

AN APPLICATION IN GIS FOR A SANITARY SEWER OVERFLOW EMERGENCY RESPONSE PROGRAM

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Key Points of Presentation

- ▣ Project background
- ▣ Components of the project
- ▣ HTML report
- ▣ GeoProcessing workflow
- ▣ ArcGIS server
- ▣ Packaged data
- ▣ Project observations
- ▣ Questions

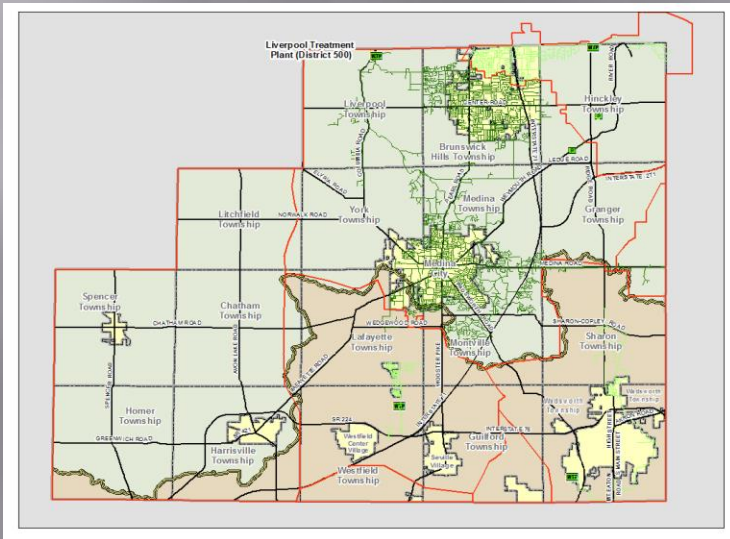
Sanitary Sewer Overflow (SSO)

- ▣ What is an SSO
 - A discharge of untreated sanitary sewage from the result of a broken pipe, equipment failure, or overload on the system [EPA]
- ▣ Why Have an effective emergency response plan
 - Better response
 - Public health
 - Compliance
 - Trust of the public
 - Liability



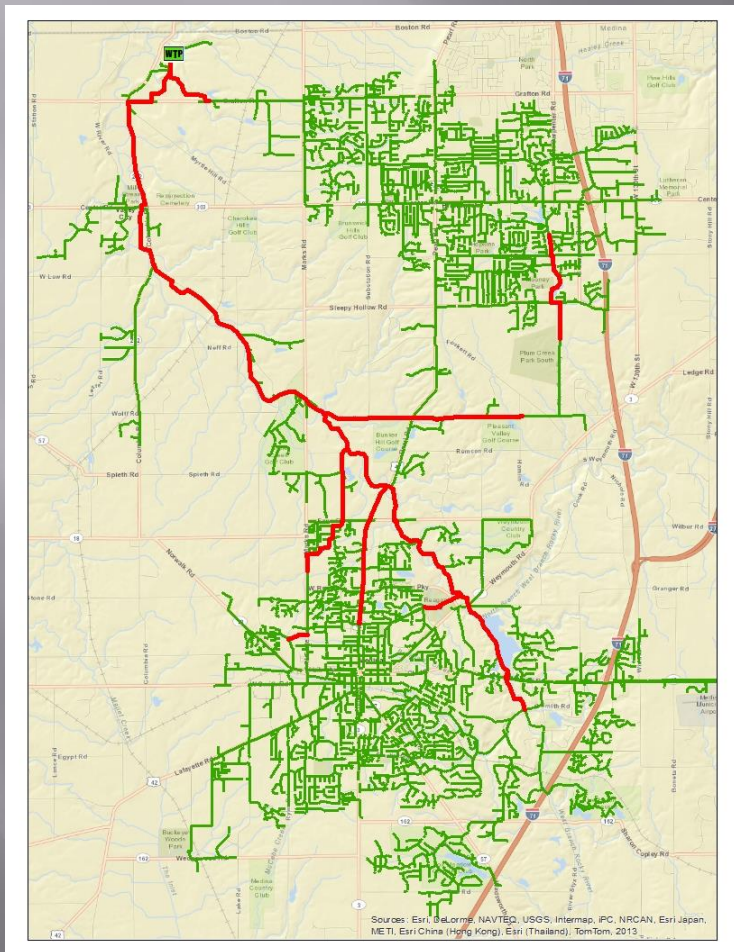
Project Background

Medina County Sanitary
Engineer (MCSE)



