

Exercise 3: Explore an operations dashboard

Technical note

1. You will make full use of web mapping services throughout this course. You will need a robust web connection to complete this exercise.
2. Use the latest version of Google Chrome, Mozilla Firefox, Apple Safari, or Microsoft Edge. Other web browsers may not display your maps and apps correctly.

Note: For information on supported web browsers for ArcGIS Online, go to ArcGIS Online Help:
Supported browsers (<https://links.esri.com/SupportedBrowsers>).

Software requirements

- An updated web browser

Introduction

In the Section 1 video *BIM-GIS use cases for AEC projects*, as well as David Reeves' *The benefits of sharing data* video in this section, you saw the example Construction Logistics Dashboard using ArcGIS Dashboards. In this final exercise, you will explore this dashboard, which was created to help with construction logistics of a large-scale project. You will learn how an operations dashboard can provide a comprehensive operating picture of an AEC project throughout its life cycle.

A dashboard is a view of geographic information and data that allows you to monitor events, make decisions, inform others, and see trends. Dashboards are designed to display multiple visualizations that work together on a single screen. They offer a comprehensive view of your data and provide key insights for at-a-glance decision-making. There are many reasons to create or use a dashboard, and there are many types of dashboards that you can create. Dashboards allow you to do the following:

- See—in one view—all the data that you need to be informed or to make decisions for your project.
- Monitor the most important information about your day-to-day operations.
- Ensure that all your colleagues are focused on the same goal through viewing and using the same information.
- Monitor in real time the health of a project, product delivery, organizational team, or logistics.
- Create a personalized view of a larger set of data to show all the metrics that matter to you or your team.

The type of dashboard that you need is based on who the intended audience is and what type of information that you want to convey. Some dashboards are operational in nature and are designed to tell you what is happening now while matching the quickly changing nature of incidents, events, and other activities. Some dashboards are more strategic and are ideal for executives and other senior managers interested in monitoring their organization's key performance indicators (KPIs) or other metrics. Some dashboards are more analytical and are used to identify data trends or other interesting data characteristics. Lastly, some dashboards are simply informative and are used to tell a story with the data.

Note: The exercises in this course include View Result links. Click these links to confirm that your results match what is expected.

Scenario

The construction project of Building E on the Esri campus in Redlands, California, is more than halfway complete. The project team created the Construction Logistics Dashboard to monitor progress and job status of utility inspections. You will explore this dashboard so that you can report the progress to stakeholders and the overall state of the project and job site.

Estimated completion time: 20 minutes

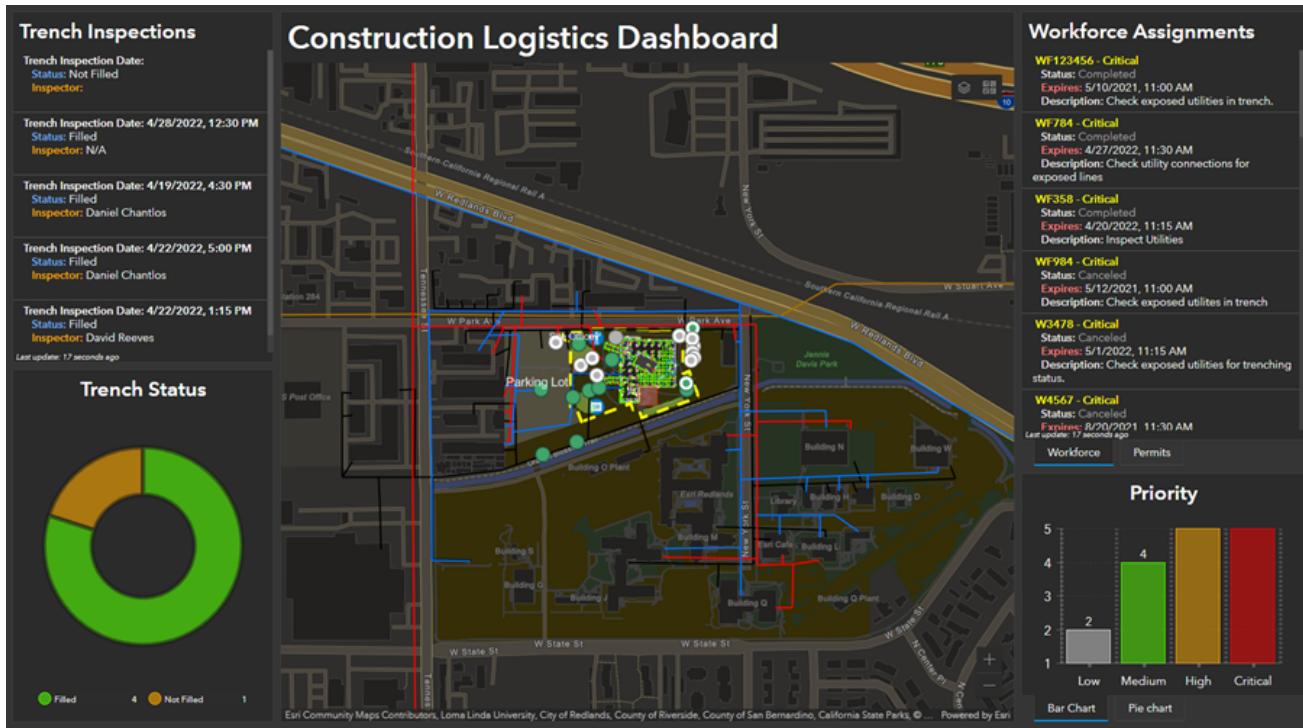
[Expand all steps](#) ▾

[Collapse all steps](#) ▲

- Step 1: Examine CAD features in a dashboard

Dashboards are configured to put multiple sources of information on a single screen. The importance of different pieces of information in a dashboard may vary by user. Therefore, many dashboards are configured to allow users to toggle layers on and off so only the information most important to the user is displayed. Control over the presentation of this information provides for quick and easy assessment of your AEC project. In this step, you will explore data from a CAD file of the Building E construction site in a Construction Logistics Dashboard.

