GIS Integration
For Daily Operations and Public Appreciation
Welcome

Introductions
GIS Leads to Better Decisions

Daily Operations, Long-term Maintenance, or Emergencies are better managed when mapped.
Anthony J Pologruto

- GIS Analyst for the Municipal Authority of Westmoreland County, Pennsylvania (MAWC)
- Employed at MAWC since August 2016
- Former Director of the GIS department for Westmoreland County Courthouse
- Father, Husband, Videogame Enthusiast
What I walked into...

- Paper Maps, Paper Work Orders
- Digital Maps on field staff laptops
  - Needed to be updated back at HQ
  - Couldn’t View Whole System at Once
  - Limited Interactivity
  - Out of date as soon as they were loaded/printed
  - Very long process for changes to show
- No Basemap
  - Data became inaccurate, fast
Web-based Map

- Esri’s Portal for ArcGIS Enterprise
  - Everyone sees the same map!
  - Misaligned areas quickly spotted
  - Updated Nightly
  - Single Sign on
  - Temporary Projects added temporarily
  - Department-Centric Maps available
  - Hyperlinks!!!
  - Print Button
  - Compatible with other Agencies
    - CAD
    - KMZ and KML
  - Grant Read-Only Access to Community Fire Departments
- Search by Hydrant, Valve, Etc.
- Symbolize Customers
- Popup Windows
- Hyperlinks to drawings and as-builds
- Ability for Field Staff to flag inaccuracies
- Google Street View
- Elevation Profile
- Measure
- Export PDFs (with or without disclaimer)
High-Accuracy GPS

- Esri’s Collector for ArcGIS
  - Paired via Bluetooth to Trimble R2 Unit
  - Corrected real-time
  - 3 inch accuracy!

- Workflows for:
  - Draftsmen
  - Hydrant Locations/Inspections
  - Valve Locations/Inspections
  - Construction Locations/Inspections
  - Meter Pits, Interconnections, Curb Stops
Smart Inspections

- Inspection Crews access live map data
- Inspections attach to the GIS feature
- Office Staff see the features in real-time
- Powers reports and dashboards
  - GIS Features update nightly
  - Nightly report of inspection results emailed to Supervisor
  - Monthly Summary for the Board
Loads of Dashboards

• Esri’s Operation Dashboard
  • Thousands of Points of Data condensed into a easy-to-read screen
  • Allows Supervisor to
    • Track daily progress of field crews
    • Track results of Inspections
    • Monitor progress towards goals
    • Use to assign follow-up work
# Hydrant Conditions

<table>
<thead>
<tr>
<th>In Service</th>
<th>Out of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair Needed: 1</td>
<td>Repair Needed: 0</td>
</tr>
<tr>
<td>03303.00 Last Service Date: 4/3/2019, 5:55 AM</td>
<td>No Data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Need to Replace: 33</th>
<th>Need to Replace: 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>00021.00 Last Service Date: 6/22/2019, 12:45 PM</td>
<td>00276.00 Last Service Date: 7/9/2019, 11:58 AM</td>
</tr>
<tr>
<td>02370.00 Last Service Date: 5/22/2019, 12:45 PM</td>
<td>03154.00 Last Service Date: 6/29/2019, 1:17 AM</td>
</tr>
<tr>
<td>03333.00 Last Service Date: 5/22/2019, 12:45 PM</td>
<td>09188.00 Last Service Date: 5/10/2019, 5:59 PM</td>
</tr>
<tr>
<td>03342.00 Last Service Date: 5/22/2019, 12:45 PM</td>
<td>No Repair Needed: 1</td>
</tr>
</tbody>
</table>

# Total Hydrant Count
- **8,470** hydrants

# Inspections by Date

### Yesterday:
- **29** inspections
  - 0314.00 Last Service Date: 4/3/2019, 10:45 PM
  - 0317.00 Last Service Date: 4/3/2019, 11:54 AM
  - 0317.70 Last Service Date: 4/2/2019, 12:38 PM
  - 0311.00 Last Service Date: 4/1/2019, 11:44 AM

### Last 30 Days:
- **500** inspections
  - 03003.00 Last Service Date: 3/13/2019, 8:44 AM
  - 03003.50 Last Service Date: 3/13/2019, 9:11 PM
  - 03004.00 Last Service Date: 3/13/2019, 3:55 AM
  - 03004.10 Last Service Date: 3/13/2019, 10:05 AM

### Over 3 Years:
- **31** inspections
  - 02153.00 Last Service Date: 3/7/2016, 8:00 PM
  - 02217.00 Last Service Date: 3/19/2016, 11:00 PM
  - 03071.10 Last Service Date: 3/1/2016, 12:00 AM

