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Municipalities and utilities leverage strategic systems such as GIS to efficiently manage public infrastructure and the various services they provide their citizens and customers.

This presentation will examine the role Esri's ArcGIS and Cityworks Server AMS each play in the successful management of our Public assets.



Cityworks[®]



Esri's ArcGIS Platform is the leading strategic GIS platform used by federal, state and local government agencies.

Cityworks[®]

Cityworks Server AMS is the industry leading GIS-Centric platform for public asset management.

Empowering GIS[®]
FOR PUBLIC ASSET MANAGEMENT



Cityworks®

- 100+ Employees
- 500+ Licensed Organizations
- 10,000s Cityworks users
- Serving populations: 3,500 to 2,000,000 +

Empowering GIS®
FOR PUBLIC ASSET MANAGEMENT



Cityworks®

- Esri Platinum Partner
 - ✓ 1 of 13 Esri Platinum Partners world wide
 - ✓ Only Esri Platinum Partner offering public asset management platform
 - ✓ Exclusive Esri Developer Partner

Empowering GIS®
FOR PUBLIC ASSET MANAGEMENT



What's Oakland doing with Esri GIS and Cityworks:

- To engage with public
- To Manage work / repairs / service
- Green DOT Management
- To show what they know
- Leveraging the ArcGIS Online to create news of understanding



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Managing Public Infrastructure Assets

Esri Pacific User Conference - October 2014



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- 1. About Oakland**
- 2. Service Requests & Work Orders
...Tracking more and more**
- 3. “Green Dot Management”
and Sewer Consent Decree
...Pipes cleaned and televised**
- 4. Heat Maps
...Quickly show what we know**
- 5. ArcGIS Online for Organizations
...New ways of understanding**





Oakland Public Works

Oakland, California

- ▶ 10th largest city in California
- ▶ Incorporated in 1852
- ▶ Population: 411,000
- ▶ 53.8 square miles



- ▶ 805 miles of **streets**
- ▶ 1500 miles of **sidewalks**
- ▶ 929 miles of **sewer pipes**
- ▶ 402 miles of **storm drain pipes**
- ▶ 309 City owned **buildings**
- ▶ 38,000 street **trees**
- ▶ 640+acres of **parks**, public grounds
- ▶ 36,000 **street lights**
- ▶ 671 **traffic signalized intersections**

6th Year of Cityworks Server CMMS

- ▶ Cityworks Server 2013
- ▶ Map Services for different work groups (e.g., sewers, illegal dumping)
- ▶ ArcGIS Server 10.1
- ▶ ArcSDE 9.2
- ▶ ArcGIS Server Web Adapter 10.11



6th Year of Cityworks Server CMMS

2009

- All Service Requests

Work Orders

- Illegal Dumping
- Parks
- Storm Drains
- Trees

2010

- Buildings
- Graffiti
- Sewers
- Sidewalks
- Street Lights
- Streets
- Traffic signals
- Traffic Signs & Striping
- Performance Measures
- Public Works Viewer

2011

- Lab Testing
- Recycling Hotline
- Surveying
- Traffic Engineering
- Watershed (illicit discharges)

2012

- Fire
- SeeClickFix
- Exemplary User Award!

2013

- Sewer PMs, MH inspections
- More SeeClickFix integration
- Open Data
- Heat Maps

2014

- Human Services
- Code Enforcement Interface
- ArcGIS Online for Organizations

**Create a Safer,
Cleaner Oakland**

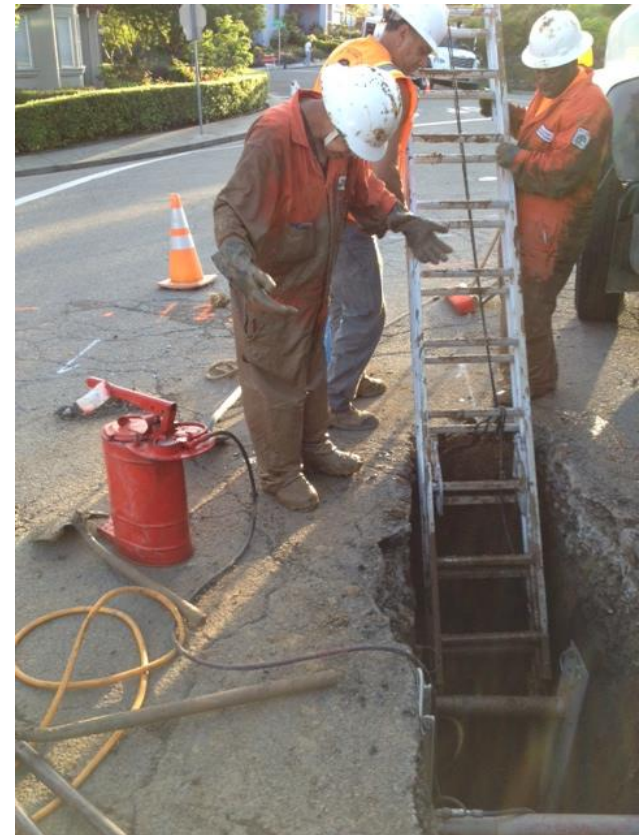
SEWERS • TRAFFIC SIGNALS • STREET SIGNS • TREES • ILLEGAL DUMPING

POT HOLES • GRAFFITI REMOVAL • FLOODING • PARKS • STREET LIGHTS

report problems to
Public Works Agency
510.615.5566
www.oaklandpw.com
pwacallcenter@oaklandnet.com
MOBILE APP: SeeClickFix


CITY OF
OAKLAND

Over 150,000 issues have been resolved since we started using Cityworks



(510) 615-5566

OPWCallCenter@oaklandnet.com



Step 1 - Select a Service Request Type

What Type of Problem Is It?

You can scroll through the complete list of service request types, or use the keyword search to narrow the choices. Then click the "Select" button next to your choice, to move to the next step.

Keyword:

Note: Use only ONE WORD in the Keyword Search.

Examples of keywords you can use: *garbage, graffiti, pothole, tree, drain, light, sign*



Service Request

Customer reports a problem using telephone, email, a smartphone app or website

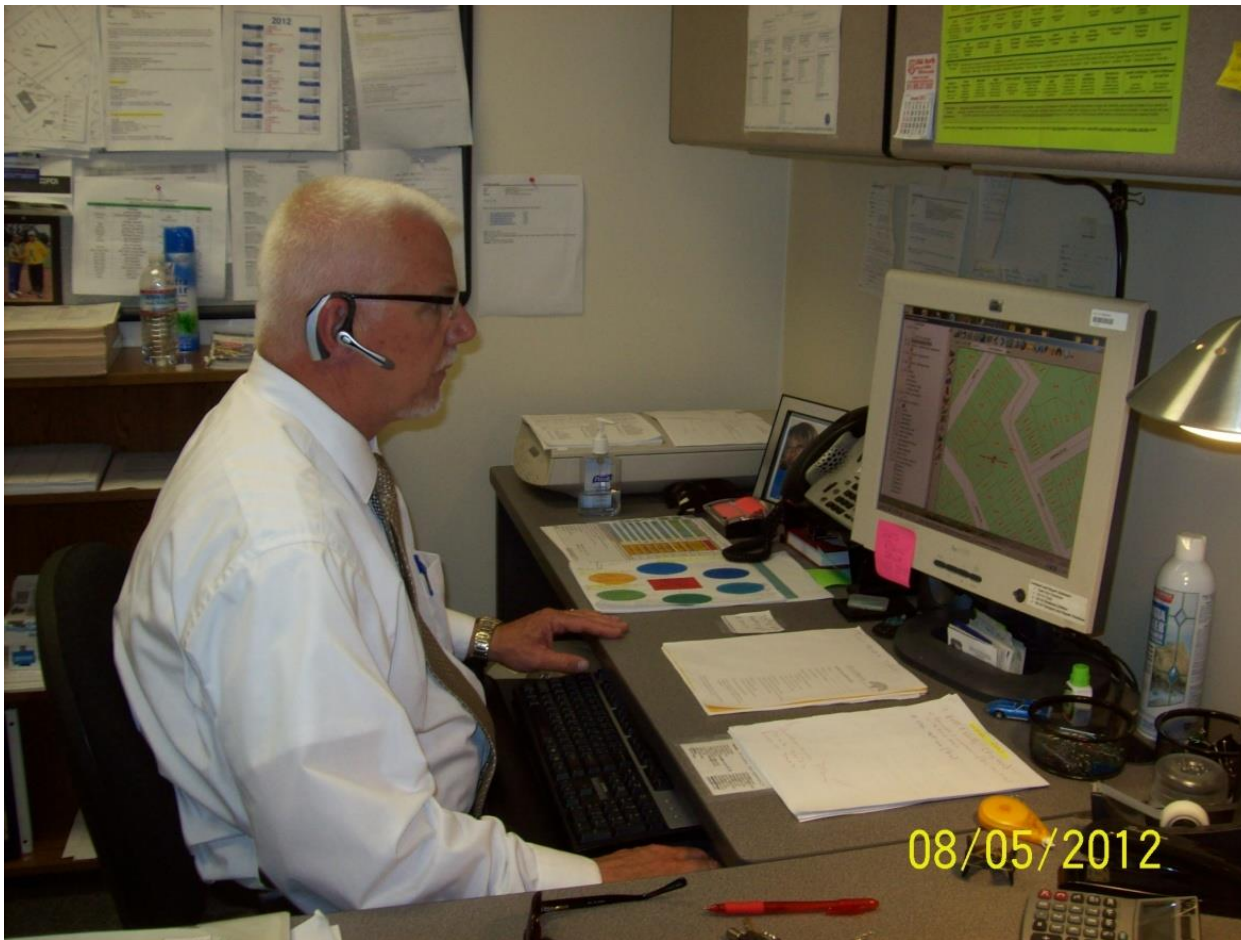


Call Center Creates a Service Request

Service Request is assigned to a Supervisor



Customer receives email confirming the issue has been created



Supervisor Assigns a Work Order

Work Order is assigned to a Crew Leader



Crew Does the Job



Crew Leader Records Work

Selects the **Asset** that received work (storm drain, street, pipe, etc.)