- Developed GIS
- Sanitary trunk sewer collapse in 2009
- Response plan to Sanitary Sewer Overflow (SSO)
- How to best utilize GIS in emergency situations

Project Background (cont.)



Components of the Project

HTML REPORT

4/25/2014 ssoFormOutput05.html

SSO Response Plan

Reporting Information Date: 2014.04.26 Current Weather Condition: Rain Specific Location: Spring Glen Dr Description of SSO: Sewage overflow from manhole Reported By: Bob Smith Contact Number: 334-321-2323	MCSE Details Call Taken By: Adam Greenwood Manhole ID at SSO: 3711 Personnel Reported To: Bob and Dave Incident called compliance about sewage overflowing in their front yard. They said this is a major health hazard
Sanitary Sewer System Information In Easement: No Easement With N/A Pipe Diameter: 10 Manhole Casting Grade: 891.64001464 Total LDI's: 50 Customers Upstream: 50 Sewerline Upstream Below Overflow: 1893.01562447391 Customers Below Overflow: 28	Environmental Concerns Buffer Radius: 3500 Feet Is there a stream(s) nearby: Yes Is there a lake(s) nearby: Yes How many addresses are nearby: 243
Factors to Consider for Equipment Needs: SSO Location Stream crossing and slope Manhole casting grade Track box or mini track box Diversion pump based on expected flow Cleanup supplies	Recommended Response Steps <ul style="list-style-type: none"> Perform initial investigation and determine cause of SSO Develop plan and fix the cause of the SSO Contain the SSO Perform any necessary clean-up Provide notification and report incident Complete documentation Further investigative work to prevent future occurrences
Recommended Response Steps <ul style="list-style-type: none"> Perform initial investigation and determine cause of SSO Develop plan and fix the cause of the SSO Contain the SSO Perform any necessary clean-up Provide notification and report incident Complete documentation Further investigative work to prevent future occurrences 	Contacts Environmental Site ID: 1-800-202-0378 Contractors & Suppliers Contractor A: XXX-XXX-XXXX Contractor B: XXX-XXX-XXXX Supplier A: XXX-XXX-XXXX Local Government Entities Madison County Engineer: 330-723-0464 Madison County Health Department: 330-723-6923

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GEOPROCESSING SERVICE

The screenshot shows a GIS application window with a map of a sewer network. A 'SSO Trace' dialog box is open, displaying a list of layers and a 'Trace' button. The dialog box also includes a 'Barriers' section with a list of manholes and a 'Weather' section with a 'Location Description' field. The map shows a blue line representing the trace path through the network.

HTML SSO Report

- ▣ Created through a python script
- ▣ Data based on derived values from sanitary sewer trace
- ▣ User inputs handle data not relevant to trace
- ▣ Designed for formatted printing or saving as a PDF
- ▣ Can be customized based on the organizations needs

HTML Report

5/8/2014

SSOExample.html

SSO Response Plan

Reporting Information

Date: 2014-04-26
 Current Weather Conditions: Rain
 Specific Location: Columbia Rd
 Description of SSO: Sewage leaking from manhole
 Reported By: John Smith
 Contact Number: 323-444-5656

MCSE Details

Call Taken By: Bill
 Manhole ID at SSO: 3719
 Personnel Reported To: Jim and Dave
 Resident complaining of sewage leaking from manhole.

