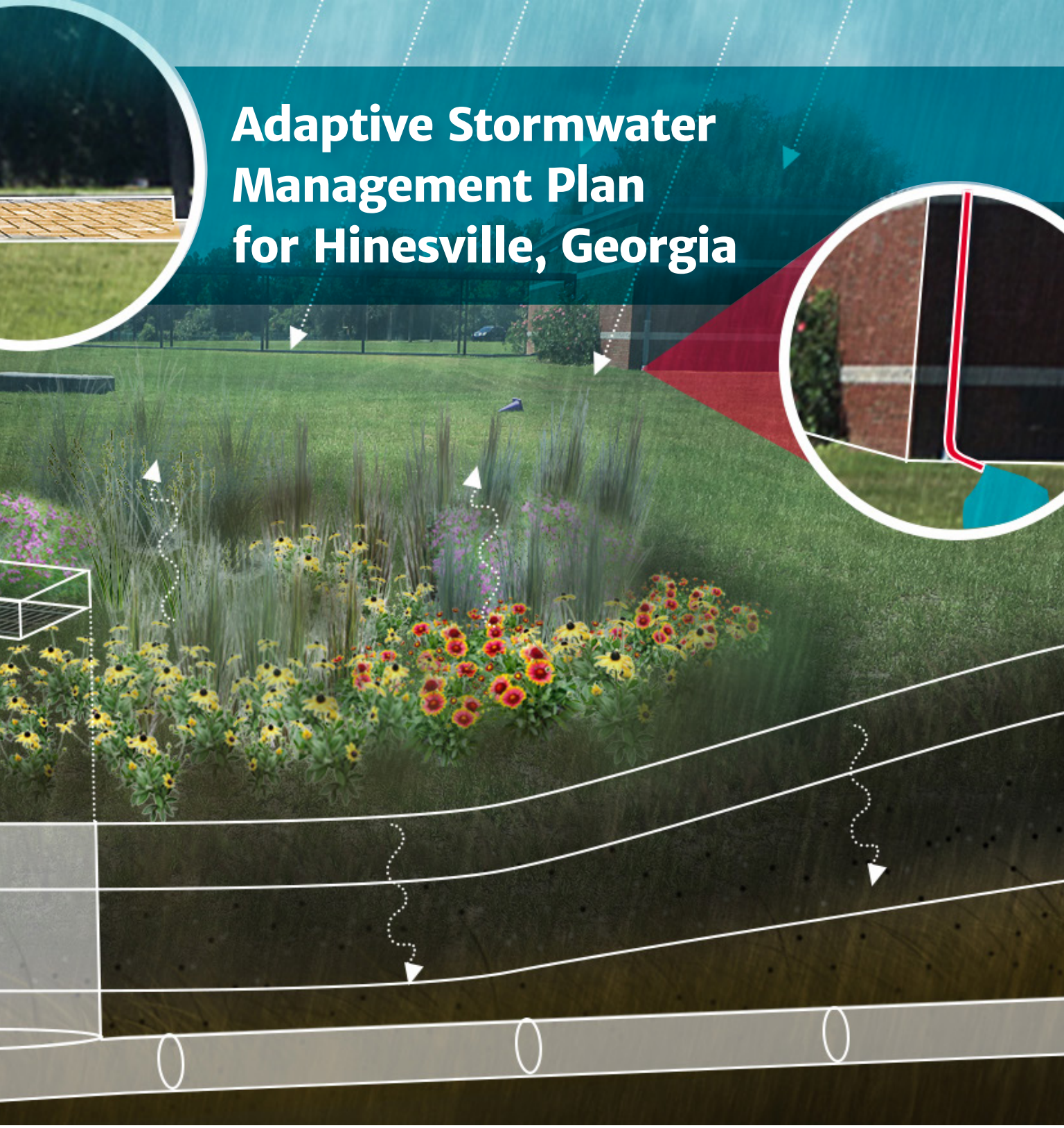
Adaptive Stormwater Management Plan for Hinesville, Georgia



Marine Extension and Georgia Sea Grant
UNIVERSITY OF GEORGIA
Sea Grant

GEORGIA
Department of Natural Resources
Coastal Resources Division

National Oceanic and Atmospheric Administration
NOAA
U.S. Department of Commerce

ACKNOWLEDGMENTS

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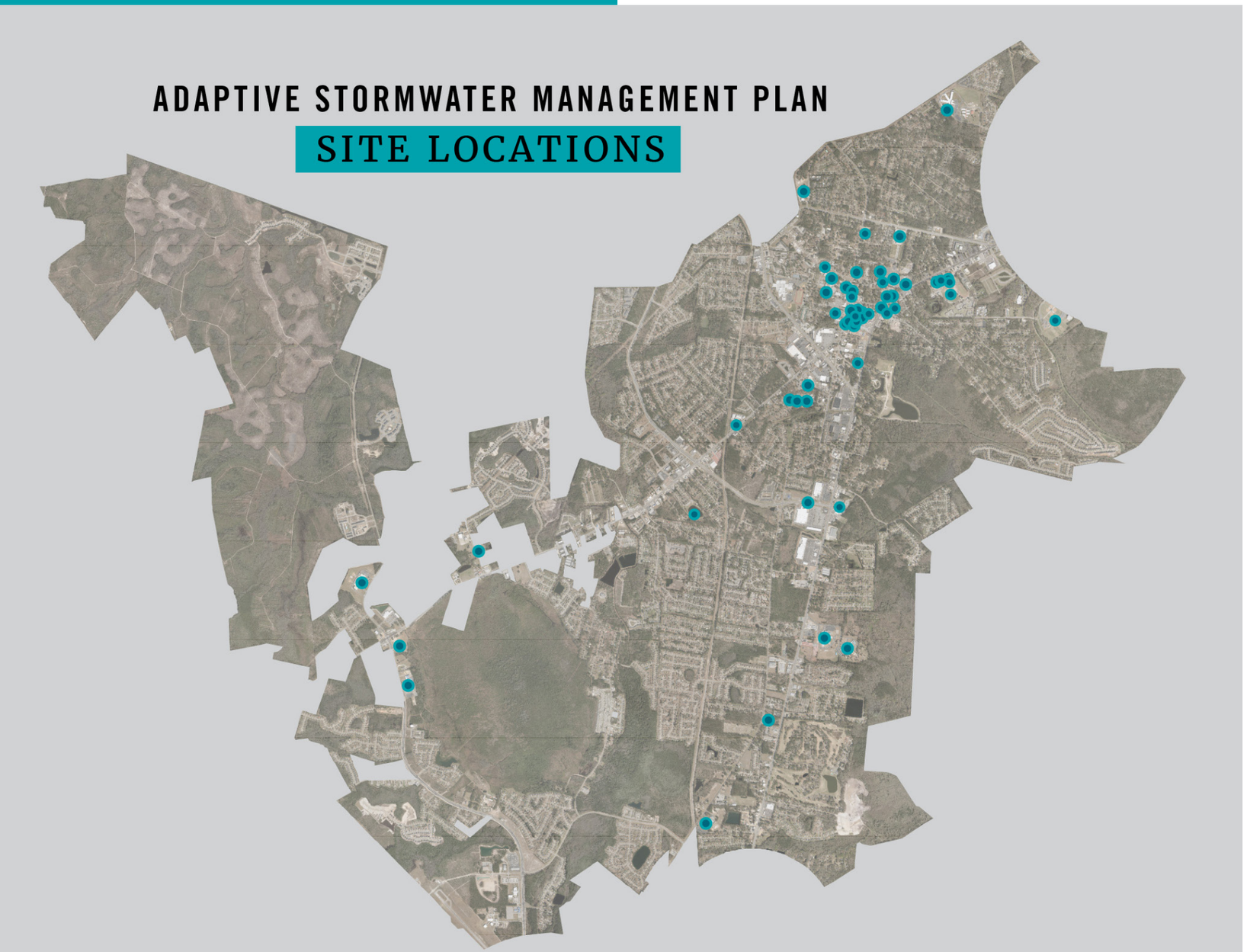
ABOUT

Marine Extension and Georgia Sea Grant is committed to improving the environmental and economic health of coastal Georgia through research, education, and outreach. The program's mission is to improve public resource policy, encourage far-sighted economic and fisheries decisions, anticipate vulnerabilities to change, and educate citizens to be wise stewards of the coastal environment.
For more information about the program, go to gacoast.uga.edu.