Enters **Labor, Equipment, Materials**

Units Accomplished (3 cubic yards, 4 square feet, etc.)

Actual Start Date, Actual Finish Date



Supervisor Reviews & Closes Work Order

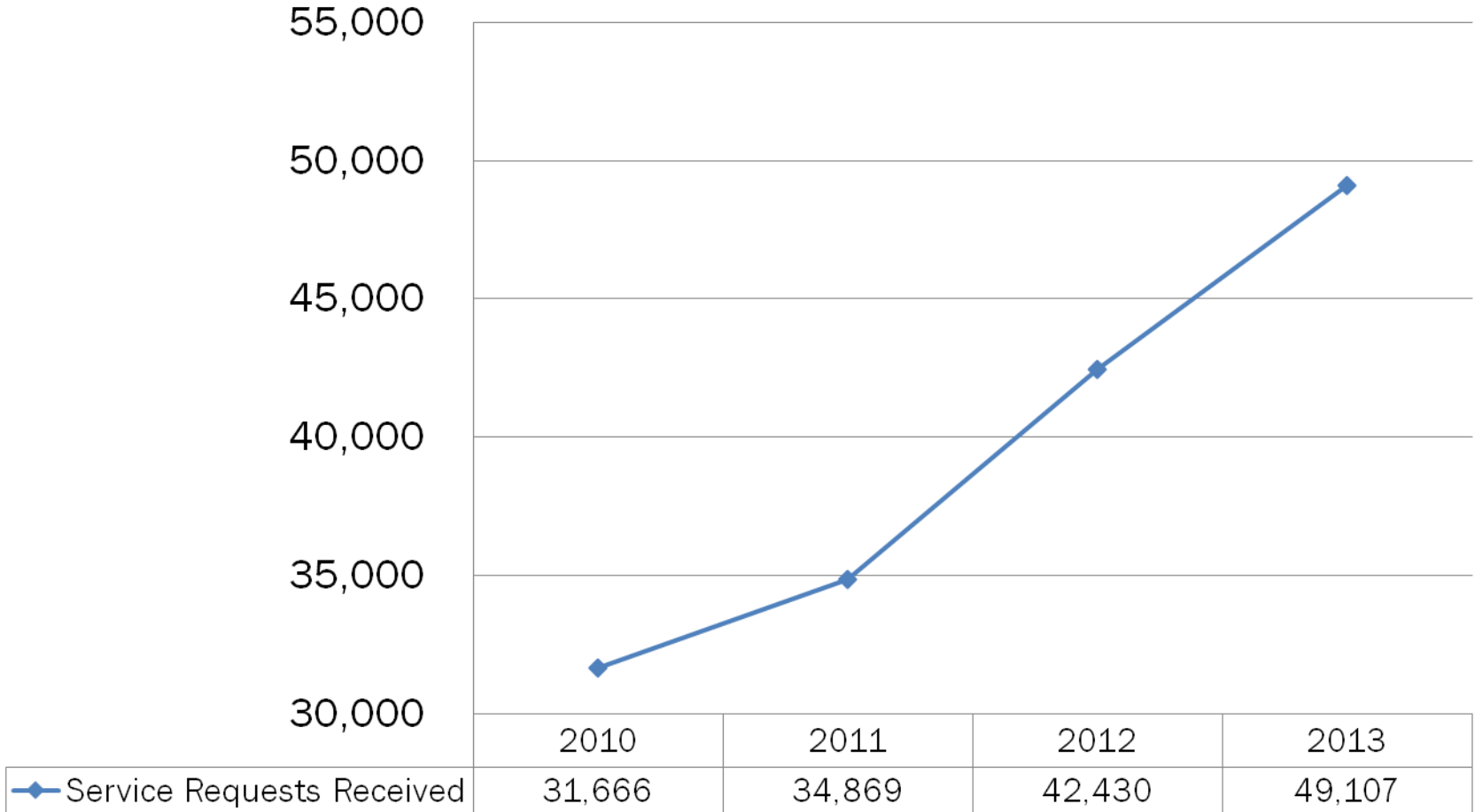
This closes the Service Request

Customer receives email that work is done.