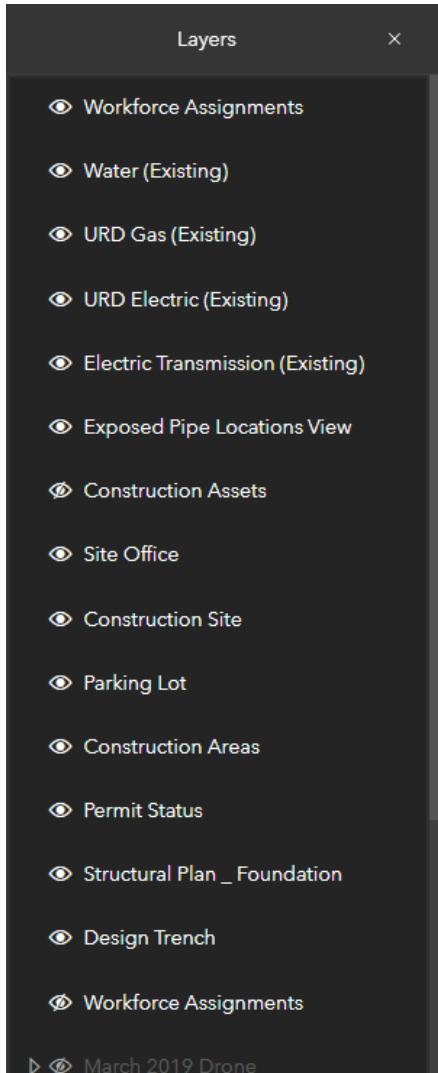
- a Click Construction Logistics Dashboard to open this dashboard in your web browser.



*Step 1a***: Examine CAD features in a dashboard.*

The dashboard contains a number of different elements, including a map of the Redlands, California area and the Building E job site. You can control how this map is visualized by configuring the visibility of the layers in the map.

- b In the map element, click the Layers button to see a list of layers in the map.



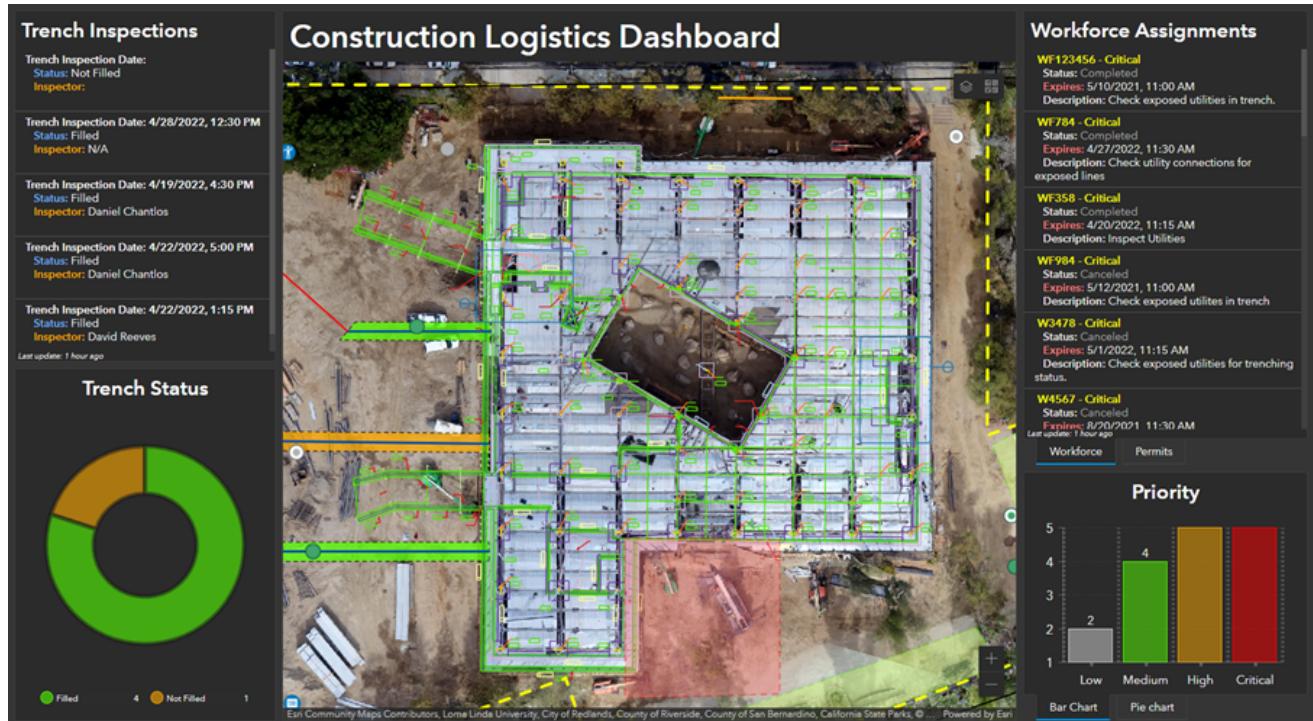
*Step 1b***: Examine CAD features in a dashboard.*

- c On your own, in the Layers window, click the Hide Layer button  and Show Layer button  on several layers to see how the GIS and CAD layers are represented.

You can manually control which GIS and CAD data are shown and hidden as hosted feature layers, but this map in the dashboard is set so that visibility of individual layers are shown or hidden based on the scale and adjust automatically. In other words, as you zoom in and out, the visibility of certain layers changes.

Hiding and showing Water (Existing), URD Gauss (Existing), URD Electric (Existing), and Electric Transmission (Existing) are the best place to start at the present map scale. GIS and CAD data on the construction site may be difficult to discriminate at this scale without inspecting any configured pop-up attributes. After examining the GIS utilities layers, you can zoom in to explore the Building E construction site.

- d Close the Layers window.
- e In the map, zoom in until you see the imagery of Building E appear.

