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DETROIT WATER AND SEWERAGE DEPARTMENT BOARD OF WATER COMMISSIONERS' RETREAT

June 7, 2018

Agenda

8:00 – 8:30 a.m.	Overview of Field Services
8:30 – 9:00 a.m.	Fire Hydrant Inspection and Repair Program
9:00 – 9:30 a.m.	Catch Basin Cleaning and Inspection Program
9:30 – 9:45 a.m.	Break
9:45 – 10:45 a.m.	Units of Service
10:45 – 11:00 a.m.	Regulatory Updates
11:00 – 11:15 a.m.	Questions/Discussion

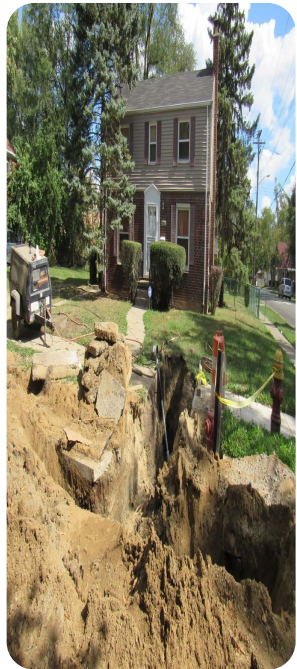
Overview of Field Services M&R/Meters

Palencia Mobley, P.E.

Who Is DWSD?

- Retail water, sewer, and drainage service provider
- Responsible for City of Detroit:
 - Customer Service
 - Billing and Collections
 - Meter Operations
 - Water and Sewer Maintenance/Repairs and Capital Improvements:
 - Pipes, hydrants, valves, catch basins, manholes, and stormwater outfalls

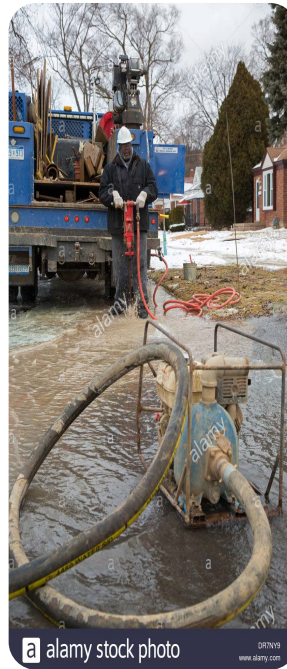
Deputy Director and Chief Engineer



**Engineering and
Construction**



**Stormwater
Management**



**Maintenance
and Repair**



**Meter
Operations**



Fleet



Facilities

Meter Operations



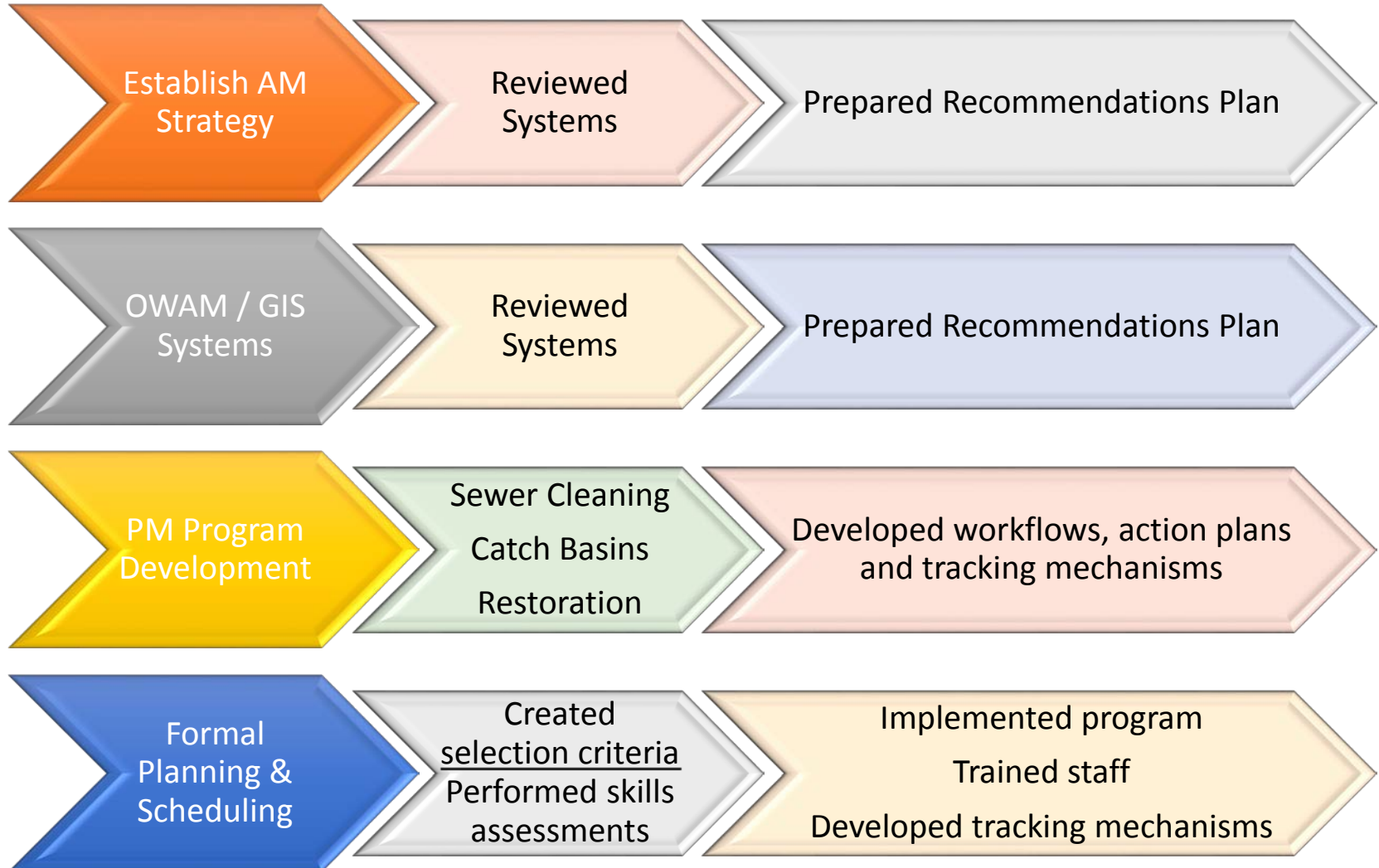
Maintenance and Repair Water and Sewer Infrastructure



Field Services Program Manager



Veolia Year 1 Accomplishments



Veolia Year 2 Activities



Decrease Basin & Flooding Occurrences

Evaluate and Revise CB PM Program

Develop and implement Sewer PM Program

Decrease Costs

Evaluate current practices vs. best practices and industry standards

Evaluate current materials purchases vs. best practices and industry standards

Improve Customer Care

Reduce Appointment blocks

Offer more afternoon and weekend appointments

Review and recommend rules & regulation revisions

Evaluate current materials utilized vs. best practices and industry standards

Increase Meter Accuracy

Implement meter testing best practices

Develop and implement large meter evaluation and replacement program

Increase Revenue

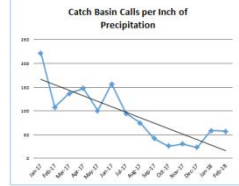
Evaluate accounts and recommend methods to reduce unbilled consumption

Review current fee structure vs. best practices and industry standards

Decrease basin and flooding occurrences

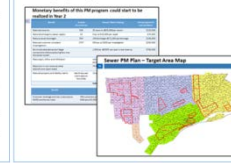
Evaluate and revise catch basin PM program

- Results of the year 1 program review and recommended revisions (ongoing)



Develop and implement a sewer PM program

- Prepared list and specifications for sewer cleaning tools (complete)
- Prepared the program and will review with the Deputy Director (ongoing)



Decrease Costs

Evaluate current practices vs. best practices and industry standards

- Reviewed current practice and prepared plans and procedures for in house restoration of soft surfaces. (complete)
- Reviewed current practice and prepared plans and procedures for use of precast materials instead of brick and mortar which require use of skilled bricklayers. (complete)

Evaluate current materials purchases vs. best practices and industry standards

- Prepared specifications for precast structures and materials for catch basins & manholes (complete)
- Prepared specifications for meter procurement (complete)
- Prepared specifications for new meter test benches (complete)
- Review of procurement specifications for Field Services (ongoing)

Improve Customer Care

Evaluate current materials utilized vs. best practices and industry standards

- Recommended and prepared specifications for precast structures and materials for catch basins & manholes (complete)
- Prepared plans for restoration practices to reduce costs, time, and customer inconveniences. (ongoing)

Review and recommend rules & regulation revisions

- SOPs have been prepared for M&R (ongoing)
- SOPs for Meter Ops (ongoing)
- Review of current DWSD rules and regs. (ongoing)

Reduce appointment blocks

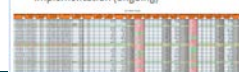
- Weekend appointments were reinstated along with a "One & Done" plan. (ongoing)
- Productivity and work order analytics were performed. The data indicates piloting a 3 hour apt. window should show favorable results. The current time to perform a work order is 37.1 minutes. (ongoing)

Week of	Avg Travel Time (min)	Avg WFO Completion Time	Avg WFO Time (min)
12/11/2017	13.81	25.88	39.69
12/18/2017	12.92	25.46	38.38
12/25/2017	14.34	25.82	40.15
1/1/2018	15.49	27.79	43.28
1/7/2018	13.54	24.34	37.88
1/14/2018	14.20	18.17	32.37
1/21/2018	12.78	27.48	40.26
1/28/2018	14.31	27.08	41.39
2/4/2018	15.34	28.15	43.50
2/11/2018	15.48	28.43	43.91
2/18/2018	14.30	26.38	40.68
2/25/2018	14.46	26.47	40.93
3/4/2018	14.08	24.38	38.46

Increase Meter Accuracy

Implement meter testing best practices

- Accuracy of the current benches were verified by DWSD vs. Veolia testing results. (complete)
- The benches were calibrated and recommended for replacement. (complete)
- Replacement bench specifications were drafted and submitted. (complete)
- Recommendations for revised test practices were prepared and submitted. (complete)
- Working with Meter Operations team on implementation (ongoing)



Develop and implement large meter evaluation and replacement program

- Large meter were separated by size and reviewed for change in consumption 2013 to present. (ongoing)
- Team was formed and plan was developed for phase one customers. (ongoing)



Increase Revenue

Evaluate accounts and recommend methods to reduce unbilled consumption

- Multiple active accounts and bump up customers were reviewed and submitted in October 2017. (complete)
- Account reviews are performed monthly and results are sent to Meter Operations and the Fraud Team (ongoing)
- Intense focus on zero consumption, large meters and water off with consumption. (ongoing)



Review current fee structure vs. best practices and industry standards

- Fee review and recommendations were prepared and submitted in November 2017. (complete)



Example- Improve Detroit Dashboard



Last update: June 4, 2018

Improve Detroit (See-Click-Fix) DWSD Progress

Fire Hydrants



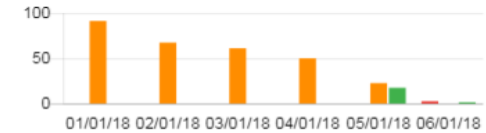
● Open ● Acknowledged ● Archived ● Closed

