Heat Maps, Green Dot Management, and GIS

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1. About Oakland
2. “Green Dot Management”  
   ..Sewer pipes cleaned and televised
3. Heat Maps  
   ..Quickly show what we know
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
- 920 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
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.
“Green Dot Management”

Green pipes are cleaned pipes, brown pipes have not been cleaned
A green pipe is a cleaned pipe. Every pipe must be cleaned.

Current: Crystal to Excel, Model Builder, Color pipes in GIS/Cityworks

Planned: Automate coloring of pipes
Current: Model Builder, create 2\textsuperscript{nd} Cleaned FC

Future: Automate: Cleaned attribute, one FC
Green Dot Management beyond the map

Work history for an asset helps identify next actions

<table>
<thead>
<tr>
<th>ENTITY DESCRIPTION</th>
<th>WORKORDER</th>
<th>ACTUAL FINISH DATE</th>
<th>WO ADDRESS</th>
<th>SSO in Date Range</th>
<th>CIWQS</th>
</tr>
</thead>
<tbody>
<tr>
<td>24803 Sewers - Back Up</td>
<td>557222</td>
<td>2013-10-10</td>
<td>1957 ASILOMAR DR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24803 Sewers - Clean - Power Rod</td>
<td>445308</td>
<td>2012-03-16</td>
<td>1965 ASILOMAR DR</td>
<td></td>
<td></td>
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<tr>
<td>24803 Sewers - CCTV</td>
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<td>2012-03-16</td>
<td>1957 ASILOMAR DR</td>
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<td>24803 Sewers - Overflow</td>
<td>445201</td>
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<td>1957 ASILOMAR DR</td>
<td><strong>SSO in Date Range 778781</strong></td>
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<td>24803 Sewers - Overflow</td>
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<td>2011-07-10</td>
<td>1965 ASILOMAR DR</td>
<td><strong>SSO in Date Range 768324</strong></td>
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</table>

### Pipe 24804

- 24804 Sewers - CCTV: Overflows in Date Range: 3
- 24804 Sewers - Overflow: Overflows in Date Range: 3
- 24804 Sewers - Clean - Power Rod: Overflows in Date Range: 3
- 24804 Sewers - Overflow: Overflows in Date Range: 3
- 24804 Sewers - Clean - Power Rod: Overflows in Date Range: 3
- 24804 Sewers - Overflow: Overflows in Date Range: 3

### Pipe 25257

- 25257 Sewers - Clean PM - Hi-Freq 3 Month: Overflows in Date Range: 2
- 25257 Sewers - Clean PM - Hi-Freq 3 Month: Overflows in Date Range: 2
- 25257 Sewers - Clean - Power Rod: Overflows in Date Range: 2
- 25257 Sewers - Clean - Hot Spot Inspect/Service: Overflows in Date Range: 2
- 25257 Sewers - Clean - Power Rod: Overflows in Date Range: 2
- 25257 Sewers - CCTV: Overflows in Date Range: 2
- 25257 Sewers - Clean - Flush: Overflows in Date Range: 2
- 25257 Sewers - CCTV: Overflows in Date Range: 2
- 25257 Sewers - Clean - Hand Rod: Overflows in Date Range: 2
- 25257 Sewers - Overflow: Overflows in Date Range: 2
- 25257 Sewers - Overflow: Overflows in Date Range: 2
- 25257 Sewers - Locate Structures: Overflows in Date Range: 2
- 25257 Sewers - Replace - Missing Manhole Cover: Overflows in Date Range: 2

Pipe: 24804

Pipe: 25257
Tracking by assets allows tracking of progress

- Regularly identify remaining pipes to clean

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**Sewer Subbasin Cleaning Tracking**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Subbasin</th>
<th>Feet Sewer Main</th>
<th>Feet Cleaned</th>
<th>% Cleaned</th>
<th>List</th>
<th>Ballpark # Days</th>
<th>Ballpark # Days Remain</th>
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<tbody>
<tr>
<td>3</td>
<td>85501</td>
<td>15,316</td>
<td>15,316</td>
<td>100%</td>
<td>Both</td>
<td>8</td>
<td>0</td>
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<tr>
<td>2</td>
<td>5401</td>
<td>48,711</td>
<td>16,603</td>
<td>34%</td>
<td>Both</td>
<td>24</td>
<td>16</td>
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<td>2</td>
<td>5416</td>
<td>37,867</td>
<td>27,561</td>
<td>73%</td>
<td>Both</td>
<td>19</td>
<td>5</td>
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<tr>
<td>2</td>
<td>5604</td>
<td>47,522</td>
<td>6,746</td>
<td>14%</td>
<td>Both</td>
<td>24</td>
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<tr>
<td>2</td>
<td>5606</td>
<td>33,421</td>
<td>21,279</td>
<td>64%</td>
<td>Both</td>
<td>17</td>
<td>6</td>
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<tr>
<td>1</td>
<td>5607</td>
<td>64,003</td>
<td>60,632</td>
<td>95%</td>
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<td>32</td>
<td>2</td>
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<tr>
<td>2</td>
<td>5612</td>
<td>52,366</td>
<td>12,114</td>
<td>23%</td>
<td>Both</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>49,106</td>
<td>12,255</td>
<td>25%</td>
<td>Both</td>
<td>25</td>
<td>18</td>
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<tr>
<td>1</td>
<td>5014</td>
<td>49,009</td>
<td>19,293</td>
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<td>15</td>
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<td>5017</td>
<td>98,136</td>
<td>18,740</td>
<td>19%</td>
<td>Both</td>
<td>49</td>
<td>40</td>
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<tr>
<td>1</td>
<td>5019</td>
<td>67,066</td>
<td>9,914</td>
<td>15%</td>
<td>Both</td>
<td>34</td>
<td>29</td>
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<tr>
<td>1</td>
<td>5021</td>
<td>63,593</td>
<td>11,618</td>
<td>18%</td>
<td>Both</td>
<td>32</td>
<td>26</td>
</tr>
</tbody>
</table>

**CCTV Tracking**

- CCTV data as of 4/7/14
- Feet CCTV
- % Cleaned

**Pie Chart**

- Cleaned
- Not Cleaned

- Cleaned So Far: 39.4%
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
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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