



Client: **City of Lawrence, Massachusetts**

There is an App for That!

SSO Mobile Application Achieves Better Reporting

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January 25, 2016

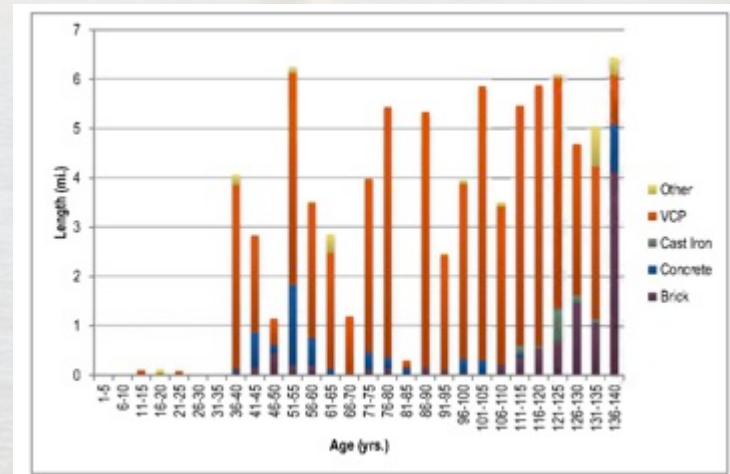
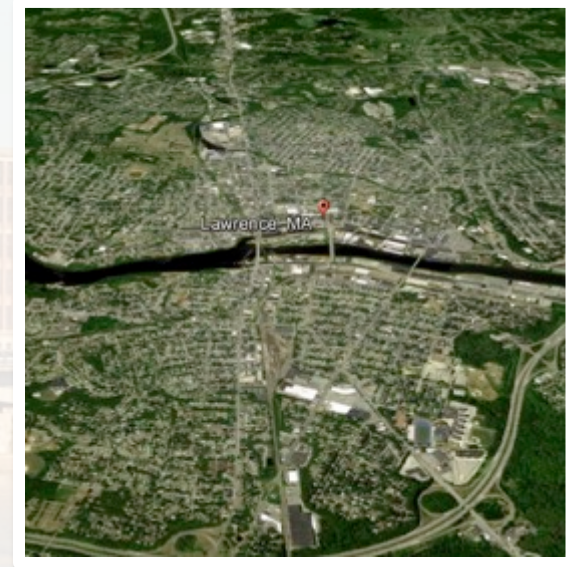
NEWEA Annual Conference





Sewer System Background

- Population: 80,000
- Miles of Sewer Pipe: 133 miles
- No. of Manholes: 3,200
- No. of Catch basins: 4,100
- Percentage Combined: 60%
- Avg. Pipe Age: 94 Years
- No. of Full Time Sewer Staff: 5





Sewer System Issues

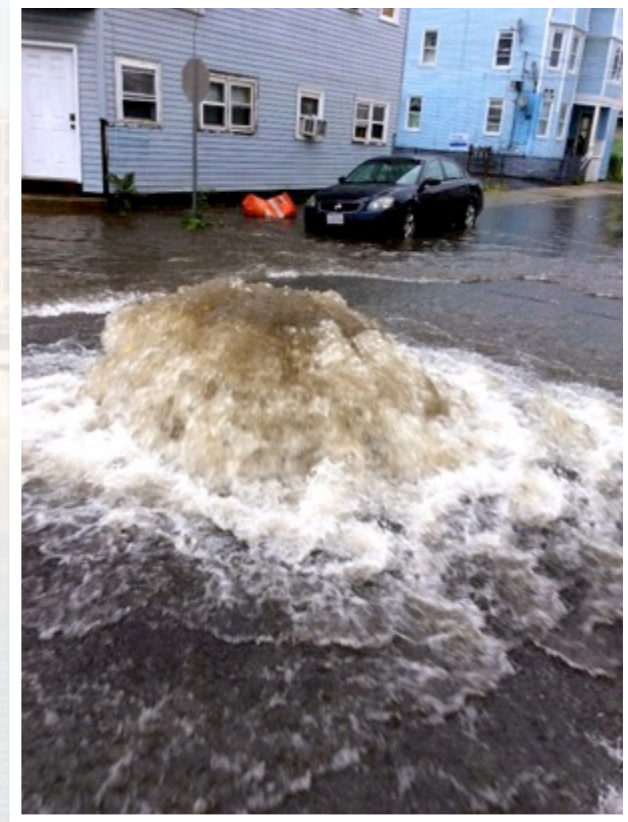
- Aging system
- High FOG Users
- Lack of Preventative Maintenance
- Minimal Capital Improvement Plan
- Has lead to:
 - Structural and O&M pipe defects
 - Frequent sewer backups, SSOs, other permit violations