### This Year:
- **1,234** inspections

# Replacements by Date

### This Year:
- **8** replacements
  - 00555.00 Last Service Date: 1/4/2019, 10:26 AM
  - 01504.00 Last Service Date: 1/4/2019, 10:11 AM
  - 06323.00

### Last Year:
- **60** replacements
  - 00644.00 Last Service Date: 2/15/2019, 11:41 AM
  - 00074.00 Last Service Date: 2/14/2019, 11:30 PM

# Inspections by Month

[Bar chart showing inspections by month]
### 2019 Hydrants Summary

<table>
<thead>
<tr>
<th>HYDRANT CONDITIONS</th>
<th>Summary to Date</th>
<th>2019 Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Service-No Repair Needed</td>
<td>3,420</td>
<td>11,383</td>
</tr>
<tr>
<td>In Service-Repair Needed</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>In Service-Need to Replace</td>
<td>33</td>
<td>5</td>
</tr>
<tr>
<td>Out of Service-No Repair Need</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Out of Service-Repair Needed</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Out of Service-Need to Replace</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRIMARY ACTIVITY</th>
<th>2019 Summary</th>
<th>March Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrant Assessments</td>
<td>1,000</td>
<td>404</td>
</tr>
<tr>
<td>Hydrant Repairs</td>
<td>38</td>
<td>25</td>
</tr>
<tr>
<td>Hydrant Flushings</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Total Gallons Used</td>
<td>140,400</td>
<td>30,000</td>
</tr>
<tr>
<td>Flow Tests</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>New Hydrant Installation</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Hydrant Replacements</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Other (thawed, fire, etc.)</td>
<td>76</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
<th>Summary to Date</th>
<th>2019 Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need to Paint</td>
<td>5,563</td>
<td>767</td>
</tr>
<tr>
<td>Hydrant Valve in Place-No</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>Hydrant Valve in Place-Unknown</td>
<td>2,081</td>
<td>234</td>
</tr>
</tbody>
</table>

Emailed Automatically on the Last Day of Month!
ArcGIS for AutoCAD

- Free Esri Plugin for AutoCAD20xx
- Connects AutoCAD to GIS Data
  - Bring in Aerial Photography
  - Parcel and Street Centerlines
- High Accuracy GPS Points!
PA1Call Tickets

- BOSS811
  - Consumes GIS Services
  - Displays Dig Box
  - Assigns Tickets based upon Logic
  - Attach Photos
  - Web-Based – Supervisors see work
  - We import the dig box into our GIS
Mapped Customers

- 139,327 mapped points
- Based upon Service Addresses
- Needs Quality Controlled
- New Customers added automatically
- This has become the basis for many projects
Work Order Management System

- Lucity Enterprise Asset Management Software
- In Progress
- Wastewater Dye Tests
- Ability to tie work and forms to Assets
  - Vehicle Accidents
  - Employee Certificates
Now it’s getting exciting

- All these systems and processes are beginning to work together
- Field and Office Staff now depend on GIS
  - Failover Environment
- Management are starting to push it further
- GIS is getting bigger
- GeoEvent Server
  - Fleet Tracking
  - SCADA
  - Meter Readings

USA-247 American Reconnaissance Satellite
Leaks and Projects Mapping
Public Relations by Committee
Importance of Communications

George Hawkins former CEO of DC Water –

“People say communications is the soft side, and I say, are you nuts?

“This is the core – if we do not have a relationship with the customers we serve, nothing else will happen. None of the big engineering, none of the big projects, none of the infrastructure improvements, none of the jobs – all of these other good things depend fundamentally on a relationship with a customer where a customer understands why they’re paying what they’re paying.”
Project: Redesign Web Page
Inspiration

http://www.cityofmadison.com/water/projects
Obstacles

- Not automated
  - We could have waited

- Many different sources of information
  - Leak reports from 3 sources
  - Planned shutdowns/upgrades
  - Engineering/construction
  - External engineers
  - Board meetings
  - Bond reports/long-term plans
Pros: Better than not depicting improvements.

Cons: Too hard to find detailed listings.
Active MAWC Projects

By clicking an icon to the left, or by scrolling down, you can access additional information about the improvement, such as cost, and in some instances, drawings, photos and other info.
Active MAWC Projects

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Avonmore Replacement Water Tank
Questions?
Sources of Information

- Engineer’s drawings
  - Internal and external engineers
- Construction updates
- Inspector photos
- Dispatchers
- Distribution and collection staff
- Foremen

Fishing from your silos to look cooperative to your customers