OCTOBER 2022 Issue 9

MANAGER'S MESSAGE

Halfway around the world, dedicated engineers are examining complex flooding problems, much like we're doing in the City of Alexandria.

Engineers are driven by their role as problem solvers, so the more complex the problem is, the more they dig in to find solutions.

I was surprised when I received a request to present at the 2022 Asia Water Forum to share what the City is doing to build greater resiliency in stormwater management. Presenting at 3 a.m. was challenging, but I was delighted for the opportunity to share our work and learn from flood mitigation experts on the other side of the world.

We are all facing similar challenges from climate change, and we benefit from sharing knowledge and potential solutions. While I was proud to share our technical approach, I was most grateful when I realized how fortunate our City is to have residents, elected officials and staff fully committed to addressing the City's flooding because that's not the case everywhere.

The commitment and drive to solve problems are what gives me the confidence our City will succeed in building a more flood-resilient community.

The more frequent, high-intensity storm events and rising sea level are further complicated by our dated infrastructure and developments built before the stormwater regulations. I am grateful to work with a community that recognizes these issues and is committed to addressing them together.

As Director of Project Implementation (DPI), I lead a team tasked with managing and delivering the City's infrastructure projects. Our team of experts from across DPI and Transportation and Environmental Services (T&ES) is taking their years of experience solving stormwater challenges throughout the U.S. and internationally to address the City's flooding. While our City staff may be leading the effort, they know that our engaged residents, professional consulting engineers, construction contractors, partner departments and agencies and neighboring jurisdictions are all part of the solution.

I'm proud that our proactive and holistic approach to flood mitigation has inspired numerous requests from others to share our strategy – and I am hopeful it can help countless people around the world as engineers dig in to find solutions.

Terry Suehr, Director of the Department of Project Implementation

Editor's note: The Manager's Message is a periodic editorial authored by senior leaders of the Flood Action Alexandria program.

PROJECT UPDATES

LARGE CAPACITY PROJECTS

The combined **Commonwealth and East Glebe Road and Ashby and East Glebe Road** project is in the final stage before design can begin: contract negotiations with the selected engineering firm.

The project will increase the capacity of the storm sewer system to allow stormwater conveyance. The project will also incorporate green infrastructure elements to allow stormwater to soak into the ground to reduce the volume of runoff. A grant from the Virginia Community Flood Preparedness Fund awarded to the City in September 2021 will support a portion of this project. The estimated cost for design and construction is $50 million.

In the second project, **Hooffs Run culvert bypass**, the City is conducting price negotiations with the top-rated firm for the design contract. The project will explore storage and conveyance options to improve the system's performance and reduce flooding. The estimated cost for design and construction is $60 million.