Sanitary Sewer Overflows

- SSOs
 - Unintentional discharges of raw sewage from municipal sanitary sewers
- Consequences:
 - Public Health & Safety
 - Environmental Contamination
 - Compliance and Financial





Sanitary Sewer “Explosions”





Historical SSO Reporting

- Minimal
- Out of sight, out of mind...
- Thin folder of paper with MassDEP
- BIG Problem





Regulatory Reporting Requirements

- U.S. Dept. of Justice Consent Decree
 - Draft received May 2014
 - Lodged April 2015
- Consent Decree requires changes to the City's SSO Response Plan.





Step #1 – SSO Emergency Response Plan

- SSO ERP
 - Preparation
 - Field Response
 - Reporting with Step by Step Instructions
 - Follow-up



*Lawrence Water and Sewer Division's
Trailer Pipe Jetter*



Step #2 – Reporting Options

- 24/hr. Notification and Full Report within 5 days.
- The City Needed a Simplified Reporting Solution
- SSO Reporting Tool Selection
 - Necessary Features and Drivers:
 - Mapping to locate assets in the field
 - Means of entering specific data, compliance reporting and asset mgmt.
 - Communication
 - Alternatives Considered:
 - Paper Reports
 - Computerized Maintenance Management System (CMMS) and Work Order Management System
 - Other....



