The Ripple Effect of Developing a Stormwater Management Manual

SESWA Annual Conference

October 5, 2018

How Did We Get Here?

A Brief History

1999 — Gwinnett County adopts SSFISS

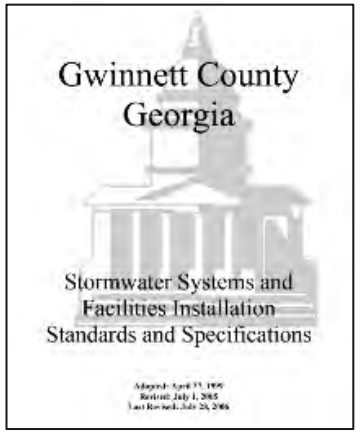
2001 — ARC introduces first GSMM

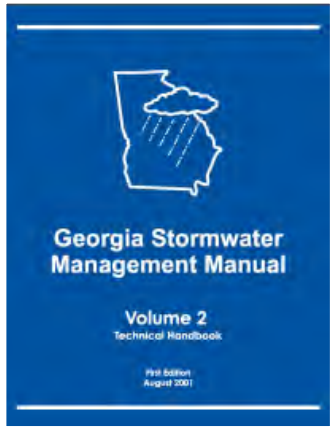
2015 — ARC engages stakeholders to develop 2016 GSMM

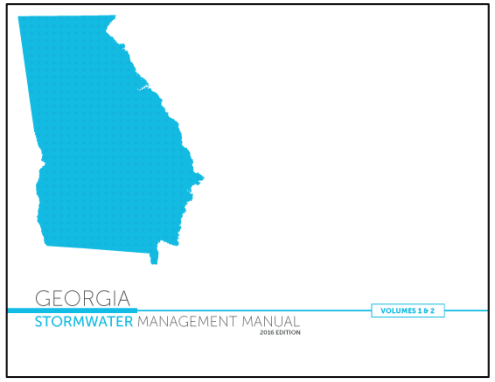
2016 — GA EPD mandates local government adoption of 2016 GSMM (or equivalent)

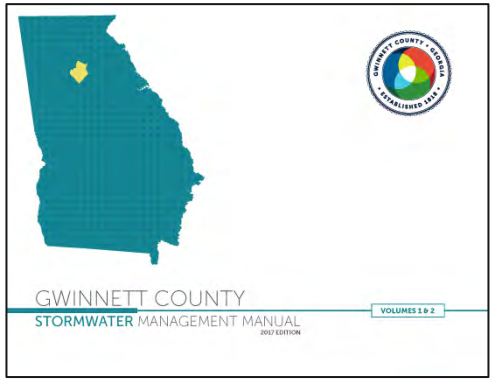
2017 — Gwinnett County develops and adopts 2017 GCSMM

2018 — **March 1** Implementation of the 2017 GCSMM









ARC – Atlanta Regional Commission
GAEPD – Georgia Environmental Protection Division

GSMM – Georgia Stormwater Management Manual
SSFISS – Stormwater Systems and Facilities Installation Standards and Specifications

Why the Change?

- Required by GA EPD
- Outdated Current Manual (SSFISS)
- New Goals:
  - Provide guidance on current post-construction stormwater management practices
  - Minimize the negative impacts of increasing stormwater runoff