Water Main Breaks



● Open ● Acknowledged ● Archived ● Closed

Water Running in Home or Building



● Acknowledged ● Archived ● Closed

Definitions

Open = not assigned

Acknowledged = assigned

Archived = closed more than 60 days

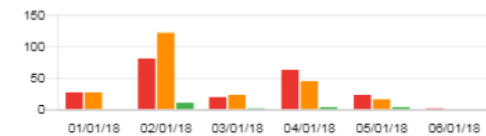
Closed = completed

Manholes



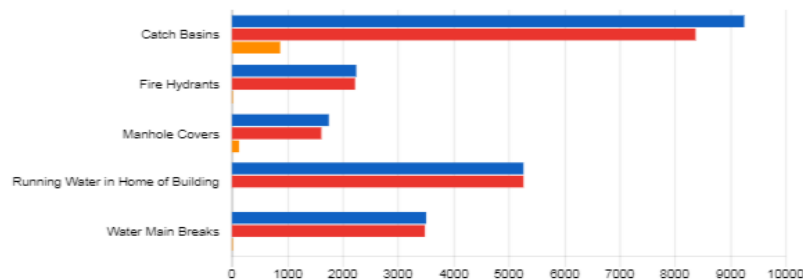
● Acknowledged ● Archived ● Closed

Catch Basins



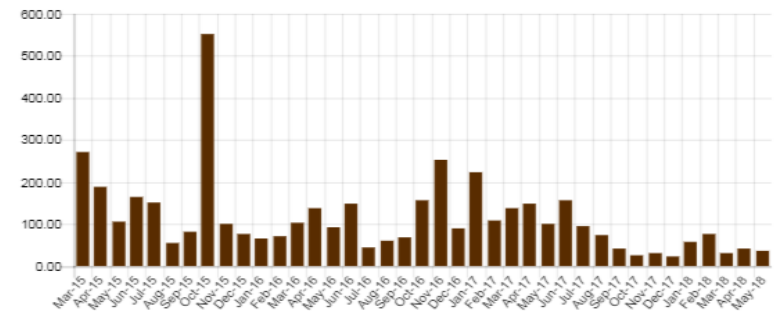
● Acknowledged ● Archived ● Closed

SCF Statistics



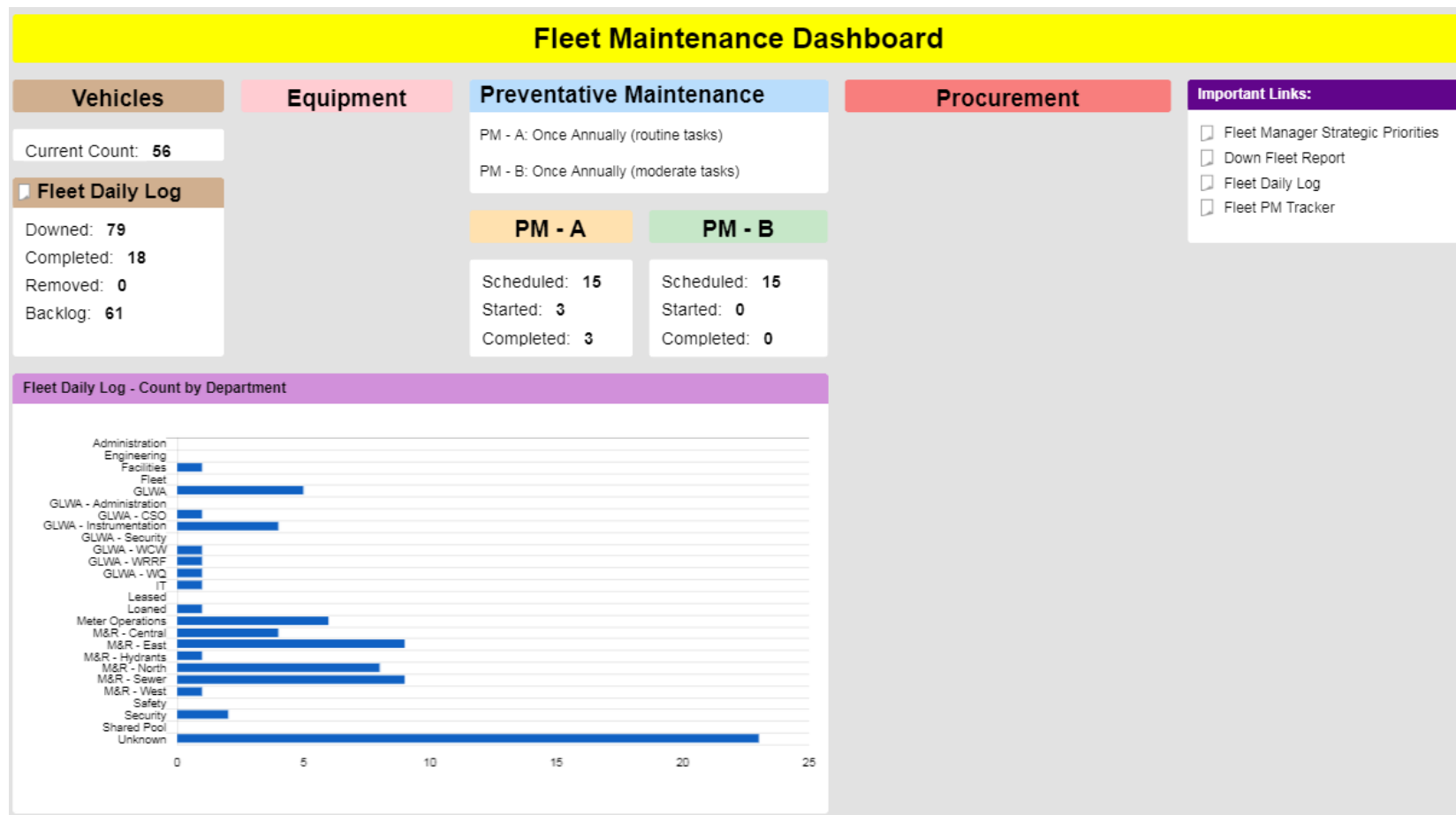
● Total Calls ● Total Closed ● Backlog

Catch Basins Vs. Precipitation (calls per inch)





Example- Fleet Dashboard (in progress)



Fleet Tracking in SmartSheets (while AssetWorks is being implemented)



Fleet Daily Log

Vehicle #	Maint. Request #	Description of Problem	Department	Vehicle Type	Assigned To	Sent To	Down Date	Sent Date	CTU Date	Repair Date	Completed Date	Repair - First Service Date	Comments	Observed	Completed	Retired	Backlog	Down by Department	Down Yrs. Count	
025179	F25812	Leak-Hydrolic	WER-Harb	Construction & Grounds	Days		04/23/18								79	18	0	61	Administration	
025701	023907	Star-Fal	Water Operations	Construction & Grounds	Afternoon		11/30/17												Engineering	
030306	F25124	TRUCK	UNKNOWN	Construction & Grounds	Days		04/11/18												Facilities	
030318	F25051	Star-Fal	UNKNOWN	Construction & Grounds	Afternoon		03/13/18												Fair	
030324	F24810	Lights	UNKNOWN	Construction & Grounds	Days		05/17/17												SURF	
1402000	010208	Leak-Harb	SURF-HCAL	Construction & Grounds	Days		10/29/17												SURF-Administration	
030323	F25047	Star-Fal	WER-Sewer	Construction & Grounds	Days		04/17/18												SURF-CSD	
030353	F25021	Truckage	UNKNOWN	Construction & Grounds	Days		04/23/18												SURF-maintenance	
030419		Star-Fal	WER-East	Construction & Grounds	Afternoon		04/24/18							Check Safety Chain					SURF-Security	
030419	F25032	The Wheel	WER-Harb	Construction & Grounds	Afternoon		05/01/18	05/01/18	05/01/18	05/01/18			After 1st off						SURF-HCAL	
030419	F24076	Leak-Hydrolic	WER-Sewer	Dump & Misc. C & D	Days		04/23/18							See kato.com					SURF-WRRF	
190102	010078	Brakes	UNKNOWN	Dump & Misc. C & D	Days		05/27/17												SURF-HCAL	
190440	F25	P25	UNKNOWN	Dump & Misc. C & D			05/27/17													
190710	030656	Leak-Corrupt	WER-Central	Dump & Misc. C & D			04/09/18												Leaked	
210702	010321	Pul-A	WER-Harb	Dump & Misc. C & D	Days		03/08/17												Water	
320002		Dump Bed	UNKNOWN	Dump & Misc. C & D			03/01/18												Water Operations	
090470	030001	Fly	SURF	Dump & Misc. C & D			02/27/18												WER-Central	
090502	030001	Suppression	UNKNOWN	Dump & Misc. C & D	Days		01/03/18							Leaf Sprays					WER-East	
090502	F25815	Leak-Hydrolic	WER-Harb	Dump & Misc. C & D	Days		03/27/18												WER-Harb	
210702	F25047	Pul-A	WER-East	Dump & Misc. C & D	Days		04/04/18	04/04/18	04/04/18	04/04/18									WER-Harb	
210702	F25037	Over Heat	WER-Central	Dump & Misc. C & D	Afternoon		04/10/18												WER-Sewer	
190710	F25104	Leak-Hydrolic	WER-Central	Dump & Misc. C & D	Days		04/11/18												WER-Fair	
130412	030142	Leak-Transmission	WER-Sewer	Dump & Misc. C & D	Days		04/12/18												Safety	
070702	F25107	Tree Study	WER-Sewer	Dump & Misc. C & D	Days		04/30/18												Security	
030419	030716	Brakes	WER-Sewer	Dump & Misc. C & D	Days		04/30/18												Street Post	
070702	010102	Transmission	Security	Passenger (3.1.1)	Days		07/07/17												Unknown	
030419	F25047	The Wheel	IT	Passenger (3.1.1)	Days		04/30/18	04/30/18	04/30/18	04/30/18										

Fleet Utilization Tracker

Vehicle	January Mileage	January Driver	January Condition	February Mileage	February Driver	February Condition	March Mileage	March Driver	March Condition	April Mileage	April Driver	April Condition
2010 Ford Van Plate# 010X074 Sewer Veh# 301059	50,828	Perkins, T.	Excellent				301,059			61,549	Perkins, T.	Excellent
2011 Ford Van Plate# 010X004 Sewer Veh# 301176	823,490	Grant, B.	Excellent				85,390			87,055	Grant, B.	Excellent
2011 Ford Van Plate# 020X324 Sewer Veh# 301107	483,069	Thomson, D.	Excellent				48,326			502,226	Thomson, D.	Excellent
2009 Ford Van Plate# 008X071 Sewer Veh# 300921							90,130			90,368	Miller, K.	Good
2007 Ford Van Plate# 020X440 Sewer Veh# 300701	090660	Baldwin, T.	Good				83,195			84,642		Good
2007 Ford Van Plate# 020X068 Sewer Veh# 300723	102,624		Poor							102,624		Poor
2007 Ford Van Plate# 020X485 Sewer Veh# 300711												
2010 International Mini-Vactor Plate# 020X356 Sewer Veh# 691063	25,557	Jet Operator	Good				25,553			25,553	Jet Operator	Good
2007 International Mini-Vactor Plate# 010X010 Sewer Veh# 990763	4,135	Jet Operator	Good				41,355			41,355	Jet Operator	Good
2014 Kenworth Vactor Plate# 019X037 Sewer Veh# 751460	4,528									4,540	Jet Operator	Fair

Fleet PM Tracker

Vehicle	Year	Make	Class	Class Type	Assignment	Mileage	Hours	Date Data Reported On	Technician	Status	Date Turned In for Repair	Date of Request
100000	2010	Ford	A	Passenger	ONCR							
100001	2010	Ford	A	Passenger	ONCR							
100002	2010	Ford	A	Passenger	ONCR							
100003	2010	Ford	A	Passenger	ONCR							
100004	2010	Ford	A	Passenger	ONCR							
100005	2010	Ford	A	Passenger	ONCR							
100006	2010	Ford	A	Passenger	ONCR							
100007	2010	Ford	A	Passenger	ONCR							
100008	2010	Ford	A	Passenger	ONCR							
100009	2010	Ford	A	Passenger	ONCR							
100010	2010	Ford	A	Passenger	ONCR							
100011	2010	Ford	A	Passenger	ONCR							
100012	2010	Ford	A	Passenger	ONCR							
100013	2010	Ford	A	Passenger	ONCR							
100014	2010	Ford	A	Passenger	ONCR							
100015	2010	Ford	A	Passenger	ONCR							
100016	2010	Ford	A	Passenger	ONCR							
100017	2010	Ford	A	Passenger	ONCR							
100018	2010	Ford	A	Passenger	ONCR							
100019	2010	Ford	A	Passenger	ONCR							
100020	2010	Ford	A	Passenger	ONCR							
100021	2010	Ford	A	Passenger	ONCR							
100022	2010	Ford	A	Passenger	ONCR							
100023	2010	Ford	A	Passenger	ONCR							
100024	2010	Ford	A	Passenger	ONCR							
100025	2010	Ford	A	Passenger	ONCR							
100026	2010	Ford	A	Passenger	ONCR							
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100099	2010	Ford	A	Passenger	ONCR							
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Fire Hydrant Inspection and Repair Program