SSO Field and Reporting App

24 hours

FIELD RESPONSE
ESRI Collector Application
Automatic email notification

5 days

OFFICE RESPONSE
Web Reporting
Report Autogeneration



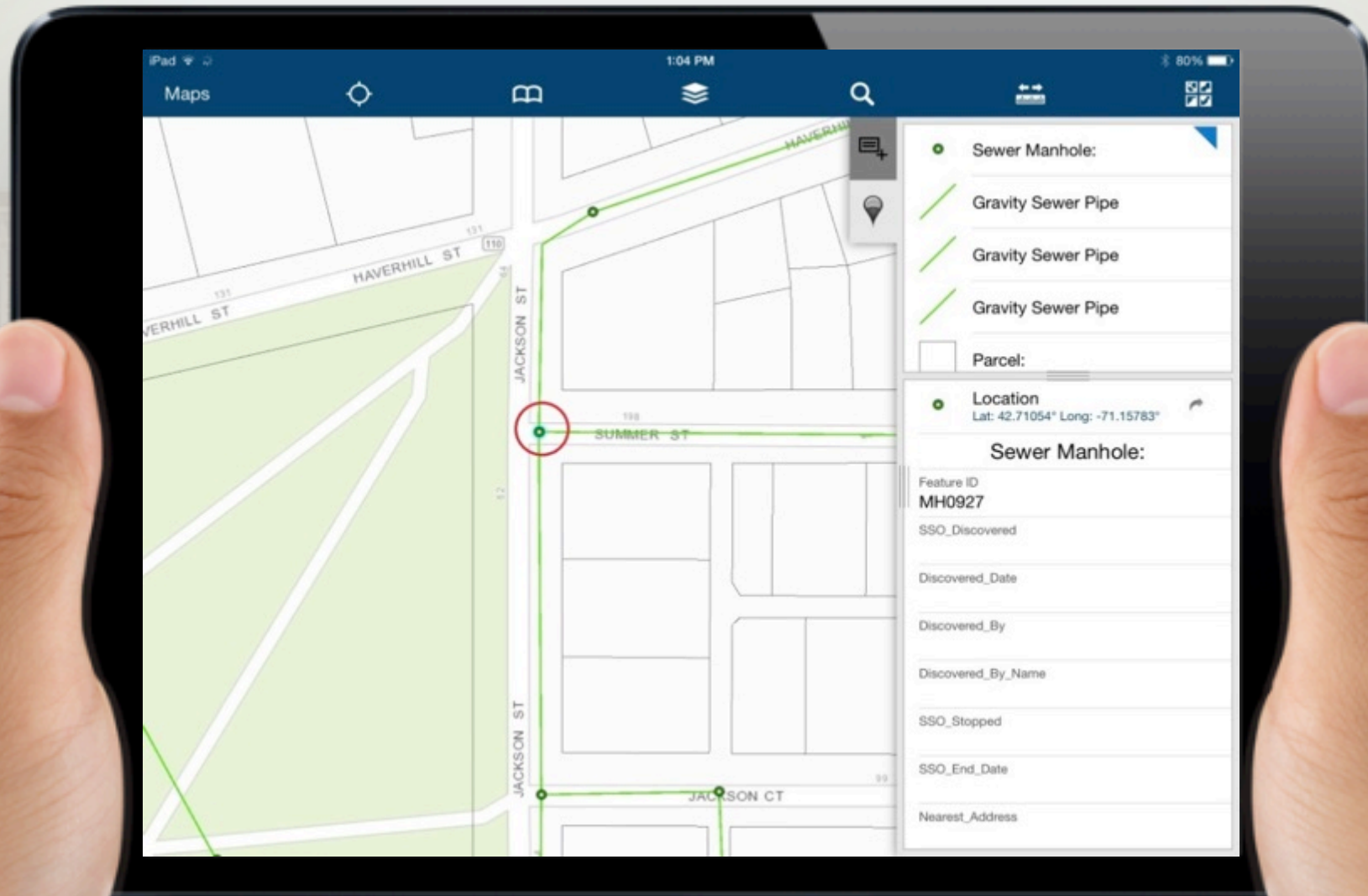
ESRI Collector Mobile Application

■ Features:

- ArcGIS Online Map ➡ Mobile mapping interface
- Editable GIS data- ArcGIS Server Feature Service – ArcSDE SQL Server geodatabase
- GPS Location / Cellular Location
- Asset Selection and Attribute Modification
- Predefined dropdown menus
- Cloud Based/ Offsite Data Storage
- Link Photos and Videos to Reports
- Export Data to Excel Tables