Sanitary Sewer System Information

In Easement: No Easement Width: NA
 Pipe Diameter: 12
 Manhole Casting Grade: 892.61999511
 Total ERU: 265
 Customers Upstream: 139
 Sewerline Upstream Below Overflow: 4065.40005892477
 Customers Below Overflow: 54

Factors to Consider for Equipment Needs:

- SSO location
- Stream crossing and slope
- Manhole casting grade
- Track hoe or mats track hoe
- Diversion pump based on expected flow
- Cleanup supplies

Environmental Concerns

Buffer Radius: 4000 Feet
 Is there a stream(s) nearby: Yes
 Is there a lake(s) nearby: Yes
 How many addresses are nearby: 270

Recommended Response Steps

- Perform initial investigation and determine cause of SSO
- Develop plan and fix the cause of the SSO
- Contain the SSO
- Perform any necessary clean-up
- Provide notification and report incident
- Complete documentation
- Further investigative work to prevent future occurrences

Contacts

Environmental
 Ohio EPA: 1-800-282-9378

Contractors & Suppliers
 Contractor A: XXX-XXX-XXXX
 Contractor B: XXX-XXX-XXXX
 Supplier A: XXX-XXX-XXXX

Local Government Entities
 Medina County Engineer: 330-723-9261
 Medina County Health Department: 330-723-9523



(Enter Field Notes Here)

GeoProcessing Service

- ▣ Combination of Python and Model Builder
- ▣ Published as a ArcGIS Server service
- ▣ Implemented into web map using the ArcGIS Flex Viewer
- ▣ Input form for data not derived from sewer trace
- ▣ Customizable for different organizations

Basics of GeoProcessing Service

Trace sanitary sewer upstream from SSO location (Geometric Network Toolbox)

Select sanitary sewer and manholes upstream of SSO

Run python script to gather relevant sewer information for report

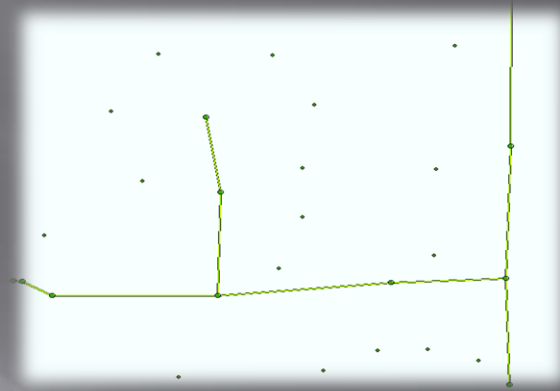
Import derived and user defined variables into HTML creation python script

Create HTML report file and embedded location map

GIS Layers

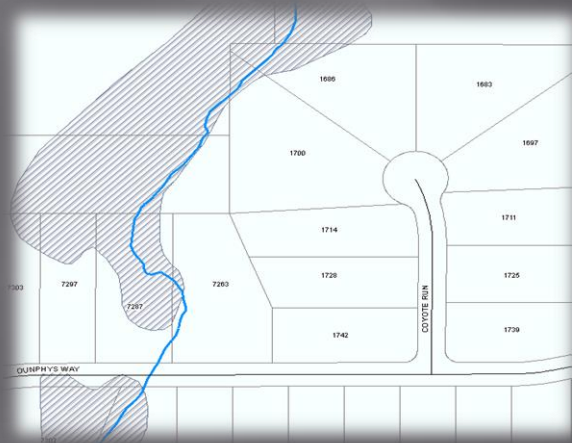
▣ Sanitary Layers

- Sanitary Sewer Lines
- Sanitary Manholes
- Sewer Customer Points



▣ Base Layers (Used in Script)