Anil Gosine, Programs and Sewer M&R Manager
Kieyona Jackson, Water M&R Manager

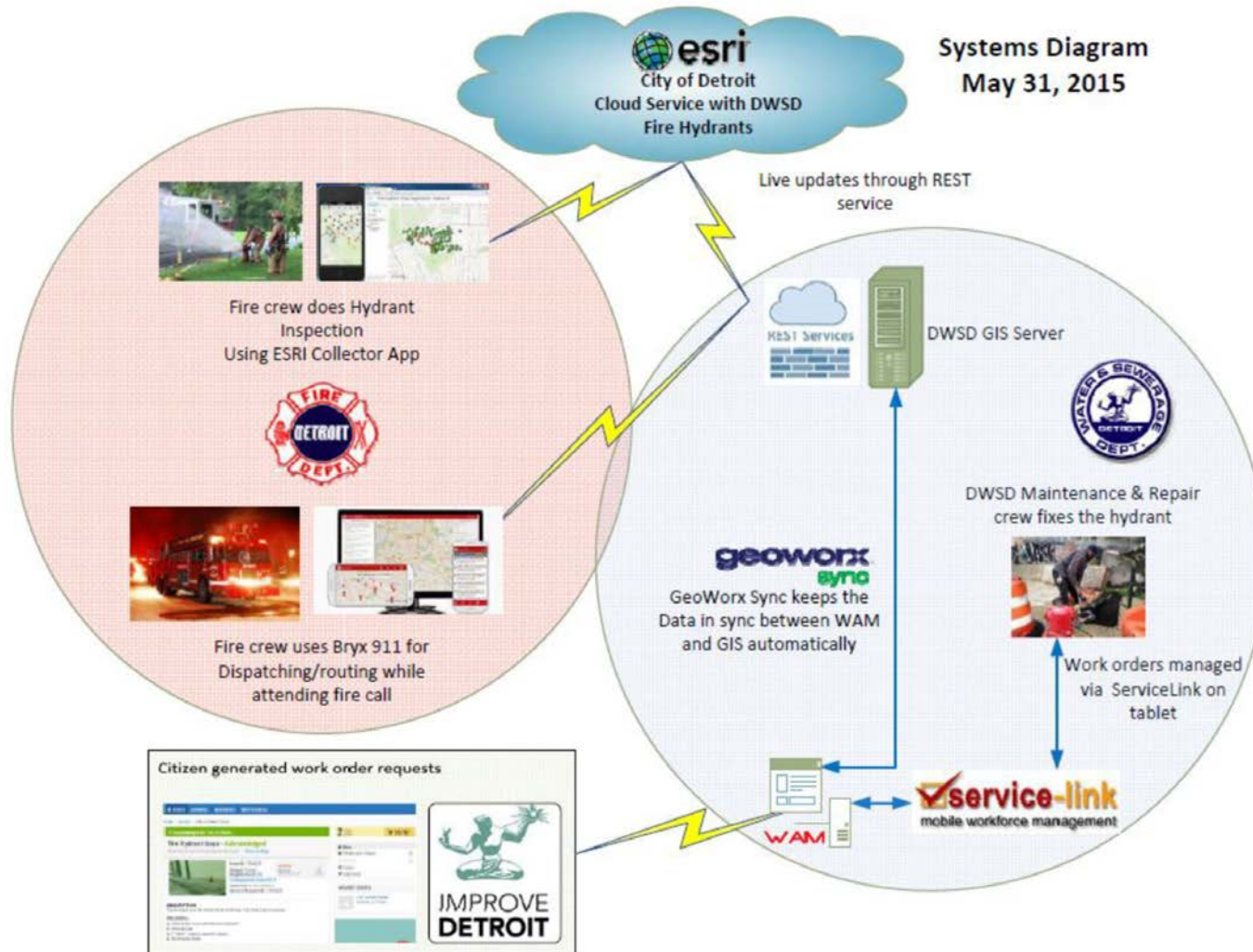
Overview

- Background Context
- Accomplishments
- Short vs Long Term Goals
- Challenge and Solutions:
 - Staffing
 - Unauthorized and Permitted Use
 - Inspections
 - Asset Identification

Background Context

- Antiquated Paper Process
- Inaccurate count of hydrants operable and inoperable
- No prioritization of hydrant repairs by proximity to critical facilities
- Inadequate repair vehicles
- Theft of hydrant parts and appurtenances in the field
- Fire department had no information on water main size or available flow
- Poor use of hydrant location and identification data

Hydrant Inspection Technology



Staffing/Operations



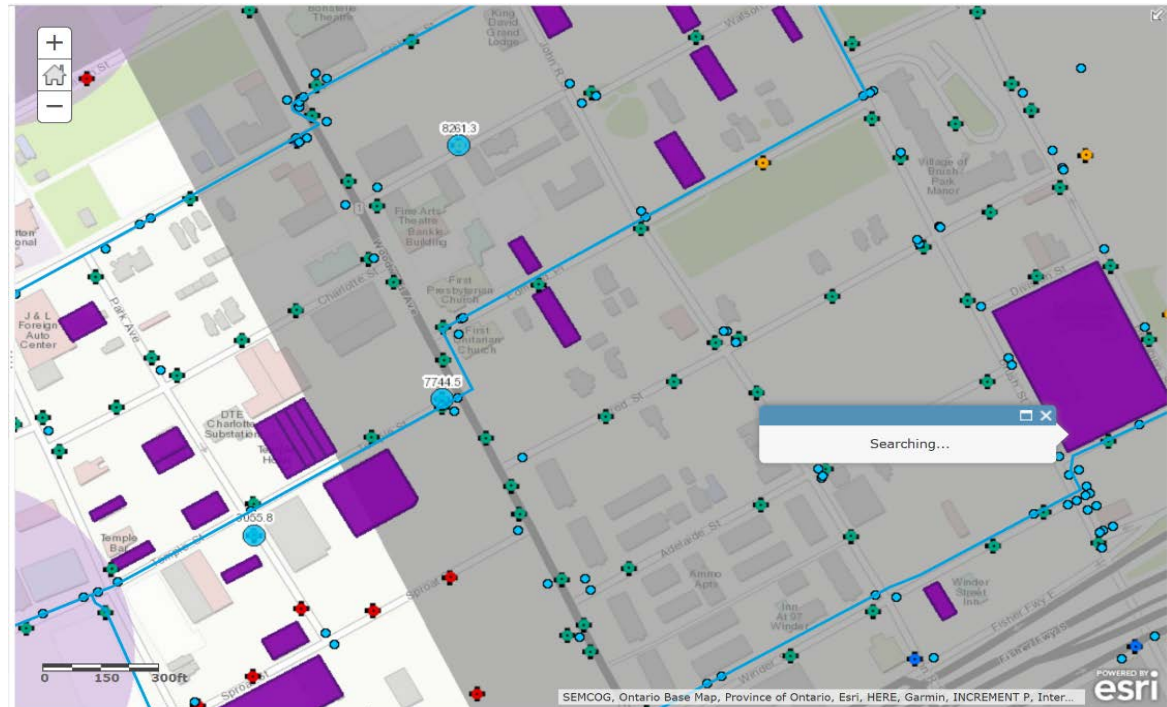
- 4 DWSD crews supplemented with contractor crews as needed
- Crews work 6 days per week



Accomplishments



- Electronic process for inspection and flow test data
- DWSD and DFD crews use the same app
- Increased frequency of inspections and fire flow tests for Insurance Service Office (ISO) audit

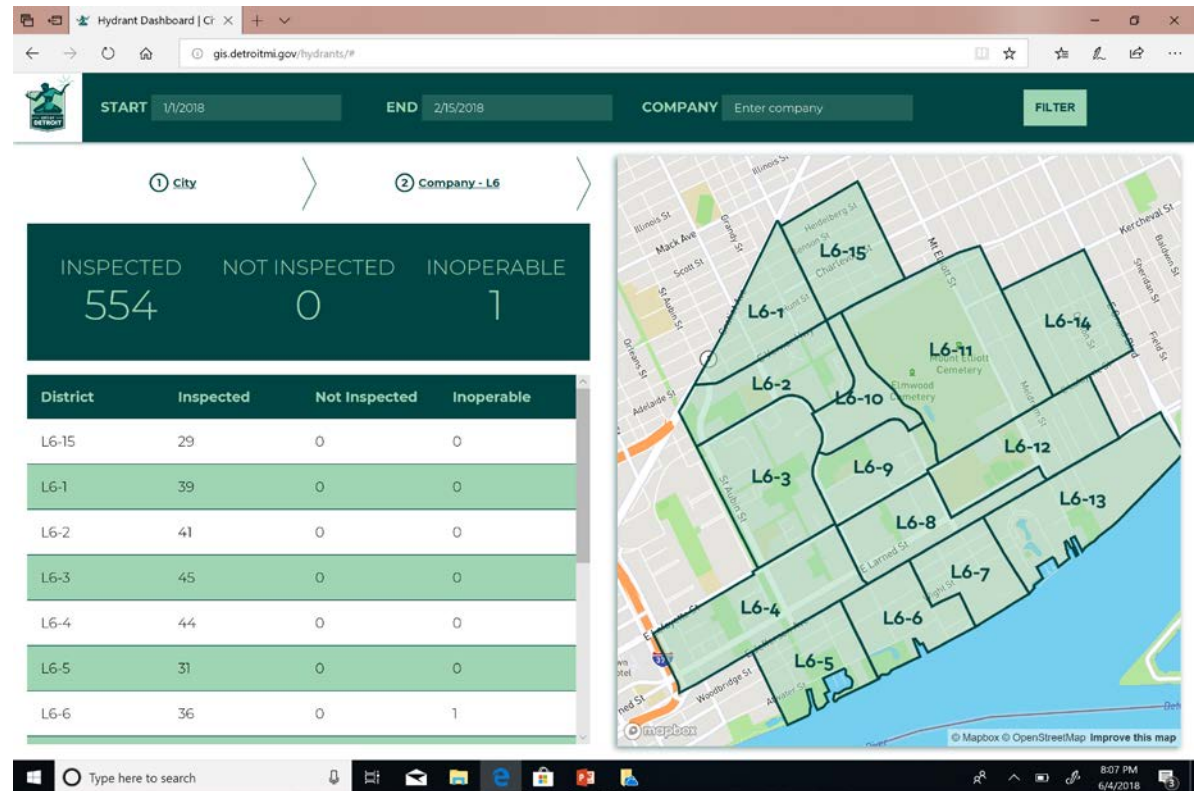


water mains, hydrant locations and actual flow values of hydrants is now available to DWSD and DFD staff

Accomplishments



- All hydrants inspected and have current date in the system
- Updated DFD inspection policy to satisfy ISO requirements
- All fire companies fully trained on field collector app and desktop computer application
- Web form reporting of duplicate or missing hydrants to update database
- Created new hydrant districts to balance workload across all fire companies



