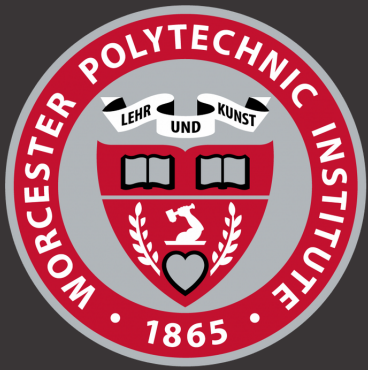


MS4 MAPPING INTEGRATION
GUIDANCE DOCUMENT
FOR CMRSWC COMMUNITIES



WPI



CENTRAL
MASSACHUSETTS
REGIONAL
STORMWATER
COALITION

massDOT
Massachusetts Department of Transportation



THE ROAD TO IMPROVED
INTEGRATION WITH THE
MASSDOT

PURPOSE

THE INTENT OF THIS GUIDANCE DOCUMENT IS TO ASSIST **CMRSWC** MUNICIPALITIES IN IMPROVING THEIR RELATIONSHIP AND DATA INTEGRATION WITH THE **MASSDOT** IN MEETING THE REQUIREMENTS OF THE **MASSACHUSETTS SMALL MS4 GENERAL PERMIT**

CREATED THROUGH A CASE STUDY WITH 3 **CMRSWC** MUNICIPALITIES

DEVELOPED AS PART OF AN **INTERACTIVE QUALIFYING PROJECT** AT **WORCESTER POLYTECHNIC INSTITUTE**

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CONTENTS

ACQUIRE MASSDOT DATA

PG. 4

A STEP-BY-STEP GUIDE ON HOW TO USE THE MASSDOT'S GIS DATABASE TO ACQUIRE THEIR DRAINAGE DATA

INCREASE MAP READABILITY

PG. 5

A RECOMMENDATION FOR CONDENSING INFRASTRUCTURE INTO THE MASSDOT'S CLASSES & SYMBOLOGY & COLOR CODING BY OWNERSHIP

INFRASTRUCTURE

PG. 7

DEFINITIONS AND CLARIFICATIONS ON THE SPECIFIC TYPES OF INFRASTRUCTURE THAT FALL WITHIN THE MASSDOT'S CONDENSED CLASSES

ATTRIBUTES

PG. 9

A RECOMMENDATION FOR FIELDS TO INCLUDE IN EACH INFRASTRUCTURE CLASS

CONTACTING THE MASSDOT

PG. 12

THE POINT CONTACT FOR MS4 MAPPING NEEDS AT THE MASSDOT

EDUCATIONAL RESOURCES

PG. 13

A LIST OF EDUCATIONAL RESOURCES RELATED TO ARCGIS AND INFRASTRUCTURE

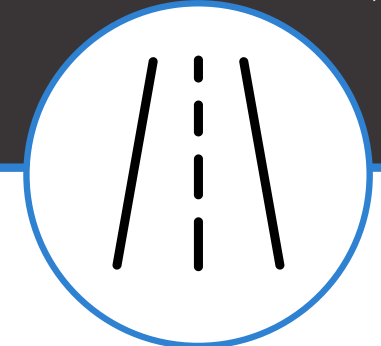


ACQUIRE MASSDOT DATA

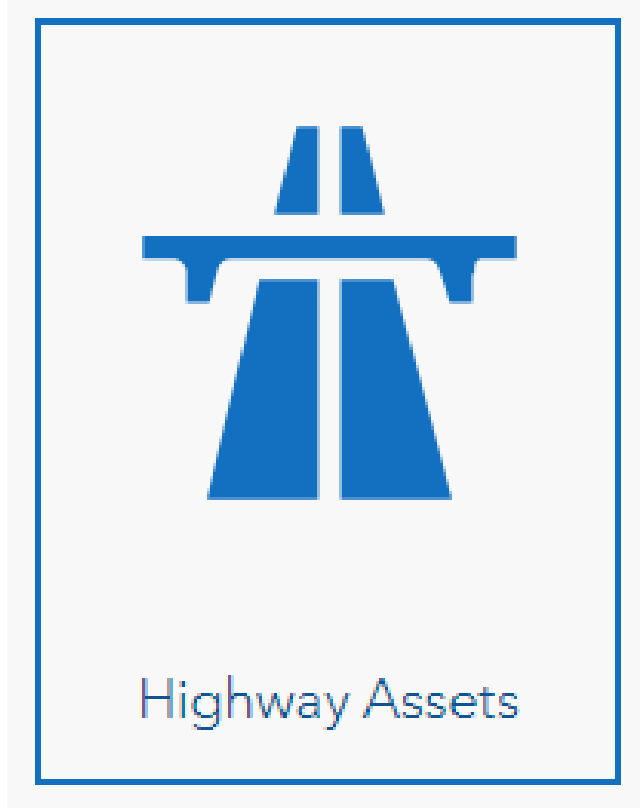
GEODOT: THE MASSDOT'S PUBLIC GIS DATABASE



VISIT THE **GEODOT** 
WEBSITE