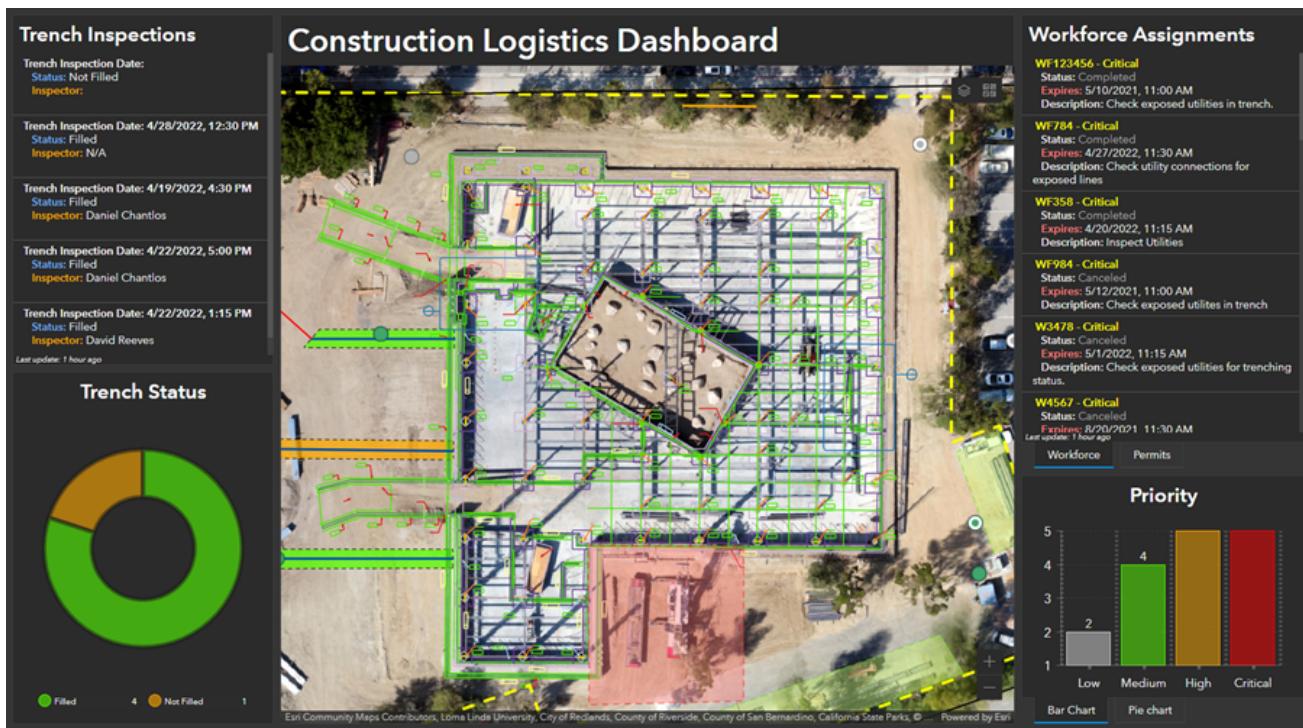


*Step 1e***: Examine CAD features in a dashboard.*

- Hint

You can use the scroll wheel on your mouse or the Zoom In button  and Zoom Out button  in the bottom-right corner of the map.

- f In the map element, click the Layers button .
- g In the Layers window, scroll down and hide all drone layer groups.
- The November 2019 drone imagery shows a later phase of construction and thus obscures some of the foundation features visible during the early stages of the Building E construction.
- h Show the September 2019 Drone layer group.
- i Close the Layers window.



Step 1i***: Examine CAD features in a dashboard.

In addition to the GIS layers for utilities, this map also includes the CAD data for the foundation of Building E. ArcGIS Pro reads CAD files as GIS-formatted datasets to add them to maps and scenes. This data can then be shared to ArcGIS Online as hosted feature layers and incorporated as a layer in a map element in a dashboard. In most maps, there is little to no visual distinction between CAD and GIS data when they are combined in a map. It is up to the map or dashboard creator to communicate to the user that certain layers originate from CAD data. CAD data can sometimes be distinguished by their file extensions (DWG, DGN, DXF) if it is included as an attribute of the hosted feature layer. This context can be helpful when viewing the built and geographic environments for the project.

In this example, the CAD data attributes are included as attributes of the hosted feature layer, and the map and dashboard are configured to show this attribute in a pop-up.

- j On your own, zoom in to visually examine some of the CAD elements.

You can view the attributes of these CAD data in a manner similar to how you can view the attributes of the GIS data.

- k In the map element, zoom in to the southwest corner of the foundation.

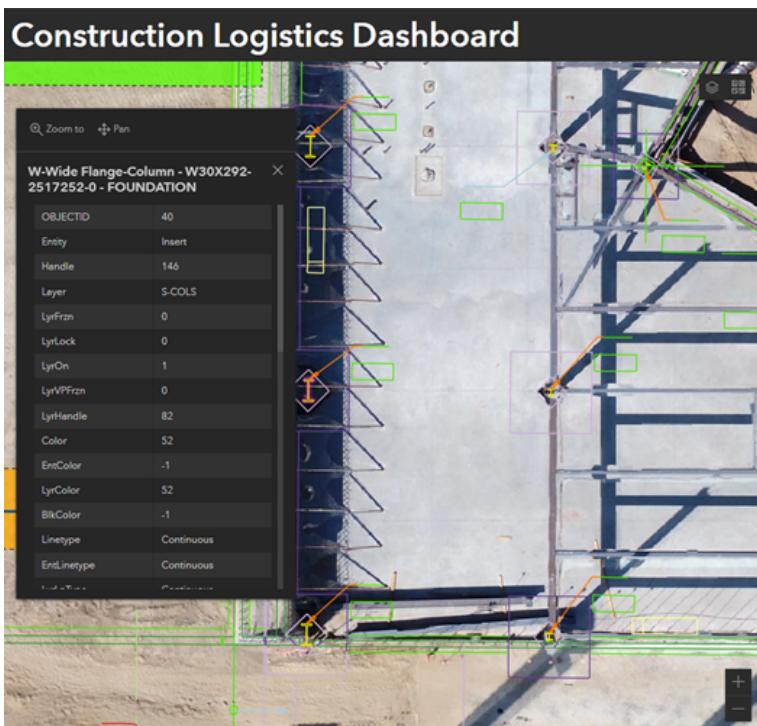
- l Click the Wide Flange Column symbol to select it, as indicated in the following graphic.

Construction Logistics Dashboard



A pop-up opens with the attributes for this particular CAD element.

- m Review the information in the pop-up.



*Step 1m***: Examine CAD features in a dashboard.*

What is the name of the CAD file that this feature is drawn from?

