Vision-Enthusiasm-Action | Slide 1

(Doreen) Thank you, Matthew for the introduction. Thanks to all of you for joining us this morning.

Mark and I are part of Independence Township’s GIS team. And in Independence we have a really big GIS team. The reason is, every employee is part of our team - whether they know it or not. Tyler from GISinc is with us as well. We call him and his crew when we need some extra brain power.
About | Slide 2
(Mark) Today we want to share with you our story and our vision. We want to share how those two things shaped our thought process, and how they lead to the idea for our dashboard.

Using these raw ingredients along with publishing feature services that reference database views in our Cityworks environment, we were able create a metrics-driven data display, that not only serves as a motivational tool, but provides valuable situational awareness at a glance. Available both internally and publicly, these displays increase transparency and improve the level of and service to our community.

Finally, we want to share why this type of dashboard is important, and tell you about the benefits we have experienced.

Hopefully, you can take the insight and technical knowledge gained from this presentation back to your own communities.
The Charter Township of Independence is located in north central Oakland County, Michigan; 40 miles northwest of Detroit, about halfway between the cities of Pontiac and Flint.
**DPW | Slide 4**

(Mark) Our story begins at the Department of Public Works. They are a team of about 20, and see their job as protecting the Township’s water supply and enhancing the quality of life for our residents and visitors. The DPW manages the Township’s public infrastructure.

(Doreen) We work closely with our colleagues at the Fire Department, sharing resources whenever possible. Creating a Township-wide GIS is one place that we have been able to work together. Through this partnership, a vision for the Township’s information technology has emerged. Our vision is to use GIS as a tool to eliminate data silos, integrate systems, and create single sources of authoritative data. It’s also about giving the subject matter experts the tools they need to curate their own data. Most importantly, however, it’s about working as a team: we are better together.
Web GIS

GIS Services

Web Based Apps

Easy to use

*Embrace Change | Slide 5*

*(Mark)* Web GIS is essential to our operation and is at the core of Cityworks.

Using Web GIS, we can deliver the right data to the right people, at the right time. Most importantly, everyone has access to the most current authoritative data.

Within Independence Township, we have *fully* embraced Web GIS. We see ourselves as a *solutions* office - we create lightweight applications, focused on a specific task, for a specific audience.
ArcGIS 10.5.1 Enterprise

Cityworks 15.2

WebApps, Operations Dashboard for ArcGIS

*The Power of Where | Slide 6*

(Mark) ArcGIS and Cityworks play well together. Cityworks is able to consume GIS services and display them in a web map. These technologies are complementary. While assets are managed in Cityworks, web applications can be used to update, display, and analyze GIS data. In many ways, ArcGIS *augments* Cityworks through the use of web applications and dashboards.
Extend the Capabilities | Slide 7

(Doreen) ArcGIS and Cityworks - together - truly enable the power of where. One example is the hydrant flushing process.

Every spring and fall, our DPW flushes fire hydrants. The process involves opening and closing a number of valves in a certain order for each zone. Senior crew members know this process well, however, much of their knowledge is based on memory and previous hand written notes. Each time, the entire process must be reconstructed through discussions and pre-planning. This is often very inefficient and time consuming. In addition, asking the crew members to complete a work order in Cityworks for each of the Township’s 1500+ hydrants only compounds their frustration.
Hydrant Flushing | Slide 8

(Doreen) As GIS professionals, it is important for us to take the time to learn - and truly understand - the processes we are modeling in GIS. Our goal was to create a better understanding of the hydrant flushing process, taking the institutional knowledge of the crews and moving it into an authoritative place of record, where it could be visualized. ArcGIS is ideal for this task. We also knew it was important to maintain inspection and work order records for all of our assets, and Cityworks is our platform of choice to house and interact with this data.

(Mark) But, the question remained: How do we create a one stop shop for our crews to not only visualize the flushing process, but also easily enter their work orders? Embedding web mapping applications directly inside Cityworks is the answer. Now crews can visualize the flushing process and progress without having to leave Cityworks.

