



Drainage and Flooding in Prince George's County



“Too much surface stormwater in my yard and a lack of sufficient storm drain inlets”

“Clogged storm drains in streets or yards, overflowing onto my property”

“Major stream or swale is causing erosion”

“Surface water floods into my parking lot, street, structure, or basement”

“Surface water is ponding in my yard”

“Major stream flooding into my yard, my structure or basement”

“Neighbor’s shed or fence is blocking flow of swale”

“Neighbor’s sump pump discharging into my yard”

“Groundwater and perched water tables draining into my yard areas”



Common Drainage Complaints



Countywide Drainage Complaints

Feb. 2018 - Feb. 2021



311 Drainage Complaints (FEB 2018 to 2021)

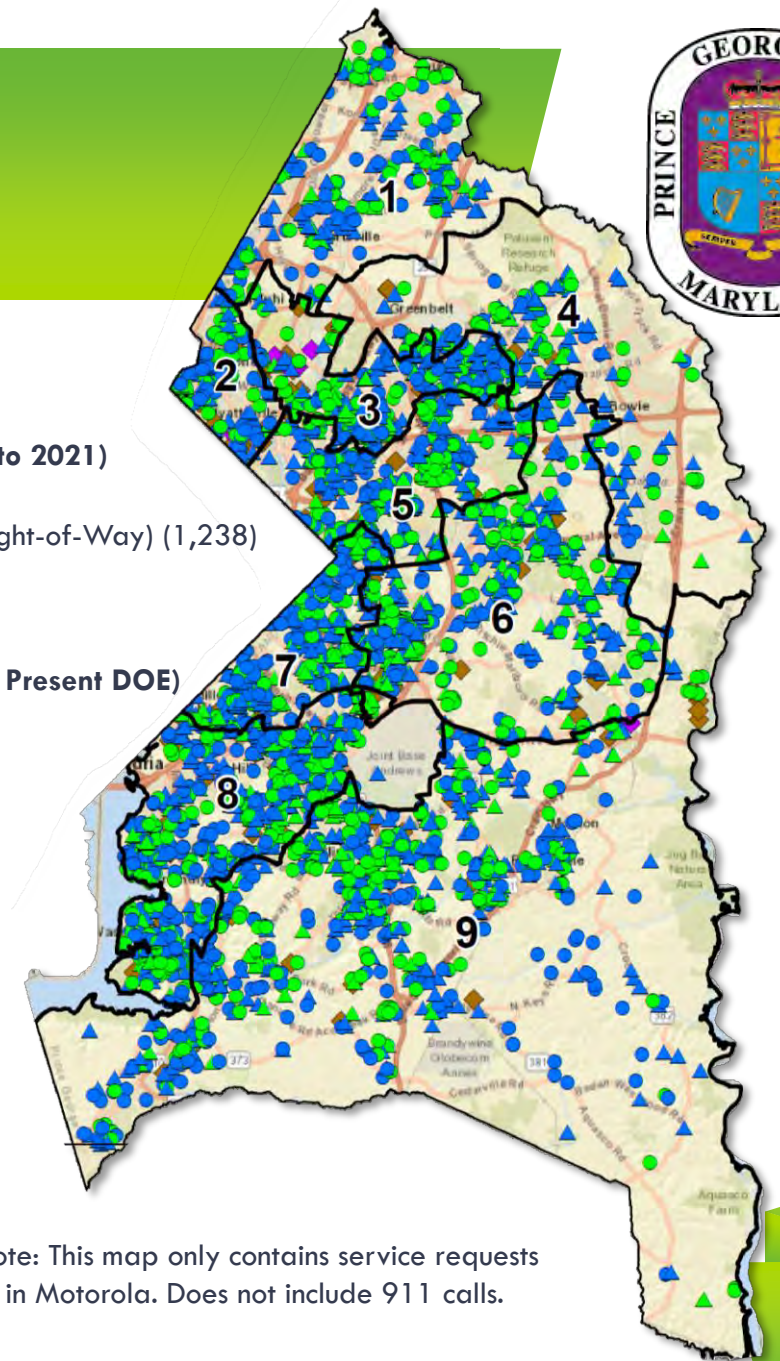
- Flooding (Yard/Private Property) (1,137)
- Flooding and Drainage Issues (Public Right-of-Way) (1,238)
- ▲ Sinkholes (Private Property) (589)
- ▲ Sinkholes (Public Right-of-Way) (1,398)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (13)
- ◆ Completed (151)
- Council Districts

SWM Flood Control Projects (1993 to present DOE)	Council District									Grand Total
	1	2	3	4	5	6	7	8	9	
In Progress		2	7		1			2	1	13
Completed	6	14	16	6	16	21	13	33	26	151
Grand Total	6	16	23	6	17	21	13	35	27	164

Service Type 311 Drainage Complaints (FEB 2018 to 2021)	Council District									Grand Total
	1	2	3	4	5	6	7	8	9	
Flooding (Yard/Private Property)	62	62	114	45	138	149	110	227	230	1137
Flooding and Drainage Issues (Public Right-of-Way)	66	54	96	36	100	140	154	299	293	1238
Sinkholes (Private Property)	36	11	50	31	52	88	72	124	125	589
Sinkholes (Public Right-of-Way)	100	38	146	101	156	216	113	226	302	1398
Grand Total	264	165	406	213	446	593	449	876	950	4362



Note: This map only contains service requests in Motorola. Does not include 911 calls.

Stormwater Management Funding in the FY22 Proposed Budget



Agency	FY 2022 Operating	FY 2022 Capital*	Total FY 2022 Proposed
DPWT	\$ 4,620,000	\$ 20,378,500	\$ 24,998,500
DoE	\$ 297,900	\$ 15,459,000	\$ 15,756,900
DPIE	\$ -	\$ -	\$ -
SOIL	\$ -	\$ -	\$ -
Total	\$ 4,917,900	\$ 35,837,500	\$ 40,755,400

Operating Funds consist of expenses related to staff working on SWM issues.

Capital Funds consist of vendor contracts who construct remedies for SWM issues.

* Includes only new funding for FY 2022. There may be additional carry forward/unspent monies from FY 2021.

Why Prince George's County?



Water Problems

- Flat Land
- Built Before Regulations
- High Groundwater
- Bad Soil

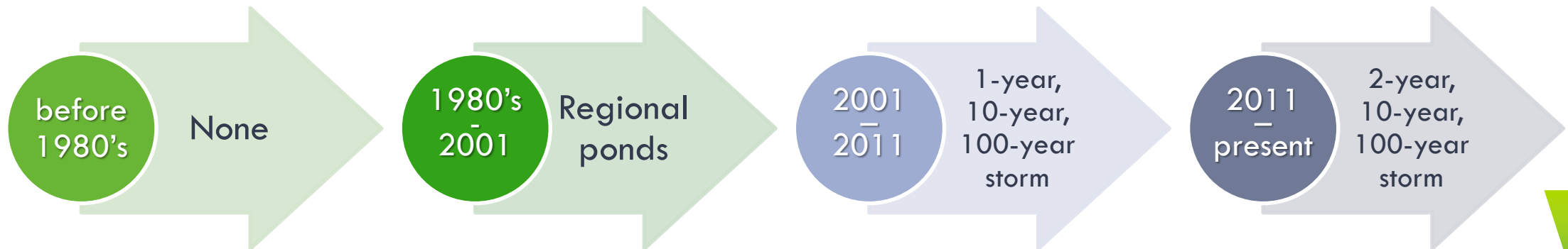
Why are houses in the Floodplain?

Many houses in Prince George's County were built before floodplain maps and regulations were established.

Frequent 100-year storms

Climate Change

Water Quantity Control Regulations Timeline



Terminology for Discussion



💧 **Flooding (Riverine)**

when the river or stream overtops banks and floods your property, house, building or roads.

💧 **Surface Drainage**

- swales with too much storm flow that inundate your yard or house
- swales blocked causing storm flows to back up or pond on your property
- storm drain pipes and inlets clogged, etc.