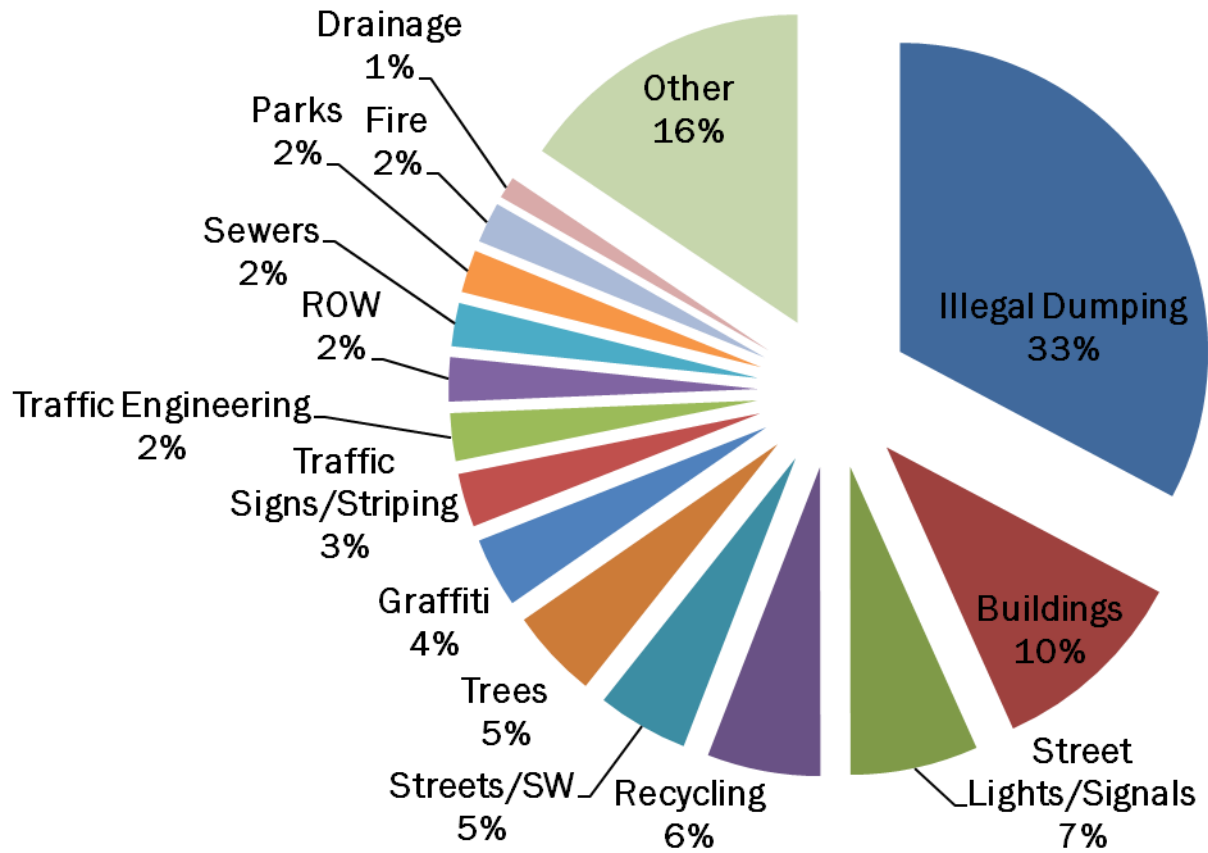


Call Center: 50,000 service requests per year

Service Requests Assigned

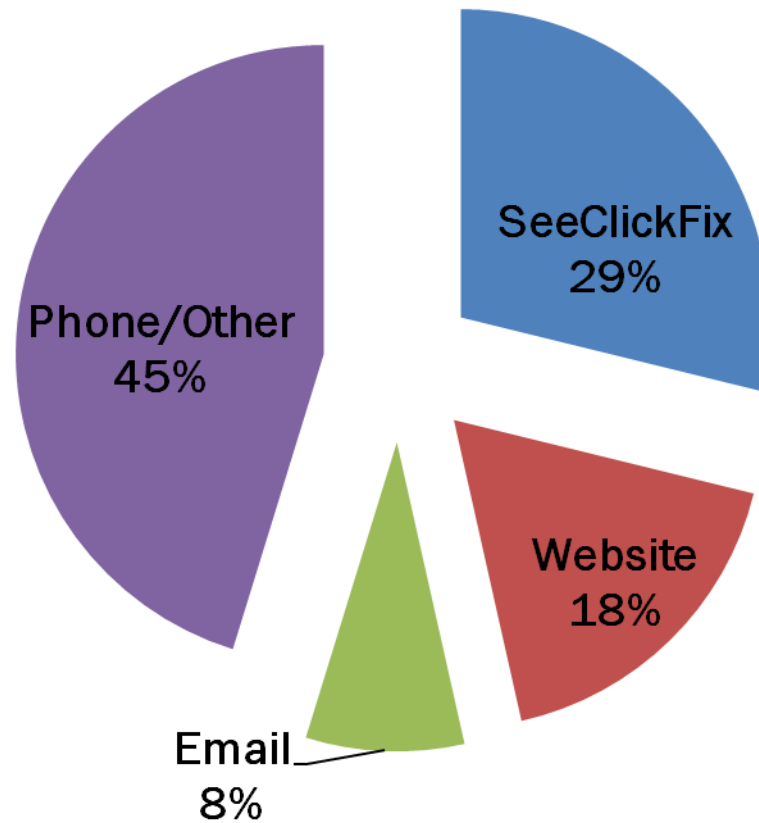


Type of Service Request

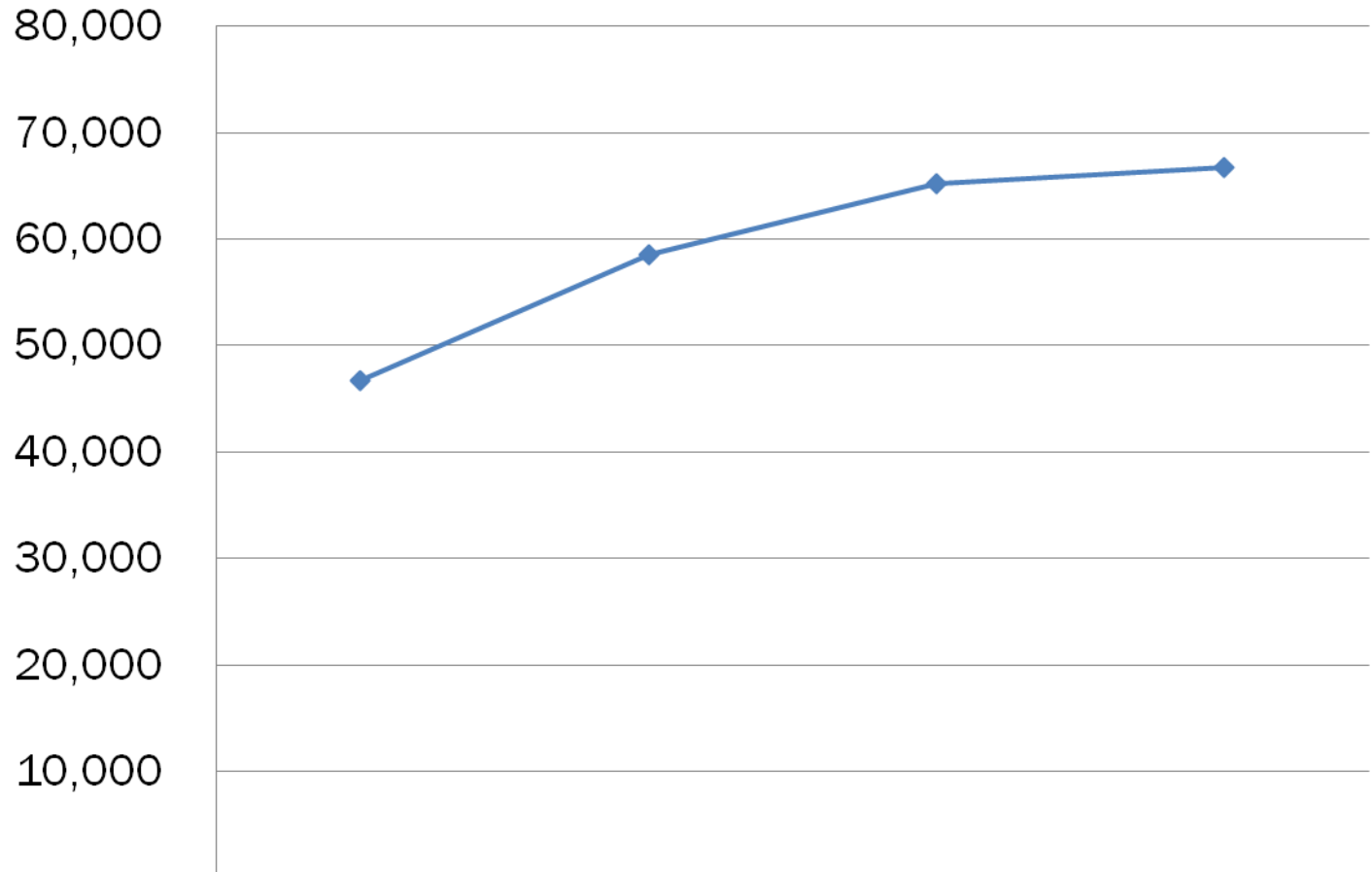


Over half of requests come electronically

Source



Over 65,000 work orders per year



◆ Qty Work Orders Finished

2010

2011

2012

2013

46,695

58,590

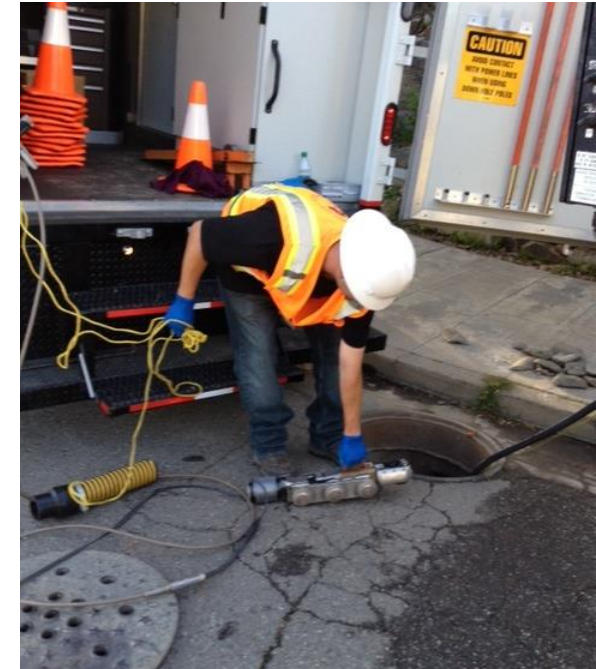
65,260

66,678

Cityworks CMMS – Completing a work order

- ▶ Crews select asset in GIS,
- ▶ Enter labor + materials + equipment,
- ▶ Enter units accomplished,
- ▶ Enter actual start date, actual finish date, completed by, and relevant custom fields

*So we can “tell the story” of:
What work is done,
on what assets,
at what cost*



Selecting the GIS asset in CMMS is inherent to completing the work

The screenshot displays the Cityworks CMMS interface. The top navigation bar includes 'Inbox', 'Recent', 'SR New', 'SR Search', 'WO New', 'WO Search', and 'I New'. A search bar is located on the right. Below the navigation bar, there are buttons for 'Work Order', 'View', 'Save', 'Close', and 'Delete'. The main interface is divided into several panels:

- 3 - Use Map to Attach Assets to Work Order:** This panel contains a table with columns: Type, Id, EntitySid, Legacy Id, and Warranty Da. The first row is highlighted in pink and contains the text:

<input type="checkbox"/>	SANITARYSEWERCOLLECTIONSYSTEM	4883	25148	
--------------------------	-------------------------------	------	-------	--

 Below the table, a note states: '- Pink rows indicate inventory still under warranty'. There are also several icons for actions like 'Add', 'Delete', and 'Check'.
- 4 - Go to View:** This panel shows cost information: Labor Cost: \$554.40, Material Cost: \$0.00, Equipment Cost: \$59.70, and Total WO Cost: \$614.10. A tooltip over the 'Add' icon reads: 'Add asset(s) currently selected on the map.' Below this is a section for 'Related Work Activities' with sub-sections for 'Service Requests', 'Inspections', and 'Work Orders'.
- Results:** This panel shows a table for 'Sewer Collection System (1)'. The table has columns: SUBBASIN, DNSTRUC, PROJECT, ISCYCLIC, STREET, and CR_STREET1. The first row contains:

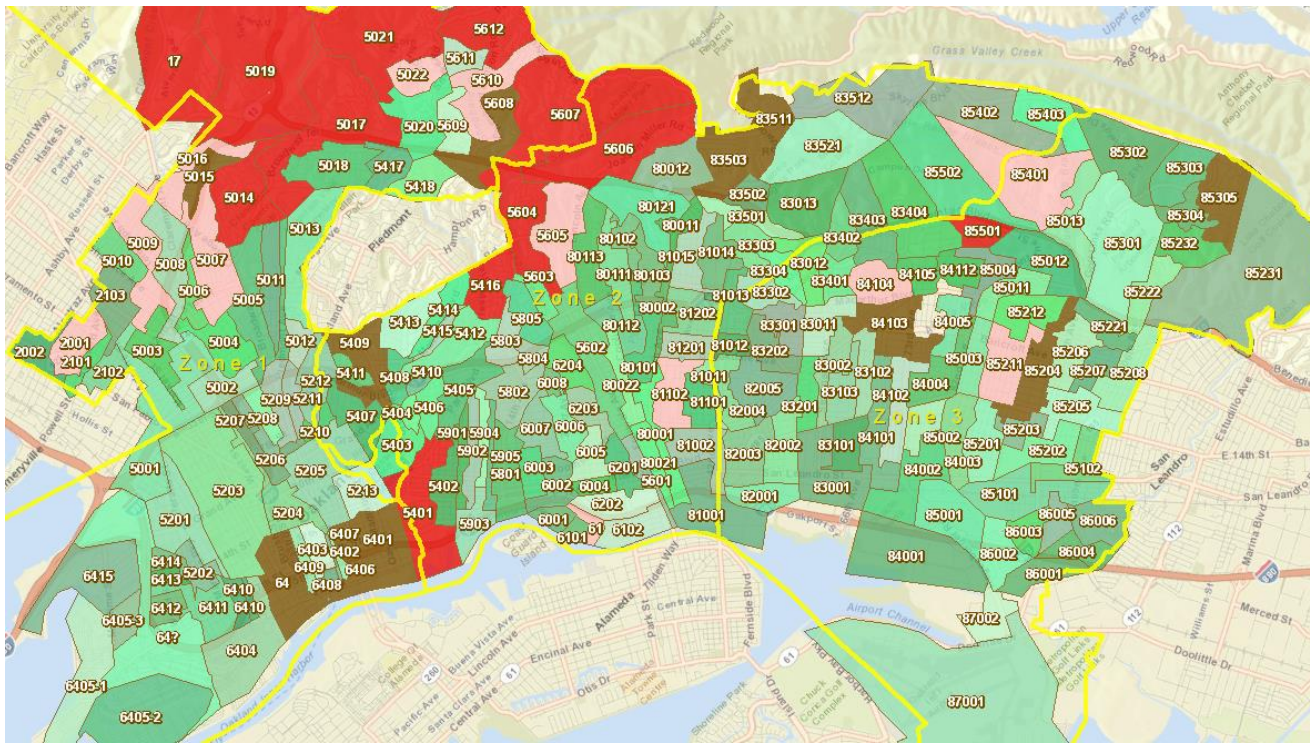
83103	83-103-37		0	65TH AV	FLORA ST
-------	-----------	--	---	---------	----------
- Map View:** The right side of the interface shows a map of a street grid. A green line representing a sewer collection system is highlighted, with asset ID 4883. Other assets are shown as yellow circles with IDs like 4904, 4905, 4906, 5383, 5384, 5385, 5386, 5387, 5388, 5389, 5390, 5391, 5392, 5393, 5394, 5395, 5396, 5397, 5398, 5399, 5400, 5401, 5402, 5403, 5404, 5405, 5406, 5407, 5408, 5409, 5410, 5411, 5412, 5413, 5414, 5415, 5416, 5417, 5418, 5419, 5420, 5421, 5422, 5423, 5424, 5425, 5426, 5427, 5428, 5429, 5430, 5431, 5432, 5433, 5434, 5435, 5436, 5437, 5438, 5439, 5440, 5441, 5442, 5443, 5444, 5445, 5446, 5447, 5448, 5449, 5450, 5451, 5452, 5453, 5454, 5455, 5456, 5457, 5458, 5459, 5460, 5461, 5462, 5463, 5464, 5465, 5466, 5467, 5468, 5469, 5470, 5471, 5472, 5473, 5474, 5475, 5476, 5477, 5478, 5479, 5480, 5481, 5482, 5483, 5484, 5485, 5486, 5487, 5488, 5489, 5490, 5491, 5492, 5493, 5494, 5495, 5496, 5497, 5498, 5499, 5500. The map also shows street names like 65TH AV and 66TH AV.

“Green Dot Management”

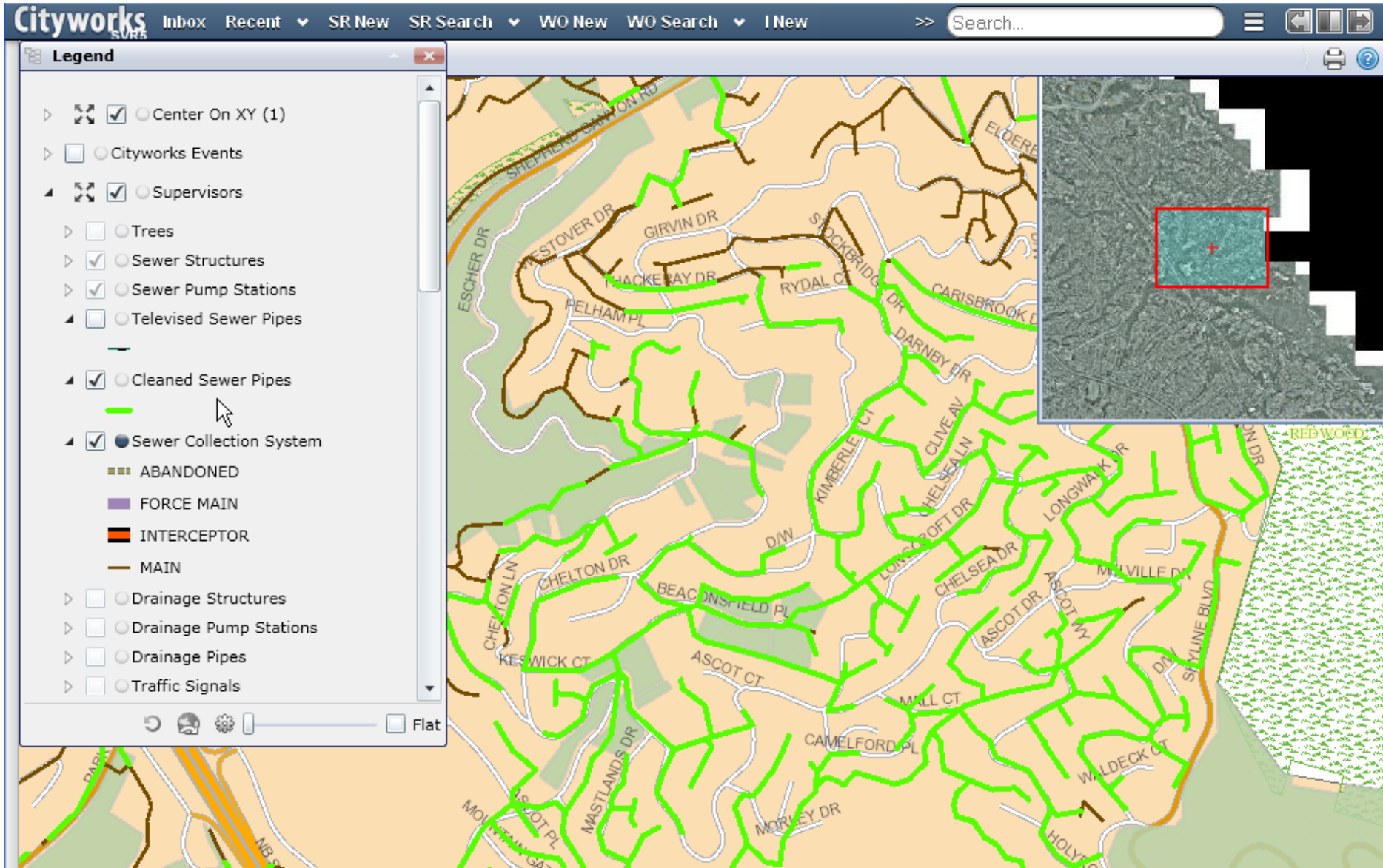
Green pipes are cleaned pipes,
brown pipes have not been cleaned

Oakland's sewer collection system

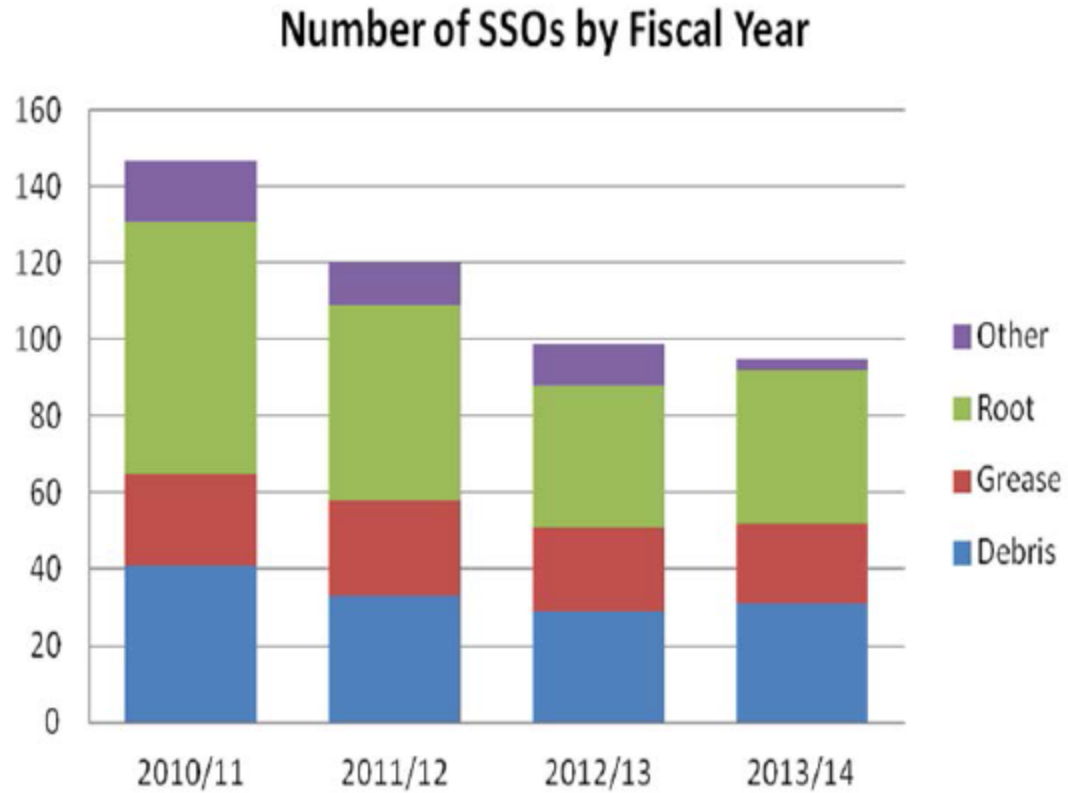
- ▶ 929 Miles
- ▶ 220 subbasins
- ▶ 7 Pump Stations
- ▶ Approximately 102,000 Private Laterals
- ▶ Treatment is responsibility of different organization (East Bay MUD)



A green pipe is a cleaned pipe. Every pipe must be cleaned.