Introduction

Project Sites



Introduction

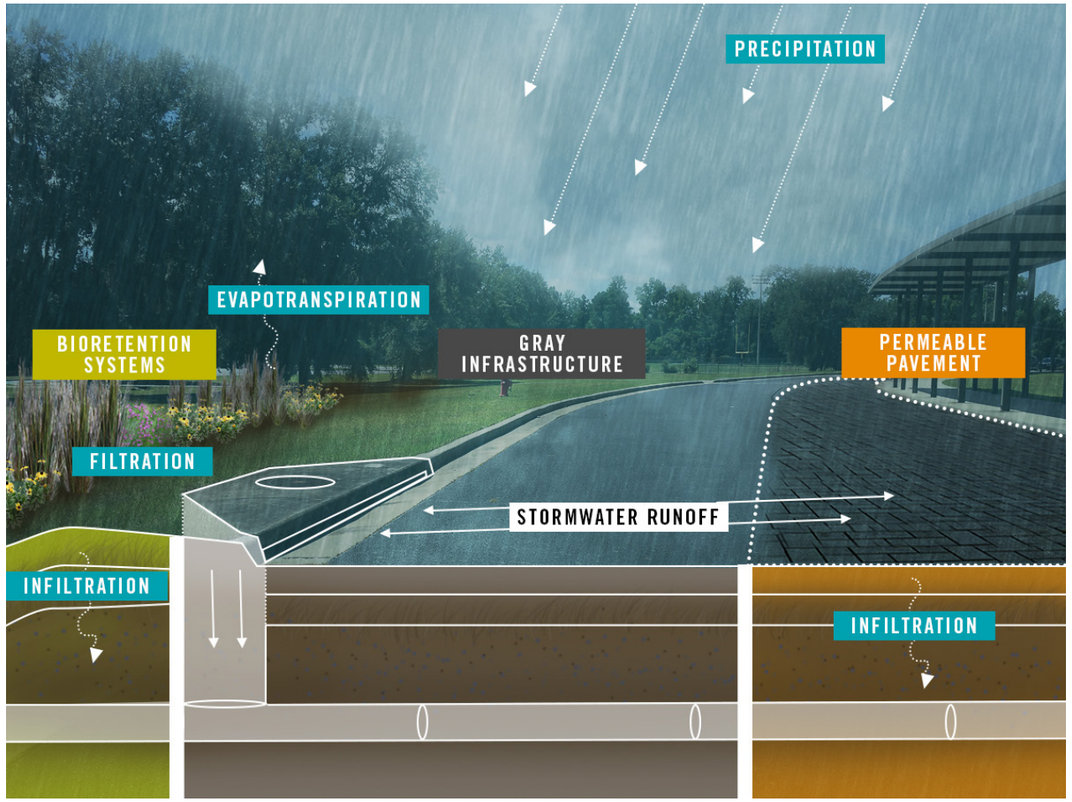
PROJECT OVERVIEW

In 2018 the Georgia Department of Natural Resources Coastal Resources Division's Enhancing Coastal Resilience with Green Infrastructure project awarded funding to the Marine Extension and Georgia Sea Grant Stormwater Program to identify priority locations within the City of Hinesville to implement stormwater green infrastructure. The primary objective of this work was to create a tailored plan to support sustainable, innovative, and cost-effective stormwater management by identifying stormwater green infrastructure opportunities positioned for implementation. This plan is intended to be a resource for decision-makers and to be used as a guide to begin implementing green infrastructure practices and demonstrate to residents and local leaders the benefits and opportunities for better managing stormwater runoff.

HINESVILLE

The City of Hinesville is the seat of Liberty County, covering approximately 18 square miles and supporting a population of 33,431 according to the 2020 US Census. Hinesville is located 40 miles

southwest of Savannah, adjacent to Fort Stewart, in the heart of the Ogeechee river basin. The majority of the City of Hinesville drains east via Peacock Creek before making it to larger tidal systems and the Ogeechee River. By evaluating the city's feasibility for green infrastructure, there are cost-effective ways to begin mitigating for flooding and water quality concerns to continue to protect the City of Hinesville's connection to the surrounding water resources and to assist in achieving their mission of providing the highest quality of life, nurturing a strong business community, and maintaining efficient government for the residents of Hinesville.

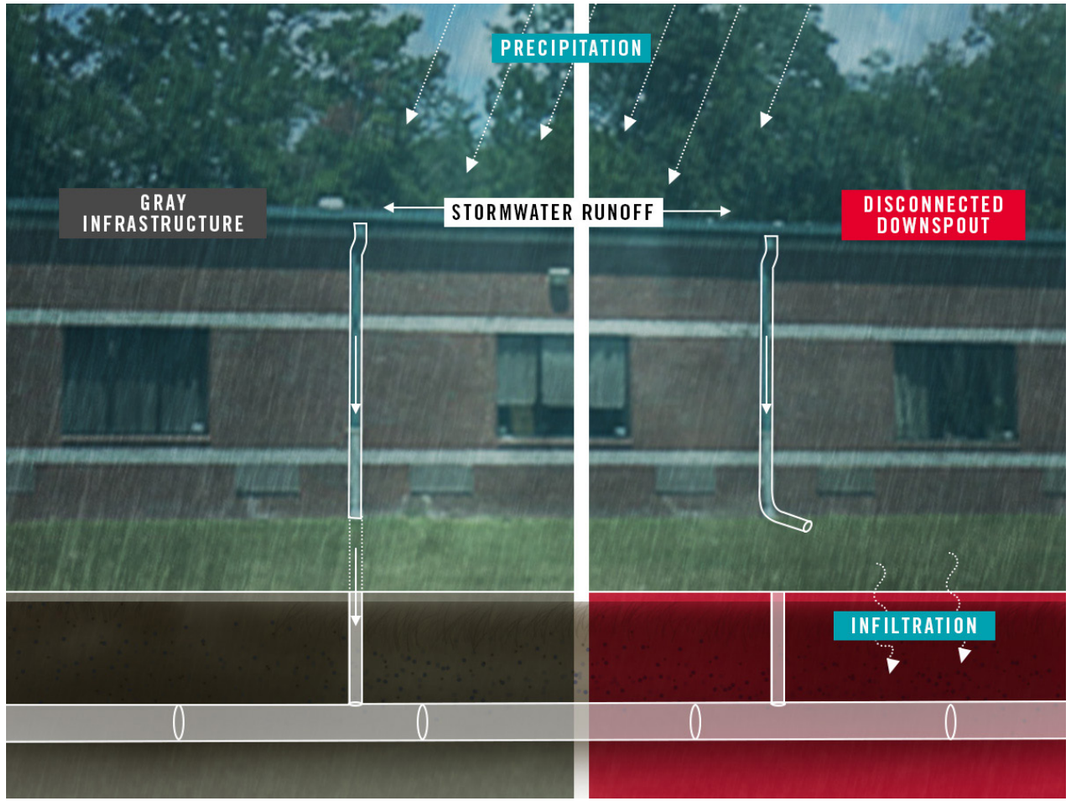


WHAT IS STORMWATER?

When rainfall flows across a surface instead of being absorbed into the ground, it is called "stormwater" or "stormwater runoff. These processes of soaking in or runoff off make up part of the natural water cycle in Georgia. When a disproportionate amount of rainfall becomes stormwater runoff, flooding, erosion, and reduced water quality can result. Green infrastructure can capture, filter, treat, and store stormwater runoff before it negatively impacts our waterways.

WHAT IS GREEN INFRASTRUCTURE?

Green infrastructure is an approach to stormwater management that protects, restores, or mimics the natural water cycle. Green infrastructure uses vegetation, soils, permeable surfaces, and rainwater harvesting to manage stormwater. Green infrastructure is a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits.