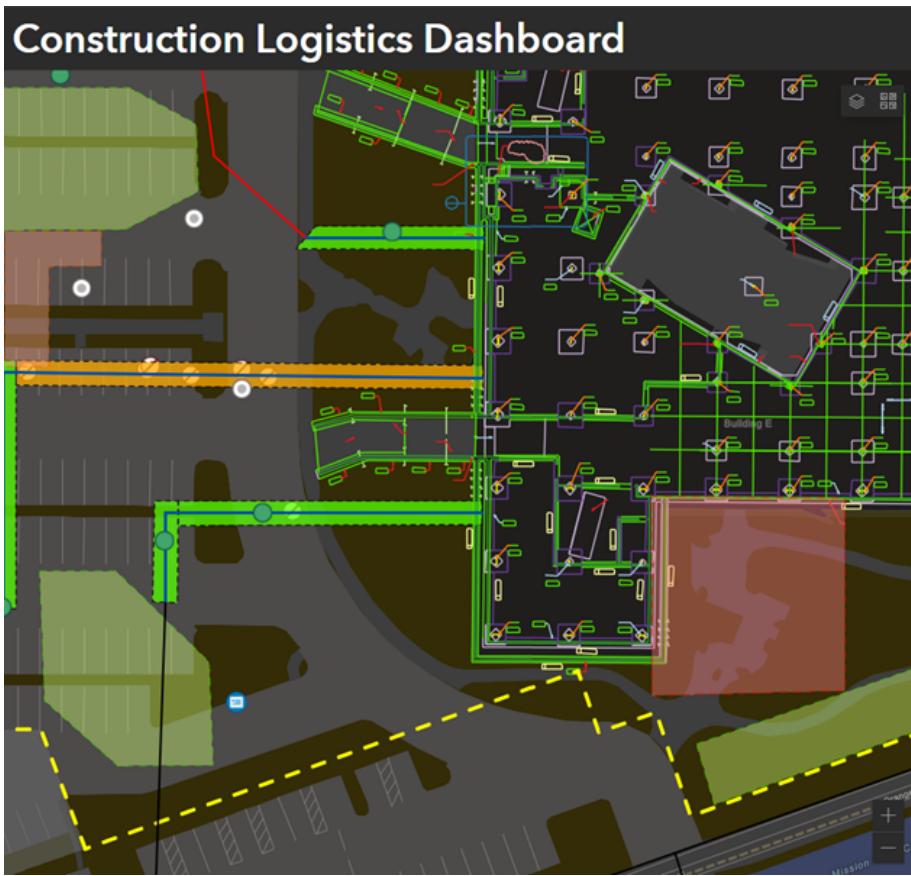
- Answer

This feature is in the Structural Plan - 0 - FOUNDATION.dwg CAD file.

- n Close the pop-up.
- o On your own, explore other GIS and CAD features in the map.

- Hint

You can hide all the drone imagery layers to see the GIS and CAD features more clearly.



*Step 1o***: Examine CAD features in a dashboard.*

For more information on CAD data and its use in ArcGIS Pro, go to ArcGIS Pro Help: What is CAD data and ArcGIS Pro Help: CAD data as ArcGIS Pro layers.

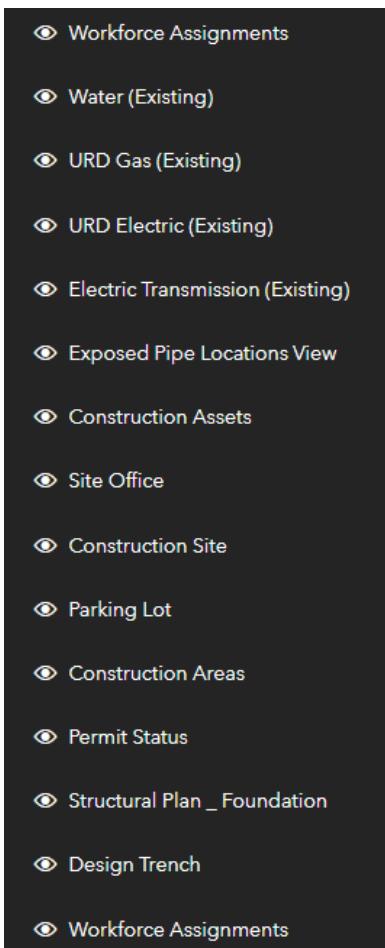
For more information on CAD data properties and essential terminology when working with CAD in ArcGIS Pro, go to ArcGIS Pro Help: CAD data file properties and ArcGIS Pro Help: Essential CAD vocabulary.

Now that you have explored some of the features in the map, you can see the value of integrating CAD and GIS throughout the project life cycle. In the next step, you will explore GIS features in the dashboard.

- Step 2: Explore GIS features in a dashboard

In this step, you will explore the GIS layers in your map and see the relationship to other elements within the dashboard.

- a In the map element, click the Layers button .
- b If necessary, hide all the drone imagery group layers.
- c Show all the GIS and CAD layers.



*Step 2c***: Explore GIS features in a dashboard.*

Note: There are two Workforce Assignments layers, so be sure that you show both of them.

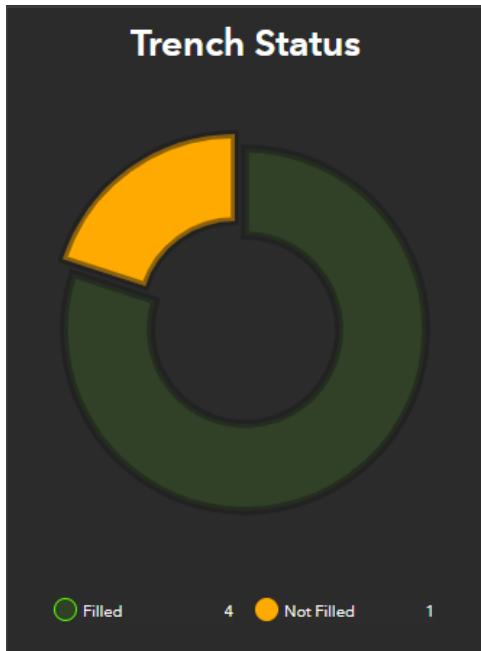
- Close the Layers window.



*Step 2d***: Explore GIS features in a dashboard.*

Dashboards are composed of configurable elements, such as maps, lists, charts, gauges, indicators, and tables. In this dashboard, the left side elements contain information on trench inspections and their status. Next you will explore the features related to these trench inspections.

- e On the left side of the dashboard, in the Trench Status element, click the Not Filled section of the ring chart.



*Step 2e***: Explore GIS features in a dashboard.*

The Filled section of the ring becomes subdued, and the Not Filled section becomes highlighted. In addition, the four Filled trenches in the map are disabled—that is, the visibility is turned off for those features.

- f In the map element, click the Not Filled trench.



*Step 2f***: Explore GIS features in a dashboard.*

Note: When you point to one of the chart elements, a pop-up with additional information about the data becomes visible.

