CTDOT MS4 Program

DOT District 1, Capital Region COG – April 23, 2019

DOT District 2, Southeast COG – April 4, 2019

DOT District 3, Metro COG – June 5, 2019

DOT District 4, Naugatuck Valley COG – May 14, 2019

CT DOT HQ, Newington, CT – May 20, 2019

CTDOT MS4 Program

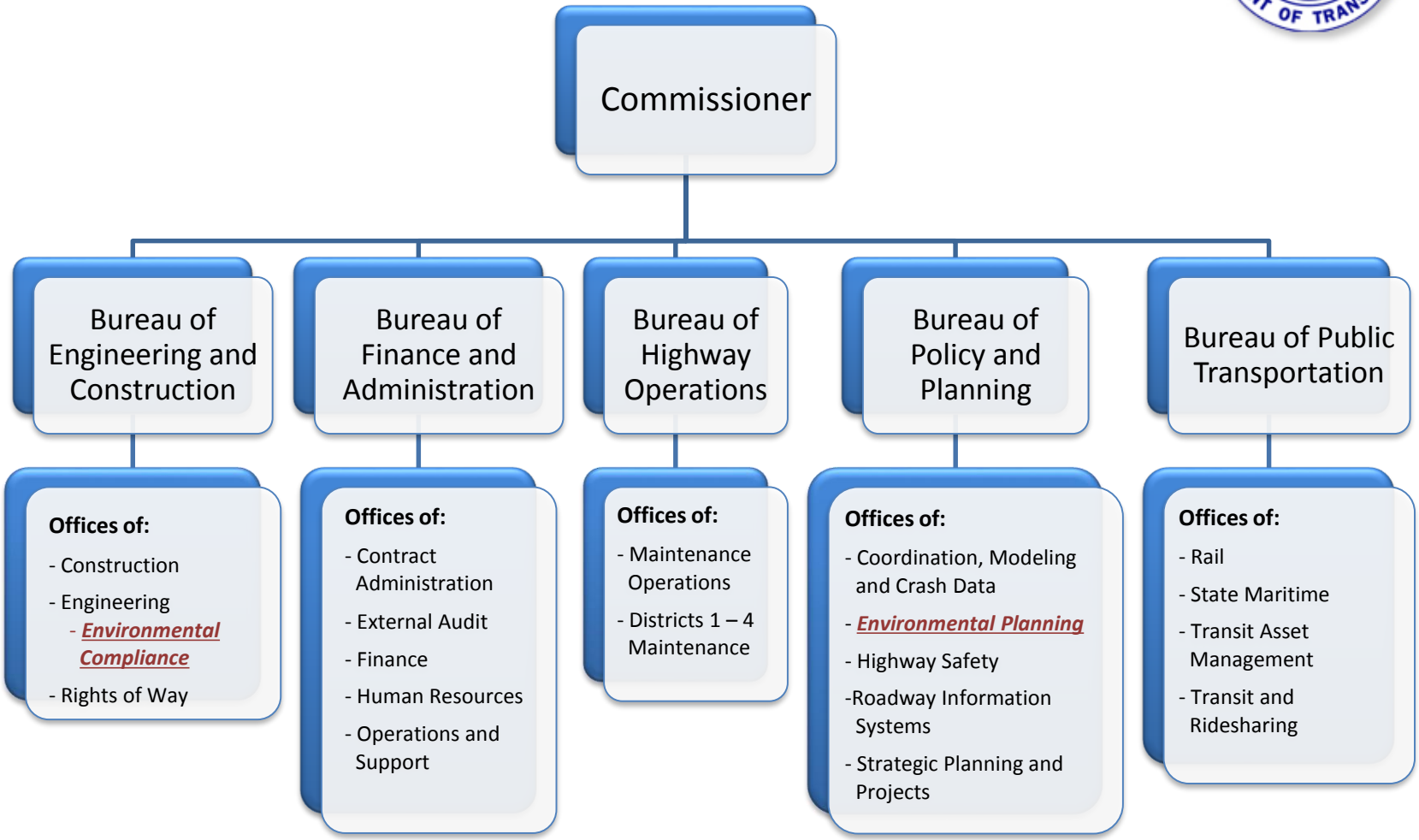
Objectives

- Review Non-Point Source Pollution and MS4 Programs
- Compare DOT & Municipal MS4 Permits
- Explain DOT's Plan to improve runoff from State roads
- Describe the opportunities for DOT & Municipal data sharing
- Inform on how to Comment on DOT's Stormwater Management Plan

Agenda

- CTDOT MS4 Team
- MS4 Basics & DOT Permit Development
- DOT MS4 Permit Overview
- DOT's Stormwater Management Plan
- Impaired Waters & USGS Water Quality Model

CTDOT MS4 Team



CTDOT MS4 Team

Bureau of Engineering and Construction
Office of Engineering
Environmental Compliance

- Adam Fox P.E.
  Transportation Principal Engineer
- Jason Coite P.E.
- Daniel Imig P.E.

Bureau of Policy and Planning
Office of Environmental Planning

- Kim Lesay
  Assistant Planning Director
- Kevin Carifa
- Jeremy Willcox

MS4 Team Email: DOT.MS4@ct.gov

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MS4 Basics

MS4

- Municipal Separate Storm Sewer System
  - A publicly owned stormwater runoff conveyance system
  - Discharges to the waters of the U.S.