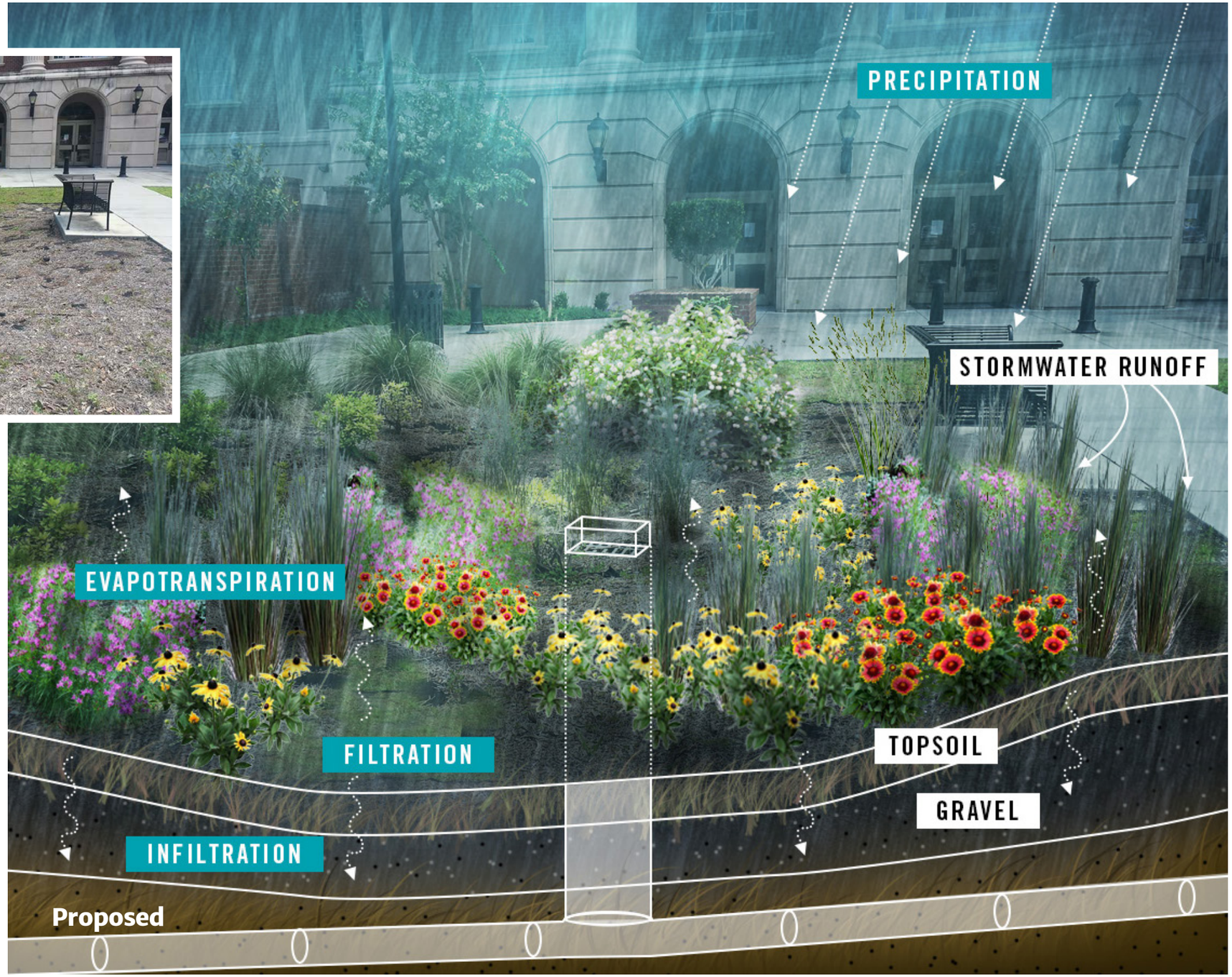
Green Infrastructure Strategies

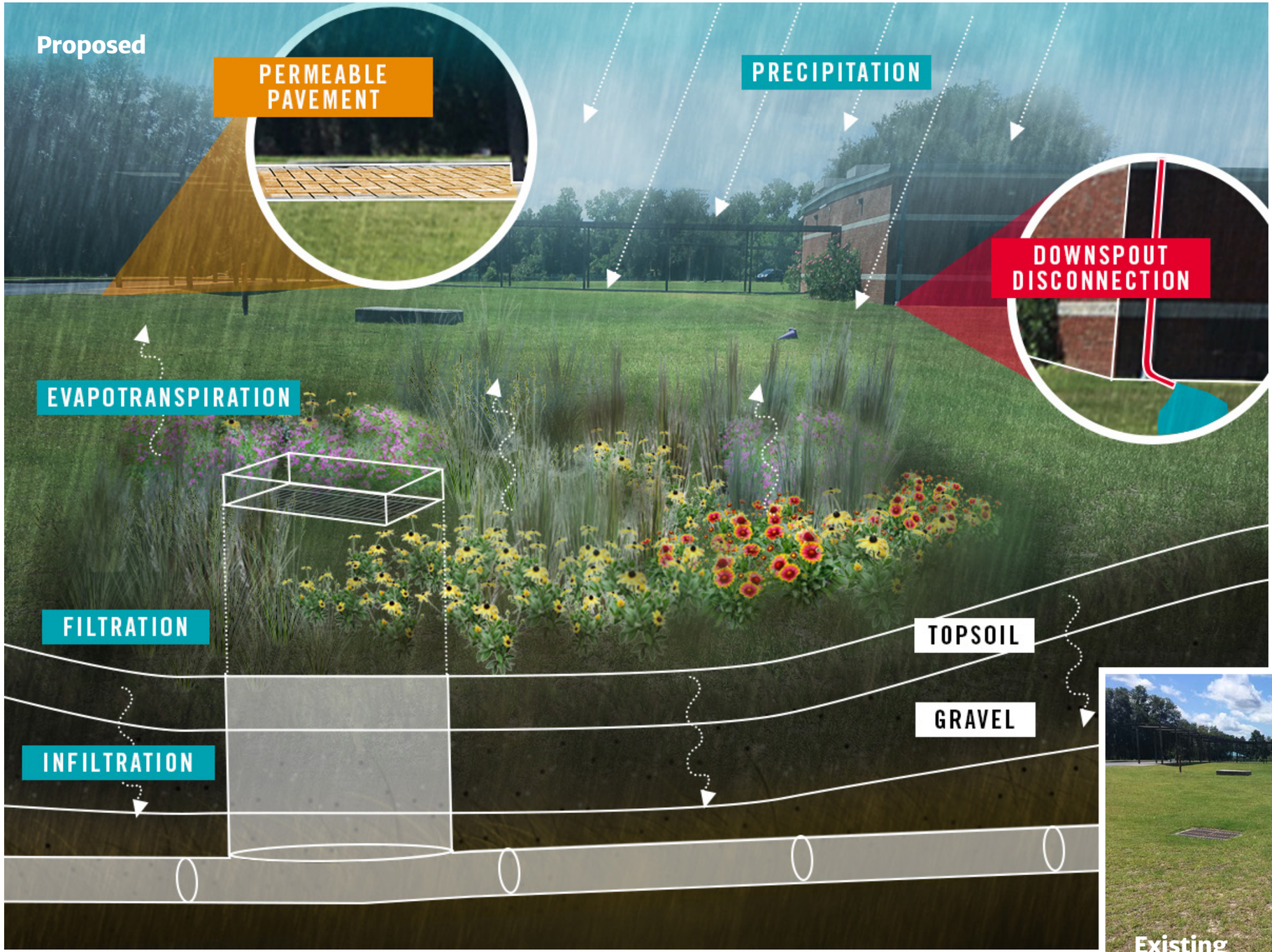
There are hundreds of different measures and strategies ranging from site to watershed scale applications that are classified as green infrastructure strategies or practices. This plan focuses on three primary strategies: bioretention systems, permeable pavement, and downspout disconnection. The plan identifies both bioretention practices and bioswales as part of bioretention systems. These are all practices recognized by the Coastal Stormwater Supplement to the Georgia Stormwater Management Manual as suitable for stormwater management in the coastal region.

SITE EXAMPLE

Liberty County Justice Center

The vegetated quadrant at the main entrance can be retrofitted with four bioretention systems to capture, treat, and infiltrate runoff from the adjacent sidewalk. Runoff from the parking lot on the south side of the site can be treated by a permeable pavement system. Downspouts on the western edge of the building can be disconnected to allow stormwater to infiltrate into the vegetated areas adjacent to the building.





SITE EXAMPLE

Lewis Frasier Middle School

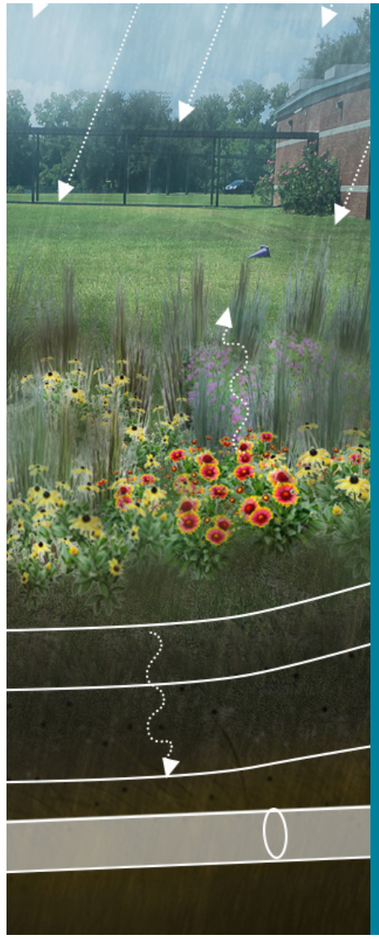
Runoff from buildings can be directed into bioretention systems that will capture, treat, and infiltrate stormwater. Additionally, downspouts from the covered walkway can be disconnected and runoff redirected to permeable pavement located in the driving lane on the southeast edge of the site.

COMMUNITY ENGAGEMENT

For the City of Hinesville to gain the support necessary to implement stormwater green infrastructure, its residents must first understand the role that this type of sustainable infrastructure can play in improving the quality of their water resources and protecting them from the effects of natural disasters and riverine flooding. The Adaptive Stormwater Management Plan does not include an exhaustive list of green infrastructure practices for the City of Hinesville. The project sites selected were chosen based on their feasibility to support green infrastructure to manage stormwater, public accessibility, and educational opportunity. The selected sites were identified through municipal engagement and field verified to support these criteria.

MAINTENANCE

Stormwater management systems and green infrastructure, like all types of infrastructure, must be maintained for performance. Additional maintenance resources can be found in Appendix E of the Georgia Stormwater Management Manual or at https://gacoast.uga.edu/outreach/programs/stormwater-management/.



Project Sites

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
78	28,899	0.70	6.60	79.6	2,182	120,413	0.9

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Permeable pavement	0.013	2	432	$8,640
Permeable pavement	0.023	3	780	$15,600

Liberty County Board of Commissioners

112 N Main Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

PERMEABLE PAVEMENT

OVERVIEW

Stormwater runoff from the streets adjacent to the building can be captured and treated in six parking stalls (three in each proposed location). There will be no loss of parking at the site. The permeable pavement systems will be connected by an existing trench drain located in the sidewalk south of the building.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
56	55,385	1.3	12.7	152.6	3,093	230,771	1.7

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.918	135	6,300	75,600

Liberty County Board of Education

9510 Hwy 196, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

A bioretention system is proposed in the center island of the parking lot north of the Liberty County Board of Education to capture the runoff from the surrounding parking stalls. The bioretention system can capture, treat, and infiltrate stormwater runoff from the parking lot.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
57	444,765	10.2	102.1	1,225.2	24,986	1,853,188	13.9

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.28	53	7,740	92,880
Bioretention	0.06	10	685	8,220