Near Real time data on Hydrant Operability



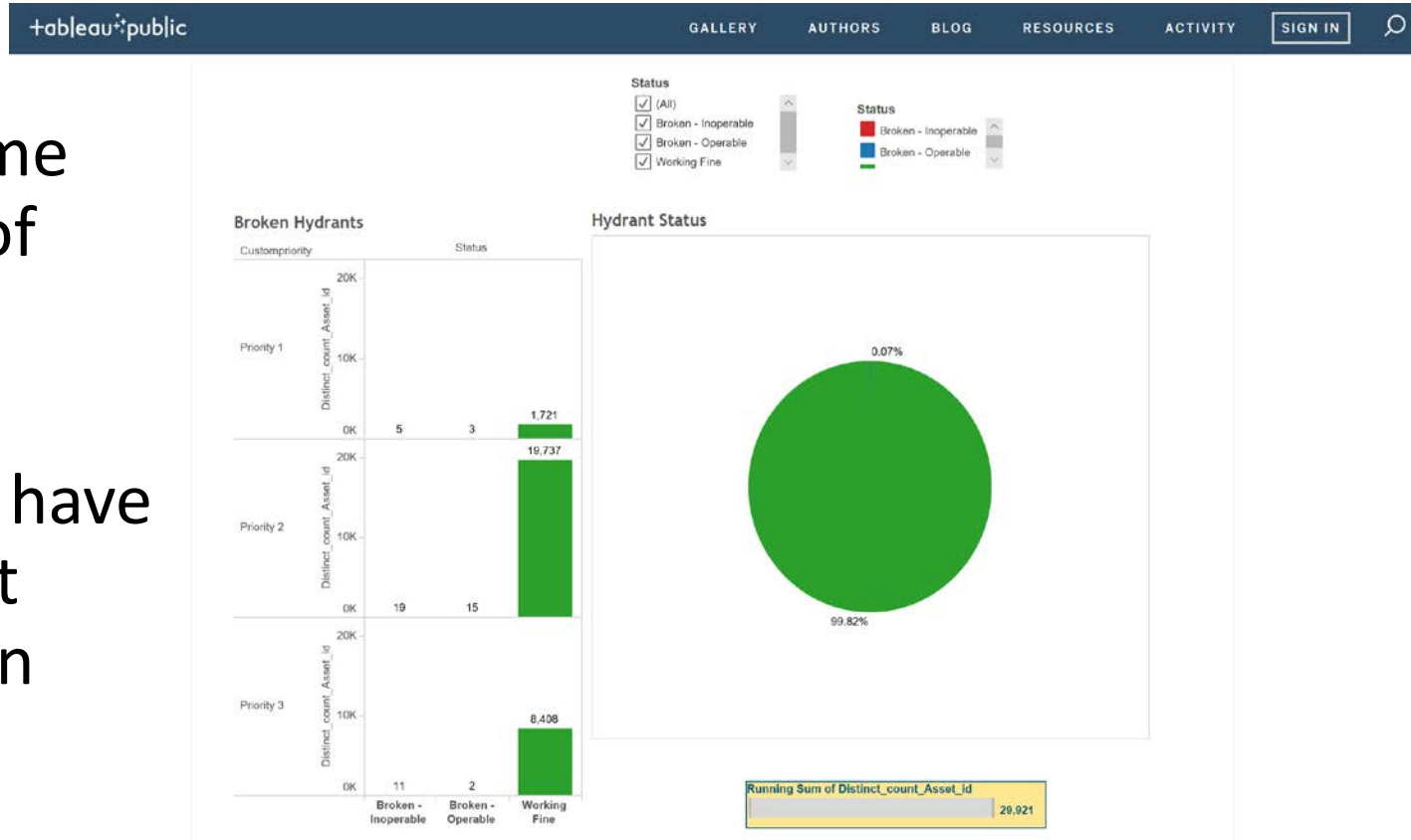
- DWSD targets to have no more than 1.5% of hydrants inoperable, based in Industry standards
- Three main categories tracked for hydrants:
 - Operable with no issues
 - Operable with minor repairs needed (cap missing)
 - Inoperable with major repairs

Category	Status
Operable (working fine)	29866
Operable (minor repairs)	20
Inoperable (major repairs)	35
Total	29,921

Accomplishments



- Near real time dashboard of hydrant operability
- All hydrants have unique asset identification number

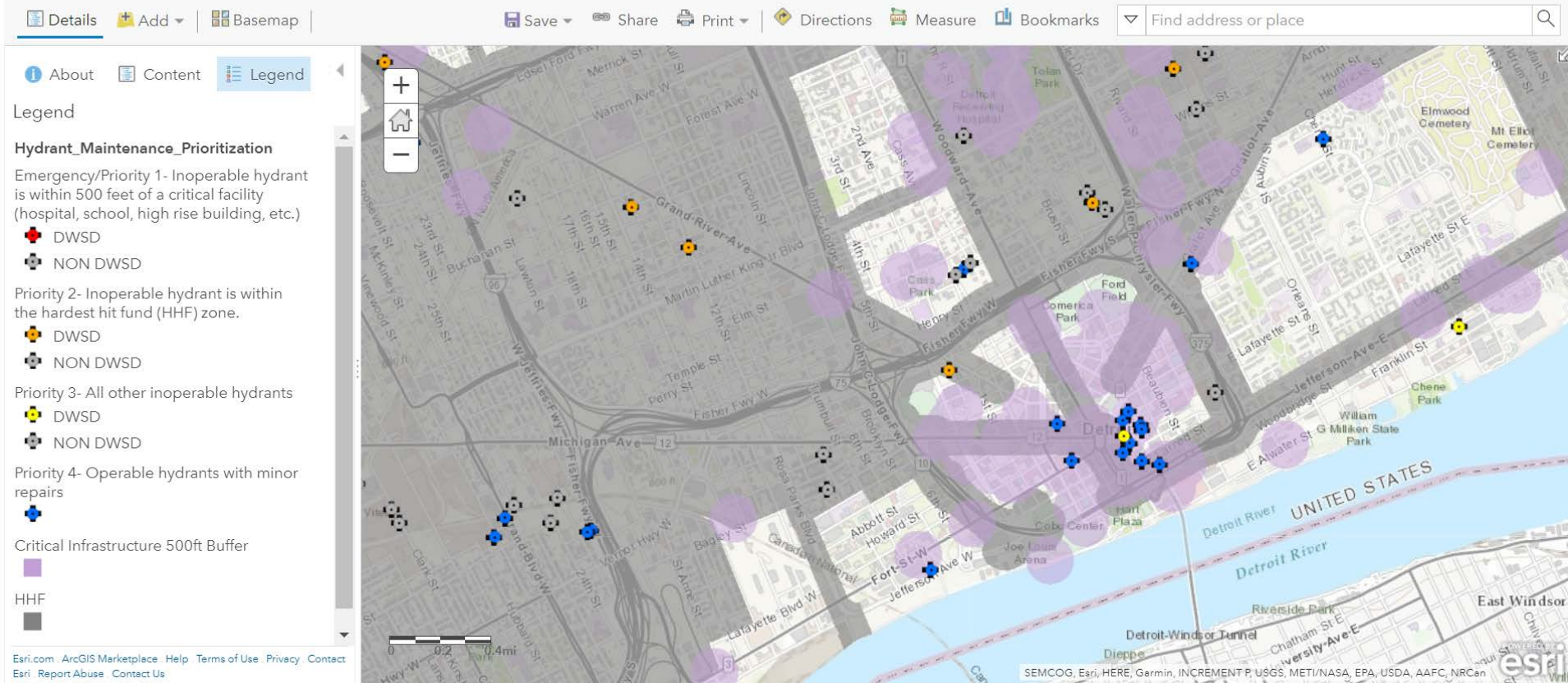


Prioritization of Work-Critical Facilities



Home ▾ Hydrant_Maintenance_Prioritization

New Map ▾ Palencia ▾



Short and Long-Term Goals

- **Short Term Goals (<90 days)**
 - Update policies and protocols for decommissioned hydrants; “Rebuild & Reuse” vs “Strip & Scrap”
- **Long Term Goals (>90 days to <1 year)**
 - Improve visual identification of hydrant flow availability and those in need of service
 - Improve use of prioritization model for repairs
 - Implement field oversight of permitted hydrant usage
 - Maintain ***operable*** hydrant availability at 97% or better

Challenge and Solution: Staffing

- **Challenge:** Increased attrition due to retirement over next 5 years
- **Solution:**
 - ✓ Modify on-boarding process for new field service technicians
 - ✓ Maintain position postings as open until filled to create pool of candidates
 - ✓ Create succession plan



Challenge and Solution: Unauthorized and Permitted Use



- **Challenge:** Customers pay (or not) for a specific use and do not follow the guidelines for that use
- **Solution:**
 - ✓ Develop GIS collector app to notify Field Services of permitted use
 - ✓ Implement field oversight and inspection of select hydrant permits issued



Challenge and Solution: Asset Identification without GIS

- **Challenge:** Inability to identify hydrant functionality without GIS
- **Solution:**
 - ✓ Paint, tag, or use barcode to place asset number on hydrant
 - ✓ Reflective tape color code hydrant with AWWA/NFPA flow rating
 - ✓ Yellow tags for inoperable hydrants, blue tags for operable hydrants that need repair



Catch Basin Inspection and Cleaning Program

Kenneth Miller, Sewer Division Team Lead

Overview

- Sewer Operations
- Wet vs Dry Weather Operation Priorities
- Catch Basin Background Information
- Program Goals
- Historical and Current Performance Analysis



DETROIT
Water & Sewerage
Department

Sewer Operations

- Investigate/rod sewers for water in basement complaints
- Investigate and repair cave-ins/sewers
- Clean, inspect, Geo-locate and repair catch basins
- Clean and repair manholes and gatewells
- Assist water main repair crews (hydro excavation, street sweeping for main breaks)
- Televise and PACP (Pipeline Assessment Certification Program) code sewers



#DWSDserving

Wet vs. Dry Weather Operations

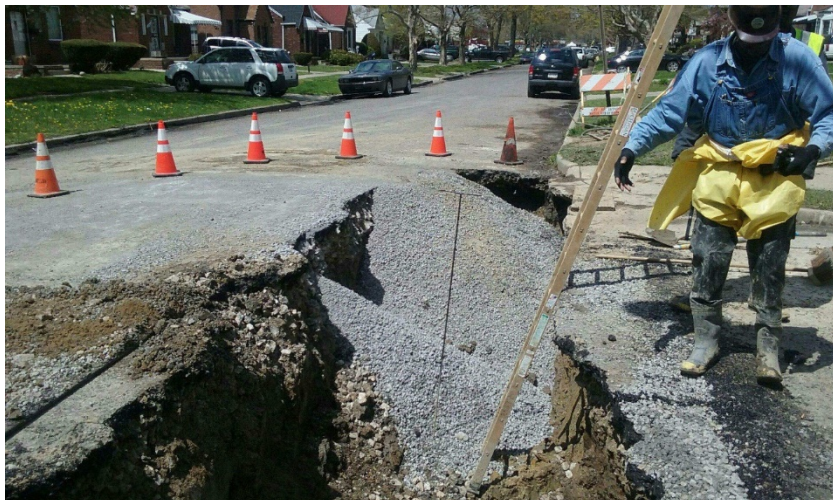
Category	Wet Weather	Dry Weather
<i>Priority of Work</i>	1. Rodding sewers to respond to water in basement complaints 2. Severely flooded city roadways	1. Unplanned catch basin cleaning/inspection 2. Planned catch basin cleaning/inspection 3. Repair/replacement of catch basin structures
<i>Staffing/Equipment</i>	All available staff and equipment	4 vactor crews- unplanned 2 vactor crews- planned
<i>Shifts</i>	All shifts	Mon-Fri: Days/Afternoons Sat-Sun: Days



DETROIT
Water & Sewerage
Department

Extent of Repair Operations

- Repair Time:
 - Simple: 2-4 hours
 - Complex: 1-5 days



Catch Basin Background Information

- 95,000 Catch Basins, no data on location/type
- No information on connectivity to sewer system
- No routine basin cleaning and inspections program since 2009-10
- No routine street sweeping program in the City
- Information technology challenges (SeeClickFix and WAM)
- Lack of skilled staff and sufficient equipment