?

Is anyone assigned to inspect this trench or is there a day when it is set to be filled? Why or why not?

- Answer

Because these attribute fields are empty, at this point in the project, no one is assigned to inspect the trench, and there is not a date set for it to be filled. The owner of this dashboard, and of this data, can update this information when the inspector and date are set.

- g Close the pop-up.
- h On the left side of the dashboard, in the Trench Inspections element, click the list item for Trench Inspection Date: 4/19/2022, as indicated in the following graphic.

Trench Inspections

Trench Inspection Date: 4/28/2022, 12:30 PM
Status: Filled
Inspector: N/A

Trench Inspection Date: 4/19/2022, 4:30 PM
Status: Filled
Inspector: Daniel Chantios

**Trench Inspection Date: 4/19/2022, 4:30 PM
Status: Filled
Inspector: Daniel Chantios**

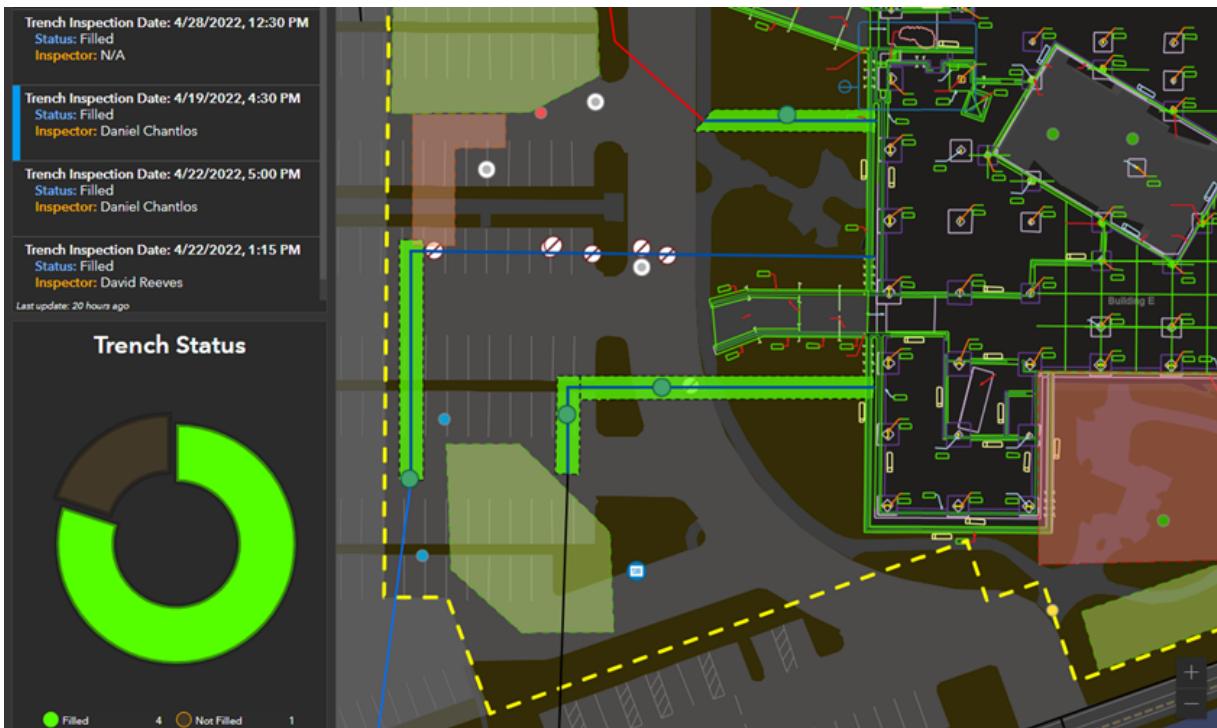
Trench Inspection Date: 4/22/2022, 5:00 PM
Status: Filled
Inspector: Daniel Chantios

Trench Inspection Date: 4/22/2022, 1:15 PM
Status: Filled
Inspector: David Reeves

Last update: 20 hours ago

This trench is a filled trench, and because you are only showing the Not Filled trench in the map, this trench is hidden in the map. However, clicking this feature in the element activates a flash highlight of the feature in the map. You will need to turn the trenches with the Fill attribute on to select this feature in the map.

- i In the Trench Status element, click Filled on the ring.



*Step 2i***: Explore GIS features in a dashboard.*

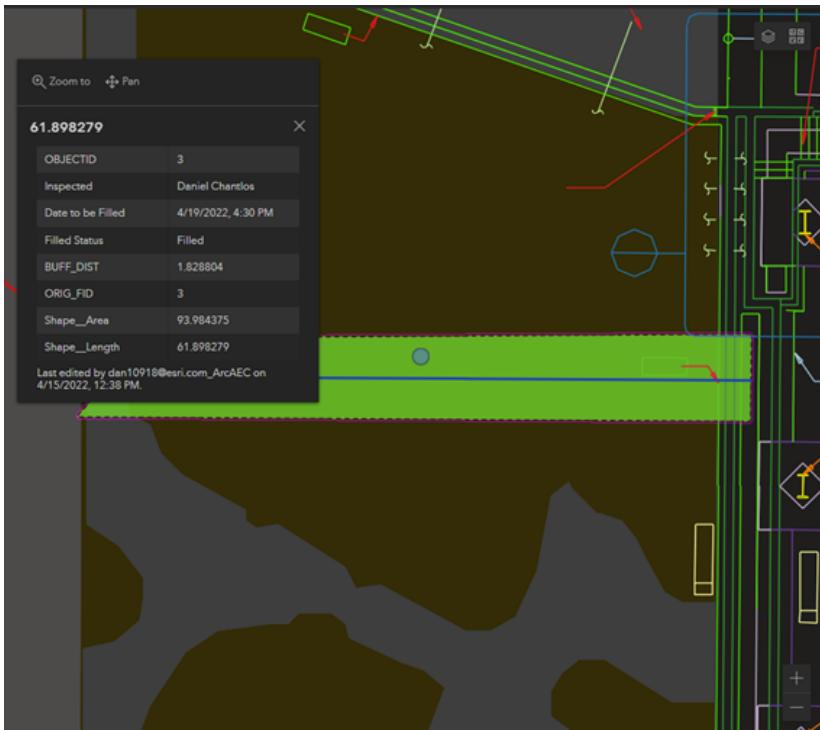
- j Click this portion of the trench and examine the pop-up.