Bradwell Institute

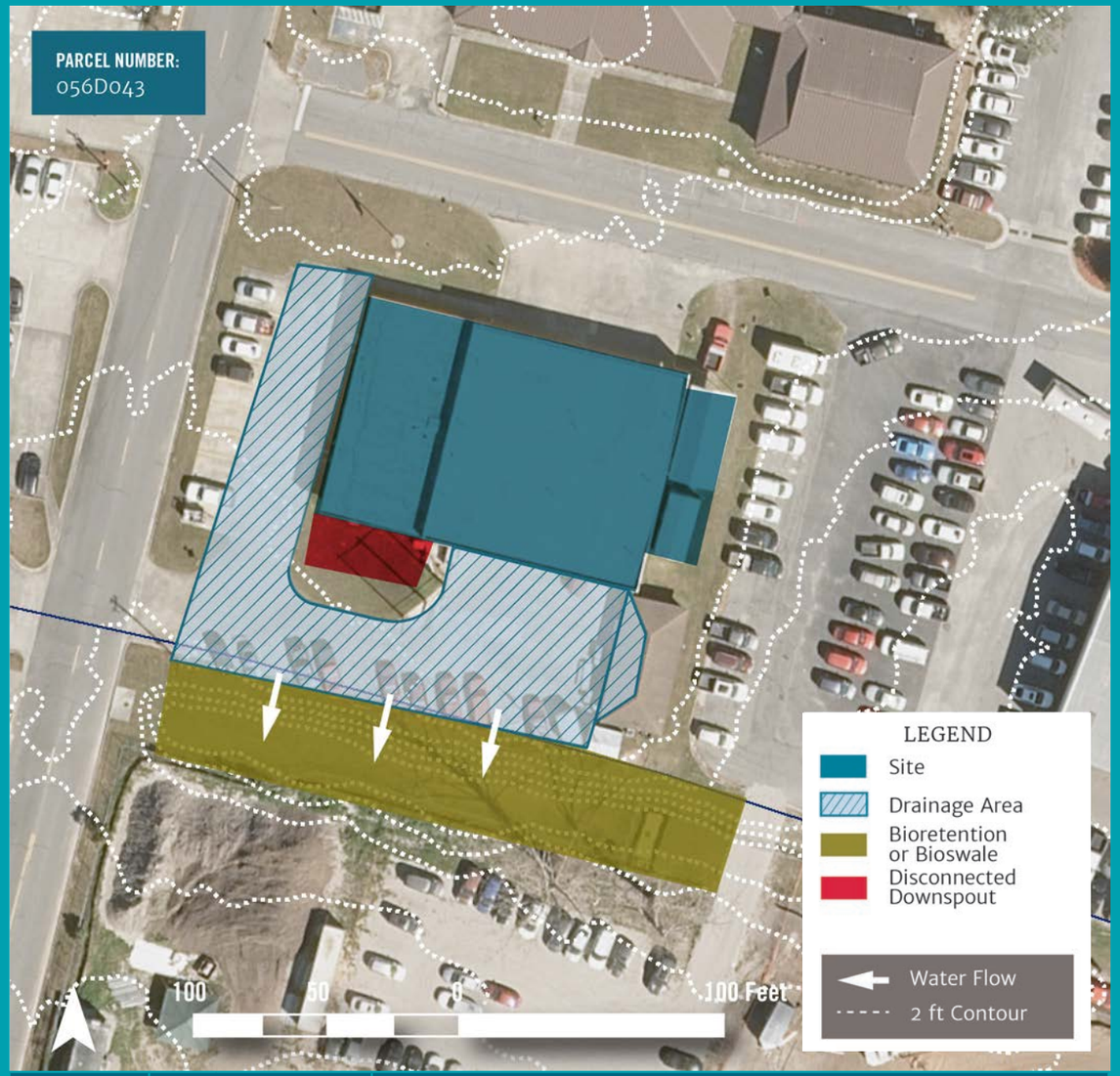
100 Pafford Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Two small bioretention systems are proposed adjacent to parking lots on the north end of the property. The systems will capture, treat, and infiltrate stormwater from parking stalls. The larger system on the northwest edge of the site will retrofit an existing detention basin.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
72	24,587	0.6	5.6	67.7	1,712	102,446	0.8

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.0278	41	5450	65,400

Fire Station

103 Liberty Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

DISCONNECTED DOWNSPOUT

OVERVIEW

Stormwater runoff is currently draining from north to south across the site. A bioretention system can be installed on the southern edge of the site. The downspouts from the building are directly connected and can be disconnected to flow over the lawn adjacent to the building.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
78	20,475	0.5	4.7	56.4	1,533	85,313	0.6

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.049	7	1,450	17,400
Bioretention	0.049	7	525	4,200
Bioretention	0.035	7	900	7,200
Permeable Pavement (perimeter only)	0.104	15	3,450	28,750

First Calvary Baptist Church

124 Rebecca Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

PERVIOUS PAVEMENT

BIORETENTION SYSTEMS

OVERVIEW

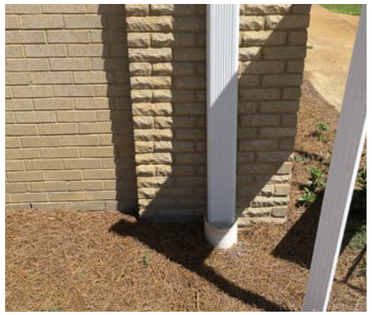
Rooftop runoff from building currently drains directly to the local storm sewer system. These downspouts can be redirected into a series of rain gardens that will capture, treat, and infiltrate stormwater runoff. A permeable pavement perimeter can be added to the basketball court across the street to capture runoff from the court.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	sq. ft.	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
62	7,505	0.2	1.7	20.7	456	31,271	0.23

Recommended Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (sq. ft.)	Estimated Cost $
Bioretention	0.116	17	1,000	12,000

First Presbyterian Christian Academy

308 E Court Street, Hinesville, GA 31313



PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

DISCONNECTED DOWNSPOUT

OVERVIEW

A bioretention system can be added to the center courtyard of the site to capture roof runoff. This bioretention system can capture, treat, and infiltrate stormwater runoff.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
54	54,700	1.3	12.6	150.7	2,934	227,917	1.7

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Permeable Pavement	0.571	84	8,500	212,500

First United Methodist Church

203 N Main Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

PERMEABLE PAVEMENT

OVERVIEW

The grassed area to the north end of the property is currently being used as overflow parking. Permeable pavement is proposed for this area to capture and treat stormwater runoff from the existing parking lot and building rooftops.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
42	57,325	1.3	13.2	157.9	2,465	238,854	1.79

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.07	13	3,000	36,000
Bioretention (Retrofit)	1.066	157	4,150	49,800

Georgia Southern University Liberty Campus

175 W Memorial Drive, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Two bioretention systems are proposed to capture, treat, and infiltrate stormwater runoff on-site. The parking lot on the east side of the site drains to an existing detention basin. This basin can be retrofitted with bioretention system.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
43	30,100	0.7	6.9	82.9	1,305	125,417	0.94

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioswale	0.422	89	3,800	22,800

Hinesville First SDA Church

173 Live Oak Church Rd, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Runoff from the parking lot is currently being directed into a ditch at the north end of the site. Sediment accumulation is happening in the parking lot from the quantity of runoff. The ditch can be retrofitted with a bioswale to treat and infiltrate stormwater.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
30	11,100	0.3	2.5	30.6	359	46,250	0.35

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioswale	0.074	16	1,850	9,250

Liberty County Division of Family and Child Services

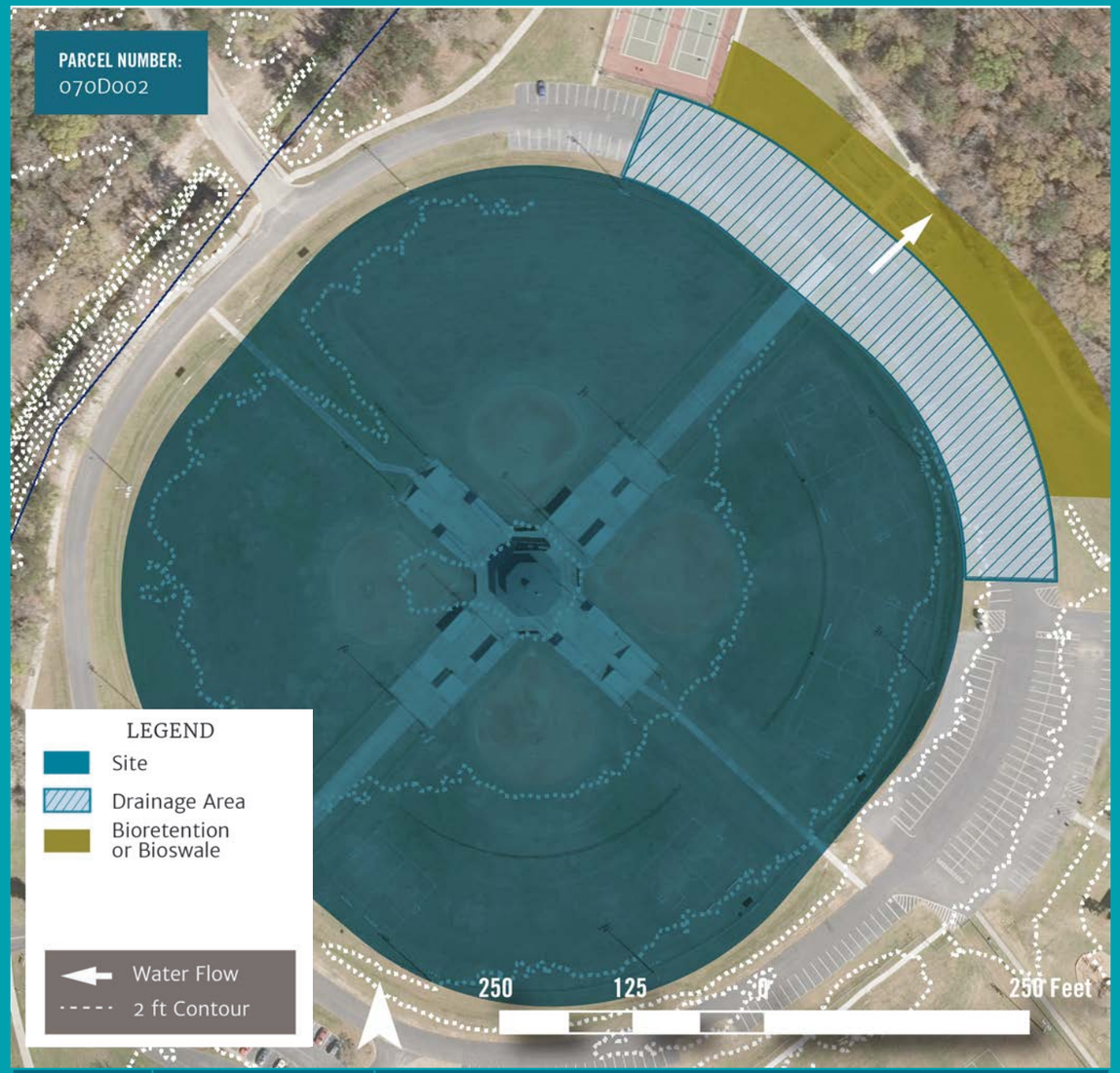
112 W Oglethorpe Hwy, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Roof runoff from the building can be redirected into a bioswale to treat and infiltrate stormwater runoff.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
14	688,475	1.6	15.7	188.6	1,213	285,313	2.13