Initial Approach

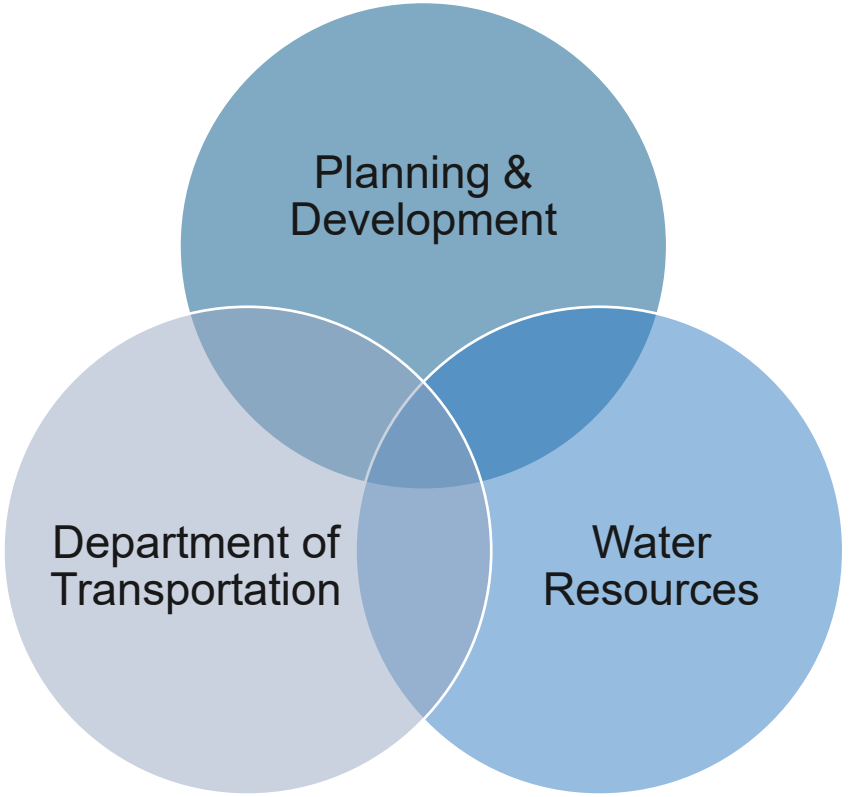
Update Team and Stakeholders

Tasked with Updating Manual:

- Gwinnett County Planning & Development
- Gwinnett County Department of Water Resources
- Gwinnett County Department of Transportation

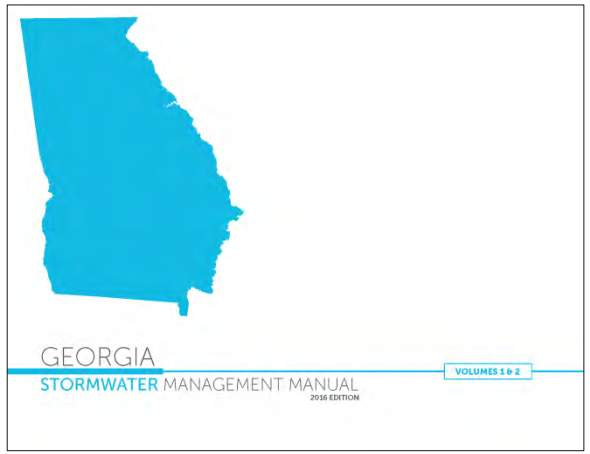
Identified as Stakeholders:

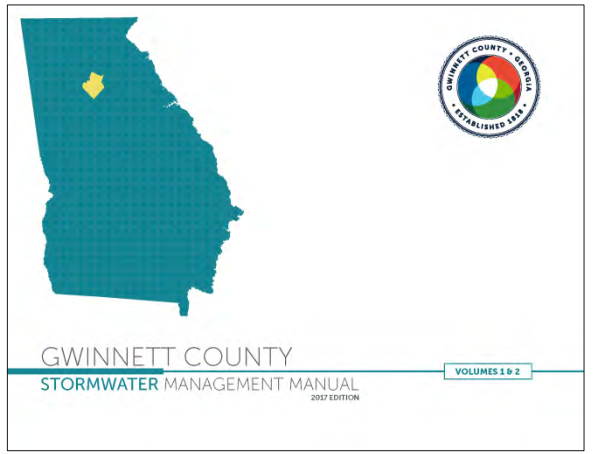
- Development Advisory Committee
- Stormwater Technical Advisory Committee
- Stormwater Authority



Process

- Started with GSMM (landscape format, clickable TOC and reference links)
- Identified GSMM sections that duplicated or conflicted with SSFISS requirements
- Drafted proposed edits to resolve conflicts
- Developed “Edit Sheets” clearly presenting proposed GSMM edits to stakeholders
- Finalized language for inclusion in GCSMM
- Highlighted GCSMM text to clearly identify changes from GSMM





Key Changes

Gwinnett County Revisions

Georgia Manual

4.3.2 Contents of a Stormwater Management Site Plan

The following elements are recommended components for local stormwater management site plan requirements. It is often required that a stormwater management site plan be sealed and signed by a licensed Professional Engineer or Landscape Architect.

Based on a community's prerogative, small-scale projects could be allowed to prepare a site plan that includes a defined subset of the elements outlined below.

Gwinnett Manual

4.3.2 Contents of a Stormwater Management Site Plan

The following elements are required components for a local stormwater management site plan. This stormwater management site plan shall be signed and sealed by either a professional engineer or landscape architect registered in the State of Georgia. Flood studies for and floodplain or flood prone areas, and hydrologic and hydraulic analysis and design calculation which are performed for the design of a dam as defined in the Gwinnett County Stormwater Management Manual shall be certified by a registered professional engineer in the State of Georgia.