- Hint

Click only the green portion of the trench polygon feature and not the exposed pipe line feature.

You will notice that the information in the Inspected field, the Date To Be Filled field, and the Filled Status field are represented in the Trench Inspections element.

- k In the pop-up, click Zoom To .



*Step 2k***: Explore GIS features in a dashboard.*

- | Close the pop-up.

The GIS and CAD layers in your map provide a visual link to both the natural and built environments. Because these layers have attributes, their information can be linked to other elements in your dashboard. In the next step, you will examine another type of data shared to ArcGIS Online or ArcGIS Enterprise that can be incorporated into your dashboard.

- Step 3: Examine a list element in a dashboard

The right side elements of this dashboard also contain information related to the construction project. The Workforce Assignments list includes information about project assignments and their priorities that has been shared from ArcGIS Workforce. ArcGIS Workforce is a mobile solution that uses location-based decision-making for better mobile workforce coordination and teamwork. It is composed of a web app used by project administrators and dispatchers in the office and a mobile app used by mobile workers on their devices in the field. These assignments, like other information available in ArcGIS Online or ArcGIS Enterprise, can be easily shared to a dashboard.

For more information on ArcGIS Workforce and how it can help transform your AEC project coordination, go to [ArcGIS Workforce Help: ArcGIS Workforce FAQ - General](#).

In this step, you will experience the benefits of integrating ArcGIS Workforce with ArcGIS Dashboards.

- a On the right side of the dashboard, in the Workforce Assignments element, on the Workforce tab, scroll down in the list and click WF6754 - High to select this assignment, as indicated in the following graphic.

Workforce Assignments

WF876 - High

Status: Assigned

Expires: 4/30/2022, 11:15 AM

Description: Check area for safety concern

WF3456 - High

Status: Assigned

Expires: 5/13/2022, 1:59 AM

Description: Check Site

WF6281 - High

Status: In Progress

Expires: 5/14/2022, 1:59 AM

Description: Check area for construction notes

WF6754 - High

Status: Completed

Expires: 5/18/2022, 11:45 AM

Description: Check the laydown area for saftey concern

30045 - High

Status: Assigned

Expires: 7/30/2022, 12:15 PM

Description:

WF567 - Medium

Status: In Progress

Expires: 5/15/2021, 12:59 AM

Description: Utility Inspection

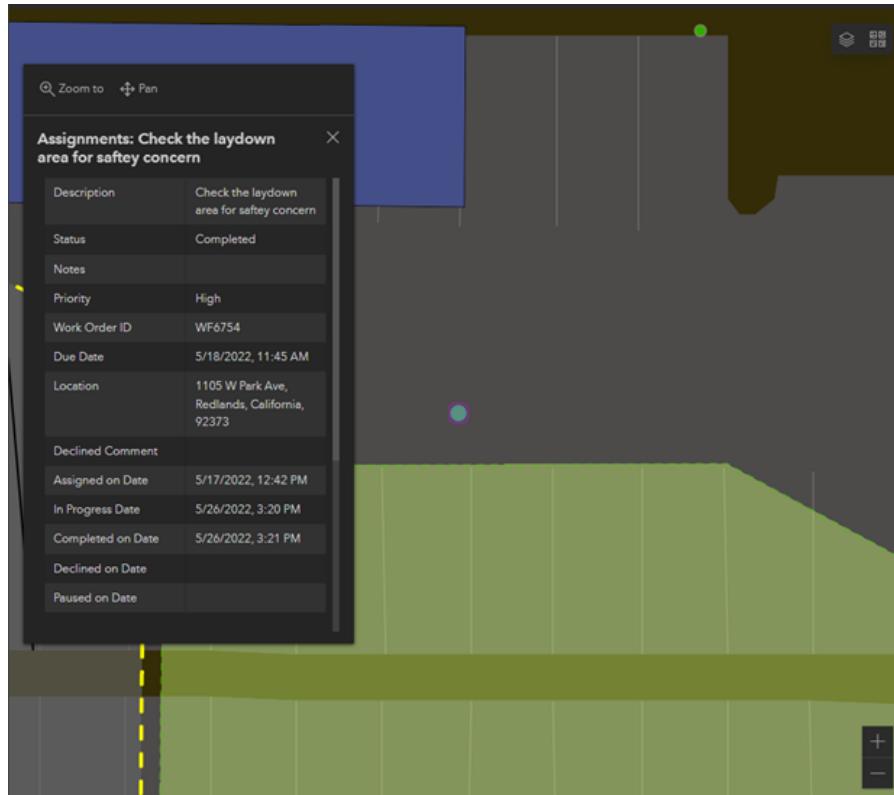
Last update: 21 hours ago

Workforce

Permits

In the map element, a new pop-up opens.

- b In the pop-up, click Pan .



*Step 3b***: Examine a list element in a dashboard.*

- c Scroll through and review the information in the pop-up, and then answer the following questions.



Did the inspector meet the required work order deadline?

- Answer

No; the due date is listed as 5/18/2022 by 11:45 a.m. (EDT). The examination was completed on 5/26/2022 at 3:21 p.m. (EDT).

How much time did the assigner allow for this task from time of assignment to due date?

- Answer

The assigner allowed for less than 24 hours. The task was assigned on 5/17/2022 at 12:42 p.m. (EDT), and the due date was almost 23 hours later on 5/18/2022.

Images and other information from the field can be included as part of the assessment from the assignee in the field.

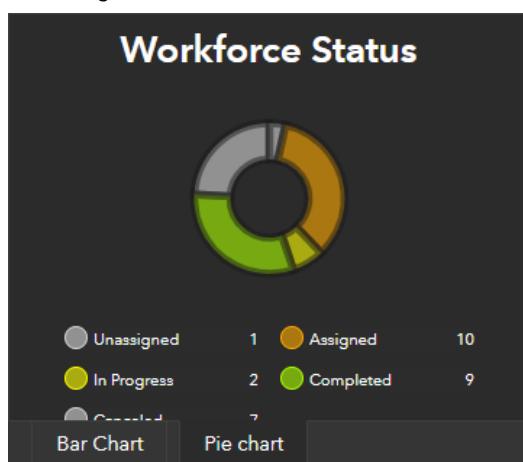
- d In the pop-up, scroll down and click Photo1.jpg.

This image of the location (laydown area) was uploaded by the inspector and shared in the dashboard so that others can see area in question. Not only has this assignment been marked as completed, but the safety concern—or what was left of it—has documentary evidence with a date and time stamp to show that it was completed and verified.