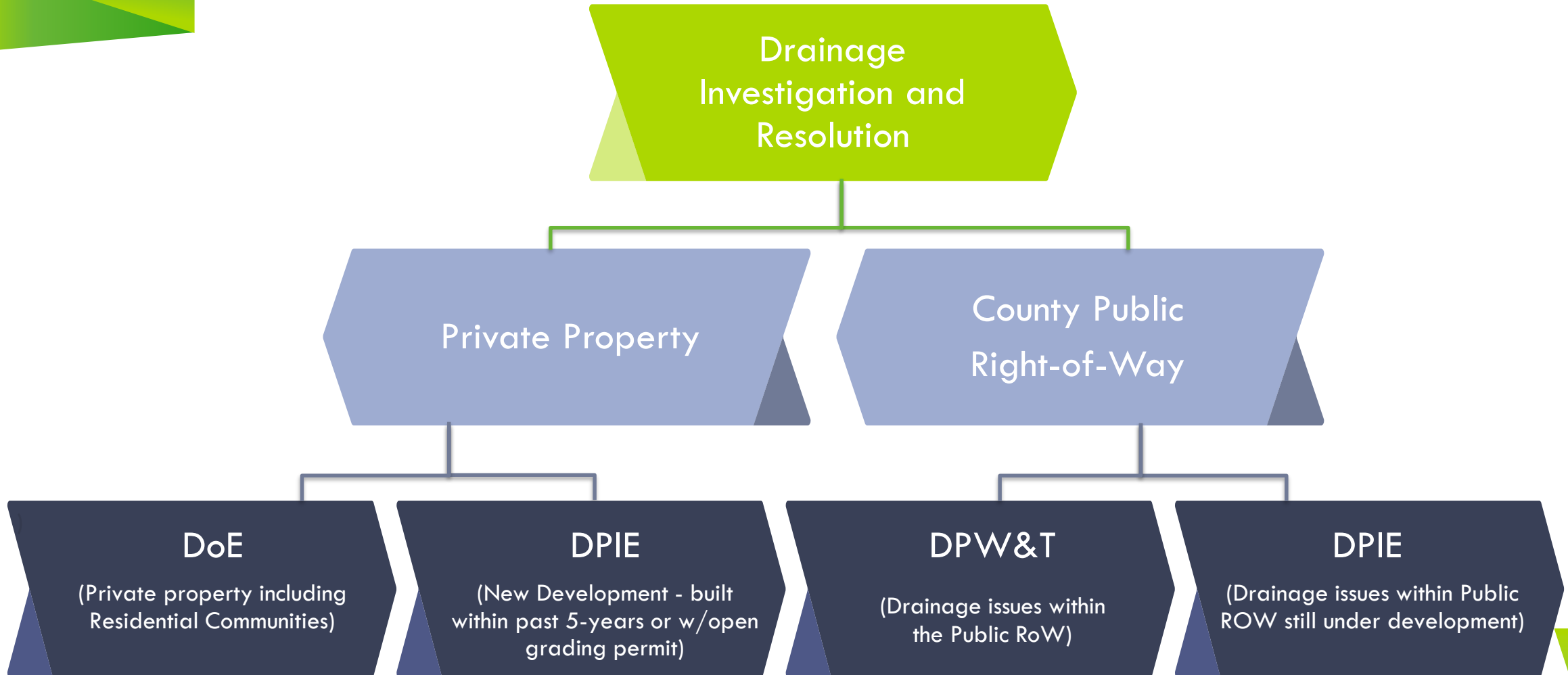
💧 **Groundwater Drainage**

- intrusion of groundwater into your basement
- sump pumps not delivering basement water away from your house

💧 **Urban Flooding**

the inundation of property in a built environment, particularly in more densely populated areas, caused by rain falling on increased amounts of impervious surfaces and overwhelming the capacity of drainage systems

Drainage Relief - Roles of Agencies



Drainage Investigation and Resolution



Service Request

Flooding Complaints

Investigation

Field investigation and record research

Drainage area, flow and conveyance estimates

Resolution

Technical advice for homeowner-led improvement

Perform maintenance

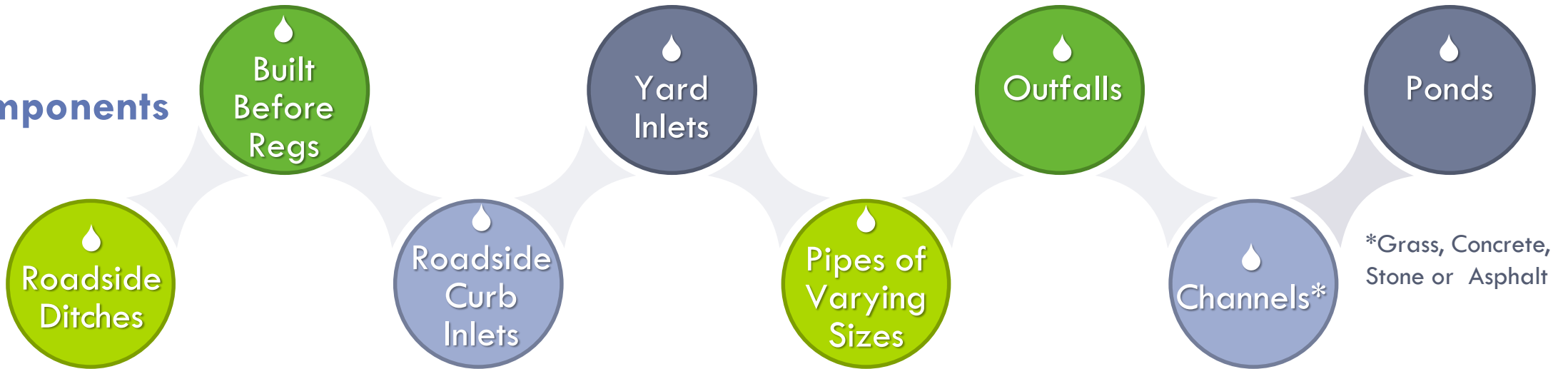
Capital Improvement Project

Storm Drain System



It's a network of structures, channels and underground pipes that carry stormwater (rain water) to ponds, lakes, streams and rivers. The network consists of both public and private systems. It's an integral part of the system in the County that is designed to control the quantity, quality, timing and distribution of storm runoff.

Components



Maintenance of the System

- County maintains the public storm drain system in the public rights of way and those with storm drain easements
- Systems on land owned by others are maintained by the land owner
- Private systems are maintained by the private property owner, including driveway culverts or pipes installed by the property owner outside of the public rights of way

Pumping Stations & Levee Systems



Pumping Stations

Stormwater pump stations help protect areas by pumping away large volumes of water, thereby preventing the occurrence of flooding from nearby large bodies of water.



Levees

Levees are man-made barriers along a water course constructed for the primary purpose of providing flood, storm and hurricane protection.

Solutions for Homeowners

Private Residential Properties



DoE Capital Improvement Program (Priority Drainage Relief Program)

- ▷ The Department of the Environment (DoE) responds to and evaluates requests from residential property owners (private property) experiencing adverse flooding, drainage and erosion conditions originating from non-public sources.

Eligibility

- ▷ DoE utilizes a three-tiered priority system to outline criteria for storm drainage projects to be included in the Capital Improvements Program. Drainage improvement projects are categorized and prioritized by severity and proximity to private residential structures.
- ▷ Residential Properties experiencing qualified recurrent habitable structural flooding or threat to habitable structural integrity due to severe erosion will have the highest priority.

Non-Qualifying Conditions

- ▷ Groundwater. Remediation of issues associated with groundwater conditions are considered the responsibility of the property owner.
- ▷ 100-Year Floodplain delineation. Remediation of issues associated with floodplain conditions are considered the responsibility of the property owner.
- ▷ Commercial, Industrial, Institutional properties will not be considered for public CIP funded projects

Types of Solutions (Best Management Practices)

- ▷ Storm Drain and Yard Inlets
- ▷ Grassed Swales
- ▷ Rain Gardens



CIP Drainage Improvement Projects



Kidder Road Storm Drain Improvement

- Project Type – Flood Control
- Location: Clinton
- Homes Protected: 4 homes
- Combination of 15 in RCP pipe system to alleviate flooding
- Completed: February 28, 2018

Horizon Estates Storm Drain Improvement

- Project Type – Flood Control
- Location: Ft. Washington
- Homes Protected: 33 homes
- Combination of 15 in RCP pipe and Underdrains to alleviate flooding
- Completed: June 23, 2020



Martha St. & Ritchie Rd. Storm Drain Improvement

- Project Type – Flood Control
- Location: Forestville
- Homes Protected: 12 homes
- Combination of 15 in RCP pipe & Concrete Swale to alleviate flooding
- Completed: February 6, 2020



DPW&T Projects



Berwyn Heights Inlet Upgrades

- Project Type – Local Drainage
- Location – Town of Berwyn Heights
- Installed new and upsized inlets
- Completed Fall 2018