Based on a community's prerogative, small-scale projects could be allowed to prepare a site plan that includes a defined subset of the elements outlined below.

Numerical Sizing Criteria

Georgia Manual

Runoff Reduction included as recommended standard

Overbank flood protection required for 25-yr 24 hour storm event only

Overbank Flood Protection	Provide peak discharge control of the 25-year, 24 hour storm event such that the post-development peak rate does not exceed the prede-velopment rate to reduce overbank flooding.

Gwinnett Manual

All but runoff reduction are required in Gwinnett County

Overbank flood protection required for 2-yr, 10-yr, and 25-yr 24 hour storm events

Overbank Flood Protection	Provide peak discharge control of the 2-25-year, 24 hour storm events such that the post-development peak rate does not exceed the predevelopment rate to reduce overbank flooding.

Proprietary Systems

Georgia Manual

Metropolitan North Georgia Water Planning District vendor review and concurrence process

Gwinnett Manual

Detailed procedure for County approval of proprietary BMP use

1. Obtain Metropolitan North Georgia Water Planning District's Post-Construction Stormwater Technology Assessment Protocol (PCSTAP) Concurrence: The applicant must supply proof of concurrence with the Post-Construction Stormwater Technology Assessment Protocol (PCSTAP) issued by the Metropolitan North Georgia Water Planning District.
2. Submit an Application to Gwinnett County for Local Analysis and Evaluation: A request to use a proprietary device at a particular
3. Local Analysis and Evaluation Completed by Gwinnett County:

Rainfall Data

Georgia Manual

Designer directed to NOAA website for rainfall data at center of project site

» **Rainfall Depths**: The rainfall depth of the 1-year, 24-hour storm will vary depending on location and can be determined from rainfall data found in the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 publication, or online using the *Precipitation Frequency Data Server* database for any location across Georgia (http://hdsc.nws.noaa.gov/hdsc/pfds/).

Gwinnett Manual

All projects designed based on rainfall data at centroid of County

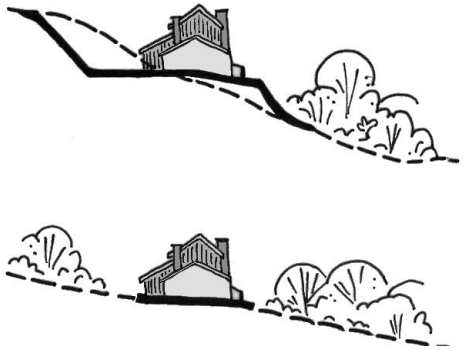
(Step 1) The 24-hour rainfall depth is determined from the NOAA 14 data for the centroid of the County. See the table below.

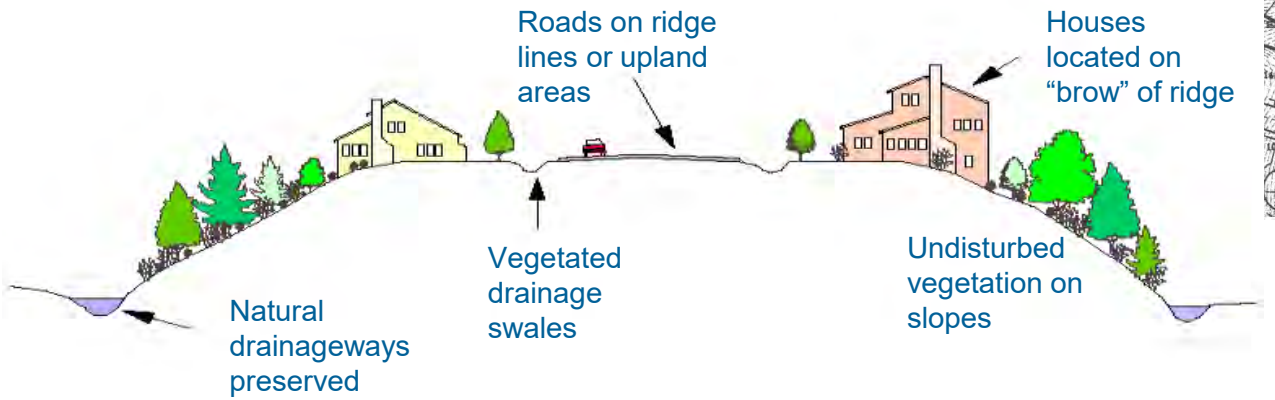
24 Hour Depth (in.)	
Return Period	**Rainfall Amount, in.**
1	3.29
2	3.72
5	4.45
10	5.07
25	5.95
50	6.65
100	7.36