- e Close the pop-up.

On the right side of the dashboard, the Priority bar chart tab shows a breakdown of the priority of the different assignments in the construction project. There are various ways to breakdown these Workforce assignments.

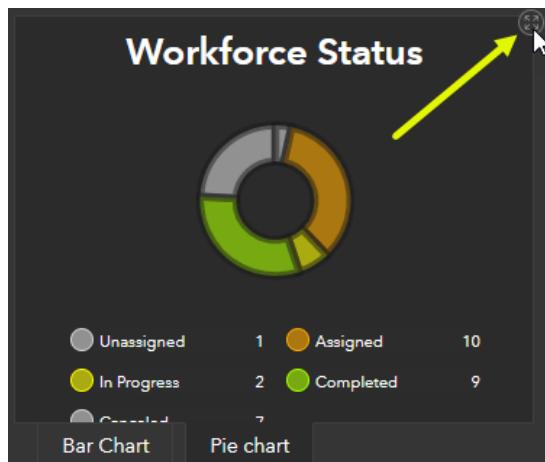
- f On the right side of the dashboard, below the Priority element, click the Pie Chart element tab.



*Step 3f***: Examine a list element in a dashboard.*

This chart provides stakeholders with a quick breakdown of how many tasks are unassigned, in progress, and so on. You can expand the chart to make it easier to read.

- g Point to the upper-right corner of the Workforce Status pie chart tab and locate the Expand button , as indicated in the following graphic.

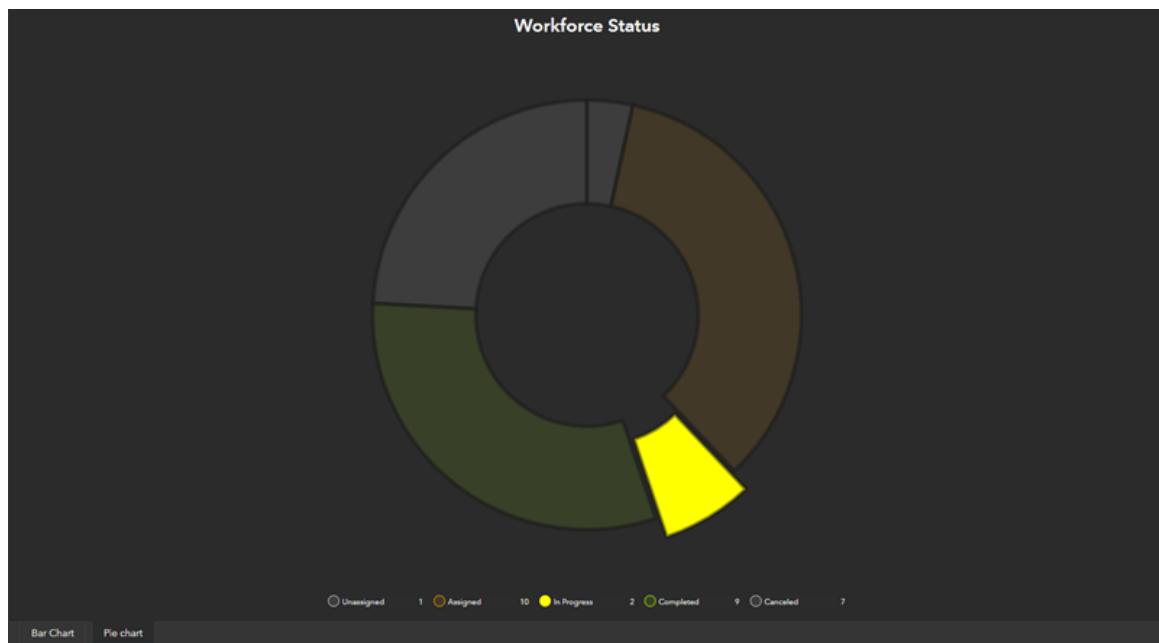


- h Click the Expand button to expand the chart.

The pie chart expands to fill your web browser.

You can interact with this chart on its own in a manner similar to when it is shown with the other elements of the dashboard.

- i Click the In Progress section of the ring pie chart.



*Step 3i***: Examine a list element in a dashboard.*

Pointing to a section gives you the count as well as the percentage of the overall tasks.

? What percentage of all the tasks are classified as In Progress?

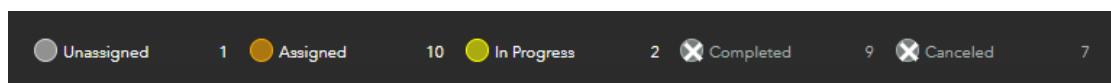
- Answer

6.9% of all the projects fall into the In Progress category.

- j Click the In Progress section of the ring pie chart again to deselect it.

You can also exclude certain categories from your project status assessment. If you only want to see and evaluate the outstanding assignments, you can remove those from your calculation.

- k Below the chart, in the legend, click Completed and click Canceled.



*Step 3k***: Examine a list element in a dashboard.*

Note: An X appears in these two categories now, showing that they are excluded from the calculations of project status assessment.

Now you can provide stakeholders with a more realistic statistic on how many working assignments are in progress.

? What percentage of tasks are classified as In Progress based on only the in progress, assigned, and unassigned projects?

- Answer

15.38% of the combined assigned, in progress, and unassigned (that is, currently working projects) are In Progress.

- l Point to the upper-right corner of the Workforce Status pie chart tab and click the Collapse button  to collapse the chart.

The Workforce Status pie chart tab is now docked with the dashboard again. In the next step, you will explore another one of the elements in this dashboard.

- Step 4: Explore tab elements in a dashboard

You can also include information on permits or other relevant information in your dashboard and attach them for your stakeholders to see. In this step, you will examine another tab in this dashboard that contains information related to active permits for the construction project.

- a On the right side of the dashboard, below the Workforce Assignments element, click the Permits tab, and then examine the list of active permits assigned to this project.