SSO Field Data Collection

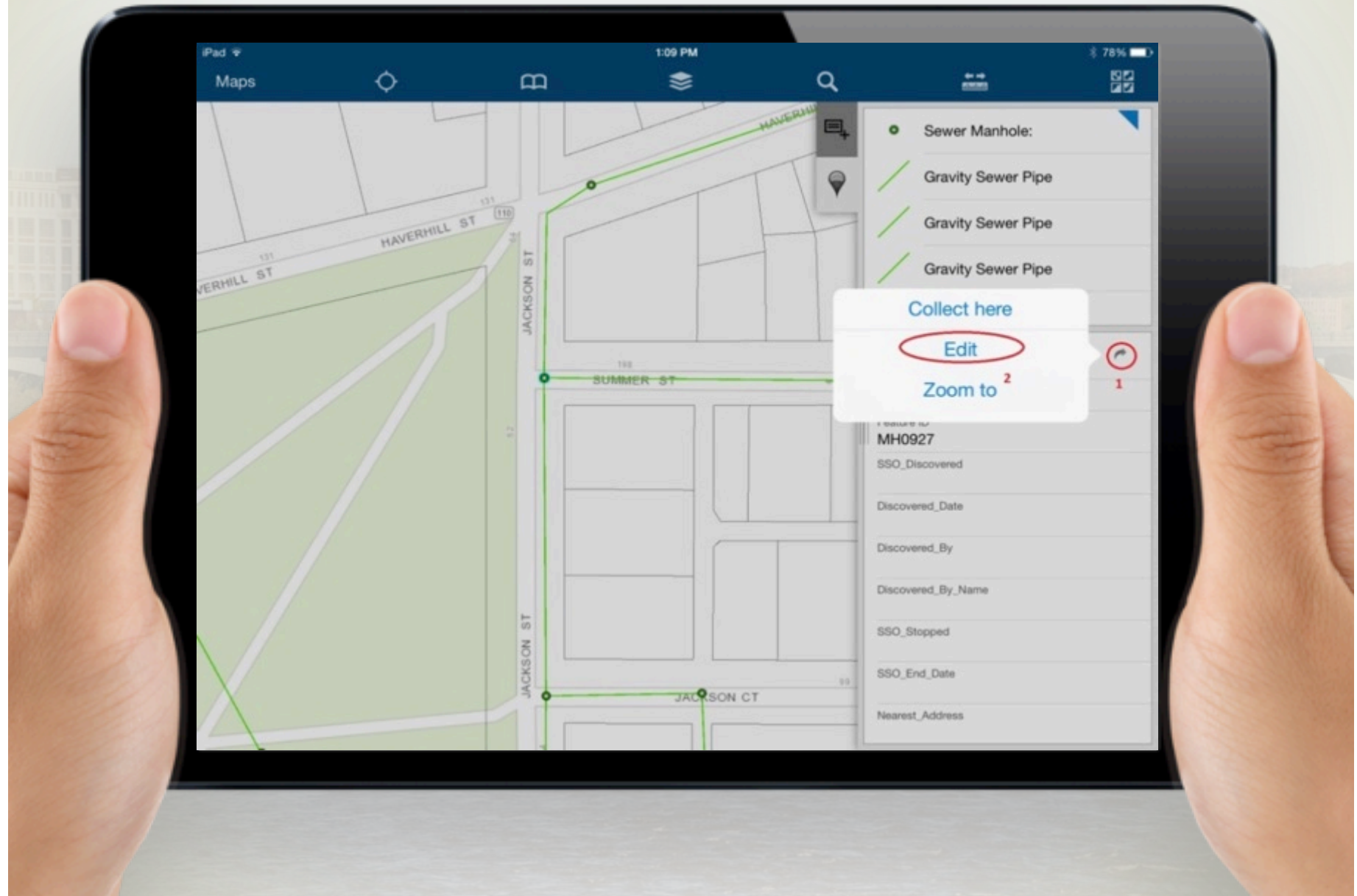


<input checked="" type="checkbox"/>	Sewer Manhole:
<input checked="" type="checkbox"/>	Gravity Sewer Pipe
<input checked="" type="checkbox"/>	Gravity Sewer Pipe
<input checked="" type="checkbox"/>	Gravity Sewer Pipe
<input type="checkbox"/>	Parcel:
<input checked="" type="checkbox"/>	Location Lat: 42.71054° Long: -71.15783°
Sewer Manhole:	
Feature ID	MH0927
SSO_Discovered	
Discovered_Date	
Discovered_By	
Discovered_By_Name	
SSO_Stopped	
SSO_End_Date	
Nearest_Address	