Paradigm Shift

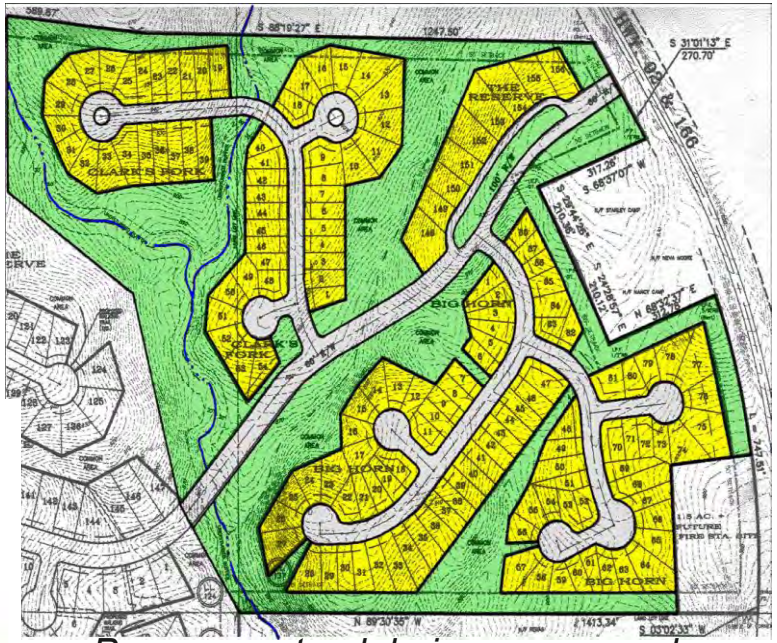
Paradigm Shift – Better Site Design

Build on flatter slopes to preserve natural land





Preserve natural topography of the site



Preserve natural drainageways and stream corridors

"Cookie Cutter" Site Design

Better Site Design

Paradigm Shift - Move from Dry Ponds to Smart Stormwater BMPs

SSFISS

8 BMPs Available

- *Bioretention Areas*
- *Bioslopes*
- *Downspout Disconnects*
- *Dry Detention Basins*
- *Dry Wells*
- *Enhanced Swales*
- *Grass Channels*
- *Gravity Oil/Grit Separators*
- *Green Roofs*
- *Infiltration Practices*

GCSMM

27 BMPs Available

- *Multi-purpose Detention Basins*
- *Organic Filters*
- *Permeable Paver System*
- *Pervious Concrete*
- *Porous Asphalt*
- *Proprietary Systems*
- *Rainwater Harvesting*
- *Regenerative Stormwater Conveyance*
- *Sand Filter*
- *Site Reforestation/Revegetation*
- *Soil Restoration*
- *Stormwater Planters/Tree Boxes*
- *Stormwater Ponds*
- *Stormwater Wetlands*
- *Submerged Gravel Wetlands*
- *Underground Detention*
- *Vegetated Filter Strip*

GCSMM BMP

BMP Also included in SSFISS

Paradigm Shift - Move from Dry Ponds to Smart Stormwater BMPs

SSFISS

- *Dry Detention Basins*
- *Grass Channels*
- *Gravity Oil/Grit Separators*
- *Infiltration Practices*
- *Sand Filter*
- *Stormwater Ponds*
- *Stormwater Wetlands*
- *Vegetated Filter Strip*

Paradigm Shift - Move from Dry Ponds to Smart Stormwater BMPs

SSFISS

- ***Dry Detention Basins***
- *Grass Channels*
- *Gravity Oil/Grit Separators*
- *Infiltration Practices*
- *Sand Filter*
- *Stormwater Ponds*
- *Stormwater Wetlands*
- *Vegetated Filter Strip*