Overflows per year are going down



Tracking by asset is necessary for compliance

Sewer Cleaning and Root Control Program. As of June 30, 2014, the City has cleaned 2,085,942 feet (395.1 miles) of the estimated 4,907,000 feet (929 miles) in its sewer system. This exceeds the Consent Decree requirement to clean 1,900,800 feet (360 miles) by June 30, 2014.

Sanitary Sewer

Annual

January 1, 2013

Stipulated Order

Minor Repairs Completed

Between January 1, 2013 and June 30, 2014, the City's Sewer Maintenance Section responded to 227 spot repair work orders. These spot repairs consisted of excavating damaged sewer lines and installing new segments of sewer line or repairing structures. The list of repair locations is shown in Table 3-2 below:

Table 3-2
Collection System Spot Repair Work (January 1, 2013 – June 30, 2014)

WorkOrderId	Description	Address
501148	Sewers - Repair - Sewer Spot Repair	5721 ELIZABETH AVE
502404	Sewers - Repair - Sewer Spot Repair	6031 MAURITANIA
505256	Sewers - Repair - Sewer Spot Repair	1632 VISTA STREET
506580	Sewers - Repair - Sewer Spot Repair	1449 AUSEON AVE
512316	Sewers - Repair - Sewer Spot Repair	5630 GOLDEN GATE
512617	Sewers - Repair - Sewer Spot Repair	5600 GOLDEN GATE

In anticipation of the new Consent Decree, staff reviewed City records and created a new Hot Spot List containing 58 locations having more than one SSO in a three year period. Each of these Hot Spots was cleaned at least once in FY 2013-14.

Every work order identifies which asset(s) from GIS were maintained

- ▶ Work history for an asset helps identify next actions

Work History for pipes that had 2 or more overflow(s) between 2011-04-01 and 2014-04-01

ENTITY\	DESCRIPTION	WORKOR	ACTUALFINISHD	WOADDRESS	SSOinDateRange	CIWQS
24803	Sewers - Back Up	557222	2013-10-10	1957 ASILOMAR DR		
24803	Sewers - Clean - Power Rod	445308	2012-03-16	1965 ASILOMAR DR		
24803	Sewers - CCTV	445272	2012-03-16	1957 ASILOMAR DR		
24803	Sewers - Overflow	445201	2012-03-15	1957 ASILOMAR DR	SSO in Date Range	778781
24803	Sewers - Overflow	401420	2011-07-10	1965 ASILOMAR DR	SSO in Date Range	768324

Pipe:	24804	Overflows in Date Range: 3				
24804	Sewers - CCTV	581752	2014-02-18	1957 ASILOMAR DR		
24804	Sewers - Overflow	580200	2014-02-08	1957 ASILOMAR DR	SSO in Date Range	803984
24804	Sewers - Clean - Power Rod	445308	2012-03-16	1965 ASILOMAR DR		
24804	Sewers - Overflow	445201	2012-03-15	1957 ASILOMAR DR	SSO in Date Range	778781
24804	Sewers - Clean - Power Rod	445192	2012-03-15	5630 BALBOA DR		
24804	Sewers - Overflow	401420	2011-07-10	1965 ASILOMAR DR	SSO in Date Range	768324

Pipe:	25257	Overflows in Date Range: 2				
25257	Sewers - Clean PM - Hi-Freq 3 Month	574115		6245 WESTOVER DR		
25257	Sewers - Clean PM - Hi-Freq 3 Month	556888	2014-01-09	6245 WESTOVER DR		
25257	Sewers - Clean - Power Rod	553729	2013-09-24	6245 WESTOVER DR		
25257	Sewers - Clean - Hot Spot Inspect/Service	539211	2013-07-11	6245 WESTOVER DR		
25257	Sewers - Clean - Power Rod	524600	2013-04-25	6245 WESTOVER DR		
25257	Sewers - CCTV	509659	2013-02-08	6245 WESTOVER DR		
25257	Sewers - Clean - Flush	509654	2013-03-08	6245 WESTOVER		
25257	Sewers - CCTV	494416	2013-01-11	6245 WESTOVER		
25257	Sewers - Clean - Hand Rod	493895	2012-11-18	6245 WESTOVER		
25257	Sewers - Overflow	493888	2012-11-17	6245 WESTOVER DR	SSO in Date Range	788251
25257	Sewers - Overflow	483868	2012-09-27	6245 WESTOVER	SSO in Date Range	786831
25257	Sewers - Locate Structures	449737	2012-04-09	6257 WESTOVER DR.		
25257	Sewers - Replace - Missing Manhole Cover	446058	2012-03-21	6245 WESTOVER DR		