**NAVIGATE TO
HIGHWAY ASSETS**

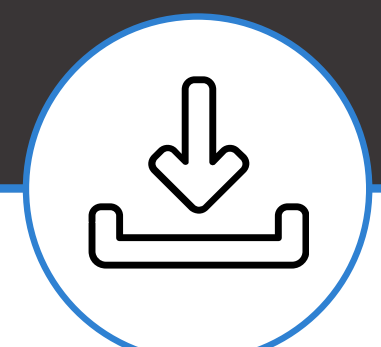


APPLY
"STORMWATER" TAG

Tags ^

stormwater x

- roads
- highways
- road inventory
- sidewalks
- ADT



**DOWNLOAD THE
FILES:**

- STORMWATER CONTROL MEASURE
- INLET
- STORMWATER DISCHARGE POINT
- CONVEYANCE
- MISCELLANEOUS STRUCTURE
- MANHOLE




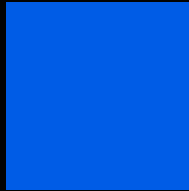
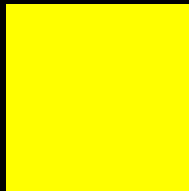
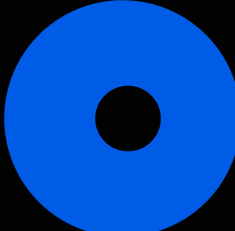
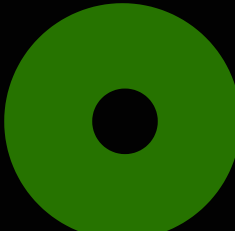
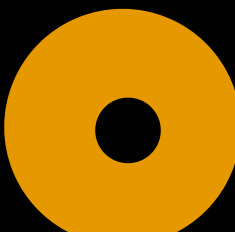
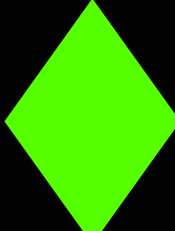
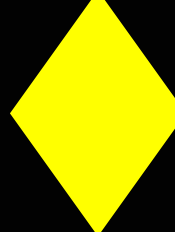

**IMPORT FILES INTO
ARCGIS**



INCREASE MAP READABILITY





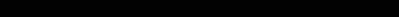


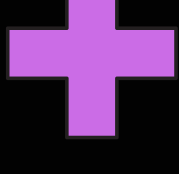

STEP 1: CONDENSE
INFRASTRUCTURE
SYMBOLOLOGY

STEP 2: COLOR CODE
INFRASTRUCTURE BY
OWNERSHIP

INFRASTRUCTURE	SYMBOL	TOWN HTML COLOR CODE	STATE HTML COLOR CODE
STORMWATER CONTROL MEASURE		#FDFDA7	#FFFF00
INLET			
INLET		#77C3EC	#005CE6
OUTLET CONTROL STRUCTURE		#FDFDA7	#FFFF00
MANHOLE			
DRAINAGE		#77C3EC	#005CE6
COMBINED SEWER		#689F38	#267300
OTHER		#FFBD59	#689F38
STORMWATER DISCHARGE POINTS			
STANDARD OUTFALL		#CCFF90	#55FF00
OUTLET TO SCM		#FDFDA7	#FFFF00
OTHER		#FFBD59	#689F38

INCREASE MAP READABILITY

CONTINUED

INFRASTRUCTURE	SYMBOL	TOWN HTML COLOR CODE	STATE HTML COLOR CODE
INTERCONNECTIONS		#CCFF90	#55FF00
CONVEYANCES PIPE SWALE/DITCH UNDERDRAIN OTHER	   	#77C3EC #CCFF90 #FF7777 #FFBD59	#005CE6 #55FF00 #FF1616 #689F38
MISC. STRUCTURES SEDIMENT FOREBAY CHECK DAM AUXILIARY SPILLWAY OTHER	   	#FF7777 #77C3EC #DBB2E6 #FFBD59	#FF1616 #005CE6 #CB6CE6 #689F38