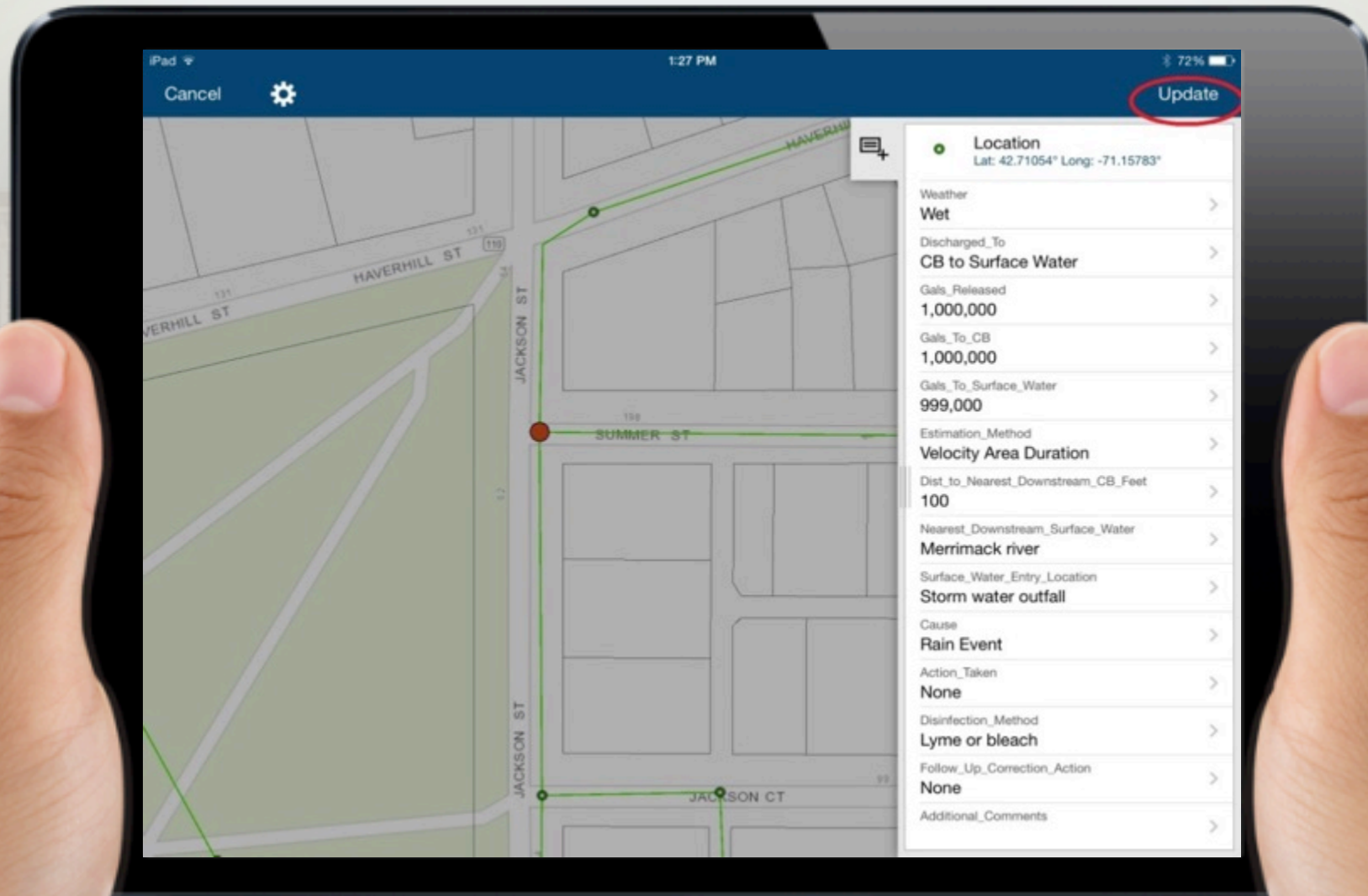


SSO Field Data Collection





SSO Field Data Collection





From Field to Office

- After “Update” is clicked in the field

- If SSO Discovered Field is filled out as “Yes”

- Within 1 hr: email notification is sent to Water & Sewer Commissioner
- At midnight: web notification is emailed to Water & Sewer Commissioner
- SSO is

- If SSO Discovered Field is filled out as “No”

- Data remains in database
- No emails as event is not a true SSO (City not responsible, private lateral backup)

**24 Hour DEP & EPA
Notification
Phone or Email**



From Field to Office

- After “Update” is clicked in the field
 - If SSO Discovered Field is filled out as “Yes”
 - Within 1 hr: email notification is sent to Water & Sewer Commissioner
 - ➔ ■ At midnight: web reporting is available, link is emailed to Water & Sewer Commissioner
 - SSO is made permanent in database
 - If SSO Discovered Field is filled out as “No”
 - Data is not reported to DEP or EPA
 - No email notification is sent (only lateral backup)