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioswale	1.012	213	13,000	65,000

James Brown Park

800 Tupelo Trail, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Runoff from the parking lot is currently eroding green space at the north end of the site. A bioswale can be added to treat, infiltrate, and diffuse the flow of stormwater.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
32	133,000	3.1	30.5	366.4	4,526	554,167	4.15

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.018	3	2,650	31,800
Bioretention	0.076	11	3,500	4,200
Permeable Pavement	0.717	106	5,200	130,000

Jordye Bacon Elementary School

100 Deen Street, Hinesville, GA 31313

PLACEHOLDER

PLACEHOLDER

PLACEHOLDER

PROPOSED STRATEGIES:

- **PERMEABLE PAVEMENT**
- **BIORETENTION SYSTEMS**
- **DISCONNECTED DOWNSPOUT**

OVERVIEW

Two bioretention systems and a permeable pavement system can be added to address stormwater runoff on-site. Downspouts from covered walkways can be disconnected and runoff redirected into bioretention systems in the courtyards. Runoff from the parking lot can be captured and treated in a permeable pavement system near the entrance on the east side of the site.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
46	197,600	4.5	45.5	554.4	9,085	823,333	6.13

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.475	70	1,700	20,400
Bioretention	0.475	70	1,200	14.400
Bioretention	0.444	65	1,500	18,000
Bioretention	0.226	33	950	11,400
Permeable Pavement	0.173	26	7.800	195,000

Lewis Frasier Middle School

910 Long Frasier Drive, Hinesville, GA 31313

PROPOSED STRATEGIES:

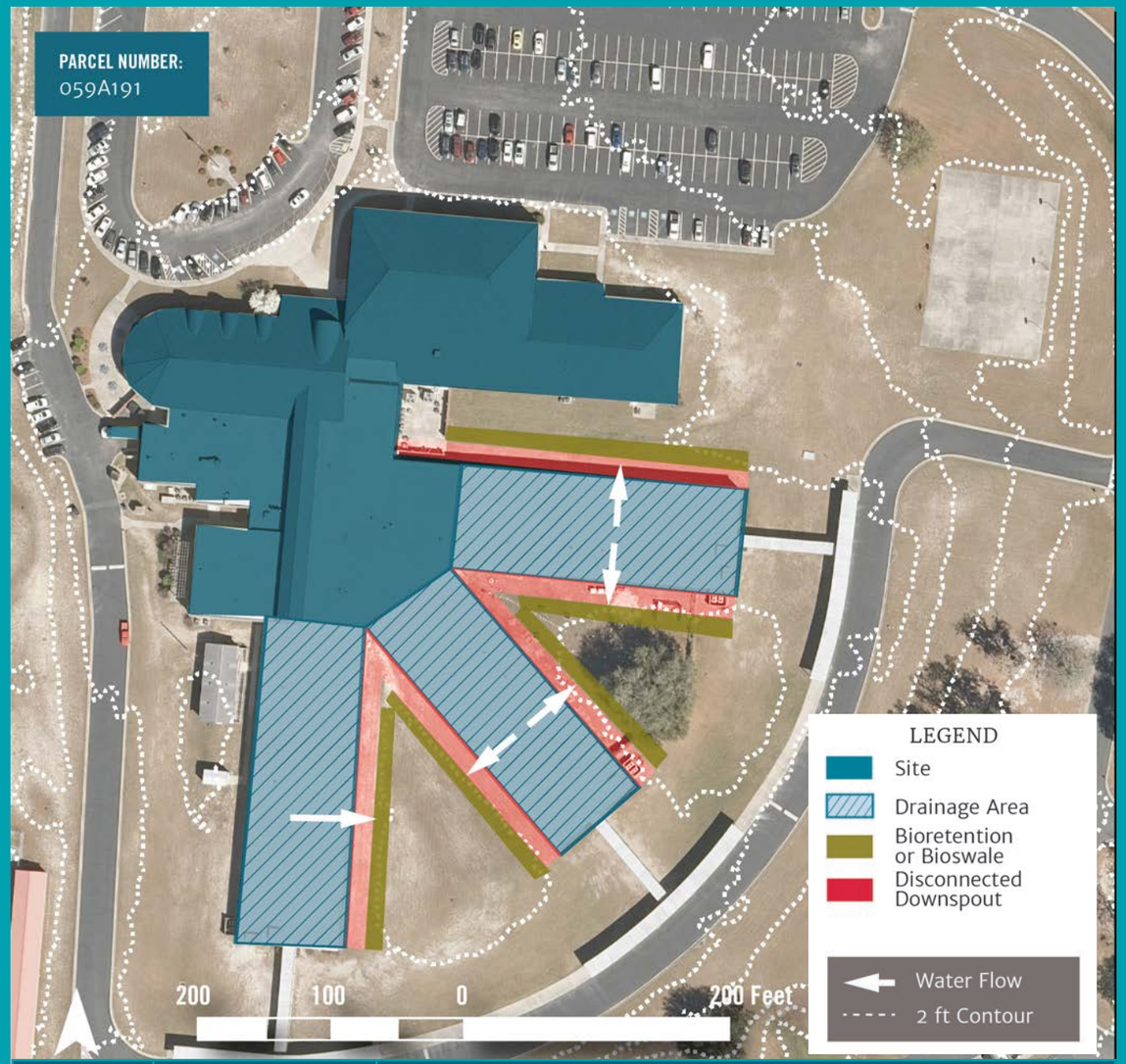
PERMEABLE PAVEMENT

BIORETENTION SYSTEMS

DISCONNECTED DOWNSPOUT

OVERVIEW

Runoff from buildings can be directed into bioretention systems that will capture, treat, and infiltrate stormwater. Additionally, downspouts from the covered walkway can be disconnected and runoff redirected to permeable pavement located in the driving lane on the southeast edge of the site.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
39	121,500	2.8	27.8	334	4,895	505,208	3.78

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioswale	0.138	29	2,150	12,900
Bioswale	0.122	26	2,150	12,900
Bioswale	0.112	24	1,700	10,200
Bioswale	0.138	29	1,700	10,200
Bioswale	0.24	51	4,875	29,250

Frank Long Elementary School

920 Long Frasier Dr, Hinesville, GA 31313

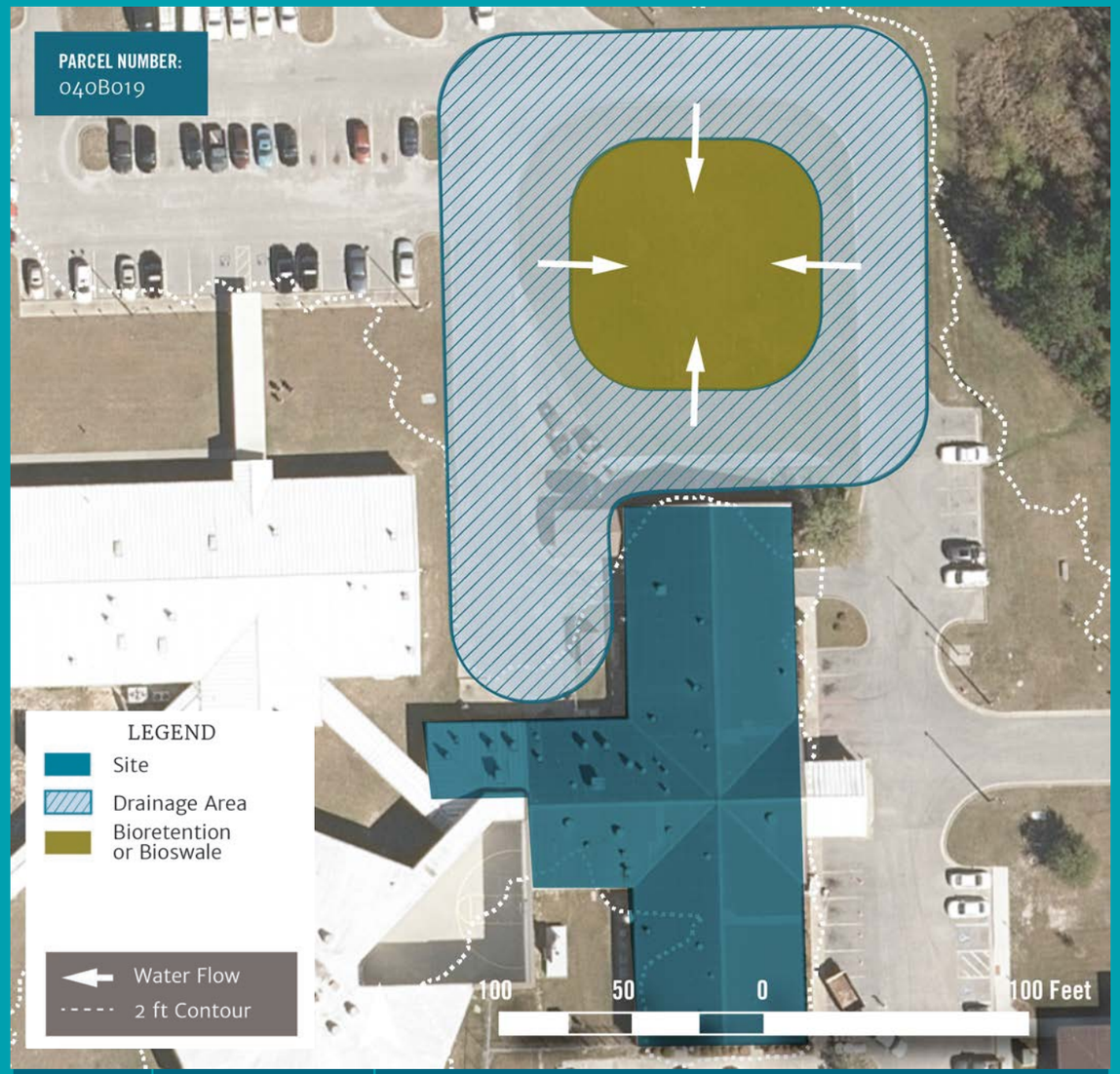
PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