By embedding ArcGIS apps inside Cityworks, we have extended the capabilities of both platforms.
Shortly after our Cityworks implementation, we had the opportunity to partner with GISinc. They are the only company that is both an Esri Platinum Partner and a Cityworks Platinum Partner. They worked with us to develop a path forward using a spatial-minded approach that aligned well with our existing investment in GIS technologies. They are also a group of some of the most knowledgeable, organized, responsive, and enthusiastic people on the planet. They have experts in all areas of GIS, including Cityworks.
We were excited to show the progress of our Cityworks deployment and also wanted to provide justification for the expense. With this in mind - and with the help of GISinc - we decided that a quick win for us would be to develop a dashboard. We wanted to use metrics-driven data to share our excitement, create awareness, and literally display our success.
### Coming up with KPIs

#### To what percentage is Cityworks implemented?

<table>
<thead>
<tr>
<th>KPI Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Lift Stations inspected</td>
<td>on whatever schedule is needed to ensure compliance with whatever compliance requirements you have to ensure sites are 100% operational.</td>
</tr>
<tr>
<td>Number of miles of sewer lines televised and jetted</td>
<td>to ensure compliance with whatever standards are applicable.</td>
</tr>
<tr>
<td>All Sewer related vehicles have been inspected</td>
<td>with whatever safety standards apply</td>
</tr>
</tbody>
</table>

__Mark__ Having worked with the field crews, we had a very good idea of what kind of data and information they needed to support their daily work routines. The management side’s needs, however, were less clear to us. We asked our DPW Director and Township Supervisor what they would like to see in a dashboard.

They each came back with a list of possible **key performance indicators** or KPIs. It was important for them to see the number of lift stations inspected and sewer lines televised. They also wanted to ensure that all vehicle inspections were up to date. Because our Cityworks deployment was brand new, we did not have the archival data to support the requested KPIs. Our Director also wanted to know “**To what percentage is Cityworks implemented?**”, as a means to justify our investment. This gave us a really hard time, because no single **data point** can determine how much a software deployment is being utilized.
KPIs can tell a bad story if you are not ready for them

KPIs are NOT the target. They are an indicator to measure toward a goal you want to achieve

Thinking KPIs | Slide 12

(Doreen) We knew the data in our brand new Cityworks deployment could not support the requested KPIs. And displaying them would not provide an accurate picture of our team's accomplishments.

Our bosses were pushing us to create more work order templates. They also were pushing the crews to create more work orders. They were focusing in on a single metric for success: total number of work orders. But, what is a good number? What is a great number? The target just seemed to be more. Focusing on KPIs began to inhibit our performance improvement and was actually becoming toxic to our success.

(Mark) In my job as a paramedic, I recognized that KPIs are like an organization's vital signs. Looking at a single vital sign does not provide you with any direct insight into a person’s health. For example, finding that a person’s pulse rate is high does not tell you very much. A vital sign being too high or too low is just an indicator of a possible problem, and you cannot make a diagnosis on this alone. You must take into account all their vital signs. It also requires an understanding of the person’s overall health and medical conditions. The same can be said for an organization, you must look at a variety of KPIs, and have an understanding of how the organization works, in order to diagnose and correct issues within the organization.
Now we understood: using KPIs as targets, we get what we measure, and nothing else. However, if we use KPIs as indicators - what the “I” actually stands for - to identify areas in need of further investigation, they become powerful enablers of improvement. A subtle, but vitally important difference.
Remembering the Vision | Slide 13

(Doreen) We thought a lot about what makes a successful Cityworks deployment. For us, it was not about total number of work orders.

Then we took a step back and remembered our vision, and the idea of using a Dashboard as a motivational tool instantly came to mind. Our crews were not aware of just how far they have advanced in their use of technology over the last two years, and how much they had already accomplished using GIS and Cityworks. We wanted something that would show them their accomplishments and could serve as a point of pride.
The Dashboard | Slide 14

(Mark) By placing an Operations Dashboard in a prominent location - in the center of the office - we were able to create a data display that is not only informative, but is also a fun daily reminder to motivate and encourage the crews. Our Dashboard has become a place for the crews to gather, plan their day, talk about their work, learn and solve problems together.

The dashboard gives us an opportunity to display our Cityworks activities in a positive way and track our progress. With that also comes: transparency, trust and service improvement.

When a project - and everyone’s task and responsibility - is visible to the entire team, people rise to a level of accountability, responsibility and performance that doesn’t happen when lost in invisible silos.
Behind the Scenes | Slide 15

(Tyler) The Cityworks work activity information was consumed within Esri's Operations Dashboard through a series of spatial and non-spatial views. We were not able to use the eURL option, as it wasn’t licensed, so instead, we published a series of spatial and tabular views to accomplish the same functionality. These published views (map services) were then consumed within the dashboard.