NPDES

- National Pollutant Discharge Elimination System
  - Permits issued by EPA or authorized states

Image from the cover of the Wastewater Facilities Plan for the Town of Fairfield, CT. Draft April 2017. Connecticut Council of Environmental Quality. Retrieved from http://www.ct.gov/ceq/lib/ceq/Fairfield_FacilityPlan_Draft_2017-04-17.pdf

MS4 Basics

1972
- Clean Water Act
- NPDES developed to address point source pollution
- Sewage Treatment Plants and Industrial Wastewater

1990
- EPA regulates MS4 Phase I
- NPDES expanded to address non-point source pollution
- Towns/Cities with populations >100,000

1999
- MS4 Phase II
- Towns/Cities with populations <100,000 (Small MS4's)
- Non-Traditional MS4s

2004
- CT DEEP issued Small MS4 General Permit
- 113 Towns/Cities

MS4 Basics

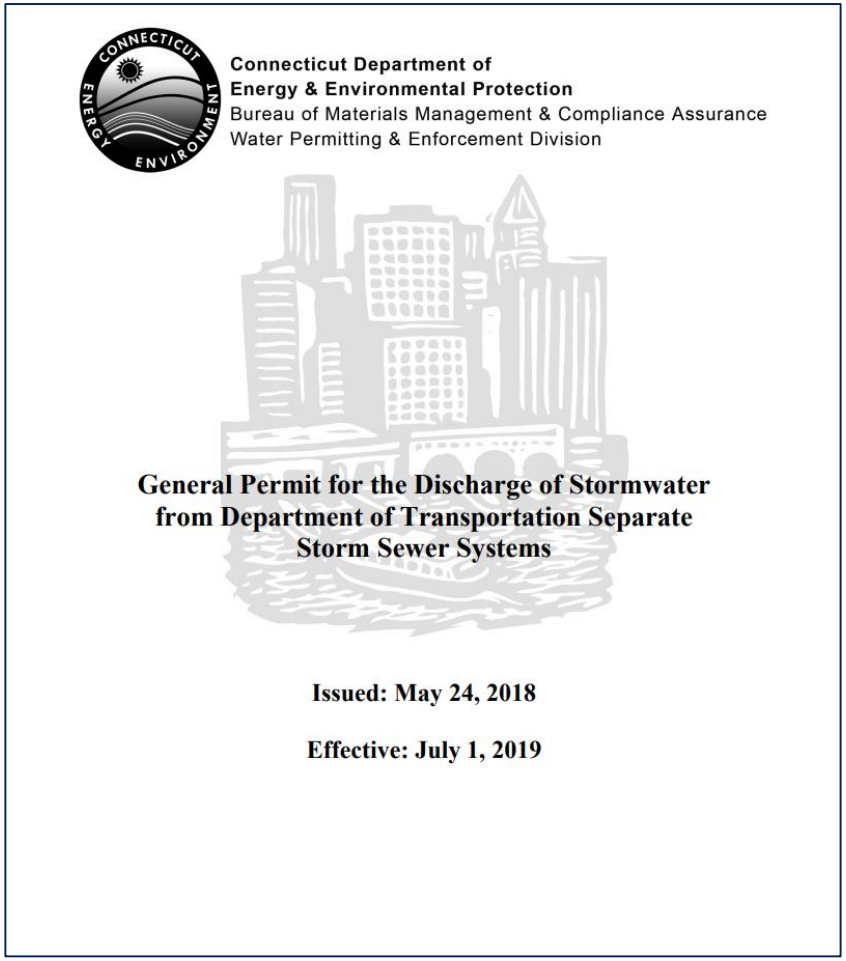
2016	• Draft DOT MS4 General Permit published for public comment
May 2018	• CT DEEP issues Final DOT MS4 General Permit
April 1 2019	• DOT Stormwater Management Plan published for public comment *(Available here: www.ct.gov/dot/ctdot-ms4)*
July 2019	• Effective Date for the DOT MS4 General Permit

MS4 Basics

- Examples of Non-Point Source Pollution
  - Septic Systems
  - Fertilizers
  - Erosion
  - Grass / Leaves
  - Pet Waste
  - Motor Oil
  - Trash
  - Detergents

CTDOT Photo

DOT MS4 Permit Development


Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit for the Discharge of Stormwater from Department of Transportation Separate Storm Sewer Systems

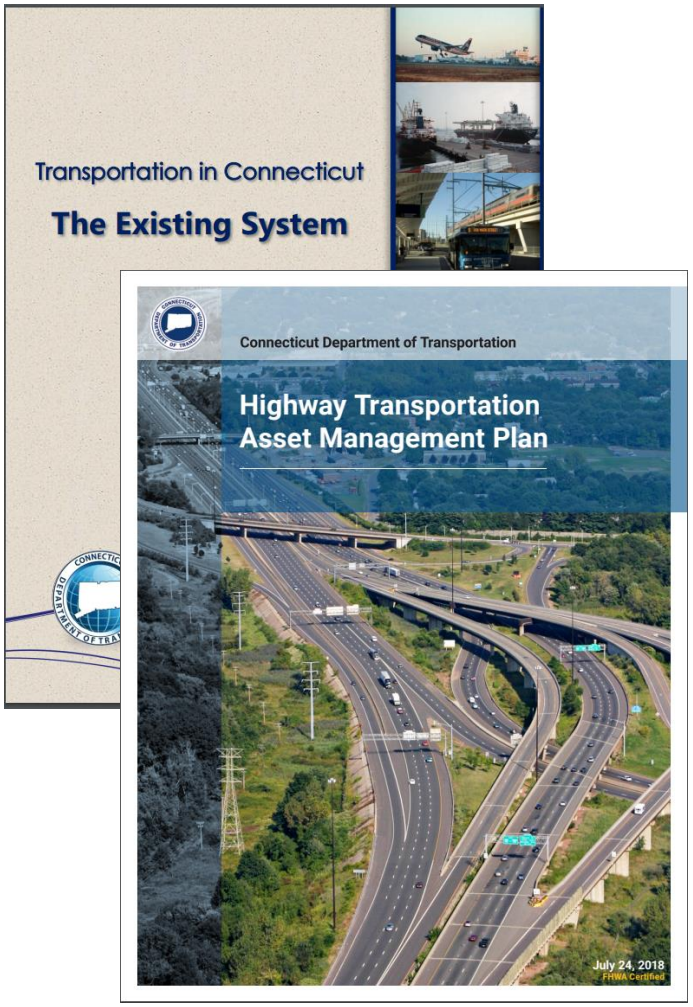
Issued: May 24, 2018

Effective: July 1, 2019

- CTDOT is considered as a non-traditional municipality
- The DOT MS4 permit
  - Based on the Small MS4 General Permit
  - A General Permit for one permittee

DOT MS4 Permit Development

- DOT Maintained Assets Include:
  - 3,719 Centerline Miles
    - Approximately 9,800 Lane Miles
  - 4,016 Bridges
  - 180 Commuter Parking Lots
  - 15 Rest Areas and Service Plazas
  - Over 250 Miles of Railroad ROW
  - 4 Rail Facilities
- Other DOT facilities covered under Commercial or Industrial Stormwater General Permits