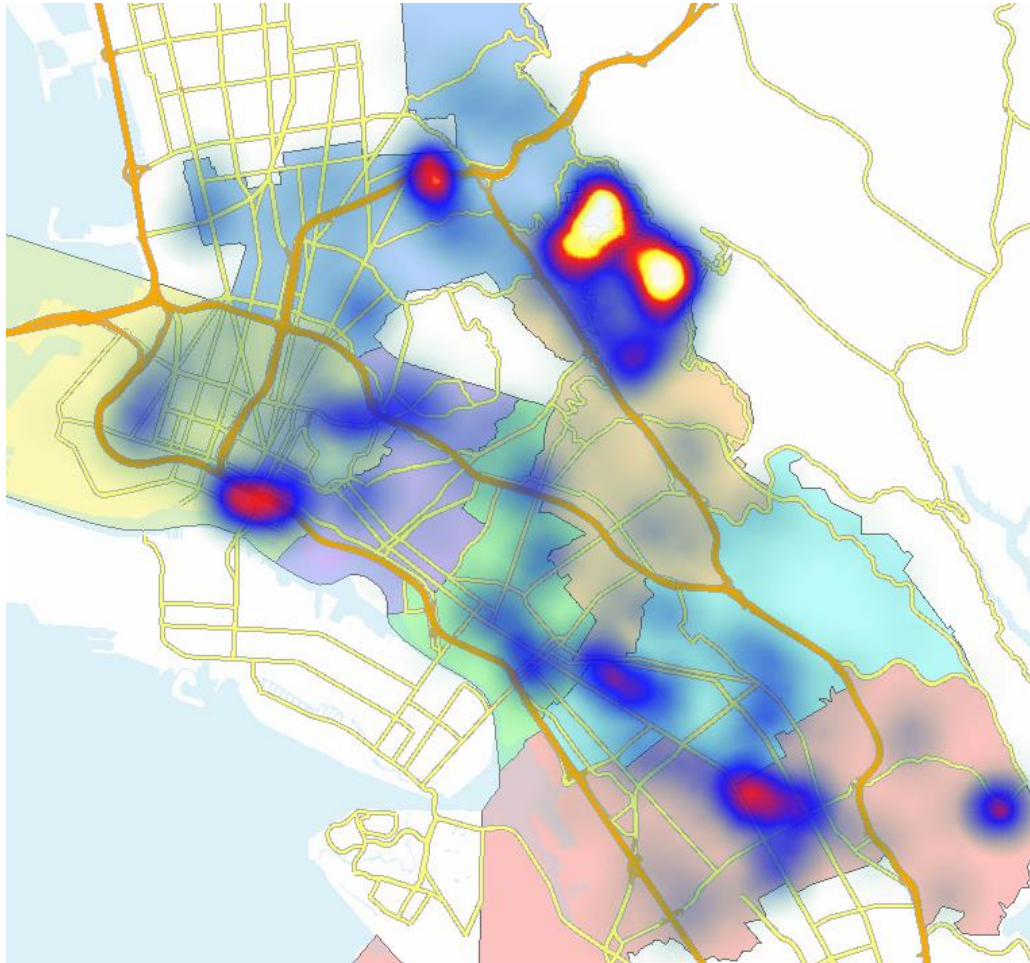


Heat Maps

Quickly show what we know

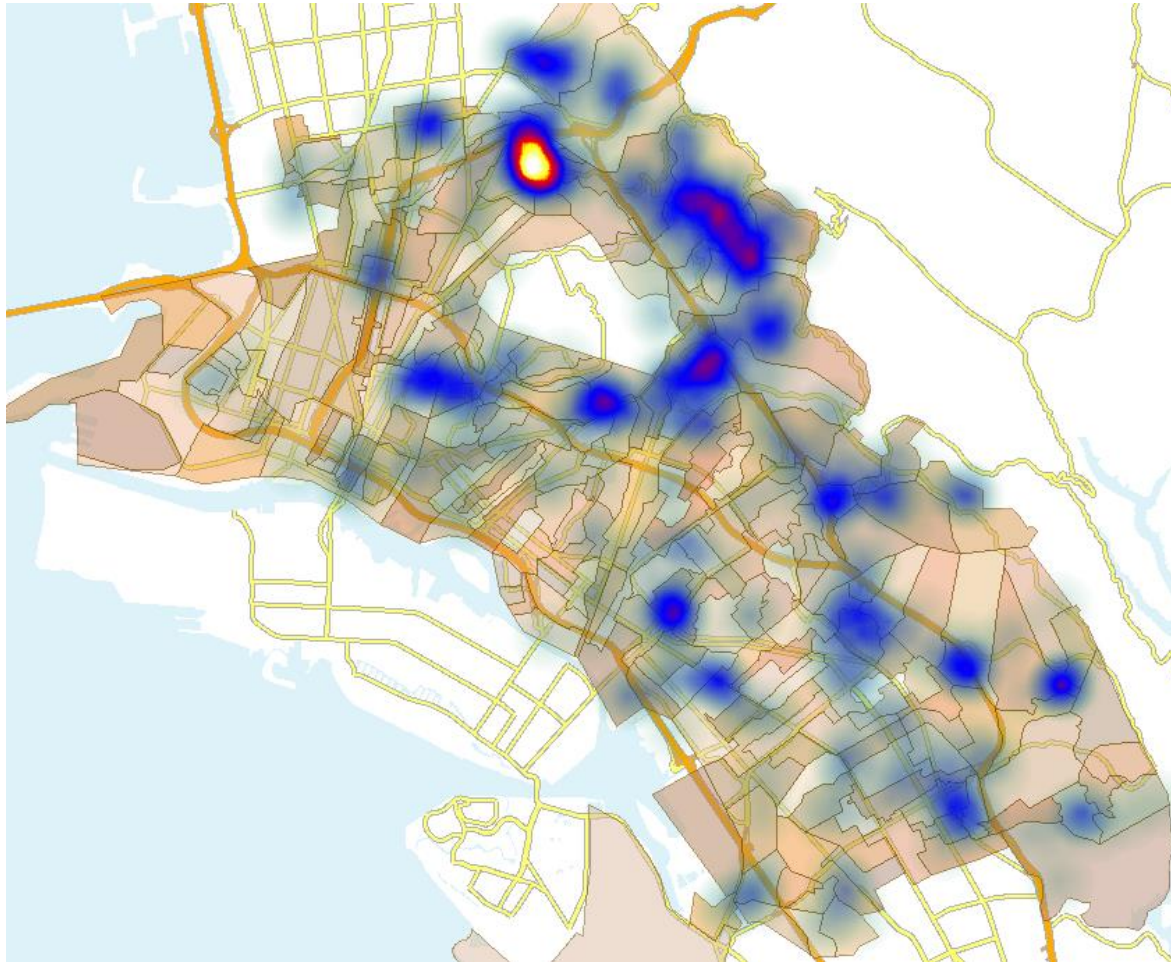
Heat Maps Answer Management Questions

- ▶ Where have we had flooding?



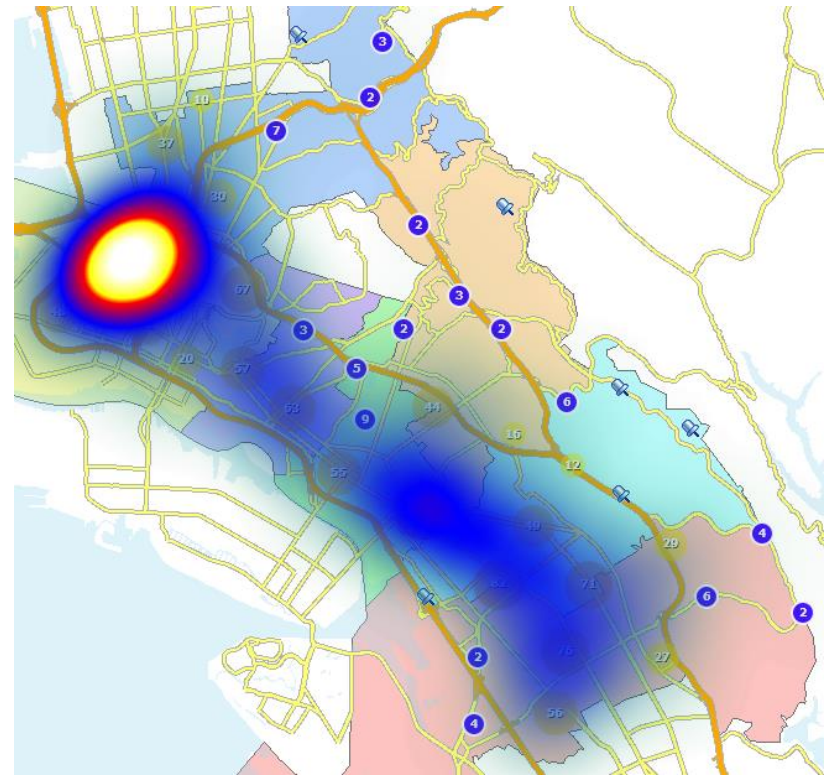
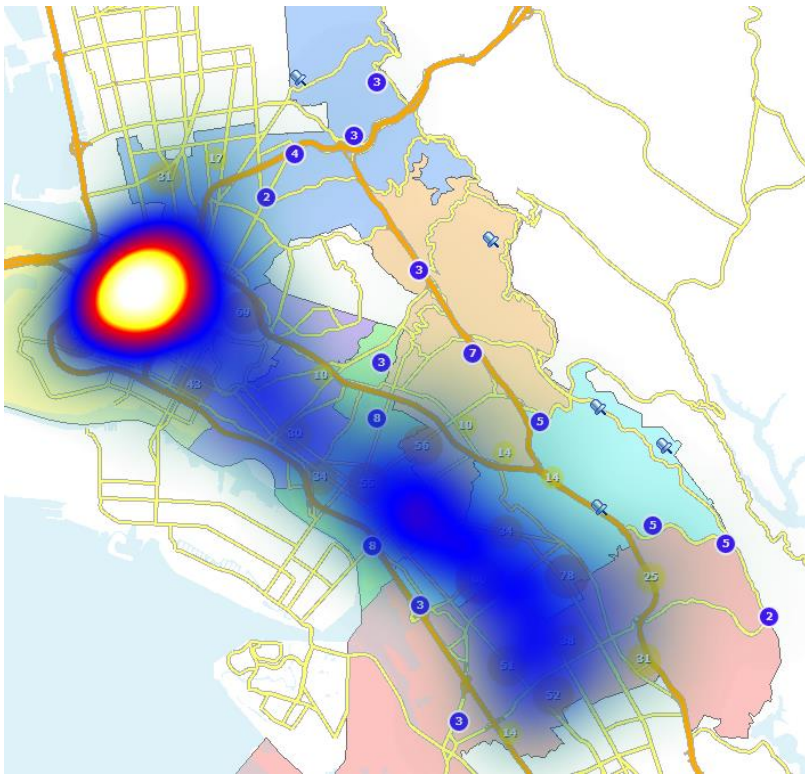
Heat Maps Answer Management Questions

- ▶ Where have we had sewer overflows?



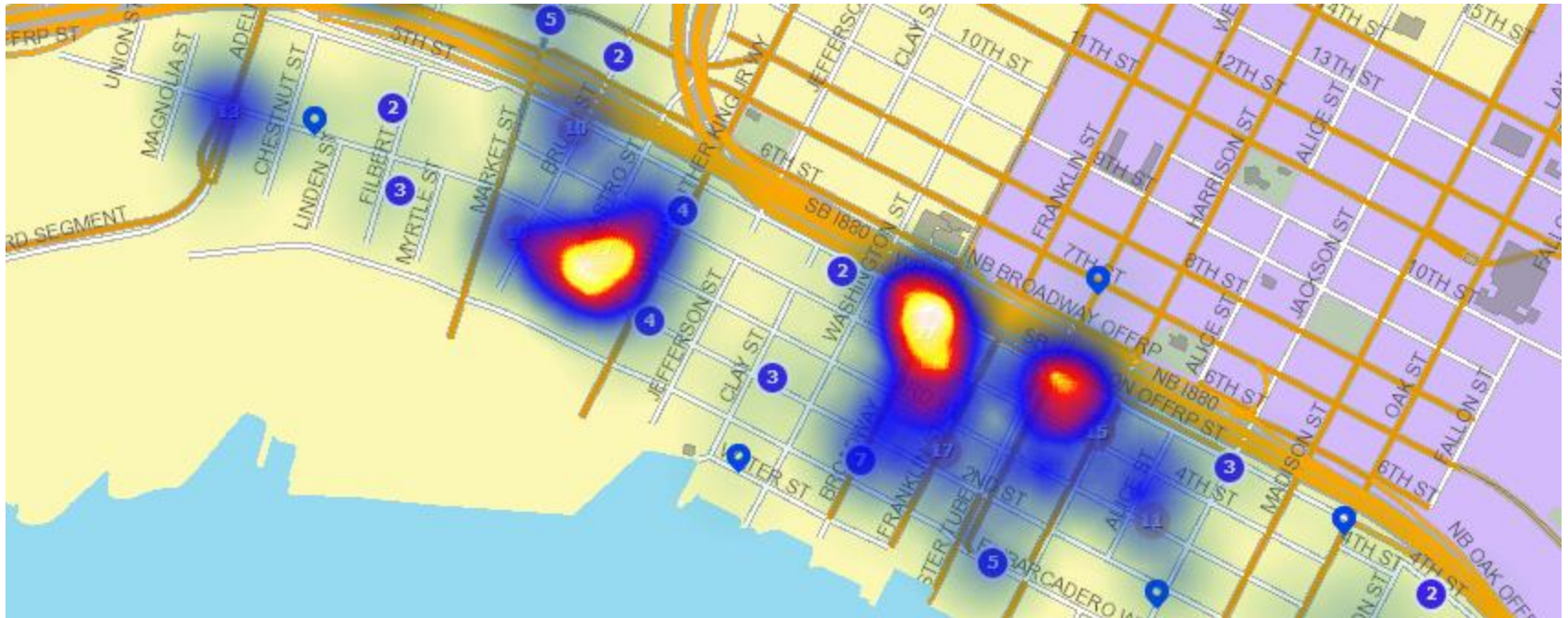
Heat Maps Answer Management Questions

- ▶ Did illegal dumping change from one year to the next?