The screenshot shows a dark-themed dashboard section titled "Active Permits". It lists five active permits:

- Planning Limits Permit #P856**
Approved: 10/2/2018, 10:15 AM
Expires: 12/31/2019, 5:45 PM
Inspection Status: Re-inspection
- Other Permit #CST2022b**
Approved:
Expires:
Inspection Status: Not Started
- State Operating Permit Permit #S435**
Approved: 10/2/2018, 1:00 AM
Expires: 11/22/2019, 1:00 AM
Inspection Status: Re-inspection
- Construction Permit #CST2020UC**
Approved: 7/24/2018, 1:00 AM
Expires: 12/31/2020, 1:00 AM
Inspection Status: Complete
- Individual Permit #CST2000ID**
Approved: 6/12/2020, 1:00 AM
Expires: 11/30/2020, 1:00 AM
Inspection Status: Re-inspection

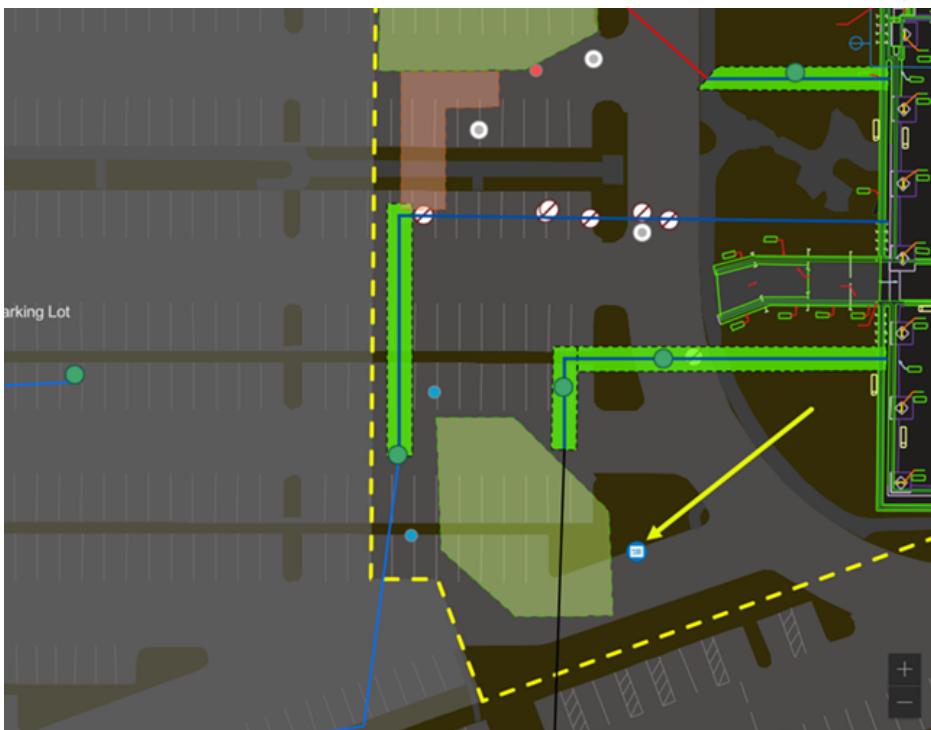
At the bottom left, it says "Last update: 23 hours ago". At the bottom right, there are tabs for "Workforce" and "Permits", with "Permits" being the active tab.

*Step 4a***: Explore tab elements in a dashboard.*

Note: Depending on your time zone, your dates and times may vary slightly from the preceding graphic.

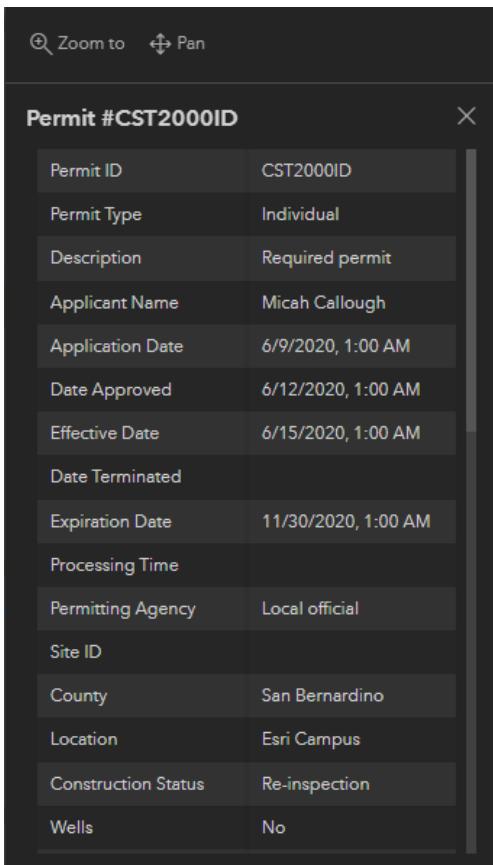
While there are five permits associated with the construction project, only two are shown in the map as GIS points.

- b If necessary, in the map element, navigate to the southwest area of the construction site.
- c Click the Permit point symbol, as indicated in the following graphic.



A new pop-up opens for Permit #CST2000ID. You can see some information for this permit on the Active Permits tab, but more detailed information is available in the pop-up.

- d Review the information in the pop-up.



*Step 4d***: Explore tab elements in a dashboard.*

- e Scroll through the pop-up to examine the various attribute fields, and then answer the following questions.

? What is the expected or scheduled inspection date?

- Answer

The expected or scheduled inspection date is 7/1/2020. For this example, all times indicate 1:00 a.m. (EDT), which is most likely a standard set by default when the permit

was assigned. If a certain time is necessary, that information can be correctly accounted for at the time of creation.

?

This permit is for a re-inspection during construction. What types of things do not need to be part of this inspection?

- Answer

Wells, Surface Water Management, Discharge Structures, Underdrain Filters or Exfiltration Trenches, Storage Areas for Treatment and Attenuation, System Grading, Diversions Conveyance Easements, and Wetland Mitigation or Restoration Areas do not need to be a part of this inspection.

?

Is there a permit condition letter on file?

- Answer

Yes, per the value in the field named Permit Condition Letter; there is also a URL field available as an attribute. If certain documents are available, inspection or maintenance staff can log and assign these documents using this URL field. However, no document is linked to this permit.

- f Close the pop-up.
- g On your own, explore other the elements and aspects of this dashboard.

Try experimenting with various layer combinations, different drone images, or even include different basemaps. You can discuss your thoughts about how best you could use a dashboard in your AEC project in the Forum for this section using the **#DashboardDiscussion** hashtag.

- h After you have completed your explorations in the dashboard, close your web browser.

In this exercise, you learned how GIS can help support the Operate phase of an AEC project, and you saw several ways in which GIS and CAD data can be deployed in an ArcGIS Dashboard.