DOT MS4 Permit Development

- DOT's financial constraints are similar to many municipalities…relative to scale
- As a new regulatory requirement, DOT requested MS4 funding from the State Legislature
- No funding for FY2019
- Funding for FY2020 TBD

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DOT MS4 Permit Overview

- Six Minimum Control Measures (MCMs)
  1. Public Outreach & Education
  2. Public Involvement / Participation
  3. Illicit Discharge Detection & Elimination
  4. Construction Site Stormwater Runoff Control
  5. Post Construction Stormwater Management
  6. Pollution Prevention / Good Housekeeping
- Plus, outfall monitoring requirements

Grassed Channel (Biofilter Swale). Structural BMP Specifications for the Massachusetts Stormwater Handbook. Vol. 2 Chap. 2. Massachusetts Department of Environmental Protection. Retrieved from https://www.mass.gov/files/documents/2016/08/qi/v2c2.pdf

DOT MS4 Permit Overview

Comparing the CT Municipal and DOT MS4 Permits

- Four of the six Minimum Control Measures are substantially unchanged from the Municipal Permit
  - MCM 1 – Public Outreach & Education
  - MCM 2 – Public Involvement/Participation
  - MCM 4 – Construction Storm-water Runoff Control
  - **MCM 6 – Good Housekeeping/ Pollution Prevention**

CTDOT Photo

DOT MS4 Permit Overview

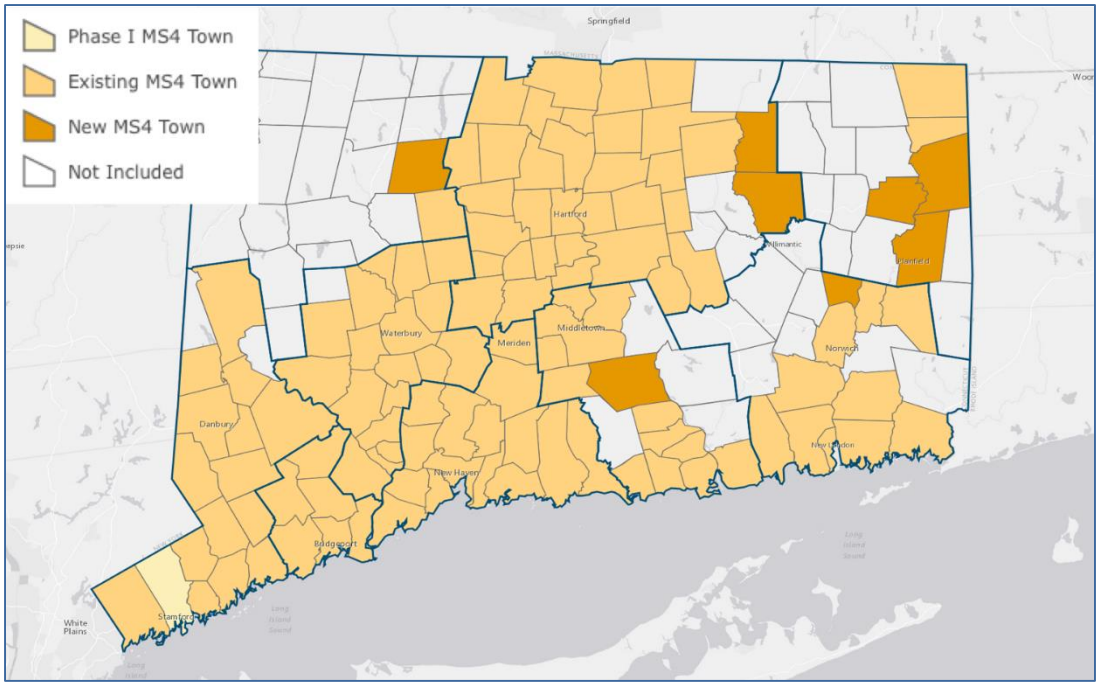
Comparing the CT Municipal and DOT MS4 Permits

- Two Minimum Control Measures have many similarities but with notable differences
  - MCM 3 – Illicit Discharge Detection and Elimination
  - MCM 5 – Post-Construction Stormwater Management

DOT MS4 Permit Overview

- 121 municipalities are regulated under the Small MS4 General Permit
- 113 municipalities since 2004

Comparing the CT



CT MS4 Municipalities. University of Connecticut Center for Land Use Education and Research and CT Nonpoint Education for Municipal Officials. Retrieved from https://nemo.uconn.edu/ms4/basics/towns-institutions.htm

DOT MS4 Permit Overview

Comparing the CT Municipal and DOT MS4 Permits

Permit Term

Phase II Municipalities	DOT
July 1, 2017 to	July 1, 2019 to
June 30, 2022	June 30, 2024

DOT MS4 Permit Overview

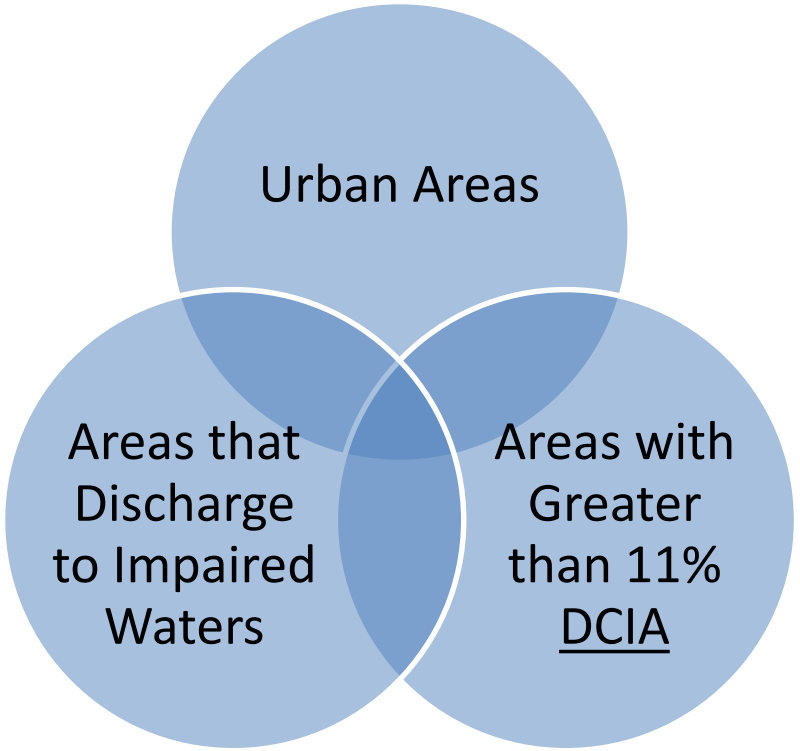
Comparing the CT Municipal and DOT MS4 Permits