**5 day DEP and EPA
Reporting Requirement**

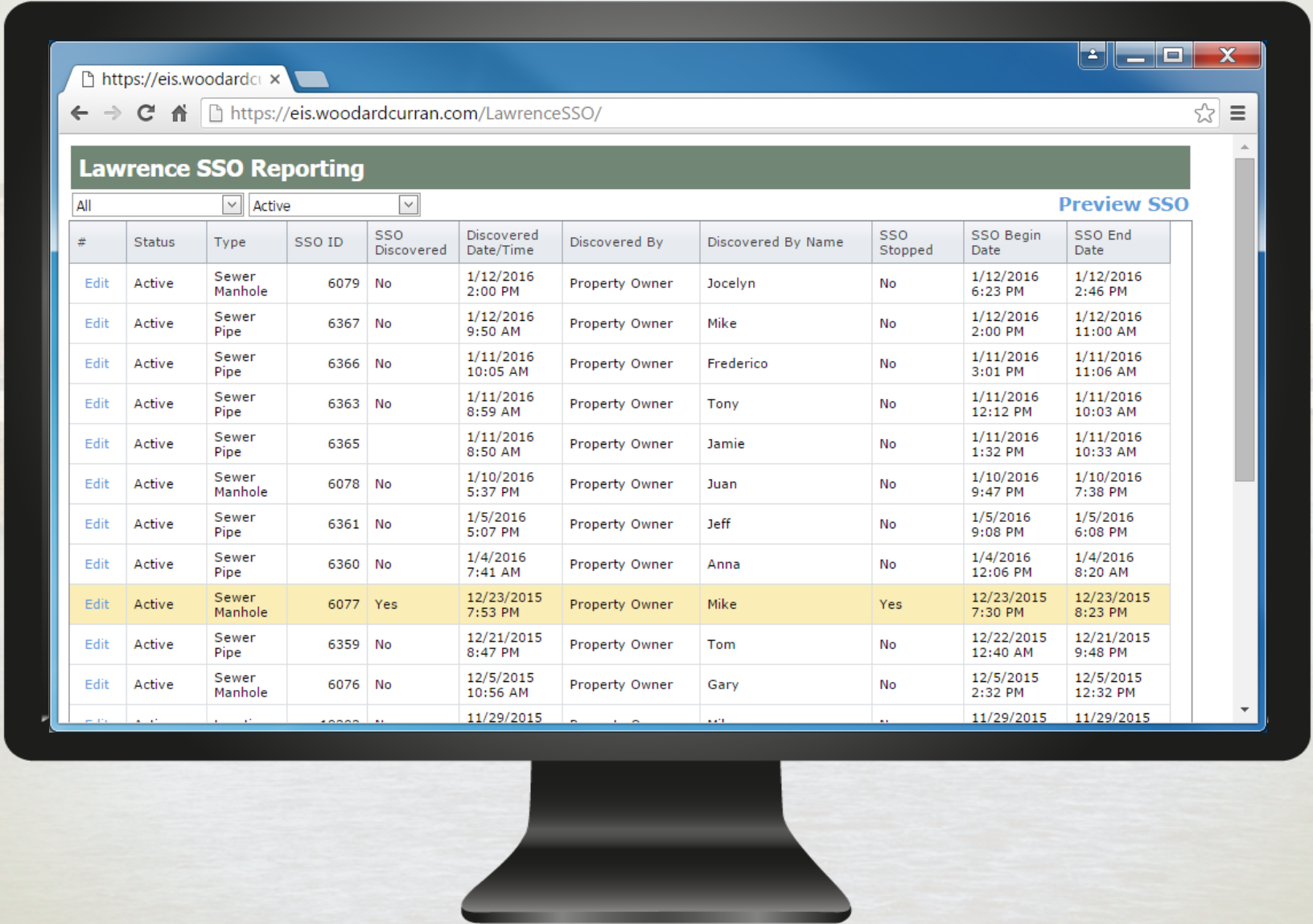


From Field to Office

- After “Update” is clicked in the field
 - If SSO Discovered Field is filled out as “Yes”
 - Within 1 hr: email notification is sent to Water & Sewer Commissioner
 - At midnight: web reporting is available, link is emailed to Water & Sewer Commissioner
 - SSO is made permanent in database
 - If SSO Discovered Field is filled out as “No”
 - Data remains in database for use in CMMS
 - No emails as event is not a true SSO (City not responsible, private lateral backup)



Web Reporting Interface





Web Reporting Interface

https://eis.woodardcurran.com/LawrenceSSO/

Manager?

Discovered Date/Time: Discovered By: Discovered By Name:

SSO Stopped: SSO Begin Date: SSO End Date:

Nearest Address: Discharged From: Discharged From Ownership:

Weather: Discharged To: Gals Released:

Gals to Catch Basin: Gals to Surface Water: Estimation Method:

Distance to Nearest Downstream Catch Basin (ft): Nearest Downstream Surface Water: Surface Water Entry Location:

Cause: Action Taken to Stop SSO: Impact Area Cleaned and/or Disinfected?

Impact Area Cleaned and/or Disinfected:

Disinfection Method: Corrective Actions Completed?

Follow Up Correction Action:

Include Attachment with Email? Additional Comments:

[Update](#) [Cancel](#)

Review, Edit and Approve



Web Reporting Interface

Lawrence SSO Reporting

All Active

[Preview SSO](#)

#	Status	Type	SSO ID	SSO Discovered	Discovered Date/Time	Discovered By	Discovered By Name	SSO Stopped	SSO Begin Date	SSO End Date
Edit	Active	Sewer Manhole	6079	No	1/12/2016 2:00 PM	Property Owner	Jocelyn	No	1/12/2016 6:23 PM	1/12/2016 2:46 PM
Edit	Active	Sewer Pipe	6367	No	1/12/2016 9:50 AM	Property Owner	Mike	No	1/12/2016 2:00 PM	1/12/2016 11:00 AM
Edit	Active	Sewer Pipe	6366	No	1/11/2016 10:05 AM	Property Owner	Frederico	No	1/11/2016 3:01 PM	1/11/2016 11:06 AM
Edit	Active	Sewer Pipe	6363	No	1/11/2016 8:59 AM	Property Owner	Tony	No	1/11/2016 12:12 PM	1/11/2016 10:03 AM
Edit	Active	Sewer Pipe	6365	No	1/11/2016 8:50 AM	Property Owner	Jamie	No	1/11/2016 1:32 PM	1/11/2016 10:33 AM
Edit	Active	Sewer Manhole	6078	No	1/10/2016 5:37 PM	Property Owner	Juan	No	1/10/2016 9:47 PM	1/10/2016 7:38 PM
Edit	Active	Sewer Pipe	6361	No	1/5/2016 5:07 PM	Property Owner	Jeff	No	1/5/2016 9:08 PM	1/5/2016 6:08 PM
Edit	Active	Sewer Pipe	6360	No	1/4/2016 7:41 AM	Property Owner	Anna	No	1/4/2016 12:06 PM	1/4/2016 8:20 AM
Edit	Active	Sewer Manhole	6077	Yes	12/23/2015 7:53 PM	Property Owner	Mike	Yes	12/23/2015 7:30 PM	12/23/2015 8:23 PM
Edit	Active	Sewer Pipe	6359	No	12/21/2015 8:47 PM	Property Owner	Tom	No	12/22/2015 12:40 AM	12/21/2015 9:48 PM
Edit	Active	Sewer Manhole	6076	No	12/5/2015 10:56 AM	Property Owner	Gary	No	12/5/2015 2:32 PM	12/5/2015 12:32 PM
Edit	Active	Sewer Pipe	6000	No	11/29/2015	Property Owner	...	No	11/29/2015	11/29/2015