DISCONNECTED DOWNSPOUT

OVERVIEW

The majority of the downspouts at this site are directly connected to the storm sewer system. Bioswales can be added to treat and infiltrate runoff adjacent to the buildings.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
63	48,250	1.1	11.1	132.9	2,977	201,042	1.5

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.999	147	3,000	36,000

Liberty County Detective Office

180 Paul Sikes Drive, Hinesville, GA 31313

PLACEHOLDERS

PLACEHOLDERS

PLACEHOLDERS

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Runoff from the driving lanes around the site can be directed into a bioretention system located in the center of the green space. The bioretention system will capture, treat, and infiltrate stormwater.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
90	84,552	1.9	19.4	232.9	7,296	352,300	2.64

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Permeable Pavement	1.581	233	3,000	75,000

Emergency Management and Information Technology

100 Liberty Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

PERVIOUS PAVEMENT

OVERVIEW

Runoff from the parking lot can be captured in permeable pavement installed in the parking stalls. The stormwater can be captured and treated in the permeable pavement system.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
92	69,250	1.6	15.9	190.8	6,082	288,542	2.16

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.296	44	4,000	48,000
Permeable Pavement	0.201	30	1,335	33,375

Liberty County Justice Center

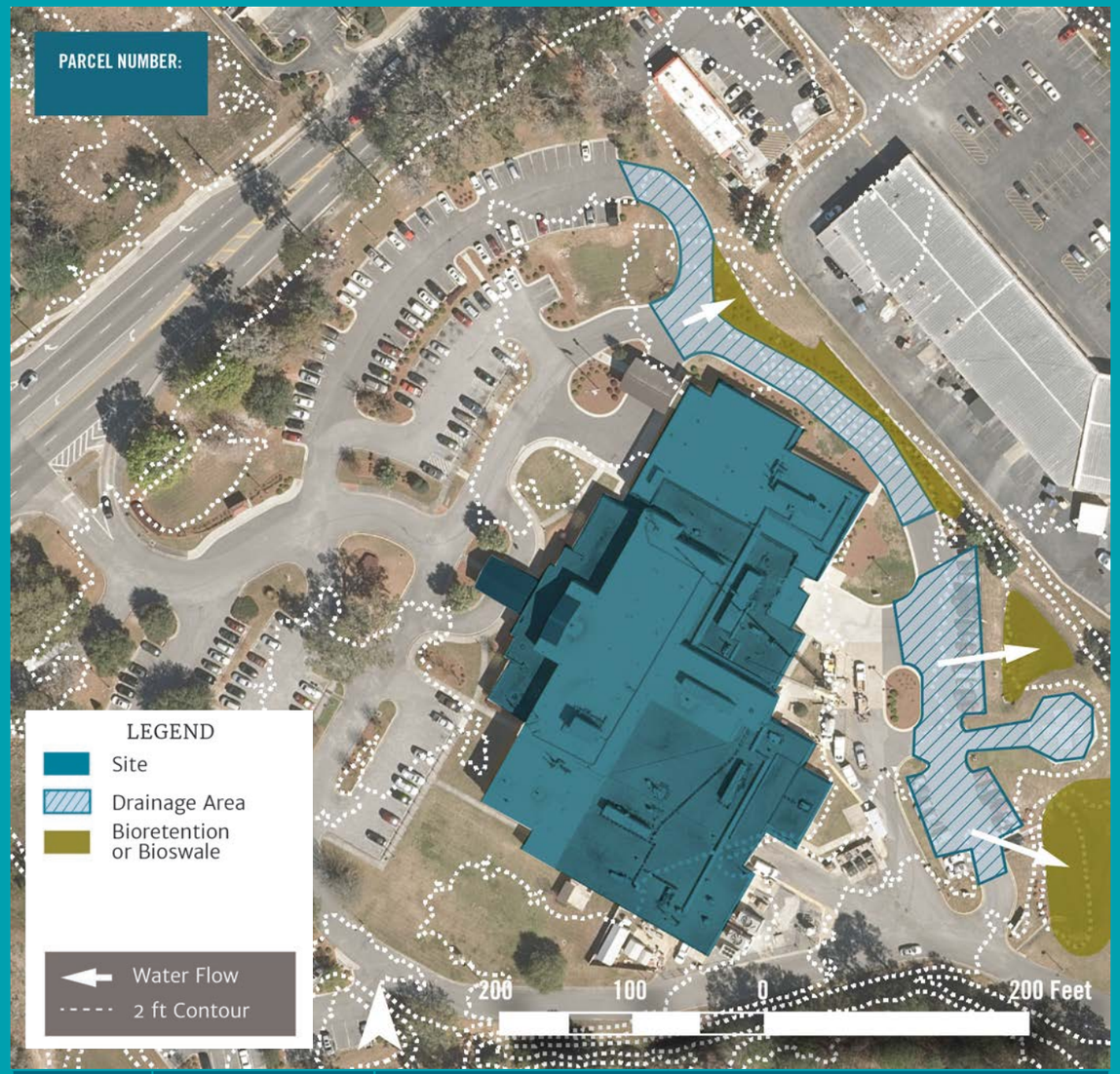
201 S Main St #1200, Hinesville, GA 31313

PROPOSED STRATEGIES:

- **PERMEABLE PAVEMENT**
- **BIORETENTION SYSTEMS**
- **DISCONNECTED DOWNSPOUT**

OVERVIEW

The vegetated quadrant at the main entrance can be retrofitted with four bioretention systems to capture, treat, and infiltrate runoff from the adjacent sidewalk. Runoff from the parking lot on the south side of the site can be treated by a permeable pavement system. Downspouts on the western edge of the building can be disconnected to allow stormwater to infiltrate into the vegetated areas adjacent to the building.

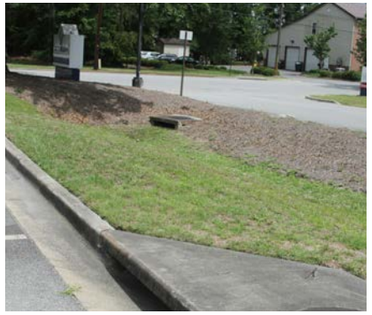


IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
71	364,900	8.4	83.8	1,005.2	25,281	1,520,417	11.37

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention (Retrofit)	0.178	26	4,200	50,400
Bioretention (Retrofit)	0.196	29	2,000	24,000
Bioretention (Retrofit)	0.164	24	3,850	46,200

Liberty County Regional Hospital

462 Elma G Miles Pkwy, Hinesville, GA 31313



PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

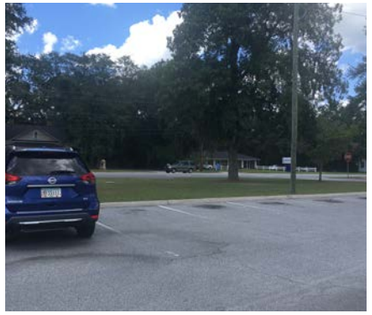
The site currently has a series of detention basins that can be retrofitted with bioretention systems to capture, treat, and infiltrate runoff from the adjacent parking lot.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
80	91,650	2.1	210	252.5	7,023	381,875	2.86

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Permeable Pavement	1.078	159	7,500	187,500