- Legal Authority
  - DOT lacks authority to regulate land use and development
- Mapping Deadlines
  - Extends other permit requirements that are reliant on mapping
- Impaired Waters Outfall Monitoring
  - Continuous sampling at limited number of sites
  - Computer modeling impacts of roadway drainage

USGS Photo

DOT MS4 Permit Overview

MS4 Priority Areas



Directly Connected Impervious Area

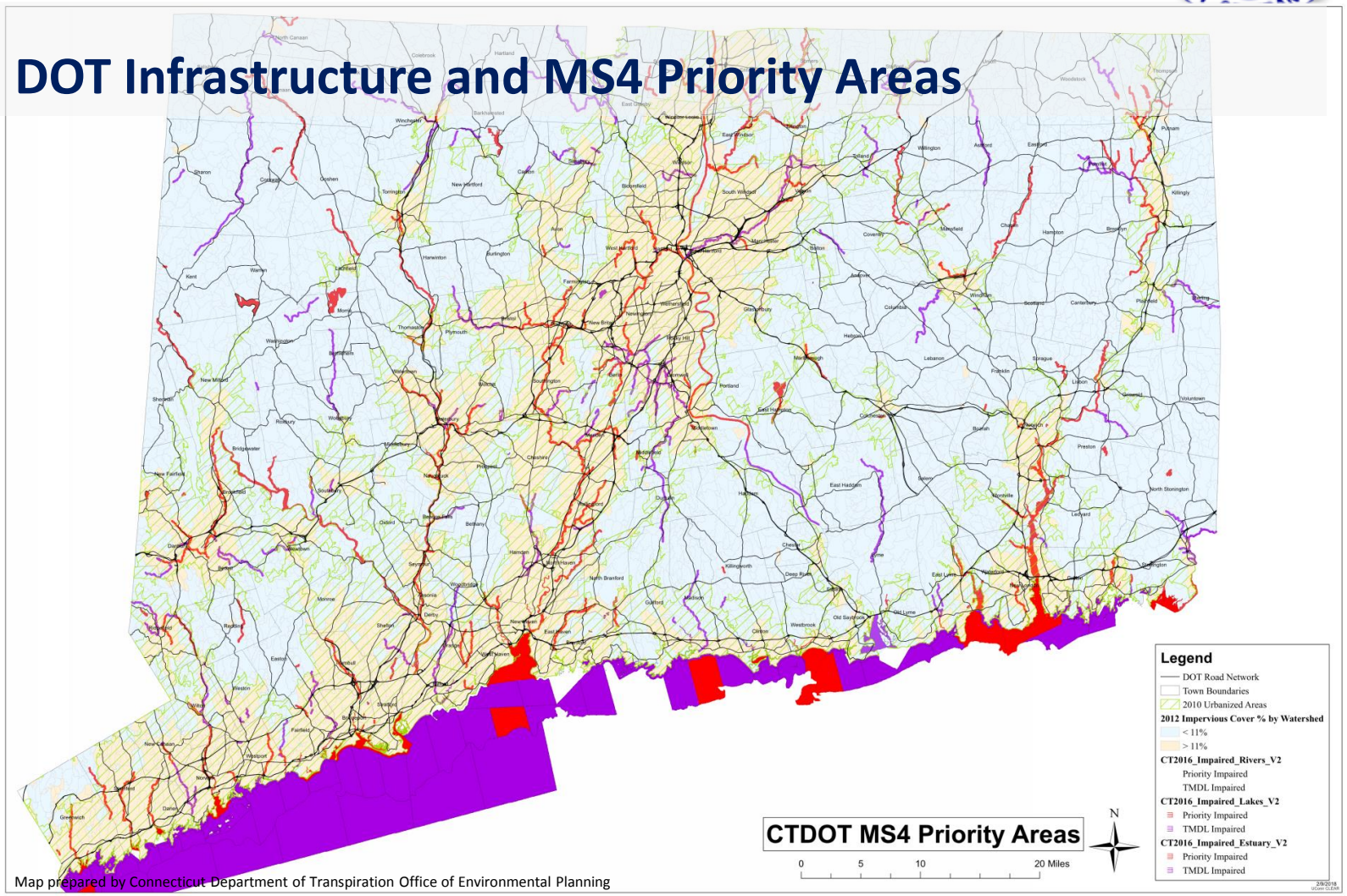
Retrieved from UCONN NEMO "What Type of Impervious Cover do you Have?"
https://nemo.uconn.edu/ic-guide/step2-type.htm

Disconnected Impervious Area

Retrieved from UCONN NEMO "What Type of Impervious Cover do you Have?"
https://nemo.uconn.edu/ic-guide/step2-type.htm

DOT MS4 Permit Overview

DOT Infrastructure and MS4 Priority Areas



Map prepared by Connecticut Department of Transpiration Office of Environmental Planning