Preview Report





Automated Report Generation

Additional Reporting Data



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Watershed Permitting Program
**Sanitary Sewer Overflow (SSO)/Bypass
Notification Form**

FOR DEP USE ONLY
04-6001394
Tax Identification Number

A. Reporting Facility

1. Facility Information
City of Lawrence, MA Reporting Sewer Authority MA0100447 Permit #
2. Authorized Representative Transmitting Form:
Brian Pena (978) 620-3588 Telephone No.
Water & Sewer Commissioner Title bpena@cityoflawrence.com E-mail Address

See DEP Regional Office telephone and fax numbers at the end of this form.

B. Phone Notifications:

1. MassDEP staff contacted: Kevin Brander first name last name
Date/Time contacted: 09/26/2015 8:04 Date Time am pm
2. EPA staff contacted: John Melcher first name last name
Date/Time EPA contacted: 09/26/2015 8:04 Date Time am pm
3. Board of Health contacted: First Name Last Name
Date/Time contacted: Date Time am pm
4. Others notified (select all that apply); Conservation Commission
 Harbormaster Shellfish Warden Division of Marine Fisheries
 Downstream Drinking Water Supplier Watershed Association
 Beach Resource Manager Other: Nihar Mohanty, MassDEP (specify)

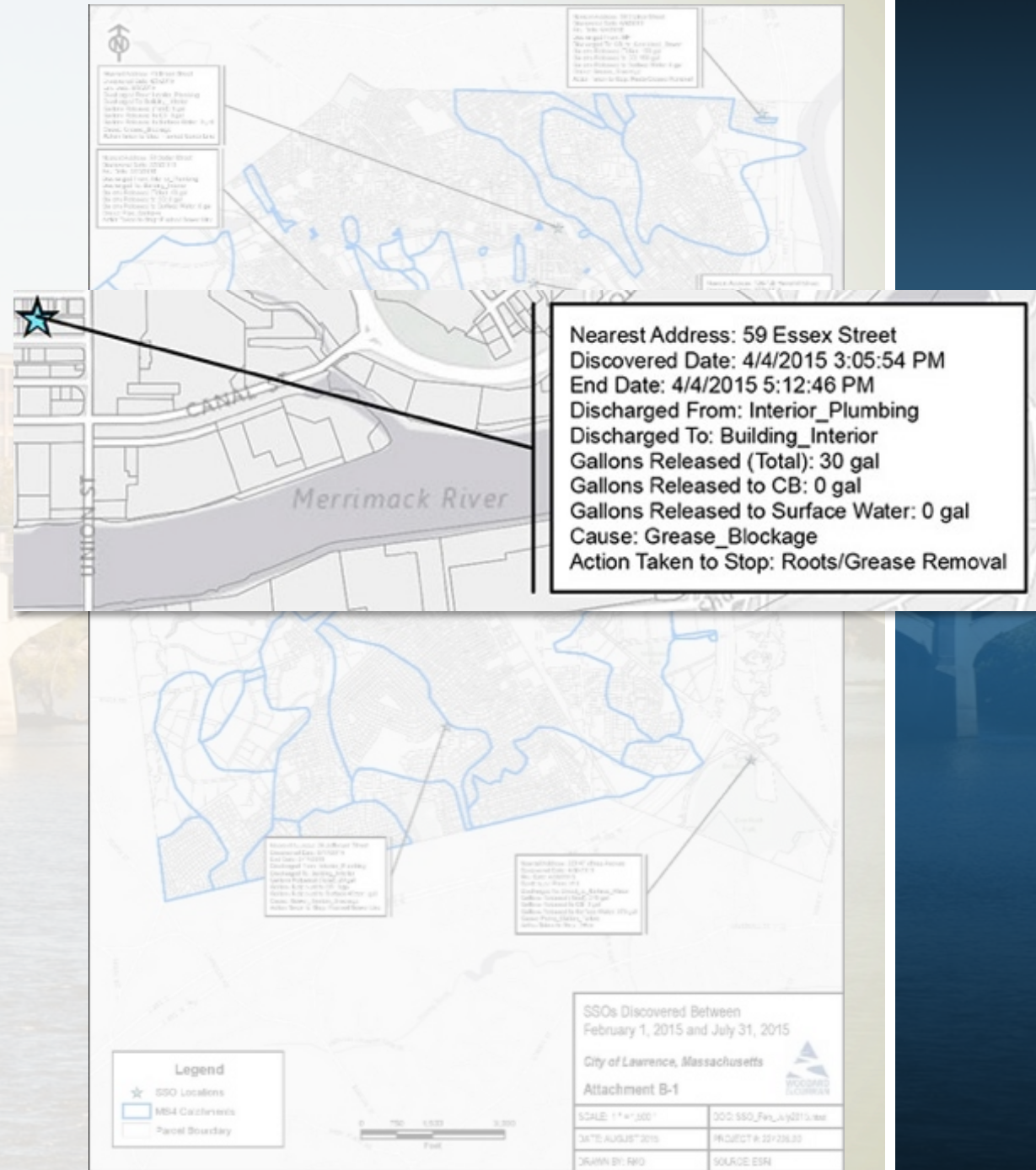
C. SSO Information

SSO Began: 09/25/2015 12:03 am pm
1. SSO Discovered: 09/25/2015 12:33 Date Time am pm
By: Property Owner
2. SSO Stopped: 09/25/2015 1:20 Date Time am pm
3. SSO Discharge from: Sanitary Sewer Manhole Pump Station
 Backup into Property Other: (specify)
4. SSO Discharge to: Ground Surface (no release to surface water)
 Direct to Receiving Water 0 gal (surface water)
 Catch basin to Receiving Water 0 gal (catchbasin) 200 ft
 Backup into Property Basement Catch basin to Combined Sewer



Results

- Effective digital and streamlined solution
- Data for Compliance Reporting Maps
- Data for Asset Management and Capital Improvement Planning Input
- Intro. to CMMS





WebGIS – Collection System & MS4

The screenshot displays a web GIS application interface for the City of Lawrence, Massachusetts. The browser address bar shows the URL: https://eis.woodardcurran.com/Html5Viewer/Index.html?configBase=https://eis.woodardcurran.com/Geocortex/Essentials/REST/sites/Lawrence/viewers/City_of_Lawrence_GIS/virt. The interface includes a search bar, navigation tools (Zoom In, Zoom Out, Pan, Initial View, Full Extent, Bookmarks, Previous Extent, Next Extent), and a layer list. The layer list is expanded to show the following layers:

