

The graphic features a dark blue background with a large white hexagon in the center. Inside the hexagon is a stylized blue and green water drop. To the right of the hexagon are several smaller hexagons of varying shades of blue and green, some containing smaller versions of the water drop icon. The overall design is modern and technical, representing water and GIS technology.

Esri Water User Group Meeting

CA – NV – HI

Questions & Answers

1. Is there any use case, where we can leverage computer vision in the water market using GIS images?
 - Yes, this is possible. With ArcGIS Pro 2.5, [Deep Learning](#) was brought more fully into the ArcGIS Platform as a series of geoprocessing tools. You can see learn more about this topic in [this Esri video](#). The [ArcGIS API for Python](#) “[arcgis.learn](#)” module lets you use python to do you own custom scripting as well. Here is a [page](#) with some tutorials to help you get started.
2. Did HDR develop directly on the SJWD server (remotely), or did they make a local copy, develop using that, and clone the solutions back to SJWD?
 - HDR developed initial CAD to GIS setup using ArcGIS Pro on external desktops. once ready to load into the Enterprise Geodatabase and publish the full UN model we worked directly on premises and remotely on the SJWD network. We did do a Water Distribution Update where we used the Asset Package tool to export the UN (clone) and load into the new schema in a file GDB then re-load the updated network into ArcGIS Enterprise without a hitch.
 - With Pro 2.5, we now have the ability to do all migration and configuring steps in a file geodatabase. This way you can do all of the tuning before loading into an enterprise geodatabase.
3. San Juan Water: Was the AutoCAD Asset Database originally GPS located or schematic? How have the locations of water mains been identified? In other words, how were the locations of below-ground assets identified?
 - At SJWD the CAD was aligned from an older county parcel dataset slightly off from the local NAD 83 CA Zone 2 feet we wanted all the data to be standardized in. To adjust we brought in the newer parcel linework from the counties which were already in the desired coordinate system and SJWD adjusted the CAD to align. This process took a couple months, but it was of course vital to start with the data as accurate as possible. With now access to the regional Aerial Imagery SJWD can see valve covers and hydrants to adjust as needed. Stephen also has access to a high precision GPS unit to do take in to the field if any areas are determined to be misplaced.



4. I am not able to edit the geometric network using ArcGIS Pro. How did Quince resolve this issue?
 - The geometric network is created on the fly by a few Python 2.7 and Python 3.x scripts run on a nightly basis. There is no direct user interaction with the geometric network. For further details on these scripts please contact Gavin Runyon at Helix.
5. Are the easements and record drawings tied to asset database or polygonal shapefiles?
 - AT SJWD we have a subdivisions polygon layer which all the record drawings and improvement plans are linked to files saved on the web server. The location sheets for BOV's, ARV's, hydrants, meters, and individual pipelines are linked to the water device and line feature class again linking to documents on the web server. We wanted to use links instead of feature attachments to keep the overall GIS data base size smaller and perform as best as possible.
6. Interested in the structure of the project tracker - is it a point feature class with related tables, one for each project? Is there a punch list associated with each project?
 - Project tracker is a polygon feature class stored in SDE but also using branch versioning. There are no related tables associated it has thirty or so fields to capture different elements, such as developer name, dates and status for the individual projects. The district wanted to get away from having separate tables for the tracker and having one consolidated table made it much easier to set up the application widgets. Yes, there was a punch list, there are several inspections the engineering group need to do in the life of these projects. We spent a lot of time reviewing their old recordkeeping and determining what was necessary to track and some data fields that weren't necessary. The Willserve application was similar in it had its own punch list but it was combined with the process of both Customer Service and the Engineering (Inspections, Etc.) Will serve however used a point feature class so the customer service desk can place immediately.
7. You said that the Geometric Database is not necessary. Can you explain a bit more about the transition? Would it be possible to transition straight from a GDB? (sorry I have not worked with a Geometric Network yet so I don't really understand what skipping that step would mean).
 - That is correct The Geometric database is not necessary to migrate into the geometric network. We created one just to try and clean up some of the CAD disconnects using the geometric networks built in tools. The process did clean some things but wasn't necessary. Simply using the normal topology rules in a feature data set will help in the pre-clean up (do not have overlaps/gaps etc.). A few must do's before migration: make sure you have a vertex for every line connection (split not necessary), no overlapping features (you can use associations later), or duplicate vertices, these will come up as errors when you first enable the network topology.