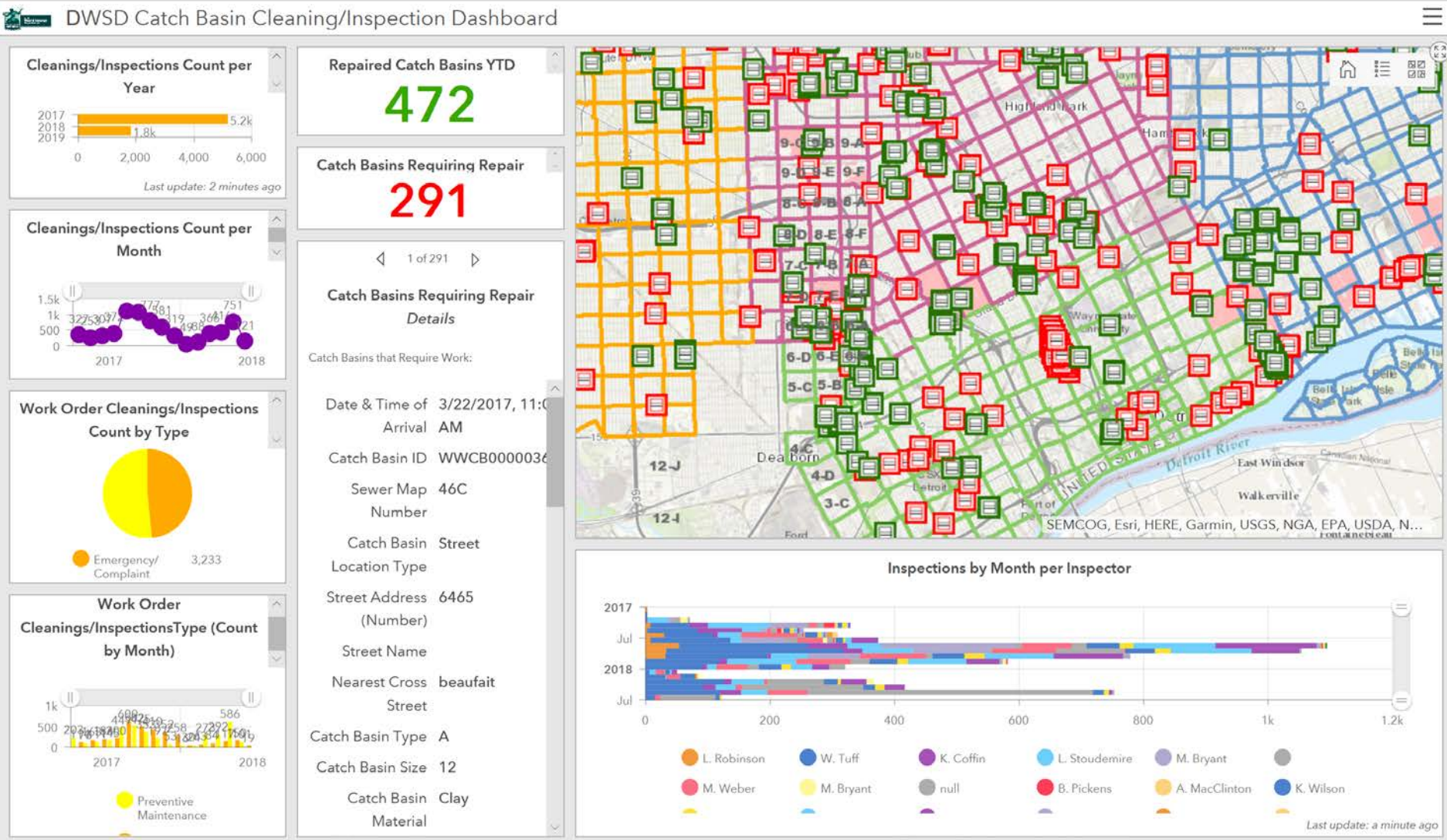
Program Goals

- Develop preventive maintenance (clean/inspect) program with 5 year level of service
 - 10,000/year FY18 – FY20
 - 11,500/year FY21
 - 13,000/year FY22
- Reduce street flooding
- Locate all catch basins and enter data in GIS
- Determine connectivity of all basins to the sewer system
- Provide data for hydraulic model- system response in dry vs. wet weather
- Eliminate ***all paper work orders***

Planned Maintenance Program- Selection Criteria

- Quarter square mile section map areas chosen based on the following:
 1. Sanitary sewer was ***cleaned and lined*** within the last 5 years, area has significant tree canopy, minimal water in basement complaints and is densely populated
 - **Group A:** Bounded by Curtis, Pembroke, Schaefer and Livernois
 - **Group B:** Bounded by Evergreen, Southfield Fwy, McNichols, and Fenkell
 2. Sanitary sewer was ***cleaned and lined*** within the last 10 years, area has significant tree canopy, minimal water in basement complaints and is densely populated
 - **Group C:** Bounded by Whitaker, Green, Rathbone, and Woodmere (Southwest Detroit)

Catch Basin Dashboard

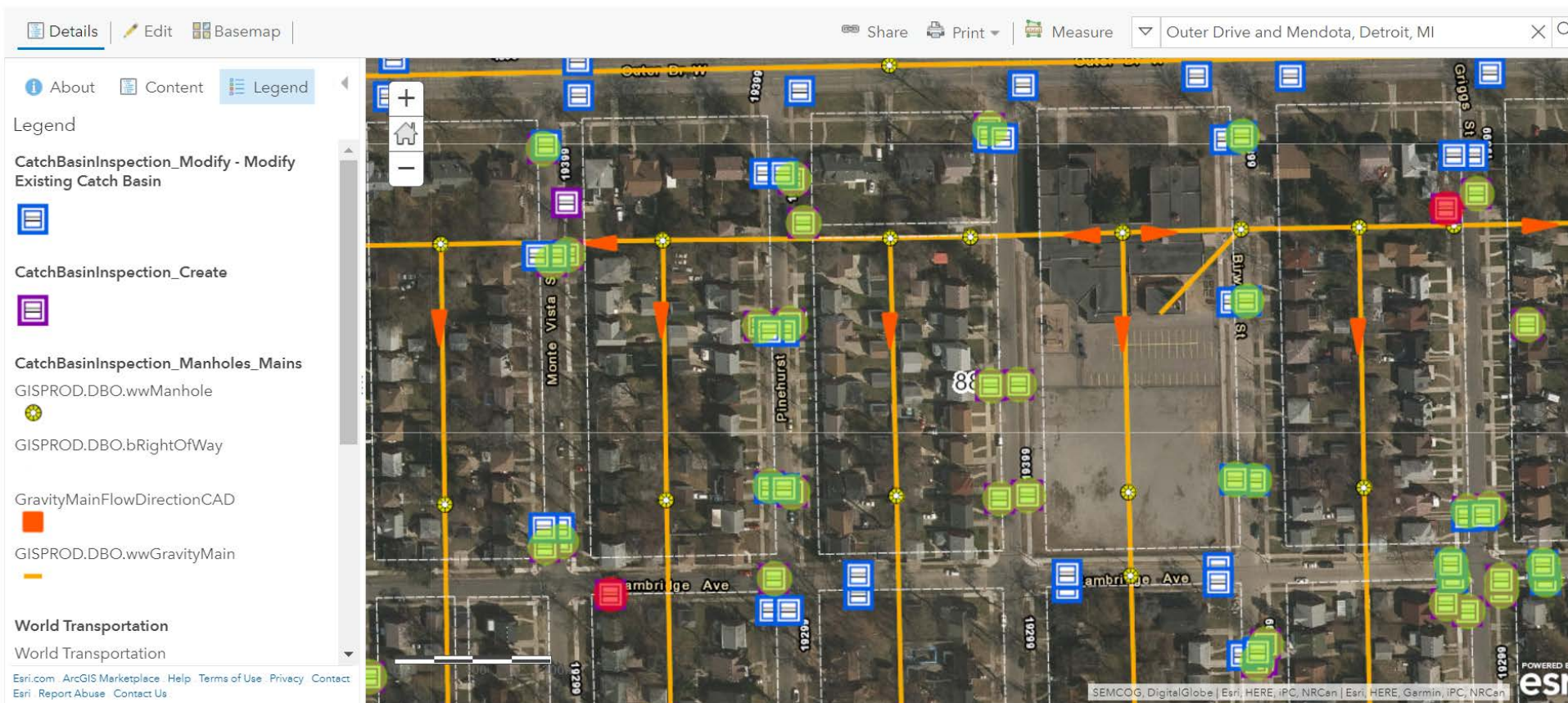


Catch Basin Cleaning and Inspection App



Home ▾ Catch Basin Inspections

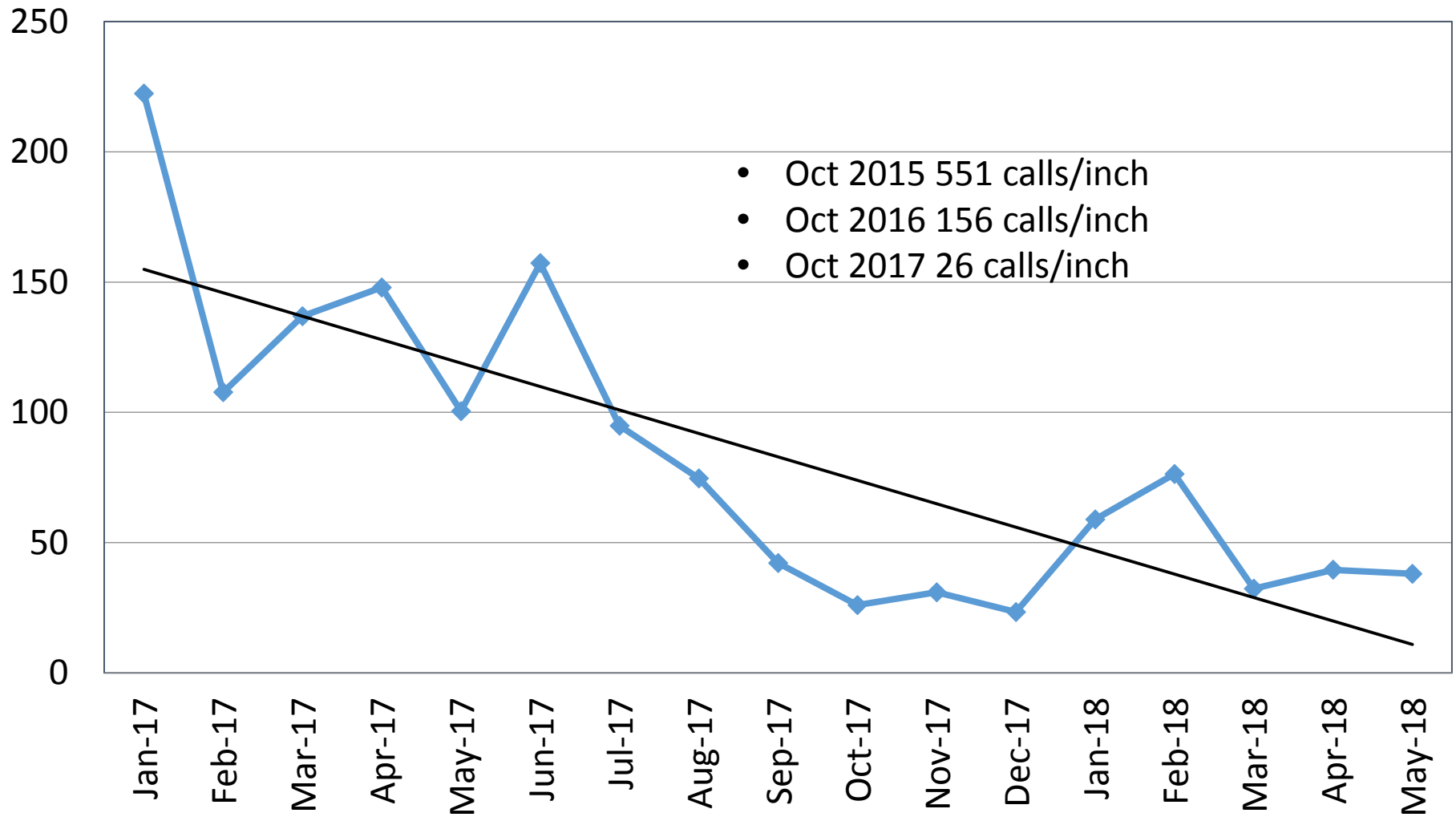
New Map ▾ Palencia



Performance Data Comparison

Category	Year			
	2010	2015	2016	2017
Complaints Total	4,836	2,974	3,926	2,783
Planned Maintenance	N/A	N/A	N/A	2,992
Unplanned Maintenance	4,566	3,969	3,318	4,487
Total Maintained	4,566	3,969	3,318	7,479
<i>Vactors in Fleet</i>	<i>26</i>	<i>11</i>	<i>11</i>	<i>9</i>
<i>Vactors Operated</i>	<i>8-12</i>	<i>4-6</i>	<i>4-6</i>	<i>4-6</i>

Complaints per Inch of Precipitation 2017



Units of Service

Palencia Mobley, P.E.,

Sam Smalley, P.E., Assets Manager

Kieyona Jackson, Water M&R Manager

Overview

- Units of Service and Non-Revenue Water
- Review of GLWA (DWSD) Operations/Impacts
- Meter Operations Improvements
- Preventive Maintenance Program Pilot
- Summary of DWSD Improvements and Recommendations

Units of Service

What is it?