Liberty County Department of Recreation

607 Oglethorpe Hwy, Hinesville, GA 31313

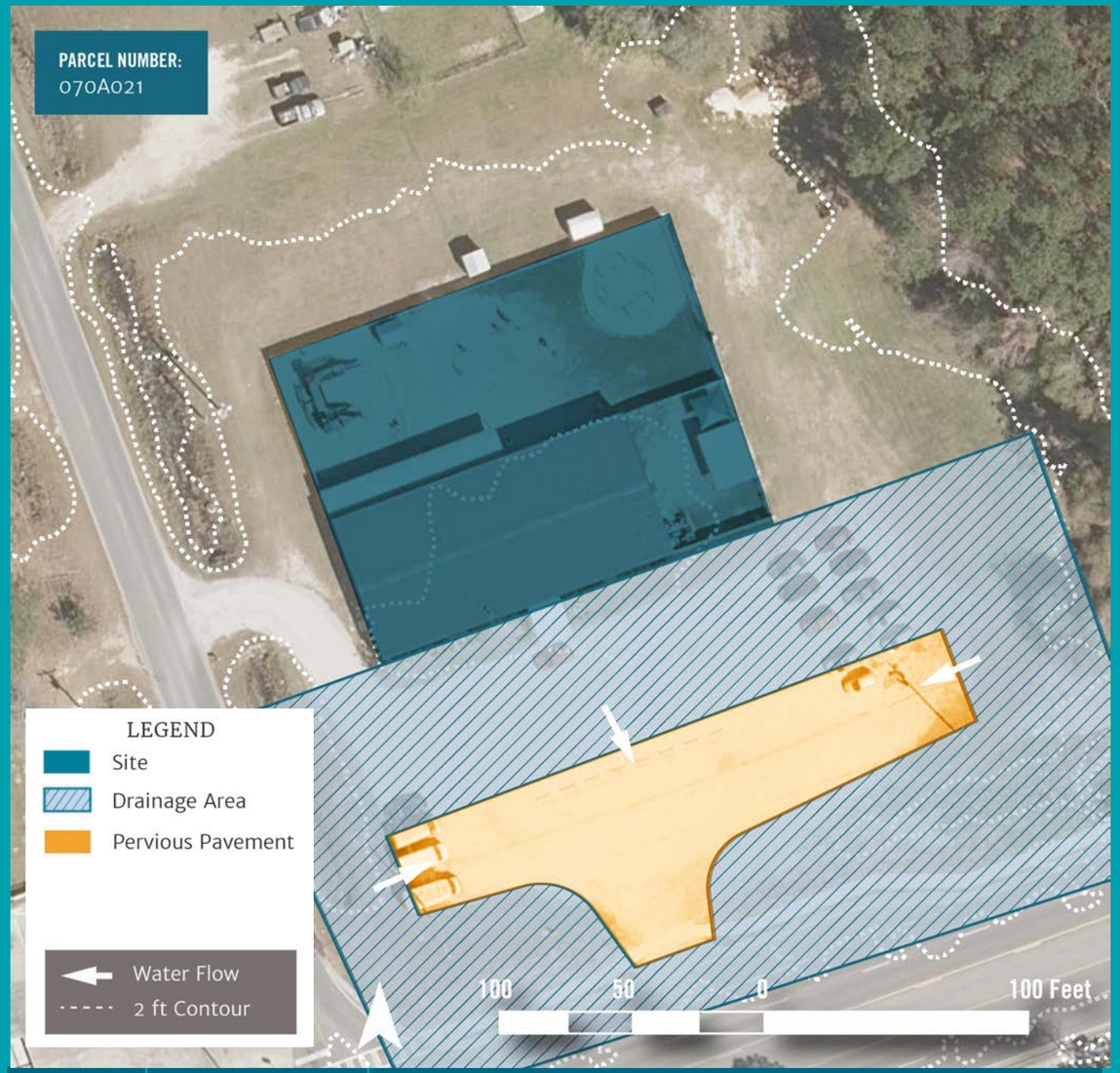


PROPOSED STRATEGIES:

PERMEABLE PAVEMENT

OVERVIEW

Runoff from the parking lot currently flows from the north to the southeast across the site. A permeable pavement system can be added to the parking stalls along the south edge of the parking lot. The permeable pavement will capture and treat stormwater.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
50	66,220	1.5	15.2	182.4	3,292	275,917	2.06

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Permeable Pavement	1.861	274	12,100	302,500

Little Treasures Learning Center

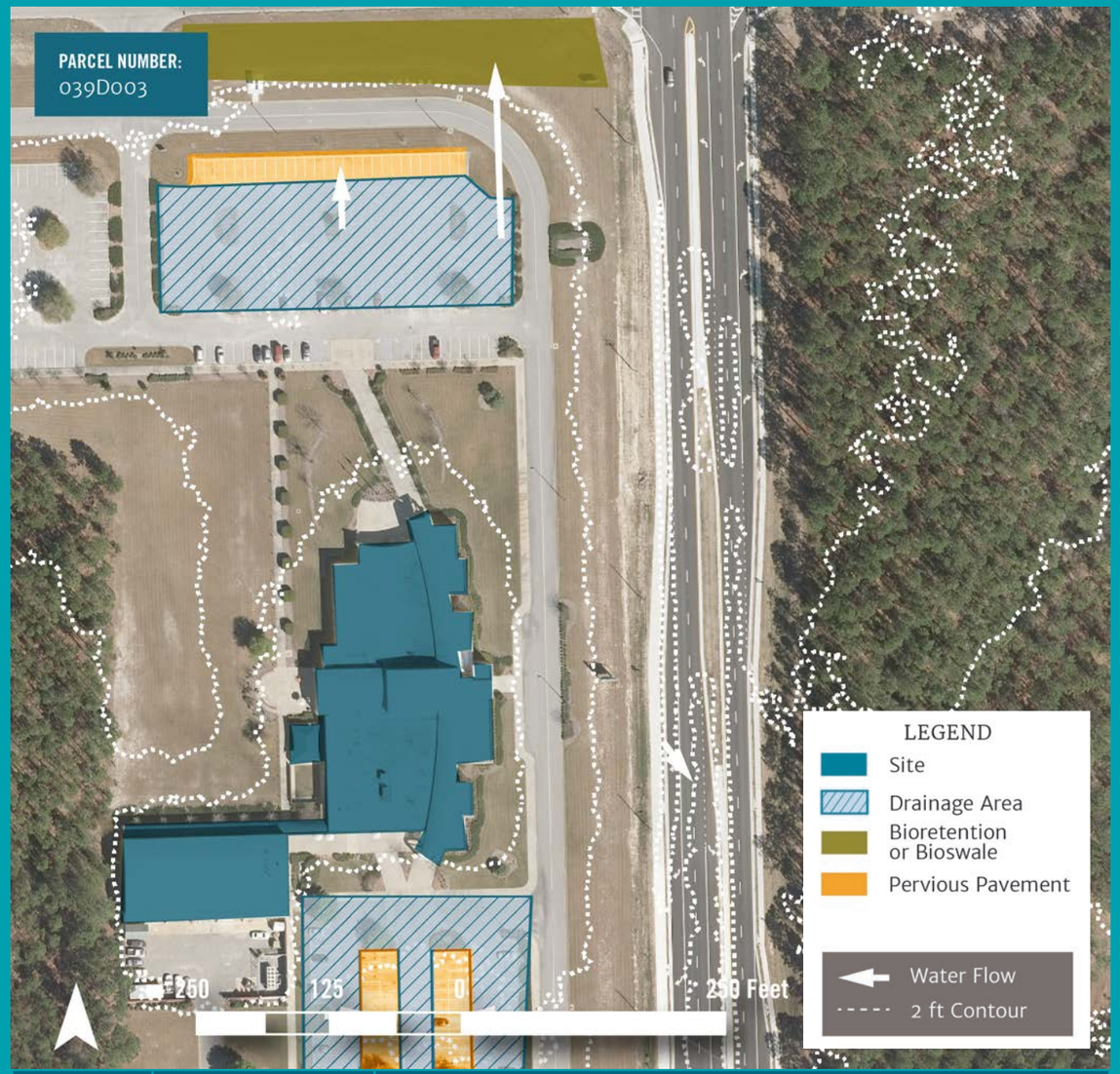
1695 Elma G Miles Pkwy, Hinesville, GA 31313

PROPOSED STRATEGIES:

PERMEABLE PAVEMENT

OVERVIEW

The current parking lot is gravel and the entrance regularly floods. A permeable pavement system can be installed at the entrance to capture and treat runoff from the building and the parking lot.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
42	250,100	5.7	57.4	689	10,752	1,042,083	7.79

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention (Retrofit)	9.513	1,401	13,000	156,000
Permeable Pavement	1.24	183	7,000	175,000
Permeable Pavement	1.036	153	8,400	210,000