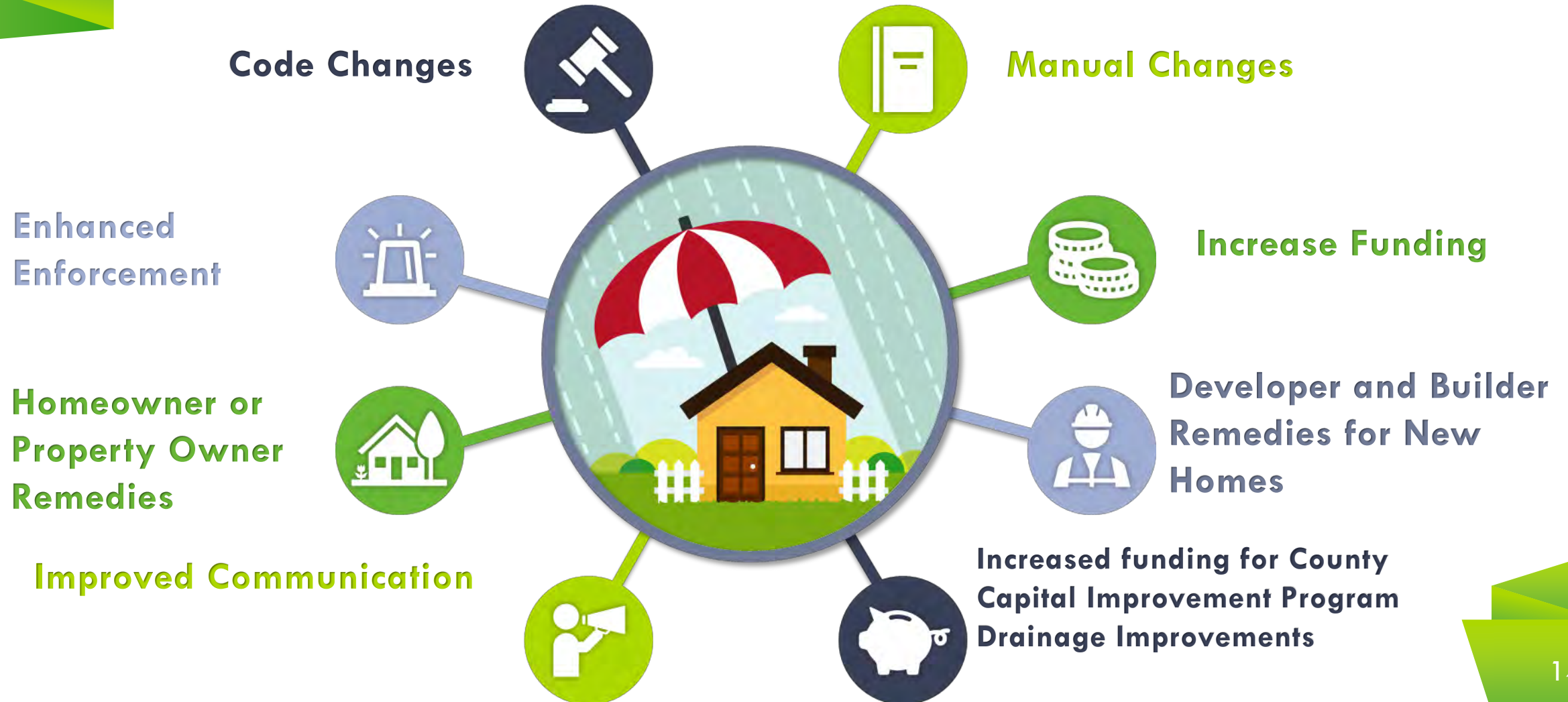


Daisy Lane Storm Drain

- Project Type – Local Drainage
- Location – Glenn Dale
- Installed storm drain
- Anticipated completion May 2021



How Do We Fix these Problems?



Homeowner or Builder/Developer Remedies



- ▷ Regrade swales to achieve positive drainage
- ▷ Regrade earth around house to achieve positive drainage
- ▷ Connect sump pump to storm drain
- ▷ Replace or upsize sump pump
- ▷ Maintain/Unclog storm drain and stormwater management systems
- ▷ Modify structure -- seal basement windows, raise basement stairwells and other floodproofing to prevent intrusion of surface water
- ▷ Install drainage pipes to intercept groundwater and perched water table
- ▷ Remove or modify sheds, fences and other structures that are blocking flow of stormwater



Builder/Developer or County Investment Remedies



- ▷ Install more storm drain in areas with excessive flows
- ▷ Reconstruct street to a higher elevation (above floodplain) *
- ▷ Construct levee and pump station to keep floodwaters out of property *
- ▷ Armor stream with rip rap to prevent erosion of property
- ▷ Install regional stormwater management pond to reduce downstream flows *

* not common

The County's Short-Term Recommendations



Developer & New Home Builders



Capital Improvement Program



Communication strategy



Owner Remedies



Code Changes






Manual Changes



Enforcement



Increase Funding

Category	Recommendations	Why is this important?
	Educate private system owners/operators on proper maintenance protocol, frequencies and benefits of system management.	To reduce flooding complaints caused by the property owner.
	Require fences to be built at least 6 inches above swales and at least 1 inch above the ground surface everywhere else.	To avoid storm water being trapped and ponding in yards.
	Enhance procedures for resolving New Home Drainage Complaints. Lead agency - DPIE.	Ensure developers and builders resolve before permits are closed.

The County's Short-Term Recommendations



Developer & New Home Builders



Capital Improvement Program



Communication strategy



Owner Remedies



Code Changes





Manual Changes



Enforcement



Increase Funding

Category	Recommendations	Why is this important?
	<p>Require any part of the house such as doors, top of exterior stairwells to basements, BILCO doors, basement windows to be set one foot above overflow elevation – AND- show 100-year overflow point on permit plans.</p>	<p>So that storm flows cannot enter basements.</p>
	<p>Revise street storm drain inlets located in low points to be at least 15 feet long (current requirement is 10 feet).</p>	<p>So that larger storm flows will be intercepted in the street and not overflow through your yard.</p>

The County's Mid-Term Recommendations



Developer & New Home Builders



Capital Improvement Program



Communication strategy



Owner Remedies



Code Changes







Manual Changes



Enforcement



Increase Funding

Category	Recommendations	Why is this important?
	Connect sump pumps, foundation drains into a drainage system.	Get the water out of your basement and out of your yard.
	Springs and surface seeps and other ground waters shall be capped with stone and perforated pipes connecting into a piped outfall.	Get nuisance storm water out of your yard.
	Require use of the higher range runoff coefficient factors.	To reduce the amount of storm flow in your yard.
	Increase minimum allowable yard and swale slopes to 3%.	To better ensure surface storm water exits property quickly.

The County's Mid-Term Recommendations



Developer & New Home Builders



Capital Improvement Program



Communication strategy



Owner Remedies



Code Changes





Manual Changes



Enforcement












Increase Funding

Category	Recommendations	Why is this important?
	Require swales with drainage area exceeding 5 acres located at least 100 feet set back from any residential lot line.	To reduce the chance of swales causing yard erosion.
	Require continuous backyard storm drain pipe system.	So builders and homeowners can easily connect sump pumps and foundation drains or yard inlets in low spots and get the storm water in a pipe and out of the yard.

The County's Long- Term Recommendations



-  Developer & New Home Builders
-  Capital Improvement Program
-  Communication strategy
-  Owner Remedies
-  Code Changes
-  Manual Changes
-  Enforcement
-  Increase Funding

Category	Recommendations	Why is this important?
	Require storm drain culverts and enclosed systems that intercept offsite drainage, convey the ultimate 100-year storm flow.	To ensure that enclosed storm drain can convey flows without impacting properties.
	Provide funding to update Watershed Models to incorporate Built SWM Ponds and watershed conditions. Currently, the County's model of each watershed to define hydrologic and hydraulic effects of various storm water management ponds from a quantity control and flooding standpoint needs to be updated.	To have a more accurate method of deciding where 100-year control ponds are needed or not.

The County's Long-Term Recommendations



Developer & New Home Builders



Capital Improvement Program



Communication strategy



Owner Remedies



Code Changes





Manual Changes



Enforcement



Increase Funding

Category	Recommendations	Why is this important?
	<p>Increase funding for maintenance storm water management systems.</p>	<p>So that our systems remain operational.</p>
	<p>Enable DoE and DPW&T drainage projects to be implemented in an expeditious manner (more funding). Implement design build approach to expedite resolution.</p>	<p>Quicker resolution to existing drainage and flooding concerns.</p>



Thanks!



Any questions?