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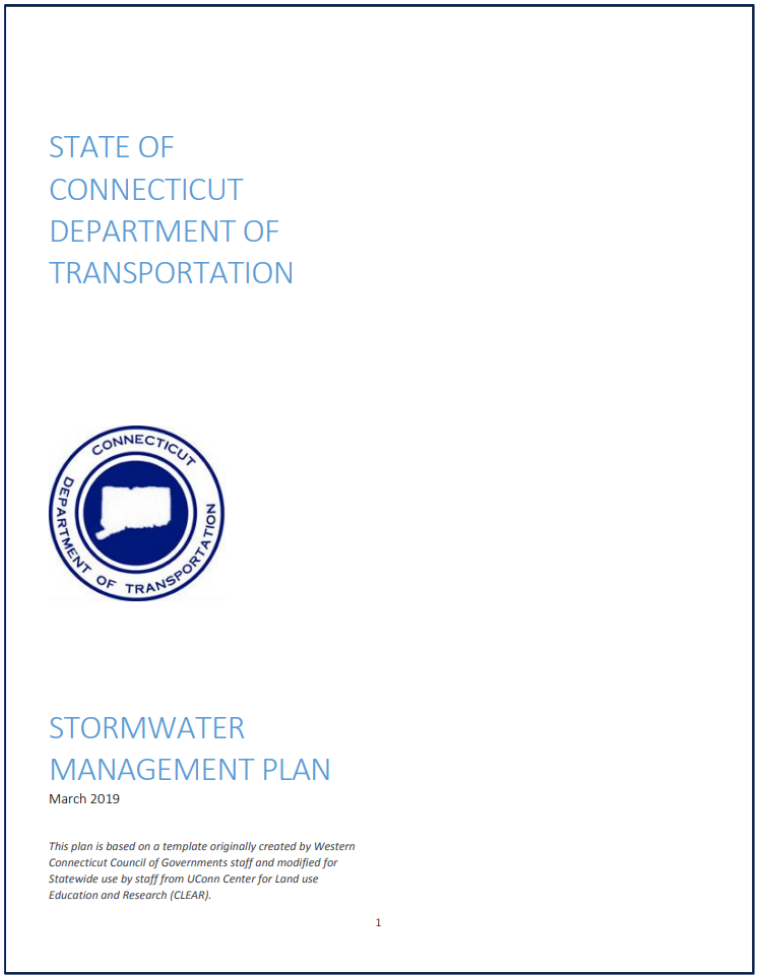
DOT's Stormwater Management Plan

SWMP

- DOT's plan on implementing its MS4 Program
- Lists the best practices to be implemented to meet permit requirements
- Plan can be found here: *www.ct.gov/dot/ctdot-ms4*
- Comments on the plan can be sent to: DOT.MS4@ct.gov
- Comment deadline is 6/30/19


STATE OF
CONNECTICUT
DEPARTMENT OF
TRANSPORTATION

STORMWATER
MANAGEMENT PLAN

March 2019

This plan is based on a template originally created by Western Connecticut Council of Governments staff and modified for Statewide use by staff from UConn Center for Land use Education and Research (CLEAR).

1

MCM 1 – Public Outreach & Education

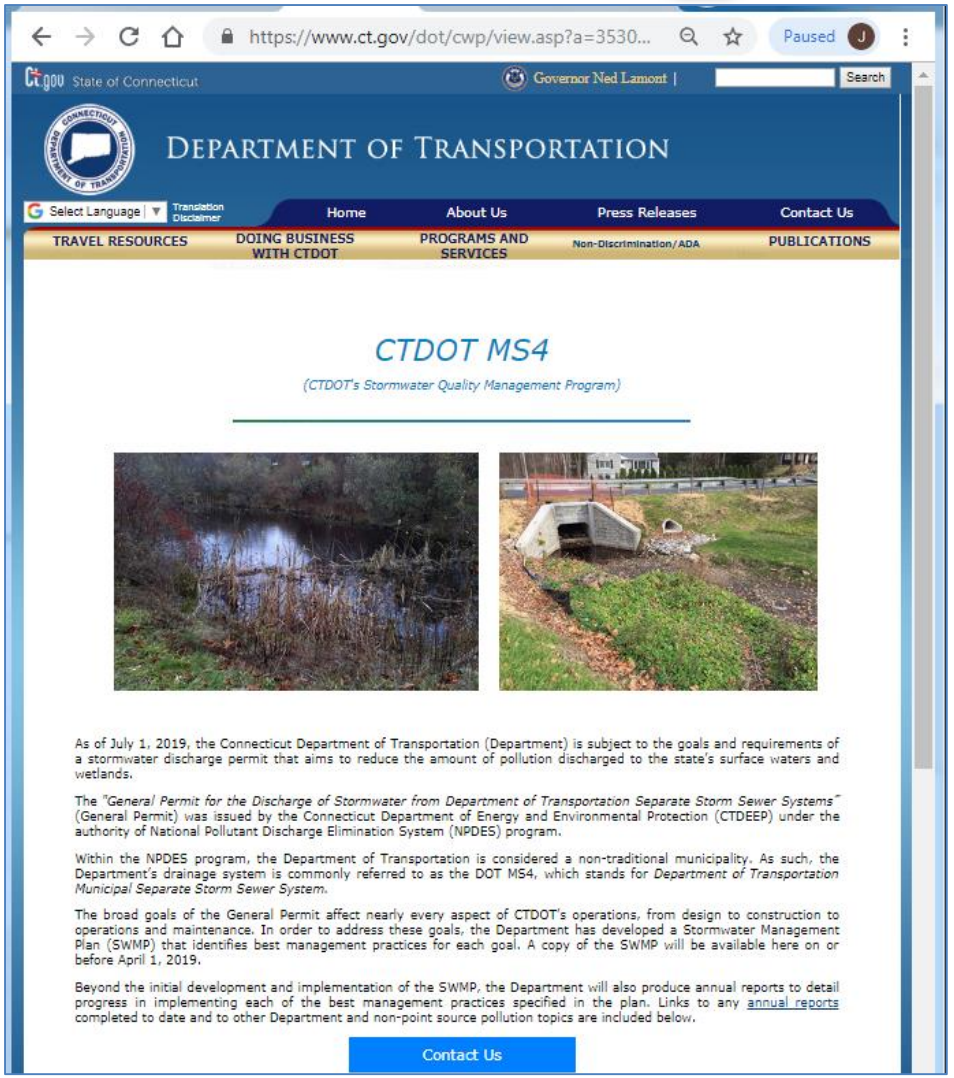
BMP ID	Deadline	Activity	Responsible Position	Measurable Goal
MCM1.1	June 30, 2021	Implement a Public Education Program	Bureau Chief of Policy & Planning	Program(s) developed and implemented
MCM1.2	June 30, 2021	Distribute non-point source educational materials at DOT public meetings	Bureau Chief of Policy & Planning	Track meetings where materials are distributed
MCM1.3	**June 30, 2021**	**Develop Dedicated MS4 Webpage on DOT Website**	**Bureau Chief of Policy & Planning**	☑