Savannah Technical College

100 Technology Dr, Hinesville, GA 31313

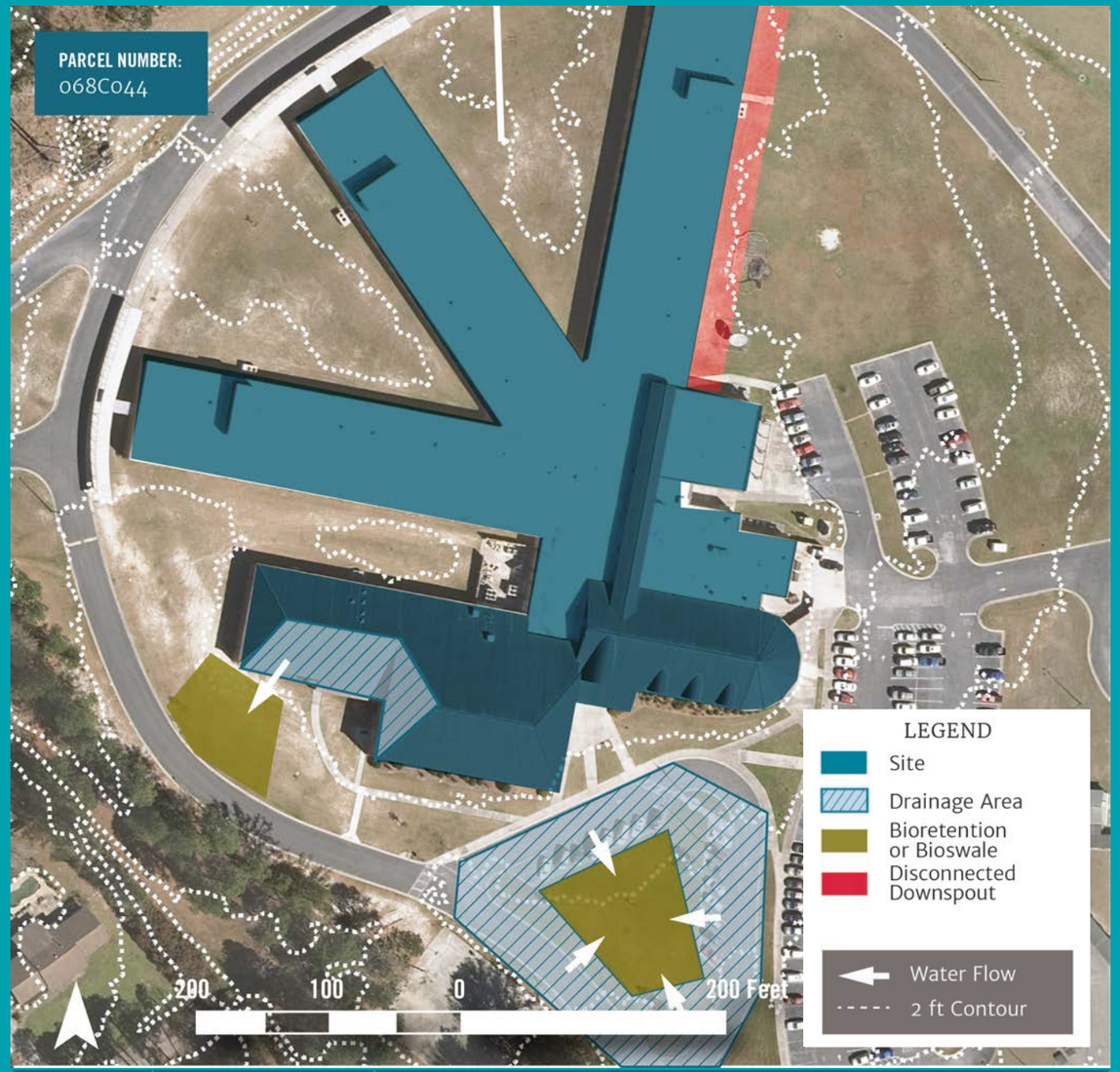
PROPOSED STRATEGIES:

PERMEABLE PAVEMENT

BIORETENTION SYSTEMS

OVERVIEW

Parking lot runoff at the north end of the site can be captured, stored, and treated in a permeable pavement and a bioretention system. A bioretention system can be used to retrofit the existing detention basin/swale along the north edge. The runoff in the parking lot on the south edge of the site can be treated in a permeable pavement system installed in the parking stalls.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
31	40,400	0.9	9.3	111.3	1,338	168,333	1.26

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.155	23	1,800	21,600
Bioretention	0.965	142	4,000	48,000

Snelson-Golden Middle School

465 Coates Road, Hinesville, GA 31313

PROPOSED STRATEGIES:

PERMEABLE PAVEMENT

DISCONNECTED DOWNSPOUT

OVERVIEW

Two bioretention systems can be added to landscaped areas on the south edge near the entrance of the site. Roof runoff and runoff from the driving lanes can be captured, treated, and infiltrated by these bioretention systems.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
27	10,185	0.2	2.3	28.1	295	42,438	0.32

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioswale	0.126	27	1,400	7,000

South Main Baptist Church

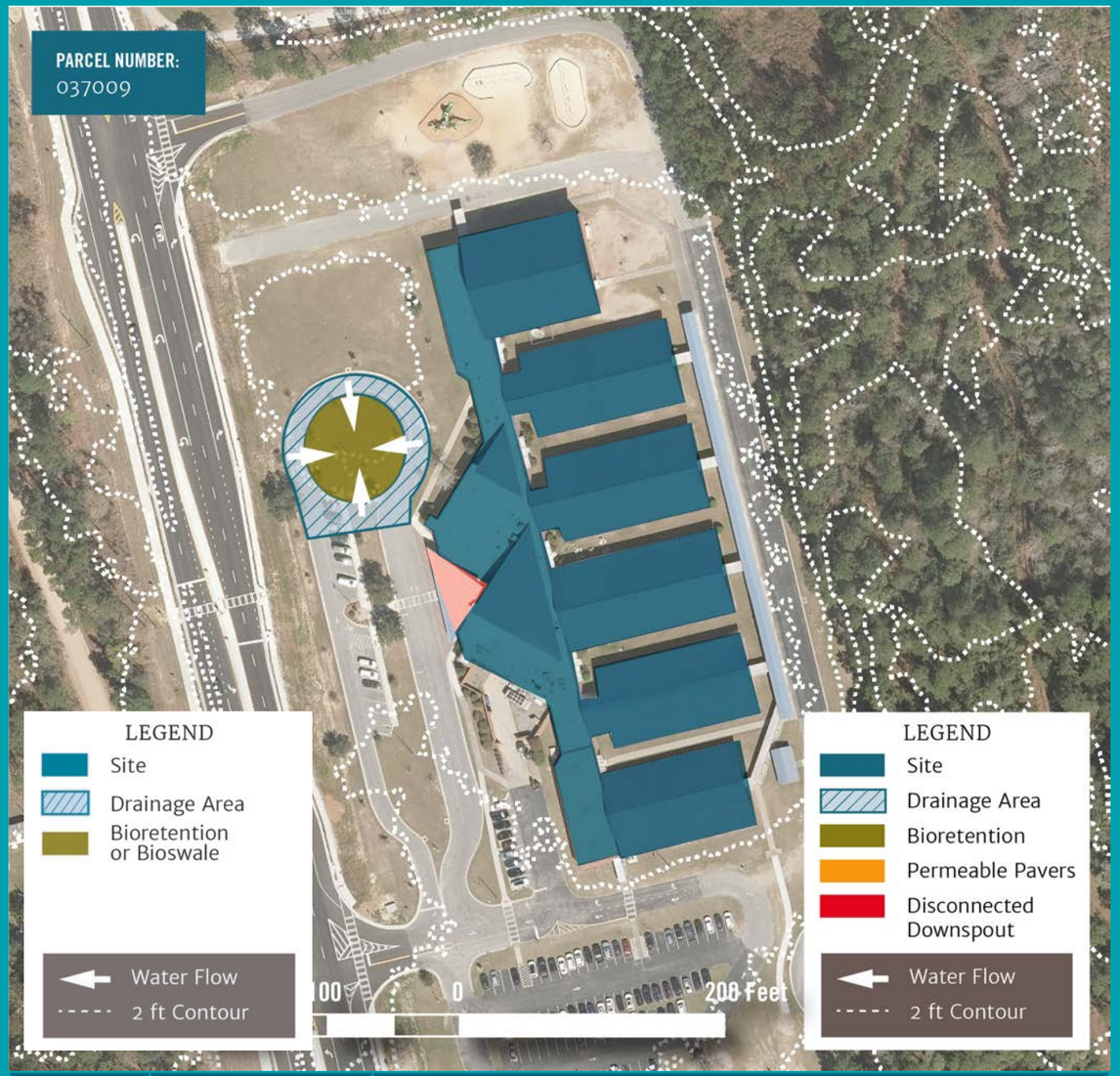
1166 S Main Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Runoff from the parking lot moves west to east across the site. A bioswale can be added to capture, treat, and diffuse stormwater flow.



IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
56	160,000	3.7	36.7	440.8	8,898	666,667	4.99

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	0.496	73	2,100	25,200

Taylor's Creek Elementary School

378 Airport Road, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

OVERVIEW

Runoff from the roundabout portion of the driving lanes can be redirected to a bioretention system installed in the interior green space. The bioretention system will capture, treat, and infiltrate stormwater.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
44	136,715	3.1	31.4	376.6	6,142	569,646	4.26

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Bioretention	1.785	263	10,850	130,200

Waldo Pafford Elementary School

2550 W 15th Street, Hinesville, GA 31313

PROPOSED STRATEGIES:

BIORETENTION SYSTEMS

DISCONNECTED DOWNSPOUT

OVERVIEW

A linear detention basin along the northern edge of the site can be retrofitted with a bioretention system. The bioretention system will capture, treat, and infiltrate stormwater. The downspouts along the covered walkway and the northern edge of can be disconnected to allow stormwater to infiltrate into the surrounding green space.

IMPERVIOUS COVER		EXISTING LOADS FROM IMPERVIOUS COVER			RUNOFF VOLUME FROM IMPERVIOUS COVER		
%	Sq Ft	TP	TN	TSS	From 1.2" Design Storm (Cu Ft)	Annual Rainfall of 50" (Cu Ft)	Annual Rainfall (50") (MGAL)
40	3,050	0.1	0.7	8.4	126	12,708	0.1

Recommended Infrastructure Practices	Recharge Potential (MGAL/yr)	TSS Removal Potential (lbs/yr)	Estimated Size (Sq Ft)	Estimated Cost $
Permeable Pavement	0.084	12	3,250	81,250

Westwood Child Care

508 Ashmore Road, Hinesville, GA 31313

PROPOSED STRATEGIES:

PERMEABLE PAVEMENT

OVERVIEW

Runoff from the parking area currently drains west toward a dirt lot at the northeast edge of the site. A permeable pavement system can be added to capture and treat stormwater.