INFRASTRUCTURE DEFINITIONS

STORMWATER CONTROL MEASURE

ALL STORMWATER MANAGEMENT PRACTICES OR FACILITIES

- BIORETENTION AREAS, CONSTRUCTED STORMWATER WETLANDS, AND GRAVEL AREAS

INLET

INLET

POINT WHERE STORMWATER RUNOFF ENTERS MS4

- CATCH BASINS, DROP INLETS, GUTTER INLETS, CURB INLETS, AND YARD DRAINS

OUTLET CONTROL
STRUCTURE

ANY ADDITIONAL DRAINAGE CONTROL STRUCTURES

MANHOLE

DRAINAGE

ALL MANHOLES

- UTILITY TYPE MUST BE CONFIRMED IF NOT DRAINAGE

MANHOLE TYPE

COMBINED SEWER

MANHOLE TYPE

OTHER

MANHOLE TYPE

STORMWATER DISCHARGE POINTS

STANDARD
OUTFALL

POINT WHERE STORMWATER RUNOFF EXITS MS4

END OF DRAINAGE SYSTEM OR DISCHARGE TO WATERBODY

OUTLET TO SCM

DISCHARGE POINTS THAT EMPTY INTO SCMS

OTHER

ADDITIONAL DISCHARGE POINTS FROM OPEN CONVEYANCES

- EX: HEADWALLS, FLARED-END SECTIONS, PIPE ENDS, SWALE ENDS, PAVED WATERWAYS, AND SCUPPERS

INFRASTRUCTURE DEFINITIONS

CONTINUED

INTERCONNECTIONS

POINT WHERE MASSDOT AND MUNICIPAL
MS4S INTERCONNECT

CONVEYANCES

THE PATH OF STORMWATER FLOW
• BOTH OPEN AND CLOSED
CONVEYANCES
CONVEYANCE TYPE

PIPE

SWALE/DITCH

CONVEYANCE TYPE

UNDERDRAIN

CONVEYANCE TYPE

OTHER

CONVEYANCE TYPE

MISC. STRUCTURES

MISCELLANEOUS STORMWATER ASSETS

SEDIMENT
FOREBAY

MISC. STRUCTURE TYPE

CHECK DAM

MISC. STRUCTURE TYPE

AUXILIARY
SPILLWAY

MISC. STRUCTURE TYPE

OTHER

MISC. STRUCTURE TYPE

ATTRIBUTES

TIER 1: REQUIRED FIELDS FOR INTEGRATION

STORMWATER CONTROL MEASURE

- SCM TYPE
- OWNED BY
- MAINTBY
- SOURCE OF DATA
- PROJECT NUMBER
- PROJECT NAME

INLET

- LOCATION
- INLET TYPE
- COVER TYPE
- DATA SOURCE
- OWNED BY
- MANAGED BY
- DIAMETER
- ELEVATION

MANHOLE

- LOCATION
- COVER TYPE
- UTILITY TYPE
- NUMBER OF INLETS TO MANHOLE
- DATA SOURCE
- OWNED BY
- MANAGED BY
- DIAMETER
- ELEVATION

STORMWATER DISCHARGE POINTS

- DISCHARGE TYPE
- OUTLET TYPE
- OUTLET MATERIAL
- DIAMETER OF OUTLET
- DATA SOURCE
- OWNED BY
- MANAGED BY
- SERVICESTATUS
- ELEVATION

INTERCONNECTIONS

- FLOW DIRECTION
- INTERCONNECTION STRUCTURE
- DATA SOURCE
- NON-MASSDOT SYSTEM OWNER

CONVEYANCES

- LINE TYPE
- MATERIAL
- DIAMETER OF OUTLET (IN)
- DATA SOURCE
- OWNED BY
- MANAGED BY
- SERVICESTATUS
- ELEVATION

MISC. STRUCTURES

- ASSOCIATED SCM ID
- LOCATION
- FEATURE TYPE
- DATA SOURCE
- OWNED BY
- MANAGED BY
- SERVICESTATUS



TIER 2: OPTIONAL FIELDS FOR INTEGRATION

STORMWATER CONTROL MEASURE

- WBID
- SCM STATUS
- IS SCM LINED?
- HAS UNDERDRAIN?
- HAS STAFF GAUGE?
- ACCESS NOTES
- SCM NOTES
- INSTALL DATE
- SOIL TYPE
- STORAGE VOLUME (FT³)
- DOT WATERSHED TO SCM (ACRES)
- IC WATERSHED TO SCM (ACRES)
- TREATMENT DEPTH (IN)
- ANNUAL IC PERCENT REDUCTION (%)
- EFFECTIVE IC REDUCED BY SCM (ACRES)
- ANNUAL P PERCENT REDUCTION (%)
- P REDUCED BY SCM (LBS/YEAR)
- ANNUAL TSS PERCENT REDUCTION (%)
- TSS REDUCED BY SCM (LBS/YEAR)