MCM 1 – Public Outreach & Education

Information on CTDOT's

MS4 Program

www.ct.gov/dot/ctdot-ms4



MCM 2 – Public Involvement & Participation

BMP ID	Task Deadline	Activity	Responsible Position	Measurable Goal
MCM2.1	Annually by July 30th	Provide Public Notice of Annual Reports	Bureau Chief of Policy & Planning	Publication of annual notices

- Public notice to be provided in multiple ways including:
  - Posting on *www.ct.gov/dot/ctdot-ms4*
  - Sending notification to MS4 listserv
    - Go to: https://nemo.uconn.edu/ms4/ (Link at bottom of the page)

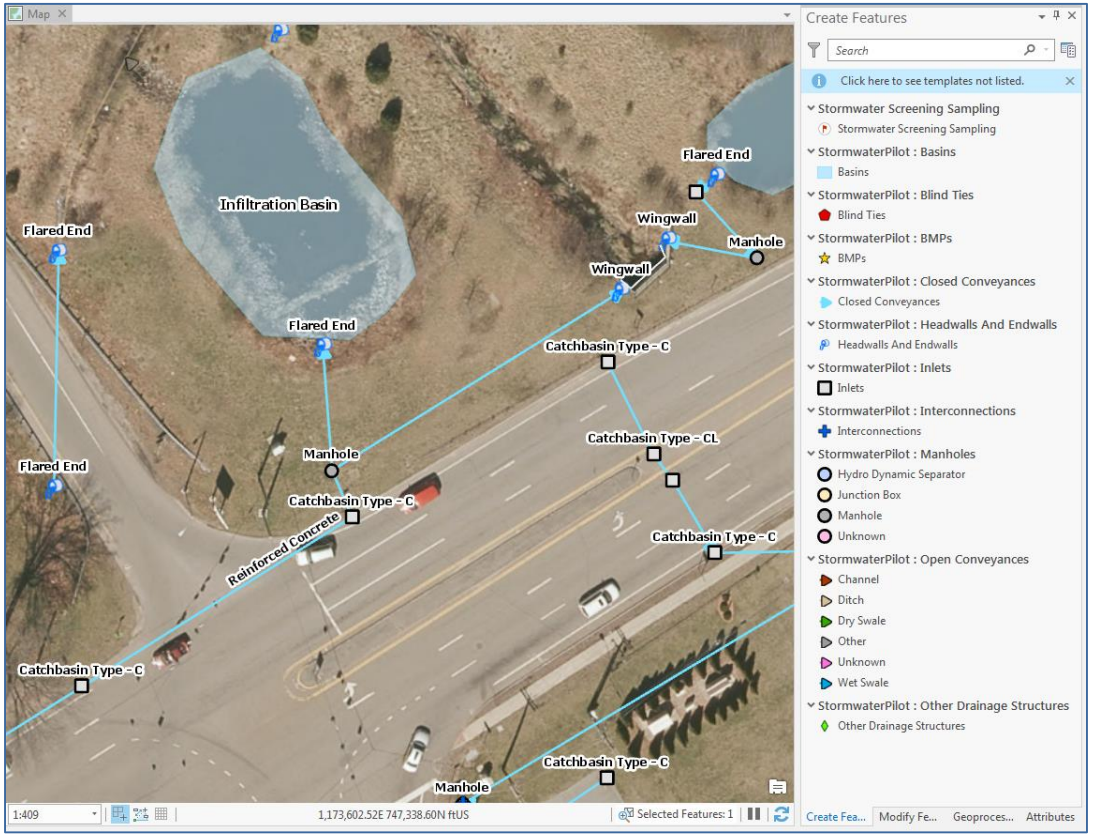
MCM 3 – IDDE

BMP ID	Deadline	Activity	Responsible Position(s)	Measurable Goal
MCM3.6	**June 30, 2024**	**Identify and map 50% of DOT's MS4 System in Priority Areas**	**Bureau Chief(s) – Engineering and Construction, Policy & Planning, Maintenance, Public Transit**	**50% of Mapping Completed**
MCM3.7	June 30, 2024	Screen and sample all mapped outfalls and key interconnection points	Environmental Compliance	Completion of screenings and/or samplings for mapped outfalls and interconnections
MCM3.8	June 30, 2021 & Annually	Provide annual IDDE training to employees	Bureau Chief(s) – Engineering and Construction, Policy and Planning, Maintenance, Public Transit	Trainings completed

MCM 3 - IDDE

Mapping DOT's Stormwater System

- Starting from scratch
- Mapping Standardization
  - COG's GIS Standards Committee
  - DOT schema will be the basis of the State Standard
- Long-term: Sharing MS4 interconnection data with municipalities



Screenshot of CTDOT GIS Stormwater Map Beta Test

MCM 4 – Construction Stormwater

BMP ID	Deadline	Activity	Responsible Position(s)	Measurable Goal
MCM4.3	July 1, 2019	Develop and implement a plan outlining how all DOT Offices with jurisdiction over land disturbance and development projects will coordinate their functions	Bureau Chief - Engineering & Construction	Plan development and implementation
MCM4.4	**July 1, 2019**	**Conduct a site plan review or confirm that a site plan review was completed by the appropriate authority**	**Bureau Chief - Engineering & Construction**	**Standard practice established to verify reviews are completed**

MCM 5 – Post-Construction Stormwater

BMP ID	Task Deadline	Activity	Responsible Position(s)	Measurable Goal
MCM5.3	**June 30, 2022**	**Implement runoff reduction for DOT development and redevelopment projects**	**Bureau Chief(s) – Policy & Planning, Engineering & Construction**	**Documented runoff reduction/LID implementation for DOT projects**
MCM5.4	**June 30, 2024**	**Calculate DCIA for DOT's MS4 catchment areas (those that have been mapped for MCM3 - IDDE)**	**Bureau Chief - Engineering & Construction**	**Report %-DCIA for DOT's mapped catchment areas**
MCM5.5	June 30, 2022	Implement a plan to ensure long term maintenance of stormwater management facilities	Bureau Chief(s) – Maintenance, Engineering & Construction	Plan development and implementation

MCM 5 – Post Construction Stormwater

Examples of Stormwater BMPs

Vegetated Swale

Photo of a Vegetated Swale. Win-brook Office Park, Brook Street Rocky Hill, CT. National Low Impact Developed (LID) Atlas Retrieved from: http://lidmap.uconn.edu/