8. If we plan to use the Esri Water Outage Solution will we need the custom Python scripts, you developed?
 - That really depends on your solution requirements. The short answer is no. Esri does deliver a functioning water outage solution that will require some configuration to work with your data model. The base solution offers decent tools for tracing, constraining, and outputting results. The amount of custom Python you'll need depends largely on how much you want to automate processes and integrate with other systems and workflows.

9. Can Eric expand on the fields he mentioned that are automatically calculated in Smart Form (flow rate etc.)?
 - When a survey is made with [Survey123 Connect](#), you can add calculations that are automatically performed based on user input. In my example, the form asked for a few parameters, such as *Hydrant A Pressure*, *Hydrant B Pressure*, and *Length of Flushing (minutes)*. The values that were input into the survey acted as variables in a pre-determined equation that Survey123 was running on the backend. With these equations, you can multiply divide, add, subtract, take a square root, and much more. The equations are great timesavers for any surveys that you are currently doing that require a field worker or office worker to do simple or complex math.
 - You can learn more about mathematical operators that are possible [here](#). To get started learning about how to use calculations in Survey123, I highly recommend [this video](#).
 - If you're new to Survey123 Connect, there are five great video tutorials on YouTube, curated by Esri, to help you get started: [Video 1](#), [Video 2](#), [Video 3](#), [Video 4](#), and [Video 5](#). They are only a few minutes each.

10. Are the services hitting the SQL database directly or a replicated database?
 - For SJWD the services are hitting the SQL database directly no replicas used.

11. Do software version updates have any observed ill effect on the software integration?
 - No, not any ill observed effects yet. Always best practice to setup a staging environment to test first before any major upgrades.



12. Do you have the Willserve Reviewer and Project tracker tied to a document management system?
- We do not currently, they are intended to be collaborative tools that live permanently in the enterprise database to be retrieved when needed. Customer Service uses the output reports generated from Willserve for their own CIS/document management uses.
13. Is the COVID-19 Business Continuity Solution available to deploy on ArcGIS Enterprise. (asking because AGOL has limited licenses and our portal has unlimited, so not all personnel could access on AGOL)
- Yes! The [Coronavirus Business Continuity Solution](#) is available for ArcGIS Enterprise. Take a look under the ArcGIS Enterprise heading on [this page](#) to learn how to get started.
14. Is Cityworks using the same Geodatabase as the Utility Network?
- Yes
15. If your data has topology issues, such as disconnected water mains, will the shutdown application still run?
- To ensure the best and most accurate results for any tracing on a network (Utility Network or Geometric Network), you will want to ensure that all mains are properly connected/snapped together, otherwise, the trace will yield incorrect results.
 - To clarify, it is possible that the trace will still work on a system with disconnected mains, but this can give you misleading or wrong results. Accurate input data leads to accurate results.
16. Eric: How long does it take to configure the COVID-19 Business continuity solution components?
- The [Coronavirus Business Continuity Solution](#) is one of the fastest Esri solutions that I've ever deployed (with its default settings). If you're using ArcGIS Online or ArcGIS Enterprise, it deploys in a few minutes. All of the surveys are made for you and already feed into the dashboards. All you need to do is (1) load in your facility locations and (2) load in your personnel information. Both of these steps can be performed by editing the solution's provided CSV tables. If you manage a larger utility (more staff/facilities), then the data entry might take a while longer. The steps used to set up the survey can be



found [here](#). Make sure you follow the directions under the appropriate heading of ArcGIS Online or ArcGIS Enterprise.

- Here's a [GeoNet thread](#) with some additional information to help you get the solution up and running.
- Please note that if you want to heavily configure/alter the default surveys, dashboards, or ArcGIS Hub pages, then the deployment time will increase.

17. Is Project Tracker a third-party solution?

- No, it is an Esri Web app Builder using the dashboard theme. Web App builder allows for editing while the dashboard theme is useful for providing quick metrics I.E. active project count front and center.