CAPACITY PROJECTS

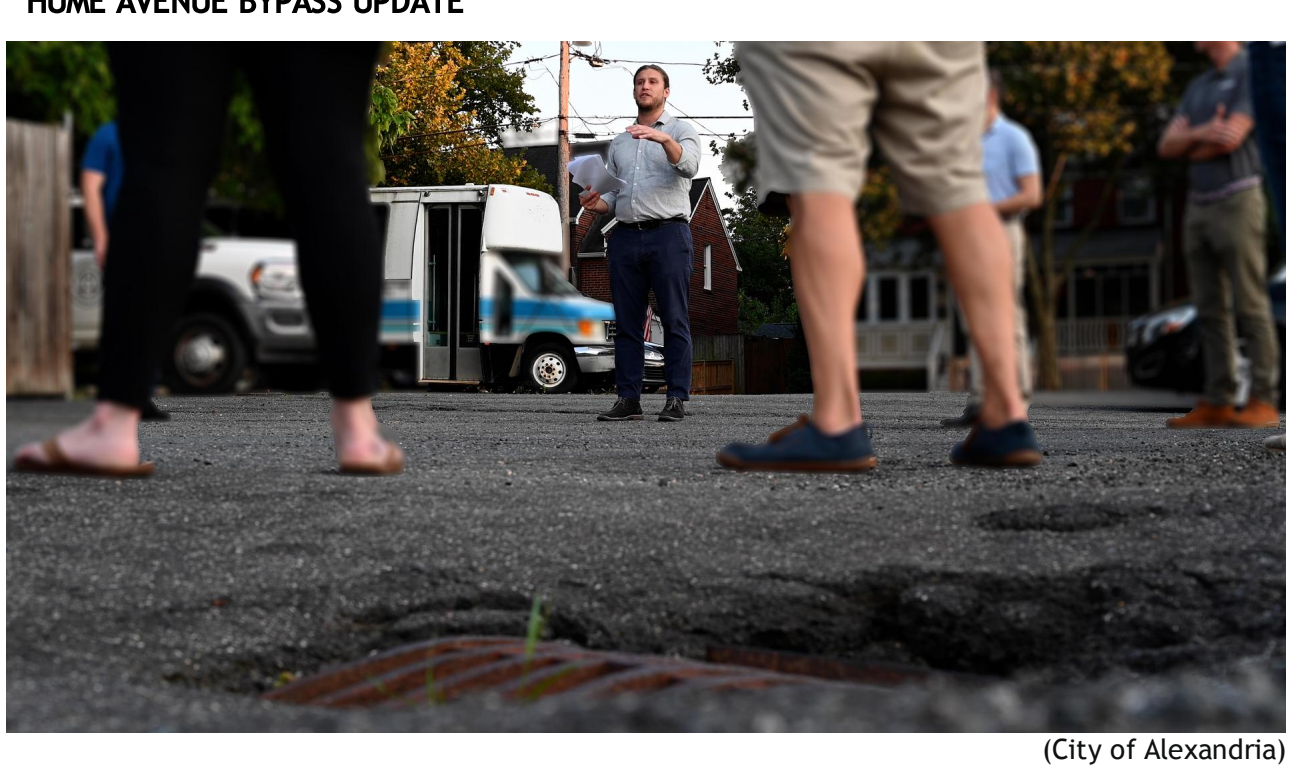
SPOT IMPROVEMENT PROJECTS

Two spot improvement projects have entered the construction procurement phase.

The first is Oakland Terrace Timber Branch, which will replace the existing retaining wall and provide stream stabilization to protect the existing sewer line that runs parallel to Timber Branch.

The second is Mount Vernon Cul-De-Sac, Inlets, and Alley, which serves odd-numbered townhomes (19 to 33) on the south end of Mount Vernon Avenue. The work includes alley grading, drainage improvements, sanitary backflow installation in the collection system and storage. The project is receiving $1.19 million in American Rescue and Recovery Act (ARPA) first tranche funding and the balance is funded by the Stormwater Utility.

HUME AVENUE BYPASS UPDATE



(City of Alexandria)

Mitch Dillon (center), project manager for the Department of Project Implementation, speaks with residents of Hume Avenue about a forthcoming flood mitigation project. Engineers designed a project to install a new storm sewer main under Hume Avenue, replacing the existing pipe in the backyards of homes on the northern side of the street. The new pipe will be larger to convey more stormwater and support the installation of inlets along the roadway to collect additional surface runoff. The project is in the design phase. Once a design is finalized, City staff anticipates beginning construction in January 2024, which is estimated to last about nine months. The project is estimated to cost about $1 million with $710,000 from the first tranche ARPA funding and the balance funded by the Stormwater Utility.

SPOT IMPROVEMENT PROJECTS

NEWS

City clinches latest round of CFPF grant funding

Two projects aimed at building resiliency to the impacts of flooding have been awarded about $2 million in state grant funding.

On Sept. 30, the City was notified it has been awarded FY 2022 Virginia Community Flood Preparedness Fund (CFPF) grants for projects in the third round of grant solicitations. The City has secured about $4 million from previous CFPF grant funding.

The first grant – $1,250,000 in matching CFPF grant funds – will replace a dual corrugated metal pipe for Mount Vernon Avenue and Edison Street in Arlandria. The project was identified through on-the-ground neighborhood investigations and supported by the City's Storm Sewer Capacity Analysis (CASSCA). The project will replace the existing, deteriorating, undersized dual corrugated metal pipes leading from Mount Vernon Avenue under the Potomac West apartments and leading to the outfall east of Edison Street. The pipes will be replaced with a larger culvert to safely convey large water flows to an outlet.

The pipe replacement helps accelerate the delivery of portions of a stormwater capacity project identified for funding in FY 2026 in the City's 10-Year Capital Improvement Plan to address flooding ahead of schedule.

The second project – $746,000 in matching CFPF grant funds – will establish a program to add new inlets and increase the size of existing inlets. City engineers use this strategy to mitigate localized flooding in neighborhoods.

Funding for the CFPF grant program comes from the Regional Greenhouse Gas Initiative (RGGI) proceeds. RGGI is a partnership among 11 Eastern states that regulate emissions through an allowance program that collects funds from power plants. Since its inception, the initiative has reduced power plant emissions by 50% and raised more than $4 billion to invest in communities in the partnership.

Sewer separation project to reduce sewer backups

Crews install a new manhole on North Pitt Street. (City of Alexandria)

A separation project aimed at reducing sanitary sewer backups has started construction in Old Town in the 500 block of North Pitt Street.