Rain Gardens and Pervious Pavers

Photo of rain gardens and pervious pavers along Main Street, Bridgeport, CT. National Low Impact Developed (LID) Atlas
Retrieved from: http://lidmap.uconn.edu/

MCM 5 – Post Construction Stormwater

Examples of Stormwater BMPs

Bioretention System

Bioretention System at lower Horne Street. Image taken from pg. 10 of Berry Brook Watershed Implementation Plan by the City of Dover, NH and UNH Stormwater Center. Retrieved from: https://www.dover.nh.gov/Assets/government/city-operations/2document/community-services/current-projects/Berry%20Brook%20Watershed%20Plan.pdf

Bioswales

Photo of bioswales at Richmond Parkway along Contra Costa 80, CA. Best Management Practices(BMPs) Examples. California Department of Transportation. Retrieved from http://www.dot.ca.gov/design/hsd/bmp/examples.html#biofiltration

MCM 5 – Post Construction Stormwater

Examples of Stormwater BMPs

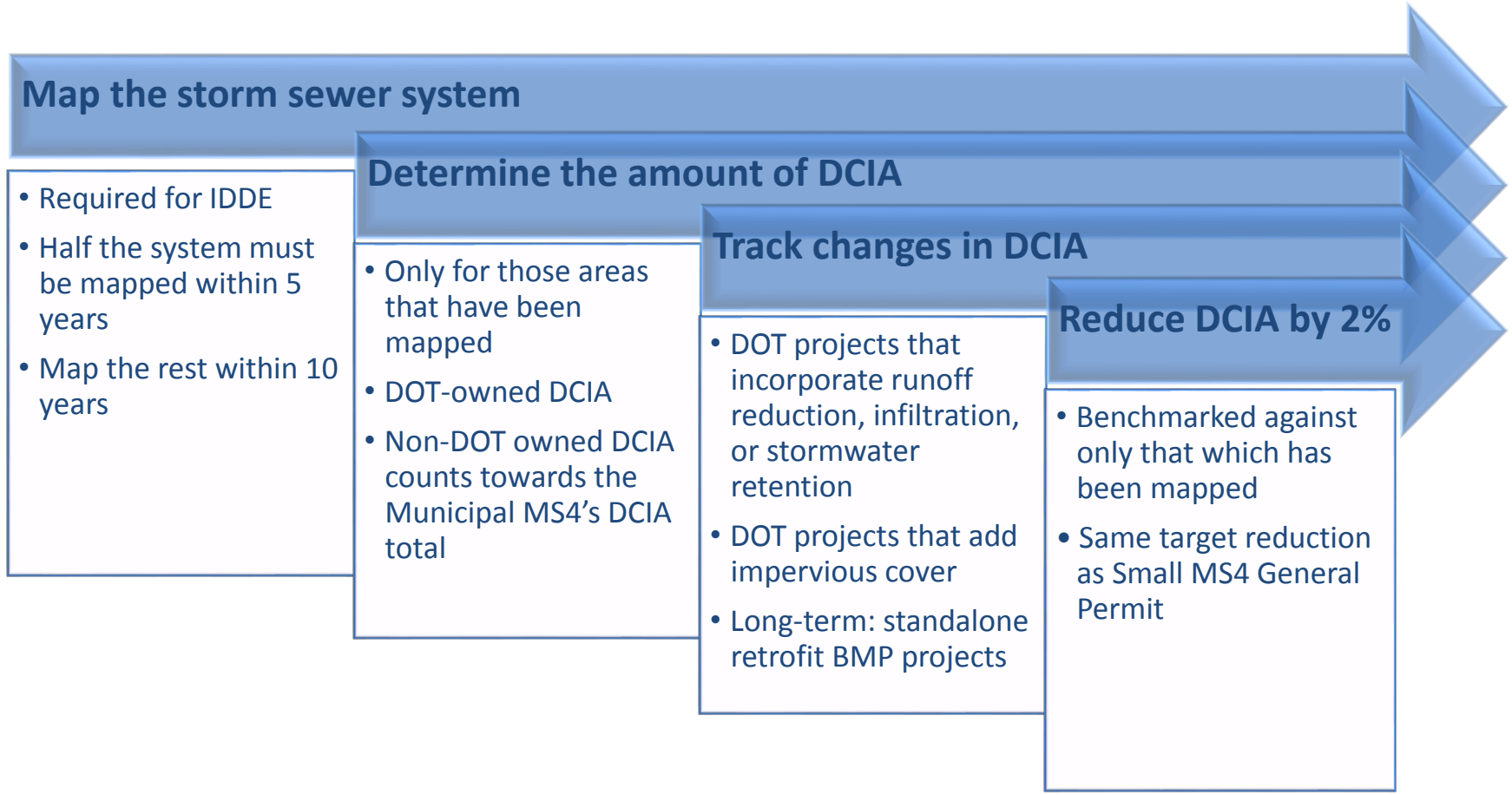
Enhanced Dry Swale

Georgia Stormwater Management Manual [GSMM], Volume 2. Retrieved from https://cdn.atlantaregional.org/wp-content/uploads/2017/03/gsmm-2016-final.pdf

Post-Construction Wet Pond

Image taken from cover of Stormwater Wet Pond and Wetland Management Guidebook, Feb. 2009. U.S.EPA. Retrieved from https://www.epa.gov/sites/production/files/2015-11/documents/pondmgmtguide.pdf

DCIA – Mapping, Tracking & Reductions



MCM 6 – Good Housekeeping / Pollution Prevention

BMP ID	Task Deadline	Activity	Responsible Position(s)	Measurable Goal
MCM6.6	July 1, 2019	Develop and implement sweeping program	Bureau Chief Maintenance	Sweeping activities documented and reported
MCM6.7	July 1, 2019	Develop plan to optimize catch basin cleaning	Bureau Chief Maintenance	Plan developed
MCM6.8	July 1, 2022	Inspect and clean (where necessary) catch basins	Bureau Chief Maintenance	Catch basins mapped, inspected and prioritized

Street Sweeping

- CTDOT has an existing street-sweeping program
- Developing a GIS-application will improve efficiency
  - Track progress
  - Prioritize problem areas

- CTDOT has limited number of street sweepers
- FY19 and FY20 funding requests for additional street sweepers not approved