Countywide Drainage Complaints February 2018 thru February 2021

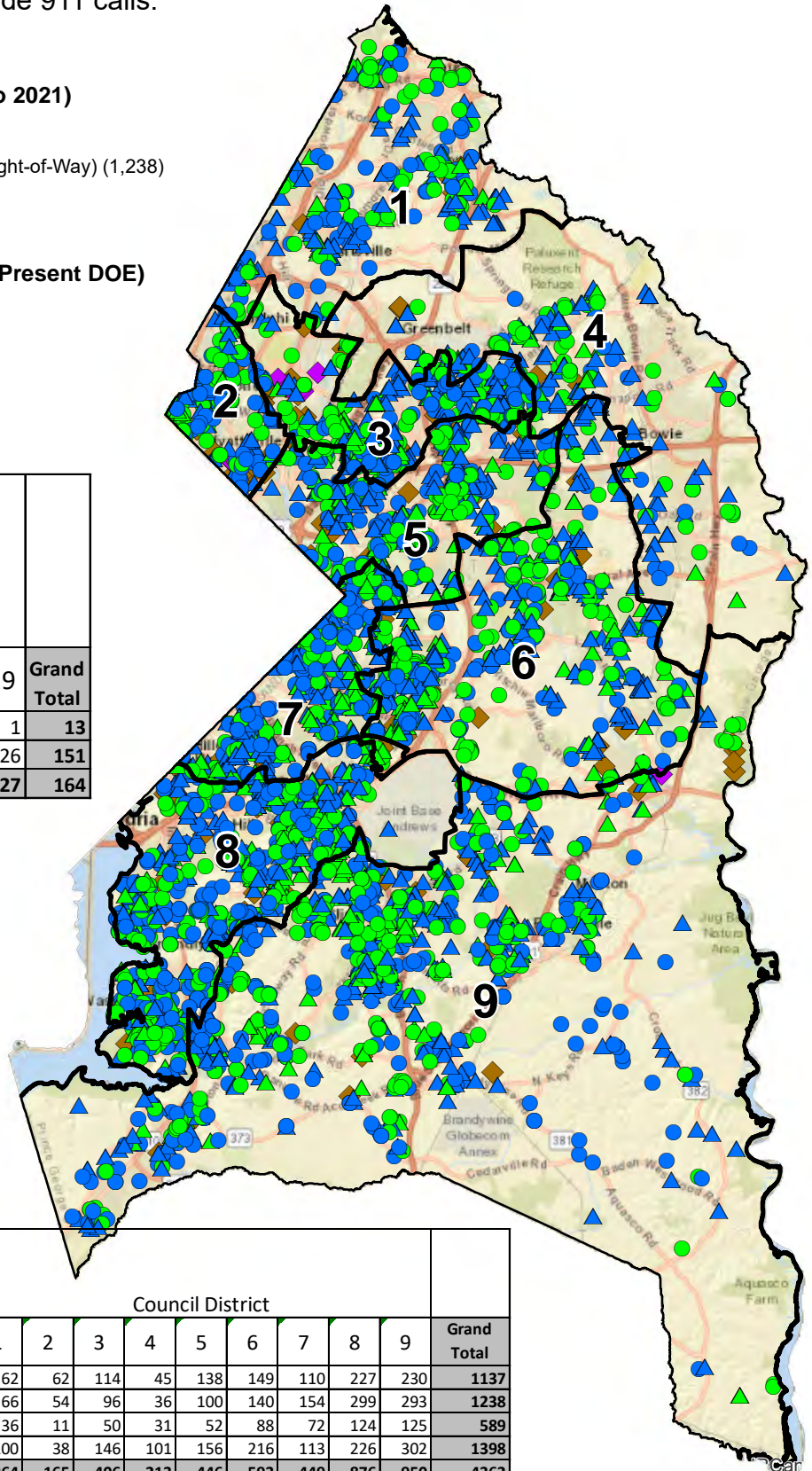
Note: This map only contains service requests in Motorola. Does not include 911 calls.

311 Drainage Complaints (FEB 2018 to 2021)

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SWM Flood Control Projects (1993 to Present DOE)

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311 Drainage Complaints by year and district

Service Type	Council District									Grand Total
	1	2	3	4	5	6	7	8	9	
2018										
Flooding (Yard/Private Property)	18	30	39	10	43	45	35	80	73	373
Flooding and Drainage Issues (Public Right-of-Way)	30	21	41	17	46	35	45	87	108	430
Sinkholes (Private Property)	24	2	23	12	24	39	27	43	65	259
Sinkholes (Public Right-of-Way)	43	14	54	47	68	60	27	85	109	507
2019										
Flooding (Yard/Private Property)	22	11	43	18	40	45	32	56	35	302
Flooding and Drainage Issues (Public Right-of-Way)	17	9	23	11	21	46	48	100	75	350
Sinkholes (Private Property)	9	4	12	11	17	25	14	39	34	165
Sinkholes (Public Right-of-Way)	42	15	53	33	50	78	36	73	87	467
2020										
Flooding (Yard/Private Property)	21	20	30	16	54	57	43	87	116	444
Flooding and Drainage Issues (Public Right-of-Way)	16	22	28	6	28	57	57	104	102	420
Sinkholes (Private Property)	3	4	15	8	11	22	29	42	26	160
Sinkholes (Public Right-of-Way)	14	9	39	20	36	75	46	64	98	401
2021										
Flooding (Yard/Private Property)	1	1	2	1	1	2		4	6	18
Flooding and Drainage Issues (Public Right-of-Way)	3	2	4	2	5	2	4	8	8	38
Sinkholes (Private Property)		1				2	2			5
Sinkholes (Public Right-of-Way)	1			1	2	3	4	4	8	23
Grand Total	264	165	406	213	446	593	449	876	950	4362

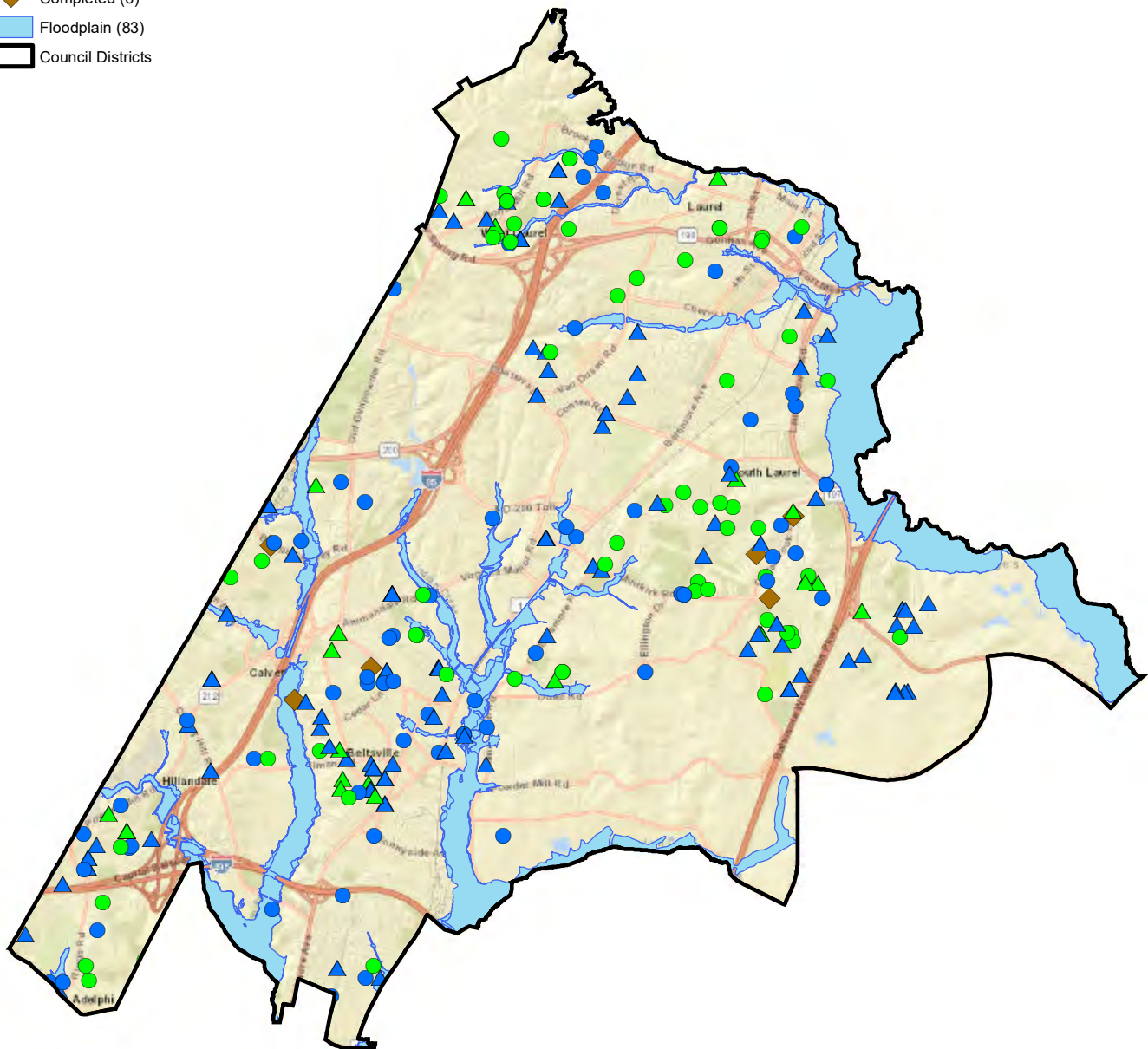
District 1 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (65)
- Flooding and Drainage Issues (Public Right-of-Way) (67)
- ▲ Sinkholes (Private Property) (36)
- ▲ Sinkholes (Public Right-of-Way) (101)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (0)
- ◆ Completed (6)
- Floodplain (83)
- Council Districts