As part of the project, crews will repair a damaged sanitary line, construct a new manhole on the existing sanitary line, connect to a fully separated sanitary sewer at Pendleton Street and abandon the connection to the combined sewer system. The project costs about $163,000.

"The City is working on a number of strategies to reduce the risk of sanitary sewer backups during wet weather," said Erin Bevis-Carver, chief of the Sanitary Infrastructure Division. "Separating the sanitary sewage from the stormwater in this area will significantly reduce the potential for backups to occur in the future."

The sewer separation project for North Pitt Street was identified through resident complaints of sewer backups into homes during heavy rainfall.

Sanitary Infrastructure staff are evaluating other areas in the combined sewer system where separation projects could alleviate sewer backups.

Combined sewer systems are sewers that collect both stormwater and wastewater in the same pipe. Although they were state-of-the-art technology in the late 1850s, combined sewer systems became archaic as knowledge improved and municipalities began constructing separate pipe systems for stormwater and wastewater.

The vast majority of the City is served by separate storm and sanitary sewer systems but about 500-acres in Old Town remain served by a combined sewer system, which can be traced to the City's historic development.

About 700 municipalities in the U.S. own and operate combined sewer systems, according to the U.S. Environmental Protection Agency. In Virginia, combined sewer systems are located in the Cities of Alexandria, Richmond and Lynchburg.

Most of the time, the City's combined sewer systems transport the wastewater to AlexRenew where it is treated and discharged to a water body. However, when it rains, the volume of the combined wastewater and stormwater flows in a combined sewer can exceed the capacity of the system and cause overflows that discharge directly into waterbodies without treatment.

As part of the RiverRenew project, AlexRenew is installing tunnels, a new interceptor, sewer diversion facilities and a pumping station to help reduce the number of combined sewer overflows. The project is expected to be completed by July 1, 2025.

Manhole insert installation to bring flood relief

The City is procuring a contractor to install 870 stainless steel manhole inserts.

Manhole inserts are pan-shaped devices that sit at the top of the manhole, directly underneath the manhole cover. They prevent stormwater inflow from gushing to the sanitary sewer after it enters the hole in the manhole cover.

The inserts have a hole that slowly drains the accumulated stormwater into the sewer after the storm ends.

Manhole inserts are one of the most cost-effective ways to reduce inflow into the sanitary sewer system. Manhole inserts will be added to the manholes identified on a map on the City's Sanitary Sewer website.

RIGHT: Manhole inserts will be placed underneath manhole covers. (City of Alexandria)

COMMUNITY MAINTENANCE WORK

City engineers solve tricky drainage improvement project

BEFORE AND AFTER: City engineers analyzed why the sidewalks on Polk Avenue near James K. Polk Elementary school experienced ponding, when the bordering road did not pond. (City of Alexandria)

An issue that caused ponding in in the public sidewalks close to the James K. Polk Elementary school but not the bordering street has been solved and corrected after City experts fine-tuned solutions.

The drainage improvement project for Alexandria Free Methodist Church at 4901 Polk Ave. challenged flood mitigation experts as they analyzed why the church's yard and the sidewalk flooded, yet the bordering street did not. Flooding in the yard after heavy rains often prompted church staff to put out cones blocking passage on the sidewalk as a precaution for pedestrians.

City staff visited the site numerous times – in dry weather and wet weather, during the day and at night – to track flooding patterns. They worked with partner organizations to work through scenarios.

Civil engineer Qais Ayubi, the project manager, realized the issue was caused by groundwater that was ponding.

As part of the project, new underdrain and cleanouts were installed to carry the groundwater into the nearest stormwater catch basin to prevent ponding in the area. The Public Works Division is scheduled to finish the project by installing new sidewalks with the appropriate slope and safety standards.

"When I began to investigate the area, I noticed that seniors and parents taking their children to the school had trouble using the sidewalk and therefore, they needed to change their route," Ayubi said. "As a City employee, my greatest joy is to bring relief to our residents and find solutions to the difficult tasks."

FEDERAL FLOOD CONTROL PROJECT

Engineers and inspectors from the City of Alexandria and Arlington County observe the progress of the dredging project at Four Mile Run as a rubber track carrier transports sediment collected from the channel. (City of Alexandria)

Dredging underway at Four Mile Run

Crews are continuing maintenance work on the Four Mile Run Flood Control Project to restore flood conveyance standards set by the U.S. Army Corps of Engineers (USACE).

The dredging project, which began in September and is conducted in partnership with Arlington County, will remove accumulated sediment from the Four Mile Run channel beginning upstream of the Mount Vernon bridge and extending about 1,200 linear feet downstream. The project also includes clearing of debris, vegetation and shoaling, as required by the USACE inspection program.