Catchbasin Cleaning

- CTDOT has an existing catch-basin cleaning program
- Developing a GIS-application will improve efficiency
  - Track progress
  - Prioritize problem catchments
  - Mapping drainage system
- CTDOT has limited number of vacuum trucks
- Request for funding for additional vacuum trucks not approved for FY19 or FY20


CTDOT Photo

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Impaired Waters Monitoring

USGS will monitor 9 representative outfalls

- Locations were selected based on land use, impervious area, and traffic
- 2 years of continuous monitoring for each out-fall

CTDOT Photo of USGS building an outfall monitoring station in Glastonbury

Impaired Waters Monitoring

- In addition, each outfall sampled 15 to 18 times
  - 18 constituents in the Small Municipality MS4 permit
  - Plus 26 additional analytes
- Sampling results will be added to FHWA stormwater runoff database
- Monitoring and sampling results to be used in USGS's model for predicting roadway impacts to water quality

USGS Water Quality Model

S.E.L.D.M.

- **S**tochastic **E**mpirical **L**oading **D**ilution **M**odel
- Highway Runoff Quality Model
  - Developed by USGS with the FHWA
  - Utilized by other DOTs
    - Washington
    - Oregon
    - Colorado
    - Massachusetts

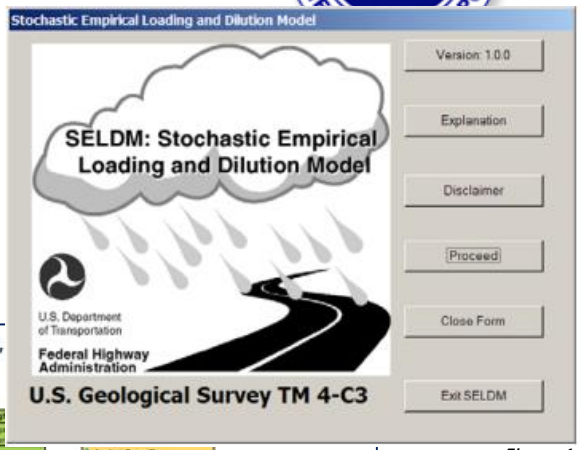

Figure 1

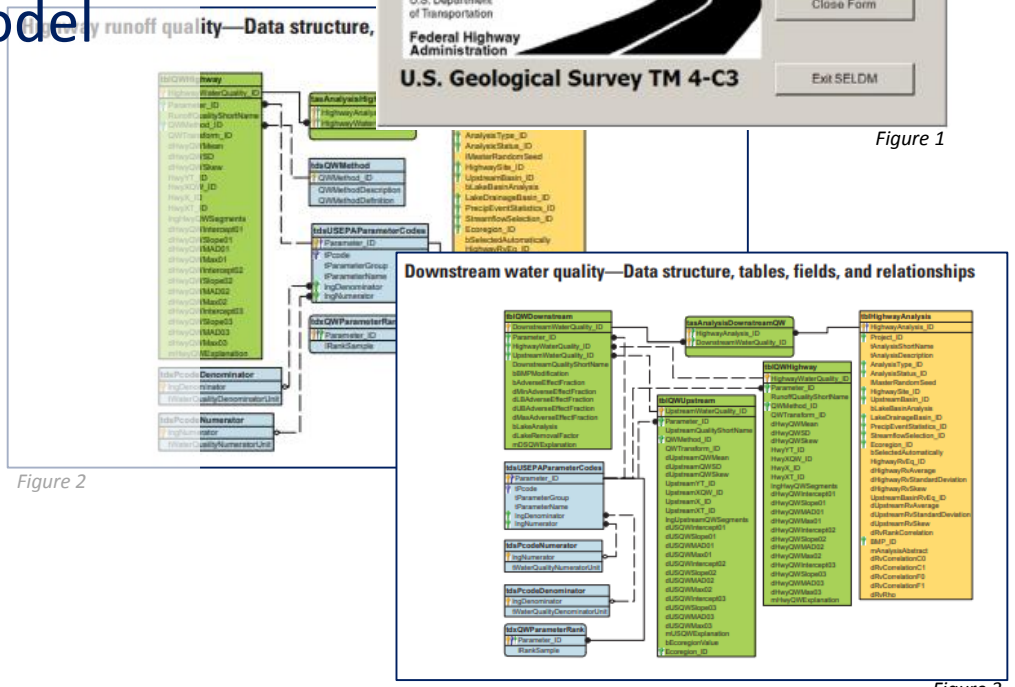

Figure 2

Figure 3

Figure 1 – SELDM Opening form. Stochastic Empirical Loading and Dilution Model (SELDM) Version 1.0.0-Appendix 4. Navigating the Graphical User Interface. U.S. Geological Survey Techniques and Methods 4–C3. Retrieved from https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_508_files/tm4-C3_apdx4_v030813.pdf

Figure 2 – Highway runoff quality—Data structure, tables, fields, and relationships. Stochastic Empirical Loading and Dilution Model (SELDM) Version 1.0.0—Appendix 3. Selected relational diagrams showing the structure of the database U.S. Geological Survey Techniques and Methods 4–C3. Retrieved from https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_508_files/tm4-C3_apdx3_plate_v022513.pdf

Figure 3 – Downstream water quality—Data structure, tables, fields, and relationships. Stochastic Empirical Loading and Dilution Model (SELDM) Version 1.0.0—Appendix 3. Selected relational diagrams showing the structure of the database U.S. Geological Survey Techniques and Methods 4–C3. Retrieved from https://pubs.usgs.gov/tm/04/c03/tm4-C3_final_508_files/tm4-C3_apdx3_plate_v022513.pdf

USGS Water Quality Model

SELDM: How will it be used?

- SELDM to be run on all mapped outfalls by the end of the permit term
  - Schedule tied to mapping
- Evaluate DOT's impact on a receiving waterbodies
- Model results will be used as basis for follow up investigations and implementation of BMPs
- Model will be used to develop Retrofit Program

DOT's Stormwater Management Plan

- Stormwater Management Plan can be found here: ***www.ct.gov/dot/ctdot-ms4***
- Comments on the plan can be sent to: **DOT.MS4@ct.gov**
- Comment period ends June 30, 2019

Questions ?

DOT.MS4@ct.gov