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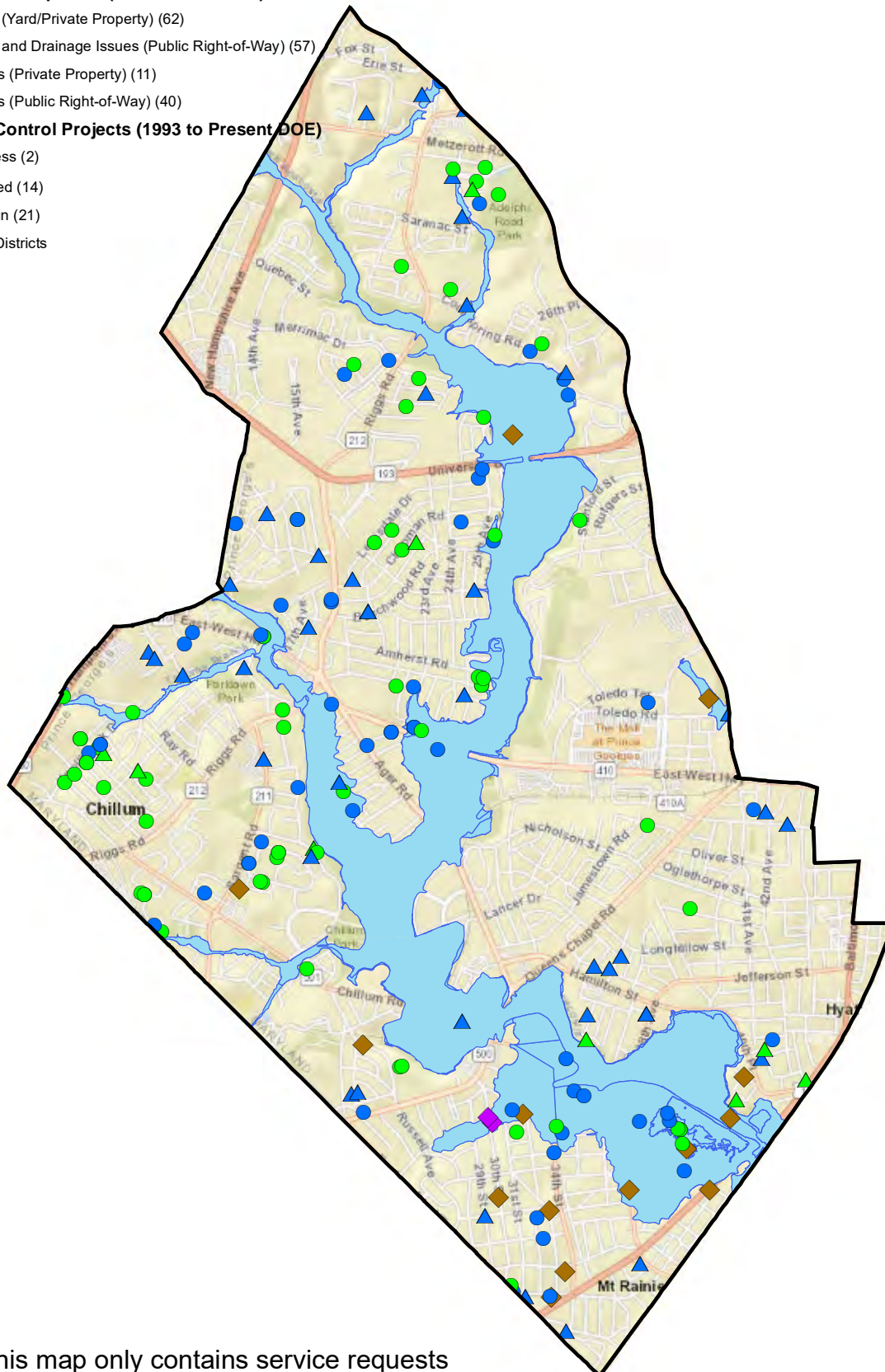
District 2 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (62)
- Flooding and Drainage Issues (Public Right-of-Way) (57)
- ▲ Sinkholes (Private Property) (11)
- ▲ Sinkholes (Public Right-of-Way) (40)

SWM Flood Control Projects (1993 to Present, DOE)

- ◆ In Progress (2)
- ◆ Completed (14)
- Floodplain (21)
- Council Districts



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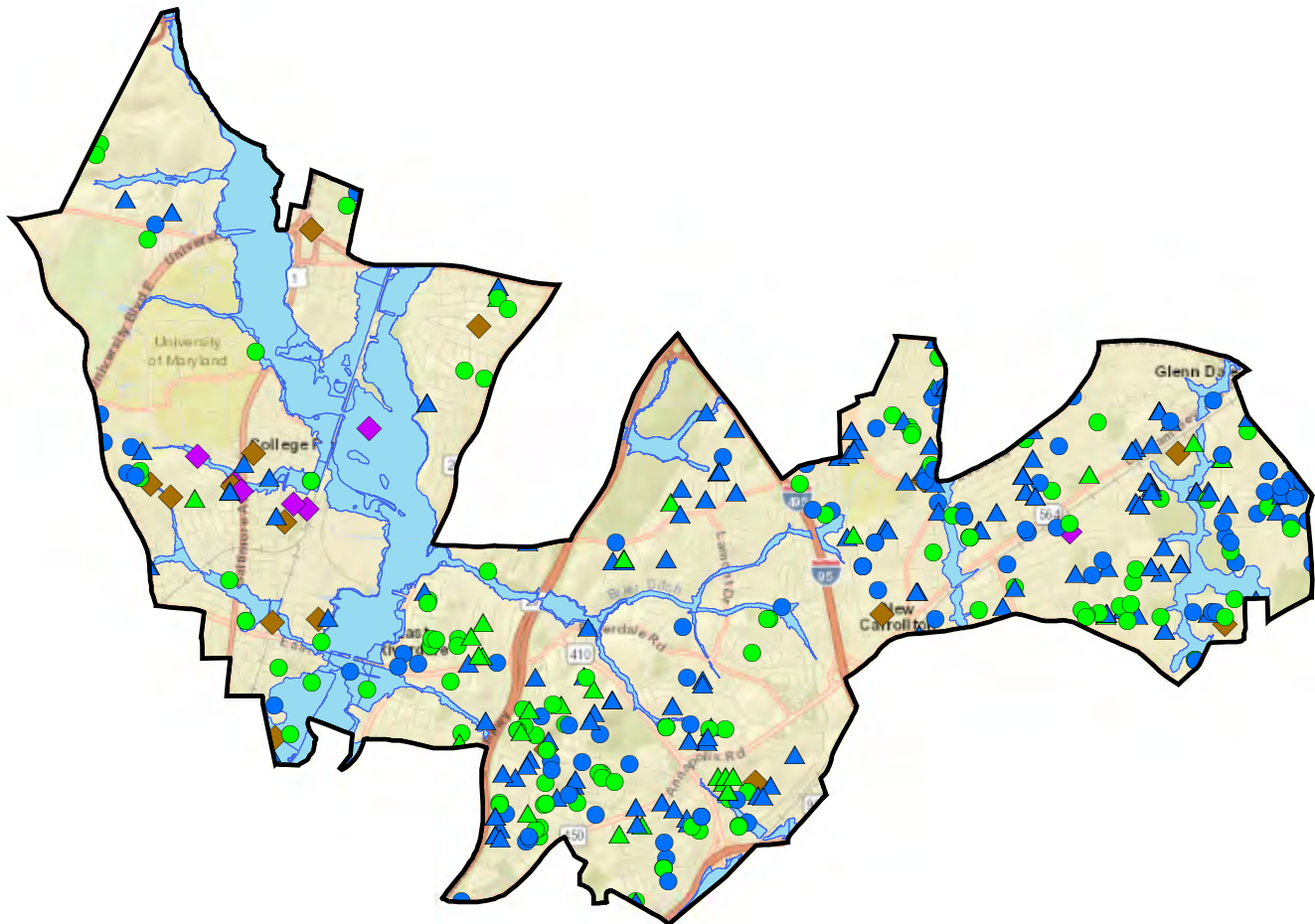
District 3 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (118)
- Flooding and Drainage Issues (Public Right-of-Way) (105)
- ▲ Sinkholes (Private Property) (51)
- ▲ Sinkholes (Public Right-of-Way) (161)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (7)
- ◆ Completed (17)
- Floodplain (81)
- Council Districts



Note: This map only contains service requests in Motorola. Does not include 911 calls.