- Capital Improvement Planning
- Infrastructure
 - Collection System Infrastructure
 - Sewer Catchments
 - CSOs (GLSD)
 - Sewer Pump Stations
 - Sewer Meter Station
 - Sanitary Sewer Manhole
 - Sewer Clean Outs
 - Sewer Catchbasin
 - Sewer Pressurized Main
 - Sewer Discontinuity Main

The map displays a network of collection system infrastructure, including sewer catchments, CSOs, pump stations, meter stations, manholes, clean outs, catchbasins, and pressurized and discontinuity mains. The map also shows a scale bar (0 to 200m) and a search bar with the text "I want to...".



WebGIS – Capital Planning

The screenshot displays a web GIS application interface for the City of Lawrence, Massachusetts. The browser address bar shows the URL: https://eis.woodardcurran.com/Html5Viewer/Index.html?configBase=https://eis.woodardcurran.com/Geocortex/Essentials/REST/sites/Lawrence/viewers/City_of_Lawrence_GIS/virt. The interface includes a search bar, navigation tools (Zoom In, Zoom Out, Pan, Initial View, Full Extent, Bookmarks, Previous Extent, Next Extent), and a layer list. The layer list is expanded to show the following layers:

- Capital Improvement Planning
 - SSO Locations
 - Illicit Discharge Locations
- Past Investigations
 - MS4 MH Inspection (2015)
 - Sewer MH Inspections
 - 2014
 - 2015
 - Sewer CCTV Inspections
 - 2014
 - 2015
 - MS4 CCTV Inspections (2015)

The map view shows a street network with various inspection locations marked by colored dots and lines. A scale bar at the bottom indicates 0, 100, and 200 meters. The map also shows a river and a building labeled 'Prospect Hill'.



Challenges/ Limitations

- Limitations of Collector Application
 - Support for related tables
 - Snapping
- Integrating SQL Server Database Management with ArcSDE Geodatabase Management
- Staff training



Other Uses for Collector

- IDDE Investigations
- Construction Site Stormwater Inspections
- Manhole/Catchbasin Inspections
- FSE Grease Trap Inspections
- Wet Weather
 - Flooding Response/Documentation
 - MS4 Outfall Monitoring
- Others?



Questions?

THANK YOU!