Paradigm Shift - Move from Dry Ponds to Smart Stormwater BMPs

GCSMM

Paradigm Shift - Move from Pounds TSS Removal to Percent Removal

SSFISS

Required maximum 850 lbs/acre/year TSS loading rate

Land Use Distribution & Pollutant Loads:			
Land Use Category	**Area (acres)**	**TSS Rate (lb/ac/yr)**	**Avg Annual TSS Load (lbs)**
Impervious Area (driveways, rooftops, parkinglots,etc)	0.00	4,000	0
Impervious Area (Sq Ft)	0	--	--
Disturbed Pervious Area (lawns, gardens, porous pavement, etc)	0.00	1,200	0
Undisturbed Upland Area (woods, preserves, etc)	0.00	500	0
Undisturbed Stream Buffers	0.00	125	0
Totals	**0.00**		**0**
TSS Loading Rate w/out BMPs (lb/ac/yr):			--
TSS Loading Rate w/ BMPs (lb/ac/yr) :			--
TSS Criterion for New Development(lb/ac/yr):			850

GCSMM

Requires removal of 80% of the TSS from site runoff from the 1.2 inch rain event

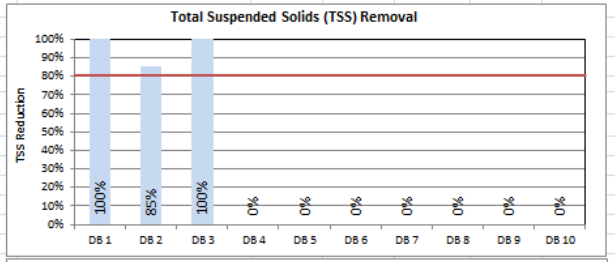
Site Summary

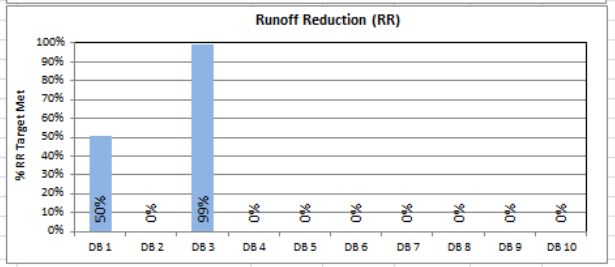
Total Pre-Development Area (ac):	11.00
Total Post-Development Area (ac):	11.00
Total Treated Area (ac):	11.00
Total Untreated Area (ac):	0.00

		I (ac)	P (ac)	CA (ac)
Drainage Basin 1	DB 1	1.90	0.60	0.50
Drainage Basin 2	DB 2	1.90	1.10	0.00
Drainage Basin 3	DB 3	0.00	5.00	0.00
Drainage Basin 4	DB 4	0.00	0.00	0.00
Drainage Basin 5	DB 5	0.00	0.00	0.00
Drainage Basin 6	DB 6	0.00	0.00	0.00
Drainage Basin 7	DB 7	0.00	0.00	0.00
Drainage Basin 8	DB 8	0.00	0.00	0.00
Drainage Basin 9	DB 9	0.00	0.00	0.00
Drainage Basin 10	DB 10	0.00	0.00	0.00
	TOTAL	3.80	6.70	0.50

I - Impervious Area, P - Pervious Area, CA - Conservation Area

Target Runoff Reduction Volume Achieved?	No
Target TSS Removal Achieved?	Yes
Total Target Runoff Reduction Volume (cf)	13,286
Runoff Reduction Volume Achieved (cf)	8,804
Total Target Water Quality Volume (cf)	15,943
% TSS Removal Achieved	95%





Official Use Only

Tracking #:		Conditions of Approval:	
Reviewed By:			
Date Approved:			

A RECORDED CONSERVATION EASEMENT OR SIMILAR FORM OF PROTECTION IS REQUIRED FOR THIS PROJECT

Consequences

Consequences: Training

- Plan Reviewers
- Construction Inspectors
- Contractors
- Long Term Inspectors
- Local Government Stormwater Staff
- Firefighters
- Homeowner’s Associations
- Property Management Firms

Consequences: Workflow Process and Supporting Documentation

- Local Unified Development Ordinance
- Stormwater Management Plan application forms
- Bonding documents
- Landscape Plans
- Stormwater Credits Manual/Forms
- Stormwater Utility Credit Application Forms (ponds to BMPs)

Consequences: Related Document Updates/Development Required

GCSMM Related Documents

- Inspectors field guide
- Stormwater credits manual
- UDO updates
- BMP maintenance guides
- GCSMM update #1

Questions?

Gwinnett

Gwinnett

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Gwinnett County Stormwater Management Manual can be found on our website:
(https://www.gwinnettcounty.com/static/departments/DWR/pdf/GCSMM_1.0.pdf)