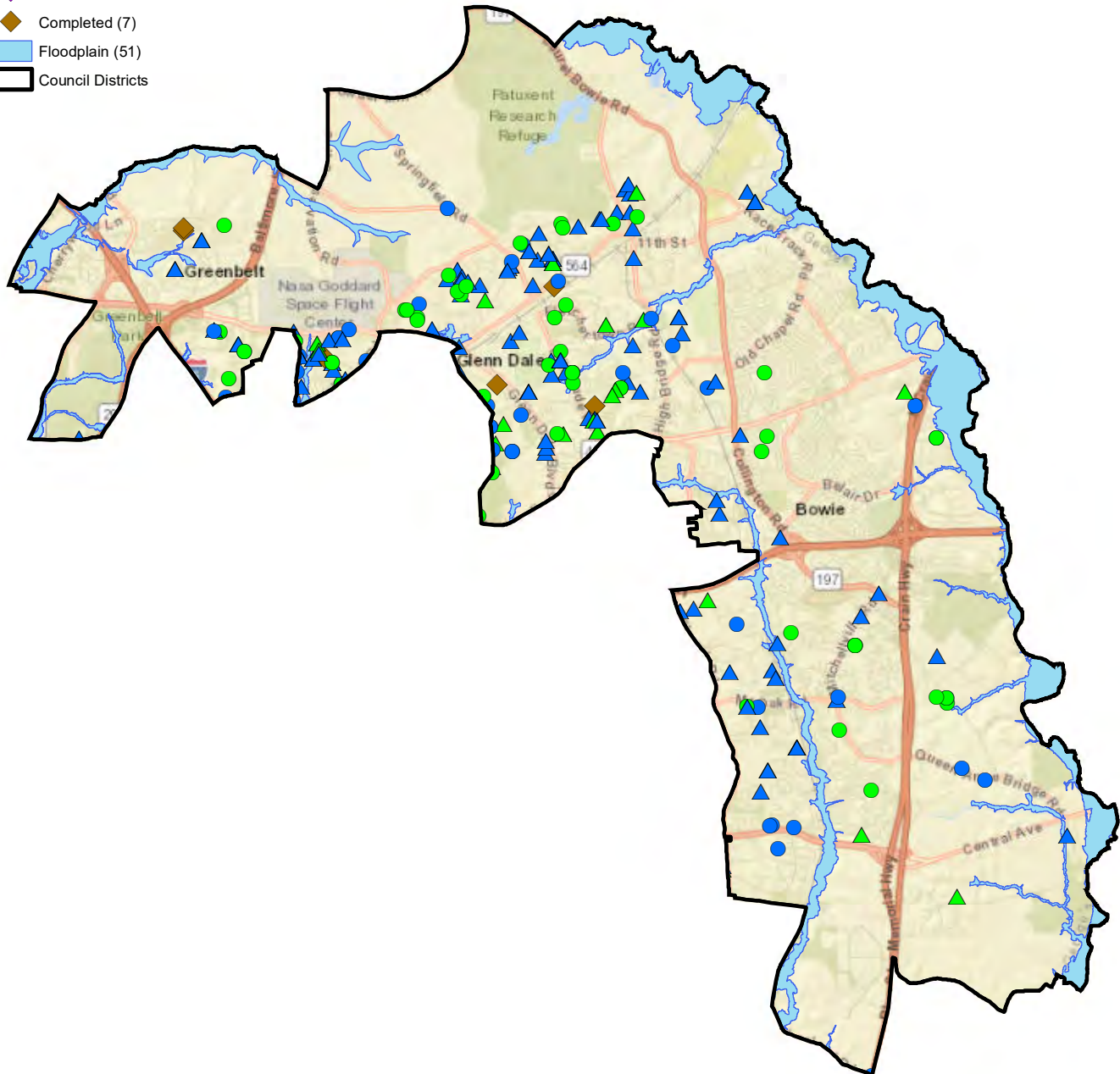
District 4 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (53)
- Flooding and Drainage Issues (Public Right-of-Way) (52)
- ▲ Sinkholes (Private Property) (33)
- ▲ Sinkholes (Public Right-of-Way) (124)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (0)
- ◆ Completed (7)
- Floodplain (51)
- Council Districts



Note: This map only contains service requests in Motorola. Does not include 911 calls.

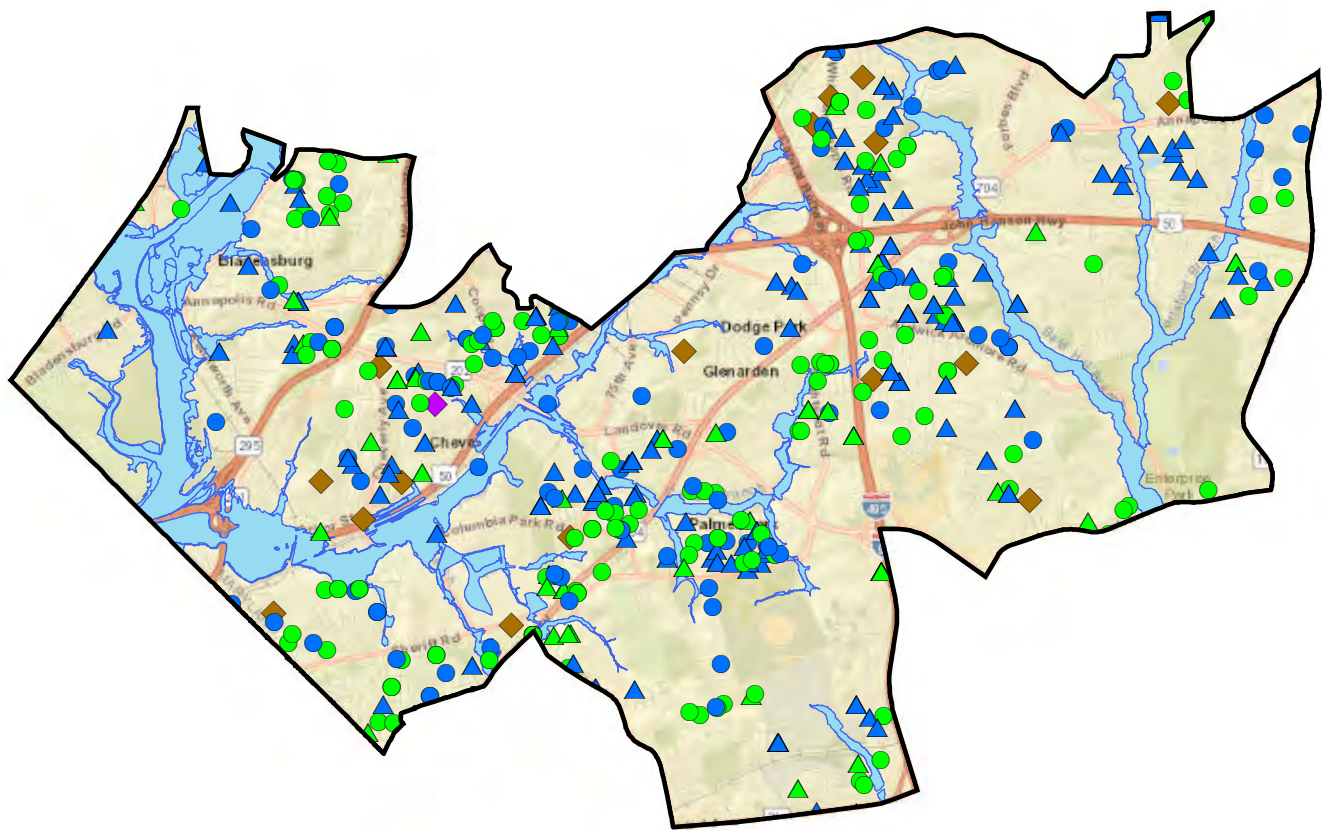
District 5 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (147)
- Flooding and Drainage Issues (Public Right-of-Way) (107)
- ▲ Sinkholes (Private Property) (54)
- ▲ Sinkholes (Public Right-of-Way) (164)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (1)
- ◆ Completed (19)
- Floodplain (101)
- Council Districts



Note: This map only contains service requests in Motorola. Does not include 911 calls.

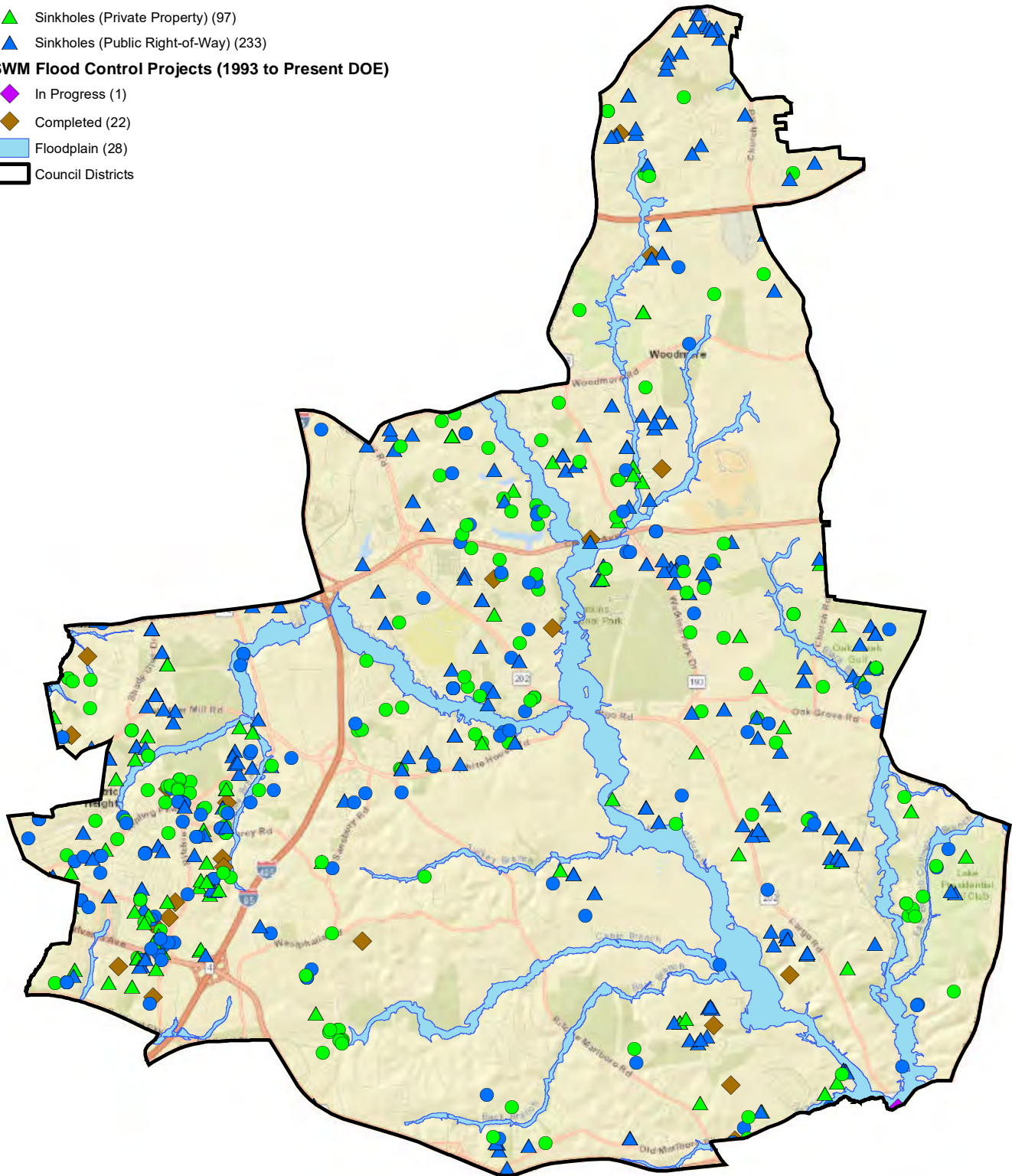
District 6 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (156)
- Flooding and Drainage Issues (Public Right-of-Way) (147)
- ▲ Sinkholes (Private Property) (97)
- ▲ Sinkholes (Public Right-of-Way) (233)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (1)
- ◆ Completed (22)
- Floodplain (28)
- Council Districts



