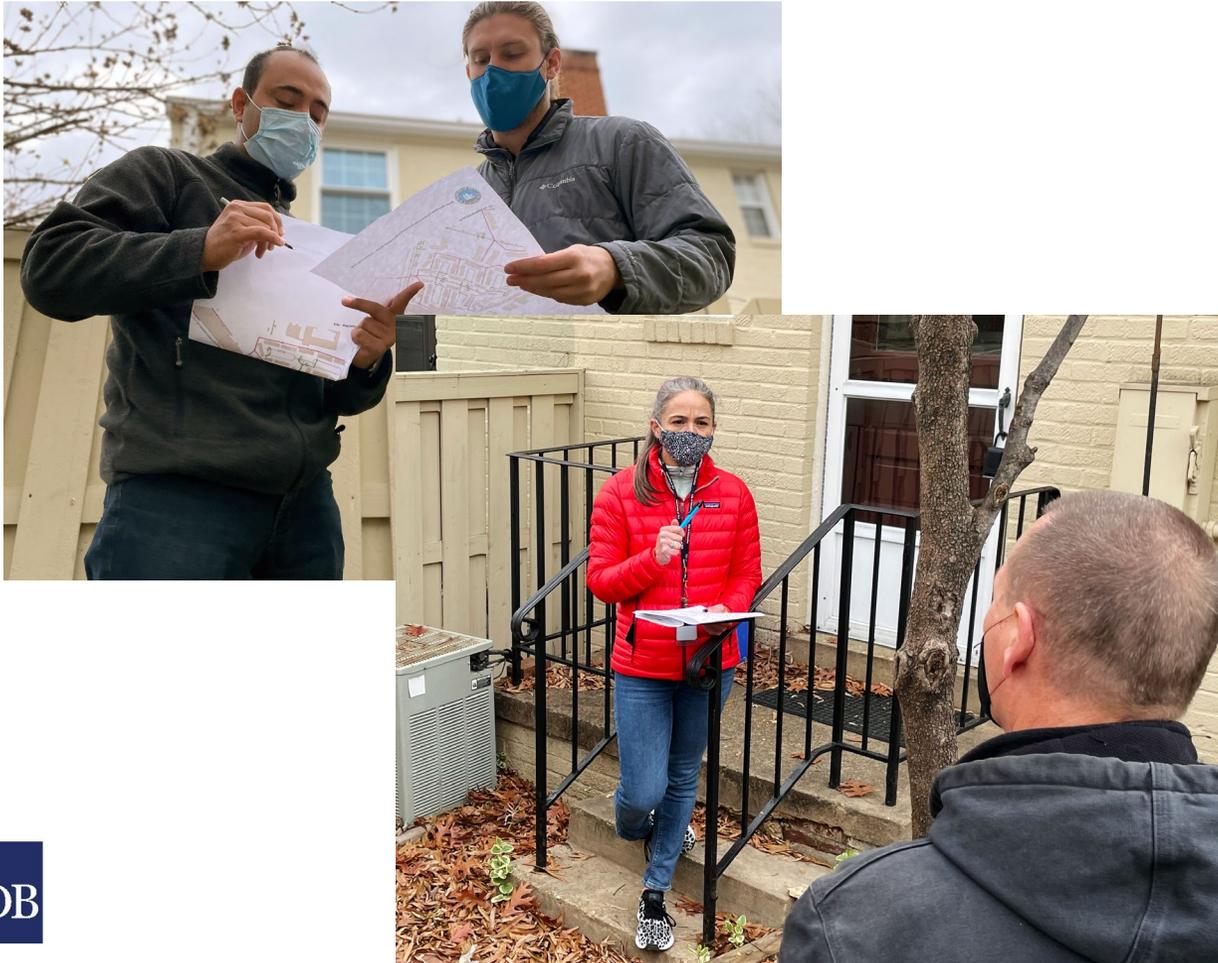
- Inspecting and cleaning storm lines every 3-5 yrs.
- Inspecting and clearing before storms
- Repairing stormwater infrastructure as needed
- Maintaining streams and channels
- Maintaining large infrastructure components, such as Hooffs Run Culvert
- Inspecting interior of sewers via CCTV
- Street sweeping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





Alexandria's holistic approach

- Community outreach



- Flood mitigation grant program





Green Infrastructure

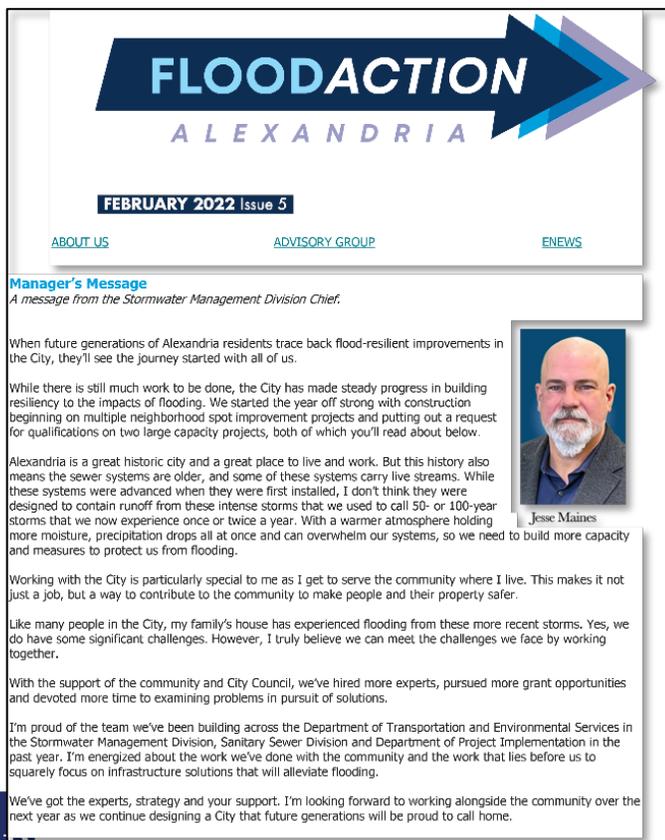




Communications

FLOOD ACTION NEWSLETTER

Project updates, news and messages



ART: FREEPIK

VIDEO STORYTELLING

Informative and educational video messaging from the staff.



SOCIAL MEDIA

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Get an inside look at projects.

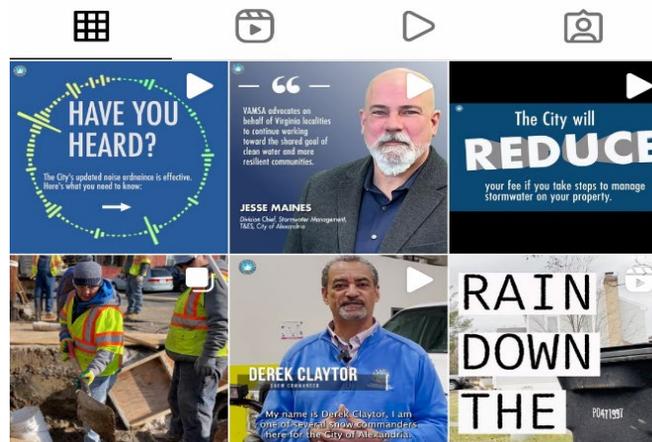


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Thank you!



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