A similar approach can be taken using the eURL option, which is quicker to deploy, but can sometimes lack information, as the content is comprised of only what the native, ad-hoc search capabilities expose. In a configuration like this, one might expect to use both the eURL and view options. Publishing spatial or non-spatial views takes a little more effort, but it gives the user the ability to publish Cityworks data that is either not exposed within the native, ad-hoc search mechanism, or data that requires a merging of SR/WO/Inspection information.

Publishing a data service from Cityworks using the eURL option is quick and easy; if you can write a search, you can create a service. Creating spatial views can be more complex and time consuming, but there are few limitations on what type of information that can be retrieved and published.
As mentioned earlier, we took the approach of creating and publishing views so that Cityworks data could be sent into Ops Dashboard, mainly because we didn't have the eURL option within Cityworks. To do this we created a series of views within the GIS database, added them to an MXD, and published these as map services using ArcGIS for Server. Once those were published, we added the REST URL into ArcGIS Online and proceeded from there.
Now, if you have access to the eURL functionality within Cityworks, this process is streamlined quite a bit. This approach is driven off the saved search. Simply create a saved search in Cityworks, much like you would for adding to your inbox...and once that’s done, you should see the “Service” link within the saved search page. If you click on this, you are presented with a feature service that is hosted by your Cityworks application. The URL that is shown here is what will be referenced in ArcGIS Online and consumed within Ops Dashboard.

Once you have your service URLs (whether published views or from eURL), you have to add your content in AGO. Simply use the “Add Item” dropdown and choose “From the web”. This will allow you to enter your URL, set a title, and add some tags. From here, you’ll have a resource in AGO that you can consume in Ops Dashboard.
In order to build your dashboard, you'll need to create an App within your AGO/Portal instance. In this case, you'll go to your “My Content” section, click “Create” and then create the app "Using Operations Dashboard". You’ll then be presented with some general configuration items...title, color scheme, etc. Once those are set, you can start adding your elements. Elements are the various widgets that are configured to visualize the data that you’re pushing out of Cityworks. There are a number of different elements that can be used, each with their own intended purpose and configurable settings.

Once an element is selected, you’ll prompted to choose the layer from which the element should pull the data.
Behind the Scenes | Slide 19
(Tyler) What you’re seeing here are examples of data elements that can be added: maps, charts, indicators, gauges, and lists (with or without details). All of the elements shown here were created using the same exact service, demonstrating the various ways that data coming from Cityworks can be visualized.
Building Transparency | Slide 20

(Mark) Being transparent means not only openly sharing data, but also being open about your methodology, ideas, concepts and tools. It can spark ideas in others. Sometimes an idea can be adopted and taken further, or in a completely different direction. This is success breeding success.

The construction activity dashboard created by our Building Department is a wonderful example of that. The Building Department was able to take the idea of a dashboard and use it to create a real-time picture of the Township's construction activity. Residents and Township employees now have a clear picture of current construction projects and the dollar value it generates.
Building Trust | Slide 21

(Doreen) Cityworks stores information that reflects on the crews and the individual. It records information about the work they have done and their hours on a job. Someone could easily draw conclusions and make assumptions about their overall performance using only these snippets of information. Like KPIs - the numbers do not tell the whole story.

It is important to approach technology responsibly. Our goal is to create a positive atmosphere, building trust and appreciation - not to point fingers or make judgements. By putting the dashboard in a public place and displaying data from all of our divisions, we are fostering a sense of teamwork and comradery.

As trust gets stronger, so does goal achievement, communication, and overall workforce productivity.
Improving the Level of Service to our Community

For us, it is not about choosing between Cityworks and GIS, but combining the strengths of both, that help our crews increase productivity and improve the level of service that we provide to our community.

- It’s the crew that can view their plans in the field, not having to go back to the office and search through paper archives. This alone, saves hours of work every year.
- It’s also having the ability to dispatch the closest crew member in the case of a sewer backup inside a resident’s basement.

Because crews are able to do all these things within Cityworks, the ability to create and complete work orders is at their fingertips.

Providing excellent service lets our residents know they are in good hands.

Service to the Community / Slide 22

(Mark) For us, it is not about choosing between Cityworks and GIS, but combining the strengths of both, that help our crews increase productivity and improve the level of service that we provide to our community.
Using geospatial technology we were able to empower and extend our two greatest assets - people and data.