18. How does the Esri solutions shown work with work orders from Cityworks?

- As of now it is a one-way process from the GIS Rest Service into Cityworks. Our approach to bring the Cityworks workorders back into the Esri Platform would be to use ArcGIS Insights.

19. For the hydraulic model integration to SQL: Is it a two-way operation where when model finds continuity errors the edits go back to SQL or is it only one way from the GIS to the model?

- With the InfoWater Pro Gateway, you can decide to use two way or one-way syncing. For us we wanted to use one way from the GIS Data to the water model in order not to get potentially crossed up with conflicting edits.

20. Overall, what was the biggest challenge to incorporating CMMS and Customer Service (billing databases)?

- Few things come to mind during this process: creating a database view specifically for GIS use is critical there are hundreds of individual tables in the Tyler CIS. We spent a lot of time determining what was needed without getting overboard. The second critical piece is making sure you have a solid field to link the records together using a relationship class. For our project we used the parcel address to do a spatial join to the meters and then even adjusting to what the exact CIS address field had, because it was easier to adjust in GIS than to have Customer Service adjust the Tyler address tables. The last challenge was to create a script to do regular updates. When creating a relationship class both tables need to be in the same database. Then you have to have



to enable editor tracking (added fields) and versioning to publish as one feature service. Getting that to all happen takes time to setup.

21. When importing data from CAD to the Utility Network, how much topology error cleaning are you doing? Have you defined topology rules in your standards for approving a drawing submittal?

- We talk about this in a previous question, but it really wasn't hard to do the first step is to export the CAD into a File Geodatabase run some basic topology rules to get the lines to snap where possible. If the CAD is in very bad Shape possibly bring it in to an intermediate geometric network (could help, but optional). Once everything is loaded in and topology enabled in the Utility network there are built in rules that help with the overall data quality while editing. Once in the UN, topology is determined by the network rules (edge-junction rules for example). These rules are customizable if you want to add or remove any individual rule you can do so at any time.

22. I've never built a geometric network, and I use ArcGIS Pro exclusively. Has anyone built the utility network from scratch?

- Yes, we have built the SJWD from CAD data and brought it into the UN without the geometric network. We tried loaded into a geometric just to try and clean up disconnected lines but wasn't necessary. A good approach might be to load in sections of your systems one at a time to become comfortable. I even recommend testing by setting up your own UN modeling your home irrigation system. I did and it taught me a lot about some of the special subnetwork controller connections and pressure zone setup.

23. Before Esri, how did you handle outages? How much money or time spent has been saved by using Esri?

- Helix Water's response – We created our first outage management solution on our previous GIS system and had been using it for nearly 15 years. That solution was built with communication and workflow in mind. This previous solution largely influenced the design of our Esri solution. Our outage solutions have saved countless hours for our operations and customer service staff over the years.



24. Can you tell me about the "Water Treatment Network Model"?

- The Water Treatment Network Model is something we at HDR are working on with Esri and SJWD, it is not an official UN model, yet. For the current project we used a series of GIS features and related asset tables to achieve the asset management hierarchy needed in Cityworks (Process Area, Sub area, Asset). In the near future we would like to take many of the concepts of the Asset Management hierarchy and plug into the utility network by adjusting the water distribution information model to add in missing components such as Motors, Control Panels, Chlorinator, Motor Operated Valve to name a few. And create a Process Area Tier similar to pressure zones where all components in a back wash system can be associated and traced. With the UN being in 3D having the true dimensions and direction reflect in the GIS model is possible. Be happy to go over progress anytime with you.

25. What process is used/needed to bring CAD into GIS directly?

If you are trying to bring in design drawings

- Make sure CAD is lined up to real world coordinates as possible.
- Drag and drop into an active ArcGIS Pro Project.
- If necessary, use georeferencing tools to align CAD with an undefined Coordinate system.

If you are trying to Migrate your water distribution CAD line work into GIS.

- Make sure CAD is lined up to real world coordinates as possible.
- Export CAD into a File Geodatabase.
- Use Cross walk tables in excel to determine fields origin to destination in the Water Information Model.
- Use the Append tool (data loader) to load in intermediate FGDB into desired final schema.