- Annual volume of water purchased from the Great Lakes Water Authority

How is it currently measured?

- Based on water sold at each property as measured by meters

Why is change needed?

- May not accurately account for all sources of non-revenue water (main breaks, leaking service lines, illegal connected properties, etc.)

Article 3.1 of Water Services Agreement with GLWA



- Independent Financial and Engineering Analysis for Units of Service (to be used for FY2017 rates)
- Water Audit via AWWA methodology (results to be used for FY2018 revenue requirements)
- Independent Wholesale Meter Audit (to begin FY2017)
- Authority Usage- all facilities in Detroit must be metered
- Water Treatment Plant Production Metering all facilities metered by June 30, 2020.

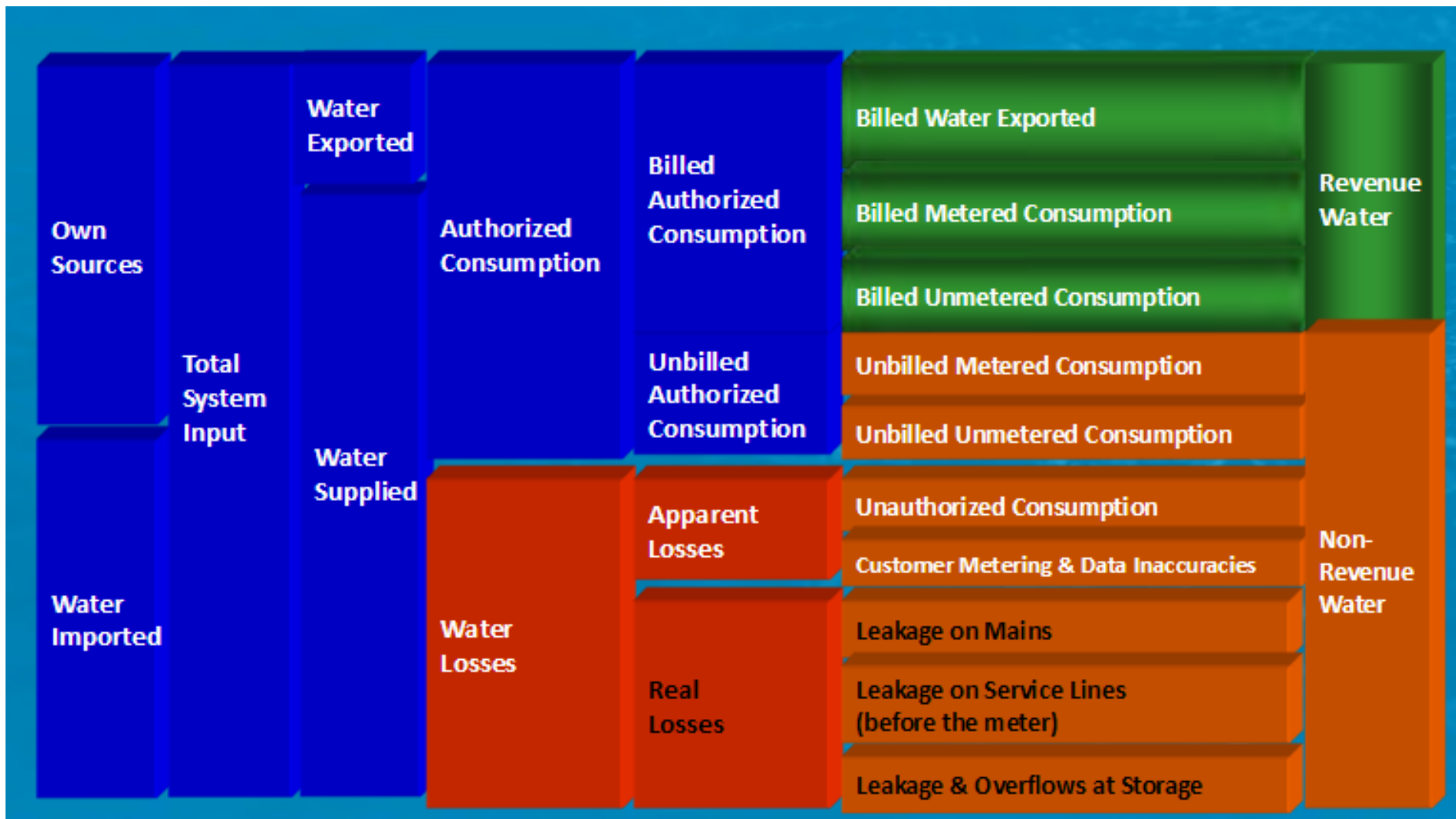
Independent Financial and Engineering Analysis



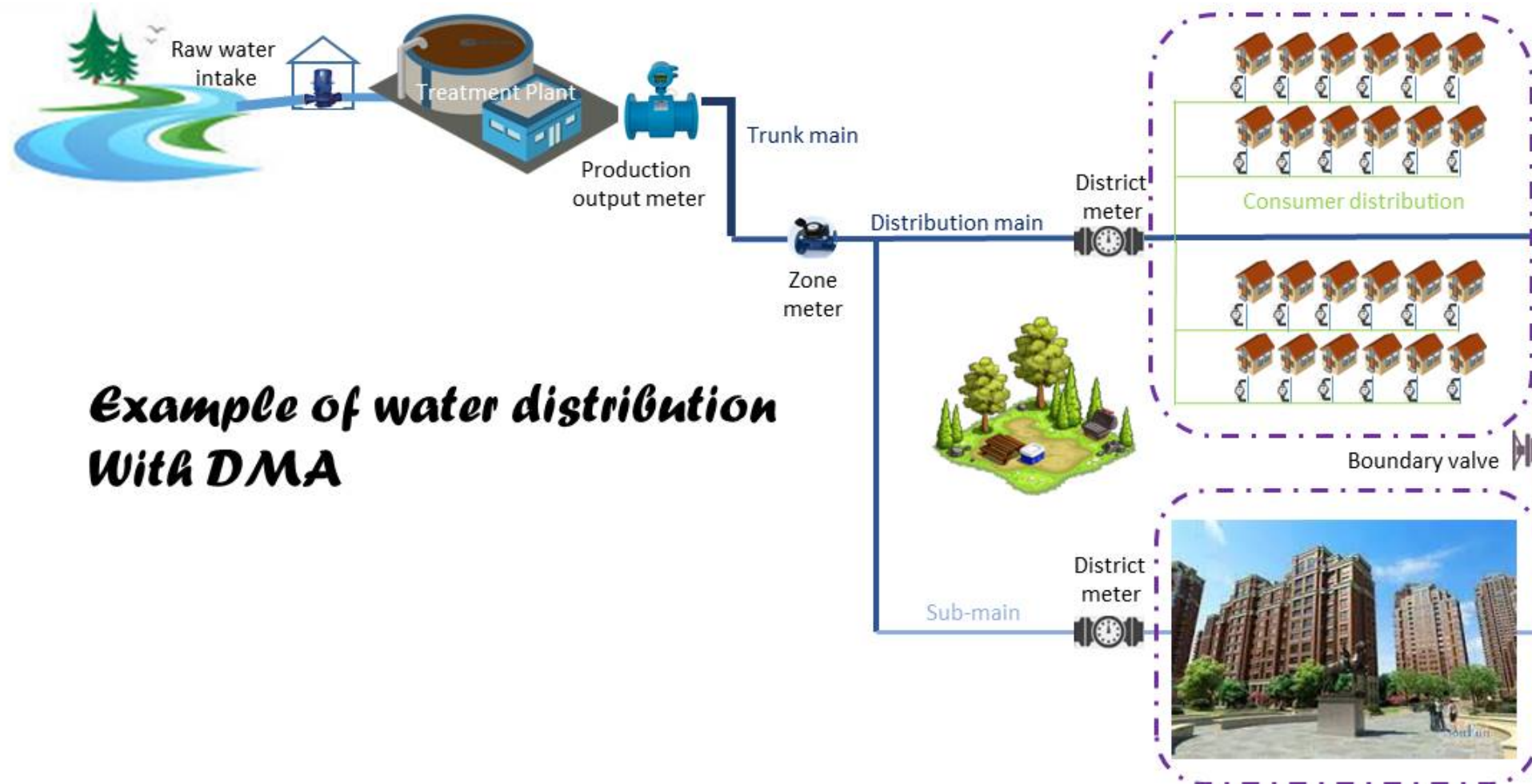
- Phase I Desktop Review of Existing Data
 - Detroit, Dearborn and Highland Park meter records and water main break records
 - GLWA Wholesale meter records
 - GLWA Water Plant pumping records
 - GLWA Transmission Main system maintenance records
- Phase II Field Data Collection
 - Temporary meter installation at water treatment plants
 - Testing of select GLWA wholesale meters
 - Installation of district metered areas (DMA) in Detroit and Dearborn



AWWA Water Audit



District Metered Area



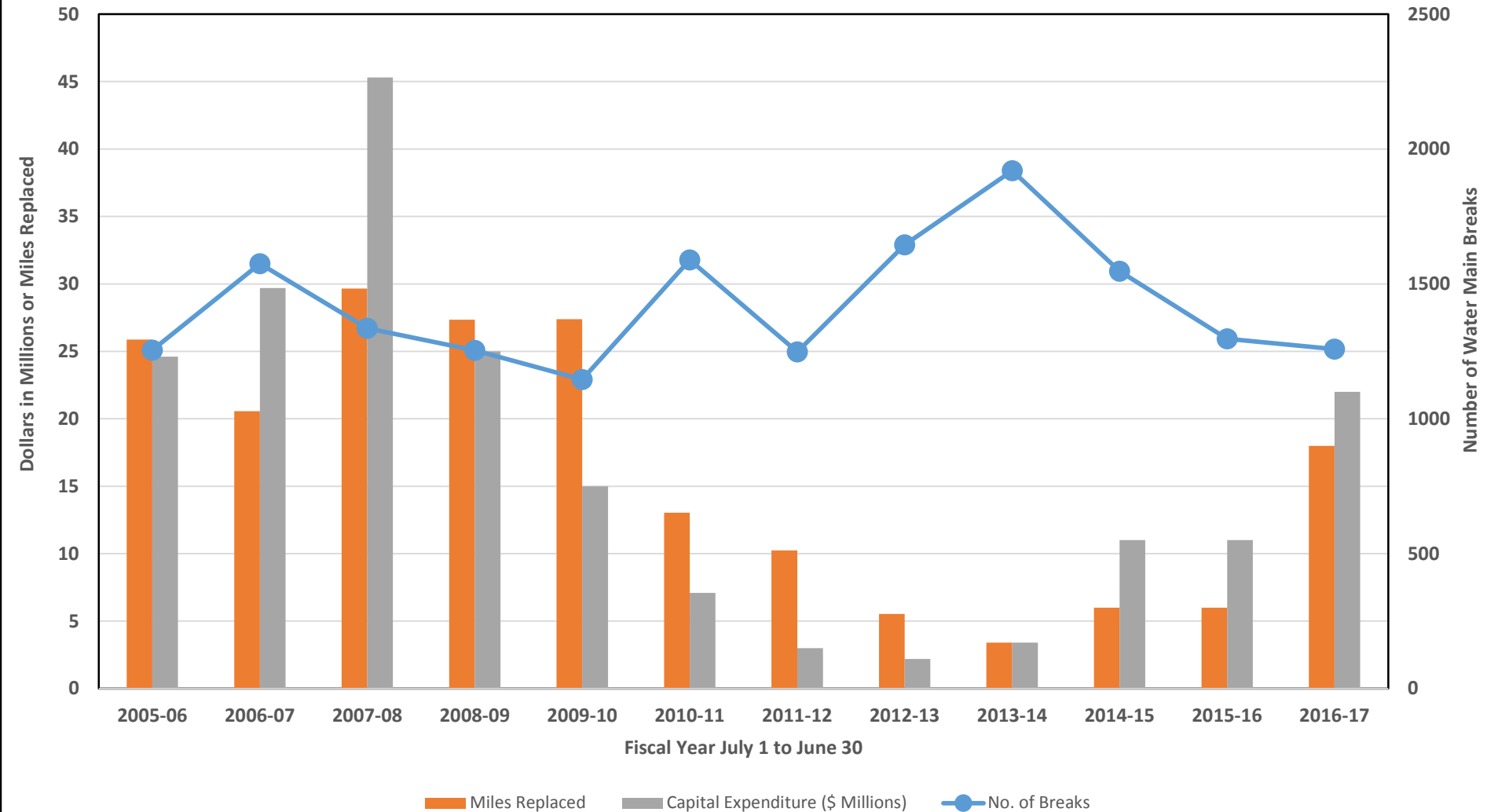
Cost Shifting Considerations

- DWSD acknowledges some cost shifting will occur
- Best available data, industry standards, or AWWA approved methodology (rather than correlations and extrapolations)
- Over allocation of costs to DWSD causes financial hardship that effects entire system/phase in required
- Commit to a timeline to complete all required work to reduce ping-pong effects of cost shifting