The project is registered on the National Levee Database.

Four Mile Run is a nine-mile-long stream with a 19.6 square-mile highly urbanized watershed covering portions of Arlington and Fairfax Counties and the Cities of Alexandria and Falls Church, until it reaches the Potomac River. The lower portion from I-395 downstream to Ronald Reagan Washington National Airport is within a hardened flood control channel shared between Arlington County and the City of Alexandria that has experienced repeated flooding since the 1940s.

Arlington County and the City of Alexandria formed a partnership with the USACE to design and build the flood-control channel in the lower portion.

The project was constructed in the late 1970s and early 1980s. Since its completion more than 20 years ago, the channel has safely conveyed the high storm flows and mitigated flooding through the two municipalities.

Arlington County and the City of Alexandria share responsibility for operations and maintenance of the Four Mile Run East and West Levee System including the open channel for Four Mile Run. Arlington County maintains the north side and the City maintains the south side.

MAINTENANCE HIGHLIGHTS

OUTFALL INSPECTIONS

Inspection and maintenance of three waterfront stormwater outfalls, including closed-circuit television inspections.

CCTV INSPECTIONS

Closed-circuit television inspections of storm drains in 18 vulnerable spots in the City.

BMP MAINTENANCE

Urban bioretention tree box filters on Pegram Street, Valley Drive, Duke Street and Mill Road; manufactured filters on Mount Vernon Avenue, Seminary Road and Mark Center Drive; stormwater vortex separation devices on Eisenhower Avenue, Seminary Road and North Beauregard Street; permeable pavement at Simpson Playground.

FROM THE AD HOC GROUP

City Council re-establishes advisory group

A group comprised of City residents that advise on flood mitigation projects has been backed by City Council to continue serving for one year.

The Ad Hoc Stormwater Utility and Flood Mitigation Advisory Group, which was established for a one-year term in January 2021, was re-established after receiving unanimous approval from City Council during a legislative meeting on Sept. 13. City Council can vote to re-establish the group at least one more time, according to the City attorney.

City Council members discussed transitioning the Ad Hoc group into a permanent committee to align it with the capital flood mitigation projects scheduled to take place through at least the next decade.

The group was established through a resolution in January 2021 and first met in June 2021. In addition to serving as liaison between City staff and the community regarding the Flood Action Alexandria Program, the group's functions include reviewing relevant Program documents and products developed by staff; reviewing recommendations for Program funding and, as appropriate, supporting funding requests; and monitoring and disseminating relevant state legislation that may affect the program.

Members of the group are John Hill, Cheryl Leonard, Katie Waynick, Dino Drudi, Charlotte Hall, Brian Sands, Christine Thuot, Howard "Skip" Maginniss, Janette Shew and Councilman John Chapman, who serves as the City Council representative.

STORMWATER STEWARD

The first time Katie Waynick met with City staff to discuss flooding issues plaguing her neighborhood, she pulled a thick stack of papers out of her purse, known as the 2016 City of Alexandria Storm Sewer Capacity Analysis.

The report spans more than 3,700 pages identifying problems and priorities for the City's massive stormwater and sanitary infrastructure systems – not for faint of heart readers. But Katie was ready to get down to business to help find relief for Alexandrians impacted by flooding.

KATIE WAYNICK

"I was initially motivated to learn more after my neighborhood saw its second flood and sewage backup in as many years," she said. "I wanted to learn as much as I could and was blown away when I discovered the 2016 CASSCA study. The scope of the issue started to become clearer, as did the fact that there was little to no funding in place to take on water quantity issues facing residents."

Katie educated herself on different types of flooding, how neighborhoods are impacted by flooding and the funding mechanisms behind the solutions.

In 2021, she joined the City's Ad Hoc Stormwater Utility and Flood Mitigation Advisory Group, to which she brings her extensive self-taught knowledge and can-do attitude. Her work with the group has led to a stronger relationship with City experts who have worked to provide residents with tools such as rain and stream gauges to monitor real-time water levels and a project dashboard to monitor the progress of flood mitigation projects.

"A personal goal of mine as Vice Chair of the Stormwater Ad Hoc group is to get the board – and residents in general – more active with this issue in Richmond," she said. "Flooding is not an Alexandria problem alone and after recent flooding events in southwest Virginia and elsewhere, I sense a growing awareness this is something that deserves a Commonwealth-wide coalition. I very much want Alexandrians to be part of that discussion and future solutions."

Communications officer Amanda Dolasinski is the editor for the Flood Action Alexandria newsletter. Email her at amanda.dolasinski@alexandriava.gov.