Note: This map only contains service requests in Motorola. Does not include 911 calls.

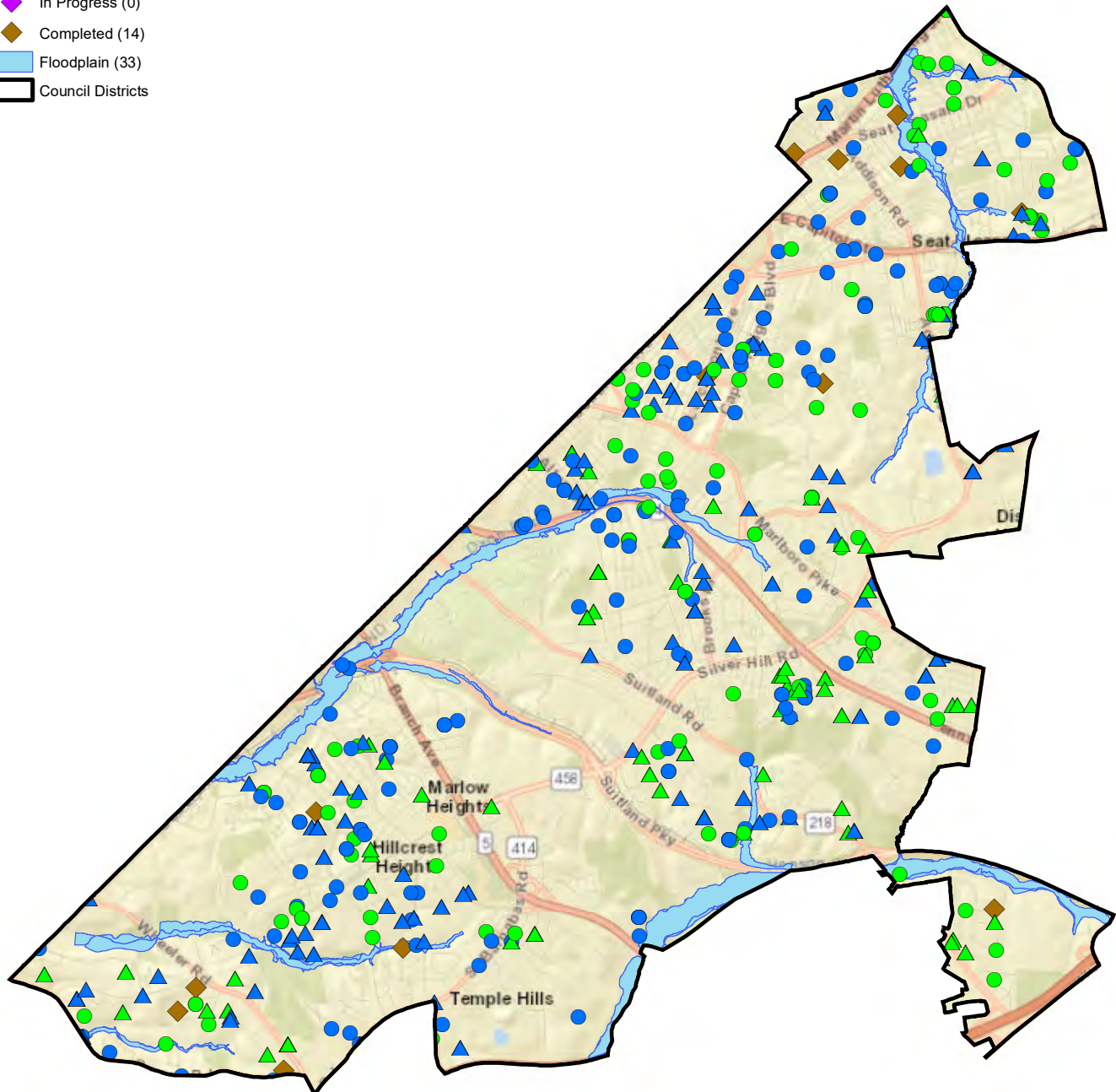
District 7 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (115)
- Flooding and Drainage Issues (Public Right-of-Way) (166)
- ▲ Sinkholes (Private Property) (76)
- ▲ Sinkholes (Public Right-of-Way) (126)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (0)
- ◆ Completed (14)
- Floodplain (33)
- Council Districts



Note: This map only contains service requests in Motorola. Does not include 911 calls.

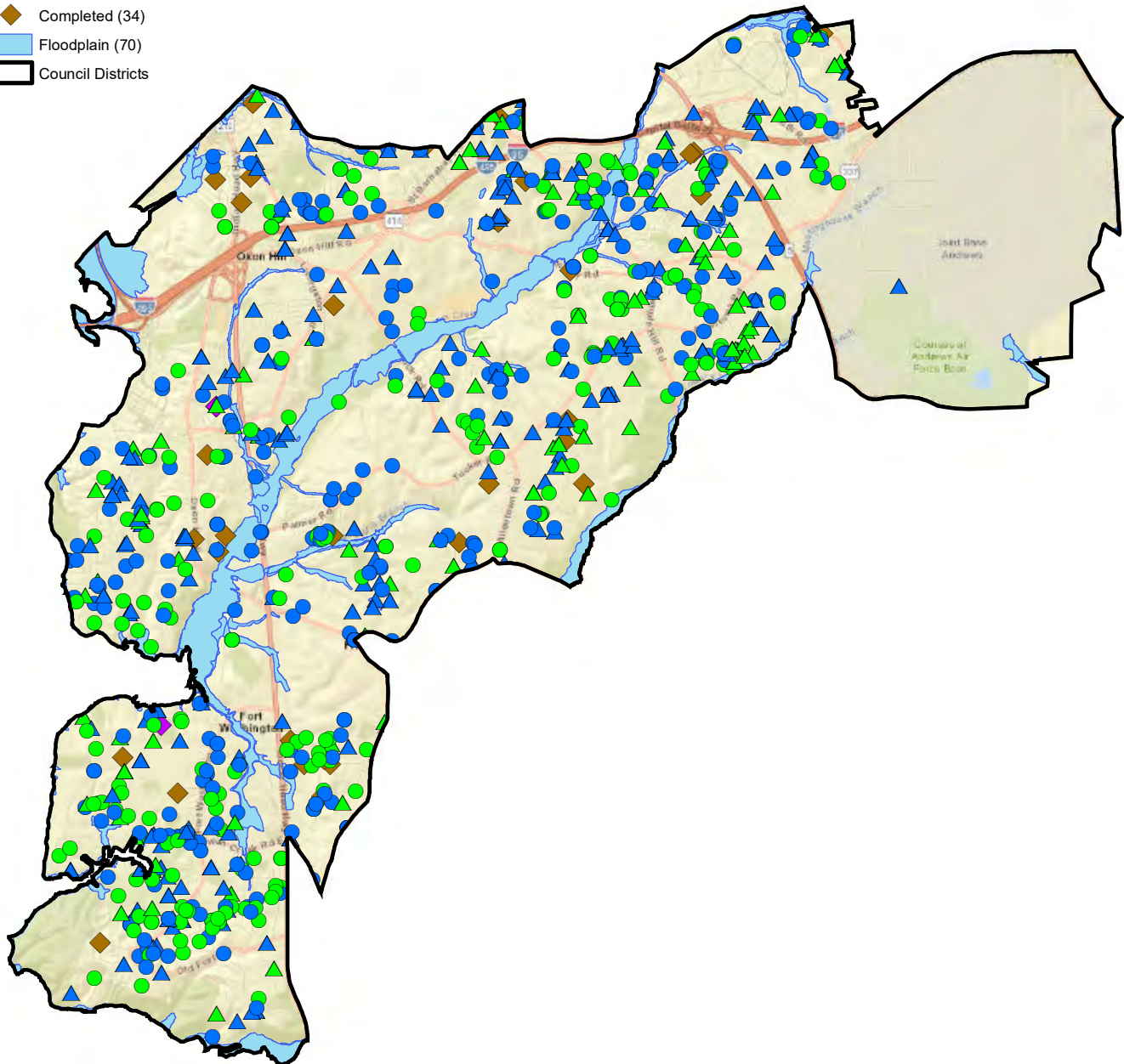
District 8 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (230)
- Flooding and Drainage Issues (Public Right-of-Way) (320)
- ▲ Sinkholes (Private Property) (130)
- ▲ Sinkholes (Public Right-of-Way) (235)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (2)
- ◆ Completed (34)
- Floodplain (70)
- Council Districts



Note: This map only contains service requests in Motorola. Does not include 911 calls.