- House Points
- Streams
- Lakes
- Easements



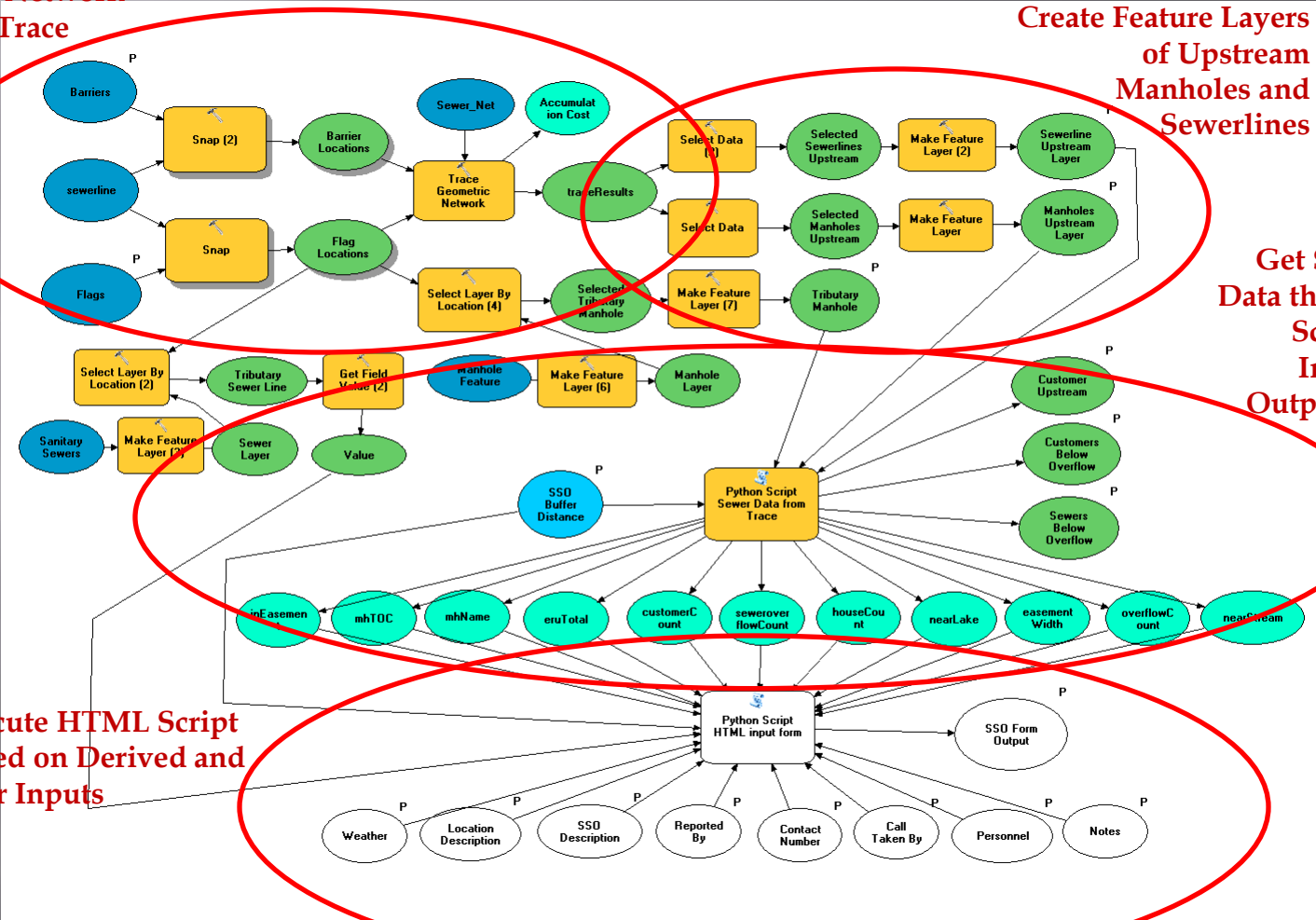
Model Builder Workflow

Geometric Network
Upstream Trace

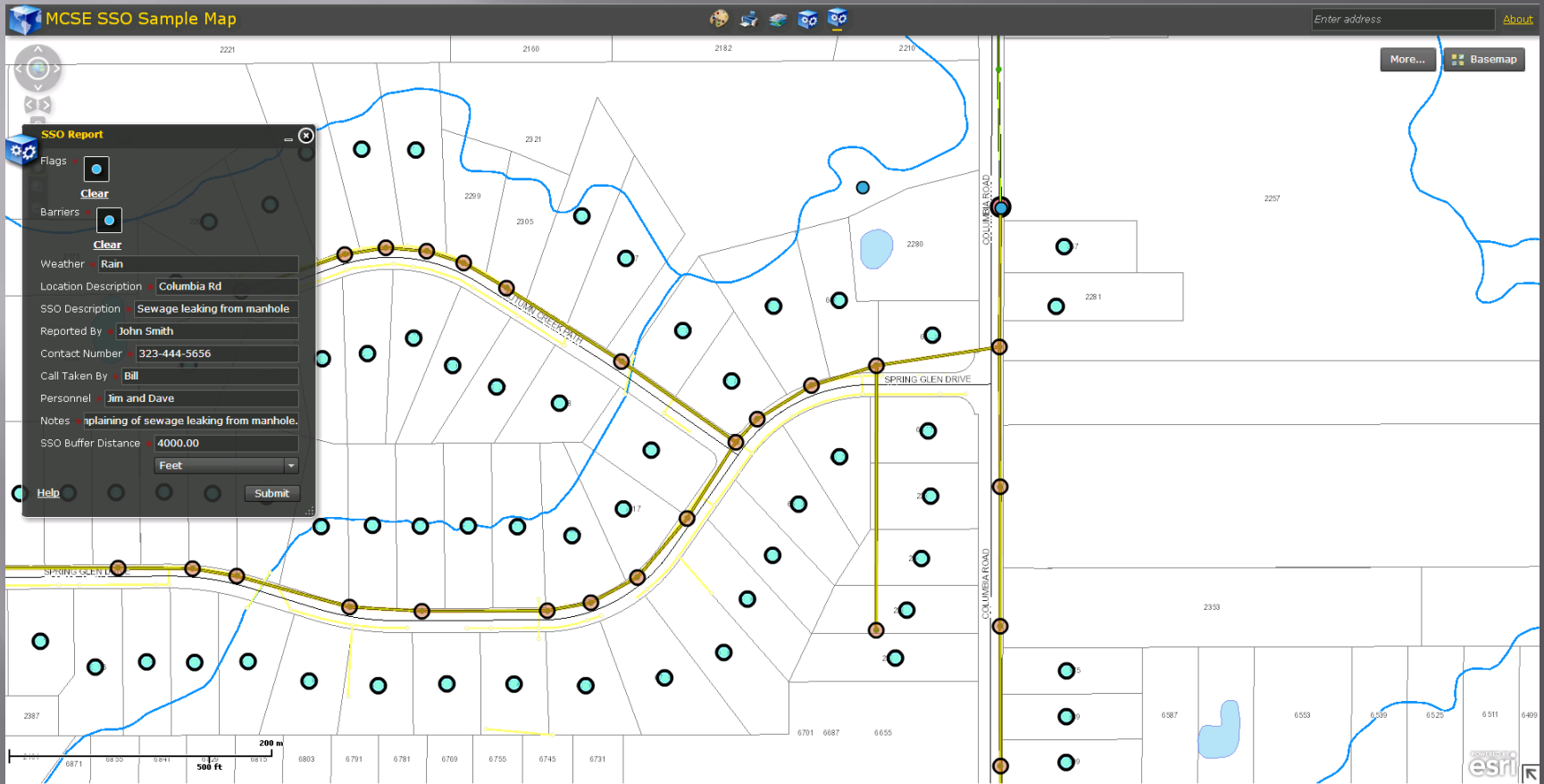
Create Feature Layers
of Upstream
Manholes and
Sewerlines

Get Sewer System
Data through Python
Script Based on
Inputs and Get
Output Parameters

Execute HTML Script
Based on Derived and
User Inputs



Integrating ArcGIS Server



Customizable Package

- ▣ All Necessary files in a zip file
- ▣ Designed for MCSE to add and remove features as necessary
- ▣ Still will need python, model builder, and ArcGIS Server knowledge for customization
- ▣ Can be applied to a different utility by altering script and reference data

Project Observations

- ▣ Model Builder, Python, or Both?
- ▣ Many different ways to manipulate the data to meet your needs
- ▣ What else is possible with the same concept
 - Emergency Management
 - Site Analysis
- ▣ Where to stop?
 - The sky is the limit
 - When does it get too complex

Contact Info

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Questions?