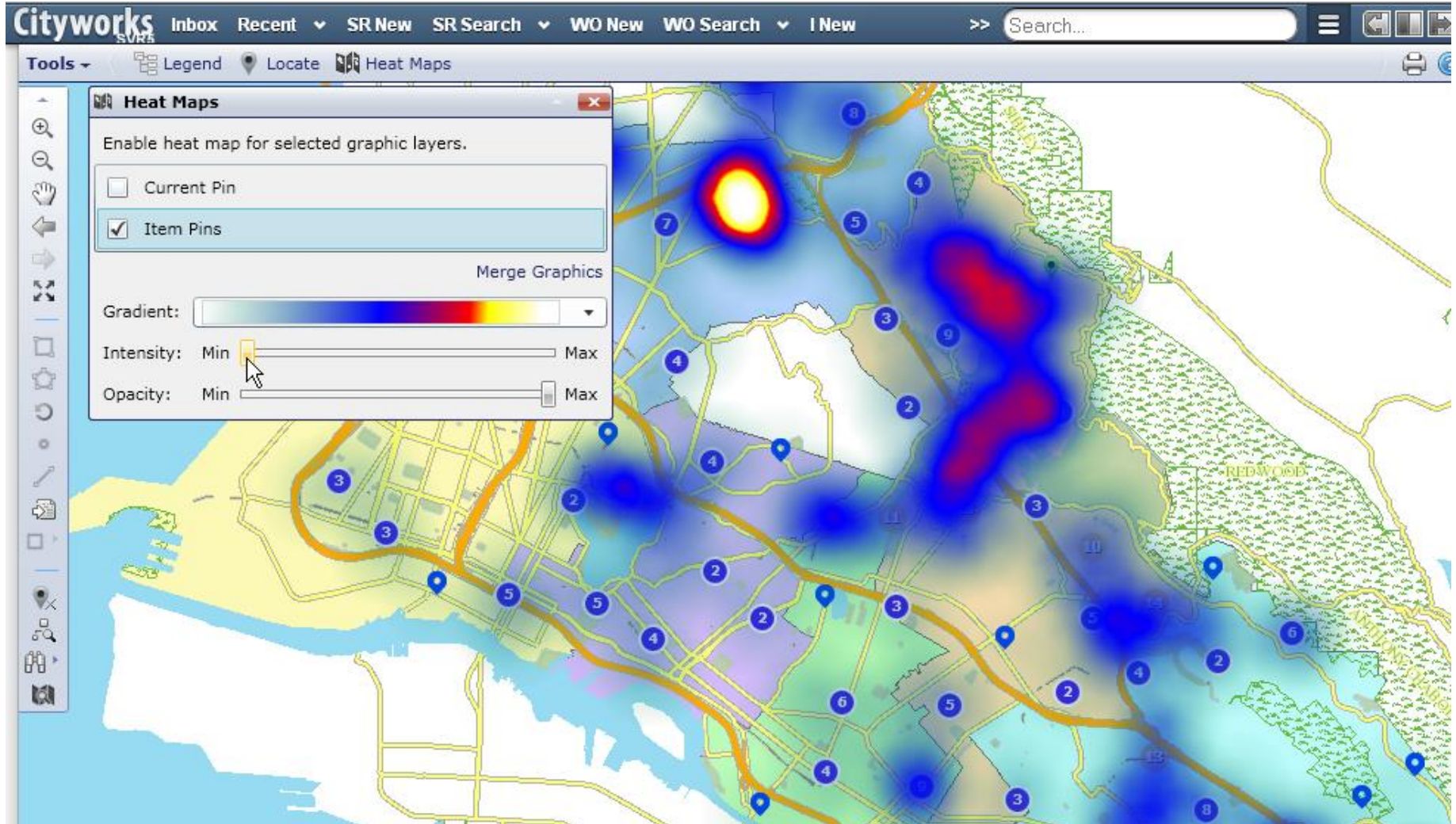


Heat Maps Answer Management Questions

- ▶ Which areas of a new Business Improvement District have the most illegal dumping issues?