Delayed Investment



Water Main Breaks, Miles Replaced, and Dollars Expended



Existing Data and Reports

- CS-1396 Tasks:
 - Leak Detection Survey 2013-2015
 - 2014 Comprehensive Water Audit
 - 2015 District Meter Area Pilot
- 2014 Peer Review Report by Veolia
- DWSD Level of Service, City Demolition Program, and Revenue Protection Unit Data

Water Plant Production Metering

- No operational production meters at the five water treatment plants
- 2014 TYJT estimates plant production over-reported by 8.2% based on 2012 data set
- Pump degradation estimate at 0.5% per year yields:
 - 447 MGD versus 498 MGD reported
- Phase II temporary metering and completion of permanent meters critical

Wholesale Customer Metering

- GLWA does not have access to wholesale customer retail data to validate volumes sold
- Required by Lease to audit (calibrate and test) all wholesale meters
- Detroit to be master metered in 40 years (as practical)
- Underreporting of Volumes:
 - Population changes
 - Sizing/Technology Selection
 - Calibration vs. Testing
 - Age of wholesale meters

2014 Veolia Peer Review Report

Table 3.1-6 – Wholesale Meter Type by Quantity/Age

Meter Type	0-10 years	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years	91-100 years	101-110 years
Magneto	39	24	1		1					
Turbine	1	84			2	1	2	1		
Venturi	1	25	2	12	33	12		2		2

Above information based on 245/290 units. The remaining 45 units in the system did not have installation date data available.

- Magnetic and Venturi meters not calibrated to flow, only electronics and pressure cells
- Turbine meter in-situ testing does not follow accepted methodology

Transmission System Losses



Transmission System Losses

Type	Description	Media
Blow Off	August 2017: Lyndon and Meyers 15 days at 20 MGD 12-inch blow off on 48" main	
Flushing	June 2016: 2227 Cortland ran for 18 days after a repair was made	https://www.facebook.com/kenneth.reed.14473/videos/vb.25714432/10102413202554788/?type=2&theater
Flushing	February 2017: Woodward and Winder, 48" main flushing for 14 days	
Flushing	July 2017: Hurlbut and Kercheval 42" main flushing for 60 days	http://www.fox2detroit.com/news/local-news/gallons-of-water-pouring-from-hose-on-detroit-street-for-months
Main Break	July 2016: Third party damages 42" water main crossing Rouge River, boil water advisory issued	http://www.fox2detroit.com/news/local-news/detroit-orders-boil-water-alert-for-most-of-southwest-side
Blind Leak	November 2016 to February 2017: Fort Street 42" water main leak; DWSD notified GLWA 11/7/2016 repair was initiated by GLWA 2/7/2017	

Pre-Bifurcation Leak Detection

- August 2015 City of Detroit representatives requested the leak detection contract be amended, request denied by DWSD EMT (now GLWA):
 - Claims that NRW was not decreased by the program
 - Comprehensive Water Audit would be performed as required by water and sewer services agreement
- Total volume reduction due to leak detection was **21 MGD**

Pre-Bifurcation Leak Detection Results

Reduced Non Revenue Water directly allocable to Detroit by **21 MGD**

Type	Number	Volume MGD
Abandoned Service Leak	1275	13.3
Hydrant Leak	134	0.16
Main Leak	209	6.75
Packing Leak	102	0.15
Service Leak	64	0.39
Totals	1,784	20.75

DWSD Non-Revenue Water Programs

- Meter Operations Program Improvements:
 - Large Meter Replacement Program
 - Meter data analytics
 - New test benches and warranty testing
 - New meter specifications/request for bids
 - Using AMR to locate and address non-reported vacant flooding properties
 - Leverage reports to identify likely instances of illegal water usage
- Capital Improvement Program
- Maintenance and Repair Preventive Maintenance Program Pilot

Large Meter Program

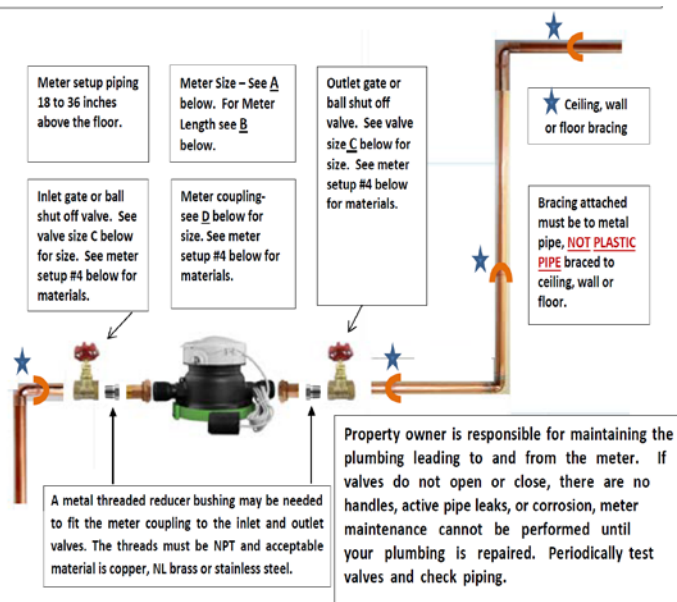
- Starting with compound meters
 - 230 remain in the system today
- Goal to replace 10 per week minimum production for replacement inclusive of site survey work
- When there's an access issue, Resource Recovery Unit is brought in to assist
- Issue ten day notice, if customer fails to make repairs, DWSD will cause repairs to be made

Meter and Billing System Analytics



- Residential consumption greater than 10 cubic feet between 12 am and 4 am
 - Field crews will check and shut service if house found vacant/abandoned
 - Approximately 5000 accounts with 748 gallons of water used in this period
- Water off – with consumption: billing system charges for consumption but not monthly meter charges
- Water on – zero consumption: billing service charges but no commodity – likely source of illegal water usage
- 1,494 large and small meters replaced Jan 1- March 31 of 2018

Small Meter Plumbing Issues



While, the residential meter setup guide was revised in 2017 to meet current regulations, it is still very difficult for customers to understand. The result is a high rate of failed meter installation attempts, due to improper plumbing.

METER SIZE AND LENGTH MEASUREMENTS

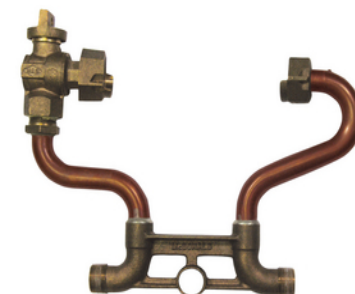
A	B	C	D
METER SIZE	METER LENGTH	VALVE SIZE	COUPLING SIZE
5/8 INCH	7 1/2 INCHES	3/4 INCH	3/4 X 1 1/2 INCH
3/4 INCH	9 INCHES	1 INCH	1 X 3/4 INCH
1 INCH	10 3/4 INCHES	1 1/2 INCHES	1 1/4 X 1 INCH

Double-check valves or other backflow prevention devices meeting the approval of the Detroit Health Department shall be installed within 180 inches of the meter whenever there is a secondary supply of water on the premises served or where provisions are made for a Fire Department pumper supply to premises.

METER SETUP REQUIREMENTS:

1. Meter must be installed horizontally and a minimum of 14 inches away from wall.
2. Meter must be installed between 18 inches and 36 inches above the floor.
3. Use metal pipe from building entry until attached to wall or ceiling (copper or approved equal). All bracing to ceiling, wall or floor must be on metal pipe.
4. Valves/meter couplings/bushings must be stainless steel or no lead/low lead brass and meet National Pipe Thread (NPT) standards.
5. Maintain clearance of 18 inches or more below, above and in front of meter and shut off valves. Avoid placing behind furnace, hot water tank or other access restrictions.

Supplying residential customers With meter setters would eliminate the complexity of the current setup & Expedite the installation process.



Meter Operations Dashboard

Last Update: June 5, 2018

DWSD Meter Operations Dashboard

Dashboard Link:

[Meter Operations - Meter Replacements](#)

May Weekly Water On Exceptions

Zero Read	Never Read	No Current Read	254 Never Read
295	48	401	26
Cut Cable	Reversing Meter	Decode Mismatch	
1.309	19	39	

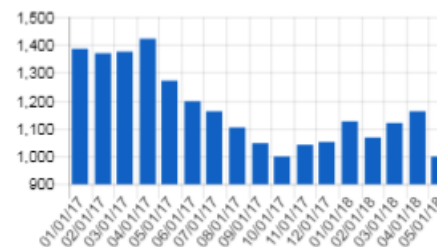
May Weekly Water Off Exceptions

Zero Read	Never Read	No Current Read	254 Never Read
157	599	374	3
Cut Cable	Reversing Meter	Decode Mismatch	
6.594	9	4	

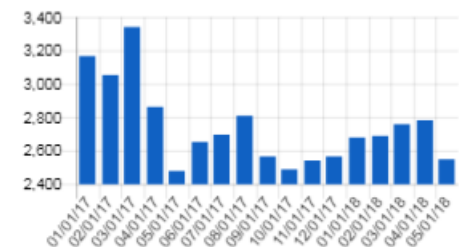
May Monthly Data

Total Active Accounts	AMR Accounts	Water off with consumption CF
253,889	200,582	8,039,353

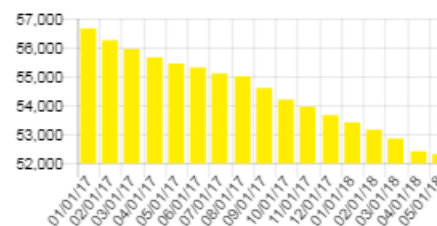
Non AMR Trend Water On



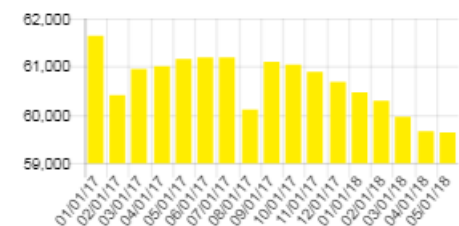
Estimated Meter Reads Water On



Non AMR Trend Water Off



Estimated Meter Reads Water Off



Exception Descriptions:

Zero Read - No registered consumption

Never Read - MIU has never transmitted

No Current Read - Less than 180 days since last AMR read

254 Never Read - More than 180 days since last AMR read

Cut Cable - AMR cable cut or wiring issue

Reversing Meter - Negative consumption recorded

Decode Mismatch - MIU setup does not match meter device code

Meter Replacement Program Dashboard



Meter Operations - Meter Replacement Dashboard

Dashboard Link:

[Meter Operations Dashboard](#)

2018 Meter Replacements



2018 Meter Population

Meter Size	Jan 2018	Feb 2018	Mar 2018
5/8"	185,612	185,635	185,639
5/8 X 3/4"	35	36	37
3/4"	45,885	45,872	45,856
1"	13,693	13,688	13,699
1 1/2"	3,308	3,308	3,306
2"	3,157	3,160	3,158
3"	743	752	751
4"	551	551	548
4 X 3/4"	4	4	4
4 X 1"	4	3	3
4 X 2"	1	1	1
6"	299	299	299
6 X 1"	1	1	1
6 X 1 1/2"	1	1	1
6 X 3"	1		
8"	95	94	94
8 X 4"	1	1	1
10"	41	41	41
12"	1	5	5
12 X 6"	5	1	1
16" ABB	1	1	1
24"	2	2	2
UNKNOWN	4	4	4
(blank)	585	565	563
	254,030	254,025	254,015