INLET

- DOES IT LOCK?
- HAS HOOD?
- HAS VALVE?
- SUMP DEPTH
- NOTES
- SERVICESTATUS
- MATERIAL

MANHOLE

- IS IT BOLTED?
- DOES IT HAVE A SUMP?
- DOES IT HAVE A VALVE?
- CASTING DEPTH (IN)
- NOTES
- SERVICESTATUS

STORMWATER DISCHARGE POINTS

- WBID
- TS4 REGULATED?
- NUTRIENT IMPAIRED WATERBODY?
- HAS GATE?
- NOTES

INTERCONNECTIONS

- PERMITTED?
- PERMIT NUMBER
- NOTES

CONVEYANCES

- NOTES

MISC. STRUCTURES

- DOES IT LOCK?
- NOTES



IMPORTANT CONSIDERATIONS

IN OUR CASE STUDY, THE MUNICIPALITIES HAD A NUMBER OF ADDITIONAL FIELDS DESCRIBING THE CONDITIONS OF THE INFRASTRUCTURE THAT MAY BE USEFUL FOR MAINTENANCE. OTHER COMMON FIELDS THAT COULD BE USEFUL IN IDENTIFYING INFRASTRUCTURE INCLUDE:

- DEPTH (INTERCONNECTIONS)
- MATERIAL
- INSTALL DATE

IT IS ALSO IMPORTANT TO INCLUDE A UNIQUE IDENTIFIER (ASSET ID) FOR EACH PIECE OF INFRASTRUCTURE TO TIE BACK TO ANY TYPE OF ASSET MANAGEMENT DATABASE

NOTE: FIELD SUGGESTIONS MAY CHANGE AS NEEDS ARE CLARIFIED

HELPFUL TIPS

- REMOVE **UNUSED FIELDS**
- IF RELUCTANT TO CHANGE FIELDS, **KEEP A LIST OF ALL FIELD NAMES AND THEIR MASSDOT EQUIVALENCIES**



CONTACTING THE MASSDOT WHO & HOW

YOUR POINT OF CONTACT

HUNG PHAM

STORMWATER PROGRAM
COORDINATOR

EMAIL:

HUNG.PHAM@STATE.MA.US

EDUCATIONAL RESOURCES

LEARNING ARCGIS

THE BASICS

- **THE BASICS OF ARCGIS PRO**
- **MAPPING & VISUALIZATION IN ARCGIS PRO**
- **ANALYSIS IN ARCGIS PRO**
- **USING ARCGIS PRO IN 3D**

ADVANCED LESSONS

- **GIS FOR POPULATION AND DEVELOPMENT STUDIES: DATA ANALYSIS AND VISUALIZATION**
- **PUBLIC TRANSIT**
- **RESOURCES FOR TEACHING WITH ARCGIS PRO**

STORMWATER EDUCATION

STORMWATER HANDBOOK

- **STORMWATER HANDBOOK** INCLUDES:
 - **WHAT STORMWATER IS, WHY IT IS MANAGED, MASSACHUSETTS' GOALS FOR STORMWATER MANAGEMENT, AND INFRASTRUCTURE INVOLVED**

STANDARDS & PERMITS

- **PERMIT INFORMATION**
- **STORMWATER STANDARDS/POLICIES**
- **RESOURCES AND TOOLS FOR MS4 COMPLIANCE**



INFORMATIVE VIDEO

- **ADDRESSES THE INFRASTRUCTURE THAT HELPS MANAGE STORMWATER**

EDUCATIONAL RESOURCES

OTHER **HELPFUL** LINKS

CONTINUED

[GIS FIELD USE INFORMATION REPORT](#)

THIS REPORT WAS DESIGNED BY THE **MASSDEP** TO HELP TOWNS NAVIGATE SOFTWARE POSSIBILITIES FOR MAPPING INFRASTRUCTURE IN THE FIELD

[THINKBLUE MASSACHUSETTS](#)

THINKBLUE IS A STATEWIDE EDUCATIONAL CAMPAIGN AIMING TO SPREAD AWARENESS ABOUT HOW STORMWATER POLLUTION AFFECTS LOCAL WATER BODIES & WETLANDS

[EPA REGULATION](#)

THIS PAGE DESCRIBES THE PROBLEMS WITH STORMWATER POLLUTION AND THE NPDES STORMWATER PROGRAM

THE TEAM

FROM **WORCESTER POLYTECHNIC INSTITUTE**

MEET **SWMAPS**



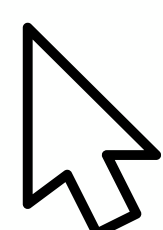
**CHRISTIAN
CHADWICK**



FERNAND GAY



ZOE MAHONEY



CONTACT - **EMAIL**

MORE INFO ON OUR PROJECT - **WEBSITE**