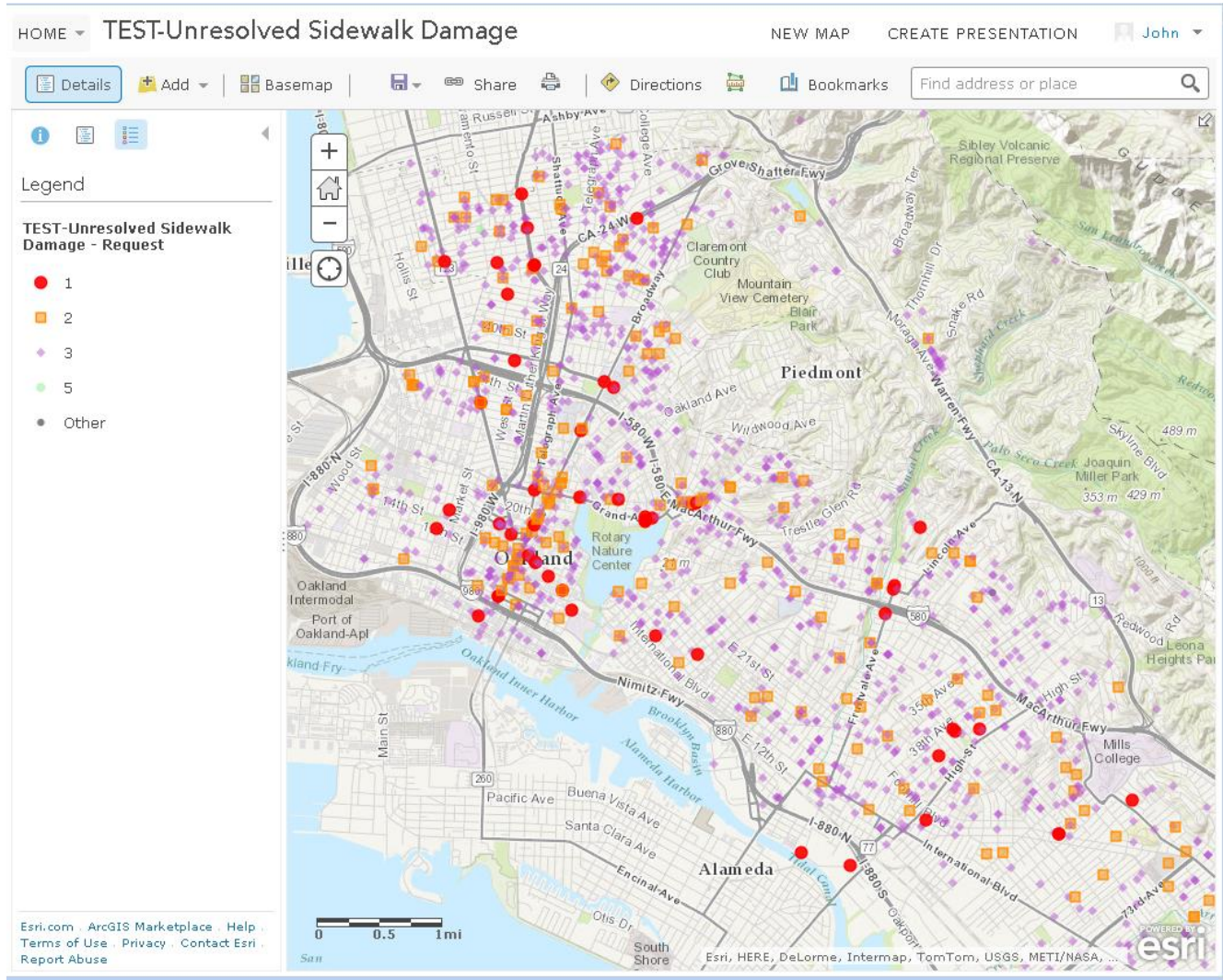


Heat maps: Created by users who are not GIS analysts

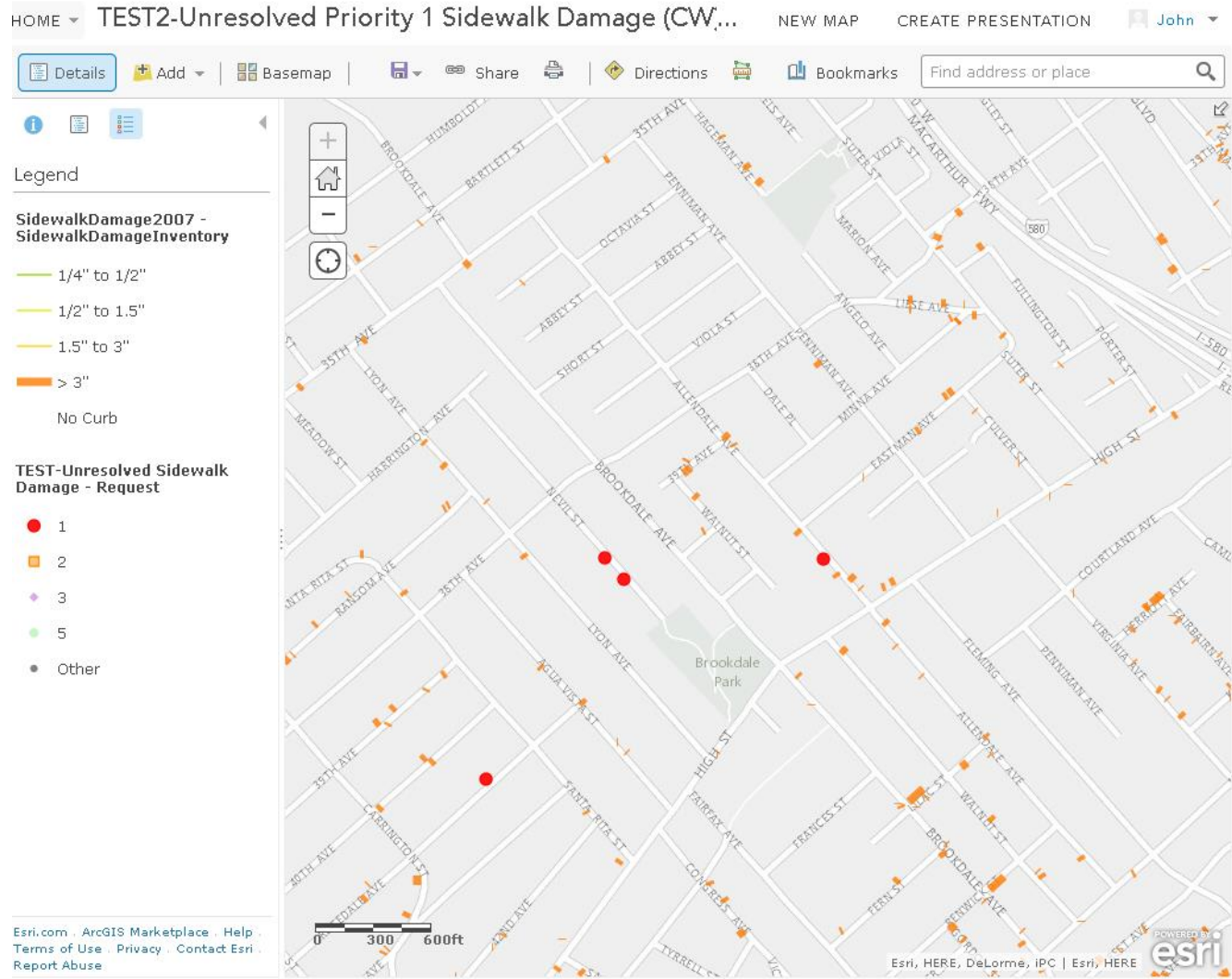


ArcGIS Online for Organizations

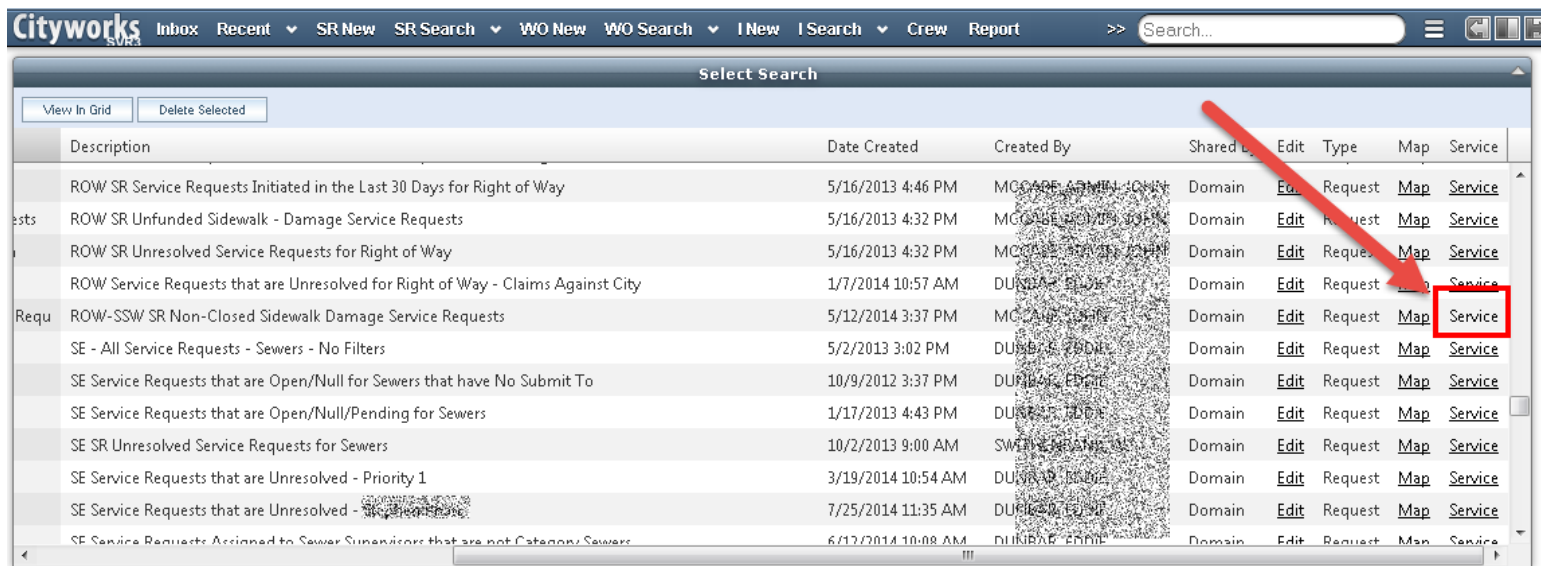
ArcGIS Online for Organizations: Testing new ways looking at data



Collaborate to understand ...decide if professional GIS analysis needed



Cityworks users can publish searches to ArcGIS Online for Organizations



The screenshot shows the 'Select Search' dialog box in the Cityworks application. The dialog has a title bar with 'Cityworks' and 'Select Search'. Below the title bar are buttons for 'View In Grid' and 'Delete Selected'. The main area is a table with the following columns: Description, Date Created, Created By, Shared By, Edit, Type, Map, and Service. The table contains several rows of search results. A red arrow points to the 'Service' link in the fifth row, which is highlighted with a red box.

Description	Date Created	Created By	Shared By	Edit	Type	Map	Service
ROW SR Service Requests Initiated in the Last 30 Days for Right of Way	5/16/2013 4:46 PM	MCCABE, JOHN	Domain	Edit	Request	Map	Service
ROW SR Unfunded Sidewalk - Damage Service Requests	5/16/2013 4:32 PM	MCCABE, JOHN	Domain	Edit	Request	Map	Service
ROW SR Unresolved Service Requests for Right of Way	5/16/2013 4:32 PM	MCCABE, JOHN	Domain	Edit	Request	Map	Service
ROW Service Requests that are Unresolved for Right of Way - Claims Against City	1/7/2014 10:57 AM	DUNBAR, EDIE	Domain	Edit	Request	Map	Service
ROW-SSW SR Non-Closed Sidewalk Damage Service Requests	5/12/2014 3:37 PM	MCCABE, JOHN	Domain	Edit	Request	Map	Service
SE - All Service Requests - Sewers - No Filters	5/2/2013 3:02 PM	DUNBAR, EDIE	Domain	Edit	Request	Map	Service
SE Service Requests that are Open/Null for Sewers that have No Submit To	10/9/2012 3:37 PM	DUNBAR, EDIE	Domain	Edit	Request	Map	Service
SE Service Requests that are Open/Null/Pending for Sewers	1/17/2013 4:43 PM	DUNBAR, EDIE	Domain	Edit	Request	Map	Service
SE SR Unresolved Service Requests for Sewers	10/2/2013 9:00 AM	SWINNEY, W	Domain	Edit	Request	Map	Service
SE Service Requests that are Unresolved - Priority 1	3/19/2014 10:54 AM	DUNBAR, EDIE	Domain	Edit	Request	Map	Service
SE Service Requests that are Unresolved - Priority 2	7/25/2014 11:35 AM	DUNBAR, EDIE	Domain	Edit	Request	Map	Service
SE Service Requests Assigned to Sewer Supervisors that are not Category Sewers	6/17/2014 10:08 AM	DUNBAR, EDIE	Domain	Edit	Request	Map	Service

Take-Aways

Take-Aways

▶ Green Dot Management

- ▶ Rapidly understood by supervisors
- ▶ Rapidly understood by management
- ▶ Rapidly understood by field staff
- ▶ Helps plan work
- ▶ Helps monitor / track compliance

▶ Heat Maps

- ▶ Quickly show what we know
- ▶ Communicate issues to management and elected officials faster than just “data”
- ▶ Are readily available in the tool that staff already uses

Questions?



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