Large Meters 1 1/2" - 16"

2018	Meter Replacements	Meter Replacements	Meter Replacements	Meter Replacements	Meter Replacements
January	1 1/2" Meters: 4	2" Meters: 8	3" Meters: 2	4" Meters: 1	6" Meters: 2
February	1 1/2" Meters: 17	2" Meters: 8	3" Meters: 3	4" Meters: 1	6" Meters:
March	1 1/2" Meters: 4	2" Meters: 7	3" Meters: 2	4" Meters: 1	6" Meters: 1

2018	Meter Replacements	Meter Replacements	Meter Replacements	Meter Replacements
January	8" Meters:	10" Meters:	12" Meters:	16" Meters:
February	8" Meters:	10" Meters:	12" Meters:	16" Meters:
March	8" Meters:	10" Meters:	12" Meters:	16" Meters:

Small Meters 5/8" - 1"

2018	Meter Replacements	Meter Replacements	Meter Replacements	Meter Replacements
January	5/8" Meters: 353	5/8" x 3/4" Meters: 1	3/4" Meters: 120	1" Meters: 43
February	5/8" Meters: 278	5/8" x 3/4" Meters:	3/4" Meters: 57	1" Meters: 23
March	5/8" Meters: 443	5/8" x 3/4" Meters:	3/4" Meters: 91	1" Meters: 24

Meter Testing

- Internal testing procedures outdated and do not meet AWWA standards
 - Issues with test benches prohibited tests at appropriate flow rates
 - New procedures implemented August 2017
 - New forms for data collection implemented April 2017 (summarize and see trends with out box tests)
- Warranty testing of new devices not being performed only testing after removal, both done now

New Meter Specifications

- Sample of meters sent to Veolia meter testing facility in Houston
- New specification brings us up to AWWA standard for meter materials and components being zero to low lead
- Allowed plastic meters but must have equal comparison to metallic meters (salvage value)
- Eliminated compound meters from specification
- Added electronic and ultrasonic meters to specification
- Using AMR system data and data loggers to match meter selection to customers need (one size does not fit all to get low and high flow range)

Capital Improvement Program

- CIPMO is complete with condition assessments in pilot areas
 - North Rosedale Park
 - Cornerstone Village
- FY2018 on track to complete 25 miles of water main replacement, 50% increase over FY2017
- FY2019 plan to complete 30+ miles of water main
- Offering full lead service line replacement as part of water main replacement program



Leak Detection Results CIPMO



North Rosedale Park

- 17 miles of water main
- 175 valves
- 184 hydrants
- 4 hydrant leaks found



Cornerstone Village

- 30 miles of water main
- 425 valves
- 332 hydrants
- 16 mainly valves and services, leak found on 24-inch GLWA main

Preventive Maintenance Program Pilot



As a part of controlling our non-revenue water loss, DWSD's Field Services Department has planned, developed and implemented the pilot phase of the following PM Programs

Valve Exercising

Water Main Flushing

Leak Detection



Valve Exercising Program

DWSD will verify the city water system valves are operating as intended. The crews will document their findings and report needed repairs that will be made within five business days. DWSD will be on the street opening and closing the valves. Customers may experience temporary rusty water, brief water service interruptions and moderate noise during this work.





Water Main Flushing Program

DWSD will test the fire hydrants and use them to flush the water main. The crews will document their findings and report any needed repairs to be completed within five business days. DWSD will be opening the hydrants to flush water, so you may see street flooding due to the water volume and some catch basins not taking on water, potential water main break causing a temporary service interruption, and moderate noise during this process





Leak Detection

DWSD will use technology to identify blind leaks, likely reducing cave-ins caused by underground water main leaks, and flooding on vacant properties. Crews will document their findings and report any needed repairs to be made within five business days. DWSD will use sensors and headsets to identify the leaks, if any. Customers may see a small yard disturbance if a crew has to connect to a curb stop to identify a leak and moderate noise activity during this work.



PM Program Customer Outreach

In an effort to provide the City of Detroit residents with an understanding of the process, benefits and possible adverse effects from the activities of the PM program, we deliver informational flyers to every resident and business in the area that will be affected.

Preventative Maintenance Pilot Program Notification with Flushing Instructions

[Overview of the program.]



When and Where will DWSD Perform the Preventative Maintenance?

- [where].
- [when]

What Maintenance Work Will be Done?

- [Brief information about the work being done.]

Insert Map of Impacted Area

FLUSH YOUR PIPES AFTER WATER UTILITY WORK IN OR AROUND YOUR HOME

DWSD recommends flushing your water taps after maintenance in your neighborhood or plumbing work in your home. DO NOT consume tap water, run hot water faucets, or use your icemaker or filtered water dispenser until flushing is complete.



1 Remove faucet aerators from all water taps in the home.



3 Let the water run for 5-10 minutes at the last tap you opened (top floor).



2 Beginning in the lowest level of your home, open all the cold water taps in the house.



4 Turn off each tap starting with the first tap you opened (bottom floor). Clean and install aerators.

DWSD Improvements

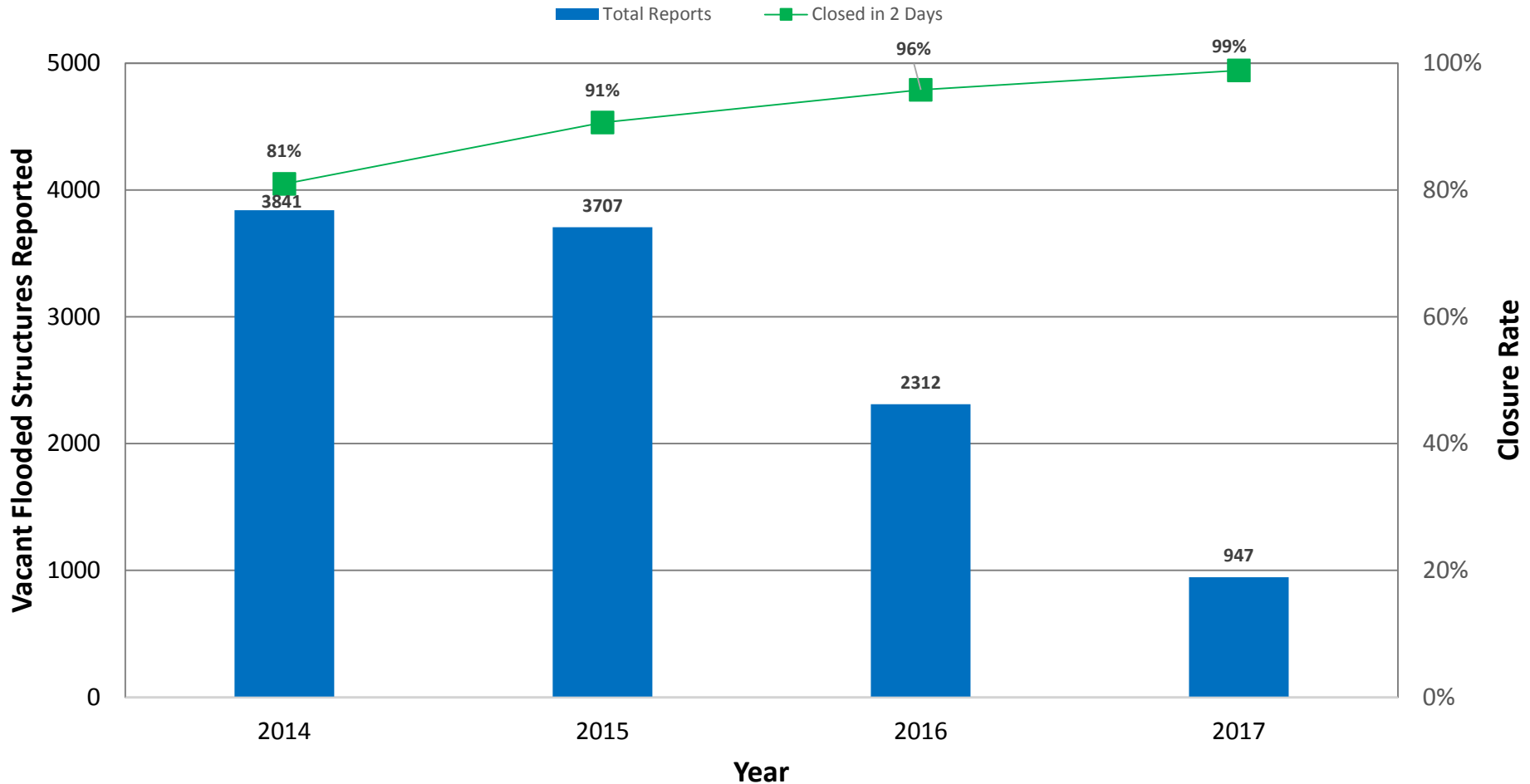


- >95% of all vacant flooding properties shut within 2 days
- >95% of all water main breaks repaired within 4 days
- Retail meter accuracy ***now*** checked prior to installation
- Aggressive demolition program reduced water loss by a minimum of 1 MGD
- Instituted revenue protection unit to address water theft by commercial customers recovered \$660,000 in lost revenue

DWSD Improvements



Vacant Flooded Structure Reports and Closure Rate



DWSD Recommendations to GLWA



- Phasing of cost shift is required due to work not completed:
 - Phase II of Water Audit Target Completion Date June 30, 2018
 - Temporary Metering at Plants
 - Testing/Calibration of Wholesale Meters
 - District Meter Area Analysis
 - Design and installation of production meters at plants current schedule for completion is FY21 for 3 of 5 plants
- Check retail billing data of wholesale meter customers during Phase II of water audit
- Update master contract to require wholesale customers submit retail billing data to GLWA annually for auditing
- Cost of service/allocation study for water system by June 30, 2019
- Optimization of transmission system and development of capital investment strategy for the service region

Regulatory Updates

Palencia Mobley, P.E.

Sam Smalley, P.E.

Consumer Confidence Report



- Required annual water quality report by July 1
- Reduced production and mailing cost by using June bill to notify customers of electronic availability
- Hard copies mailed upon request

← → ↻ ⓘ www.detroitmi.gov/How-Do-I/Find/Water-Quality-Reports ☆ ⋮

Water Quality Reports

How Do I... > Find > Water Quality Reports

DWSD Water Quality Reports for Detroit Customers

2017 Water Quality Report (PDF)

2016 Water Quality Report (PDF)

2015 Water Quality Report (PDF)

PAY YOUR BILL

Skip the Line

Keep Your Water Flowing

Alerts and News

Follow Us:

Customer Care



Lead and Copper Rule

- Lowers Lead Action Level from 15 to 12 ppb
- Requires sequential sampling – will yield higher results
- Requires full inventory update of all service line materials in system by 2025
- Requires full lead service line replacement within 20 years or as agreed to by MDEQ
- May require source water change testing as recommended by multiple water utilities
- Significantly increases sampling and testing



Other Sampling Changes



- MDEQ hired AECOM to perform emerging contaminant sampling for Per- and Polyfluoroalkyl (PFAS)
 - Sample collection before December 15, 2018
 - PFAS used in firefighting foams, food packaging, cleaning products, plumbing taps, cosmetics, clothing, etc.
- MDEQ rescinded modified consecutive system monitoring for Great Lakes Water Authority customers:
 - All GLWA customers must meet standard regulatory requirements for sampling 240 samples per month versus 54 currently for total coliform
 - Currently have 17 sites, will need a minimum of 60 sites (once a week at each site)



Signage for Combined Sewer Outfalls



- EPA requires notification signs at all CSO outfalls to the **Great Lakes** effective January 1, 2018
- Treated outfalls throughout the region will have the Operation Clean Water logo



- Untreated outfalls will not be branded with anything other than the operators logo
- All signs have operators contact information, NPDES Permit No. and the outfall number or name

Questions



Thank You



facebook.com/DWSDDetroit



[@DetroitWaterDep](https://twitter.com/DetroitWaterDep)



[@detroitwatersewerage](https://instagram.com/detroitwatersewerage)