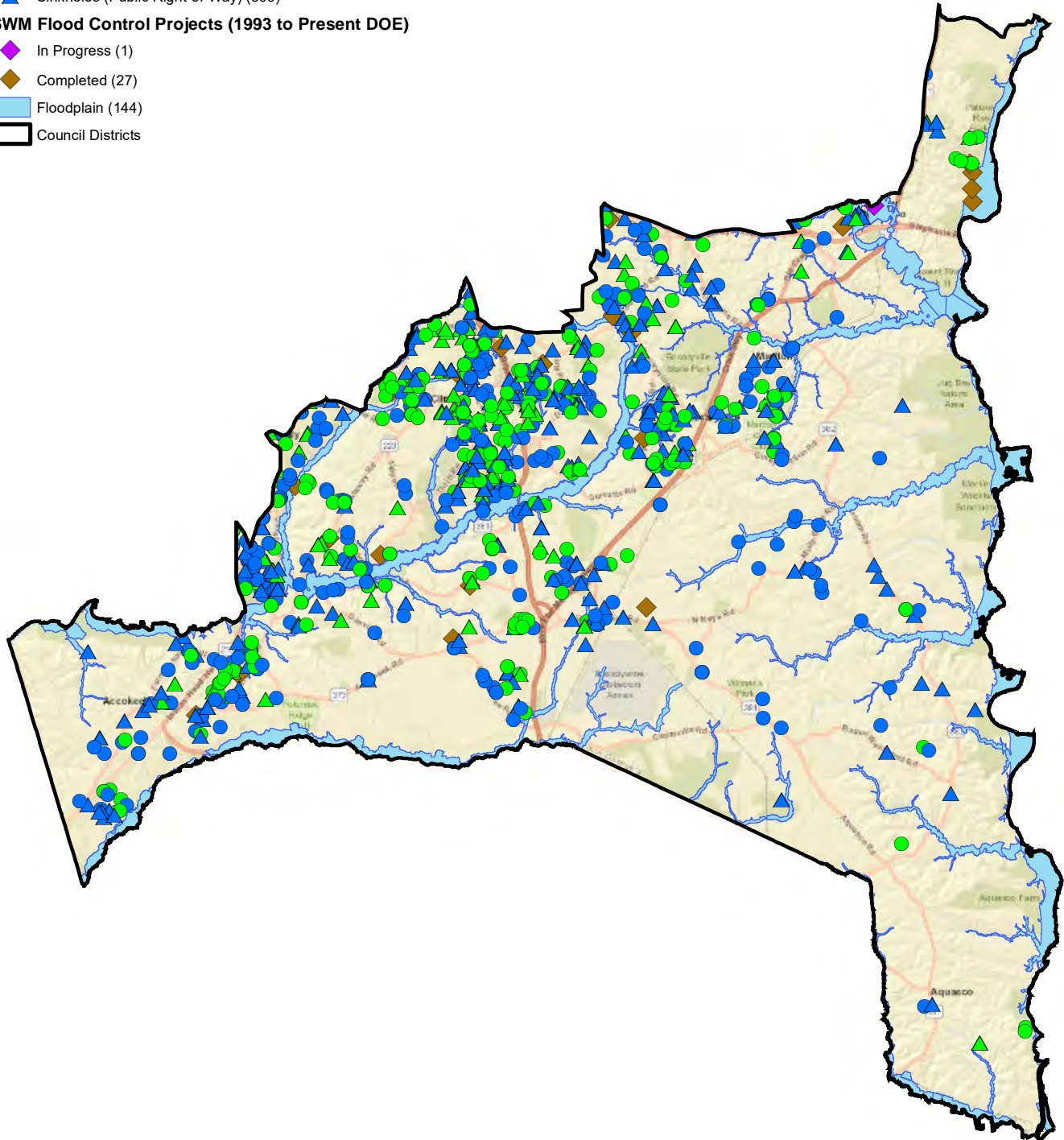
District 9 Drainage Complaints February 2018 thru February 2021

311 Drainage Complaints (FEB 2018 to 2021)

- Flooding (Yard/Private Property) (247)
- Flooding and Drainage Issues (Public Right-of-Way) (317)
- ▲ Sinkholes (Private Property) (140)
- ▲ Sinkholes (Public Right-of-Way) (309)

SWM Flood Control Projects (1993 to Present DOE)

- ◆ In Progress (1)
- ◆ Completed (27)
- Floodplain (144)
- Council Districts



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DPW&T

Drainage Improvements

Recently completed and Ongoing Projects



- D1 – 7018 Redmiles Storm Drain repair
 - Project Type – Local Flooding (Urban)
 - Location – Laurel
 - Installed inlet and storm drain
 - Completed March 2020



- D1 – Greencastle Bridge and Storm Drain
 - Project Type – Flood Control
 - Location – Laurel
 - Installed inlet and storm drain
 - Completed March 2020

- D2 – Allison Street Levee
 - Project Type – Flood Control
 - Location – Laurel
 - Upgrade existing levee system
 - Anticipated Completed 2021

- D3 – Wells Run Channel Improvements
 - Project Type – Flood Control
 - Location – Riverdale
 - In-Kind replacement and Naturalization of channel
 - Anticipated Construction in 2022



- D3 – Berwyn Heights Inlet Upgrades

- Project Type – Local Drainage
- Location – Town of Berwyn Heights
- Installed new and upsized inlets
- Completed Fall 2018



- D4 – Daisy Lane Storm Drain

- Project Type – Local Drainage
- Location – Glenn Dale
- Installed storm drain
- Anticipated completion May 2021



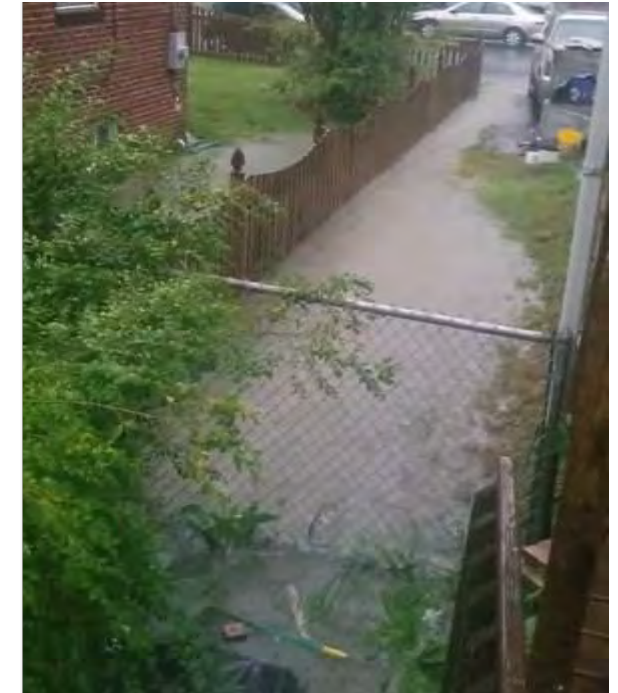
- D5 – Otis Street Outfall

- Project Type – Local Flooding
- Location – Laurel
- Installed inlet and storm drain
- Anticipated Completion is Fall 2021



- D6 – Pinevale Drainage Improvements

- Project Type – Local Flooding (Urban)
- Location – District Heights
- Installed inlets and storm drain
- Completed December 2020



- D7 – Suitland Outfall

- Project Type – Local Flooding (Urban)
- Location – Hillcrest Heights
- Installed inlet and storm drain
- Completed Summer 2019



- D8 – Trafalgar Outfall

- Project Type – Outfall Repair
- Location – Fort Washington
- Repaired failed outfall
- Completed December 2019



- D8 – Groveton

- Project Type – Local Flooding (Urban)
- Location – Clinton
- Installed inlet and storm drain
- Completed March 2019



- D9 – South Springfield Road Washout

- Project Type – Emergency Repair
- Location – Brandywine
- Installed inlet and storm drain
- Completed 2016



PRINCE GEORGES COUNTY DRAINAGE COMPLAINT RESOLUTION PROCESS

DOE – DEPARTMENT OF ENVIRONMENT
 DPIE – DEPARTMENT OF PERMITTING, INSPECTIONS
 AND ENFORCEMENT
 DPWT – DEPARTMENT OF PUBLIC WORKS AND
 TRANSPORTATION

